Energy Efficiency and Renewable Energy in Florida

For the Florida Energy and Climate Commission

By

The Florida Energy Systems Consortium

Dr. Julie Harrington, Director
Dr. Bassam Awad
Zafar Siddiqui
David Glassner
Stephen Muscarella
Center for Economic Forecasting and Analysis (CEFA)
Florida State University

Ted Kury, Director, Energy Studies
Achala Acharya
The UF Public Utility Research Center (PURC)
University of Florida

Erik Sander, Associate Director
The Florida Energy Systems Consortium (FESC)
Jack Sullivan Jr.
Dr. Aster R. Adams

March 22, 2010

Acknowledgments:

The authors would like to thank the Director of the University of Central Florida Venture Lab, Kirstie Chadwick, and the Director of the University of Florida Office of Technology Licensing, David Day, for their assistance relating to venture capital (VC) companies in Florida. The authors would like to extend thanks to Sena Black, of Enterprise Florida, for providing information on Florida's Opportunity Fund. In addition, the authors are grateful to Mark Futrell and Walter Clemence, of the Public Service Commission (PSC), and to Buck Martinez, of Florida Power and Light (FP&L), for providing clarification on issues relating to Florida.

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Introduction

Clean energy is the future. Due to increasing environmental concerns, fluctuating fossil fuel prices and rising public awareness and interest in renewable energy, both globally and domestically, countries, states and municipal governments, and private and non-profit entities are trying to steer the momentum of economic development towards cleaner and renewable sources of energy.

Florida, like other US states, is also in a transition stage of how to best plan to make the shift from traditional energy resources to cleantech[1]. However, the production of renewable energy is currently more cost intensive than conventional energy production methods with using fossil fuels that are more readily accessible and integrated into the current energy market, although certain renewable energy fields such as photovoltaic are quickly approaching grid parity in some parts of the country. As such, in order to increase the amount of renewable energy sources, incentives and subsidies must be used. Sales tax exclusions on materials for hydrogen cars, investment tax credits and various other monetary incentives are used to attract more activity to the market of renewable and clean energy.

To truly estimate the impact of any regulation on energy production, all possible aspects must be examined. The policy enacted will dictate how the market responds. The limitation of any system trying to increase investment and activity in the renewable energy sector is how well they are supported by market powers. The possible options at present are to continue on the path of monetary and tax incentives, create a state Renewable Portfolio Standard (RPS), enact a Feed-in-Tariff[2], and various other programs. Each one of these options is specialized to varying technologies and outcomes.

This study aims to provide a framework or roadmap for the transition to clean and renewable energy sources, and energy efficiencies, in line with market driven forces. We conduct a comprehensive review of almost all existing statutory incentives supporting the deployment of energy efficiency and renewable energy in Florida followed by a discussion of effective mechanisms to overcome barriers to commercialization and project finance, and finally, with an analysis of the economic impact of a state renewable portfolio standard. In

[1] Cleantech definition: knowledge-based products and services that optimize the use of natural resources while reducing ecological impact and adding economic value through lowered costs or improved profitability. See further description on page 10, and in the Barriers to Commercialization section of this report.

[2] The City of Gainesville has implemented a Feed-In--Tariff. Other states include Hawaii, Illinois, Indiana, Maine, Massachusetts, Michigan, Minnesota, New Jersey, New York, Oregon, Rhode Island, Virginia, Washington and Wisconsin. (http://www.nrel.gov/docs/fy09osti/45549.pdf)

conclusion, this project aims to provide a necessary foundation or baseline for the next step in renewable energy and energy efficiency strategic planning and implementation, along with some suggestions and recommendations.

The report begins with providing an overview of the definition and description of renewable energy and cleantech, in general, with a brief section on the current status of clean energy in Florida. After this introductory section, the main body of the report is then structured into four sections.

The second section outlines the current incentives available in Florida and at the Federal Government level, for the promotion of renewable energy and energy efficiency. In consultation with the Florida Energy and Climate Commission and Enterprise Florida, we summarize Florida's current clean energy incentives. We list all economic incentives that affect the clean energy sector in Florida along with details about State funds allocated to each incentive and the incentive's annual use. Additionally, we briefly cover each incentive's interaction with similar Federal incentives. We then evaluate the success of the State's investment in the cleantech sector and analyze the intended economic impact of each incentive program. We aim to benchmark the performance/impact against similar types of programs or programs with similar objectives in other jurisdictions or analogous industries/sectors. In Florida, there are broad based economic development programs that prequalify the clean energy sector. We analyze these programs and verify their effectiveness as to how well they cater to clean sector companies. We also identify and include federal, state and local incentives targeting the deployment of energy efficiency and renewable energy products. At the end of this section, we develop a list of Florida's incentives that target energy efficiency and demand side management. In order to give a comprehensive and more holistic picture, we cover the Florida Energy Efficiency and Conservation Act (FEECA), the programs offered by local utilities, cities, and counties, federal incentives for the deployment of energy efficiency and renewable energy products.

The third section of the report covers barriers to commercialization and project finance for cleantech projects in Florida. In this section, we identify Florida's university, business and financial resources and list barriers to commercializing intellectual property and deploying clean technology businesses. In the ensuing discussion, we incorporate analysis of stages of resources

and capital necessary to progress business from inception to full-scale deployment. Additionally, we identify and discuss the availability of resources for each stage in Florida. In consultation with FESC, state incubation networks (Public & Private), technology transfer offices and early stage industry partnership programs in Florida, we aim to identify and list the resources that are available to transition clean technology intellectual property (IP) into the market. This section also provides some successful models from other states and aims to identify challenges that are unique to Florida regarding project financing.

The fourth section of the report deals with regulatory changes. We provide an analysis of the potential economic impact of a renewable portfolio standard (RPS) including aspects such as job creation in Florida, growth in state GDP, and other economic factors. In addition, we provide a comparison between various state programs including a breakdown of RPS among different renewable energy industries/sectors.

The final section of the report encompasses the conclusions and recommendations. In this section, we provide suggestions and recommendations to the Florida Energy and Climate Commission (FECC) in a series of pros and cons in key areas: 1) whether to renew existing incentives 2) how to target sunsetting incentives to the cleantech area 3) a portfolio of programs to decrease barriers to cleantech commercialization and project finance, and; 4) whether to pursue an RPS for Florida and; 5) suggest to the FECC effective demand side incentives.

Definitions of Renewable Energy, Clean Energy, Cleantech and Energy Efficiency

Renewable Energy in Florida

According to the Florida Legislature, FL HB 7135 defines renewable energy (with alternative energy) as:

> "Electrical, mechanical, or thermal energy produced from a method that uses one or more of the following fuels or energy sources: ethanol, cellulosic ethanol, biobutanol, biodiesel, biomass, biogas, hydrogen fuel cells, ocean energy, hydrogen, solar, hydro, wind, or geothermal. “Biomass” means a power source that is comprised of, but not limited to, combustible residues or gases from forest products manufacturing, waste, byproducts, or products from agricultural and orchard crops, waste or co-products products from livestock and poultry operations, waste or byproducts from and food

processing, urban wood waste, municipal solid waste, municipal liquid waste treatment operations, and landfill gas." [3]

Clean Energy and Cleantech

The Renewable Energy Trust defines clean energy as "energy from renewable sources such as biomass, wind, or solar power." The goal of clean energy is to have a low environmental impact, with low or zero emissions, and minimal impact on the physical surroundings. Hydropower can be defined as clean energy due to zero emissions, but today's hydropower often has substantial impacts on aquatic ecosystems. Waste-burning and wood-burning plants that capture emissions can be clean energy generators. Fossil fuels do not provide clean energy because of their emissions and environmental impacts."[4]

From the Japan Video Encyclopedia, clean energy is "the solar energy, wind power, geothermal energy and coal technology projects underscores Japan's enthusiasm for clean energy and reduced emissions of carbon dioxide."[5]

According to Jesper Lindgaard Christensen,[6] "there seems to be more consensus around the term "clean technology" or "cleantech" to embrace knowledge-based products and services that optimize the use of natural resources while reducing ecological impact and adding economic value through lowered costs or improved profitability." In other words, clean technologies are inherently designed to (1) provide superior performance at lower costs; (2) reduce or eliminate negative ecological impact; and (3) improve the productive use of natural resources. Cleantech spans many industries, from alternative forms of energy generation (including "clean energy" i.e., renewable and alternative energy technologies) to water purification to materials-efficient production techniques.

Looking at the impact on the environment, Green Ideas defines renewable energy as an energy source that, from an Earth perspective, is continually replenished. The renewable resource can be replenished at a rate equal to or greater than its rate of depletion; i.e., solar, wind, geothermal and biomass resources.[7] Green Ideas provides a short cut definition of clean

[3] Florida Legislature FL HB 7135 CHAPTER 2008-227
[4] http://masstech.org/cleanenergy/energy/glossaryAtoC.htm
[5] http://www.mofa.go.jp/j_info/japan/video/pamph.html
[6] Jesper Lindgaard Christensen, Greens Rush In?: Cleantech Venture Capital Investments – Prospects or Hype? June 2009. See also New York City Investment Fund: Cleantech: A New Engine of Economic Growth for New York State, page 3, January 2007; and Forum for the Future, 2006: Clean Capital - Financing clean technology firms in the UK.
[7] The inclusion of Nuclear energy in the clean energy definition is controversial. Clean energy is energy that is produced without burning fossil fuels. Examples include wind, hydro-electricity and, controversially, nuclear power. The reason for this definition is that Nuclear energy

energy that summarizes the two points: "energy created from renewable sources with low environmental impact."[8]

From these definitions, clean energy must have the following two characteristics:

1- It has to be renewable.

2- It has low or zero negative impact on the environment.

This means that it is sufficient for the energy source to have low environmental impact to be considered a clean energy source. However, it is not a sufficient condition to be determined a renewable resource in order to be categorized as clean energy.[9] In order to provide an overview of those industries that are related to clean energy, the following table provides a detailed list of clean energy industries and associated North American Industrial Classification System (NAICS) codes.

Table 1. Clean Energy Related Industries List of NAICS

Industry	NAICS Code	NAICS Title	Includes
Renewable energy			
generation			
wind, solar, tidal	221119	Other Electric/Power Generation	solar, tidal, wind, other
geothermal	221330	Steam Production	geothermal steam production
waste incineration	562213	Solid Waste Combustors & Incinerators	
biomass	321113	Sawmills	cogeneration plants selling electricity
	322110	Pulp Mills	
	322121	Paper Mills	100% recycled paper, mnf with Green-E certified renewable energy
fuel cells/other	335999	All Other Miscellaneous Electrical Equipment Manufacturing	fuel cells and other alternative electrical sources
Renewable energy systems			
transmission/distribution	221122	Electric Power Distribution	
Renewable energy systems			
support functions			
design	541712	R&D in Physical, Engineering and Life Sciences	
engineer	541330	Engineering Services	engineering consulting, design, and/or services
finance	522110	Commercial Banking	
	522120	Savings Institutions	
	522130	Credit Unions	
	522190	Other Depository Credit	
	523910	Miscellaneous Intermediation	venture capital companies, investment

produces no greenhouse gas emissions but it still uses uranium (and sometimes plutonium) which is a natural resource like gas and oil. (http://www.ehow.com/about_4579290_nuclear-energy-renewable-nonrenewable.html)

[8] http://www.egreenideas.com/glossary.php?group=r

[9] Nuclear energy sector will not be included in our overall analysis in this report for the following reasons: despite the absence of emissions, nuclear generation, in general, still produces radiation as its byproduct. Also, in terms of the Cleantech definition(s) prevalent in the current Cleantech literature, nuclear power is often not included. In addition, for the purpose of this project, detailed data on renewable energy/clean energy was more readily available than detailed data on other Cleantech sectors.

Industry	NAICS Code	NAICS Title	Includes
			clubs
Renewable energy systems			
construction			
	237130	Power and Communication Line/Structures	alternative energy structure construction
	238221	Residential Plumbing, Heating, AC	solar heating installation
	238222	Nonresidential Plumb, Heating AC	solar heating installation
	238151	Residential Glass and Glazing	
	238152	Nonresidential Glass and Glazing	
	238161	Residential Roofing	
	238162	Nonresidential Roofing	
	238171	Residential Siding	
	238172	Nonresidential Siding	
	238211	Residential Electrical	
	238212	Nonresidential Electrical	
	238311	Residential Drywall/Insulation	
	238312	Nonresidential Drywall/Insulation	
Biofuels			
	325199	All Other Basic Organic Chemical Mnf	100% bio-diesel production
	324199	All Other Petroleum Mnf	purchasing petrol and blending with 100% vegetable oil to make blend
	111110	Soybean Farming	
	111120	Oilseed, Except Soybean	
	111150	Corn Farming	
Energy efficiency			
development	541712	(R&D see above)	
	541420	Industrial Design Services	
Energy efficiency	335110	Electric Lamp Bulb/Parts Mnf	
manufacturing	335121	Residential Electric Lighting Fixture Mnf	

Source: Initial Washington Green Economy Industry List E2SHB 2815 Implementation Team May 16, 2008. http://www.labormarketinfo.edd.ca.gov/contentpub/greendigest/wa-naics-industry-list.pdf.

Energy Efficiency

In addition to clean and renewable energy, the other area of interest in this study is energy efficiency. It can be simply defined as the efficient use of energy. An operational definition can be given as "Using less energy to provide the same service". [10] It should be noted that there are a number of perspectives regarding the definition of energy efficiency. The EIA held a series of workshops and found that the participant definition can be thought of from two perspectives: either (1) a service perspective or (2) a mechanistic, strict intensity, perspective.[11] Some view energy efficiency as being very different from energy conservation, and that energy

[10] Berkeley Laboratories, 2009. http://eetd.lbl.gov/ee/ee-2.html

[11] http://www.eia.doe.gov/emeu/efficiency/conf_papers.htm#Energy%20Information%20Administration%20Energy-Efficiency%20Workshop%20Summary%20Papers

conservation relates primarily to behavior. People with a social view of energy efficiency might consider the energy savings to be an efficiency gain, while those with a more technical view of efficiency would classify the savings as conservation rather than efficiency improvement.[12] An example of energy conservation is turning off the light when the room is unoccupied.[13] Examples of energy efficiency for the purpose of our study include:

1. Marketing, education and outreach - big overlap with conservation message.
2. Lighting - replacing bulbs and lighting systems with efficient models.
3. Heating, ventilation and air conditioning system (HVAC) - retrofit, repair and replacement.
4. Energy efficient new construction - incorporating energy efficient design concepts and the latest innovations.

Economic Costs and Benefits of Clean Energy in Florida

Energy supply and production is of critical importance for most Floridians. Florida, and the nation in general, are concerned with the status of current energy reserves; based primarily on non-renewable resources (e.g., fossil fuel (coal and oil) and nuclear power). The diversification of the nation's energy mix to include renewable resources helps improve: 1) energy reliability and independence from foreign production 2) greenhouse gas emissions and/or global warming 3) national security and; 4) long term energy price stability. In addition to clean and renewable energy, the other area of interest in this study is energy efficiency.

This section highlights renewable or alternative energy technologies currently available in Florida. The following table provides a summary of renewable technologies costs for Florida, as of 2009.

[12] http://www.eia.doe.gov/emeu/efficiency/definition.htm

[13] Furthermore, Most of what is defined as energy efficiency is in fact energy intensity: " Energy intensity is the ratio of energy consumption to some measure of demand for energy services—what we call a demand indicator. However, at best, energy-intensity measures are a rough surrogate for energy efficiency. This is because energy intensity may mask structural and behavioral changes that do not represent "true" efficiency improvements such as a shift away from energy-intensive industries." (http://www.eia.doe.gov/emeu/efficiency/definition.htm)

Table 2. Renewable Technology Costs for U.S.

Technology	Total Overnight Cost ($/kW)	Variable O&M Cost ($mills/kWh)	Fixed O&M Cost ($/kW)
Solar PV	6,038	0.00	11.68
Solar Thermal	5,021	0.00	56.78
Biomass	3,766	6.71	64.45
Landfill	2,543	0.01	114.25
Wind	1,923	0.00	30.30
Wind (offshore)	3,851	0.00	89.48
Geothermal	1,711	0.00	161.64
Hydropower	2,242	2.43	13.63
Advanced Nuclear	3,318	0.49	90.02

Source: Energy Information Administration. March 2009. Assumptions to the Annual Energy Outlook 2009.

Table 3. Renewable Technology Estimated Economic Impacts for Florida

Technology	GSP ($ Millions)	Jobs	Income ($ Millions)
Solar	N/A	7.41-30/MW	N/A
Biomass	1,149*	17,682	687*
Wind	N/A	0.71-2.79/MW	N/A

Sources: Southern Bioenergy Roadmap, Southeast Agriculture & Forestry Energy Resources Alliance (SAFER) UF/IFAS publication: http://www.saferalliance.net. Economic Impacts of Extending Federal Solar Tax Credits, Solar Energy Research and Education. Foundation (SEREF), http://www.seia.org/galleries/pdf/Navigant%20Consulting%20Report%209.15.08.pdf. * In 2007$.

Florida has twice the solar insolation of the largest PV market in the world, Germany.[14] The capacity for solar power in Florida is among the highest in the country. Solar systems have higher capital startup costs than some other technologies, but the lack of fuel needs and very low O&M costs and requirements can offset the higher construction (capital) costs. These PV systems are estimated to create up to 30 direct jobs per Megawatt (MW), leading to 22,500-114,000 direct jobs through 2020, dependent on the expansion of solar output.[15] A USA Today study found that when consumers were asked about powering their homes with electricity from solar panels, 2% already had them, and about 43% of the respondents thought it would happen in less than five years.[16]

Being the leader in biomass feedstock, Florida has the ability to attract numerous biomass projects with in-state fuels, avoiding the need and cost of shipping in feedstock from elsewhere. Solid biomass plants can be powered by organic material such as residual production (wood chips from logging, wheat straw, etc) or purpose grown crops. Florida currently ranks first in bioenergy feedstock of sugarcane and citrus, forest residues and urban wood waste.[17] The SAFER 2007 study reported that biomass projects generated $1.15 billion in

[14] http://www.greentechmedia. See Faire Study.
[15] Vote Solar Initiative. www.votesolar.org
[16] USA Today, July 15, 2009, citing Solar Survey Study by CSA International.
[17] Bioenergy at UF/IAFS PowerPoint. August 12, 2008. Mary Duryea

output and over 17,500 jobs in Florida[18]. Longer-term renewable energy sources include offshore wind, ocean current and algal harvesting for biomass feedstock and fuel production. Research is currently being conducted in these areas, among others, in Florida.

Nuclear energy is one of the alternative energies in Florida. The three nuclear plants (five total units) in Florida produced a combined 2.69GW in March of 2009.[19] This accounts for 4% of the states' total energy consumption. Projected upgrades at the facilities in Levy County will increase Progress Energy Florida's nuclear generation by 2.38GW. Florida Power and Light is projected to add 2.61GW of nuclear power generation with upgrades at the St. Lucie and Turkey Point facilities.[20]. Advanced nuclear has a variable O&M cost of $0.49/kWh and a Fixed O&M cost of $90.02/kWh. The average capital cost is $90.51.[21]

Given the volatility of recent fossil fuel prices, Floridians are becoming increasingly aware of the costs of energy consumption in the state. By establishing new clean power generation systems and investing in demand side management (energy efficient) programs, utilities (suppliers) and consumers will not only lessen our impact to the environment but also help with dampening Florida's increasing energy demand. Innovation, investment, and energy efficient conservation can help propel the state into becoming a prosperous, self-sufficient provider of its own clean power.

On June 25, 2008, Governor Charlie Crist signed into law, House Bill 7135, which requires the Public Service Commission to develop a Renewable Portfolio Standard (RPS) by February 1, 2009. Each electricity provider, except municipal utilities and rural cooperatives, must supply an as-yet unspecified amount of renewable energy to its customers. Although HB 7135 does not specify the RPS target, Governor Crist's Executive Order 07-127 from July 13, 2007 requires utilities to produce at least 20 percent of their electricity from renewable resources. [22] However, to date, no RPS target policy has been passed by the Florida legislature.

The renewable energy incentives in Florida encompass corporate tax credits, sales tax exemptions, local rebate programs, loans, industry supports and production incentives. Florida

[18] Southern Bioenergy Roadmap, Southeast Agriculture & Forestry Energy Resources Alliance (SAFER) UF/IFAS publication: http://www.saferalliance.net.
[19] http://tonto.eia.doe.gov/state/state_energy_profiles.cfm?sid=FL#overview
[20] Personal Communication. Ted Kury, Public Utility Research Center. August 18, 2009
[21] EIA Assumptions Report: 2009. http://www.eia.doe.gov/oiaf/aeo/assumption/index.html.
[22] http://www.flsenate.gov/data/session/2008/House/bills/billtext/pdf/h713503er.pdf, and the Executive Order 07-127: http://www.dep.state.fl.us/ ClimateChange/files/2007.07.13_eo_07-127.pdf

does not currently have programs for personal income tax, grants and bonds. The energy efficiency incentives include Local Rebate Programs, grants, and loans.

The District of Columbia and 24 states have an RPS policy in place. Five other states, North Dakota, South Dakota, Utah, Virginia, and Vermont, have nonbinding goals for adoption of renewable energy instead of an RPS. Most of the states set the standards in percentage of energy to be generated by renewable sources. These percentages ranged from 8% in Pennsylvania to 40% in Maine, with the majority of the states in the 20% range. Texas and Iowa set their renewable energy production goals by Megawatts to be generated by renewable resources. The target year to attain the desired RPS differs widely by state. Vermont and New York's target year is 2013, whereas California targeted 2030 to attain its RPS goals. See Table 28 in Appendix A.

Current Incentives Mix

Authors:

Dr. Julie Harrington, Director, FSU CEFA and FSU IESES member

Dr. Bassam Awad

Zafar Siddiqui

David Glassner

Ted Kury, UF PURC

This section outlines the current incentives available in Florida and at the Federal Government level, for the promotion of renewable energy and energy efficiency. In consultation with the Florida Energy and Climate Commission and Enterprise Florida, we summarize Florida's current clean energy incentives in this section and list all economic incentives that affect the clean energy sector in Florida. In addition, we include details about the total amount of State funds allocated to each incentive, and the incentive's annual use.

This section highlights the state incentive's interaction with similar Federal incentives. In addition, this section also includes an evaluation of the state incentives targeting the cleantech sector and an analysis of the intended economic impact of each incentive program. We aim to benchmark the performance or impact against similar types of programs or programs with similar objectives in other jurisdictions or analogous industries/sectors.

In Florida, there are broad based economic development programs that prequalify the clean energy sector. In order to give a comprehensive and a more holistic perspective, we cover Florida Energy Efficiency and Conservation Act (FEECA), the programs offered by local utilities, cities, and counties, and federal incentives for the deployment of energy efficiency and renewable energy products.

Inventory of Economic Incentives That Impact the Clean Energy Sector in Florida

Government incentives (both State and Federal) can be categorized into two basic categories; up front incentives and performance based incentives. This section will look at current Florida renewable energy incentives. The types of incentives that will have an impact on the Clean Energy Sector in Florida are shown in Table 4. There are various types of incentives that are directed at different technologies and sectors of the economy. The Corporate Tax

Credit from the Renewable Energy Production Program and Renewable Energy Technologies Investment program are directed at the Commercial sectors.

The Renewable Energy Production Tax Credit applies to solar thermal electric, photovoltaics, wind, biomass, hydroelectric, geothermal electric, CHP/Cogeneration, hydrogen, tidal energy, wave energy and ocean thermal technologies. The incentive amount is $0.01/kWh of electricity produced from 1/1/2007 to 6/30/2010. While there is no individual maximum, no entity will receive more than $5 million per fiscal year. The Renewable Energy Technologies Investment Tax Credit is aimed at renewable fuel vehicles, fuel cells, hydrogen, refueling stations, ethanol and biodiesel technologies. The credit covers 75% of all capital costs including Operations and Maintenance (O&M) and Research and Development (R&D). The maximum incentive amount varies by project and the expiration date is 6/30/2010.

The Renewable Energy Property Tax Exemption focuses on incentives for the Commercial, Industrial, and Residential sectors. The program offers incentives for solar water heaters, photovoltaics, wind, geothermal heat pumps, and direct-use geothermal technologies. It offers a 100% exemption from property tax on units installed after 1/1/2009.

The Solar Energy Systems Equipment Sales Tax Exemption offers complete exemption on sales tax for solar water heaters, solar space heaters, photovoltaics, and solar pool heating within the sectors of Commercial, Residential, and General Public/Consumer. The Renewable Energy Equipment Sales Tax Exemption applies to the same sectors, but only to the technologies of renewable fuel vehicles, fuel cells, other alternative fuel vehicles, refueling stations, ethanol, and biodiesel. The expiration date for this program is 7/1/2010.

Florida also offers a state grant program, the Renewable Energy Technologies Grants Program, directed at commercial, nonprofit, school, local government and utility sectors with varied incentive amounts. The grants are available for the technology development in heat recovery, solar water heating, solar space heating, solar thermal electric, solar thermal process heat, photovoltaics, wind, biomass, hydroelectric, geothermal heat pumps, CHP/Cogeneration, hydrogen, direct-use geothermal, solar pool heating, tidal energy, wave energy and ocean thermal.

The Solar Energy System Incentives Program is a state rebate program for solar water heaters, photovoltaics and solar pool heating. There are many restrictions on size requirements

for the rebate and varying maximum award levels as shown in Table 4. Commercial, Residential, Nonprofit, Schools, Local Government, Federal Government, Multi-Family Residential and Institutional sectors are covered under this program. The expiration date for this program is 6/20/2010.

Table 4. Inventory of Incentives That Impact the Clean Energy Sector in Florida

Incentive Name	Incentive Type	Eligible Technologies	Applicable Sectors	Amount	Maximum Incentive	Eligible System Size	Expiration Date
Capital investment tax credit (Florida Statutes §220.191)	Capital Investment Tax Credit	Solar panel manufacturing facility	Industrial, Commercial	100%, 75% and 50% for a qualifying project which results in a cumulative capital investment of at least $100, between $50-$100 million, and between $25-50$ respectively.	100% of the qualifying project		
Renewable Energy Production Tax Credit (Florida Statutes §220.193)	Corporate Tax Credit	Solar Thermal Electric, Photovoltaics, Wind, Biomass, Hydroelectric, Geothermal Electric, CHP/Cogeneration, Hydrogen, Tidal Energy, Wave Energy, Ocean Thermal	Commercial	$0.01/kWh for electricity produced from 1/1/2007 through 6/30/2010	No individual maximum; State max of $5 million per fiscal year for all credits		6/30/2010
Renewable Energy Technologies Investment Tax Credit (Florida Statutes §220.192)	Corporate Tax Credit	Renewable Fuel Vehicles, Fuel Cells, Hydrogen, Refueling Stations, Ethanol, Biodiesel	Commercial	75% of all capital costs, operation and maintenance costs, and research and development costs	Varies		6/30/2010
Renewable Energy Property Tax Exemption (Florida Statutes §196.175)	Property Tax Exemption	Solar Water Heat, Photovoltaics, Wind, Geothermal Heat Pumps, Direct-Use Geothermal	Commercial, Industrial, Residential	100% exemption (for units installed after 1/1/2009			
Solar Energy Systems Equipment Sales Tax Exemption(Florida Statutes §212.08(7)(hh))	Sales Tax Exemption	Solar Water Heat, Solar Space Heat, Photovoltaics, Solar Pool Heating	Commercial, Residential, General Public/Consumer	All sales tax			
Renewable Energy Equipment Sales Tax Exemption(Florida Statutes §212.08(7)(ccc))	Sales Tax Refund	Renewable Fuel Vehicles, Fuel Cells, Other Alternative Fuel Vehicles, Refueling Stations, Ethanol, Biodiesel	Commercial, Residential, General Public/Consumer	All sales tax			7/1/2010
Renewable Energy Technologies Grants Program (Florida Statutes	State Grant Program	Heat recovery, Solar Water Heat, Solar Space Heat, Solar Thermal Electric,	Commercial, Nonprofit, Schools, Local Government,	Varies			6/30/2010

Incentive Name	Incentive Type	Eligible Technologies	Applicable Sectors	Amount	Maximum Incentive	Eligible System Size	Expiration Date
§377.804)		Solar Thermal Process Heat, Photovoltaics, Wind, Biomass, Hydroelectric, Geothermal Electric, Geothermal Heat Pumps, CHP/Cogeneration, Hydrogen, Direct-Use Geothermal, Solar Pool Heating, Tidal Energy, Wave Energy, Ocean Thermal	Utility				
Solar Energy System Incentives Program (Florida Statutes §377.806)	State Rebate Program	Solar Water Heat, Photovoltaics, Solar Pool Heating	Commercial, Residential, Nonprofit, Schools, Local Government, State Government, Fed. Government, Multi-Family Residential, Institutional	PV: $4/watt DC, Solar Water Heaters: Residential - $500; Non-residential & Multi-family - $15 per 1,000 BTU/day, Solar Pool Heaters: $100	PV: Residential - $20,000; Non-residential - $100,000, Solar Water Heaters: Residential - $500; Non-residential & Multi-family - $5,000, Solar Pool Heaters: $100	PV: 2 kW and larger, Solar water heaters must provide at least 50% of a building's hot water consumption	6/20/2010

http://www.dsireusa.org/incentives/index.cfm?State=FL

In summary, of these eight programs, the following five programs are scheduled to sunset June 30, 2010:

- Renewable Energy Production Tax Credit- Florida Statutes §220.193
- Renewable Energy Technologies Investment Tax Credit - Florida Statutes §220.192
- Renewable Energy Equipment Sales Tax Exemption - Florida Statutes §212.08(7)(ccc)
- Renewable Energy Technologies Grants Program - Florida Statutes §377.804
- Solar Energy System Incentives Program (Solar Rebate) - Florida Statutes §377.806

Total State Funds Allocated to Each Incentive and the Incentive's Annual Use

As shown in the following table(s), for fiscal year 2009-10, a total of $20 million is allocated to the incentives for clean energy sector. In Florida, $11 million is earmarked for the 'Renewable Energy Technology Investment Tax Credit'. This can be applied to 75% of all capital costs, operation and maintenance costs and research and development costs. However, upper caps are defined as $3 million in connection with hydrogen-powered vehicles and fueling

stations; $1.5 million in connection with an investment in commercial stationary hydrogen fuel cells in the state; and $6.5 million in connection with an investment in the production, storage and distribution of biodiesel and ethanol.

The 'Renewable Energy Production Tax Credits' account for $5 million of the budget during 2009-2010. This credit is available to encourage the development and expansion of facilities that produce renewable energy in Florida. This credit will be equal to $0.01 for each kilowatt-hour of electricity produced and sold by the taxpayer to an unrelated party during a given tax year. There is an upper limit of $5 million per state fiscal year per applicant.

The third major category of incentives is the 'Renewable Energy Technologies, Machinery, Equipment, and Material Sales and Use Tax Refund', which account for $4 million of budgetary allocation. Businesses may apply for a refund of sales and use taxes paid on equipment, machinery, and other materials for renewable energy technologies. There is a $2 million annual statewide cap for hydrogen-powered vehicles, materials incorporated into hydrogen-powered vehicles, and hydrogen fueling stations. For materials used in the distribution of biodiesel and ethanol, including fuelling infrastructure, transportation and storage, there is an annual statewide cap of $1 million.[23]

As outlined in the following Table 5, a total of about $16.23 Million for (out of a potential $20 Million) is still unused in program funding in the renewable energy tax credit and sales and use tax categories.[24]

Some tax incentives have been used more than others. The Production Tax Credit has been consistently used and the bio-fuel infrastructure credit is showing increased consumption, but the hydrogen vehicle incentive has been barely used. The legislature should review each technology granted a tax incentive and determine whether the tax code is the proper instrument to catalyze that market. If Florida elects to support pre-commercially deployed technologies, then the state should design incentives targeted to those technologies' needs. The data suggests there are state dollars allocated to these incentives that might be more productively used. In addition, it would be beneficial to examine the current method of information dissemination to the public regarding the state incentive program, to ensure the broadest coverage, application rate, and use of currently available incentives.

[23] http://www.bdb.org/clientuploads/PDFs/CleanEnergyIncentives.pdf
[24] Personal Communication with EOG staff member April Groover, February 22, 2010

Table 5. Remaining Balances as of January 29, 2010 of Renewable Tax Credits/Sales Tax Refunds

Renewable Energy Production Tax Credit				
	2008	**2009**	**2010**	**2011**
Appropriation	$5,000,000.00	$5,000,000.00	$5,000,000.00	$5,000,000.00
Funds Expended	$1,925,730.00	$1,676,830.00	$0.00	$0.00
Balance	$3,074,270.00	$3,323,170.00	$5,000,000.00	$5,000,000.00
Percent of Funds Expended	38.51%	33.54%	n/a	n/a
Renewable Energy Technologies Investment Tax Credit				
Hydrogen (Vehicles)	**FY06-07**	**FY07-08**	**FY08-09**	**FY09-10**
Appropriation	$3,000,000.00	$3,000,000.00	$3,000,000.00	$3,000,000.00
Funds Expended	$0.00	$0.00	$0.00	$1,547,586.75
Balance	$3,000,000.00	$3,000,000.00	$3,000,000.00	$1,452,413.25
Percent of Funds Expended	0.00%	0.00%	0.00%	51.59%
Hydrogen (Stationary Fuel Cells)	**FY06-07**	**FY07-08**	**FY08-09**	**FY09-10**
Appropriation	$1,500,000.00	$1,500,000.00	$1,500,000.00	$1,500,000.00
Funds Expended	$0.00	$0.00	$1,500,000.00	$1,500,000.00
Balance	$1,500,000.00	$1,500,000.00	$0.00	$0.00
Percent of Funds Expended	0.00%	0.00%	100.00%	100.00%
Biodiesel & Ethanol Infrastructure	**FY06-07**	**FY07-08**	**FY08-09**	**FY09-10**
Appropriation	$6,500,000.00	$6,500,000.00	$6,500,000.00	$6,500,000.00
Funds Expended	$3,347,482.62	$4,519,660.30	$2,473,456.24	$0.00
Balance	$3,152,517.38	$1,980,339.70	$4,026,543.76	$6,500,000.00
Percent of Funds Expended	51.50%	69.53%	38.05%	0.00%
Renewable Energy Equipment Sales Tax Exemption				
Hydrogen (Vehicles)	**FY06-07**	**FY07-08**	**FY08-09**	**FY09-10**
Appropriation	$2,000,000.00	$2,000,000.00	$2,000,000.00	$2,000,000.00
Funds Expended	$0.00	$0.00	$0.00	$0.00
Balance	$2,000,000.00	$2,000,000.00	$2,000,000.00	$2,000,000.00
Percent of Funds Expended	0.00%	0.00%	0.00%	0.00%
Hydrogen (Stationary Fuel Cells)	**FY06-07**	**FY07-08**	**FY08-09**	**FY09-10**
Appropriation	$1,000,000.00	$1,000,000.00	$1,000,000.00	$1,000,000.00
Funds Expended	$0.00	$0.00	$219,004.98	$235,176.90
Balance	$1,000,000.00	$1,000,000.00	$658,944.91	$764,823.10
Percent of Funds Expended	0.00%	0.00%	21.90%	23.52%
Biodiesel & Ethanol Infrastructure	**FY06-07**	**FY07-08**	**FY08-09**	**FY09-10**
Appropriation	$1,000,000.00	$1,000,000.00	$1,000,000.00	$1,000,000.00
Funds Expended	$0.00	$3,982.60	$41,349.06	$482,726.69
Balance	$1,000,000.00	$996,017.40	$958,650.94	$517,273.31
Percent of Funds Expended	0.00%	0.40%	4.13%	48.73%

Concerning the companies that have engaged in the SEP tax credit and sales tax program from FY06-10, the following observations were made:

- **Biodiesel and Ethanol:** Almost all of the tax credit funds are used by one company - Marathon Petroleum. It is unknown what innovations have been produced by this company to date. The sales tax program has more widespread usage in small

quantities. First Coast Energy LLP used about a quarter of the funding in FY2009-2010. Kinder Morgan Liquids Terminals LLC and Central Florida Pipeline each used about a tenth of the funding during the same time period.

- **Hydrogen (Cells):** Metro PCS Florida LLC is the only company using both the credits and the sales tax program. They perhaps were unaware of the tax credit and sales tax offerings from earlier, in FY2006 - 2008, but have since used all the tax credits available and part of the sales tax exemption. It appears that one company is using the majority of the funds hence; it is assumed it is directed towards a usable technology. The results of the technology generated by these incentive offerings are unknown at this time.
- **Hydrogen (Cars):** United Natural Food is the only company using the tax credits.

Since 2006, The Renewable Energy Technology Grant Program has distributed $42.5 million dollars. Grants are attractive to industry because the application process is relatively straight forward and the awards are flexible. Although popular, the state may want to consider self-sustaining mechanisms such as: a loan program, performance based incentives, or an investment program rather than appropriating general revenue each year for the grant. The state may want to use public/private partnerships to leverage funding and engage a broader stakeholder group to select award winners.

Table 6. Renewable Energy Technologies Grants Program

	FY06-07	FY07-08	FY08-09	FY09-10
Appropriation	$15,000,000.00	$12,500,000.00	$15,000,000.00	$0.00
Funds Committed	$15,000,000.00	$12,500,000.00	$15,000,000.00	$0.00
Funds Expended	$6,880,995.61	$1,458,730.21	$1,048,187.08	$0.00

* As of Jan 29, 2010

** $1.676 out of $5 million appropriated, has been applied for

Since 2006, the Solar Energy System Incentives Program (Solar Rebate) has distributed $24.9 million dollars (Table 7). The legislature should address the effectiveness and revise the Solar Rebate Program. The Solar Rebate's $4 per watt subsidy has not changed since 2006 although both the cost of the technology and other incentives has reduced the need for the state subsidy. In addition to the declining costs of solar hardware, both the federal tax code and Florida Energy Efficiency and Conservation Act (FEECA) have provided alternative incentives. The Energy Improvement and Extension Act of 2008 (H.R. 1424) included an eight-year extension of the 30% personal income tax credit to December 31, 2016, the ability to take the credit against the alternative minimum tax, and the removal of the $2,000 credit limit for solar-electric systems beginning in 2009. In 2009, FEECA utilities were authorized to provide up

to $24.5 million in total annual incentives for customer-owned solar water heaters and photovoltaic systems. The current rebate appears to be outdated and in light of other incentives, may not be needed to encourage the deployment of residential and commercial solar systems.

Table 7. Solar-Energy System Incentives Program (Solar Rebate)

	FY06-07	FY07-08	FY08-09	FY09-10
Appropriation	**$2,500,000.00**	**$3,000,000.00**	**$5,000,000.00**	**$14,400,000.00**
Funds Expended	**$0.00**	**$0.00**	**$0.00**	**$14,400,000.00**
Balance	**$2,500,000.00**	**$3,000,000.00**	**$5,000,000.00**	**$0.00**
Percent of Funds Expended	**100.00%**	**100.00%**	**100.00%**	**100.00%**

The ARRA, or Federal Stimulus Plan, allocates $40.5 million to Florida under the State Energy Program (SEP). An economic impact analysis was performed on the individual state energy programs using Regional Economic Models, Inc., or REMI. REMI (v9.26 2007) is a widely used dynamic (multiple time-period, up to year 2050) integrated input-output and econometric model. REMI is used extensively to measure proposed legislative and other program and policy economic impacts across the private and public sectors of the state by the Florida Joint Legislative Management Committee, Division of Economic & Demographic Research, the Florida Department of Labor, and other state and local government agencies. In addition, it is the chosen tool to measure these impacts by a number of universities and private research groups that evaluate economic impacts across the state and nation. FSU CEFA uses the REMI model that has been developed for the state of Florida and includes 169 sectors (based on the North American Industrial Classification System, or NAICS). As presented in Table 8, the number of projected jobs associated with each SEP program totaled 494 jobs. The most successful program under SEP in terms of jobs creation is the Solar Energy Rebate Program, which resulted in 193 jobs. It was followed by the Solar Energy (Water Heating) Loan Program and Solar for Schools and Shelters Program with 119 and 103 jobs, respectively.

Table 8. Economic Impact of State Incentives in Terms of Jobs Created

State Energy Programs	**Actual allocation**	**Jobs Created as per Actual Allocation**
Solar Energy (Water Heating) loan	$10,000,000	103
Solar Energy Rebate Program	$14,408,000	193
Solar for Schools & Storm Shelters	$10,000,000	119
E-85 Installation/Conversion Revolving Loans	$5,000,000	62
Program Administration, Marketing & Analysis	$1,074,300	17
Subtotal - Renewable Energy	$40,482,300	494

Regarding the incentive's interaction with similar Federal incentives (i.e. – State offers a solar rebate, Federal government offers an income tax credit), this report found no language in any incentive provisions indicating that accepting an incentive from either State or Government would prohibit one from accepting an incentive from the other, granted the technology applies to both incentives. There is indication of a "double dipping" provision to reduce the federal incentive in the Private Trust Companies (PTC) statute. For wind-based power generation, the Federal Production Tax Credit (PTC) is a significant incentive. It provides federal tax credit to the owners of utility-scale wind projects. While the federal PTC has been a major stimulus to the growth of the domestic wind power market, its so-called "double-dipping" provision may also diminish the value of certain types of state wind power incentives. The provision requires that the federal PTC be reduced if a wind project receives certain other kinds of support. To eliminate "double dipping," the federal PTC is reduced for any local, state, or federal grants, subsidized energy financing, and any other credits. The purpose of this rule is stated to prevent "excessive" reliance on government assistance. [25]

Federal Incentives for Florida

Table 29 (in Appendix A) outlines the full slate of incentive offerings by the federal government.

The specific language in the PTC is as follows: Credit Reduced for Grants, Tax-exempt Bonds, Subsidized Energy Financing, and Other Credits: The amount of the credit... with respect to any project for any taxable year... shall be reduced by the amount which is the product of the amount so determined for such year and a fraction:

(A) The numerator of which is the sum, for the taxable year and all prior taxable years, of

- grants provided by the United States, a State, or a political subdivision of the State for use in connection with the project,
- proceeds of an issue of State or local government obligations used to provide financing for the project the interest on which is exempt from tax under section 103,
- the aggregate amount of subsidized energy financing provided (directly or indirectly)

[25] Ing, E. 2002. "The Effect of NYSERDA's Wind Project Assistance on the Federal Production Tax Credit." Prepared for the New York State Energy Research and Development Authority. Rader, N. and R. Wiser. 1999. "Strategies for Supporting Wind Energy: A Review and Analysis of State Policy Options." Washington, D.C.: National Wind Coordinating Committee. Ryan Wiser, Mark Bolinger and Troy Gagliano. Sep 2002. "Analyzing the Interaction Between State Tax Incentives and the Federal Production Tax Credit for Wind Power". Ernest Orlando Lawrence Berkeley National Laboratory. http://eetd.lbl.gov/EA/EMS/reports/51465.pdf

under a Federal, State, or local program provided in connection with the project, and

- the amount of any other credit allowable with respect to any property which is part of the project, and

(B) The denominator of which is the aggregate amount of additions to the capital account for the project for the taxable year and all prior taxable years.

The statutory language leaves ambiguity as to which specific type of state incentives may trigger the double dipping provision. Albeit, it is clear that a number of forms of state aid will offset – at least partially – the benefit associated with the federal PTC. Nonetheless, despite legislative history and a number of private letter rulings, there remains a lack of clarity on the kinds of state incentives that would trigger the offset. Some studies provide tangible examples of incentive types that are or are not likely to offset the value of the PTC. [26]

Government incentives that are likely to trigger a PTC offset include up-front grants that buy down the project's capital costs, and below-market interest loans and other forms of subsidized financing. Incentives that are not likely to trigger PTC offsets include price support payments, production incentive payments, grants to meet operational costs, loan guarantees, and implicit subsidies provided through renewable purchase mandates.[27]

Therefore, it is clear that state tax incentives are at risk of reducing the value of the federal PTC, via the so-called 'double-dipping' provision. But federal tax law and IRS rulings are not clear enough to specify what types of incentives trigger this offset. Given this provision of federal PTC's and their uncertain application to state tax incentives, non-tax-based state wind power policies (cash-based production incentives, renewable purchase mandates, etc.) that clearly do not offset the federal PTC may be preferable.

The New Jersey experience is an example of the success of incentives contingent on the amount of jobs created. In particular, there is a definite need to create a market by policy to incentivize the market. The key is to create the market not for the end purpose of installing PV in the state (an added benefit) but the goal should be to attract the high level jobs (e.g. cell/panel manufacturing, supply chain manufacturing (e.g. balance of systems), systems design and R&D).

[26] Ryan Wiser, Mark Bolinger and Troy Gagliano 2002
[27] Ing, E. 2002

The Federal government has several existing programs to promote home energy efficiency. Some of these programs were initiated under the Emergency Economic Stabilization Act of 2008 (EESA) and continued under the American Recovery and Reinvestment Act of 2009 (ARRA or Stimulus Package). Others were initiated under the ARRA. This group of programs is implemented in the form of a direct tax credit to the taxpayer, or applicant. Because it is a tax credit, the taxpayer will see a dollar for dollar return on the investment, regardless of the taxpayer's income tax bracket. [28]

It is critical to understand that not all Energy Star appliances qualify under these programs, but only appliances from selected categories. The first group of programs applies only to appliances and improvements installed in the applicant's primary residence and will continue through December 31, 2010. They do not apply to new construction. Some of these credits include installation costs, while others do not. These credits are 30% of the actual cost of the appliance or improvement, up to $1,500. The types of appliances and improvements covered under this program are biomass stoves, high SEER HVAC units of various technologies, insulation, metal and asphalt roofs, high energy-factor water heaters (excluding solar), and energy-efficient doors, windows, and skylights. The credits for biomass stoves, HVAC units, and water heaters include the costs of installation, while the credits for insulation, metal and asphalt roofs, and energy-efficient doors, windows, and skylights, do not.

The second and third groups of programs relate to the home installation of renewable electric generation systems, and will continue through December 31, 2016. The second group applies to the applicant's primary or secondary residence, but not to rental homes. These credits can be applied to both new and existing homes. Installation costs are covered under these programs. The credit is for 30% of the installed cost of the system with no upper limit. The systems covered include geothermal heat pumps, residential wind turbines of no more than 100 kW, solar water heaters (excluding pool heaters), and solar photovoltaic systems. The third program applies only to the applicant's primary residence, which can be an existing home or new construction. Residential fuel cell and micro turbine systems of at least 0.5 kW apply to

28 The ARRA extends until 2014 tax credits for renewable energy that had previously been scheduled to expire and by providing $6 billion worth of loan guarantees authorized by the Energy Policy Act of 2005 for renewable electricity development. These loan guarantees are expected to stimulate the deployment of conventional renewable and transmission technologies and innovative biofuels technologies. For renewable projects to qualify they must be under construction by September 30, 2011. See Appendix G for details on Federal Loan Guarantee

this program. The credit covers 30% of the installed cost of the system, up to a maximum of $500 per 0.5 kW.

Florida Energy Efficiency and Conservation Act (Section 366.82)

Florida utilities with sales of 2,000 GWh or more are subject to the Florida Energy Efficiency and Conservation Act (FEECA). This act requires each utility to implement cost-effective energy efficiency programs and to conduct energy audits. The Legislature directs the Florida Public Commission to develop and adopt overall goals and authorizes the commission to require each utility to develop plans and implement programs for increasing energy efficiency and conservation and demand-side renewable energy systems within its service area. The major objectives of the FEECA are to:

- Reduce and control the growth rates of electric consumption;
- Reduce the growth rates of weather-sensitive peak demand;
- Increase the overall efficiency and cost-effectiveness of electricity and natural gas production and use;
- Encourage further development of demand-side renewable energy systems; and conserve expensive resources, particularly petroleum fuels.

The Commission is authorized to financially reward those utilities that exceed their goals and may impose penalties for those utilities that fail to meet their goals. The Commission is authorized to allow an investor-owned electric utility an additional return on equity of up to 0.5% for exceeding 20 percent of their annual load growth through energy efficiency and conservation measures.

Energy Efficiency and Renewable Energy Incentives in Clean Energy Jobs and American Power Act 2009

Table 29 (in Appendix A) consists of federal programs available through the Department of the Treasury, Department of Energy, and Department of Agriculture. Some of these programs are enabled through the American Recovery and Reinvestment Act of 2009. This list is thought to be complete, but may not be exhaustive.

Section 161: Renewable Energy

Under this section, the Administrator, in consultation with the Secretaries of Energy, Interior, and Agriculture, is authorized to establish a program to provide grants to states for renewable energy projects that facilitate compliance with a state Renewable Portfolio Standard (RPS). Qualifying sources of energy include solar, wind, biomass, landfill gas, ocean (including tidal, wave, current, and thermal), geothermal, municipal solid waste, or new hydroelectric generation capacity achieved from increased efficiency or additions of new capacity at an existing hydroelectric project. The amount of the grant may not exceed 50 percent of the total cost of the renewable energy project that is to be funded by the grant. Applications that come from a state that have a binding renewable energy portfolio standard and projects that are cost-effective are to be given priority when awarding the grant. To monitor the grant program, the Administrator is required to submit a report to the Committees on Energy and Commerce of the House of Representatives and the Senate. The report must include information about the project applications received, project applications approved, amount allocated to each project and the cumulative benefits of the grant program.

Section 162: Advanced Biofuels

According to Section 162 of the Bill, an individual, corporate entity, unit of State or local government, Indian tribe, farm cooperative, institution of higher learning, rural electric cooperative, or public utility will be entitled to a grant to support;

- research regarding the production of advanced fuels
- the development of new advanced biofuel production and capacity-building technologies
- the development and construction commercial-scale advanced biofuel production facilities
- the expanded production of advanced biofuels

The grants will be awarded based on cost-effectiveness, technical and economic feasibility and innovation. Furthermore, priority will be given to programs that can be replicated and that are being financed by private resources.

Section 163 Energy Efficiency in Building Codes

Energy Efficiency Targets

This section requires the Administrator (or another agency head as designated by the President) to set national targets for improving energy efficiency in residential and commercial buildings, and write regulations establishing building codes to meet those targets. Buildings would have to meet the energy efficiency targets beginning Jan. 1, 2014 and every year thereafter through Dec. 31, 2030. The Administrator or other agency head is required to report to Congress annually on the status and implementation of the codes and regulations.

Section 164: Retrofit for Energy and Environmental Performance

This section of the bill establishes the Retrofit for Energy and Environmental Performance (REEP) program. The purpose of the program is to retrofit existing buildings across the United States to achieve maximum cost-effective energy efficiency improvements and significant improvement in water use.

Financial Incentives for Residential and Non-Residential Buildings are as follows:

For Residential Buildings:

- $1,000 for a combination of prescriptive measures designed to reduce energy consumption by more than 10% (but not less than 10%), and $2000 for prescriptive measures designed to reduce energy consumption by 20%;
- $3,000 for actual demonstrated savings of 20% utilizing the performance based structure, and $150 per additional percentage point of energy savings achieved;
- Incentives may accumulate to a maximum incentive not to exceed 50% of retrofit costs.

For Non-Residential Buildings:

- A maximum of $0.15 per square foot of retrofit area for energy use reductions from 20% to 30%;
- $0.75 per square foot for energy use reductions from 30% to 40%;
- $1.60 per square foot for energy use reductions from 40% to 50%; and
- $2.50 per square foot for energy use reductions exceeding 50%.

Incentives may accumulate to a maximum incentive not to exceed 50% of retrofit costs.

Programs Offered by Local Utilities, Cities, and Counties

In Florida, some counties and municipal governments, and utilities offer in-house programs. Table 30 in Appendix A provides a listing of those programs. Some programs have proven more successful than others. Among counties, Miami-Dade, and Orange counties offered programs ranging from green building to solar/thermal installers. Among city-based utilities, the City of Tallahassee offers programs like solar efficiency loans, pool/water heating programs, residential energy efficiency rebate programs, energy star new homes rebate program, solar loan program, utility rebate program and various others. Programs like on-bill financing were successful whereas the solar loan program has proven to not be successful. Prominent among the programs offered by Orlando Utility Commission are the home energy efficiency fix-up program, utility grant program, residential insulation loan program, residential solar loan program and the residential energy efficiency rebate program. The Gainesville Regional Utilities has its own solar feed-in-tariff and energy efficiency rebate programs. The Fort Pierce Utility Authority's prominent programs are the residential energy efficiency rebate program, utility rebate program and building insulation program. The Kissimmee Utility Authority offers the residential energy-efficiency rebate program, utility rebate program and various building insulation improvement plans. Various private power companies also offer different energy efficiency programs. Gulf Power offers the geothermal installation rebate program, utility rebate program, solar water heater program and solar thermal water heating pilot programs among others. A home energy check audit and rebate program is offered by the Progress Energy Florida. Its other programs are utility rebate programs and solar water heating with EnergyWise program. Florida Power and Light's prominent programs include the residential energy efficiency program, utility rebate program, building insulation program. Generally speaking, utility rebate programs are mostly successful in county and city-based utilities, in addition to the private power companies.

Commercial Incentives

There are several federal incentives available to manufacturers of certain appliances that use energy or water more efficiently. The tax credits associated with these appliances go directly to the manufacturer, and not to the consumer, but the government expects that the credit will be reflected in the price of the appliance. Through 2010, the manufacturers of high

efficiency refrigerators can receive up to $200 per unit, the manufacturers of clothes washers can receive up to $250 per unit, and the manufacturers of dishwashers can receive up to $75 per unit.

Finally, there is another class of incentives that apply to commercial buildings to cut their energy consumption. Federal tax incentives consist of either a $1.80 or $0.60 per square foot credit, depending on the system scope of the program.

Renewable Feed-in Tariffs

In addition, several states have begun offering incentives to promote electric generation from renewable energy sources. These incentives are increasingly taking the form of a feed-in-Tariff. Although feed-in-Tariffs are often associated with subsidies, they differ from them structurally. A feed-in-Tariff is more closely related to a purchased power agreement, but with an indefinite sales volume. The form of a feed-in-Tariff is a fixed payment for all energy generated from a given project, over a particular time period. One of the purposes of a feed-in-Tariff is to shift the volumetric, or production, risk away from the provider of the grant, generally the government, and towards the power plant operator. Since the power plant operator enjoys greater control over the production of the plant, this should be a more equitable allocation of risk. The provider of the tariff, then, agrees to purchase all of the output associated with the project. The first solar feed-in-Tariff in North America was introduced in Gainesville, Florida in February of 2009, and many states have adopted similar programs.

In May of 2009, the state of Vermont adopted a system of feed-in-Tariffs for an array of renewable energy technologies. A final order establishing the program was issued on September 30, 2009, and by October 19, the 50 MW available under the program had been fully subscribed.

In July of 2009, the state of Oregon established the pilot program for a solar photovoltaic feed-in tariff. The program will have a participation cap of 25 MW, or close by 2015, whichever comes first. The rules for the administration of the feed-in-Tariff are to be determined by April 1, 2010, but the term has already been set at 15 years.

In September of 2009, the state of Hawaii established a feed-in-Tariff for renewable energy technologies. The offer prices have yet to be established, but the term of the tariff will

be for 20 years. The initial period for the tariff will be 2 years, and the state will reevaluate the program every 3 years.

In October of 2009, the state of California announced the implementation of a system of feed-in-Tariffs for renewable generation beginning in 2010. The customer will be able to choose the term of the feed-in tariff, and the tariff price will be based on the operating costs of a so-called market price referent. The current generation proxy is a natural gas combined cycle plant.

In addition, Maine, Minnesota, New Jersey, South Carolina, and Washington offer subsidy production incentives for some forms of renewable energy.

Barriers to Commercialization and Project Finance

Authors:

Erik Sander, Associate Director, Florida Energy Systems Consortium

Dr. Aster Adams

Jack Sullivan Jr., President / CEO, Florida Research Consortium

There is a consensus among cleantech experts and observers alike that cleantech companies are currently underfunded and that the financial gap in the early stages of cleantech companies' development needs to be closed. In order to close this financial gap, we need to identify the factors that have contributed to it.

Cleantech is essentially built on the alignment of technology, capital, and policy. For the cleantech industry to thrive, the underlying technologies must continue to develop and expand into commercialization, private and public capital must be made readily available and accessible to potential investors and local, state and federal policies and regulations must be conducive to market development. At all stages of cleantech development, the three pillars must work hand in hand to sustain investors' efforts.

This section discusses the "barriers to commercialization and project finance" of cleantech projects. Those barriers are divided into three major groups: technological, financial, and policy. Technological barriers are those barriers that relate to the novelty of a technology or the lack of an appropriate, more cost-efficient technology to use in a project. Financial barriers are those related to the funding and capital availability throughout the development stages of the technology. Financial barriers can be traced back to the investor's inability to raise sufficient personal and family funds to push a new technology forward. They are also barriers related to raising private capital or public (local, state or federal) support funds due to perceived risks associated with the new technology (i.e., technical, financial, legal) compared to competing technologies. Finally, policy barriers are associated with obscure public policies and regulations, which may make it difficult for investors to finance all the stages of the new technology. Policy barriers also include the lack of technical or commercial skills as the industry lags behind other sectors with well-established training institutions.

In the following sections, we will discuss the main technologies for a project to be classified as cleantech, the stages of cleantech project development and funding, and barriers to commercialization of cleantech projects.

Cleantech Overview

Clean technologies can be grouped into four major sectors:

Table 9. Clean Technologies

Alternative Energy & Power	Materials & Green Building	Transportation & Logistics	Air & Water Technologies
• Distributed and renewable energy generation (e.g. fuel cells, geothermal, wind, solar, biofuels, wave/tidal) • Energy storage and power quality • Energy infrastructure and management systems (including related Internet and IT-based services) • Energy efficiency and transmission	• Materials recovery and recycling • Advanced and bio-based materials • Nanotechnology (i.e. precision manufacturing instruments) • Green buildings and sustainable design	• Alternative-fueled vehicles (e.g. hybrid vehicles) • Logistics (e.g. logistics software)	• Water purification (e.g. water recycling, ultra-filtration systems and desalination equipment) • Water management (e.g. meters, sensors and automation systems) • Air quality (e.g. air testing equipment and services, emission scrubbers)

Source: New York City Investment Fund: Cleantech: A New Engine of Economic Growth for New York State, page 3, January 2007

Table 8 fails to include cleantech services such as investment, consulting, research and development, and communications without which the development of clean technologies would be impossible. Table 9 illustrates cleantech subsectors tracked by Cleantech Venture Network and the types of cleantech businesses.

In the past several years, cleantech industries have grown rapidly, due in part to concerns over rising oil prices and the global debate over climate change. Cleantech growth has been driven largely by government and local state actions including new laws and regulations in favor of clean technologies such as the American Recovery and Reinvestment Act (ARRA) signed into law on February 17, 2009 and which makes cleantech a key driver of economic stabilization and job growth. Cleantech spending and tax plans comprised $83 billion out of the $787 billion of ARRA funding, or about 10.5%. Many states have their own cleantech incentives including grants, mandates, and tax incentives.

Table 10. Cleantech Subsectors Tracked by Cleantech Venture Network and the Types of Cleantech Businesses

- Agriculture and nutrition
- Air quality
- Enabling technologies
- Energy related
- Environmental IT
- Manufacturing/industrial
- Materials and nanotechnology
- Materials recovery and recycling
- Transportation and logistics
- Water purification and management

Type	Key features	Examples
Cleantech SMEs	Smaller companies that apply already developed technologies or provide other ancillary services. They may not have very fast or high growth potential but are a vital part of cleantech value chains.	• Wind and solar household installation • Niche green products (e.g. construction)
Technology start-ups	Young companies commercialising technologies into products and entering markets with good growth potential.	• Ceres Power • Nanosolar
Pure Play cleantech	Cleantech firms that have developed into significant independent corporations, usually publicly listed and making the majority of revenue from cleantech as core business.	• Vestas Wind • Suzlon Energy • Suntech Power
Traditional environmental goods and services	Water utilities and waste management companies, including large private or public firms and a wide range of smaller waste management companies, environmental consultancies, contaminated land remediation etc.	• Severn Trent • SITA • Veolia
Subsidiaries	Business units within major corporations involved in cleantech, which form a small part of the overall business.	• General Electric • Mitsubishi • Sharp

Source: Forum for the Future: Clean Capital – Financing Clean Technology Firms in UK, p.7.

In 2008, the total investment in cleantech sectors in the United States amounted to $7.5 billion, which was three times higher than the 2006 investments of $2.5 billion, and more than 16 times the 2001 cleantech investments of $448 million.[29]

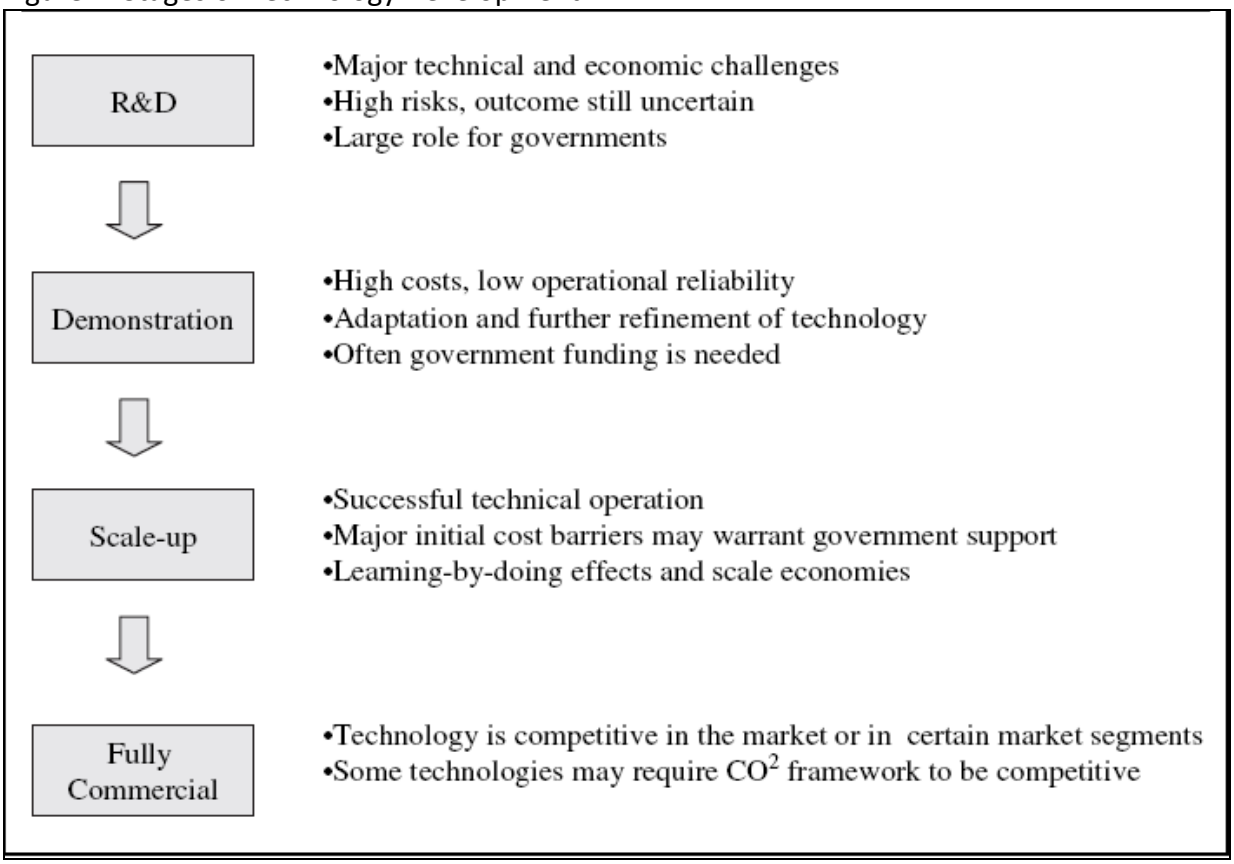
Stages of Cleantech Project Development and Funding

Experts may not use the same terms when describing the development stages of a project, but there is a consensus on four development stages: the Pre-Seed (or Research & Development) stage, the Startup/Seed (Early Capital) stage, the Expansion (Mid/Late Capital) stage and the Late Stage (Project Asset Finance) stage. Figure 1 below illustrates how the World Bank describes the four stages of technology development and the major corresponding activities. Those stages are R&D, demonstration, scale-up, and full commercialization.[30]

These stages of cleantech project and corresponding funding opportunities are illustrated in the figures 2 through 4 below. Figure 2 combines the pre-seed and startup/seed stages into one stage for the purpose of funding.

[29] Data from the Cleantech Networks Database. http://Cleantech.com/research/databases.cfm.
[30] World Bank Working Paper No. 138: Accelerating Clean Energy Technology Research, Development, and Deployment - Lessons from Non-energy Sectors, May 2008.

Figure 1. Stages of Technology Development



Source: World Bank Working Paper No. 138, Appendix A.

Cleantech projects can be very expensive and are rarely wholly financed by personal or family savings. The per-unit cost of clean technologies are initially high especially at the first full integration of the project at which time the developer typically faces large capital needs compared to available resources. It is when the clean technology reaches maturation that the per-unit costs will have sufficiently declined, enabling full commercialization of the project. The rising and falling per-unit costs are referred to as the Mountain of Death for new technology innovation. It has its corresponding Valley of Death which is explained below.

Research and development resources to support the creation of a new cleantech project, as well as project investment funds are generally available from corporate research or government agencies but very rarely from personal savings or assets. Between personal assets, family and friends, cleantech entrepreneurs have typically few sources of funding available to them in order to bring their project to completion. This gap in funding is what is called the Valley of Death for cleantech project developers. In order to bridge this gap, their funding resources include angel investors (e.g. wealthy individuals or philanthropists often interested in

cleantech companies or products)[31]; equity investment firms interested in high-tech startups; venture capital firms specialized in seed investments; state or federal government programs specifically designed for the purpose; and university funding from public or private sources.[32]

During the R&D pre-seed stage, entrepreneurs / small companies formulate project ideas and finance initial R&D expenses with their own personal family savings or friends funding. Other entrepreneurs' ideas are financed through federal grants and incentives such as the National Science Foundation (NSF) and the Small Business Innovation Research (SBIR) or the Small Business Technology Transfer (STTR) programs.[33]

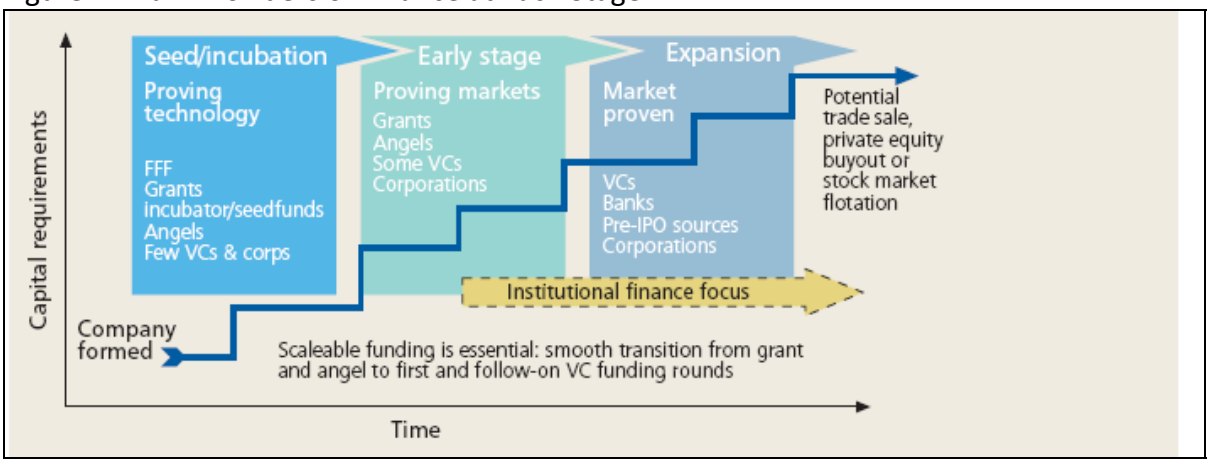
Figures 2 and 3 below show a web of relationships between funding sources and cleantech project developers, and the importance of venture capital funding at all stages of project finance. They show that during the Startup or Seed stage, cleantech projects are generally financed by angel investors, technology labs, SBIR/STTR, and select corporations and venture capitalists. The Early Stage is also financed through the same investors as the Startup/Seed stage, but more corporations and venture capital investments are provided. The Late Stage or Expansion/Commercialization stage is mostly financed through venture capital, banks, corporations, equity and initial public offering (IPO) sources.

[31] See more information here at http://www.angelcapitalassociation.org/default.aspx

[32] National Institute of Standards and Technology (NIST): Between Innovation and Invention: An Analysis of Funding for Early-Stage Technology Development, page 33, November 2002.

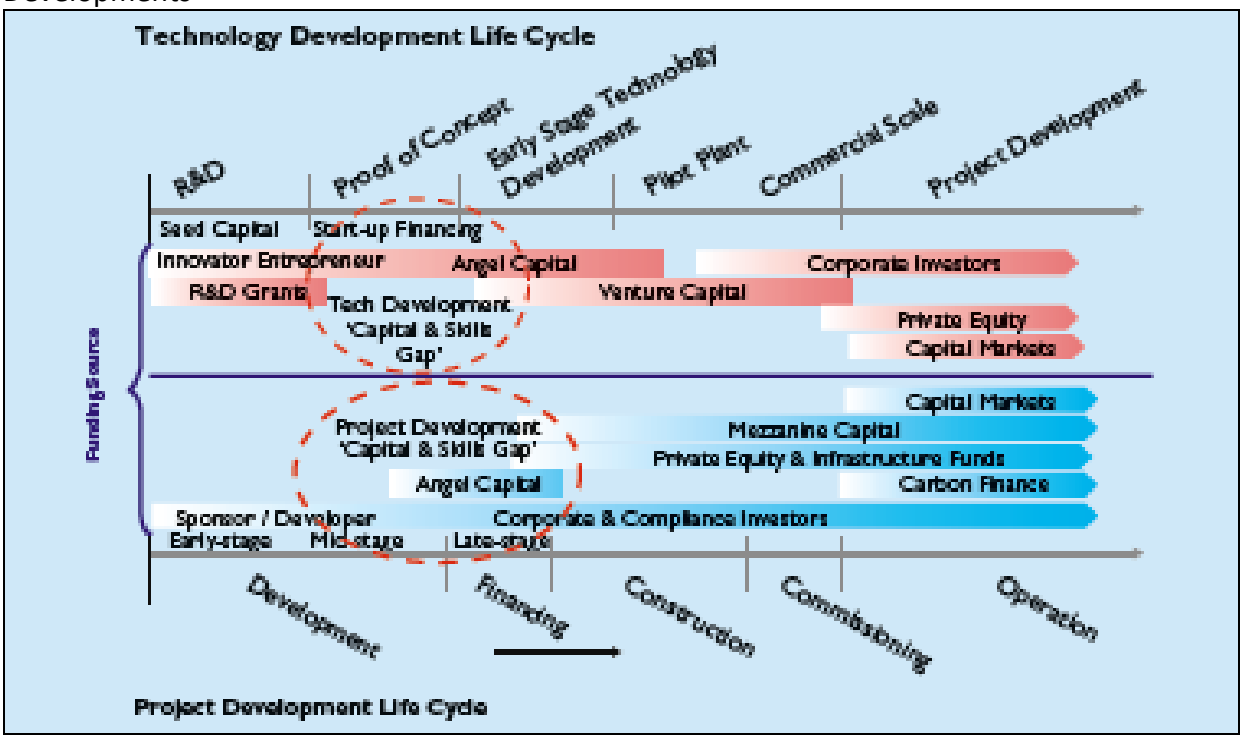
[33] Small Business Innovation Research (SBIR) and Small Business Technology Transfer (STTR) are U.S. Government programs in which federal agencies with large research and development (R&D) budgets set aside a small fraction of their funding for competitions among small businesses only. Small businesses that win awards in these programs keep the rights to any technology developed and are encouraged to commercialize the technology. Although officially based in the U.S. Small Business Administration's Office of Technology, SBIR funding is actually available directly from 11 different federal agencies. The following agencies offer both SBIR and STTR programs: U.S. Department of Energy, U.S. Department of Defense, National Institutes of Health, National Science Foundation and National Aeronautics & Space Administration (NASA), The next agencies only offer SBIR programs: U.S. Department of Agriculture, U.S. Department of Education, Environmental Protection Agency, U.S. Department of Commerce—National Institute of Standards and Technology, U.S. Department of Commerce—National Oceanographic and Atmospheric Administration, U.S. Department of Transportation, and U.S. Department of Homeland Security. http://www.science.doe.gov/sbir/aboutSBIR.html

Figure 2. Main Providers of Finance at Each Stage



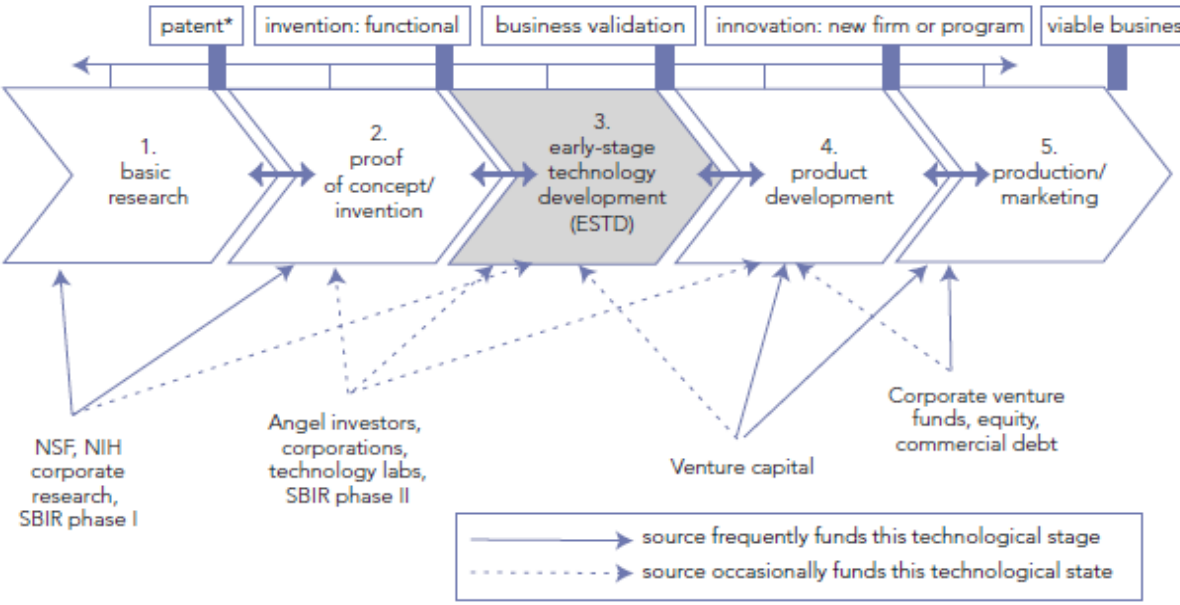
Source: Forum for the Future: Clean Capital – Financing Clean Technology Firms in UK , 2006, page 12.

Figure 3. The "Capital and Skills Gap" for Cleantech and Clean Energy Infrastructure Project Developments



Source: Josh Carmody and Duncan Ritchie: Investing in Clean Energy and Low Carbon Alternatives in Asia, Asian Development Bank, p. 61.

Figure 4. Sequential Model of Development and Funding



Note:

The region corresponding to early-stage technology development is shaded in gray.

The boxes at top indicate milestones in the development of a science-based innovation.

The arrows across the top of, and in between, the five stages represented in this sequential model are intended to suggest the many complex ways in which the stages interrelate. Multiple exit options are available to technology entrepreneurs at different stages in this branching sequence of events.

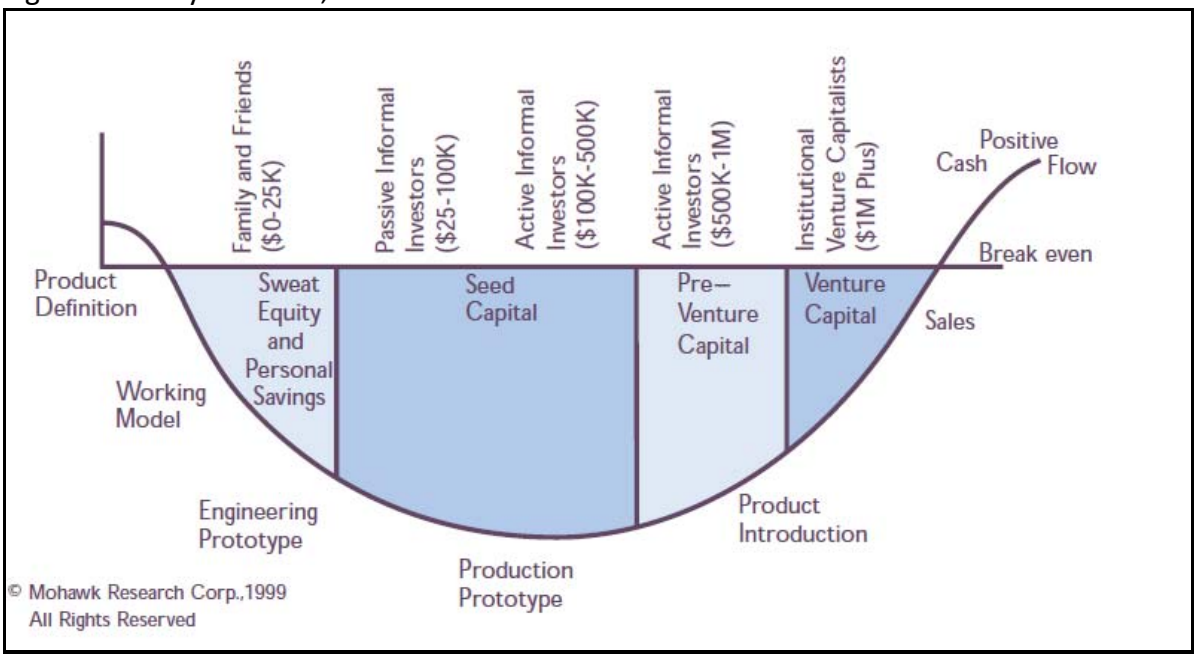
*A more complete model would address the fact that patents occur throughout the process.

Source: National Institute of Standards and Technology (NIST): Between Innovation and Invention: An Analysis of Funding for Early-Stage Technology Development, page 33, November 2002.

Figures 5 and 6 illustrate a phenomenon known as the "Valley of Death." They show that from the product definition to the product introduction and sales stages, developers of cleantech projects are exposed to multiple funding gaps and typically only break even when the cleantech company is in its growth / expansion stage. Our research confirms that federal, state and local government entities offer a number of incentive programs, including corporate tax and personal tax incentives, grants, loan guarantees, sales tax incentives, property tax incentives, and many other such programs which help overcome the "Valley of Death." However, some states offer better financial incentives than others, enabling them to attract greater cleantech investments. It is also important to recognize that company funding needs

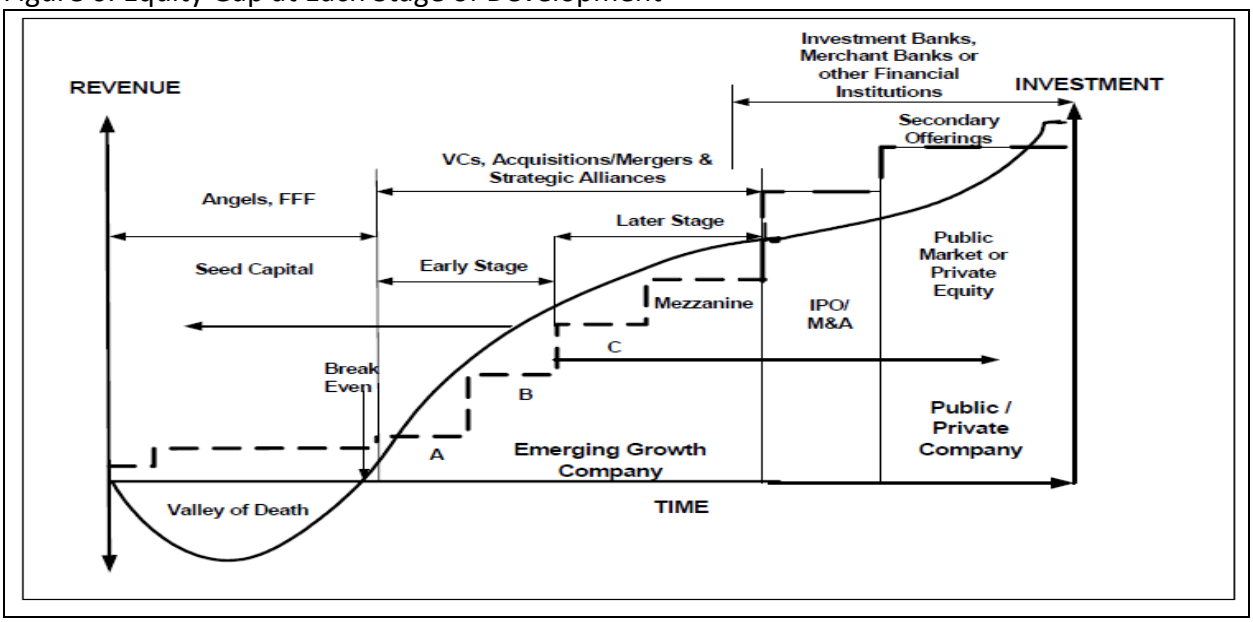
increase in size from the early stage to company expansion. However, at later stages, private investors such as banks and venture capitalists are more willing to provide funding as the perceived risk is lower compared to the high risk associated with the early stages.

Figure 5. Valley of Death, from Invention to Innovation



Source: U.S. Department of Energy: From Invention to Innovation, August 1999, p. 13.

Figure 6. Equity Gap at Each Stage of Development



Source: European Business Angel Network (EBAN) Tool Kit: Introduction to business angels and business angels network activities in Europe, June 30, 2009, p. 19

Main Barriers to Cleantech Commercialization and Project Finance

Perceived High Risk of Cleantech Businesses

Cleantech projects present risks in terms of technology, credit worthiness, revenue security and market competition.[34] The perceived risk of cleantech businesses is particularly important for project developers and investors to overcome as it is the basis of the "Valley of Death" explained above. When the perceived risk is high and the expected return is low, cleantech developers can only depend on their own capital. When the perceived risk is high and the expected return is moderate to high, the funding of cleantech projects is usually of interest to Angel and Venture Capital investors. Conventional lenders such as banks supply loans to cleantech developers only when the risk-return relationship is low.

We found that the perceived high risk of cleantech businesses is aggravated by disparate and inconsistent policies and regulations affecting the industry which introduce an element of risk that detracts from the attractiveness of a potential investment. More importantly, clean technologies are considered by developers to be high risk business because they are mostly nascent technologies, require high initial costs, and are believed to be associated with higher financial and business risks when their potential revenue streams are compared to investments in traditional industries.

Insufficient Investments in R&D

The chief barrier to cleantech project development is the lack of sufficient investments in R&D by both the federal government and private investors in order to address the nation's supply, security, and sustainability challenges. According to a recent report by Brookings, the federal government funds 27% of U.S. R&D efforts. The same report states that "Today's investments in energy R&D by the federal government and large industrial firms are only one-fifth the level of the early 1980s, and make up just 1.1 percent of the nation's total R&D investment and 0.03 percent of the nation's GDP."[35]

The same report states that "in 2007, the federal government spent $2 billion on non-defense energy technology-related R&D, comprising just 1.7 percent of the federal R&D budget

[34] National Renewable Energy Laboratory: Technical Report NREL/TP-600-38723, October 2005: Financing Projects That Use Clean-Energy Technologies: An Overview of Barriers and Opportunities By D.P. Goldman, New Energy Capital, LLC; J.J. McKenna, Hamilton Clark & Co. and L.M. Murphy National Renewable Energy Laboratory.

[35] James Duderstadt et al., February 2009: Blueprint for American Prosperity – Unleashing the Potential of a Metropolitan Nation, p. 14, Metropolitan Policy at Brookings.

(4.2 percent of the non-defense portion) and 0.014 percent of the nation's GDP. Estimated federal energy technology R&D spending for 2009 is up to $2.37 billion, higher than its 1998 low of $1.27 billion but substantially lower than the $10.5 billion spent at the height of federal spending in 1978 and 1979 (in real terms)."[36]

Public investment in cleantech research is also crucial for the following reasons:[37]

- In its magnitude alone, it can accelerate the pace of research innovation and development.
- It helps to reassure private investors that this area is important to the public, is worthy of investment, and will receive real public support.

Potential investors interpret the public support by a state as a positive message that the state intends to create a business environment that is supportive of cleantech.

Inconsistency and Unpredictability of Policies and Regulations Affecting the Industry

Government will play a substantial role in the evolution of cleantech more than it will in information technology (excluding telecommunications services).

According to a 2007 cleantech report, among the investors surveyed, the most often cited barrier to investment in cleantech was the inconsistency and unpredictability of policies affecting the industry. One investor stated that "If the federal policy is unclear or inconsistent, it introduces an element of risk that detracts from the attractiveness of a potential investment. If a federal policy is supportive and appears stable, it makes the investment more attractive."[38]

The federal government and all the states have implemented myriad financial incentive programs with the obvious objective to encourage investment in clean technologies. However, those policies are often accompanied with regulations and rules which are not always harmonized between the federal and state governments, or between states within the same region, and even between states and city governments. For example, the Southeast region may benefit from attracting a clean technology which has the potential to thrive in the region but not in other regions.

[36] Id.
[37] James Stack : Cleantech Venture Capital: How Public Policy Has Stimulated Private Investment. A joint report by Environmental Entrepreneurs and Cleantech Network LLC, June 2007, pp. 29.
[38] Id., pp. 26-27

Even where states have implemented well thought out laws and policies to improve the cleantech environment, the legislation and policies are left to the interpretation of regulatory agencies which must translate them into tariffs that are often difficult to understand for less informed investors or require investors to engage high-cost expertise at the expense of investing in the project.

The lack of federal and state policy coordination is more visible through the state renewable portfolio standards. The Energy Policy Act of 2005 ("EPACT2005") extended existing tax incentives to encourage the integration of renewable energy production within state-level Renewable Portfolio Standards. However, there has been no federal legislation to mandate a specific financial mechanism to implement clean technology in the energy sector. This leaves states to construct their own solutions. To illustrate this point, cleantech investors believe that a national renewable portfolio standard (national RPS) would be a critical or important factor in their decisions to invest in next-generation clean energy technologies. Therefore, there is a need to harmonize and simplify federal and state policies related to cleantech. This policy harmonization will bring certainty and reduce the perceived risk for entrepreneurs and investors alike.

Recently, the federal government issued a report in which it clarified its strategy for American innovation. The main priorities outlined are to unleash a clean energy revolution by promoting renewable and energy efficiency technologies, investing in clean energy innovation, supporting advanced vehicle technologies, driving innovations in health care technology and harnessing science and technology to address the "Grand Challenges" of the 21st Century.[39]

Costs and Pricing (Subsidies for Competing Existing Businesses, High Initial Costs, Transaction Costs, Environmental Externalities)

On average, cleantech requires higher initial costs compared to other sectors. For example, the most recent report by Merrill Lynch (2008) concluded that cleantech requires roughly 2.5 times as much capital as IT.[40] Higher initial costs for cleantech businesses contribute to the Mountain of Death of cleantech costs. When compared to marginal costs of competing technologies, the higher initial costs of cleantech represent a serious barrier to investment in

[39] Executive Office of the President National Economic Council Office of Science and Technology Policy: A Strategy for American Innovation: Driving Towards Sustainable Growth and Quality Job, September 2009, pp 19-22.
[40] Merrill Lynch, November 17, 2008: Clean Technology - The Sixth Revolution: The Coming of Cleantech.

cleantech, one that the state of Florida should address in order to attract more cleantech businesses.

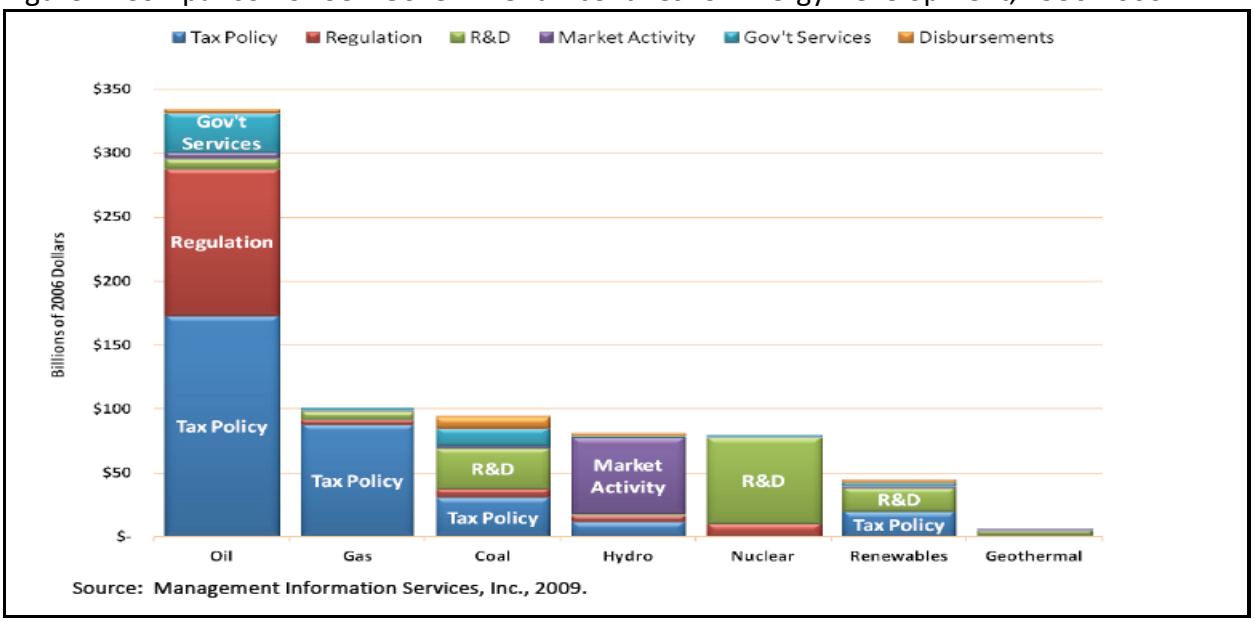
However, in a June 2008 study of comparative "levelized cost of energy" for various technologies on a $/MWh basis, Lazard concluded that "Certain Alternative Energy generation technologies are already cost-competitive with conventional generation technologies under some scenarios, even before factoring in environmental and other externalities (e.g., RECs, potential carbon emission costs, transmission costs) as well as the fast-increasing construction and fuel costs affecting conventional generation technologies." Nevertheless, as shown in Table 62, the cost per MWh of conventional generation technologies (gas combined cycle, coal and nuclear) ranges from $73 to $135 while the cost per MWh of the most expensive technologies (fuel cell, solar PV and solar thermal) ranges from $90 to $154. The same study shows that "the capital costs for a number of Alternative Energy generation technologies (e.g., solar PV, solar thermal) are currently in excess of conventional generation technologies (e.g., gas, coal, nuclear)" but that "declining costs for many Alternative Energy generation technologies, coupled with rising construction and fuel costs for conventional generation technologies, are working to close formerly wide gaps in electricity costs."[41]

It is still possible that cleantech products are not competing with traditional alternatives on a level playing field. Indeed, some cleantech investors believe that "conventional technologies such as coal, natural gas and petroleum regularly receive large government subsidies that give them a price advantage, even though these technologies have been in the mainstream for decades."[42]

The following figure illustrates this barrier. Oil, gas, coal and nuclear received more government incentives, including tax incentives than renewable and geothermal fuels, keeping in mind that these sources also produced the lion's share of energy in the U.S.

[41] Lazard: Levelized Cost of Energy Analysis – Version 2.0, June 2008, pages 2, 7.
[42] Id., p. 26.

Figure 7. Comparison of USA Government Incentives for Energy Development, 1950-2006



Source: Management Information Services, Inc.: Why Clean Energy Public Investment Makes Economic Sense - The Evidence Base. An analysis of the connection between government clean energy spending and various measures of economic health, 2009, page vi.

According to the Union of Concerned Scientists, compared with renewables, nuclear and fossil fuel technologies enjoyed for years a considerable advantage in government subsidies for research and development, and lower tax burden than renewables.[43]

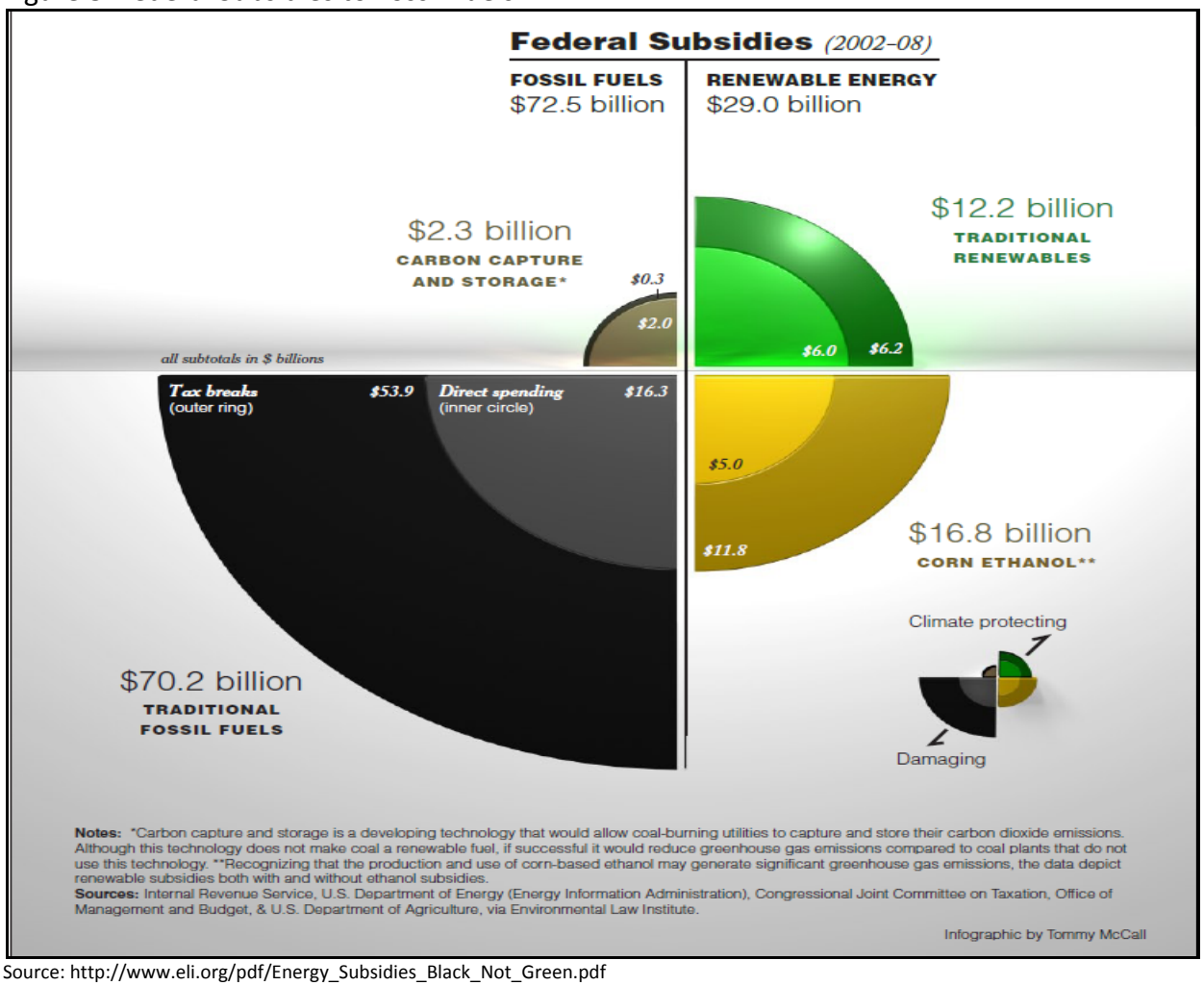
- Through 1978, of $516 billion spent on energy subsidies, 50 percent went to oil, 25 percent to electricity, and 25 percent to nuclear, hydro, gas, and coal.
- During fiscal year 1992, direct federal subsidies totaled $8 billion. Renewables (except ethanol for transportation) received about one-third as much as coal and less than one-quarter as much as natural gas. The oil industry received $3.1 billion in indirect subsidies.
- During the fiscal year 1996, Congress appropriated a combined $1.3 billion for fossil fuels, nuclear fusion, nuclear fission, and nuclear waste, but only $273 million for all renewable energy technologies combined.
- A study released by the Environmental Law Institute, a nonpartisan research and policy organization, shows that during the years 2002-2008, the federal government provided subsidies to fossil fuels totaling approximately $72 billion, while subsidies for renewable fuels totaled only $29 billion or 40 percent of subsidies provided to fossil fuels over the same period. The same study reveals that the vast majority of subsidies went to energy

[43] http://www.ucsusa.org/clean_energy/technology_and_impacts/energy_technologies/barriers-to-renewable-energy.html.

sources that emit high levels of greenhouse gases when used as fuel.[44] Figure 9 below illustrates the situation.

Given the size of federal subsidies to traditional fuels, these fuels are able to keep their costs artificially low and it is difficult for many states to offer state tax and other incentive policies sufficient to make up the disadvantage against cleantech businesses. Again, it must be stressed that the level of incentives dedicated to traditional fuels are to a great degree driven by the sheer magnitude of the energy produced by these traditional sources.

Figure 8. Federal Subsidies to Fossil Fuels



Source: http://www.eli.org/pdf/Energy_Subsidies_Black_Not_Green.pdf

The Possibilities of First Mover Advantages

The theory of pioneering and first-mover advantage states that companies gain this advantage in at least three ways: 1) by making new products, 2) by using a new process, or 3)

[44] Environmental Law Institute: Estimating U.S. Government Subsidies to Energy Sources: 2002-2008, September 2009, p. 3.

by entering a new market.[45] By moving first in fostering cleantech businesses, state pioneers have gained advantage by making first moves in technology, product or marketing innovation and have established industry best practices which are often difficult to meet for states interested in these technologies. The state leaders in cleantech have also created new market demand for cleantech products and have created a financial, fiscal, social and political environment conducive to new cleantech ventures in the state. Other states have the advantages of not reinventing the wheel of cleantech businesses, but at the same time face higher starting costs than leading states.

While advising the state of North Carolina and discussing the importance of early or leading clusters, Carbonell states that "patterns of regional development, once established, exhibit "positive feedbacks" that reinforce the position of the cluster. Clusters generate regional advantages that cannot be easily reproduced elsewhere: they form large pools of skilled labor; they cultivate relationships with local suppliers, investors, financiers, and attorneys who understand their needs; they develop a strong "regional brand" that attracts still more investment."[46] He concluded that "If North Carolina chooses to pursue clean energy as an economic development opportunity; it may be wise to deploy proactive policies now, when markets are more fluid, rather than attempt to imitate the successful policies of other states only after they have claimed a dominant position."[47]

Other Barriers to Cleantech Commercialization and Project Finance

Experts in cleantech commercialization and finance list many other barriers to commercialization. For example a World Bank Working Paper on accelerating investment in clean energy[48] discusses a number of barriers including negative externality of carbon emissions which is difficult to valuate, climate change mitigation, the "Valley of Death" between public- and private- sector development, the "Mountain of Death" of technology costs, concerns about Intellectual Property protection, and the limits of integration of new technologies into the existing network infrastructure.

[45] Đorđe Kaličanin: A Question Of Strategy: To be a pioneer or a follower? Communications, p. 90.
[46] Carbonell, Tomás (Yale Law School): Getting Ahead: New Opportunities in Clean Energy, page 5.
[47] Id.
[48] World Bank Working Paper No. 138: Accelerating Clean Energy Technology Research, Development, and Deployment - Lessons from Non-energy Sectors, May 2008, Chapter 4.

The Forum for the Future identifies other barriers including the lack of managerial experience, undeveloped markets and business models, lack of a route to market, technology and public policy risk, and business without a sound commercial case and potential returns.[49]

Clean Technology Life Cycle and Funding Sources

Research Methodology

The tasking for this section of the report suggested that a Gap Analysis would be an appropriate and effective mechanism to identify barriers to commercialization and project finance across the four-stage model presented below. This analysis protocol involves identifying the current and desired conditions of support and resources for key metrics (input and output) and resultant gaps in resources that would need to be filled to transition from the current to the desired condition.

Florida has the 4th largest gross state product (GSP) and this benchmark was utilized to define the desired condition for a key set of energy related metrics (4th ranking among US states). We researched the availability of funds, and report on the "funding gaps" against what one would expect of a state with the nation's 4th largest GSP in four lifecycle stages of clean technology development, finance, and commercialization.

Data was segmented from myriad sources into the four-stage development / commercialization model discussed below:

- Primary Information sources included representatives of Florida's energy industry, technology investment community, technology incubators, universities, and state government agencies.
- Secondary information sources included the National Science Foundation, Dow Jones Venture Source, the National Association of Seed and Venture Funds, and Ventyx, among many others.

Information was not available by state or technology for 1) angel deal flow and volume or 2) the dollar value of project finance by state for cleantech or renewable projects. In these cases, proxy measures (e.g. MW of added capacity) were utilized.

[49] Forum for the Future, p. 21 and Fred Beck and Eric Martinot, Renewable Energy Policies and Barriers, *Encyclopedia of Energy,* Cutler J. Cleveland, ed., 2004.

For a complete picture, researchers identified key assets driving performance as well as the output metrics. For instance, Florida's research performance at 16th in the US is better understood in the context of its 13th position in the number of PhD scientists and engineers.

National policy / incentive programs that could successfully close gaps in the key metrics were studied for programmatic recommendations.

Current Situation and Relative Performance Metrics

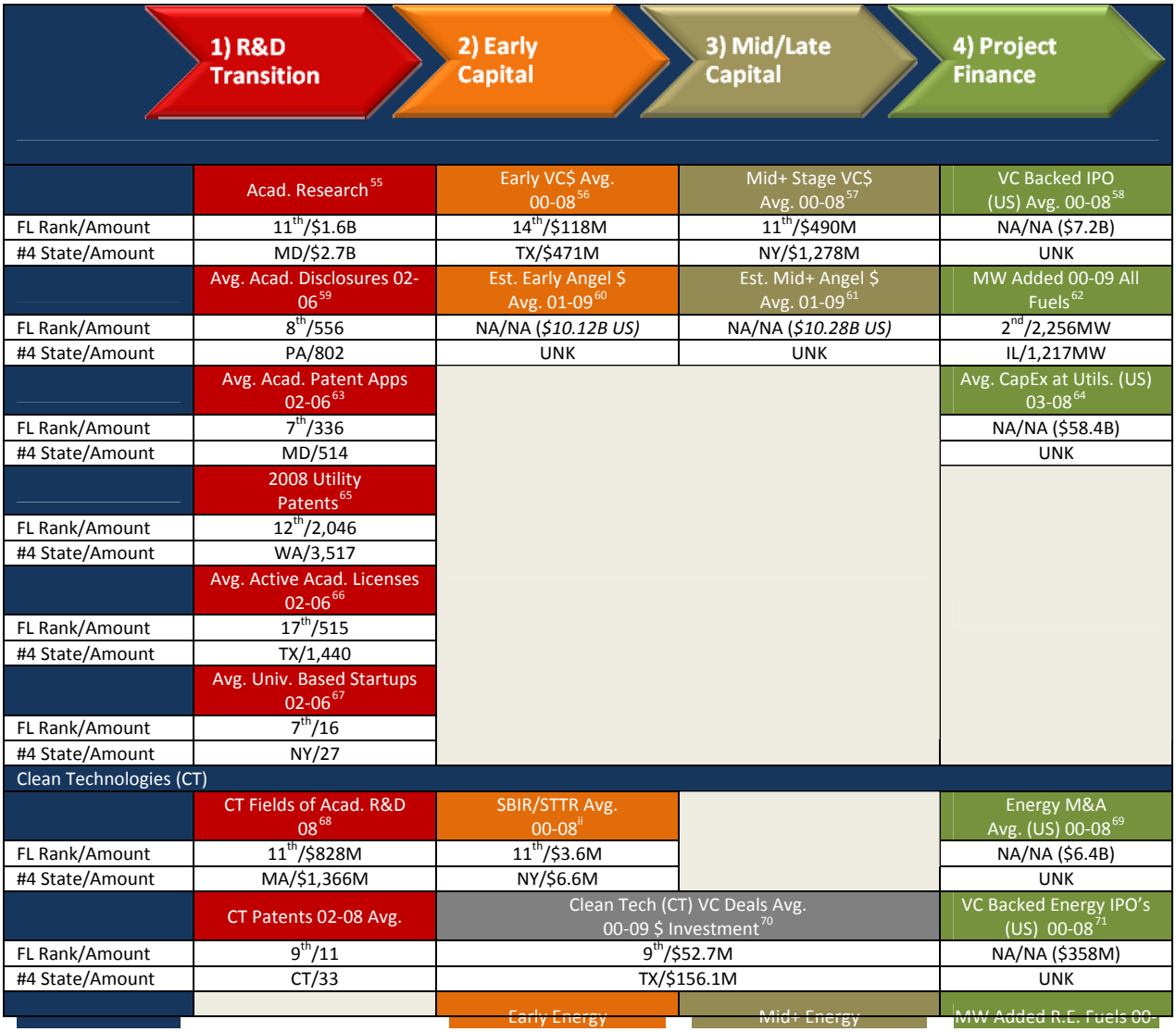
The following table and analysis identify each technology development and commercialization stage and comment on the availability of funding in each stage, and corresponding business and financial resources in Florida. The analysis compares the relative performance of the state of Florida against other states, especially with states comparable to Florida in resources and economic performance. The descriptive analysis will be followed by a comparative analysis of current policies and incentives.

From 2004 to 2008, the state of Florida had the nation's fourth highest Gross State Product (GSP) behind California, Texas and New York. In assessing the relative performance of the state of Florida in metrics related to cleantech commercialization, we compare Florida's relative position in selected metrics to the fourth place ranked state in each metric and calculate the gap that Florida should strive to overcome in each metric in order to improve its relative position.

Table 11. Current Situation and Relative Performance Metrics

Current Situation And Relative Performance Metrics				
All Technologies				
	Total R&D[50]	SBIR/STTR Avg. 00-08[51]		M&A Avg. (US) 00-08[52]
FL Rank/Amount	16th/$6.34B	12th/$41M		NA/NA ($46.9B)
#4 State/Amount[53]	TX/$17.1B	MD/$87M		UNK[54]

[50] National Science Foundation, 2006 data, http://www.nsf.gov/statistics/nsf10302/
[51] SBA Data base, http://web.sba.gov/tech-net/public/dsp_search.cfm
[52] National Venture Capital Association 2009 Yearbook, http://www.nvca.org/index.php?option=com_docman&task=cat_view&gid=89&Itemid=464
[53] Florida has the 4th largest economy in the nation. For purposes of "relative comparison" the authors have identified the state performing 4th and its performance on each metric as a relative target indicator.
[54] UNK represents Unknown. In most instances the standard presentation format used here of ranking performance by state and stage of development requires a data source that is individual deal/project driven. In many instances, this information was not available to the authors due to cost constraints or it is not consistently collected and reported. This is particularly true of "Project Finance information", particularly the financial aspects of construction activity at utilities



	Acad. Research[55]	Early VC$ Avg. 00-08[56]	Mid+ Stage VC$ Avg. 00-08[57]	VC Backed IPO (US) Avg. 00-08[58]
FL Rank/Amount	11th/$1.6B	14th/$118M	11th/$490M	NA/NA ($7.2B)
#4 State/Amount	MD/$2.7B	TX/$471M	NY/$1,278M	UNK
	Avg. Acad. Disclosures 02-06[59]	Est. Early Angel $ Avg. 01-09[60]	Est. Mid+ Angel $ Avg. 01-09[61]	MW Added 00-09 All Fuels[62]
FL Rank/Amount	8th/556	NA/NA (*$10.12B US*)	NA/NA (*$10.28B US*)	2nd/2,256MW
#4 State/Amount	PA/802	UNK	UNK	IL/1,217MW
	Avg. Acad. Patent Apps 02-06[63]			Avg. CapEx at Utils. (US) 03-08[64]
FL Rank/Amount	7th/336			NA/NA ($58.4B)
#4 State/Amount	MD/514			UNK
	2008 Utility Patents[65]			
FL Rank/Amount	12th/2,046			
#4 State/Amount	WA/3,517			
	Avg. Active Acad. Licenses 02-06[66]			
FL Rank/Amount	17th/515			
#4 State/Amount	TX/1,440			
	Avg. Univ. Based Startups 02-06[67]			
FL Rank/Amount	7th/16			
#4 State/Amount	NY/27			
Clean Technologies (CT)				
	CT Fields of Acad. R&D 08[68]	SBIR/STTR Avg. 00-08[ii]		Energy M&A Avg. (US) 00-08[69]
FL Rank/Amount	11th/$828M	11th/$3.6M		NA/NA ($6.4B)
#4 State/Amount	MA/$1,366M	NY/$6.6M		UNK
	CT Patents 02-08 Avg.	Clean Tech (CT) VC Deals Avg. 00-09 $ Investment[70]		VC Backed Energy IPO's (US) 00-08[71]
FL Rank/Amount	9th/11	9th/$52.7M		NA/NA ($358M)
#4 State/Amount	CT/33	TX/$156.1M		UNK
		Early Energy	Mid+ Energy	MW Added R.E. Fuels 00-

[55] NSF, 2006 data

[56] Down Jones Venture Source Database, http://fis.dowjones.com/products/venturesource.html, Access to the Venture Source Data Base was Graciously Provided by Kirstie Chadwick of UCF's Venture Lab

[57] Down Jones Venture Source Database, http://fis.dowjones.com/products/venturesource.html, Access to the Venture Source Data Base was Graciously Provided by Kirstie Chadwick of UCF's Venture Lab

[58] National Venture Capital Association 2009 Yearbook, http://www.nvca.org/index.php?option=com_docman&task=cat_view&gid=89&Itemid=464

[59] AUTM 2008 data, http://www.autmsurvey.org/statt/index.cfm. Data averages from 2002-2006.

[60] Source: Center for Venture Research, http://wsbe.unh.edu/cvr. Data is calculated using CVR provided figures.

[61] Source: Center for Venture Research, http://wsbe.unh.edu/cvr. Data is calculated using CVR provided figures.

[62] Ventyx Database. Access Graciously provided by FP&L Group. http://www1.ventyx.com/velocity/vs-overview.asp

[63] AUTM 2008 data, http://www.autmsurvey.org/statt/index.cfm. Data averages from 2002-2006.

[64] Edison Electric Institute Data which includes Generation, Transmission, Facilities and Equipment. http://www.eei.org/whatwedo/DataAnalysis/IndusFinanAnalysis/Pages/QtrlyFinancialUpdates.aspx

[65] USPTO, http://www.uspto.gov/web/offices/ac/ido/oeip/taf/cst_utl.htm

[66] AUTM 2008 data, http://www.autmsurvey.org/statt/index.cfm. Data averages from 2002-2006.

[67] AUTM 2008 data, http://www.autmsurvey.org/statt/index.cfm. Data averages from 2002-2006.

[68] Data is from an NSF database. http://webcaspar.nsf.gov/index.jsp?subHeader=WebCASPARHome

[69] National Venture Capital Association 2009 Yearbook, http://www.nvca.org/index.php?option=com_docman&task=cat_view&gid=89&Itemid=464

[70] Data is from the Cleantech Networks Database, http://Cleantech.com/research/databases.cfm. The authors combined the Primary Industries into headings of Energy, Environmental and Industrial for clarity and brevity of presentation Seed and Early stage includes rounds identified by the Cleantech Network as Seed or First Round with all other classified as Mid+.

[71] National Venture Capital Association 2009 Yearbook, http://www.nvca.org/index.php?option=com_docman&task=cat_view&gid=89&Itemid=464

		Avg. 00-09 $ Inv[72]	Avg. 00-09 $ Inv[73]	09[74]
FL Rank/Amount		27th/$1M	14th/$21.4M	25th/19MW
#4 State/Amount		NY/$12M	TX/$58.1	CA/171MW
		Early Environ. Avg. 00-09 $ Inv[75]	Mid+ Environ. Avg. 00-09 $ Inv[76]	
FL Rank/Amount		16th/$1.1M	3rd/$28.7M	
#4 State/Amount		WA/$5.6M	MA/$14.1	
		Early Industrial Avg. 00-09 $ Inv[77]	Mid+ Industrial Avg. 00-09 $ Inv[78]	
FL Rank/Amount		24th/$.1M	23rd/$.441M	
#4 State/Amount		AZ/$3.6M	TX/$9M	
	ARRA Energy (Combined) 09 Awards[79]			
FL Rank/Amount	3rd/$414.1M			
#4 State/Amount	TX/$361.7M			
	ARRA ARPA -E Awards 09[80]	ARRA Biomass 09 Awards[81]	ARRA Geothermal 09 Awards[82]	ARRA Smart Grid 09 Awards[83]
FL Rank/Amount	1of 33 with $0	4th/$50M	35th/$.250M	1st/$267M
#4 State/Amount	CO/$14.1M	FL/$50M	CA/$24.5M	CA/$203M
		ARRA SBIR/STTR 09 Awards[84]	ARRA Battery 09 Awards[85]	ARRA Reg. Smart Grid, 09 Awards[86]
FL Rank/Amount		4th/$1.2M	3rd/$95.5M	1 of 42 with $0
#4 State/Amount		FL/$1.2M	SC/$50.1M	TX/$27.4M
			ARRA Adv. Vehicles 09 Awards[87]	
FL Rank/Amount			1 of 32 with/$0	
#4 State/Amount			WI/$15M	
		Global Clean Technology VC Investment in 09 (preliminary)		Global M&A Activity 09 (Prelim.)

[72] Data is from the Cleantech Networks Database, http://Cleantech.com/research/databases.cfm. The authors combined the Primary Industries into headings of Energy, Environmental and Industrial for clarity and brevity of presentation Seed and Early stage includes rounds identified by the Cleantech Network as Seed or First Round with all other classified as Mid+.

[73] Data is from the Cleantech Networks Database, http://Cleantech.com/research/databases.cfm. The authors combined the Primary Industries into headings of Energy, Environmental and Industrial for clarity and brevity of presentation Seed and Early stage includes rounds identified by the Cleantech Network as Seed or First Round with all other classified as Mid+.

[74] Ventyx Database. Access Graciously provided by FP&L Group. http://www1.ventyx.com/velocity/vs-overview.asp

[75] Data is from the Cleantech Networks Database, http://Cleantech.com/research/databases.cfm. The authors combined the Primary Industries into headings of Energy, Environmental and Industrial for clarity and brevity of presentation Seed and Early stage includes rounds identified by the Cleantech Network as Seed or First Round with all other classified as Mid+.

[76] Data is from the Cleantech Networks Database, http://Cleantech.com/research/databases.cfm. The authors combined the Primary Industries into headings of Energy, Environmental and Industrial for clarity and brevity of presentation . Seed and Early stage includes rounds identified by the Cleantech Network as Seed or First Round with all other classified as Mid+.

[77] Data is from the Cleantech Networks Database, http://Cleantech.com/research/databases.cfm. The authors combined the Primary Industries into headings of Energy, Environmental and Industrial for clarity and brevity of presentation . Seed and Early stage includes rounds identified by the Cleantech Network as Seed or First Round with all other classified as Mid+.

[78] Data is from the Cleantech Networks Database, http://Cleantech.com/research/databases.cfm. The authors combined the Primary Industries into headings of Energy, Environmental and Industrial for clarity and brevity of presentation Seed and Early stage includes rounds identified by the Cleantech Network as Seed or First Round with all other classified as Mid+.

[79] Data is combined from two sources, The Cooley Clean Tech Stimulus Portal and the Department of Energy. http://www.cooley.com/Cooley_Clean_Tech_Stimulus_Portal, http://www.energy.gov/recovery/index.htm

[80] Department of Energy ARPA-E, http://arpa-e.energy.gov/public/PR-102609.pdf

[81] Cooley Clean Tech Stimulus Portal, http://www.cooley.com/Cooley_Clean_Tech_Stimulus_Portal

[82] Cooley Clean Tech Stimulus Portal, http://www.cooley.com/Cooley_Clean_Tech_Stimulus_Portal

[83] Cooley Clean Tech Stimulus Portal, http://www.cooley.com/Cooley_Clean_Tech_Stimulus_Portal

[84] Cooley Clean Tech Stimulus Portal, http://www.cooley.com/Cooley_Clean_Tech_Stimulus_Portal

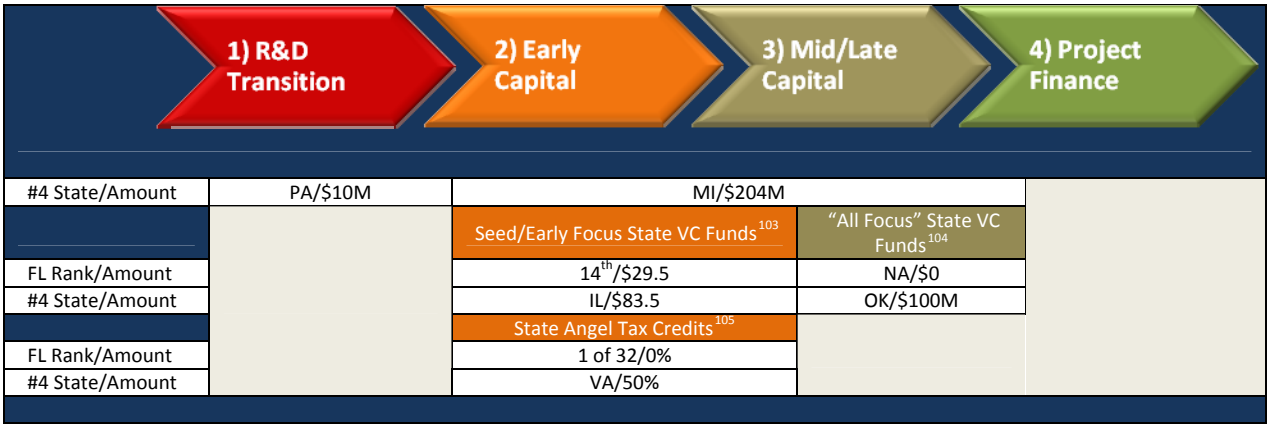
[85] Cooley Clean Tech Stimulus Portal, http://www.cooley.com/Cooley_Clean_Tech_Stimulus_Portal

[86] Source: http://www.energy.gov/news2009/documents2009/SG_Demo_Project_List_11.24.09.pdf

[87] Cooley Clean Tech Stimulus Portal, http://www.cooley.com/Cooley_Clean_Tech_Stimulus_Portal

FL Rank/Amount		NA/NA ($5.6B)	NA/NA ($31.8B)
#4 State/Amount		UNK	UNK
			Global IPO Activity 09 (Prelim.)
FL Rank/Amount			NA/NA ($4.7B)
#4 State/Amount			UNK (72% Asia)
Current Assets And/Or System Inputs			
	Total PhD Sci & Engineers 06[88]	Number of Angel Groups 07[89]	ST Pub Benefit Funds for RE[90]
FL Rank/Amount	13th/17,630	9th/5	1 of 32/$0
#4 State/Amount	MA/32,400	NC & IL/9	CT/$444M
	Total University Faculty 07[91]	Total VC Firms w/ Principal Office in State 09[92]	RPS STDs by ST, Nov 09
FL Rank/Amount	6th/16,792	12th/33	1[93] of 14/0%
#4 State/Amount	PA/19,926	IL/107	CT/27%
	Total Tenure Track Faculty 07[94]	Average Venture Capital Under Management by State 00-08[95]	
FL Rank/Amount	7th/9,375	17th/$1,459M	
#4 State/Amount	OH/10,450	CT/$12,578M	
	Faculty Student Ratio 07[96]	Commitments to Venture Capital Funds by State 00-08[97]	
FL Rank/Amount	45th/21	18th/$165M	
#4 State/Amount	CA,NY,TX,PA,MA[98]/15	CT/$1,713M	
	Avg. Acad Lic Managers 02-06[99]	Venture Capital Firms in State with a Clean Tech Focus 09[100]	
FL Rank/Amount	8th/25	13th/3	
#4 State/Amount	TX/43	MA/17	
	Avg. Acad Patent Expenses 02-06[101]	State VC Funds by Total Fund Size[102]	
FL Rank/Amount	10th/$6.7M	21st/$29.5M	

[88] National Science Foundation, 2006 data, http://www.nsf.gov/statistics/nsf10302/
[89] National Governor's Association Report, http://www.nga.org/Files/pdf/0802ANGELINVESTMENT.PDF
[90] www.dsireusa.org
[91] Information comes from a previous Florida Research Consortium Study. Source is a Carnegie Foundation database on Higher Education. http://classifications.carnegiefoundation.org/
[92] Capital Vector Venture Capital Directory, http://www.capitalvector.com/
[93] Florida has implemented 110MW of Renewable Energy that allows for Cost Recovery. The % requirements by state vary greatly as to time to implementation and MW's against which the standard is applicable. However, the comparison highlights a significant impediment to project finance for renewable energy in Florida, uncertainty about revenues to support investment in renewable energy. RPS standards provide investment cost recovery mechanisms. States without RPS standards in one form or another face a great deal of uncertainty as to how renewable projects generated megawatts are priced in the market, which effectively halts project finance.
[94] Information comes from a previous Florida Research Consortium Study. Source is a Carnegie Foundation database on Higher Education. http://classifications.carnegiefoundation.org/
[95] National Venture Capital Association 2009 Yearbook, http://www.nvca.org/index.php?option=com_docman&task=cat_view&gid=89&Itemid=464
[96] Information comes from a previous Florida Research Consortium Study. Source is a Carnegie Foundation database on Higher Education. http://classifications.carnegiefoundation.org/
[97] National Venture Capital Association 2009 Yearbook, http://www.nvca.org/index.php?option=com_docman&task=cat_view&gid=89&Itemid=464
[98] These are the top 5 Academic R&D performing states. While Florida is not as limited in total faculty as the numbers would suggest, it also enjoys an abundance of students, on par with Texas and New York whose faculty counts are almost double Florida's. Faculty has two primary jobs, teaching and research. High Student/Faculty ratios are indicative of higher teaching loads and thus less time available for research.
[99] USPTO, http://www.uspto.gov/web/offices/ac/ido/oeip/taf/cst_utl.htm
[100] Capital Vector Venture Capital Directory, http://www.capitalvector.com/
[101] USPTO, http://www.uspto.gov/web/offices/ac/ido/oeip/taf/cst_utl.htm
[102] National Association of Seed and Venture Funds, http://www.nasvf.org/pdfs/VCFundsReport.pdf.



1. Research & Development Transition

As stated above, R&D plays an important role to transition clean technology intellectual property into the market. Most of academic R&D funding is provided by seed capital and grants from federal agencies such as the National Science Foundation (NSF) and Department of Energy (DOE) through avenues such as the SBIR/STTR programs. However, even though some SBIR and STTR grants are directed toward R&D, the majority of the grants are for project development rather than technology research. For this reason, federal and state resources (grants, loans and other programs) will be discussed in the Early Capital stage.

In general, the state of Florida has not achieved the expected level of investment in R&D for all technologies combined, for clean technologies and for current assets and/or system inputs. This includes academic research, academic patents, academic licenses, and academic resources.

In 2006, Florida ranked 16th overall in terms of R&D expenditures for a total amount of $6.34 billion. In order for the state to improve her position to the 4th place, the state needs to close an annual R&D funding gap on the order of $10 billion so as to make up the deficit in academic research, academic patents and licenses, and university assets. For clean technologies, the state total expenditures on clean tech fields were $828 million in 2008 compared to a potential spending of $1,366 million. Thus, the state needs to close an annual R&D funding gap over $500 million annually.

In 2006, Florida ranked 12th in terms of all utility patents granted by the United States Patent and Trademark Office (USPTO) and held in the state (2,046), a gap of 1,471 patents compared to the 4th ranking. From 2002 to 2009, when considering only the number of patents

[103] National Association of Seed and Venture Funds, http://www.nasvf.org/pdfs/VCFundsReport.pdf.
[104] National Association of Seed and Venture Funds, http://www.nasvf.org/pdfs/VCFundsReport.pdf.
[105] National Governor's Association Report, http://www.nga.org/files/pdf/0802angelinvestment.pdf.

for clean energy sectors, Table 12 shows that Florida ranks 9th with 85 patents, falling behind by 160 patents. An alarming fact is that the top seven states outperformed the state of Florida by a factor of 2:1 in terms of clean energy patents.

Table 12. Top States with Clean Energy Patents

State Name	2002	2003	2004	2005	2006	2007	2008	2009	TOTAL
Michigan	93	112	123	105	97	113	90	64	**797**
California	60	52	78	44	55	60	67	73	**489**
New York	43	51	46	39	60	60	76	41	**416**
Connecticut	31	30	36	38	49	23	25	13	**245**
Texas	9	16	21	20	34	17	26	12	**155**
Illinois	23	17	27	25	13	17	19	9	**150**
Massachusetts	9	7	12	12	15	20	9	28	**112**
New Jersey	6	16	13	9	14	9	13	7	**87**
Florida	13	12	11	11	13	10	7	8	**85**
Washington	13	6	18	6	13	7	13	8	**84**

Source: Data provided by the Clean Energy Patent Growth Index (CEPGI); http://cepgi.typepad.com/heslin_rothenberg_farley_/

In the academic world, when considering the state's R&D expenditures for academic research in all technologies, Florida's relative position is better, in the 11th place with $1.6 billion total R&D expenditures. This amount is $1.0 billion less than the expected 4th position. The state average academic patent expenses for 2002-2006 were $6.7 million or a funding gap of $3.3 million a year. Florida ranks 7th in terms of academic patent applications, 7th in terms of university-based start-ups and 17th in terms of active academic licenses held. In terms of academic research into new technologies, the state ranks 11th, spending $1.6 billion in 2006. This was equivalent to a funding deficit of more than $1.0 billion that year.

The relative poor performance in R&D expenditures compared to the expected position of the state translated to an annual average of 16 university-based startups from 2002 to 2006, or a deficit of 11 startups per year if the state had performed at the expected level. However, the number of university-based startups doubled from 2002 to 2005-2006, in contrast to the states with the largest number of startups, which either regressed or barely improved from their 2002 positions. This is an indication that even though the research academic institutions in the state of Florida had a late start, they continued to improve the relative position of the state over the period.

Florida High Tech Corridor Council Matching Grants Research Program

The Florida High Tech Corridor Council (FHTCC) was established by the Florida Legislature in 1996 to attract, retain, and grow high tech industry and to help develop the

workforce to support those industries in the service areas of the University of Central Florida and the University of South Florida through the Florida High Tech Corridor Council Matching Grants Research Program. In 2005, the FHTCC was expanded to include the University of Florida as the third partner of this economic development initiative, merging the strengths of three universities and bringing the number of Corridor counties to 23 including Alachua, Putnam, Levy, Marion, Flagler, Citrus, Sumter, Lake, Volusia, Seminole, Brevard, Orange, Osceola, Polk, Hernando, Pasco, Hillsborough, Pinellas, Manatee, Sarasota, De Soto, Hardee, and Highlands.

Since the inception of the program in 1996, the University of Florida, the University of Central Florida, and the University of South Florida have partnered with over 340 companies on 1,067 research projects involving 2,134 students and 281 faculty members in the sectors of Agritechnology, Aviation and Aerospace, Digital Media/Interactive Entertainment, Financial Services, Information Technology, Life Sciences/Medical Technologies, Microelectronics / Nanotech, Modeling, Simulation and Training, Optics and Photonics, and Sustainable Energy.

The $53 million in funds that have been invested by FHTCC have been matched by corporate cash and in-kind investments of nearly $148 million, generating an additional $524 million in quantifiable downstream impacts, resulting in a return of $672 million and total project value of $726 million. Additionally, 103 patents plus 146 patent applications are projected to have resulted from FHTCC projects.

This is an excellent model to replicate and expand upon in building the early stage energy R&D base of Florida's universities and companies. The FHTCC Matching Grants Research Program model relies on co-investments from 1) the state through Florida's universities and 2) Florida based industry to support cutting edge R&D in Florida's universities. At this point, the FHTCC program funding is limited to UF, UCF, and USF working with companies in the 23 counties of the Corridor. However, this program can be easily scaled to include all of the SUS universities and companies located in all of Florida using today's proven funding and operational model. In fact, the Florida Energy Systems Consortium is already preparing to release a Request for Proposals based on the FHTCC model for energy related R&D projects supported by limited FESC commercialization funds and industry matching funds. FESC's program will target all SUS universities and companies from across the state, but is limited in

scope as only ~$250k is available for project funding. This could be quickly expanded with additional funding from the state.

2. Early Capital Stage

During this stage, the majority of funding is supplied by the federal government through grants, loan guarantees, by angel investors, and by venture capitalists. Given that for the period 2005-2008 the state of Florida is ranked fourth in terms of Gross State Product behind California, Texas and New York, we measured Florida's current performance or ranking relative to the performance of the state ranked fourth in all the areas of our analysis. For the period 2000 to 2008, the state of Florida ranked 12th and received from the federal government a total of $372.5 million in SBIR/STTR funding (or an annual average of $41.4 million) compared to a potential $783.4 million (or an annual average of $87 million) the state could have received under optimistic conditions. This represents a total gap in funding of more than $410 million over the nine-year period.

When considering government-supplied early capital through SBIR and STTR for clean energy technologies, during the same nine-year period, the state of Florida ranked 11th and received a total of $32.4 million compared to $59.4 million that the federal government could have invested in the state under ideal conditions. This represents an early capital funding gap for clean energy technologies of $27 million over nine years (or a yearly deficit of $3 million).

Table 13. Top States Receiving SBIR and STTR Funds for Clean Energy Technologies 2000-2008

No.	State Code	Total Awards	Total Dollars	Average Dollars
1	CA	732	$216,427,068	$24,047,452
2	MA	482	$162,761,803	$18,084,645
3	MD	200	$64,396,076	$7,155,120
4	NY	176	$59,431,502	$6,603,500
5	VA	214	$56,101,592	$6,233,510
6	TX	170	$54,213,374	$6,023,708
7	CO	164	$46,166,680	$5,129,631
8	OH	143	$46,003,607	$5,111,512
9	PA	128	$37,889,101	$4,209,900
10	NJ	96	$37,562,222	$4,173,580
11	FL	94	$32,410,649	$3,601,183

Source: http://web.sba.gov/tech-net/public/dsp_search.cfm

With the exception of the top two states (California and Massachusetts); the other top states received significantly similar amounts of SBIR and STTR funding. Maryland and

Massachusetts fared exceptionally well given that their respective Gross State Products rank 15th and 13th respectively. The state of Florida needs to put in place strategic economic development policies and incentives to attract more federal funding in terms of SBIR and STTR.

State specific data for Angel investors was not readily available for this study. However, based on aggregate data obtained from the Center for Venture Research from 2001 to the second quarter of 2009, Angel capitalists invested $189.3 billion in 408,600 ventures involving more than 1.8 million active investors. Of the total Angel investment, only 9% on average from 2005 to 2009 went to the industrial and energy sectors. Angel investors provided on average 45% of their capital to ventures in the Seed and Early Stages and 46% to the Mid and Late Stages. These numbers indicate that Angel investors are not typically interested in funding R&D but are persistently committed to funding all the other stages of technology development.

Absent data on Angel funding by state, we analyzed state policies to assist new technology businesses by encouraging angel investment. Eighteen states have Angel Tax Credit policies in place ranging from 10% (New Jersey and Vermont) to 100% (Hawaii), up to $5 million aggregate per business and in varying cap amounts, except for Hawaii, New Jersey and Oklahoma which do not have caps. The state of Florida does not have a state Angel Tax Credit policy.

The third and largest funds source for states financing cleantech is from venture capitalists. From 2000 to 2008, the state of Florida ranked 12th averaging $608 million a year of total venture capital investments in the state. This level of venture capital investments in the state of Florida corresponds to approximately $1.2 billion in annual venture capital investment funding gap compared to the expected level of performance (4th ranking). For all the states, venture capital investments decreased from historical high levels in 2000 to the lowest levels in 2009[106].

This report shows that the state experienced a venture capital funding gap for early capital stage in the amount of $353 million a year from 2000 to 2008 for all technologies. For the period 2000 to 2009, the annual funding gaps for early capital investment in clean technologies were $11 million for clean energy, $8 million for other clean technologies.

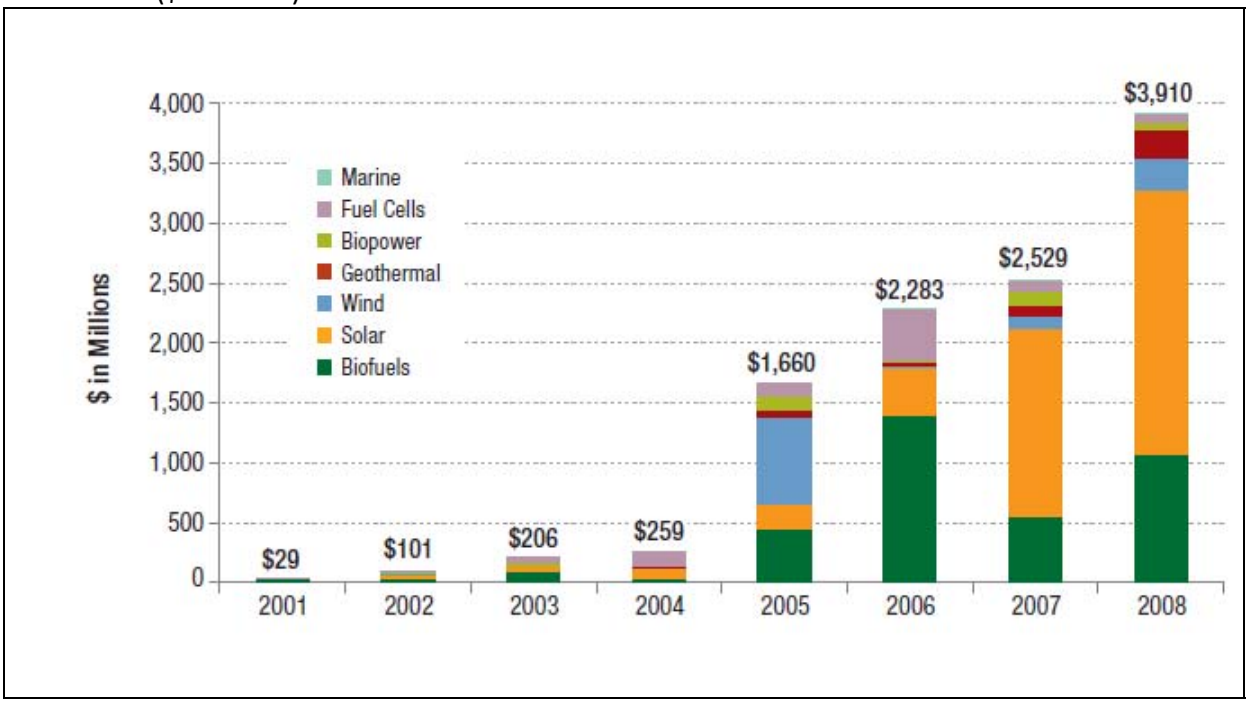
[106] Given that venture capital investment remained high in the recession years of 2007 and 2008, it is not clear why venture capital funding declined significantly in 2009.

Of these venture capital investments, a large proportion went to investments in cleantech sectors which are dominated by clean energy industries (which include renewable energy projects).

According to the U.S. DOE Energy Efficiency and Renewable Energy's report, venture capital and private equity investment in renewable energy technology companies increased from $29 million in 2001 to $3.9 billion in 2008 (See Figure below).

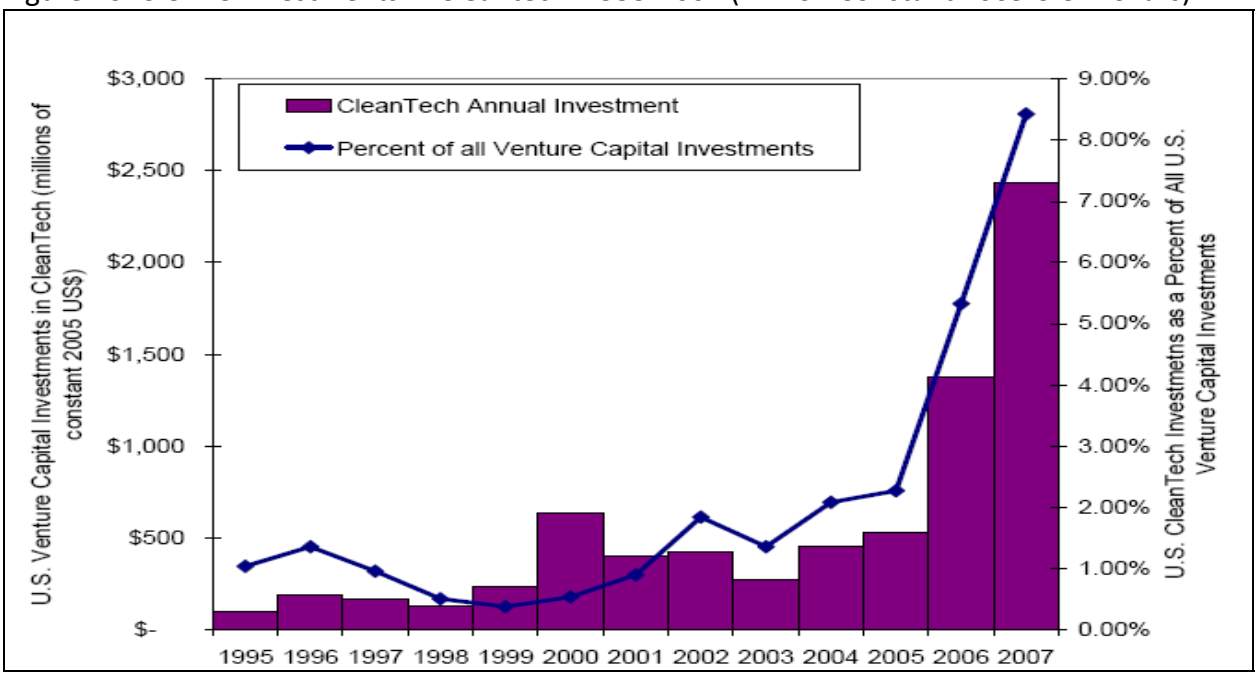
In addition, Figure 10 below shows that U.S. Venture Capital Investments in cleantech increased from less than 1% of all Venture Capital Investments before 2000 to more than 7% in 2007 (in constant 2005 U.S. dollars).

Figure 9. U.S. VC and Private Equity Investment in Renewable Energy Technology Companies, 2001–2008 ($ Millions)



Figures represent Disclosed Deals derived from New Energy Finance's Desktop database. Source: U.S. Department of Energy - Energy Efficiency &Renewable Energy: 2008 Renewable Energy Data Book, July 2009, page 112.

Figure 10. U.S. VC Investments in Cleantech: 1995-2007 (Million Constant 2005 U.S. Dollars)



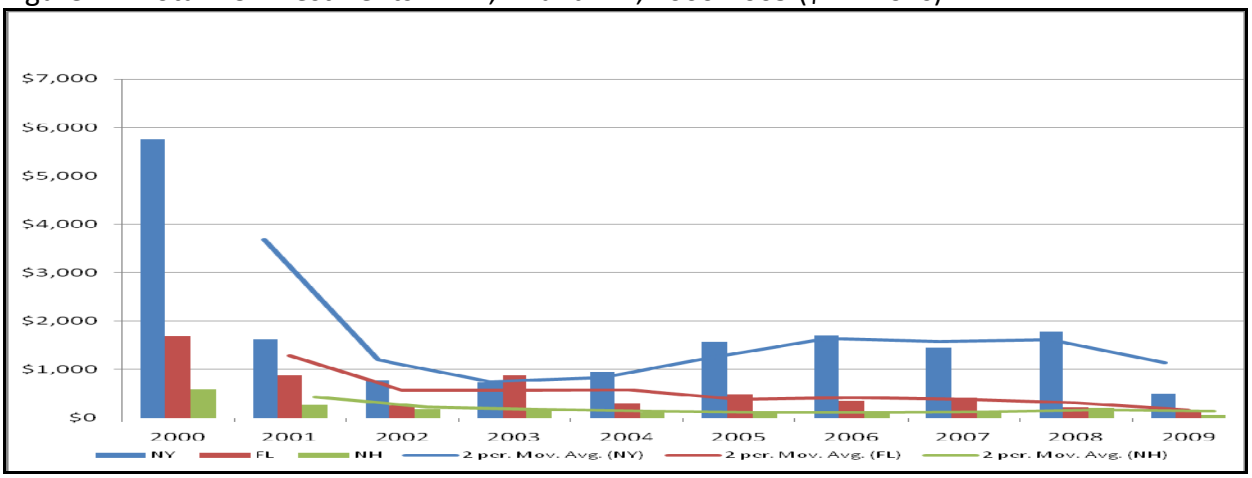
Source: Dooley, J.J. (Pacific Northwest National Laboratory): Trends in U.S. Venture Capital Investments Related to Energy: 1980-2007, October 2008.

In constant 2005 U.S. dollars, cleantech venture capital investments in 1995 were less than $100 million and about 1% of all U.S. venture capital. In 2007, cleantech venture capital investments accounted for approximately $2.4 billion and slightly more than 8% of all venture capital investments. This trend is expected to continue with ARRA funding of clean technologies and with state incentives to encourage renewable energy and energy efficiency projects.

The figure below shows that venture capital investments in the state of Florida declined significantly over the period from the high $1,697 million in 2000 to only $215 million in 2008. As explained above, Florida was compared to the state in the 4th position, a position which the state was expected to achieve under the assumption of competitive advantage based on the state's rank in Gross State Product. For the purpose of analysis, another state was randomly picked as the state in or around the 20th position. This state could be over or under-performing compared to its GSP position. The purpose was simply for the comparison of the trends. The trend of venture capital investments in the state of Florida was not unlike the trend of venture capital investments in other states like New York (4th rank) or New Hampshire (20th rank). The same declining trend was observed for all the states. None of the states have shown even an incremental increase in VC investments during the time period under review. The high venture capital investments in 2000 correspond to the "dot-com bubble" or "IT bubble" when the stock

value of the technology-heavy dot-com industry more than doubled within one year and declined significantly thereafter.

Figure 11. Total VC Investments in NY, FL and NH, 2000-2009 ($ Millions)



Source: http://fis.dowjones.com/products/venturesource.html

Although the state of Florida ranked 11th in total venture capital investments, the state ranked 9th in total venture capital investments in cleantech from 2000 to 2009 with an annual average venture capital investment of $53 million. This level of venture capital investments in cleantech in the state of Florida corresponds to more than $100 million in annual cleantech venture capital investment funding gap compared to the expected level of performance (4th ranking).

Table 14. Top States - Cleantech VC Deals 2000-2009 ($ Millions)

		2003		2004		2005		2006		2007		2008		2009		Average 00-09	
Rank	State		#		#		#		#		#		#		#		#
1	CA	$302	36	$228	42	$453	55	$1,180	68	$1,863	112	$3,440	137	$2,108	118	$1,021	64
2	VA	$4	2	$18	4	$15	4	$53	4	$70	5	$468	7	$1,816	5	$246	3.7
3	MA	$98	17	$96	16	$189	23	$241	25	$371	22	$451	37	$373	28	$200	20
4	TX	$43	9	$36	11	$57	10	$278	15	$254	20	$513	14	$285	26	$156	12
5	CO	$35	7	$54	9	$9	3	$55	7	$104	7	$442	14	$104	11	$85	6.4
6	WA	$25	6	$49	6	$24	7	$107	8	$209	18	$187	15	$74	17	$76	8.3
7	PA	$8	7	$5	7	$9	8	$58	8	$67	6	$189	11	$310	6	$71	6.5
8	NJ	$27	6	$27	6	$0.3	1	$59	6	$175	8	$274	9	$47	7	$62	4.9
9	FL	$20	9	$26	2	$44	3			$84	7	$111	6	$176	8	$53	4
10	IL	$18	9	$18	4	$28	8	$20	2	$0.25	2	$87	6	$265	2	$48	4.6

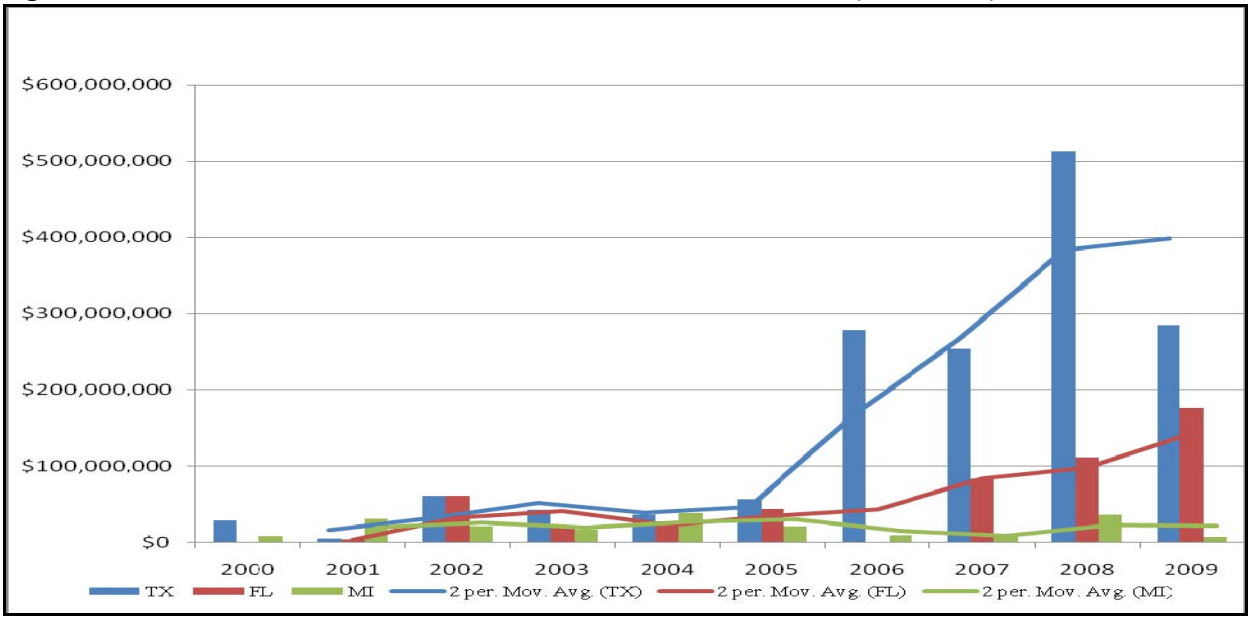
Source: http://cleantech.com/research/databases.cfm

However, even though total venture capital investments in cleantech in the state of Florida declined over the period, the figure below shows that venture capital investments in cleantech in the state increased by a 2.5 factor on average from $20 million in 2003 to $176 million in 2009, averaging $53 million a year from 2000 to 2009, The Figure below shows however that venture capital investments in cleantech in Texas (4th ranked state) increased

almost four time on average during the same time period compared to the 2003 level, but achieved $0.5 billion in 2008. In general, for both Florida and Texas, the amount of investments followed an upward trend starting in 2004. On the other hand, the state of Michigan followed a reverse trend as it saw venture capital investments in cleantech decline over time.

As discussed above, the third and largest funding source for the Early Capital stage comes from venture capitalists. Table 14 below shows the top states receiving the most venture capital funding of the Early Capital project stage.

Figure 12. Cleantech VC Investments in TX, FL and MI, 2000-2009 ($ Millions)



Source: http://Cleantech.com/research/databases.cfm

Table 15. Top States Receiving VC Funding for Early Capital Stage ($ Millions, Selected Years)

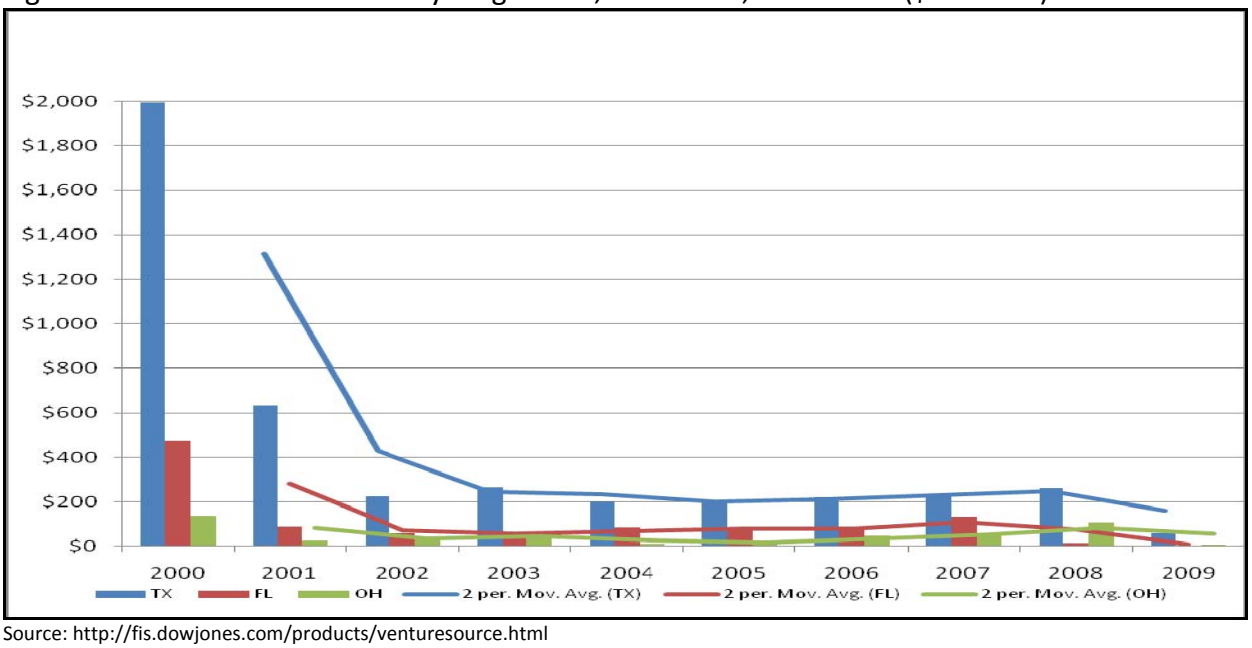
State	2000	2001	2005	2006	2007	2008	2009	Avg. 00-08
California	$10,260	$3,153	$2,323	$2,595	$3,179	$2,319	$521	$3,258
Massachusetts	$2,681	$838	$535	$596	$715	$677	$136	$833
New York	$2,045	$429	$476	$538	$301	$623	$117	$534
Texas	$1,994	$633	$200	$222	$236	$261	$59	$471
New Jersey	$1,047	$330	$247	$94	$214	$157	$27	$274
Washington	$695	$245	$254	$144	$298	$253	$73	$247
Pennsylvania	$758	$129	$92	$217	$198	$182	$34	$217
Illinois	$1,016	$95	$88	$41	$188	$122	$24	$191
Virginia	$980	$117	$113	$110	$149	$60	$4	$192
Maryland	$682	$94	$137	$198	$94	$86	$6	$181
Georgia	$765	$156	$83	$60	$109	$67	$5	$180
Colorado	$664	$139	$65	$91	$111	$123	$161	$161
North Carolina	$838	$126	$76	$68	$114	$113	$8	$168
Florida	$476	$87	$77	$80	$134	$16	$4	$118

Source: http://fis.dowjones.com/products/venturesource.html

The state of Florida ranks 14th with an average of $118 million a year from 2001 to 2008, which is equivalent to a funding gap of $353 million a year. The top four states, California, Massachusetts, New York and Texas averaged $3,258 million, $833 million, $534 million and $471 million annually, respectively, in venture funding of the Early Capital stage.

The figure below shows that venture capital investment in the Early Capital stage in the state of Florida declined from $476 million in 2000 to only $16 million in 2008 and $4 million in 2009. This trend is alarming because the state of Florida does not receive sufficient funding from other sources of capital for these stages, especially from the federal government. The figure shows however that the downward trend from 2000 to 2003 was generalized, affecting all states regardless of their performance.

Figure 13. VC Investments in Early Stage In TX, FL and OH, 2000-2009 ($ Millions)



Source: http://fis.dowjones.com/products/venturesource.html

Finally, many states, including the state of Florida have in place state-supported venture capital funds to support funding of the seed and early stage. The Florida Opportunity Fund of $29.5 million was authorized in 2007. This fund was created to realize significant long-term capital appreciation by investing in high-quality venture capital funds, businesses and infrastructure projects that will provide a lasting benefit to Florida.[107] In comparison,

[107] " Legislation passed by Florida Legislature in 2007, which created Sections 288.9621-288.9625 of the Florida Statutes, collectively referred to as the Florida Capital Formation Act, provided for the creation of the Florida Opportunity Fund ("FOF" or the "Fund"), initially as a fund of funds program that invests in venture capital funds. In 2009, The Florida Legislature expanded the Florida Opportunity Fund's mandate under the Florida Capital Formation Act to create direct investment programs that invest in businesses and infrastructure projects. The Florida Opportunity Fund is sponsored by Enterprise Florida and is managed by Florida First Partners ("FFP"). The Florida Opportunity Fund officially

Massachusetts' fund of $35 million was authorized in 1978, New York's fund of $20 million was authorized in 1981 and Texas' fund of $290 million was authorized in 2005. Enterprise Florida can attest to one project which the state lost because of the absence of a RPS. (It was one of two reasons that Florida lost the company to another state). This project, had it come to Florida, would have generated $64 million in capital investment with a projected total employment of 200 jobs at an average annual salary of $40,000. California has no state-supported venture capital fund but leads all other states in venture capital and cleantech investments because of longstanding incentives and policies. The state of Florida ranks 21st in terms of investment capital in the state-supported venture capital fund and was authorized in 2007 compared to the majority of states with higher capital funding levels but which authorized these funds several years earlier.

State of Affairs: Florida Venture Capital Community

A review of the venture capital community in Florida reveals significant challenges for entrepreneurs in the early stage[108] capital markets in Florida. Industry experts including University of Central Florida (UCF) Venture Lab's Kirstie Chadwick, and University of Florida (UF) Office of Technology Licensing Director, David Day, helped develop a list of VC firms actively investing in the state of Florida.[109] A large number of these firms (as many as 35) were excluded from the list due to mislabeling as Venture Capitalists. Many of these entities are consultants, with no funds devoted to 1st – 3rd round financing. Based on the knowledge of Ms. Chadwick and confirmed by Mr. Day, a fair number of the Florida-based VC firms have ceased to exist or are not actively investing in new opportunities at this time. Those deemed non-active were removed from the final listing for this report. We must also note that not all are Venture Capital-focused; with a handful investing at all stages up to and including the traditional territory of investment banks; initial public offerings. The key filtering criteria required recent active investment activity.

launched its fund of funds program in 2008. In 2010, The Florida Opportunity Fund will be launching a direct investment program with the Florida Energy and Climate Commission." http://www.floridaopportunityfund.com/HomePage.asp

[108] The seed/early stage corresponds to a project development stage during which seed capital and startups financing is made available for R&D, proof of concept/invention, early stage technology development and pilot plant/construction. During the mid/late stage, investors fund the commercial scale of the project which includes project development, production and marketing, and project expansion.

[109] https://www.venturesource.com/login/index.cfm?CFID=1487158&CFTOKEN=57304535

Of the 37 active firms operating in Florida, six invest only in the seed/early stage, only two invest in both seed/early and mid-later stages, three are angel investors, and twenty venture capital firms invest only in mid-later stage.[110] Notably, for cleantech funding, there are only two firms solely seed and early stage focused. Eight firms are mezzanine financing and buyout firms. There appears to be a glaring gap in resources available to entrepreneurs and seed-stage ventures present in Florida as compared to states with similar populations and GSP. Additionally, Florida does not compare favorably with the number of deals closed or amounts financed. Moreover, funding supplied to all areas of venture creation has contracted, resulting in a more cautious venture capital market and less innovation transitioning to commercial production. The current economic landscape precludes Florida VCs from assuming the same risk profiles in their investment portfolios as in the past decade and it appears that true seed money of a significant amount is almost non-existent in Florida.

There were seven firms –including five venture capital firms—operating in Florida that highlight their desire to fund cleantech ventures and established businesses as a part of their overall investment strategy. Of these seven, none were specifically cleantech/renewable energy focused, but instead invested in at least three different sectors of the economy. This is not uncommon as the investment community typically seeks to diversify its investment portfolio and reduce its risks. Most expressed no exclusion of, or preference for, cleantech. It appears that there is an opportunity to focus greater investor attention to the "Green Technology" trend, as the seven firms investing in cleantech have only begun doing so as of recently and many see cleantech as a favorable investment market.[111, 112].

3. Mid/Late Capital Stage

As discussed above, due to the lack of disaggregated data for the mid to late capital and the expansion or project finance stages, the analysis presented here is for both stages. Over the period 2001- Q2 2009, Angel investments funded this combined stage for $87.35 billion or approximately 46% of the total Angel investments. From 2005 - Q2 2009, Angel investments totaled $103 billion, of which 9% or $11.1 billion went to finance industrial and energy projects

[110] The numbers here are slightly different from numbers on Figure X [metrics] because we more closely analyzed firms listed as doing business in Florida. We removed those that have been inactive for the past few years and added newcomers involved in deals made in the state.
[111] http://Cleantech.com/news/5464/Cleantech-hits-record-vc-deal-2009
[112] http://Cleantech.com/about/pressreleases/20090106.cfm

and almost half of this amount ($5.1 billion) financed the mid to late capital and project finance stages of industrial and energy projects.

The largest funds source for the Mid/Late Capital stage comes from venture capitalists. As discussed above, for all the states, venture capital investments decreased from historical high levels in 2000 to the lowest levels in this decade in 2009. The table below shows the top states receiving the most venture capital funding of Mid/Late Capital stage.

Table 16. Top States Receiving VC Funding for Mid/Late Capital Stage ($ Millions, Selected Years)

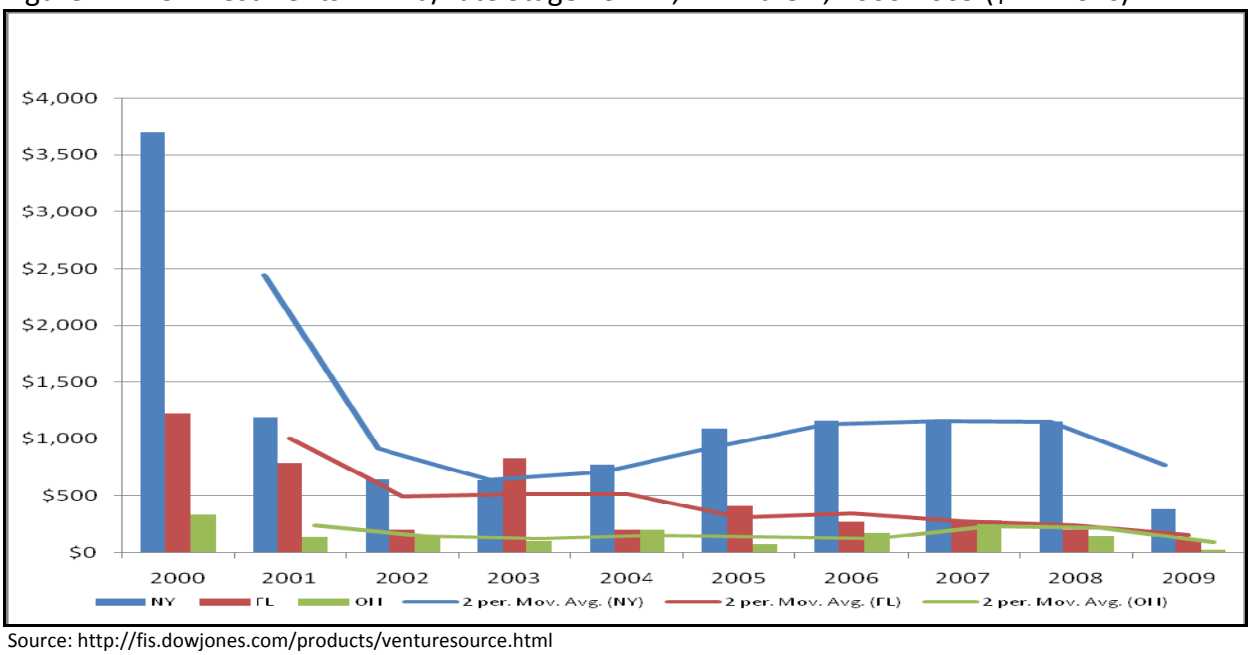
State	2000	2001	2002	2006	2007	2008	2009	Avg. 00-08
California	$30,006	$11,562	$7,571	$10,618	$11,140	$12,226	$3,612	$11,856
Massachusetts	$6,949	$3,475	$2,233	$2,372	$2,810	$2,281	$976	$2,993
Texas	$4,000	$1,969	$1,106	$1,054	$977	$876	$233	$1,406
New York	$3,699	$1,189	$643	$1,163	$1,151	$1,153	$384	$1,278
Colorado	$3,108	$851	$522	$358	$523	$785	$345	$813
Washington	$2,065	$713	$464	$822	$1,038	$628	$330	$801
New Jersey	$1,403	$1,486	$463	$635	$378	$449	$240	$795
Pennsylvania	$1,664	$722	$298	$1,270	$834	$450	$192	$722
Maryland	$1,085	$964	$570	$435	$439	$601	$60	$581
Virginia	$1,254	$735	$342	$392	$468	$495	$99	$524
Florida	$1,221	$785	$204	$268	$284	$199	$123	$490

Source: http://fis.dowjones.com/products/venturesource.html

The state of Florida ranks 11th with an average of $490 million a year from 2001 to 2008, which is equivalent to a funding gap of $788 million a year. The top four states, California, Massachusetts, Texas and New York averaged $11,856 million, $2,993 million, $1,406 million and $1,278 million annually, respectively, in venture funding of the Mid/Late Capital stage.

Figure 14 below shows that in the state of Florida, venture capital investments in the Mid/Late Capital stages declined from a high of $1,221 million in 2000 to a low of $123 million in 2009. A similar trend was generally followed by most states including Ohio (18th). However, states which performed well such as New York (4th rank), saw a steady increase in venture capital investments in this stage from 2002 to 2008.

Figure 14. VC Investments In Mid/Late Stage For NY, FL And OH, 2000-2009 ($ Millions)

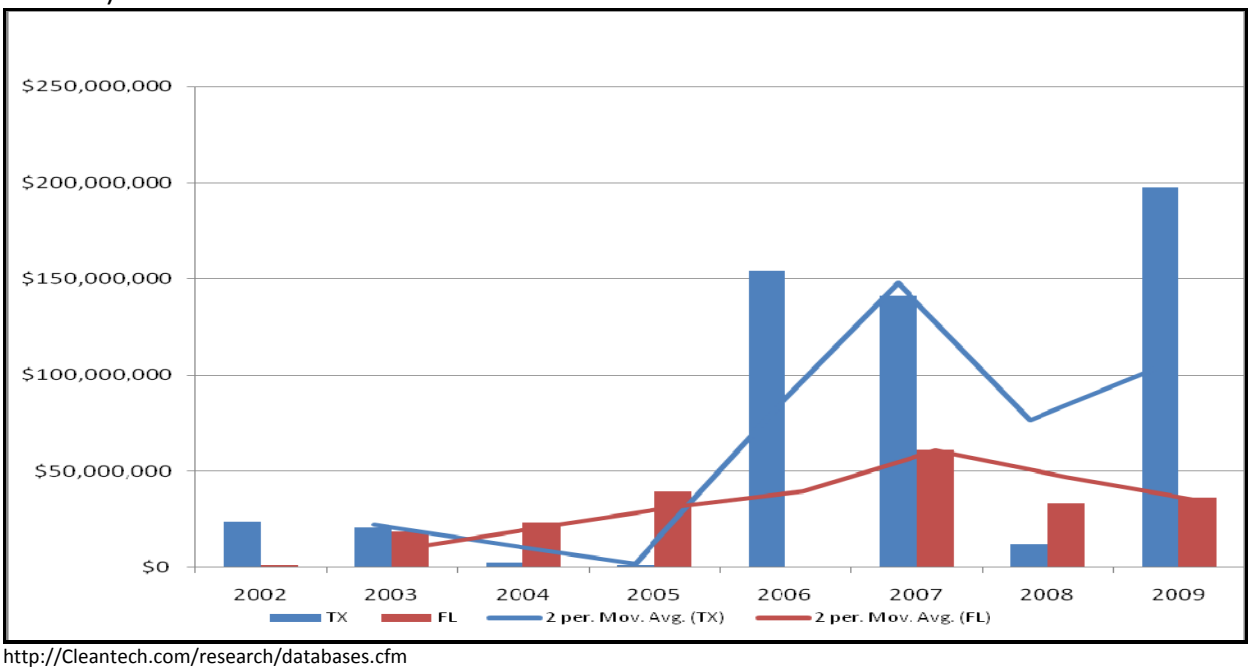


Source: http://fis.dowjones.com/products/venturesource.html

For all technologies, from 2000 to 2008, the state of Florida, on average, received $490 million annually. This analysis estimates that the state funding gap is a stunning $788 million a year.

For clean energy technology funding, Florida received an annual average of $21.4 million for the period 2000-2009 for Mid/Late Capital stage and the funding gap is $36.7 million a year. The data shows an incoherent funding pattern for most states. In 2009, following the federal government awards of Stimulus Funding of clean technologies, the state of Florida received over $414 million, or a projected funding surplus of $52.4 million compared to the state's expected position.

Figure 15. Cleantech VC Investments an Mid/Late Capital Stage In FL and TX, 2002-2009 ($ Millions)



http://Cleantech.com/research/databases.cfm

4. Cleantech Project Finance

Cleantech Market Performance and Project Finance

Project finance is defined as asset-based financing, which means that "the project lenders have recourse only to the underlying assets of a project. It involves both debt and equity, where the debt-to-equity ratio is typically large (e.g., 70% debt to 30% equity). Debt is used when available and when it is the least expensive form of financing, with equity still needed for credit worthiness. Most important, revenue from the project must be able to generate a return to the equity investors, and pay for interest and principal on the debt, transaction costs associated with developing and structuring the project, and operations and maintenance costs."[113]

According to published research, the current financial crisis has severely affected cleantech market performance and infrastructure and project finance. Project finance banking and capital markets have been affected by the global recession because of reduced availability of credit and increased business risk, which forced investors to require large upfront fees and margins before funding projects. As a consequence of the global recession, financial lending

[113] Daniel P. Goldman et al.: Financing Projects That Use Clean-Energy Technologies: An Overview of Barriers and Opportunities. Technical Report NREL/TP-600-38723. October 2005, page 1.

institutions and investors have become more conservative in estimating their risk-return relationship.

In order to accurately describe the current and future state of cleantech project finance, we need to understand the strong relationship between cleantech market performance and cleantech project finance. In general, the required return on any investment is determined by the perceived relative risk of the project and the level of return associated with risk-free investments (generally U.S. Government long-term Treasury Bonds). If a cleantech project was perceived to be more risky than an investment in other businesses, investors generally will require return premiums on equity to compensate for the high risk. The figure below shows that clean tech stock indices (CTIUS and NEX) [114], performed well relative to the S&P 500 index from January 2005 to January 7, 2010. [115]

Table 17. Historical Growth Rates of CTIUS, NEX and S&P500 Indices

Stock Indices	1/02/2009 to 1/07/2010	11/20/2008 to 1/07/2010	1/03/2006 to 1/07/2010	1/11/2005 to 1/07/2010
SP 500 Index	23%	52%	-10%	-3%
CTIUS Index	37%	90%	2%	23%
NEX Index	38%	90%	17%	49%

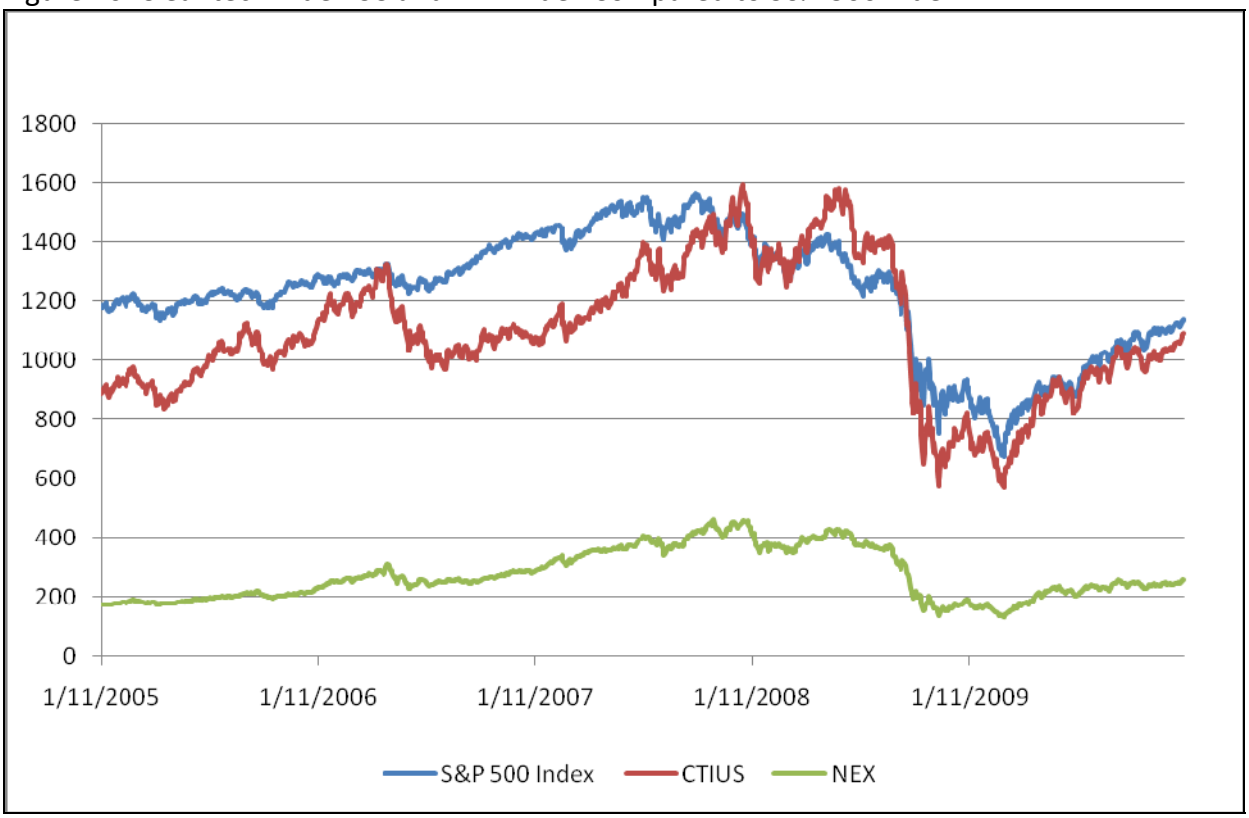
Source: http://www.amex.com/othProd/prodInf/OpPiIndMain.jsp?monthVal=60&Product_Symbol=CTIUS. http://finance.yahoo.com

The graph and historical growth rates table show that the global cleantech index outperformed the U.S. Cleantech index and the S&P 500 index from January 2005 to January 2010. Generally, cleantech companies have reflected a similar trend to the wider market, recovering from a low point at the end of February 2009, but leveling off in recent months. Our analysis shows that wind and biofuel sectors have been remarkably steady over this time period.

[114] The Cleantech Index (CTIUS) is a modified equal-dollar weighted index of the leading Cleantech companies worldwide from a broad range of industry sectors. "Cleantech" is defined as knowledge-based products and services that improve operational performance, productivity or efficiency; while reducing costs, resource and energy consumption, waste or pollution. The Cleantech index was established with a base value of 500.00, at market close, December 31, 1999. The Index is rebalanced every March, June, September and December. The Index was created by and is a trademark of Cleantech Indices LLC.
http://www.amex.com/othProd/prodInf/OpPiIndMain.jsp?monthVal=60&Product_Symbol=CTIUS

[115] The WilderHill New Energy Global Innovation Index (NEX) is comprised of companies worldwide whose innovative technologies and services focus on generation and use of cleaner energy, conservation and efficiency, and advancing renewable energy generally. Included are companies whose lower-carbon approaches are relevant to climate change, and whose technologies help reduce emissions relative to traditional fossil fuel use.

Figure 16. Cleantech Index US and NEX Index Compared to S&P 500 Index



Source: http://www.amex.com/othProd/prodInf/OpPiIndMain.jsp?monthVal=60&Product_Symbol=CTIUS. http://finance.yahoo.com

However, during the period from November 20, 2008[116] to January 7, 2010, the CTIUS and NEX indices performed exceptionally well compared to the S&P 500 index, recovering nearly all their losses and almost doubling the index values as of November 20, 2008. While the performance since January 3, 2006 of the CTIUS and NEX indices as of January 7, 2010 were respectively 2% and 17%, the S&P 500 index is 10% below its peak level of 1/03/2006 (negative performance of 10%). Given this performance of cleantech indices, one must conclude that cleantech investments in project finance will bounce back to the pre-November 2008 upward trend, given the right federal and state investment incentives. Thus, our conclusions that cleantech project finance should continue to attract private investors, provided that the federal and state governments put in place appropriate incentives and programs to mitigate the high risk associated with cleantech projects.

In order to complete an asset financing, multiple structures can be utilized including all debt or all equity or some combinations of debt and equity. Project finance is sensitive to the risk-return relationship as higher return on equity and rate of return will be required to match

[116] On November 20, 2008 all the three indices plunged to their lowest levels.

the risk in the technology. In addition, if the cash flow associated with the technology is not predictable, the project risk is higher and investors will demand a risk premium to invest in the technology.

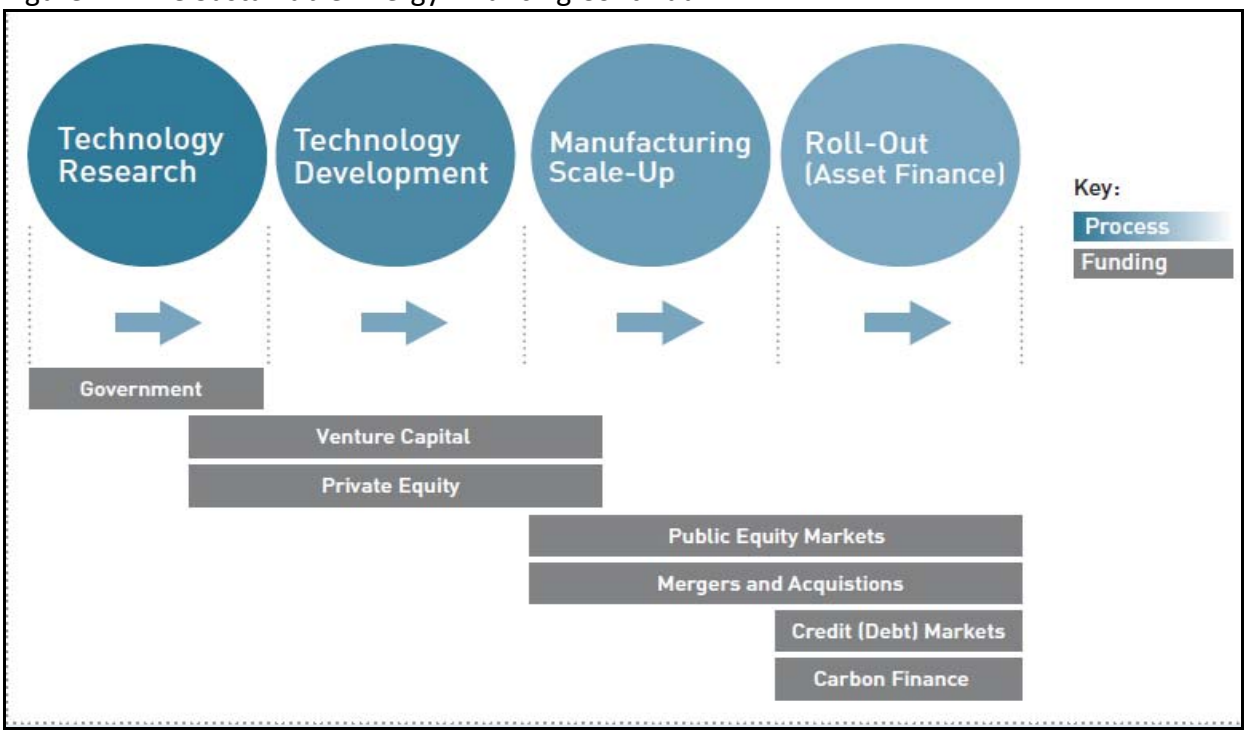
The sources of a project cash flows come from cash and tax benefits generated from federal and state production or investment tax credits, state and local government incentives, tax benefits from accelerated depreciation, renewable energy certificates ("RECs") and the project revenue.

The graph below shows the sustainable energy financing continuum. R&D and technology development are respectively funded through government programs and venture capital and private equity, while manufacturing scale-up and asset finance (or project roll-out) are financed through public equity markets, mergers and acquisitions (M&A), credit (debt) markets and carbon finance.[117]

Therefore, asset financing options which are available to cleantech projects include public markets (stock exchanges and Initial Public Offerings - IPOs), private equity (venture capital, equity markets, hedge funds, federal agency stimulus packages, state incentives), Mergers and Acquisitions (MAs), special purpose acquisition company (SPAC), and banks and private debt.

[117] Carbon finance is defined as an investment vehicle that seeks either to repay investors in carbon credits, or to use income from selling such credits to generate or enhance investment returns. Such funds can either simply buy credits, or invest in the underlying projects and claim title over emission reductions they generate. (http://www.carbon-financeonline.com/index.cfm?section=glossary&letter=C). Another definition is "a new branch of environmental finance. Carbon finance explores the financial implications of living in a carbon-constrained world, a world in which emissions of carbon dioxide and other greenhouse gases (GHG) carry a price. Financial risks and opportunities impact corporate balance sheets, and market-based instruments are capable of transferring environmental risk and achieving environmental objectives. Issues regarding climate change and GHG emissions must be addressed as part of strategic management decision-making. According to Wikipedia as mentioned by Garcia and Roberts (http://cbey.research.yale.edu/uploads/Carbon%20Finance%20Speaker%20Series/00%20Front%20Matter.pdf) " The general term is applied to investments in GHG emission reduction projects and the creation (origination) of financial instruments that are tradable on the carbon market.

Figure 17. The Sustainable Energy Financing Continuum



Source: Global Trends in Sustainable Energy Investment 2009: Analysis of Trends and Issues in the Financing of Renewable Energy and Energy Efficiency, p. 9

Although the main sources of debt and equity for project finance are banks, capital markets and private debt, federal and state government programs are of paramount importance in cleantech project finance. In addition, many incumbent companies doing business in industries or sectors directly in competition with clean technologies make strategic decisions driven by multiple factors (including competitive purposes, preservation of monopolistic power, investment portfolio diversification purposes, diversification of the generation portfolio, or simply taking advantage of advanced technologies (for example the Smart Grid)) to heavily invest in cleantech projects. Examples are utility subsidiaries of American Electric Power Company (AEP), Florida Power & Light (FPL), AES Corporation, oil companies, and other large energy corporations such as General Electric (GE) which are today among the leaders in clean technologies including clean energy.

Other source of cleantech project finance include monetization of RECs, Power Purchase Agreements (PPAs), tax benefits and other revenue streams, long-term power price hedges, financial hedges, equity financing driven by tax credit requirements, and other innovative sources of project finance, discussed below.[118]

[118] More detailed discussions of this topic are offered in Edward Kayukov: New Developments In Renewable Project Finance: Industry Growth Forum Philadelphia, PA; October 24-26, 2006

More than $440 billion has been invested worldwide in cleantech since 2004, even though the trend is down during the 2008-2009 recession. Asset finance continues to constitute the largest share of total investment. Corporate M&A and public markets are also major providers of investment in cleantech, but their contributions fluctuate over time. Venture capital investment represents the smallest source of investment, but its share is steadily increasing.[119]

Global asset finance of new-build clean energy projects grew from $4.5 billion in 2001 to $84.5 billion in 2007 and to $97.7 billion in 2008. Global asset finance of new-build energy projects increased by 15.4% from 2007 to 2008 and experienced a compound annual growth rate (CAGR) of 62% from 2004 to 2008. Asset financing new investment using project finance grew from $1.5 billion in 2002 (one-third of total) to $48.5 billion in 2008 (50% of total). Most asset financing went to wind, solar and biofuel projects respectively.

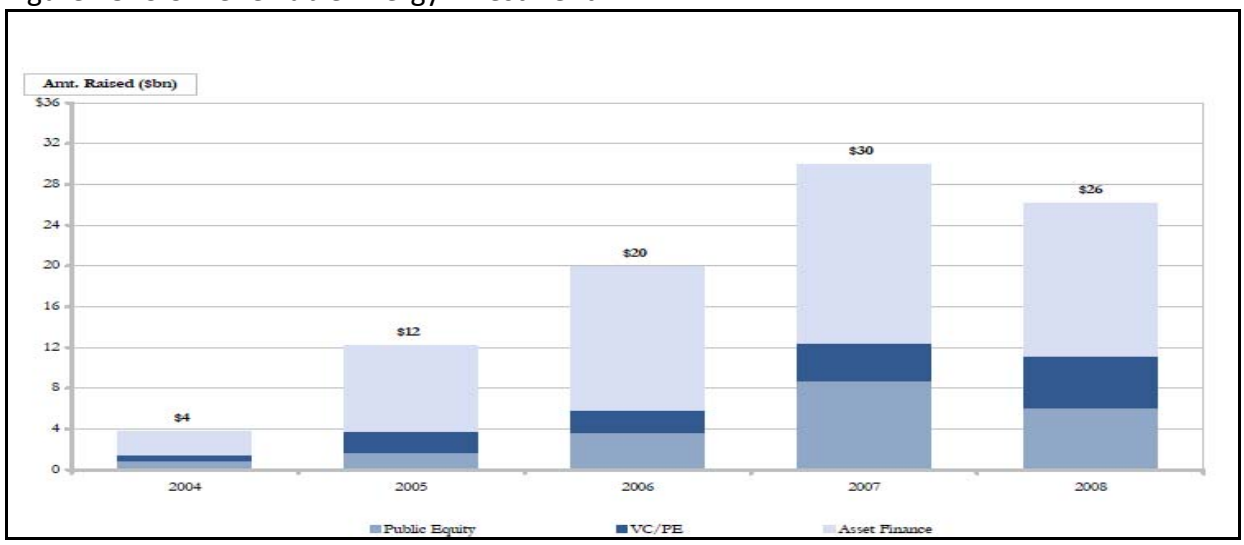
The largest share was provided through balance sheet financing and syndicated equity, but the share of project finance grew steadily over the same period, surpassing balance sheet financings from 2005 to 2007.

New-build wind project financing increased by 16% during 2007-2008 from $41.3 billion in 2007 to $47.9 billion in 2008. On the other hand, new-build solar project financing increased significantly by 84% from $12.1 billion in 2007 to $22.1 billion in 2008. However, they both fell sharply in the first quarter of 2009 following the sharp decline of the market performance of the cleantech indices.

The figure below shows that while total financing of renewable energy in the United States grew from $4 billion in 2004 to $30 billion in 2007, decreasing to $26 billion in 2008, the trend of financing is upward. The decline in funding in 2008 is due to a decline in public equity financing from 2007 to 2008. During the period from 2004 to 2008, renewable energy asset finance often represented more than 50% of the total investment. Public equity financing is the second largest provider of investment in renewable energy. Venture capital and private equity provided the smallest share of total investment in renewable energy but its share is steadily increasing during the period 2004 to 2008.

[119] Clean Tech Webinar Series: Thriving in Tough Times: The Stimulus Plan and
Clean Tech Under Obama, February 26, 2009, page 24. See also United Nations Environment Programme (UNEP): Global Trends in Sustainable Energy Investment2009 Analysis of Trends and Issues, page 36.

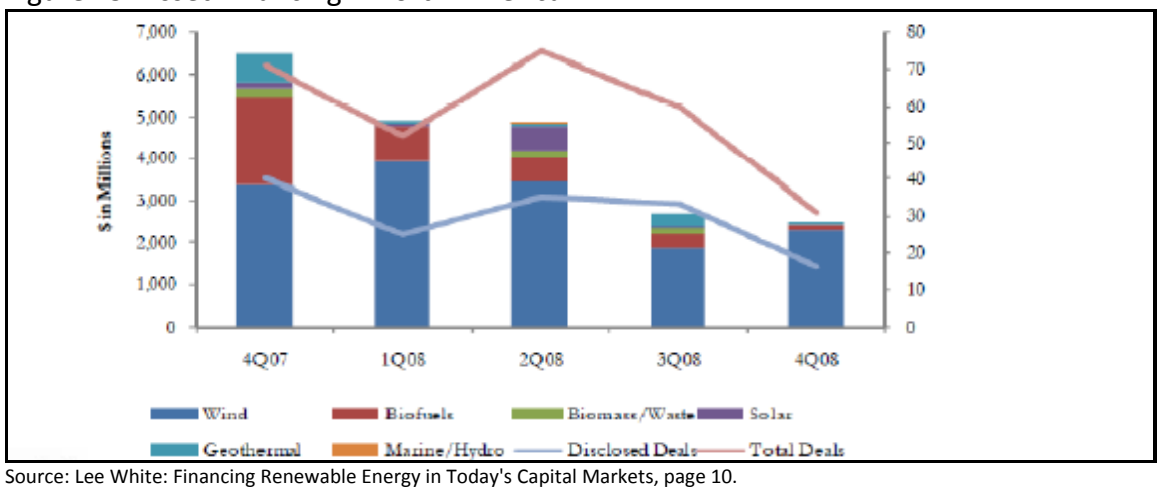
Figure 18. U.S. Renewable Energy Investment



Source: Lazard: Renewable Energy Financing Environment, February 2009, page 4.

An analysis of quarterly financing data by technology shows that wind energy received a lion's share of the funding, as high as $4 billion in the first quarter of 2008 out of a total of less than $5 billion. Even though there has been a decline in funding renewable technology from the fourth quarter of 2007 to the fourth quarter of 2008, wind energy continued to receive the largest share of the funding. Biofuels asset finance received the second largest investment amounts. While solar asset finance surged in the second quarter of 2008, it continues to receive negligible funding. In general, asset finance for renewable energy projects declined significantly from 2007 to 2008, and more so for the last two quarters of 2008 continuing into 2009.

Figure 19. Asset Financing – North America



Source: Lee White: Financing Renewable Energy in Today's Capital Markets, page 10.
http://www.gkbaum.com/renewableEnergy/CRES%20Presentation%20032009.pdf

Asset Finance Beyond Capital Markets, Venture Capital, Private and Public Equity, and Debt and Private Capital.

Mergers, Acquisitions and IPOs

A review of published reports shows that asset finance activity has not been confined to conventional public and private capital and equities. Over the years, many cleantech companies changed their capital structure through a number of cleantech M&A and IPO transactions. Although M&A and IPO transactions and capital raised grew significantly from 2000 to 2008, (see tables 91, 92 and 93) as companies sought to diversify and acquire low-carbon generation assets, expand globally and offer new cleantech products and services, 2008 and 2009 saw few such transactions and less capital was raised as a consequence of the global recession.

Tax Incentives

For the development of a clean energy sector, Carbonell[120] identified the foundations of a new clean economy as the presence of a strong and sustainable demand for the product, a local labor pool and entrepreneurial support, adequate supply of capital, the presence of complementary firms, and the presence of a positive cooperative regulatory and institutional environment.

The following section discusses existing state and federal programs intended to encourage investment in cleantech sectors. Many of the programs are open to different projects and not specific for clean technology projects but are relevant in showing how different states have implemented policies to attract economic development projects.

The federal and state governments do offer many tax incentives to support clean energy development. Three prevalent tax options that states and local governments have used are 1) investment or production tax credits, 2) sales tax exemptions and 3) property tax exemptions.

Investment and Production Tax Credits

Investment tax credits (ITCs) and production tax credits (PTCs) provide a way for renewable energy system owners to reduce the cost of the system through a credit on their personal or corporate state income taxes. An investment tax credit represents a share of the system cost while a production tax credit is based on measured system output.

[120] Source: Carbonell, Tomás (Yale Law School): Getting Ahead: New Opportunities in Clean Energy, page 6.

ITCs and PTCs are easy to administer, easy to modify, but they provide insufficient tax liability and they can have negative impacts on state revenue because they are open-ended and can have a greater than anticipated impact on state tax revenue.

Sales Tax Exemptions

Twenty six states currently offer state sales tax exemptions on the purchase of renewable energy systems. These exemptions act as an upfront discount on the price of these systems. Sales tax exemptions are easy to administer, but they are not a strong incentive. Florida recently established a state production tax credit of $0.01/kWh from qualified renewable energy technologies. However, the credit is limited to an aggregate amount of $5 million per year across all qualifying projects. [121]

Property Tax Exemptions

A number of states offer property tax exemptions on the installed value of a residential or commercial renewable energy system. These exemptions do not typically extend to utility scale projects. Property tax exemptions are easy to administer, do not raise tax burden, but alone are not a strong incentive. The state of Florida does not offer a state property tax exemption program.

Although the state of Florida ranks 9th in the total number of programs offering financial incentives to renewable energy businesses, the state does not have in place important direct programs and incentives. In order to be more renewable energy friendly and create more opportunities for economic development, the state of Florida should consider implementing certain state-sponsored programs in addition to the programs and incentives already in place. The majority of clean energy developers believe that a combination of long-term carbon price, stable subsidies, higher targets and tax breaks is very important for institutional investors.

Public Benefit Fund

States use public benefit funds (PBFs) to support a variety of renewable energy-related programs such as R&D, renewable energy education activities, grants, loans, rebates, and many other activities. Though these clean energy funds, states are investing to stimulate cleantech innovation and projects.

[121] *http://www.dep.state.fl.us/energy/energyact/incentives.htm*

Other roles played by state PBFs in states with RPSs include providing financial assistance to renewable generation projects, serving as the recipient and manager of ACPs, and administering the RPS itself. Similarly, state PBFs are believed to have helped to encourage resource diversity in state RPS policies by providing incentives to help bring down the costs of higher cost RPS-eligible technologies. Most of these benefits would accrue to Florida, especially if a state RPS program is put in place.

Many PBFs work by imposing a small, nonbypassable per-kWh charge attached to the distribution service bill (typically called a "system benefit charge" or "public benefit charge"). To date, 21 states and the District of Columbia have set up some sort of PBF. Seventeen have funds for renewable energy and for energy efficiency. Seven have funds just for energy efficiency.

PBF Goals

1. To educate Floridians on the importance of energy efficiency and renewable energy with information on readily available and cost-saving solutions
2. To provide financial assistance to Floridians for the purchase and long-term financing of renewable energy systems and energy efficiency improvements
3. To establish secure, long-term market conditions for investors, manufacturers, and installation contractors for creating Florida jobs, achieving lower installation costs, and raising industry standards
4. To provide incentive packages for solar manufacturing companies that establish factories in Florida, thereby employing Floridians and eliminating high shipping costs

The Pros of a state PBF

- A PBF is a potentially flexible funding mechanism, depending on legislative authorizations which can be used to fund R&D activities, loans, grants, rebates, education, etc.
- A PBF can be large enough to offer substantial funding support for cleantech projects and help overcome current barriers to financing cleantech projects
- A neutral party instead of a profit-seeking utility designs energy programs

- Provided at low cost to Floridians (usually, the PBF is funded through a small system charge, usually less than 2 mills per kWh per month)
- A PBF has public support especially when it is transparent to ratepayers

The Cons of a state PBF

- A state PBF is often viewed as another tax on ratepayers.
- It is difficult to preserve social equity among regions and ratepayers when funds are disbursed without regard to the geographic locations of utility ratepayers.
- It is difficult to explain to ratepayers how they will benefit from a state PBF.
- Costs of the program and to ratepayers could escalate uncontrollably if no hard cap is set
- Sans state legislation prohibiting the use of a PBF to close state budget gaps, a PBF can be raided to close state budget gaps or reduce state deficits.

Property-Assessed Clean Energy (PACE) & Energy Financing Districts Models

According to Merrian C. Fuller et al. (September 2009), "Energy Financing Districts (a.k.a Property-Assessed Clean Energy (PACE), Sustainable Energy Financing, Clean Energy Assessment Districts (CEAD), Contractual Assessments, or Special Tax Districts) were first proposed by the City of Berkeley, California in 2007 and have received increasing attention as a mechanism for financing residential or commercial clean energy projects, including energy efficiency, solar photovoltaic, or solar thermal systems." [122] These programs are also called property tax financing authorization, municipal energy financing districts, or land-secured financing districts.

EFDs or PACE programs allow property owners to borrow money to pay for renewable energy and/or energy-efficiency improvements and over a period of years then repay the loan (often at below-market rates) over a long-term period through an increased property tax assessment or utility bill. This means that state or local governments that decide to offer PACE programs must do so through an enabling legislation which will also create a structure to

[122] Merrian C. Fuller et al. (Renewable and Appropriate Energy Laboratory – RAEL): Guide to Energy Efficiency & Renewable Energy Financing Districts for Local Governments, September 2009, page
3. This report also discusses all the above programs and their strengths and weaknesses. The report also compares some Energy Financing Districts which have been implemented around the country.

administer the program and make sure that the special property tax assessment is used for the purpose intended.

Thus, these programs are based on the premises that efficiency improvements and renewable power generation qualify as a public benefit worth funding by a state or local government.

The structure of the program and the funding mechanism are straightforward: a municipality or a state raises funds with a municipal or state bond issue to fund homeowners' clean energy (particularly solar) and efficiency projects. The bondholders' risk associated with these funds is low because the loans are collateralized with the borrower's home. A state or local government energy financing structure allows "property owners to "opt-in" to attach up to 100% of the cost of energy improvements to their property tax bill…. The assessment runs with the property at law and successor owners are responsible for remaining balances."[123] This means that the financial obligation to repay the loan stays with the property, regardless of a change of ownership.

In order for these programs to be cost-benefit efficient, repayment terms should match both the energy savings/energy generation and useful life of the asset. Also, these financing programs can offer other financial incentives such as rebates and should not prevent a homeowner from accepting other available state or federal tax incentives, including the ability to deduct the repayment obligation from federal taxable income, as part of the local property tax deduction.

The main strength of PACE and similar state or local government clean energy fund is that they provide the initial capital needed for the homeowner to make a sound investment decision. Other benefits include long-term loans at fixed-cost and reduced interest rates; loans which are not tied to the homeowner's credit rating but tied to the asset used as collateral; a transferable repayment obligation when the home is sold to new owners; and reduced transactions costs. Finally, the programs do not leverage public dollars and at the same time create a long-term loan repayment schedule which in turn allows the borrowers to benefit from the programs and the state or local government to use the loan proceeds to fund additional loans or for other uses.

[123] The White House: Policy Framework for PACE Financing Programs, October 18, 2009. See Policy Principles at http://www.whitehouse.gov/assets/documents/PACE_Principles.pdf

Prior to 2009, only two states - California and Colorado - had passed legislation authorizing property tax financing. Berkeley with its Finance Initiative for Renewable and Solar Technology (CityFIRST) program, launched in November 2008 and Palm Desert in California were the first municipalities to implement a property tax assessment financing.[124] As of November 2009, 18 states authorize PACE: 16 states have authorized PACE legislation and 2 states (HI and FL) permit it based on existing law: CA, CO, FL, HI, IL, LA, OK, MD, NC, NM, NV, NY, OH, OR, TX, VA, VT, WI.[125]

A variation in the structure of PACE programs is illustrated by the Portland model[126] which is partially funded by federal stimulus dollars, in the form of an energy efficiency and conservation block grant (EECBG), to provide $2.5 million in loans to homeowners to finance efficiency improvements, not solar installations. In this model, borrowers repay the loans on their monthly gas or electric bills instead of using the property tax assessment mechanism. See Appendix G.

1705 Federal Loan Guarantee[127]

The ARRA extends until 2014 tax credits for renewable energy that had previously been scheduled to expire and by providing $6 billion worth of loan guarantees authorized by the Energy Policy Act of 2005 for renewable electricity development. These loan guarantees are expected to stimulate the deployment of conventional renewable and transmission technologies and innovative biofuels technologies. For renewable projects to qualify they must be under construction by September 30, 2011.[128]

There is currently no state offering a loan guarantee program (LGP) for renewable energy. Under the federal loan guarantee program projects applying for loan guarantees do not necessarily need to employ new or significantly improved technologies.

Before implementing a state LGP and in order to help mitigate risk to the state taxpayers, we recommend that the state conducts an analysis of the federal LGP and adopts the

[124] Claudia Eyzaguirre and Annie Carmichael: Municipal Property Tax Assessment Financing: Removing Key Barriers to Residential Solar, Vote Solar Initiative, October 2008. Available at http://www.votesolar.org/linked-docs/Solar%20Finance%20Paper_100808_Final.pdf

[125] www.dsireusa.org/documents/.../PACE%20map%20Nov%202009.ppt

[126] Portland (Clean Energy Works) *www.cleanenergyworksportland.org/index.php*

127 Source: http://www.cooley.com/files/20090913_LoanGrntyEnrgyGen.html
The Loan Guarantee Solicitation Announcement can be read at http://www.lgprogram.energy.gov/CTRE.pdf

[128] Energy Information Administration, *An Updated Annual Energy Outlook 2009 Reference Case*, April 2009.

following recommendations that the federal Government Accountability Office (GAO) recently issued for improvement of the federal LGP:

- Complete detailed internal loan selection policies and procedures that lay out roles and responsibilities and criteria and requirements for conducting and documenting analyses and decision making;
- Clearly define needs for contractor expertise to facilitate timely application reviews;
- Amend application guidance to include more specificity on the content of independent engineering reports and on the development of project cost estimates to provide the level of detail needed to better assess overall project feasibility;
- Improve the LGP's full tracking of the program's administrative costs by developing an approach to track and estimate costs associated with offices that directly and indirectly support the program and including those costs as appropriate in the fees charged to applicants;
- Further develop and define performance measures and metrics to monitor and evaluate program efficiency, effectiveness, and outcomes; and
- Clarify the program's equity requirements to the 16 companies invited to apply for loan guarantees and in future solicitations.

Cleantech Project Finance & ARRA 2009

Most recently, the federal government enacted the American Recovery and Reinvestment Act of 2009 (ARRA 2009) which includes a number of incentives for energy projects, specifically $43 billion in expenditures and $22 billion in tax incentives. The majority of these funds are for projects in early capital (advanced battery research) to mid/late capital stages (Smart Grid). Specifically for clean energy and clean technology projects, ARRA 2009 includes $6.0 billion for Innovative Technology Loan Guarantee Program, $4.5 billion for Electricity Delivery and Energy Reliability (Smart Grid), $3.4 billion for Fossil Energy Research and Development, $2.0 billion for Advanced Battery Manufacturing, $2.5 billion for Energy Efficiency and Renewable Energy Research, Development, Demonstration and Deployment, $3.1 billion for State Energy Program, $3.2 billion for Energy Efficiency and Conservation Block Grants. Other ARRA 2009 programs include tax credits and loan guarantee programs such as a Modified Existing Energy Credit ($2.3 billion), Grants in Lieu of Tax Credits ($5 million),

Expanded Investment Tax Credit ($285 million), and Production Tax Credit Extension ($13.1 billion).

For tax incentives, the ARRA 2009 extends the Production Tax Credit, removes the limitation on existing Business Energy Credit, expands Investment Tax Credit, creates a New Grant in Lieu of Tax Credit, creates a New Credit for Investment in Advanced Energy Property and extends Bonus Depreciation (50%) through 2010.

In addition, ARRA 2009 creates the Clean Energy Finance Authority (CEFA) which is designed to promote a clean energy future for America. ARRA 2009 changed the traditional role played by the federal departments such as DOE, the Department of Agriculture, the Department of Defense and others in financing cleantech projects. The figure below illustrates the traditional role of the DOE. With ARRA 2009, the role of the DOE moved from funding R&D and applied science to finance of technology investors and asset investors (for example, financing the Smart Grid).

The modified role of the federal government in cleantech asset finance provides an important benefit to the society: It allows increased debt flow and improves equity flowing to cleantech developers because an increased government role in cleantech increases the confidence of private lenders and investors in the cleantech market. The following figure illustrates the expected impact of ARRA 2009 on renewable energy project development.

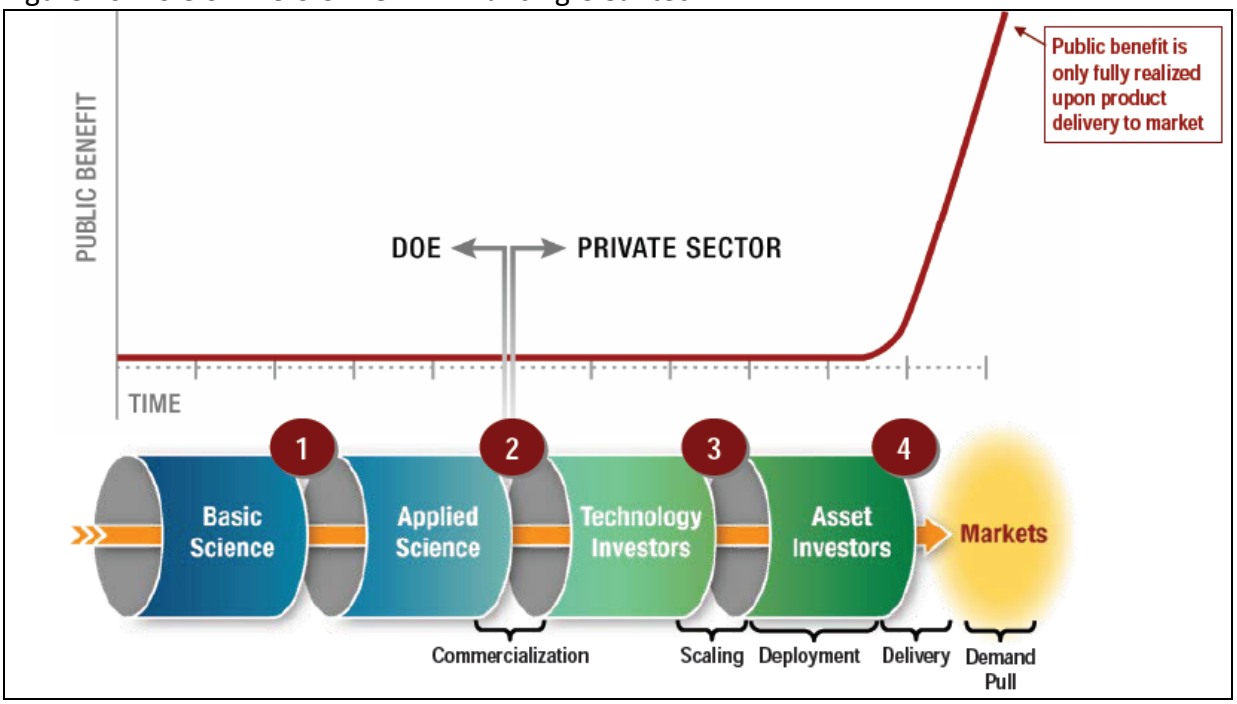
Without ARRA 2009, cleantech developers were facing limited capital from lenders and equity markets, resulting in fewer projects on-line. The different federal government incentives will serve to lift the capital constraints and improve the capital markets.

Usually, renewable energy projects have received funding through tax incentives offered by both the federal and state governments to renewable energy generating facilities. The most common tax credits used are the Renewable Electricity Production Tax Credit ("PTC")[129] and the Business Energy Investment Tax Credit ("ITC").[130]

[129] The federal PTC is 2.1 ¢/kWh subject to availability of annual appropriations in each federal fiscal year of operation, and based on the amount of electricity produced and sold by the taxpayer for qualified energy facilities; the credit is paid annually for 10 years.
See http://apps1.eere.energy.gov/repi

[130] The federal ITC is a tax credit equal to 30% of the qualified project costs for certain qualified renewable energy projects; the credit is paid upfront.
See http://www.energy.gov/recovery/48C.htm

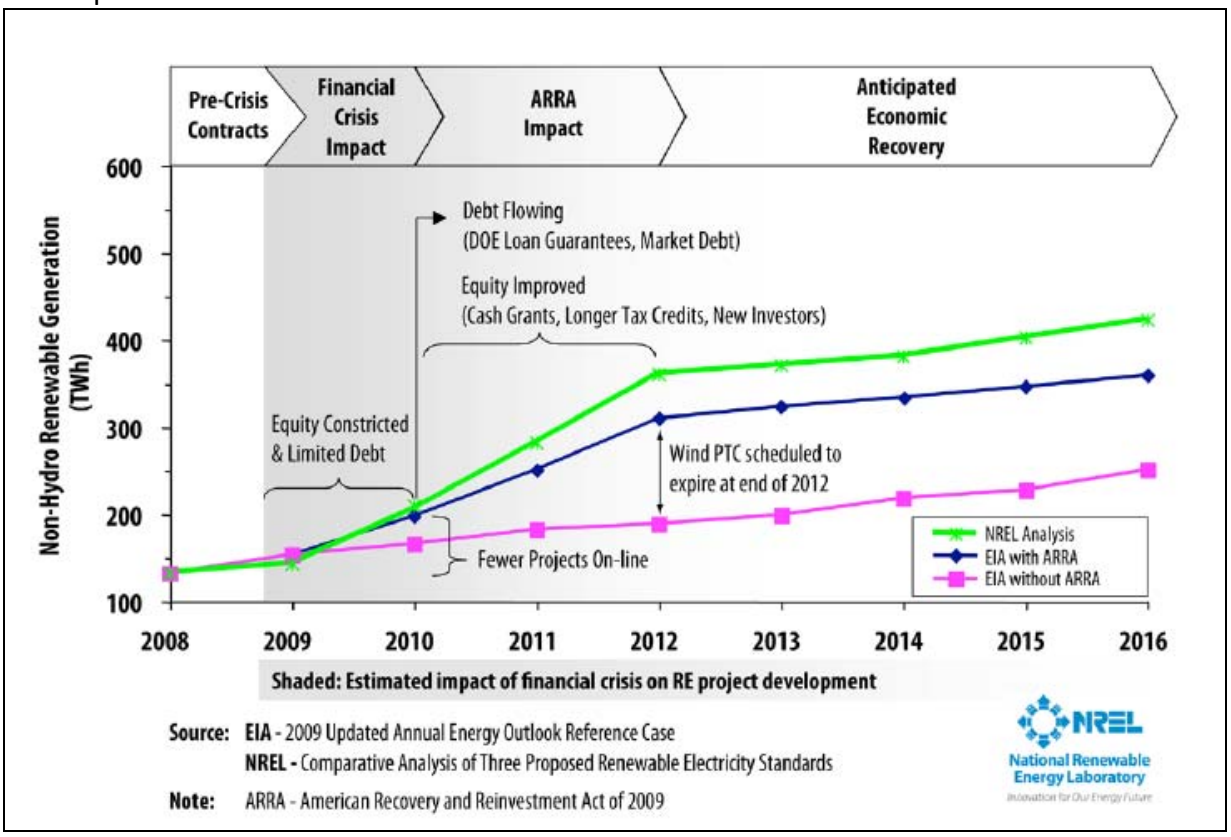
Figure 20. Role of The U.S. DOE in Financing Cleantech



Source: Technology Commercialization Energy Efficiency and Renewable Energy U.S. Department of Energy February 2009 RETECH Acting Assistant Secretary Steven Chalk Wendolyn Holland, Senior Advisor, page 8.

For cleantech-related ARRA 2009 funding, many of the projects funded are multi-state projects such that the aggregate data was not broken into the individual elements. Examples of such multi-state funding are Smart Grid investment grant awards to the Midwest Independent Transmission System Operator (MISO), PJM Interconnection (PJM) which are both regional transmission organizations (RTO). Other such funding is for utilities with affiliates operating in different states. For state specific projects, the following tables illustrates how much cleantech-related funding the state of Florida received from the federal government in 2009 compared to the top states receiving the funding in each cleantech category.

Figure 21. Impacts of the Financial Crisis and Federal Legislation on Renewable Energy Project Development



Source: Paul Schwabe et al.: Renewable Energy Project Financing: Impacts of the Financial Crisis and Federal Legislation, *Technical Report,* NREL/TP-6A2-44930, July 2009, page 12

Table 18. Top States with Most ARRA Cleantech Funding

Multi-State	$2,737,217,186
California	$476,688,707
Michigan	$468,874,119
Florida	$414,142,173
Texas	$361,671,480
Indiana	$309,587,026
Pennsylvania	$292,641,293
Nevada	$208,402,362
Maryland	$206,353,504
Mississippi	$163,269,680
Ohio	$150,695,983

http://www.cooley.com/Cooley_Clean_Tech_Stimulus_Portal

The table above shows that the State of Florida received the third highest total ARRA cleantech-related funding and was only outperformed by the states of California and

Michigan.[131] Florida received a total of $414 million in grants or approximately 6% of the ARRA cleantech-related funding. The states of Michigan, Indiana, Nevada, Maryland and Mississippi outperformed other states in gaining ARRA cleantech-related funding compared to their respective gross state product rankings (Mi at 12th, IN at 18th, NV at 31st, MD at 15th, and MS at 35th).

The analysis below shows the states that received the most ARRA funding for specific clean technologies: Smart Grid projects, Smart Grid regional demonstration and energy storage projects, electric drive vehicle battery projects, geothermal projects, biomass projects and SBIR-STTR cleantech projects. The state of Florida received ARRA cleantech-related funding in all the categories except for the Smart Grid regional demonstration and energy storage projects. The federal government also distributed $298.5 million in ARRA funding for clean cities, but there was no funding received by the state of Florida.

Table 19. Top States with Most Smart Grid Investment Grants

Multi-State	$1,359,748,037
Florida	$267,197,537
Texas	$257,194,844
Pennsylvania	$219,486,141
California	$203,010,487
Maryland	$200,000,000
Nevada	$138,000,000
Michigan	$103,158,878

http://www.cooley.com/Cooley_Clean_Tech_Stimulus_Portal
http://www.energy.gov/recovery/smartgrid_maps/SGIGSelections_Category.pdf

The State of Florida received the most direct funding for Smart Grid investment grants ($267 million). This amounts to approximately 8% of the total ARRA funding of Smart Grid Investments in all the states. The table above shows a large funding gap between the top five states (FL, TX, PA, CA and MD) and the second tier states.

The state of Florida received the third most direct funding for electric drive vehicle battery grants ($95.5 million). This amounts to approximately 5% of ARRA funding for this category. However, the state of Florida was not included in any of the multi-state grants distributed for this funding category.

[131] This may not be true after the multi-state Smart Grid Investment Grant Awards are distributed to the different states. The state of Florida was only included in one multi-state grant award, $164, 527,160 awarded to the Southern Company Services, Inc., for the company's service territory in Alabama, Florida, Georgia, Mississippi, North Carolina and South Carolina.

Table 20. Top States with Most Electric Drive Vehicle Battery Grants

Multi-State	$1,044,100,000
Michigan	$329,600,000
Indiana	$270,600,000
Florida	$95,500,000
South Carolina	$50,100,000
Colorado	$45,100,000
Pennsylvania	$40,600,000
Ohio	$34,100,000
Oregon	$21,000,000
Louisiana	$20,600,000
Arkansas	$12,600,000

http://www.cooley.com/Cooley_Clean_Tech_Stimulus_Portal
http://www1.eere.energy.gov/recovery/pdfs/battery_awardee_list.pdf

The state of Florida received the fourth most direct funding for biomass projects ($50 million), which is approximately 9% of ARRA funding for this category. This is a single project presented by INEOS New Planet BioEnergy, LLC to produce ethanol and electricity from wood and vegetative residues and construction and demolition materials.

Table 21. Top States with Most Biomass Grants

Mississippi	$131,134,686
Illinois	$52,334,592
New Mexico	$50,000,000
Florida	$50,000,000
Louisiana	$50,000,000
California	$45,445,849
Oregon	$25,000,000
Texas	$25,000,000
Missouri	$25,000,000
Hawaii	$25,000,000

http://www.cooley.com/Cooley_Clean_Tech_Stimulus_Portal
http://www.energy.gov/news2009/documents2009/564M_Biomass_Projects.pdf

Only $250,000 (rank = 35th) was received by Florida International University to gather and analyze data to improve Geothermal Heat Pump (GHP) loop design and efficiency in systems intended for use in hot and humid regions of the country.

Additionally, ARRA 2009 included funding for breakthrough projects that could fundamentally change the way we use and produce energy." A total of $151 million was awarded to multiple projects including $30.6 million for energy storage projects, $27.7 million

for biomass projects, $21.8 million for solar projects, and $11.3 million for wind energy projects. The table below shows that the state of Florida received no funding for "breakthrough projects" while the top 5 states received $94.8 million or 63 percent of all the funding for breakthrough projects.

Table 22. Top States with Most Geothermal Grants

Nevada	$70,252,935
Oregon	$40,004,516
Multi-State	$34,360,371
Texas	$25,524,879
California	$24,481,202
Arkansas	$16,993,447
New York	$13,711,321
Colorado	$12,099,922
Idaho	$10,190,110
Tennessee	$9,800,000
New Mexico	$7,045,834
…	…
Florida	$250,000

http://www.cooley.com/Cooley_Clean_Tech_Stimulus_Portal
http://www.energy.gov/news2009/documents2009/338M_Geothermal_Project_Descriptions.pdf

Table 23. ARRA Funding for Breakthrough Projects ($ Millions)

State	Solar	Biomass	Energy Storage	Vehicle Technologies	Oil & Gas	Wind	Geothermal	Building Efficiency	Carbon Capture	Water	Waste Heat Capture	Total
MA	8	5	12			8						33
CA		5	4	1		3		5	1	2		21
OH		6	2					5	5			18
CO							9	5				14
DE		9										9
FL												0
ALL	22	28	31	17	1	11	9	15	11	2	5	151

http://www.cooley.com/Cooley_Clean_Tech_Stimulus_Portal;
http://www.energy.gov/news2009/documents2009/ARPA-E_Project_Selections.pdf

Table 24. Top States with Most SBIR/STTR Cleantech Grants

Massachusetts	$3,718,248
California	$2,885,848
Colorado	$1,493,594
Florida	$1,194,636
Pennsylvania	$747,947
Texas	$745,709
Delaware	$600,000
Washington	$575,959
New Jersey	$449,995
Virginia	$449,958

http://www.cooley.com/Cooley_Clean_Tech_Stimulus_Portal; www.energy.gov/media/SBIR_Awards_112309.pdf

The state of Florida received the fourth most direct funding for SBIR/STTR cleantech-related grants ($1.2 million), which is approximately 6.5% of SBIR/STTR funding for cleantech projects. The Florida projects financed cover advanced building air conditioning and refrigeration, thermal load shifting and cool roofs, advanced gas turbines and materials, sensors, controls and wireless networks, and advanced solar technologies. The state of Florida did not receive any funding for projects dealing with water usage in electric power production, power plant cooling, advanced water power technology development, and smart controllers for Smart Grid applications.

The following table provides a summary of Florida's current situation and the associated funding or achievement gap. With the national VC recognition of cleantech as an attractive market, Florida seems to be lagging far behind other states (e.g., CA, TX, MA, NY, etc. and others that primarily have a state RPS in place) and the private sector of VC is not showing the response to be expected from a normal, healthy economy that should react appropriately to consumer demand for cleantech products.

Table 25. Summary Table of Florida's Current Situation and Achievement Gap

	FL	FL Rank	Expected Spending	Funding or Achievement Gap
All Technologies				
R&D Transition				
Total R&D	$ 6.34	16	$ 17.10	$ 10,760
Academic Research	$ 1.60	11	$ 2.70	$ 1,100
Average Academic Disclosures 02-06	556	8	802	246
Average Academic Patent Applications 02-06	336	7	514	178
2008 Utility Patents	2046	12	3517	1471
Average Active Academic Licenses 02-06	515	17	1440	925

	FL	FL Rank	Expected Spending	Funding or Achievement Gap
Average University Based Startups 02-06	16	7	27	11
Early Capital Stage				
Average SBIR/STTR 00-08	$ 41.00	12	$ 87.00	$ 46.00
Average Early VC Funding 00-08	$ 118.00	14	$ 471.00	$ 353.00
Mid/Late Capital Stage				
Average VC Investments 00-08	$ 490.00	11	$ 1,278.00	$ 788.00
Clean Technologies				
R&D Transition				
Cleantech Fields of Academic R&D	$ 828.00	11	$ 1,366.00	$ 538.00
Total Clean Energy Patents 02-09	85	9	245	160
ARRA ARPA-E Awards 09	$ -		$ 14.10	$ 14.10
Early Capital Stage				
Average SBIR/STTR 00-08	$ 3.60	11	$ 6.60	$ 3.00
Average Early Capital Energy 00-09	$ 1.00	27	$ 12.00	$ 11.00
Average Early Capital Environmental 00-09	$ 1.10	16	$ 5.60	$ 4.50
Average Early Capital Industrial 00-09	$ 0.10	24	$ 3.60	$ 3.50
ARRA Biomass Awards 09	$ 50.00	4	$ 50.00	$ -
ARRA SBIR/STTR Awards 09	$ 1.20	4	$ 1.20	$ -
Mid/Late Capital Stage				
Average Mid/Late Capital Energy 00-09	$ 21.40	14	$ 58.10	$ 36.70
Average Mid/Late Capital Environmental. 00-09	$ 28.70	3	$ 14.10	$ (14.60)
Average Mid/Late Capital Industrial 00-09	$ 0.44	23	$ 9.00	$ 8.56
ARRA Geothermal Awards 09	$ 0.25	35	$ 24.50	$ 24.25
ARRA Battery Awards 09	$ 95.50	3	$ 50.10	$ (45.40)
ARRA Advanced Vehicles Awards 09	$ -		$ 15.00	$ 15.00
Project Finance				
ARRA Smart Grid Awards 09	$ 267.00	1	$ 203.00	$ (64.00)
ARRA Reg. Smart Grid Dem Projects Awards 09	$ -		$ 27.40	$ 27.40
Current Assets and/or System Inputs				
R&D Transition				
Average Academic Patent Expenses 02-06	$ 6.70	10	$ 10.00	$ 3.30
Total PhD. Sci & Engineers 06	17,630	13	32,400	14,770
Total University Faculty 07	16,792	6	19,926	3,134
Total Tenure Track Faculty 07	9,375	7	10,450	1,075
Faculty/Student Ratio 07	21	45	15	(6)
Average Academic License Associates 02-06	25	8	43	18
Early Capital Stage				
Number of Angel Groups 07	5	9	9	4
Focus State VC Funds	$ 29.50	14	$ 83.50	$ 54.00
Mid/Late Capital Stage				
All focus State VC Funds	$ -		$ 100.00	$ 100.00
Early, Mid and Late Capital Stages				

	FL	FL Rank	Expected Spending	Funding or Achievement Gap
Total VC Firms with Principal Office in FL 09	33	12	107	74
VC Firms in FL with a Cleantech Focus 09	3	13	17	14
Average VC Under Management 00-08	$ 1,459.00	$ 17.00	$ 12,578.00	$ 11,119.00
Commitments to VC Funds 00-08	$ 165.00	$ 18.00	$ 1,713.00	$ 1,548.00
State VC Funds by Total Fund Size	$ 29.50	$ 21.00	$ 204.00	$ 174.50
Project Finance				
State Public Benefit Funds for Renewables	$ -		$ 444.00	$ 444.00

Source: Table 10 above

Regulatory Changes

Author:

Ted Kury

Director, Energy Programs, UF PURC

The RPS and Its Economic Impact

The previous RPS (alternatively RES, for Renewable Energy Standard) economic impact studies are encouraging. There are already success stories in the application of RPS in enhancing employment, growth and environment. These are specified in Appendix H and include:

- Net metering, interconnection standards, renewable portfolio standards, tax incentives, renewable energy access laws, and generation-disclosure laws are the most commonly implemented renewable energy policies within the U.S. states.
- Net metering, tax incentives, and renewable portfolio standards were the most commonly added state renewable energy policies during the past year.
- As more policies are implemented on various levels, policymakers must pay increasing attention to the interactions between federal and state policies, as well as between policies of different types.

A renewable portfolio standard, or the mandate to generate a set percentage of electricity from renewable energy sources, is often viewed as an incentive for renewable energy production; this is not always the case. Such standards create markets for renewable energy credits, but often create price ceilings for these credits. This price protection may provide protections against market manipulation and price spikes, but they also create disincentives for deploying renewable generation. If, for example, a renewable energy rule creates a price cap of $25/MWh for a renewable energy credit, an energy provider can simply pay the price cap in lieu of producing energy from renewable sources. That is, if an electricity producer has to choose between producing from coal at $65/MWh, say, and biomass at $110/MWh, the producer may choose to produce with coal and pay the $25/MWh cap for a renewable energy credit.[132] Moreover, a producer with a regulatory mandate to produce at the least cost would have no

[132] It should be noted that with the addition of cost factors in the future such as: cost of greenhouse gas emissions, and that conventional fuels are aging and newer fuels will require carbon capture and coal gasification technologies, this current condition will significantly change.

choice but to produce with coal and buy credits. Regulatory and technical factors such as potential costs associated with CO_2 emissions and carbon capture and storage technology have the potential to change this relationship in the future.

An alternative, or more properly, an expansion, of the idea behind RPS is so-called Clean, or Alternative Energy Standards (CES or AES). These standards expand the scope of RPS to include other technologies that may be desirable from the states' point of view. These technologies may be alternatives to the traditional wind, solar, and biomass technologies that do not emit CO_2, such as nuclear energy. They may also include parochial fuels. Pennsylvania, for example, includes energy generated from waste coal in its alternative energy standard. Nevada includes electricity generated from waste tires. Ohio, Michigan, and West Virginia all include electricity production from clean coal technologies in their clean energy standard, and Ohio includes nuclear power.

From a policy perspective, a RPS or CES is implemented to encourage the construction of generation that would not otherwise be constructed. This generation is generally not constructed for economic reasons, that is, because it is not the most cost-effective resource. According to the 2009 Load and Resource Plan for the State of Florida, the current and planned generating units for the state are sufficient to meet the state's projected load growth for the next ten years, including an 18% to 21% reserve margin, without implementing any of Florida's load management programs. With these programs, Florida has a capacity reserve of 25% to 30%. This means that Florida doesn't really need additional generating resources to meet its future needs at this time, and that any new renewable resource will be displacing an existing source of electricity, whose fixed costs are still being borne by the Florida ratepayer, regardless of whether the unit produces electricity.

The economic impacts of renewable energy standards in individual states are difficult to quantify for two reasons. First, many states implement industry incentive programs in addition to RPS and it may be difficult to separate the effects of industry incentives from any signal that it being given by an RPS. The state of Michigan, for example, enacted industry support programs for attracting infrastructure investment before it established a statewide RPS. The state offers a tax credit for up to 25% of the capital costs associated with the construction of a PV facility, or $15 million. Other states have implemented similar programs, and these

programs may be implemented before or after the establishment of RPS. Oregon's program, for example, awards 50% of construction costs up to $20 million. Arizona offers tax credits of 10% of capital costs. Kansas offer credits up to $5 million in costs. Montana offers 50% tax abatement for 15 years for all qualifying projects. Other states award capital directly to renewable energy manufacturers. Maryland has offered $7 million in 2 funding cycles. New York offers $1.5 million for each project, while Ohio awards $50,000 to $2 million. New Mexico offers a 5% credit for purchase of manufacturing equipment.

Some of these incentives have resulted in ironic unintended consequences. Michigan has been very aggressive in its pursuit of renewable energy manufacturers. But because the manufacture of solar panels and components is such an energy-intensive process, the demand for inexpensive, reliable electricity from Hemlock Semiconductor and Evergreen Solar manufacturing plants in Michigan have necessitated the construction of a new 800 MW coal-fired generating station. In addition, the state is currently constructing two more such plants to serve future generating needs.

The second reason that the economic impacts of RPS policy is difficult to quantify is that RPS policy is relatively immature in the United States. As a result, available data make forensic analyses difficult. However, we may be able to look at forensic studies of similar programs in other markets to gauge the possible success of these programs in the United States. Europe, for example, has supported green jobs programs since 1997, and we might be able to learn something from the experiences of European nations, despite the fact that implementation in the European market has differed slightly from the planned implementation in the United States. Gabriel Alvarez published a study in March of 2009 that caused considerable controversy.[133] Alvarez and his team conducted a forensic study of the effects of incentive programs for renewable energy production in the electric market in Spain since 1997 and arrived at the conclusion that for every four 'green' job that the government programs created, 9 traditional jobs were destroyed by the allocation of government resources. Many questions and accusations have been directed toward Alvarez for both his methods and any existing bias he may have harbored towards these government programs. His argument, however, is essentially the "crowding out" argument that has existed in economic theory for over 200

[133] http://www.juandemariana.org/pdf/090327-employment-public-aid-renewable.pdf

years. That is, that government spending in a market has a tendency to displace private investment, and that government expenditure is not as efficient as creating value as private investment. Thus, Alvarez' argument is not that 9 jobs are destroyed, but that these jobs are not created as a result of the government spending. While his focus on opportunity costs has garnered his study much criticism, this does not mean that the opportunity costs of government spending should be summarily ignored.

A study by Ulrike Lehr[134] of the German market concluded that emphasis on renewable energy has, and would continue to lead to net benefits to the German economy. But the study has two interesting conclusions. First, that the cost of renewable energy would be partially offset by a robust market price of CO_2 emissions, a market that does not presently exist in the United States. However, the current administration has expressed its desire to establish such a market, and many states are currently preparing for one, and second, the value of export markets in determining the benefits. Lehr found that it was essential to export materials and technology to fuel economic benefits to the system. The degree to which manufacturers in Florida will be able to export their materials and technology will likely play a critical role in the degree of economic benefit that will be realized by the state.

An RPS for Florida

A February 2, 2010 study by Navigant Consulting[135] studied the impact of a national Renewable Electricity Standard (RES) program.[136] Its findings also support the implementation of a Florida RPS program in order to maximize economic development through job creation. Findings from the report pertinent to Florida include: 1) The biomass, hydropower, and waste-to-energy industries would see significant job gains in the Southeast United States under a strong national policy. Biomass jobs would double, with most of the increase concentrated in Louisiana, Florida, Georgia, Alabama and Kentucky. 2) Specifically for the state of Florida, the study found that without a national RES, Florida will gain up to 2,500 renewable electricity supported jobs between now and 2025. However, with a 25% RES by 2025, the state will see between 15,000 and 17,500 renewable electricity supported jobs. With a strong near-term target, Florida and Pennsylvania will see the largest job gains: between 5,000 and 7,500

[134] http://www.ecomod.org/files/papers/148.pdf
[135] Navigant Consulting: Jobs Impact of a National Renewable Electricity Standard, February 2, 2010.
[136] See: http://www.res-alliance.org/public/RESAllianceNavigantJobsStudy.pdf.

additional jobs will be supported by 2014. A 20% RES in 2020 will support between 12,500 and 15,000 more renewable electricity jobs in the state than without a national policy. Stronger RES targets will mean more than 150,000 job-years of work by 2025 in the state of Florida.

Incentives to manufacturers and producers have the advantage of being largely complementary at the federal, state, and local level. However, each type of incentive has its own strengths and weaknesses, and these should be considered when crafting incentive packages. Incentives can take one of two basic forms, direct payments such as capital grants, deferred payments such as tax credits, or production credits such as subsidies and Feed-in-Tariffs. Direct payments will have the most utility to firms that are unable to raise capital in the capital markets. However, without investment or employment conditions on the grants, monitoring of those conditions, and the legal recourse to rescind those grants, there is no incentive for the firm receiving the grant to actually use the grant in the manner in which it was intended. Therefore, the costs of monitoring and non-performance may serve to erode any benefit associated with the program. Deferred payments such as tax incentives may not directly help with the attraction of investment capital, but do represent a known future revenue stream with which an investor may secure financing. However, these credits share many of the same drawbacks as direct payments in that investment and employment conditions may be necessary to ensure that the industrial customer uses the tax credit in the manner in which it was intended.

Table 26. Summary of State Industrial Incentive Programs

State	Effective Date	Industrial Incentive Program
Arizona	1/1/2010	Tax credit of up to 10% of capital investment, providing employment and wage conditions are fulfilled
Connecticut		$10,000 grants to up to 5 small firms annually that develop energy efficient technologies
Florida (Miami-Dade County only)	Apply by 9/30/10	Up to $9,000 per new job created by solar thermal or photovoltaic manufacturer or repair company
Hawaii	7/1/01	100% tax credit (up to $2,000,000) for qualified high tech business
Kansas	4/6/09	Up to $5,000,000 for financing solar or wind manufacturing project, subject to employment and investment conditions
Maryland	Apply by 4/30/10	Up to $7,000,000 in ARRA funds for clean energy development projects
Massachusetts	1979	100% corporate tax deduction for 5 years on any income derived from patents deemed beneficial for energy conservation or alternative energy development
Michigan	9/11/08	25% of capital costs (not exceed $15,000,000, but one project may receive $25,000,000) of the construction of a photovoltaic manufacturing facility
Montana	5/25/07	50% property tax abatement for new renewable energy production facilities,

State	Effective Date	Industrial Incentive Program
		new renewable energy manufacturing facilities, or renewable energy research and development equipment
New Jersey		Up to $3,300,000 in grants and loans, per project, for manufacturing of energy efficient and renewable energy products
New Mexico	7/1/06	5% tax credit on the purchase of manufacturing equipment for alternative energy products and components
New York		Up to $1,500,000 in grants, per new or existing project, for manufacturing of energy efficient and renewable energy products
Ohio	6/12/07	Awards of $50,000 to $2,000,000 for projects that create advanced energy jobs, subject to employment conditions
Oklahoma		$25 per square foot of rotor swept area tax credit for producers of wind turbines between 1 kW and 50 kW
Oregon	6/20/08	50% tax credit, up to $20,000,000, of the construction costs for a facility to manufacture renewable energy systems
Pennsylvania	7/9/08	Program of loans up to $5,000,000 and grants up to $2,000,000 to develop alternate energy production and clean energy projects
Tennessee	7/1/09	99.5% tax credit to manufacturers of clean energy technologies, subject to investment and employment conditions
Texas	1982	Franchise tax exemption for companies engaged solely in the business of manufacturing, selling, or installing solar energy devices
Utah	5/12/09	Up to 100% tax credit of all new state tax revenues for renewable energy producers and manufacturers
Virginia	1/1/96	Grant of up $0.75 per watt sold for the first two years of operation for solar panel manufacturers. Grant amount is $0.50 per watt for years 3 and 4, and $0.25 per watt for years 5 and 6.
Washington		43% reduction of business and occupation tax for manufacturers and wholesale marketers of photovoltaic modules or silicon components

http://www.dsireusa.org/incentives/index.cfm?SearchType=Recruitment&EE=0&RE=1

Finally, there are a wide range of production credits that may be used. The two most popular are unit subsidies and Feed-in-Tariffs. A unit subsidy simply pays a certain amount for unit of output from a production facility. An example might be the Solar Pilot Program offered by the Orlando Utilities Commission ("OUC"). Under this program, OUC offers production credits of $0.03/kWh for electricity generated by solar thermal systems and $0.05/kWh for electricity generated by solar photovoltaic systems. This payment, then, is used by the producer to supplement the value otherwise derived from the electricity. As such, it functions to pay the producer over and above a market value of the electricity. Feed-in Tariffs like the one offered by Gainesville Regional Utilities; on the other hand, represent a payment for the entire value of the electrical output, typically above current market rates. Unlike a subsidy, a Feed-in-Tariff represents a long term, guaranteed, revenue stream that a project developer can use in financial analyses to secure financing for a project, where the revenue from a program under subsidy still depends on market conditions. Both programs share similar strengths. Since any

benefit to the producer accrues as production increases, any risk of non-performance, or volumetric risk, is borne by the producer of the electricity. Since the producer is more likely to control this risk than the government, most economists would agree that this is an equitable risk allocation. A direct or deferred payment, however, allocates more of the risk of non-performance to the government agency offering the payment. The only types of programs that could not co-exist with another type of program are Feed-in-Tariffs, as the producer can only sell its output once.

Many recent projects have primarily relied upon direct or indirect payments to attract investment. As previously noted, this places the responsibility of proper controls and the risk of non-performance firmly with the government agency offering the funding. As the New Jersey experience shows, this burden may turn out to be quite significant as incentive packages may attract companies with little or no experience in the industry, simply chasing the dollar signs.

Pennsylvania has taken a proactive approach to their RPS program. According to Clean Energy States Alliance, "the reason that Pennsylvania has been successful in developing their wind resources is early action by some Load-Serving Entities (LSEs) in the state to acquire wind energy in anticipation that a RPS would be enacted, and strategic investments and production incentive auctions by Pennsylvania's public benefit funds, in particular the Sustainable Development Fund of Pennsylvania (SDF). Pennsylvania's relatively streamlined siting process, at least compared to other states in the northeast, also played a role. Pennsylvania relies on local siting and does not have a state siting process."[137]

A package that combines direct or indirect payments with production incentives may serve the dual purpose of attracting investment and mitigating the risk to the government agency.

Policy Considerations for Florida - Recent Developments

The companies' decision(s) to locate facilities elsewhere hinged on other states support for regional development of the market for their technologies. Renewable Portfolio Standards or other mechanism's that allow utilities or consumers to earn a return on their investments have been key elements supporting that market development.[138]

[137] http://www.cleanenergystates.org/Publications/CESA_Progress_Report_Porter_NE-MA_Regional_RPS_Dec2008.pdf, page 19.
[138] Sullivan, Jack. Personal Communication. January 27, 2010.

Energy Conversion Devices, Inc. (ECD): a leading manufacturer of thin-film flexible solar laminate products for the building integrated and commercial rooftop markets recently moved to Battle Creek Michigan and set up a new 120MW solar cell manufacturing facility. Their projected number of jobs to be created is estimated to be 350 jobs over the next three years. The economic incentives offered by the State, County and Battle Creek governments totaling $120 million were key factors in their decision to select Battle Creek. The incentive package included:

- The Michigan Economic Development Corporation (MEDC) offered Michigan Business Tax credits valued at $41.4 million over 20 years.
- A $12.6 million Community Development Block Grant to fund infrastructure improvements for the new plant.
- The MEDC and city have supported a 15 year tax free Renaissance Zone and property tax abatements for the site worth an additional $67 million to the company.
- Additional funding for training assistance.

MX USA: a solar energy manufacturing company in solar module manufacturing created from a joint venture of: MX Group SPA (a solar energy manufacturing company based in Northern Italy) and IPP Solar (a leading developer, owner, and operator of photovoltaic solar systems in the United States). They expect to create 260 new jobs. The new MX USA facility is located in Millville, New Jersey. One factor involved in the MX USA's decision to locate in New Jersey included the RPS of 22.5% (by 2020), which was recently increased to 30% by 2020, as outlined in the State's Energy Master Plan. The incentive package for MX USA included:

- Economic Development Authority's Business Employment Incentive Program committed $2.4 million. The company will receive the funds as a rebate from the income taxes generated by the new jobs produced by the plant.
- Local incentives.

Suntech Power: a solar panel manufacturer, opening first American plant in Phoenix, Arizona. Sunpower's decision to locate in Phoenix was based on shipping costs. The company estimates up to 200 jobs will be created when the plant is fully operational. Suntech was offered a set of strong incentives by the state of Arizona, and the company has applied for a 30 percent investment tax credit.

BP Solar and Jabil Circuit Inc.: Solar module assembly for the North American market. The plant is located in Jabil's plant, in Chihuahua, Mexico. This partnership dovetails with an ongoing relationship with BP Solar module manufacturing in Poland (that covers the European market) through manufacturing agreements. The Jabil plant in Mexico has proven to be very reliable in their time to market for North American customer base.

Conclusions and Recommendations

The economic impacts of renewable energy standards in individual states are difficult to quantify for two reasons. First, many states implement industry incentive programs in addition to RPS and it may be difficult to separate the effects of industry incentives from any signal that it being given by an RPS. The second reason is that many state RPS policies are relatively immature in the United States. As a result, available data make forensic analyses difficult.

However, previous RPS economic impact studies are encouraging. There are already success stories in the application of an RPS enhancing employment and economic growth. An analysis was conducted to determine the effectiveness of best practice design elements for three individual policies: RPS, net metering, and interconnection. Some of the features of a well-designed RPS policy are found to significantly contribute to renewable energy development when looked at individually; however, none of them can be combined into a model that adequately predicts any of the renewable energy generation indicators.

Other important RPS policy decisions that Florida should consider include the following:

- Florida should evaluate the impact of an explicit cost associated with CO2 emissions on conventional fuels and generation costs and in mitigating the need for government subsidization or mandate of clean energy technologies, and the relative impact of either program on short-term energy costs for consumers.
- RPS programs will not necessarily lead to increases in clean energy production as long as there is a cap on the price of renewable energy credits. However, the absence of a price cap puts consumers at risk of price spikes in the energy market.
- Current ten-year site plans show that Florida has no need for additional generating capacity beyond what is already planned for the next ten years, and producers are therefore more likely to purchase renewable energy credits or offsets elsewhere. The state might address the impacts of this situation with a comprehensive long-range capacity plan under various carbon pricing and technology scenarios.
- Conditions on capital investment and employment should accompany any incentive program for clean energy producers or manufacturers.

Explore the Possibilities of[139]:

- Expanding net metering to all utilities (i.e., munis and co-ops)
- Increasing capacity covered by the Interconnection rules from 2 MW to 20 MW[140]
- Removing requirements for redundant external disconnect switch on larger systems
- Removing interconnection requirements for additional insurance on larger systems
- Expanding interconnection procedures to all utilities (i.e., munis and co-ops). (See Appendix I).[141]

The chief barrier to cleantech project development in the state and the nation is the lack of sufficient investments in R&D by both the federal government and private investors in order to address the nation's supply, security, and sustainability challenges.

It is still possible that cleantech products are not competing with traditional alternatives on a level playing field. Indeed, some cleantech investors believe that "conventional technologies such as coal, natural gas and petroleum regularly receive large government subsidies that give them a price advantage, even though these technologies have been in the mainstream for decades." Oil, gas, coal and nuclear received more government incentives, including tax incentives, than renewable and geothermal fuels, understanding that traditional sources produce the lion's share of energy in the U.S.

The State of Florida is lagging behind its expected historical relative performance in funding all the stages of cleantech projects. There appears to be a glaring gap in resources available to cleantech entrepreneurs at all stages of cleantech development in Florida as compared to states with similar populations and Gross State Product. Florida does not compare favorably in terms of amounts financed, current assets and/or system inputs, and academic achievement related to new technologies including cleantech. Moreover, funding supplied to all areas of venture creation has contracted, resulting in a more cautious venture capitalist market and less innovation making it to commercial production. The current economic landscape precludes Florida VCs from assuming the same risk profiles in their investment

[139] See: www.freeingthegrid.org

[140] Explore a two-tiered approach based on utility load; for example, 20 MW might be achievable for IOUs, and 5MW might be more feasible for muni's.

portfolios as in the past decade and it appears that true seed money of a significant amount is very limited in Florida.

However, during 2009, the state of Florida took advantage of the ARRA funding opportunities for cleantech and other clean energy projects except for geothermal and wind projects. In general, when considering the ARRA 2009 funding, the state of Florida outperformed its relative position based on its rank by Gross State Product except for funding of geothermal projects. Should this trend be sustained in the future, Florida would be able to reduce the funding and achievement gaps outlined above. [142]

In 2008-2009, FPL invested in 110 MW of solar capacity in Florida. This investment in solar has moved Florida from last place, to second in the nation (behind California). The solar investment was a result of the 110MW tranche that the Florida legislature approved in 2008.

This is a clear illustration that Florida utilities – and investors interested in clean technologies are interested in investing in clean energy in states with the right policy and incentives and with appropriate market to enable a reasonable return on investment . This is an indication that given similar or better incentives applied to the right technologies, those utilities and other investors in clean technologies will invest more in the state of Florida.

Although the State of Florida ranks 9th in the total number of programs offering financial incentives to renewable energy businesses, the state currently does not have in place important direct programs and incentives. In order to be more renewable energy friendly and create more opportunities for economic development, the state of Florida should consider implementing the following state-sponsored programs in additional to the programs and incentives already in place: direct state grants and loans, economic development incentives to support job-creating new industries, and production incentives.

While this analysis shows that the state of Florida has a lot of ground to cover in helping clean technology developers overcome the "Valley of Death" for their projects, many tools have been developed by other states and the federal government over the years of which the state can take advantage. The state needs to more accurately evaluate the best clean technologies with the greatest benefit-cost ratio for support in Florida. In addition, an analysis of the comparative advantages the state has over the many other states which have implemented and

[142] See Table 46.

financially supported such technologies can help in making the final determination of which clean technology will thrive in the state.

Clean technologies are unique. Funding mechanisms and incentives policies which worked well with other technologies may not produce effective support to investors in clean technologies. In order to overcome the main barriers to cleantech commercialization and project finance identified in this analysis, the state needs to look at those polices that worked well for clean energy and related sectors.

In addition to the programs recommended above, in order to help finance the high upfront costs of clean technologies, the state of Florida should explore the development of Power Purchase Agreements (PPAs), PACE and EECBG models, a Green Bank, Clean Technology Victory Bonds, Tax Credit Bonds, State Loan Guarantees, and Clean Tech City Funds.[143] Similar models have been used successfully in the U.S. and other countries. These programs have great potential to finance and sustain clean technology in the state. Conditions on capital investment and employment should accompany any incentive program for clean energy producers or manufacturers.

There is a need to harmonize and simplify federal and state policies related to cleantech. This policy harmonization will bring certainty and reduce the perceived risk for entrepreneurs and investors alike. Companies are looking for the state to “set the market for 4-5 years" through incentive programs in order to justify coming to Florida (justification to not only their management teams, but also to their investors). As more policies are implemented on various levels, policymakers must pay increasing attention to the interactions between federal and state policies, as well as between policies of different types.

The State of Florida has the advantage not to reinvent the wheel of cleantech commercialization and project finance, but at the same time may face higher starting costs than leading states. A number of other states (e.g., CA, TX) have gained competitive advantage by making first moves in technology, product or marketing innovation. They have also created new market demand for cleantech products and have created a financial, fiscal, social and political environment conducive to new cleantech ventures, at the same time attracting new cleantech investments away from states like Florida which are starting to set up new policies

[143] Ron Pernick and Clint Wilder, Clean Edge Inc.: Five Emerging U.S. Public Finance Models: Powering Clean-Tech Economic Growth andJob Creation, October 2009.

and incentives for cleantech projects. If Florida chooses to pursue clean technologies as an economic development opportunity, now is the time to benefit from a global pro-cleantech environment, with fundamentally strong federal support and a growing penetration of cleantech companies in the capital markets.

Incentives to manufacturers and producers have the advantage of being largely complementary at the federal, state, and local level. The design of an incentive package must consider, among other things, the strengths and weaknesses that each type of incentive package might have.

In order to maximize the benefits associated with the opportunities offered by an increase in federal funding of cleantech at all stages, the state should evaluate the possibilities of making net metering and interconnection standards the best in the nation. Florida should balance the implementation of the best net metering and interconnection practices with the potential increased costs to consumers such implementation would have in the short term. The state's goals should be to implement the best net metering and interconnection standards and at the same time, put in place state policies to alleviate the short term increase in rates associated with such policies. The improved net metering and interconnection standards should explore the possibilities to expand net metering and interconnection standards to all utilities (i.e., munis and co-ops) through an opt-in process, to increase capacity covered by the Interconnection rules to a level that provide the greatest incentive for investors, to remove requirements for redundant external disconnect switch on larger systems, and to remove interconnection requirements for additional insurance on larger systems.

Task 1

Recommend to the Florida Energy and Climate Commission whether the state should (1) renew the current incentives "as-is" (2) renew the current incentives with technical changes and review of funding levels, or (3) allow the current incentives to sunset.

The results of the analysis show that the sunsetting programs have had varying degrees of success and must be analyzed on an incentive-by-incentive basis. The following chart analyzes each sunsetting activity:

Table 27. Current Incentive Programs and Recommendations

Program Category	Availability in Florida	Recommendation	Pros	Cons
Solar Rebate	Solar Energy System Incentives Program Expires June 2010 FEECA utility programs	Amend: expiration date, decrease the subsidy and consider impact of FEECA. Link to project performance	▪Support market transformation ▪Adjustable ▪Provide upfront capital ▪Low administrative burden	▪Create rebate dependency ▪Can be economically inefficient ▪Not linked to project performance
State Corporate Tax Incentives	▪ State Corporate tax incentives ▪ Renewable Energy Production Tax Credit, Expires June 2010 ▪ Renewable Energy Technologies Investment Tax Credit Expires June 2010	Continue and Amend: Only available to commercial Continue and Amend: Include Residential Continue and Amend: Include residential, remove hydrogen vehicles and stations	▪Easy to administer ▪Easy to modify	▪Insufficient tax liability ▪Impact on state revenue ▪May not be the best incentive for each technology
Renewable Sales Tax Exemptions	▪ Renewable Energy Equipment Sales Tax Exemption Expires June 2010 ▪ Solar Energy Systems Equipment Sales Tax Exemption	Continue and Amend: No expiration date Continue the program as is	▪Easy to administer	▪Not a strong incentive
Renewable Energy Technology Grant Program	Expires June 2010	Continue and Amend: Investment/loan program instead of grant.	Investment/Loan Program ▪Lower administrative requirements ▪Leverage private capital ▪Leverage state funds ▪Build lender confidence ▪Support innovative projects	Investment/Loan Program ▪Reliance on private lenders ▪Default risk ▪Narrow target market

In order to be more renewable energy friendly and create more opportunities for economic development, the state of Florida should consider implementing certain state-sponsored programs in addition to the programs and incentives already in place. The majority

of clean energy developers believe that a combination of long-term carbon price, stable subsidies, higher targets and tax breaks is very important for institutional investors.

The state has limited resources and those resources need to be spent in a way that leverages as much private capital as possible and is equitably distributed among as many Floridians as possible. Programs called property tax financing authorization, municipal energy financing districts, or land-secured financing districts have received increasing attention as a mechanism for financing residential or commercial clean energy projects, including energy efficiency, solar photovoltaic, or solar thermal systems. Some of the pros and cons of these programs are outlined below in the Task 4 recommendation.

In order to increase the state share of funding from the current ARRA 2009 and any future extension of the federal stimulus program, the state should consider the following:

- Identify specific areas of R&D that match state objectives and the expertise of Florida universities and research institutes.
- Through a cleantech advisory committee coordinate efforts to pursue ARRA cleantech-related funds.
- Consider a partnership with the private sector to provide matching research dollars as incentives to pursue research in strategic areas.
- Create a system to channel through and coordinate cleantech-related workforce development funding.
- Partner with private companies to promote research and development of hybrid vehicles, advanced batteries, advanced fossil energy technology (including coal gasification), hydrogen fuel cell technology, advanced nuclear energy facilities, carbon capture and storage, efficiency end-use energy technologies, production facilities for fuel efficient vehicles, pollution control equipment, and oil refineries using state tax credits or other supportive incentives.

Federal Incentives Pros/Cons:

Our recommendation for federal incentives would be a combination of up front (grant, loan or tax) incentives and performance based measures. Up front incentives have the advantage of providing a funding source and they don't require monitoring. Performance based incentives require a company to actually fulfill their promises, although they do require monitoring and enforcement, if the company fails to perform.

Up Front Incentives

Pros:

- Can be used as a source of financing to secure additional capital
- No ongoing oversight responsibility for government agency
- Total incentive amount is predictable
- Provide immediate benefit for producer

Cons:

- May be no incentive to perform as promised – performance risk allocated to government
- Due diligence on recipient is critical

Performance or Volume Based Incentives

Pros:

- Recipient must perform or produce to receive incentive – performance risk allocated to producer
- Incentive amount per unit of production is predictable
- Not as much due diligence of recipient required

Cons:

- Cannot be used as a source of financing to secure additional capital
- Requires oversight from regulator or government
- Requires legal recourse to deny or revoke incentive

Recommendations

In order to increase the state share of funding from the current ARRA 2009 and any future extension of the federal stimulus program, the state should consider the following:

- Identify specific areas of R&D that match state objectives and the expertise of Florida universities and research institutes.
- Through a cleantech advisory committee coordinate efforts to pursue ARRA cleantech-related funds.
- Consider a partnership with the private sector to provide matching research dollars as incentives to pursue research in strategic areas.
- Create a system to channel through and coordinate cleantech-related workforce development funding.
- Partner with private companies to promote research and development of hybrid vehicles, advanced batteries, advanced fossil energy technology (including coal gasification), hydrogen fuel cell technology, advanced nuclear energy facilities, carbon capture and storage, efficiency end-use energy technologies, production facilities for fuel efficient vehicles, pollution control equipment, and oil refineries using state tax credits or other supportive incentives.

Task 2

Recommend to the Florida Energy and Climate Commission how to cater non-sunsetting existing incentives to the clean technology sector

Maximizing the benefits associated with an increase in federal funding of cleantech at all stages will require the state to implement the best net metering and interconnection standards. The state's goals should be to implement the best net metering and interconnection standards and at the same time, put in place state policies to alleviate the short term increase in rates associated with such policies. The improved net metering and interconnections standards should explore the possibilities to expand net metering and interconnection standards to all utilities including municipal and co-operative utilities through an opt-in process, to increase the capacity covered by the interconnection rules to a level that provides the greatest incentive for investors, to remove requirements for redundant external disconnect switches on larger

systems, and to remove interconnection requirements for additional insurance on larger systems.

A major incentive for clean energy project finance would be to calculate the "full avoided costs" in Section 366.051 of Florida Statutes based on the actual cost of renewable energy generation and provide a reasonable rate of return in order to make clean energy projects profitable. The new "full avoided costs" formula would be based on the type of clean energy resource or technology, potential carbon emission reduction, the size of the plant, the resource intensity of the renewable energy plant, the time of day in which generation occurs (i.e., peak or off-peak), and the geographic location.

Another incentive is to enable cleantech developers to effectively recover investments in cleantech projects at the fully avoided costs of the projects.

Potential Impact for Florida

Pros

- Help improve the fuel diversity of the state's electric utilities
- Reduction of air pollution and greenhouse gas emissions
- Enhance the state's green job creation and economic development
- Allow customers to produce and sell excess power to utilities
- Allow customers to effectively manage their energy consumption. Mitigate price volatility in the power sector
- Encourage greater renewable energy generation

Increase energy independence

Cons

- Provide a subsidy for production of renewable energy
- Increased rates for consumers
- Consumers lack sufficient knowledge of the power market
- High Education and Marketing expenses
- The reliability of the distribution and transmission could be compromised
- Complicated billing system for small utilities (i.e., munis and co-ops)

Table 28. Incentive Programs and Their Availability in Florida

Program Category	Availability in Florida	Recommendation
Rebates	Solar Energy System Incentives Program Expires June 2010 Plus utility programs	Amend: expiration date Link to project performance
Direct Loans	PACE Financing – NONE CREATED http://www.floridaspecialdistricts.org Utility offered City of Tallahassee Utilities - Solar and Efficiency Loans Clay Electric Cooperative, Inc - Energy Conservation Loans Clay Electric Cooperative, Inc - Solar Thermal Loans Gainesville Regional Utilities- Low-Interest Energy Efficiency Loan Program Orlando Utilities Commission - Residential Solar Loan Program	Revise to include best practices Legislation to require IOUs to offer program
Feed-In Tariffs	The Gainesville Regional Utilities - Solar Feed-In-Tariff	Investigate
State Tax Incentives	State Corporate tax incentives: Renewable Energy Production Tax Credit Renewable Energy Technologies Investment Tax Credit	Only available to commercial Include Residential Include residential
Sales Tax Exemptions	Renewable Energy Equipment Sales Tax Exemption Solar Energy Systems Equipment Sales Tax Exemption	Make NO expiration date Continue the program as is
Production Incentive (*)	Offered Gainesville Regional Utilities - Solar Feed-In-Tariff Orlando Utilities Commission - Pilot Solar Programs	Investigate partnership with IOUs Implement after a state RPS is implemented

Task 3

Recommend to the Florida Energy and Climate Commission a portfolio of programs to decrease financial barriers to clean sector technology commercialization.

Although the State of Florida ranks 9th in the total number of programs offering financial incentives to renewable energy businesses, the state currently does not have in place certain important direct programs and incentives. In order to be more renewable energy friendly and create more opportunities for economic development, the state of Florida should consider implementing certain state-sponsored programs in addition to the programs and incentives already in place. The majority of clean energy developers believe that a combination

of long-term carbon price, stable subsidies, higher targets and tax breaks is very important for institutional investors.

If Florida chooses to pursue clean technologies as an economic development opportunity, now is the time to benefit from a global pro-cleantech environment, with a fundamentally strong federal support and a strong performance of cleantech companies on the capital market. The following are proposed incentive programs that the state should investigate or implement in order to decrease financial barriers to cleantech commercialization and project finance.

Table 29. Pros and Cons of Each Portfolio of Programs To Decrease Barriers To the Commercialization of the Clean Technology Sector

Program Category	Availability in Florida	Recommendation	Pros	Cons
Rebates	Solar Energy System Incentives Program Expires June 2010 Plus utility programs	Amend: expiration date Link to project performance	▪Support market transformation ▪Adjustable ▪Provide upfront capital ▪Low administrative burden	▪Create rebate dependency ▪Can be economically inefficient ▪Not linked to project performance
Direct Loans	PACE Financing – NONE CREATED Several Utility offered programs	Revise to include best practices Legislation to require IOUs to offer program	▪Reduce upfront cost barriers ▪Improve upon standard ▪Can offer below-market interest rates ▪Longer repayment terms ▪Increase market confidence	▪Require high initial capital ▪Require high administrative costs ▪May impact tax credit
Matching loans	Not offered	Implement	▪Preservation of capital ▪Can be at below-market interest rates ▪Can offer more flexible repayment terms than private lenders ▪Reduce risk and Increase market confidence ▪Low admin. Costs	▪Reliance on private lenders ▪May impact tax credit
Interest Rate Buy-down	Not offered	Investigate	▪State subsidizes interest rate offered by private lenders ▪State needs not fund the capital ▪State does not bear project risk ▪State partners (not compete) with private lenders	▪Reliance on outside lenders ▪Outside lenders bear underwriting risks ▪May impact tax credit
Linked Deposits	Not offered	Investigate	▪Similar to interest rate buy-down ▪Limited cost to state ▪Limited administrative costs and oversight ▪No legislation needed	▪Reliance on outside lenders ▪Require active marketing
LEASES	Not offered	Investigate	▪Avoid upfront cost barriers ▪Used with other incentives ▪Increase leveraging	▪Transfer difficulties

Program Category	Availability in Florida	Recommendation	Pros	Cons
Loan Guarantees	Not offered	Implement	▪Lower administrative requirements ▪Leverage private capital ▪Leverage state funds ▪Build lender confidence ▪Support innovative projects	▪Provide no upfront capital ▪Reliance on private lenders ▪Default risk ▪Narrow target market
RPS Set-aside and RECs	Not offered	Implement	▪Drive technology deployment ▪Provide technology-specific support ▪Reduce need for rebates ▪Reduce administrative burden	▪No upfront support ▪Need long-term support ▪Aggregators of RECs gain
State Tax Incentives	▪ State Corporate tax incentives: ▪ Renewable Energy Production Tax Credit, and ▪ Renewable Energy Technologies Investment Tax Credit	Only available to commercial Include Residential Include residential	▪Easy to administer ▪Easy to modify	▪Insufficient tax liability ▪Impact on state revenue
Sales Tax Exemptions	▪ Renewable Energy Equipment Sales Tax Exemption ▪ Solar Energy Systems Equipment Sales Tax Exemption	Make NO expiration date Continue the program as is	▪Easy to administer	▪Not a strong incentive
Production Incentive (*)	Offered ▪ Gainesville Regional Utilities - Solar Feed-In-Tariff ▪ Orlando Utilities Commission - Pilot Solar Programs	Investigate partnership with IOUs Implement following a state RPS	▪Easy to administer ▪ Drives technology deployment ▪Support market transformation ▪ Encourage large-scale renewable energy projects. ▪ Appear not to trigger offsets to the federal production tax credit (PTC)	▪ Require long-term power purchase agreement ▪ Must have a Credit-Worthy Purchasers of Project Output ▪ Requires an RPS ▪ Requires upfront incentive to work as intended
Public Benefit Fund (PBF)(*)	Not offered	Investigate	▪Flexible funding mechanism ▪ Upfront funding support ▪ A not-for-profit-seeking entity designs energy programs ▪ Low cost to consumers / ratepayers ▪ Has public support if transparent to ratepayers	▪Viewed as another tax ▪Does not preserve social equity among regions and ratepayers ▪Ratepayers do not understand its benefits ▪Costs of the program could be very high if no hard cap is set ▪Could be raided by a state to close state budget gaps unless prohibited by law.

Source: Charles Kubert and Mark Sinclair: Distributed Renewable Energy Finance and Policy Toolkit, Clean Energy States Alliance, December 2009. (*) Added by authors of this report.

Additionally, a number of recommendations are offered for consideration to reduce barriers to commercialization and project finance, including:

- R&D Stage

    - Support the Innovation Caucus initiative to increase SUS funding and provide university GAP Program funding.
    - Build R&D partnerships with industry by expanding the Florida High Tech Corridor Council model focused on cleantech across Florida.
- Early Stage Capital
    - Allow angel & corporate investors to earn a transferable corporate income tax liability credit for qualified high risk early venture investment.
    - Expand the Florida Opportunity Fund to invest in pre-commercialized cleantech.
- Mid to Late Stage Capital
    - Enhance the state's role as a purchaser of cleantech (e.g. energy efficiency).
- Project Finance
    - Enact policy to drive cleantech market demand as outlined in the report.
    - Partner with corporate leaders and others to establish a special purpose fund which can be used in loan guarantee programs, longer term grants to support commercialization of clean technologies, and other similar purposes
    - Authorize Florida to partner with DOE to access the Section 1705 Loan Guarantee Program that could help Florida secure $400–800 million of federal loan guarantees

Task 4

Recommend to the Florida Energy and Climate Commission whether to pursue an RPS

An RPS package that combines direct or indirect payments with production incentives will serve the dual purpose of attracting investment and mitigating the risk to the government agency. The previous economic impact studies are encouraging, although it can be difficult to distinguish the policy effects of RPS from the effects of economic incentives. While an RPS increases the demand for targeted renewable energy products and services, reduces the carbon footprint of electricity in a state and reduces the need for rebates, it does not provide much needed upfront capital, almost certainly leads to higher electricity prices and places additional administrative and oversight burden on a state. Unlike a state RPS, a CES (or Clean Energy Standard) expands the scope of available energy technologies to include nuclear energy. Nuclear power is considered a clean energy and generates a large amount of energy, but has

some limitations such as the uncertainty associated with the disposal of nuclear waste. The pros and cons of implementation of an RPS or CES, are outlined below.

Pros:

- Increases demand for renewable energy products and services
- Ability to target favored technologies
- Reduces the need for rebates

Cons:

- Almost certainly leads to higher electricity prices, which may increase the costs to existing and prospective businesses
- Favored technologies may not prove to be the most effective in the long run
- Cost caps could result in production of less renewable energy than anticipated
- Eligibility of energy efficiency to qualify under the standard may reduce the amount of renewable energy produced
- Renewable Energy Credit market places additional administrative and oversight burden on government
- Does not provide upfront capital support and requires a long-term support/contract in order to be successful

Recommend a Clean Energy Standard (CES)

Pros:

- Expand the scope of available technologies to meet clean energy needs
- Increases demand for clean energy products
- Federal assistance for nuclear power is increasing and more people are acknowledging its part in a low emissions future

Cons:

- Nuclear power is not widely viewed as 'environmentally friendly'
- May need to address long term storage issue for spent fuel, as federal programs have not advanced
- Almost certainly leads to higher electricity prices, which may increase the costs to existing and prospective businesses
- Cost caps could result in production of uncertain amounts of renewable energy

- Renewable Energy Credit market places additional administrative and oversight burden on government

There are currently six states that have a CES. Michigan, Ohio, and West Virginia all allow electricity production with clean coal. There are no standards on the amount of CCS (carbon capture sequestration), though. Ohio and New Mexico allow nuclear. Nevada allows waste tires, and Pennsylvania allows waste coal.

A successful RPS should be supported by interconnection standards and net metering policies which provide sufficient incentives to investors and to small and large consumers.

Net Metering Best Practices:[144]

- Allow net metering system size limits to cover large commercial and industrial customers' loads; systems at the 2 MW level are no longer uncommon.
- Do not arbitrarily limit net metering as a percent of a utility's peak demand.
- Allow monthly carryover of excess electricity at the utility's full retail rate.
- Specify that customer-sited generators retain all renewable energy credits for energy they produce.
- Allow all renewable technologies to net meter.
- Allow all customer classes to net meter.
- Protect customer-sited generators from unnecessary and burdensome red tape and special fees.
- Apply net metering standards to all utilities in the state, so customers and installers fully understand the policy, regardless of service territory.

Recommendation for Florida: Expand net metering to all utilities (i.e., munis and co-ops)

Best Practices in Interconnection Procedures By The Leading State: VA

- Set fair fees that are proportional to a project's size.
- Cover all generators in order to close any state-federal jurisdictional gaps in standards.

[144] The leading states with the best practices in net metering include CO, DE, MD, NJ, CA, OR, PA, FL, UT, CT, and AZ.

- Screen applications by degree of complexity and adopt plug-and-play rules for residential-scale systems and expedited procedures for other systems.
- Ensure that policies are transparent, uniform, detailed and public.
- Prohibit requirements for extraneous devices, such as redundant disconnect switches, and do not require additional insurance.
- Apply existing relevant technical standards, such as IEEE 1547 and UL 1741.
- Process applications quickly; a determination should occur within a few days.
- Standardize and simplify forms.

Recommendations for Florida:

- Increase covered capacity to greater than 2 MW[145]
- Remove requirements for redundant external disconnect switch on larger systems
- Remove requirements for additional insurance on larger systems
- Expand interconnection procedures to all utilities (i.e., munis and co-ops)

Task 5

Recommend to the Florida Energy and Climate Commission effective demand side incentives

Recognizing the importance of providing the right financing incentive, the federal government created through ARRA 2009 the Clean Energy Finance Authority (CEFA) which is designed to promote a clean energy future for America. States around the country have also created similar programs. Property-Assessed Clean Energy (PACE), an emerging cleantech financing program, is quickly becoming a key incentive for residential and commercial property owners to invest in cleantech projects. Although existing Florida laws permits municipalities and counties to create special districts for financing projects that serve the public purpose and benefit the municipality or county, as of January 2010, no counties or municipalities in Florida have created such special districts for PACE financing programs. The Florida Legislature should investigate barriers to properly functioning PACE programs, through an analysis of existing successful PACE models in other states.

Many states around the country are also developing innovative financing mechanisms designed to help finance the high upfront costs of clean technologies. The state of Florida

[145] Explore a two-tiered approach based on utility load; for example, a maximum of 20 MW might be achievable for IOUs, and 5MW might be more feasible for muni's.

should explore the development of those financing mechanisms which include a Green Bank, Clean Technology Victory Bonds, Tax Credit Bonds, State Loan Guarantees, energy efficiency and conservation block grant (EECBG) models, Cleantech City Funds and Public Benefit Funds (PBF).

As no state loan guarantee program (LGP) currently exists, Florida LGP, if implemented, should be modeled after the federal LGP. In order to improve the implementation of a state LGP and to help mitigate risk to the state taxpayers, we recommend that an analysis of the federal LGP be performed to determine improvements to a similar program for Florida and adopts the recommendations that the federal Government Accountability Office (GAO) recently issued for improvement of the federal LGP.

Pros of a state PBF

- A PBF is a potentially flexible funding mechanism, depending on legislative authorizations which can be used to fund R&D activities, loans, grants, rebates, education, etc.
- A PBF can be large enough to offer substantial funding support for clean technology projects and help overcome current barriers to financing cleantech projects
- A neutral party instead of profit-seeking utility designs energy programs
- Low cost to Floridians (usually, the PBF is funded through a small system charge usually less than 2 mills per kWh per month)
- A PBF has public support especially when it is transparent to ratepayers

Cons of a state PBF

- A state PBF is often viewed as another tax on ratepayers.
- It is difficult to preserve social equity among regions and ratepayers when funds are disbursed without regard to the geographic locations of utility ratepayers.
- It is difficult to explain to ratepayers how they will benefit from a state PBF.
- Costs of the program and to ratepayers could escalate uncontrollably if no hard cap is set
- Unless a state legislation prohibits the use of a PBF to close state budget gaps, a PBF can be raided by a state to close state budget gaps.

Pros of PACE Financing

Property Owner:

- Lower energy bills and substantially reduced upfront costs for energy retrofits
- Improved return on investment/positive cash flow on retrofits (annual savings>cost)

State of Florida, Cities & Municipalities:

- Significant job creation
- Accelerates movement toward energy independence & reduces GHG emissions
- Promote energy efficiency improvements in buildings
- Make the shift to renewable energy more affordable
- Reduce energy costs for Florida residents and businesses
- Very low fiscal cost & high probability of success
- No credit or general obligation risk
- Obligation is liability of real estate owner
- Greenhouse gas reductions/energy independence
- Opt in: Only those real estate owners who opt in pay for it

Existing Mortgage Lenders:

- Borrowers cash flow/credit profile improves (energy savings > annual tax cost)
- Property/collateral value increases

Lender:

- Virtually no risk of loss as property tax liens are senior to mortgage debt
- 97% of property taxes are current & losses are less than 1%

Cons of PACE Financing

- Legal and administrative expenses to set up
- Slower turn around for financing, more appropriate for larger projects
- Some resistance by lenders whose priority in bankruptcy may be reduced.
- Lack of information for many customers who do not know how to implement energy efficiency or solar energy, and may not understand the benefits of a project.
- Uncertainty of savings as homeowners and businesses may not trust that the improvements will save them money or have the other benefits claimed.

- Split incentives (when the decision-maker does not receive many of the benefits of the improvements).
- Transaction costs because of the time and effort required to get enough information to make a decision, apply for financing, and arrange for the work to be done which may simply not be perceived as worth the return in energy savings and other benefits.
- Initial capital investment which may deter investment, either because the resident or business owner does not have access to capital or they choose to make other higher-priority investments.
- Length of paybacks as homeowners and business owners may not want to invest in comprehensive retrofits if they do not plan to stay in the building long enough to recoup their investment.

1705 Federal Loan Guarantee Programs

There is currently no state offering a loan guarantee program (LGP) for renewable energy. Under the federal loan guarantee program projects applying for loan guarantees do not necessarily need to employ new or significantly improved technologies.

The Pros of a loan guarantee program[146]:

• **Lower Administrative Requirements**: The state does not have to administer a full loan program. Loan underwriting and approval is done by a private lender, although the state still must approve the loan guarantee.

• **Leverages Private Capital**: A loan guarantee program does not compete with but, rather, assists commercial banks.

• **Leverages State Funds**: A loan guarantee program significantly leverages available state funding, as much as 10:1 or higher.

• **Builds Lender Confidence**: Loan guarantees have high value to banks making loans for unknown/unproven technologies and during periods of tight credit. Further, the guaranteed portions of loans are removed from banks' balance sheets, providing them with greater lending capacity.

[146] Charles Kubert and Mark Sinclair: Distributed Renewable Energy Finance and Policy Toolkit, Clean Energy States Alliance, December 2009.

• **Supports Innovative Projects**: Loan guarantees are particularly valuable for pre-commercial or innovative technologies in which the perceived lending risk is greater.

The Cons of a loan guarantee program

• **Provides No Upfront Capital**: Loan guarantees do not reduce the upfront capital to the project owner/developer (although they may facilitate a higher loan amount or improved terms).

• **Reliance on Private Lenders**: The project owner still must find a lender willing to underwrite the loan. This can still be challenging for large or riskier projects, even with a loan guarantee.

• **Default Risk**: Program administrators must understand default risk and set aside appropriate funds as a reserve against these defaults.

• **Narrow Target Market:** Loan guarantees are best suited for large projects, rather than individual distributed generation projects.

In order to improve the implementation of a state LGP and to help mitigate risk to the state taxpayers, we recommend that the state requests an analysis of the federal LGP to determine improvements to a similar program for Florida and adopts the following recent recommendations that the federal Government Accountability Office (GAO) recently issued for improvement of the federal LGP:

- Complete detailed internal loan selection policies and procedures that lay out roles and responsibilities and criteria and requirements for conducting and documenting analyses and decision making;
- Clearly define needs for contractor expertise to facilitate timely application reviews;
- Amend application guidance to include more specificity on the content of independent engineering reports and on the development of project cost estimates to provide the level of detail needed to better assess overall project feasibility;
- Improve the LGP's full tracking of the program's administrative costs by developing an approach to track and estimate costs associated with offices that directly and indirectly support the program and including those costs as appropriate in the fees charged to applicants;

- Further develop and define performance measures and metrics to monitor and evaluate program efficiency, effectiveness, and outcomes; and
- Clarify the program's equity requirements to the 16 companies invited to apply for loan guarantees and in future solicitations.

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Appendices

Appendix A: Tables

Table 30. Renewable Portfolio Standards by State

State	Renewable Energy Mix as a Percentage of Total Energy Production	Year
Arizona	15%	2025
California	33%	2030
Colorado	20%	2020
Connecticut	23%	2020
District of Columbia	20%	2020
Delaware	20%	2019
Hawaii	20%	2020
Iowa	105 MW	
Illinois	25%	2025
Massachusetts	15%	2020
Maryland	20%	2022
Maine	40%	2017
Michigan	10%	2015
Minnesota	25%	2025
Missouri	15%	2021
Montana	15%	2015
New Hampshire	23.8%	2025
New Jersey	22.5%	2021
New Mexico	20%	2020
Nevada	20%	2015
New York	24%	2013
North Carolina	12.5%	2021
North Dakota	*10%*	*2015*
Oregon	25%	2025
Pennsylvania	8%	2020
Rhode Island	16%	2019
South Dakota	*10%*	*2015*
Texas	5,880 MW	2015
Utah	*20%*	*2025*
Vermont	*10%*	*2013*
Virginia	*12%*	*2022*
Washington	15%	2020
Wisconsin	10%	2015

Source: http://apps1.eere.energy.gov/states/maps/renewable_portfolio_states.cfm?print

Table 31. Federal Incentives that Impact Clean Energy in Florida

Program	Incentive Type	Eligible Technologies	Amount	Maximum Amount	Expiration Date
Energy Efficient Commercial Buildings Tax Deduction	Corporate Deduction	Efficiency Technologies	$0.30-$1.80 per square foot, depending on technology and amount of energy reduction	$1.80 per square foot	2013
MACRS + Bonus Depreciation	Corporate Depreciation	Renewable Energy Technologies	50% bonus depreciation		Expired 2009, May be renewed
Residential Energy Conservation Subsidy Exclusion	Corporate Exemption	Solar Water Heat, Solar Space Heat, Photovoltaics, and Efficiency Technologies in the Residential Sector	Subsidy is exempt from income tax		
Business Energy Investment Tax Credit	Corporate Tax Credit	Renewable Technologies	30% for solar, fuel cells and small wind 10% for geothermal, microturbines and CHP	Fuel cells: $1,500 per 0.5 kW Microturbines: $200 per kW Small wind turbines placed in service 10/4/08 - 12/31/08: $4,000 Small wind turbines placed in service after 12/31/08: no limit All other eligible technologies: no limit	
Energy Efficient Appliance Tax Credit for Manufacturers	Corporate Tax Credit	Clothes Washers/Dryers, Dishwasher, Refrigerators	Dishwashers: $45 or $75 per unit, varies by energy and water efficiency Clothes washers: $75 - $250 per unit, varies by type, and energy and water efficiency Refrigerators: $50 - $200, depending on energy-efficiency rating	The aggregate amount of credit allowed is $75 million per taxpayer. Certain refrigerators and clothes washers will not add to the aggregate credit amount.	Varies by Appliance, but most run through 2010
Energy Efficient New Homes tax Credit for Home Builders	Corporate Tax Credit	Whole Building	$1,000-$2,000, depending on energy savings and home type	$2,000	Expired in 2009, but may be renewed
Renewable Energy Production Tax Credit	Corporate Tax Credit	Renewable Energy Technologies	2.1¢/kWh for wind, geothermal, closed-loop biomass 1.1¢/kWh for other eligible technologies. Generally applies to first 10 years of operation		In service by 2012 for wind, 2013 for other technologies
Tribal Energy Grant	Federal Grant Program	Efficiency and	Varies by		No Current

Program		Renewable Technologies	Solicitation		Solicitations
Treasury Department Renewable Energy Grants	Federal Grant Program	Renewable Energy Technologies	30% of property that is part of a qualified facility, qualified fuel cell property, solar property, or qualified small wind property 10% of all other property	$1,500 per 0.5 kW for qualified fuel cell property $200 per kW for qualified microturbine property 50 MW for CHP property, with limitations for large systems	
Rural Energy for America Program Grants	Federal Grant Program	Efficiency and Renewable Technologies	Varies	25% of Project Cost	
Clean Renewable Energy Bonds	Federal Loan Program	Renewable Technologies in the Public Sector	Varies		8/4/09
Energy Efficient Mortgages	Federal Loan Program	Residential Energy Efficiency and Renewable Technologies	Varies	5% of Property Value	
Qualified Energy Conservation Bonds	Federal Loan Program	Efficiency and Renewable Technologies in the Public Sector	Varies		
Department of Energy Loan Guarantee Program	Federal Loan Program	Efficiency and Renewable Technologies in the Non-Federal Sector	Project Cost over $25 million		
Rural Energy for America Program Loan Guarantee	Federal Loan Program	Efficiency and Renewable Technologies in the Commercial and Agricultural Sector	Varies	$25 million	
Qualifying Advanced Energy Manufacturing Investment Tax Credit	Industry Recruitment/Support	Advanced Lighting and Renewable Energy Technologies	30% of qualified investment		Expired in 2009, but may be renewed
Residential Energy Conservation Subsidy Exclusion	Personal Exemption	Efficiency and Solar Technologies	100% of subsidy		
Residential Energy Efficiency Tax Credit	Personal Tex Credit	Efficiency and Biomass Stove Technologies	30% of project cost	$1,500	2010
Residential Renewable Energy Tax Credit	Personal tax Credit	Renewable Energy Technologies	30% of Project Cost	Solar-electric systems placed in service before 1/1/2009: $2,000 Solar-electric systems placed in service after 12/31/2008: no maximum Solar water heaters placed in service before 1/1/2009: $2,000 Solar water heaters placed in service after 12/31/2008: no maximum Wind turbines placed in service in 2008: $4,000 Wind turbines placed in service after 12/31/2008: no maximum Geothermal heat	2016

				pumps placed in service in 2008: $2,000 Geothermal heat pumps placed in service after 12/31/2008: no maximum Fuel cells: $500 per 0.5 kW	
Renewable Energy Production Incentive	Production Incentive	Renewable Energy Technologies in the Public Sector	2.1¢/kWh	10 years	Facility Operating by 2016

Table 32. Programs Offered by Local Utilities, Cities, and Counties

Incentive Name	Incentive Type	Eligible Technologies
Miami-Dade County - Green Buildings Expedite Process	Green Building Incentive	Comprehensive Measures/Whole Building, Solar Water Heat, Photovoltaics, Wind, Biomass, Geothermal Heat Pumps, Daylighting, Small Hydroelectric
Miami-Dade County - Targeted Jobs Incentive Fund	Industry Recruitment/Support	Solar Thermal Electric, Photovoltaics
Orange County - Solar Hot Water Rebate Program	Local Rebate Program	Solar Water Heat
Lakeland Electric - Solar Water Heating Program	Other Incentive	Solar Water Heat
Orlando Utilities Commission - Pilot Solar Programs	Production Incentive	Solar Water Heat, Photovoltaics
Orlando Utilities Commission - Home Energy Efficiency Fix-Up Program	Utility Grant Program	Equipment Insulation, Caulking/Weather-stripping, Duct/Air sealing, Building Insulation, Windows, Doors, Custom/Others pending approval, Water Heater Insulation
Orlando Utilities Commission - Residential Insulation Loan Program	Utility Loan Program	Building Insulation
Orlando Utilities Commission - Residential Solar Loan Program	Utility Loan Program	Solar Water Heat, Photovoltaics
Orlando Utilities Commission - Residential Energy Efficiency Rebate Program	Utility Rebate Program	Heat pumps, Air conditioners, Caulking/Weather-stripping, Duct/Air sealing, Building Insulation, Windows, Roofs, Solar Screen, Window Film, Injected Wall Foam
Gainesville Regional Utilities - Solar Feed-In-Tariff	Production Incentive	Photovoltaics
Gainesville Regional Utilities - Energy Efficiency Rebate Program	Utility Rebate Program	Air conditioners, Duct/Air sealing, Building Insulation, Roofs, Comprehensive Measures/Whole Building
Gainesville Regional Utilities - Solar Water Heating Rebate Program	Utility Rebate Program	Solar Water Heat
Gainesville Regional Utilities - Solar-Electric (PV) System Rebate Program	Utility Rebate Program	Photovoltaics
City of Tallahassee Utilities - Solar and Efficiency Loans	Utility Loan Program	Clothes Washers, Refrigerators/Freezers, Heat pumps, Air conditioners, Heat recovery, Duct/Air sealing, Building Insulation, Windows, Doors, Roofs, Solar Water Heat, Photovoltaics, Solar Pool Heating
City of Tallahassee Utilities - Energy Star Certified New Homes Rebate Program	Utility Rebate Program	Comprehensive Measures/Whole Building
City of Tallahassee Utilities - Residential Energy Efficiency Rebate Program	Utility Rebate Program	Clothes Washers, Refrigerators/Freezers, Heat pumps, Air conditioners, Building Insulation
City of Tallahassee Utilities - Solar Water Heating Rebate	Utility Rebate Program	Solar Water Heat
Clay Electric Cooperative, Inc - Energy Conservation Loans	Utility Loan Program	Refrigerators/Freezers, Water Heaters, Heat pumps, Air conditioners, Heat recovery, Programmable Thermostats, Duct/Air sealing, Building Insulation, Windows, Doors, Metal roofing, Solar Water Heat, Solar Thermal Electric, Solar Pool Heating
Clay Electric Cooperative, Inc - Solar Thermal Loans	Utility Loan Program	Solar Water Heat, Solar Pool Heating
Clay Electric Cooperative, Inc - Energy Smart Energy Efficiency Rebate	Utility Rebate Program	Heat pumps, Building Insulation

Incentive Name	Incentive Type	Eligible Technologies
Program		
Clay Electric Cooperative, Inc - Energy Smart Solar Water Heater Rebate Program	Utility Rebate Program	Solar Water Heat
Beaches Energy Services - Residential Energy Efficiency Rebate Program	Utility Rebate Program	Heat pumps, Programmable Thermostats, Building Insulation, Window Film/Solar Screens, Solar Water Heat
Florida Power and Light - Residential Energy Efficiency Program	Utility Rebate Program	Heat pumps, Air conditioners, Duct/Air sealing, Building Insulation, Ceiling Insulation
Florida Public Utilities (Electric) - Residential Energy Efficiency Rebate Programs	Utility Rebate Program	Heat pumps, Air conditioners, Building Insulation, Geothermal Heat Pumps
Florida Public Utilities (Gas) - Residential Energy Efficiency Rebate Programs	Utility Rebate Program	Water Heaters, Furnaces, Gas Stoves, Clothes Dryers
Fort Pierce Utilities Authority - Residential Energy Efficiency Rebate Program	Utility Rebate Program	Clothes Washers, Refrigerators/Freezers, Heat pumps, Air conditioners, Programmable Thermostats, Building Insulation
Gulf Power - Geothermal Installation Rebate Program	Utility Rebate Program	Geothermal Heat Pumps
Gulf Power - Solar Thermal Water Heating Pilot Program	Utility Rebate Program	Solar Water Heat
JEA - Solar Incentive Program	Utility Rebate Program	Solar Water Heat
Kissimmee Utility Authority - Residential Energy Efficiency Rebate Program	Utility Rebate Program	Lighting, Air conditioners, Duct/Air sealing, Building Insulation
Lake Worth Utilities - Energy Conservation Rebate Program	Utility Rebate Program	Clothes Washers, Refrigerators/Freezers, Heat pumps, Air conditioners, Programmable Thermostats, Ultra-low Flush Toilets
Lakeland Electric - Residential Conservation Rebate Program	Utility Rebate Program	Lighting, Building Insulation, HVAC Maintenance
New Smyrna Beach - Residential Energy Efficiency Rebate Program	Utility Rebate Program	Duct/Air sealing, Building Insulation, Duct Leak Repair, Energy Audit
Progress Energy Florida - Home Energy Check Audit and Rebate Program	Utility Rebate Program	Heat pumps, Air conditioners, Duct/Air sealing, Building Insulation, Windows, Roofs
Progress Energy Florida - Solar Water Heating with EnergyWise Program	Utility Rebate Program	Solar Water Heat
Tampa Electric - Residential Energy Efficiency Rebate Program	Utility Rebate Program	Heat pumps, Duct/Air sealing, Building Insulation, Windows

Table 33. Florida Projects Funded through ARRA 2009

Awardees	Project Category (if available)	Grant Amount	Total Value/Cost	Project Location (City)	Description
Mainstream Engineering Corporation	Advanced Building Air Conditioning and Refrigeration, Thermal Load Shifting, and Cool Roofs	149,979		Rockledge	Mainstream Engineering is developing an active thermal energy storage that combines the best features of existing chilled water and ice-storage systems. The system will allow for significant shifting of the demand load from peak hours to off-peak hours resulting in substantial cost savings.
Florida Turbine Technologies, Inc.	Advanced Gas Turbines and Materials	149,917		Jupiter	This project will verify and validate testing of innovative new Spar-Shell turbine component designs to clear the technology for full engine test and to eventually facilitate revolutionary advances of power plant performance, efficiency and clean operation.
Fractal Systems Inc.	Advanced Solar Technologies	149,718		Belleair Beach	Low cost solar power based on organic materials has the potential to reduce security and reliability risks and to reduce environmental impacts and will find uses in homes and commercial buildings as well as in military gear and equipment
Mainstream Engineering Corporation	Advanced Solar Technologies	149,956		Rockledge	New distributed power systems produce waste heat that is either not used or combined with a waste heat recovery system, which uses a working fluid with high global warming potential. Mainstream will develop a new commercially-viable system that increases efficiency, reduces pollutant emissions, and uses an environmentally-sustainable fluid.
Mainstream Engineering Corporation	Advanced Solar Technologies	149,938		Rockledge	Cement manufacturing is inefficient, consumes large amounts of energy, and emits large volumes of greenhouse gases. Mainstream will demonstrate an environmentally-friendly, cost-effective, commercially-viable manufacturing improvement to reduce energy loss, reduce emissions, and make the US cement industry (3rd in the world) more competitive while creating additional US jobs
Cobb Design Inc	Advanced Solar Technologies	145,472		Saint Petersburg	The project will allow Cobb Design to refine a design for components of a solar energy system that generates power at a

Awardees	Project Category (if available)	Grant Amount	Total Value/Cost	Project Location (City)	Description
					cost competitive with fossil-fuel sources. Commercialization of this system will generate new green jobs to expand use of technology that reduces both energy imports and greenhouse gases.
Mainstream Engineering Corporation	Sensors, Controls, and Wireless Networks	149,656		Rockledge	Mainstream has developed a wireless Remote Monitoring System that automatically monitors and detects problems in residential air conditioning systems thereby saving valuable energy, reducing homeowner expenses, avoiding unexpected failures, and creating jobs in Florida (since this product, like all Mainstream products, is Made in the USA
Fieldmetrics Inc.	Sensors, Controls, and Wireless Networks	150,000		Seminole	The multi-function integrated sensor platform is an enabling technology for the smart grid. The project creates sensors for immediate deployment on the power grid to detect energy theft, improve energy delivery efficiency, provide early warning of grid instability and accurately monitor renewable energy resources
INEOS New Planet BioEnergy,LLC	Pilot and Demonstration Scale FOA – Demonstration Scale	50,000,000	50,000,000	Vero Beach	This project will produce ethanol and electricity from wood and vegetative residues and construction and demolition materials. The facility will combine biomass gasification and fermentation, and will have the capacity to produce 8 million gallons of ethanol and 2 megawatts of electricity per year by the end of 2011.
Florida International University Board of Trustees	Ground Source Heat Pump Demonstration Projects	250,000		Miami	Florida International University will gather and analyze data to improve GHP loop design and efficiency in systems intended for use in hot and humid regions of the country.
Saft America, Inc.	Cell, Battery, and Materials Manufacturing Facilities	95,500,000		Jacksonville	Production of lithium-ion cells, modules, and battery packs for industrial and agricultural vehicles and defense application markets. Primary lithium chemistries include nickel-cobalt-metal and iron phosphate.
Lakeland Electric	Advanced Metering Infrastructure	20,000,000	48,306,833	Lakeland	Install more than 125,000 smart meters network for residential, commercial and industrial electric customers across the utility's

Awardees	Project Category (if available)	Grant Amount	Total Value/Cost	Project Location (City)	Description
					service area.
Talquin Electric Cooperative, Inc.	Advanced Metering Infrastructure	8,100,000	16,200,000	Quincy	Install a smart meter network system for 56,000 residential and commercial customers in a mainly rural, four-county service area in North Florida. Also, integrate an outage management system and geographic information as part of the Smart Grid.
City of Quincy, FL	Advanced Metering Infrastructure	2,471,041	4,942,082	Quincy	Deploy a smart grid network across the entire customer base, including two-way communication and dynamic pricing to reduce utility bills.
City of Tallahassee	Customer Systems	8,890,554	17,781,108	Tallahassee	Implement a comprehensive demand response program, including smart thermostats and advanced load control systems that will target residential and commercial customers and lead to an estimated 35 MW reduction in peak power.
Intellon Corporation	Customer Systems	4,955,583	9,911,166	Orlando	Modify existing power line communications to enhance smart grid functionality.
Florida Power & Light Company	Integrated and/or Crosscutting Systems	200,000,000	578,347,232	Miami	Energy Smart Florida is a comprehensive project to advance implementation of the Smart Grid, including installing over 2.6 million smart meters, 9,000 intelligent distribution devices, 45 phasors, and advanced monitoring equipment in over 270 substations. By incorporating intelligence into the transmission, distribution and customer systems, the utility will be able to anticipate and respond to grid disturbances, empower customers through alternative rate programs, and enable the integration of renewable and on-site energy sources.
JEA	Integrated and/or Crosscutting Systems	13,031,547	26,204,891	Jacksonville	Upgrade metering and data management infrastructure; install 3,000 smart meters with two-way communications, introduce a dynamic pricing pilot, enhance the existing IT system, and implement consumer engagement software to provide consumers with detailed energy use data.
City of Leesburg, Florida	Integrated and/or Crosscutting Systems	9,748,812	19,497,625	Leesburg	Enable new energy efficiency and conservation programs to all 23,000 electric consumers through deployment of smart

Awardees	Project Category (if available)	Grant Amount	Total Value/Cost	Project Location (City)	Description
					meter networks, energy management for municipal buildings, integrated distributed generation, and new substation power transformer with enhanced monitoring and control. Key consumer initiatives include time differentiated rates and demand response options for reducing peak load.
		414,142,173	50,000,000		

Table 34. Total SBIR/STTR Awards, All Agencies, All Technologies, 2000-2008

No.	State Code	State Name	Phase 1 Awards	Phase 1 Dollars	Phase 2 Awards	Phase 2 Dollars	Total Awards	Total Dollars	Average
1	CA	California	7,458	$831,376,836	3,258	$2,378,303,385	8,370	$3,209,680,222	$356,631,136
2	MA	Massachusetts	5,049	$563,259,719	2,213	$1,588,654,950	5,718	$2,151,914,670	$239,101,630
3	VA	Virginia	2,284	$218,266,520	1,035	$699,225,786	2,568	$917,492,307	$101,943,590
4	MD	Maryland	1,893	$229,705,567	774	$553,692,998	2,150	$783,398,566	$87,044,285
5	CO	Colorado	1,876	$188,413,790	793	$552,377,621	2,093	$740,791,412	$82,310,157
6	NY	New York	1,652	$193,080,018	700	$515,607,708	1,856	$708,687,726	$78,743,081
7	TX	Texas	1,702	$184,622,363	703	$503,152,986	1,894	$687,775,349	$76,419,483
8	OH	Ohio	1,540	$166,584,476	698	$493,398,364	1,714	$659,982,840	$73,331,427
9	PA	Pennsylvania	1,416	$158,556,079	668	$485,591,685	1,578	$644,147,764	$71,571,974
10	NJ	New Jersey	1,013	$104,154,510	440	$305,370,695	1,149	$409,525,206	$45,502,801
11	WA	Washington	837	$96,937,114	429	$307,540,442	975	$404,477,556	$44,941,951
12	FL	Florida	973	$94,705,178	418	$277,755,283	1,085	$372,460,461	$41,384,496
13	MI	Michigan	828	$90,796,207	362	$260,541,044	919	$351,337,252	$39,037,472
14	AL	Alabama	772	$74,086,380	352	$243,024,653	860	$317,111,033	$35,234,559
15	AZ	Arizona	720	$72,722,338	311	$213,475,783	812	$286,198,121	$31,799,791
16	NC	North Carolina	609	$83,754,782	252	$188,443,946	693	$272,198,729	$30,244,303
17	IL	Illinois	675	$72,893,927	286	$185,307,271	770	$258,201,198	$28,689,022
18	CT	Connecticut	632	$74,330,433	261	$176,113,018	724	$250,443,452	$27,827,050
19	MN	Minnesota	528	$57,861,961	231	$166,030,883	610	$223,892,844	$24,876,983
20	NM	New Mexico	613	$60,896,725	226	$151,564,029	682	$212,460,755	$23,606,751
21	OR	Oregon	449	$53,814,218	217	$154,893,407	527	$208,707,626	$23,189,736
22	NH	New Hampshire	409	$37,856,772	219	$150,848,295	467	$188,705,067	$20,967,230
23	WI	Wisconsin	414	$60,279,966	173	$124,057,646	468	$184,337,613	$20,481,957
24	GA	Georgia	461	$47,536,440	174	$117,803,842	509	$165,340,282	$18,371,142
25	UT	Utah	353	$38,432,872	147	$101,356,820	411	$139,789,692	$15,532,188
26	IN	Indiana	296	$31,881,205	123	$90,709,944	329	$122,591,150	$13,621,239
27	TN	Tennessee	273	$27,614,313	129	$86,711,908	318	$114,326,221	$12,702,913
28	MT	Montana	206	$25,582,034	89	$51,244,797	236	$76,826,831	$8,536,315
29	MO	Missouri	235	$26,846,895	74	$49,807,810	256	$76,654,705	$8,517,189
30	SC	South Carolina	161	$17,459,510	63	$45,603,750	188	$63,063,260	$7,007,029
31	RI	Rhode Island	134	$18,601,730	58	$43,142,775	156	$61,744,505	$6,860,501
32	OK	Oklahoma	173	$20,253,144	62	$41,230,163	191	$61,483,307	$6,831,479
33	DE	Delaware	172	$16,116,784	70	$44,089,152	194	$60,205,936	$6,689,548
34	HI	Hawaii	137	$19,106,891	55	$36,751,404	153	$55,858,295	$6,206,477
35	KY	Kentucky	129	$19,761,114	44	$32,921,248	147	$52,682,362	$5,853,596
36	ME	Maine	124	$11,226,920	57	$40,817,875	139	$52,044,795	$5,782,755
37	NV	Nevada	111	$10,767,364	58	$39,781,262	124	$50,548,626	$5,616,514
38	AR	Arkansas	146	$16,543,491	53	$33,193,397	153	$49,736,888	$5,526,321
39	VT	Vermont	92	$9,608,050	53	$36,687,823	115	$46,295,873	$5,143,986
40	KS	Kansas	110	$10,517,430	63	$33,107,095	136	$43,624,525	$4,847,169
41	DC	Dist. of Columbia	87	$9,914,680	42	$30,390,181	112	$40,304,861	$4,478,318
42	IA	Iowa	114	$14,148,421	40	$24,472,065	124	$38,620,487	$4,291,165
43	WV	West Virginia	94	$8,404,936	38	$29,555,668	103	$37,960,604	$4,217,845
44	LA	Louisiana	95	$9,530,457	39	$26,703,868	109	$36,234,325	$4,026,036
45	ID	Idaho	92	$7,984,528	38	$23,751,030	100	$31,735,558	$3,526,173
46	NE	Nebraska	71	$11,103,099	24	$15,918,464	82	$27,021,563	$3,002,396
47	WY	Wyoming	70	$6,930,550	35	$18,729,697	83	$25,660,247	$2,851,139
48	MS	Mississippi	67	$5,774,262	31	$19,473,419	81	$25,247,681	$2,805,298
49	ND	North Dakota	41	$4,167,701	24	$11,963,240	54	$16,130,941	$1,792,327
50	SD	South Dakota	35	$3,297,710	15	$7,008,390	46	$10,306,100	$1,145,122
51	AK	Alaska	30	$2,570,685	7	$3,637,681	34	$6,208,366	$689,818
52	PR	Puerto Rico	8	$630,260	5	$2,258,868	10	$2,889,128	$321,014
		Totals:	**38459**	**$4,221,269,373**	**16729**	**$11,813,795,529**	**43375**	**$16,035,064,902**	**$1,781,673,878**

http://web.sba.gov/tech-net/public/dsp_search.cfm

Table 35. Total SBIR/STTR Awards, All Agencies, All Technologies, 2008

#	State Code	State Name	Phase 1 Awards	Phase 1 Dollars	Phase 2 Awards	Phase 2 Dollars	Total Awards	Total Dollars
1	CA	California	762	$90,118,606	388	$300,896,820	1,145	$391,015,426
2	MA	Massachusetts	541	$66,796,031	250	$187,802,332	786	$254,598,363
3	VA	Virginia	254	$25,407,174	157	$107,454,398	409	$132,861,572
4	MD	Maryland	182	$27,057,308	91	$72,869,398	273	$99,926,707
5	NY	New York	219	$26,641,567	82	$67,081,391	300	$93,722,958
6	CO	Colorado	206	$22,411,277	90	$69,448,939	296	$91,860,216
7	PA	Pennsylvania	150	$20,659,443	92	$65,236,119	241	$85,895,562
8	OH	Ohio	144	$16,434,599	78	$59,095,976	221	$75,530,576
9	TX	Texas	165	$19,299,381	69	$54,947,802	233	$74,247,183
10	NC	North Carolina	76	$14,470,897	40	$38,475,889	116	$52,946,786
11	FL	Florida	121	$11,848,912	56	$38,750,099	176	$50,599,011
12	NJ	New Jersey	99	$11,242,411	53	$37,663,195	152	$48,905,606
13	MI	Michigan	95	$12,001,811	42	$36,273,734	136	$48,275,545
14	WA	Washington	76	$12,611,983	46	$34,916,265	121	$47,528,248
15	AL	Alabama	85	$8,826,351	42	$32,656,014	127	$41,482,365
16	IL	Illinois	85	$8,885,300	41	$26,663,364	126	$35,548,665
17	MN	Minnesota	44	$6,030,478	32	$27,076,749	76	$33,107,227
18	CT	Connecticut	76	$10,088,150	33	$22,460,674	107	$32,548,825
19	AZ	Arizona	73	$6,847,566	32	$22,145,288	104	$28,992,855
20	WI	Wisconsin	50	$7,879,337	23	$18,851,330	73	$26,730,667
21	NH	New Hampshire	46	$4,254,761	34	$21,918,142	80	$26,172,904
22	GA	Georgia	53	$5,991,032	26	$18,078,799	79	$24,069,831
23	NM	New Mexico	74	$8,306,203	22	$15,393,030	96	$23,699,233
24	OR	Oregon	42	$6,653,514	23	$16,720,331	65	$23,373,845
25	IN	Indiana	39	$3,887,592	22	$17,463,780	61	$21,351,372
26	UT	Utah	42	$7,491,516	12	$11,268,491	54	$18,760,007
27	TN	Tennessee	26	$2,560,697	18	$15,329,547	44	$17,890,244
28	KY	Kentucky	23	$3,348,732	13	$12,284,101	36	$15,632,833
29	MT	Montana	18	$2,642,651	12	$6,769,437	30	$9,412,088
30	DE	Delaware	17	$1,536,299	11	$7,479,094	28	$9,015,393
31	AR	Arkansas	24	$2,889,233	11	$5,843,933	35	$8,733,166
32	VT	Vermont	10	$1,161,537	8	$6,638,838	18	$7,800,375
33	HI	Hawaii	16	$1,703,415	11	$5,845,592	27	$7,549,007
34	OK	Oklahoma	17	$2,065,269	6	$5,386,932	23	$7,452,201
35	MO	Missouri	31	$3,558,565	7	$3,672,034	37	$7,230,599
36	IA	Iowa	17	$2,229,761	5	$3,178,328	22	$5,408,089
37	SC	South Carolina	15	$1,985,481	5	$3,068,610	20	$5,054,091
38	NE	Nebraska	12	$3,097,020	3	$1,713,559	15	$4,810,579
39	ME	Maine	8	$724,223	6	$4,029,084	14	$4,753,307
40	LA	Louisiana	9	$933,237	5	$3,303,825	14	$4,237,062
41	KS	Kansas	7	$698,934	5	$3,154,994	12	$3,853,928
42	RI	Rhode Island	11	$1,387,944	3	$2,198,294	14	$3,586,238
43	NV	Nevada	7	$719,548	5	$2,779,556	12	$3,499,104
44	WY	Wyoming	7	$729,505	2	$1,708,648	9	$2,438,153
45	DC	Dist. of Columbia	5	$513,107	2	$1,810,733	7	$2,323,840
46	ID	Idaho	7	$677,354	2	$1,496,984	9	$2,174,338
47	MS	Mississippi	5	$469,140	2	$1,639,142	7	$2,108,282
48	WV	West Virginia	6	$556,884	2	$1,349,641	8	$1,906,525
49	AK	Alaska	6	$514,825	1	$963,144	7	$1,477,969
50	ND	North Dakota	3	$250,000	2	$1,099,955	5	$1,349,955
51	SD	South Dakota	3	$329,019	0	$0	3	$329,019
		Totals:	**4109**	**$499,425,590**	**2023**	**$1,524,352,360**	**6109**	**$2,023,777,950**

Table 36. Total SBIR/STTR Awards, All Agencies, Clean Energy Technologies, 2000-2008

#	State Code	State Name	Phase 1 Awards	Phase 1 Dollars	Phase 2 Awards	Phase 2 Dollars	Total Awards	Total Dollars	Average Dollars
1	CA	California	591	$65,180,673	204	$151,246,394	732	$216,427,068	$24,047,452
2	MA	Massachusetts	349	$39,783,047	165	$122,978,755	482	$162,761,803	$18,084,645
3	MD	Maryland	164	$23,788,645	49	$40,607,431	200	$64,396,076	$7,155,120
4	NY	New York	134	$14,666,531	57	$44,764,971	176	$59,431,502	$6,603,500
5	VA	Virginia	164	$15,825,450	63	$40,276,142	214	$56,101,592	$6,233,510
6	TX	Texas	116	$11,795,403	63	$42,417,970	170	$54,213,374	$6,023,708
7	CO	Colorado	131	$13,647,155	47	$32,519,524	164	$46,166,680	$5,129,631
8	OH	Ohio	102	$10,251,754	52	$35,751,853	143	$46,003,607	$5,111,512
9	PA	Pennsylvania	98	$11,556,352	40	$26,332,749	128	$37,889,101	$4,209,900
10	NJ	New Jersey	73	$8,408,734	40	$29,153,488	96	$37,562,222	$4,173,580
11	FL	Florida	64	$5,744,103	37	$26,666,546	94	$32,410,649	$3,601,183
12	WI	Wisconsin	41	$8,411,094	16	$16,950,543	53	$25,361,637	$2,817,960
13	WA	Washington	46	$8,468,607	21	$16,610,463	62	$25,079,070	$2,786,563
14	MN	Minnesota	48	$4,896,965	24	$19,116,793	68	$24,013,758	$2,668,195
15	AL	Alabama	63	$5,668,620	26	$18,160,764	83	$23,829,384	$2,647,709
16	NC	North Carolina	52	$8,008,802	19	$13,759,090	65	$21,767,892	$2,418,655
17	CT	Connecticut	50	$6,021,651	20	$14,537,976	62	$20,559,627	$2,284,403
18	AZ	Arizona	55	$5,964,114	18	$13,884,577	65	$19,848,691	$2,205,410
19	IL	Illinois	48	$5,312,676	19	$13,314,966	63	$18,627,642	$2,069,738
20	GA	Georgia	44	$4,501,816	22	$14,047,419	60	$18,549,235	$2,061,026
21	MI	Michigan	48	$5,051,421	17	$11,140,080	60	$16,191,501	$1,799,056
22	NM	New Mexico	39	$3,514,903	17	$11,323,702	50	$14,838,605	$1,648,734
23	OR	Oregon	39	$4,114,854	14	$10,662,333	50	$14,777,187	$1,641,910
24	NH	New Hampshire	32	$2,908,167	14	$8,755,466	39	$11,663,633	$1,295,959
25	IN	Indiana	20	$2,042,334	10	$7,861,330	26	$9,903,664	$1,100,407
26	TN	Tennessee	27	$2,665,128	8	$6,791,221	33	$9,456,349	$1,050,705
27	UT	Utah	24	$2,632,951	9	$5,680,913	32	$8,313,864	$923,763
28	DE	Delaware	21	$2,096,179	6	$4,098,682	26	$6,194,861	$688,318
29	MT	Montana	18	$2,308,971	5	$2,644,331	22	$4,953,302	$550,367
30	HI	Hawaii	9	$838,285	6	$3,496,438	14	$4,334,723	$481,636
31	WV	West Virginia	8	$681,512	5	$3,413,721	12	$4,095,233	$455,026
32	OK	Oklahoma	11	$1,951,997	3	$1,989,710	13	$3,941,707	$437,967
33	NE	Nebraska	9	$935,262	5	$2,966,085	13	$3,901,347	$433,483
34	SC	South Carolina	12	$1,048,185	5	$2,806,587	14	$3,854,772	$428,308
35	RI	Rhode Island	8	$1,576,244	3	$2,263,000	11	$3,839,244	$426,583
36	IA	Iowa	14	$2,025,316	2	$1,789,661	14	$3,814,977	$423,886
37	MS	Mississippi	4	$329,978	5	$3,349,984	9	$3,679,962	$408,885
38	NV	Nevada	5	$466,669	3	$2,843,759	7	$3,310,428	$367,825
39	KY	Kentucky	8	$1,053,782	4	$2,041,558	11	$3,095,340	$343,927
40	LA	Louisiana	7	$597,484	4	$2,326,070	10	$2,923,554	$324,839
41	ND	North Dakota	6	$853,486	4	$2,039,835	8	$2,893,321	$321,480
42	AR	Arkansas	11	$1,119,742	3	$1,744,165	14	$2,863,907	$318,212
43	ME	Maine	12	$1,129,670	2	$1,554,267	13	$2,683,937	$298,215
44	VT	Vermont	8	$790,816	3	$1,649,629	11	$2,440,445	$271,161
45	KS	Kansas	6	$531,627	4	$1,842,039	6	$2,373,666	$263,741
46	ID	Idaho	6	$539,236	2	$1,511,960	7	$2,051,196	$227,911
47	MO	Missouri	10	$1,066,083	2	$847,907	12	$1,913,990	$212,666
48	WY	Wyoming	7	$595,155	2	$1,035,174	8	$1,630,329	$181,148
49	SD	South Dakota	6	$599,342	1	$463,361	7	$1,062,703	$118,078
50	DC	Dist. of Columbia	2	$218,814	0	$0	2	$218,814	$24,313
51	AK	Alaska	2	$169,793	0	$0	2	$169,793	$18,866
		Totals:	**2872**	**$324,355,587**	**1170**	**$844,031,387**	**3736**	**$1,168,386,975**	**$129,820,775**

http://web.sba.gov/tech-net/public/dsp_search.cfm

Table 37. NVCA: Venture Capital Investments by State 2000 to 2008 ($ Millions)

Rank	State	2000	2001	2002	2003	2004	2005	2006	2007	2008	Average
1	CA	42,568.60	16,541.30	9,444.80	8,536.20	10,208.40	10,962.00	12,844.30	14,720.20	14,277.80	15,567.07
2	MA	10,337.80	4,775.80	2,532.70	2,733.30	3,114.40	2,582.50	2,995.00	3,721.40	2,996.70	3,976.62
3	TX	6,003.00	2,943.00	1,296.00	1,246.90	1,154.50	1,174.90	1,389.40	1,468.50	1,287.30	1,995.94
4	NY	6,795.60	2,015.90	779.7	658.8	761.6	1,127.40	1,273.20	1,129.70	1,297.80	1,759.97
5	NJ	3,271.60	1,528.40	904.7	870.1	1,004.50	886.4	807.3	607.6	694.8	1,175.04
6	WA	2,773.80	1,124.70	579.8	463.5	863.6	838.3	1,106.30	1,377.20	962.3	1,121.06
7	CO	4,103.70	1,222.40	536.5	621.4	408	643.7	645.1	609.7	817.4	1,067.54
8	PA	2,853.20	927.1	451.8	498	602.3	481.9	854	820.2	700.9	909.93
9	VA	3,307.00	936.1	423.9	408.2	301.9	525.8	439.6	556.7	486.4	820.62
10	MD	1,817.70	997.4	636.1	346	549.8	486.6	661.9	610.7	460.7	729.66
11	FL	2,682.50	846.5	410.2	308.7	363.7	329	387.2	767.5	238.4	703.74
12	GA	2,314.50	890.3	564.7	295.3	501.2	253.1	369.5	474.9	423.4	676.32
13	IL	2,350.50	964.2	308.9	374.1	208.9	276.7	403.4	505.4	444.9	648.56
14	NC	1,823.70	584.5	562.2	380.7	306.7	392.5	418.8	546.7	459.1	608.32
15	MN	1,023.30	455.9	402.7	233	386.9	239.6	327.3	488.1	487	449.31
16	CT	1,509.40	549.8	182.7	212.3	205.1	201.6	269.7	295.9	129.7	395.13
17	OH	973.6	233.6	264.8	179	76.6	139.9	78.5	192.8	258.1	266.32
18	OR	789.5	230.1	151.1	107.5	143.7	134.4	152.8	312.1	176	244.13
19	UT	673.6	208.1	129.5	106.5	227.8	192	180.9	188.3	193.6	233.37
20	NH	750.6	224.6	207.8	154.3	135.6	92.4	78.7	135.2	181.1	217.81
21	AZ	622.6	196	191.1	73.3	70.7	123.4	262.6	202.9	208	216.73
22	MI	337.2	153.6	107.8	80.2	129.6	80.8	116.9	104.7	245.7	150.72
23	MO	590.3	237.4	76	78.4	26	56	43.7	91.7	86.5	142.89
24	TN	453.3	212.8	115.8	84.4	85	88.6	41.5	124.7	65.1	141.24
25	DC	478.1	162.2	20.3	56.1	80.2	26.4	43.9	90.5	31	109.86
26	IN	269	39.7	40	24.5	67.8	103.6	70.3	82.8	133.6	92.37
27	SC	447.6	98.1	79.5	14.3	13.6	2.7	10.3	87.2	34	87.48
28	WI	191.8	93.1	50.8	37.5	57.1	68.5	72.3	90.1	75.2	81.82
29	RI	74.6	118.7	95.9	61.3	58	76.3	82.7	7	39.2	68.19
30	AL	266.3	80.3	56.3	29.9	26	20.2	18.9	31.5	24.1	61.50
31	KS	264.8	40.3	7.4	24.9	48.7	1.7	21.5	82.1	45.5	59.66
32	NE	134.8	88.6	12.6	204.6	0.2	13.1	6.5	0	16	52.93
33	KY	201.8	23.9	13.8	4.8	47.2	32	27.7	53.4	29.5	48.23
34	NM	21.1	14.2	53.7	3.6	24	76.4	32.1	128.5	69.4	47.00
35	DE	134.7	164.6	19.4	0.4	2.1	7.2	5.3	6.5	62.7	44.77
36	NV	30.8	28.2	31.8	40.2	47.6	158.5	19.6	29.4	12.6	44.30
37	HI	203	37.8	4.4	12.8	13.7	11.9	32.1	4.9	7.2	36.42
38	LA	112.7	80.5	19.3	1.3	3.2	4.1	11.5	15.9	8.2	28.52
39	OK	52.5	29.8	33	31.1	63.9	0	14.9	8.1	17.3	27.84
40	ME	140.2	3.9	15.4	0.9	12	4.5	7.6	5	20.2	23.30
41	VT	46.4	11.6	3.7	5.2	5.1	35.2	10.1	8.7	42.9	18.77
42	UN	58.8	26.3	0	0	0.9	57.1	0	0	0	15.90
43	IA	30.8	6	2	0	5.3	32.1	1.5	6.3	40.2	13.80
44	ID	18.5	2.7	10.6	52.2	2.5	8	1.5	16.2	11.9	13.79
45	AR	34.3	10.4	9.7	1.2	3.7	12.6	39.2	0.2	0	12.37
46	PR	31.1	32	0.5	0.1	1.5	1.7	14.3	16	13.8	12.33
47	WV	4.5	1.4	15.9	12.6	5.8	10.5	4.7	10.2	24	9.96
48	MT	16.7	24.8	0	0	0	27.4	0	4	15.6	9.83
49	MS	19.5	30	5	0.9	4.9	10	1	5.9	0	8.58
50	SD	0.3	0.5	18.1	3.5	1.9	0	0	4	0.5	3.20
51	ND	6.1	1	0	14.5	2	0	0	0.2	0.4	2.69
52	WY	0	0	0	0	1.5	4.1	6.5	0.2	1.5	1.53
53	AK	3.5	0	0	0	0	0	0	0	0	0.39
	Total	**104,020.50**	**40,250.00**	**21,880.30**	**19,688.80**	**22,436.90**	**23,115.10**	**26,703.70**	**30,847.60**	**28,355.20**	**35,255.34**

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Table 38. NVCA - Capital Under Management by State 2000 to 2008 ($ Millions)

Rank	Year	2000	2001	2002	2003	2004	2005	2006	2007	2008	Average
1	CA	78,830	89,359	90,067	92,500	97,866	104,497	110,241	103,763	84,479	94,622
2	MA	35,805	43,276	45,776	44,610	45,415	47,665	50,391	48,159	36,149	44,138
3	NY	44,727	46,033	43,733	43,021	43,217	42,890	35,581	30,874	17,950	38,670
4	CT	9,021	12,286	12,112	12,065	13,924	13,874	15,057	13,083	11,781	12,578
5	MD	8,709	8,458	8,430	8,418	8,906	9,417	11,396	10,868	7,316	9,102
6	TX	7,211	8,373	8,207	8,127	8,446	8,122	7,794	6,165	4,591	7,448
7	PA	4,892	5,093	4,911	5,304	5,182	5,104	5,680	5,370	3,803	5,038
8	IL	4,172	4,590	5,294	5,692	5,789	5,536	5,430	4,575	3,851	4,992
9	CO	4,751	5,266	5,408	5,394	5,218	4,897	4,686	3,033	1,571	4,469
10	NJ	3,635	4,296	4,181	4,389	4,092	4,091	5,177	5,073	4,174	4,345
11	WA	2,814	3,638	3,640	3,512	4,493	4,469	4,467	5,508	4,954	4,166
12	DC	4,478	5,268	4,223	3,956	2,733	3,046	4,153	4,346	4,410	4,068
13	VA	2,554	2,752	2,763	2,943	3,141	3,720	3,613	3,494	2,310	3,032
14	MN	2,202	2,141	2,317	2,307	2,315	2,403	2,550	2,441	1,644	2,258
15	OH	1,856	1,878	1,878	1,855	2,053	1,878	1,790	1,652	1,008	1,761
16	NC	1,314	1,394	1,542	1,738	1,619	1,449	1,658	1,540	1,204	1,495
17	FL	1,765	1,730	1,661	1,567	1,556	1,718	1,436	1,166	530	1,459
18	GA	1,286	1,279	1,274	1,197	1,229	1,267	1,268	1,443	853	1,233
19	TN	1,197	1,289	1,169	1,161	1,048	1,040	844	675	569	999
20	MI	709	712	711	751	944	780	796	510	503	713
21	UT	272	479	452	526	540	499	603	1,130	1,159	629
22	LA	478	731	727	709	745	585	512	437	421	594
23	IN	479	477	466	499	409	417	429	415	119	412
24	MO	215	241	209	198	296	276	335	547	460	309
25	ME	203	291	218	219	215	217	278	162	165	219
26	WI	184	183	90	89	100	85	255	258	185	159
27	AL	108	108	107	107	125	178	177	169	161	138
28	SD	168	168	167	167	162	163	101	102	19	135
29	OK	140	140	140	139	117	118	111	117	42	118
30	WY	118	118	117	117	118	119	119	120	0	105
31	AZ	37	48	89	124	125	143	116	117	139	104
32	OR	100	100	113	83	85	86	76	79	23	83
33	NE	176	165	165	71	38	38	38	39	0	81
34	KY	7	7	0	14	14	18	218	220	225	80
35	DE	140	140	116	68	56	56	57	57	31	80
36	SC	79	80	93	80	80	86	86	87	21	77
37	IA	16	60	60	55	65	54	60	68	69	56
38	AR	71	71	71	71	71	72	72	0	0	55
39	PR	39	69	68	68	68	69	29	31	31	52
40	NH	66	66	84	65	66	19	30	30	31	51
41	RI	0	24	24	24	24	24	97	98	100	46
42	NM	12	12	12	34	35	70	75	77	78	45
43	VT	15	41	41	41	41	41	41	55	40	40
44	ID	14	14	14	14	14	14	85	86	73	36
45	MS	25	53	53	28	28	28	29	30	30	34
46	KS	52	51	51	28	19	0	0	0	0	22
47	WV	21	21	21	21	21	21	21	21	0	19
48	NV	23	23	23	23	23	24	24	0	0	18
49	HI	11	11	11	9	16	16	16	8	14	12
50	ND	0	0	0	0	0	0	0	0	13	1
51	MT	0	0	0	0	0	0	0	0	0	0
52	AK	0	0	0	0	0	0	0	0	0	0

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Table 39. Venture Capital Fund Commitments - 2000-2008 (Millions)

State	2000	2001	2002	2003	2004	2005	2006	2007	2008	Average
CA	$41,901	$13,328	$2,735	$4,652	$9,203	$14,930	$10,902	$14,866	$15,096	$14,179
MA	$16,173	$9,563	$2,577	$1,597	$1,692	$5,144	$4,641	$6,257	$3,501	$5,683
NY	$16,588	$2,504	$1,025	$1,245	$2,183	$2,096	$2,583	$5,223	$1,973	$3,936
CT	$3,050	$3,904	$60	$165	$2,327	$1,216	$3,186	$625	$886	$1,713
MD	$4,039	$521	$478	$1,100	$278	$833	$2,868	$1,377	$447	$1,327
TX	$4,160	$2,739	$186	$76	$794	$652	$363	$284	$1,172	$1,158
DC	$1,423	$1,122	$315	$0	$392	$566	$1,413	$240	$1,293	$752
WA	$1,195	$938	$83	$1	$995	$281	$590	$1,882	$489	$717
PA	$2,290	$334	$86	$488	$463	$349	$486	$754	$1,025	$697
NJ	$1,206	$652	$392	$561	$197	$344	$1,962	$235	$48	$622
IL	$1,007	$1,073	$478	$702	$432	$81	$465	$558	$236	$559
VA	$2,345	$201	$41	$238	$72	$428	$555	$599	$83	$507
MN	$2,473	$17	$276	$26	$50	$295	$398	$275	$325	$459
CO	$2,414	$513	$140	$94	$84	$69	$133	$371	$157	$442
OH	$662	$330	$102	$5	$276	$544	$125	$209	$194	$272
NC	$601	$120	$72	$291	$3	$101	$398	$166	$1	$195
GA	$861	$19	$0	$0	$55	$104	$103	$518	$19	$187
FL	$936	$26	$8	$56	$1	$313	$11	$109	$25	$165
UT	$129	$224	$29	$34	$40	$24	$130	$142	$559	$146
TN	$262	$82	$22	$101	$16	$84	$62	$100	$129	$95
MO	$65	$286	$0	$0	$80	$29	$40	$220	$45	$85
MI	$286	$8	$11	$51	$33	$101	$13	$49	$106	$73
LA	$70	$112	$52	$8	$75	$4	$13	$0	$0	$37
KY	$0	$135	$8	$2	$0	$5	$65	$98	$12	$36
WI	$82	$14	$0	$0	$11	$0	$78	$101	$0	$32
AL	$80	$16	$11	$7	$19	$60	$19	$0	$68	$31
IN	$103	$40	$10	$36	$17	$6	$24	$1	$0	$26
OK	$110	$0	$0	$0	$0	$12	$38	$5	$0	$18
ME	$0	$77	$16	$3	$0	$0	$46	$20	$0	$18
SD	$131	$1	$0	$0	$5	$0	$0	$0	$15	$17
AZ	$0	$21	$42	$41	$0	$19	$0	$0	$20	$16
ID	$15	$27	$0	$0	$0	$0	$0	$75	$0	$13
RI	$0	$25	$0	$0	$0	$0	$64	$14	$0	$11
IA	$21	$26	$0	$0	$10	$0	$43	$0	$0	$11
SC	$70	$0	$15	$0	$0	$6	$0	$0	$0	$10
OR	$65	$0	$14	$0	$2	$0	$0	$2	$5	$10
NM	$0	$0	$0	$18	$22	$34	$5	$7	$0	$10
AR	$69	$0	$0	$0	$0	$0	$0	$0	$0	$8
VT	$20	$25	$0	$0	$0	$0	$0	$11	$3	$7
NE	$41	$0	$0	$0	$0	$0	$0	$0	$0	$5
NH	$0	$0	$11	$9	$0	$0	$5	$7	$0	$4
PR	$0	$31	$0	$0	$0	$0	$0	$1	$0	$4
DE	$0	$0	$22	$0	$10	$0	$0	$0	$0	$4
MS	$30	$0	$0	$0	$0	$0	$1	$0	$0	$3
WY	$26	$0	$0	$0	$0	$0	$0	$0	$0	$3
WV	$6	$4	$13	$2	$0	$0	$0	$0	$0	$3
HI	$0	$0	$3	$0	$8	$0	$0	$0	$6	$2
ND	$0	$0	$0	$0	$0	$0	$0	$0	$13	$1
KS	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
NV	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
UN	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Total	**$105,005**	**$39,056**	**$9,330**	**$11,608**	**$19,845**	**$28,728**	**$31,828**	**$35,398**	**$27,948**	

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Table 40. Progress of States in Attaining RPS

			Eligible RPS Generation		RPS Target (% of covered volume)			Planned Renewables (MW)					
State	MWh Deliveries 2007	% Subject to RPS	Total MWh	As % of total	2010-2012	2014+	2020+	Total	Under Construction	Under Dev and Announced	% Wind	% Hydro	Other
Arizona	77,193,000	63.30%	111,384	0.20%	3.50%	4.50%	10.00%	1,995	123	1,872	42%	0%	58%
California	264,235,000	98.00%	29,100,554	11.20%	20.00%	20.00%	33.00%	21,220	174	21,046	37%	23%	40%
Colorado	51,299,000	94.00%	3,634,045	7.50%	10.00%	15.00%	20.00%	1,856	191	1,665	71%	22%	7%
Connecticut	34,129,000	94.30%	1,294,897	4.00%	12.00%	14.00%	23.00%	353	-	353	0%	1%	99%
Delaware	11,869,000	74.70%	48,116	0.50%	8.50%	11.50%	20.00%	1,560	-	1,560	99%	1%	0%
Illinois	146,055,000	73.00%	2,474,161	2.30%	7.00%	9.00%	20.50%	3,148	1,340	1,807	89%	9%	2%
Iowa	45,270,000	76.0%	5,200,313	15.1%	0.7%	0.7%	0.7%	2,517	360	2158	96%	2%	2%
Kansas	40,166,000	69.0%	1,779,109	6.4%	10.0%	15.0%	20.0%	1,167	-	1,167	100%	0%	0%
Maine	11,860,000	95.0%	131,621	1.2%	5.0%	7.0%	10.0%	2,812	132	2680	60%	40%	0%
Maryland	65,391,000	73.0%	732,977	1.5%	9.0%	17.4%	20.0%	3,479	0	3,479	97%	0%	3%
Massachusetts	57,139,000	86.0%	2,046,878	4.2%	7.0%	9.0%	15.0%	3,300	4	3,296	97%	1%	3%
Michigan	109,297,000	100.0%	6,507,215	6.0%	2.0%	10.0%	10.0%	2,006	11	1,995	99%	0%	1%
Minnesota	68,231,000	100.0%	4,209,329	6.2%	15.0%	21.0%	25.0%	2,497	8	2,490	98%	2%	1%
Missouri	85,533,000	70.0%	2,897,453	4.8%	2.0%	5.0%	15.0%	2,206	146	2060	70%	30%	0%
Montana	15,532,000	71.6%	590,308	5.3%	10.0%	15.0%	15.0%	2,684	111	2573	96%	4%	0%
Nevada	35,643,000	88.1%	3,500,178	11.1%	15.0%	18.0%	20.0%	5,133	311	4823	26%	9%	65%
New Hampshire	11,236,000	100.0%	1,431,608	12.7%	10.7%	12.8%	20.8%	105	4	100	95%	0%	5%
New Jersey	81,934,000	98.0%	2,106,832	2.6%	10.1%	12.1%	22.5%	4,602	1	4,601	76%	22%	2%
New Mexico	22,267,000	87.9%	1,072,856	5.5%	10.0%	15.0%	20.0%	4,364	110	4,254	85%	0%	15%
New York	148,178,000	82.0%	1,285,869	1.1%	5.8%	6.6%	6.6%	9,693	37	9,657	61%	38%	1%
North Carolina	131,881,000	100.0%	122,745	0.1%	3.0%	6.0%	12.5%	259	2	258	0%	4%	96%
Ohio	161,771,000	88.8%	235,475	0.2%	1.5%	2.5%	12.5%	1,523	-	1,523	53%	1%	46%
Oregon	48,697,000	100.0%	5,841,766	12.0%	5.0%	15.0%	25.0%	6,518	164	6354	42%	53%	6%
Pennsylvania	151,573,000	97.0%	8,187,275	5.6%	10.7%	11.3%	18.5%	1,360	500	860	72%	20%	8%
Rhode Island	8,013,000	99.0%	159,119	2.0%	6.5%	8.5%	16.0%	291	1	289	52%	0%	48%
Texas	343,829,000	76.0%	16,709,530	6.4%	3.8%	5.2%	8.9%	16,154	794	15360	95%	0%	5%
Washington	85,742,000	85.0%	5,340,367	7.3%	3.0%	3.0%	15.0%	6,404	154	6250	61%	37%	3%
Wisconsin	71,301,000	100.0%	2,873,906	4.0%	4.2%	10.0%	10.0%	990	-	990	91%	4%	5%
Totals	2,385,264,000	86.8%	109,625,886	5.3%	7.4%	9.8%	14.9%	110,195	4,676	105,518	67.10%	17.1%	15.8%

http://www.snl.com/Sectors/Energy/whitepapers_library.aspx

Table 41. Retail Sales of Electricity by State 2000-2007 Total Electric Industry

State	2000	2001	2002	2003	2004	2005	2006	2007	00-07	2020
TX	318,262,529	318,044,174	320,845,849	322,685,955	320,614,840	334,258,262	342,724,213	343,828,582	1.1 %	396,881,750
CA	244,057,202	247,758,778	235,213,332	243,221,316	252,025,973	254,249,507	262,958,528	264,234,911	1.1 %	306,237,920
FL	195,842,976	200,752,133	210,473,530	217,378,622	218,584,494	224,977,011	228,219,544	231,084,600	2.4 %	314,217,862
OH	165,194,857	155,797,714	153,407,098	152,189,238	154,221,114	160,176,303	153,428,844	161,770,827	-0.3 %	155,599,088
NY	142,026,560	144,180,760	147,440,116	144,044,703	145,081,709	150,147,571	142,238,019	148,177,523	0.6 %	160,316,219
PA	133,845,326	135,271,933	139,819,870	140,369,128	143,501,493	148,272,940	146,150,358	151,572,950	1.8 %	190,959,717
IL	134,696,962	136,033,549	138,447,313	136,247,891	139,253,956	144,986,215	142,447,811	146,055,151	1.2 %	169,750,987
GA	119,185,076	117,790,473	123,789,078	123,676,657	129,465,784	132,265,452	134,834,168	137,453,878	2.1 %	179,134,552
NC	119,855,456	119,026,943	122,686,468	121,335,121	125,656,807	128,335,377	126,698,979	131,880,754	1.4 %	157,505,855
MI	104,772,216	102,409,347	104,713,520	108,877,193	106,606,040	110,444,563	108,017,697	109,296,749	0.6 %	118,224,220
VA	96,715,402	96,453,175	100,618,570	101,509,731	105,424,173	108,849,552	106,721,241	111,569,552	2.1 %	145,472,698
IN	97,774,925	97,733,968	101,428,550	100,467,779	103,094,263	106,548,910	105,664,484	109,420,150	1.6 %	134,851,423
TN	95,727,709	96,130,718	98,233,027	97,455,808	99,660,665	103,905,421	103,931,744	106,716,934	1.6 %	130,581,739
AL	83,524,220	79,358,258	83,067,078	83,844,220	86,870,519	89,201,620	90,677,695	91,828,464	1.4 %	109,503,097
KY	78,316,156	79,975,499	87,266,835	85,219,631	86,521,156	89,351,466	88,743,435	92,404,100	2.4 %	125,634,281
WA	96,511,121	78,495,247	75,403,856	78,133,501	79,981,608	83,425,200	85,033,335	85,741,947	-1.7 %	68,828,115
SC	77,011,969	74,832,367	77,819,392	77,054,098	79,908,340	81,254,088	80,877,321	81,948,158	0.9 %	91,970,111
LA	80,690,346	74,692,751	79,260,989	77,769,322	79,737,112	77,389,170	77,467,748	79,566,937	-0.2 %	77,521,936
MO	72,642,699	73,213,157	75,000,629	74,239,888	74,054,296	80,940,494	82,015,230	85,532,850	2.4 %	115,845,845
NJ	69,977,129	73,177,390	74,602,620	76,382,512	77,593,167	81,896,813	79,680,947	81,934,334	2.3 %	109,824,296
WI	65,146,487	65,218,293	66,999,296	67,241,494	67,975,709	70,335,683	69,820,749	71,301,300	1.3 %	84,315,888
AZ	61,130,045	62,274,304	62,600,737	64,079,560	66,933,251	69,390,686	73,252,776	77,193,206	3.4 %	119,056,441
MD	60,677,804	61,640,020	68,379,906	71,258,583	66,891,700	68,365,385	63,173,143	65,390,660	1.1 %	75,135,748
MN	59,782,089	60,686,852	62,162,361	63,087,339	63,340,315	66,019,053	66,769,931	68,231,182	1.9 %	87,217,739
MA	51,773,113	52,496,075	53,707,537	55,514,357	56,142,019	57,227,588	55,850,090	57,138,822	1.4 %	68,622,596
OK	49,564,141	49,666,725	49,485,466	50,428,168	50,942,042	53,707,102	54,905,314	55,193,200	1.5 %	67,398,085
CO	43,020,284	44,236,038	45,936,696	46,494,645	46,723,841	48,353,236	49,733,698	51,299,156	2.5 %	71,131,923
OR	50,330,414	45,884,830	45,255,173	45,194,730	45,636,448	46,419,245	48,069,265	48,696,965	-0.5 %	45,802,757
MS	45,336,178	44,286,865	45,451,850	45,543,881	46,032,538	45,901,064	46,936,437	48,153,181	0.9 %	53,857,368
AR	41,611,188	41,732,449	42,449,558	43,108,259	43,672,360	46,164,923	46,635,624	47,054,891	1.8 %	59,124,336
IA	39,087,867	39,443,755	40,897,543	41,207,284	40,902,773	42,756,808	43,336,835	45,269,523	2.1 %	59,459,969
KS	35,921,461	35,846,951	36,713,540	36,735,390	37,126,540	39,024,283	39,751,302	40,165,977	1.6 %	49,423,993
CT	29,952,407	30,540,758	31,005,489	31,830,218	32,214,610	33,095,029	31,677,453	34,129,107	1.9 %	43,492,291
NV	27,791,691	28,167,293	29,204,272	30,131,660	31,312,306	32,500,630	34,586,260	35,643,402	3.6 %	56,580,888

WV	27,692,998	27,669,432	28,463,122	28,296,993	28,918,612	30,152,069	32,312,126	34,183,839	3.1 %	50,542,666
NE	24,349,189	24,722,640	25,661,061	25,856,566	25,875,930	26,975,944	27,276,292	28,248,400	2.1 %	37,221,763
UT	23,185,277	23,217,308	23,267,188	23,860,350	24,511,704	25,000,498	26,365,716	27,785,447	2.6 %	38,886,449
ID	22,834,099	21,096,017	20,699,666	21,218,685	21,808,674	21,852,681	22,761,749	23,755,186	0.6 %	25,565,485
NM	18,800,676	18,726,594	19,206,917	19,330,491	19,845,735	20,638,951	21,434,957	22,267,394	2.4 %	30,490,309
WY	12,367,684	12,949,505	12,874,060	13,253,836	13,539,513	14,137,727	14,946,612	15,535,552	3.3 %	23,727,664
MT	14,579,982	11,446,658	12,831,388	12,824,660	12,956,782	13,478,838	13,814,980	15,531,985	0.9 %	17,467,978
ME	12,162,977	12,151,997	11,441,358	11,971,837	12,367,668	12,362,879	12,284,768	11,860,202	-0.4 %	11,317,759
DE	11,274,290	11,378,626	12,018,734	12,599,590	11,761,153	12,136,788	11,554,672	11,868,810	0.7 %	13,057,344
DC	10,615,521	10,880,472	11,128,743	10,946,383	11,414,847	11,816,207	11,396,424	12,110,185	1.9 %	15,466,674
NH	10,158,903	10,315,551	10,383,387	10,972,542	10,973,309	11,244,628	11,094,343	11,235,856	1.4 %	13,547,948
ND	9,413,409	9,809,757	10,219,353	10,461,108	10,516,400	10,839,990	11,245,238	11,905,695	3.4 %	18,416,108
HI	9,690,596	9,784,563	9,891,638	10,390,836	10,731,520	10,538,910	10,567,912	10,585,299	1.3 %	12,471,809
SD	8,282,740	8,626,999	8,936,801	9,079,990	9,213,844	9,811,017	10,056,387	10,603,301	3.6 %	16,774,568
RI	7,301,336	7,392,917	7,560,699	7,796,626	7,887,575	8,049,112	7,799,126	8,013,022	1.3 %	9,523,877
AK	5,309,970	5,454,080	5,465,489	5,563,682	5,788,484	5,912,571	6,182,291	6,326,610	2.5 %	8,759,123
VT	5,638,614	5,585,446	5,629,263	5,352,429	5,663,772	5,883,053	5,795,029	5,864,006	0.6 %	6,306,767
Grand Total	**3,421,414,266**	**3,394,458,104**	**3,465,466,011**	**3,493,734,486**	**3,547,479,483**	**3,660,968,513**	**3,669,918,840**	**3,764,560,712**	**1.4 %**	**4,495,746,207**

http://www.eia.doe.gov/cneaf/electricity/epa/epa_sprdshts.html

Table 42. List of States with an Angel Tax Credit Program

State	Name of Tax Credit (TC)	Rate	
Hawaii	High Tech Investment TC	100%	
Oregon	University VC Funds	60%	
West Virginia	High Growth Business Investment TC	50%	
Virginia	QB Investment Credit	50%	Tied w/ WV, LA, KS
Louisiana	Angel Investor TC	50%	
Kansas	Angel Investor TC	50%	
North Dakota	Seed Capital Investment TC	45%	
Maine	Seed Capital TC	40%	
Kentucky*	Kentucky Investment Fund Act	40%	
Arizona	Angel Investing TC	30%	
New Mexico	Angel Investment Credit	25%	
North Carolina	QB Investment TC	25%	
Ohio	Tech Investment TC	25%	
Wisconsin	Angel Investor TC	25%	
Indiana	VC Investment TC	20%	
Iowa	QB Investment TC	20%	
Oklahoma	Small Business Capital Credit	20%	
New Jersey	High Tech Investment TC	10%	
Vermont**	Seed Capital Fund	10%	
Michigan*	Angel Investor Incentive	N/A	
Florida	None	0%	Tied for 35th w/ 30 States w/ no Program

*Kentucky and Michigan were described in the report, but not listed as an angel tax credit in the NGA Appendix F. This is most likely because Kentucky's tax credit does not apply to a single investor; rather it applies to a fund of multiple investors investing in multiple companies. Michigan does not offer angels an income tax credit; rather, it offers a deduction from capital gains income as an incentive for angel investing.

**According to the research of this paper, Vermont's 10% Seed Fund tax credit, though still on the books, is in fact nonexistent. Instead, Vermont currently has an Angel Venture Investment Capital Gain Deferral Credit that provides an up to 60% deferral of capital gains on investments of up to $200,000. This paper did not investigate all states, and other states have since created new programs and eliminated others, such as the Iowa program.

Source: Angel Capital Education Foundation (Jeffrey Williams, Belmont University): Tax Credits and Government Incentives for Angel Investing in Various States, July, 2008.

Table 43. Renewable Portfolio Standards by State As of November 2009

State	RPS % Standards		RPS MW Standards		RPS with Solar/DG Provisions		
	% benchmarks	Target Year	MW benchmark	Target Year	% or MW benchmarks	Target Year	
Alabama							
Alaska							
Arizona	15%	2025			4.5% DG	2025	
Arkansas							
California	33%	2020					
Colorado (Coops & large Munis)	10%	2020					
Colorado (IOUs)	20%	2020			0.8% solar-electric	2020	
Connecticut	23%	2020					
Delaware	20%	2019			2.005% Solar PV	2019	Triple credit for PV
District of Columbia	20%	2020			0.40%	2020	1.1 multiplier for solar
Florida* (Voluntary w/ Rate Recovery OK)			110.0				43rd
Georgia							
Hawaii	40%	2030					
Idaho							
Illinois	25%	2025			1.5% solar PV	2025	
Indiana							
Iowa			105				
Kansas	20%	2020					
Kentucky							
Louisiana							
Maine	30%	2000					
Maine (New RE)	10%	2017					
Maryland	20%	2022			2% Solar-electric	2022	
Massachusetts	15%	2020					(+ 1% annual increase for Class I Renewables)
Michigan	10%	2015	1,100	2015			Triple credit for solar
Minnesota	25%	2025					
Minnesota - Xcel	30%	2020					
Mississippi							
Missouri	15%	2021			0.3% solar-electric	2021	
Montana	15%	2015					
Nebraska							
Nevada	25%	2025			1.5% Solar	2025	2.4 to 2.45 multiplier for PV
New Hampshire	24%	2025			0.3% Solar-electric	2014	
New Jersey	23%	2021			2.12% Solar-electric	2021	
New Mexico (Coops)	10%	2020					
New Mexico (IOUs)	20%	2020			4% solar-electric; 0.6% DG	2020	
New York	24%	2013			0.1312% customer-sited	2013	
North Carolina (Coops & Munis)	10%	2018					
North Carolina (IOUs)	13%	2021			0.2% solar	2018	
North Dakota	10%	2015					RP Goal
Ohio	25%	2025			0.5% solar	2025	
Oklahoma							
Oregon (large utilities)	25%	2025			20 MW solar PV	2020	Double credit for PV
Oregon (smaller utilities)	5% - 10%	2025					
Pennsylvania	18%	2020			0.5% Solar PV	2020	
Rhode Island	16%	2020					
South Carolina							
South Dakota	10%	2015					RP Goal
Tennessee							
Texas			5,880	2015	500 MW		Double credit for non-wind
Utah	20%	2025					RP Goal, 2.4 multiplier for solar
Vermont	20%	2017					RE & CHP or any increase in retail sales by 2012
Virginia	15%	2025					RP Goal
Washington	15%	2020					Double credit for DG
West Virginia	25%	2025					RP Goal; various multipliers for solar
Wisconsin	10%	2015					varies by utility
Wyoming							

Source: www.dsireusa.org

- = No data reported.

Solar water heating eligible Minimum solar or customer-sited requirement. State RPS with solar/DG provisions: 16 states & DC: AZ, CO, DE, DC, IL, MA, MD, MO, NC, NH, NJ, NM, NV, NY, PA, OH, OR.

* Title XXVII, Chapter 366 Florida Statutes

366.92 Florida renewable energy policy.

In order to demonstrate the feasibility and viability of clean energy systems, the commission shall provide for full cost recovery under the environmental cost-recovery clause of all reasonable and prudent costs incurred by a provider for renewable energy projects that are zero greenhouse gas emitting at the point of generation, up to a total of 110 megawatts statewide, and for which the provider has secured necessary land, zoning permits, and transmission rights within the state. Such costs shall be deemed reasonable and prudent for purposes of cost recovery so long as the provider has used reasonable and customary industry practices in the design, procurement, and construction of the project in a cost-effective manner appropriate to the location of the facility. The provider shall report to the commission as part of the cost-

recovery proceedings the construction costs, in-service costs, operating and maintenance costs, hourly energy production of the renewable energy project, and any other information deemed relevant by the commission. Any provider constructing a clean energy facility pursuant to this section shall file for cost recovery no later than July 1, 2009.

Table 44. Renewable Portfolio Standards: Notes by State

State (Notes and comments)	Memo Notes and Updates
Arizona	
California	09/30/09 - Revised compliance schedule, notes, and load covered to include the newly enacted 33% by 2020 standard authorized under Executive Order S-21-09, to be implemented by the CA Air Resources Board under their authority to adopt regulations for meeting CA's GHG reduction goals. In addition to extending the previous standard for 10 more years, the EO also applies it to municipal utilities, which were formerly not covered. The yearly fractional goals section uses an equal annual increase towards the 33% target although the EO does not set any interim benchmarks.
Colorado	
Connecticut	
Delaware	08/27/09 - Revised load covered data for S1 and S2 per numbers from DE PSC. Revised numbers include actual industrial exemptions from 2007-2008 compliance year and use a 2009 Delmarva SOS (S2) percentage of 33%. S2 will sunset in 2010 as existing 2005 and 2006 SOS contracts expire. 07/24/09 - Revised annual compliance schedule by pushing it back one year in keeping with methodology for other states with mid-year compliance deadlines (e.g., NJ, PA), which refer to the year the period ends. The state of DE still refers to compliance years by the year in which they begin. 04/03/09 - Corrected error in secondary RPS (Schedule 2) Tier I compliance percentage for 2010. Total compliance % was indicated as 6% but should have been 5%. Correcting the error reduced Tier I (2010) from 4.892% to 3.892%. Added comment indicating rationale for load covered %.
District of Columbia	4/24/2009 - Added DC into spreadsheet.
Hawaii	07/27/09 - Revised compliance schedule for H.B. 1464. The revision increases the 2020 target (formerly the last compliance year listed) from 20% to 25%, extends the 25% target through 2029, and adds a 40% target for 2030. Also revised notes to describe sunset of EE counting under the RPS in 2015. EE will have a separate standard. 04/24/09 - Added Hawaii into spreadsheet.
Illinois	08/28/09 - Revised to create secondary RPS for competitive sales which works out to be 12.5% by 2025 (same schedule, but secondary requires ACPs to be used for at least 50% of the obligation). Also added Tier 3 to both RPS types for solar carve-out of 6% of annual requirements for 2015-2025. Wind carves out for secondary RPS is 60% as opposed to 75% for primary RPS. Starting % of secondary RPS (4% or 5%) remains in question. 04/03/09 - Illinois enacted Public Act 095-1027 in January 2009, expanding the RPS to cover alternative retail electric suppliers. This increased the load covered from 46% to 87.7% using 2007 EIA data as a reference. This expanded load % will not apply until 2010. Additional legislation is now in the works to clarify certain aspects of extending the RPS to competitive suppliers.
Iowa	04/06/09 - Removed mention of conditional RPS for IPL based on IPL's application to the IUB approval to build a 630 MW coal-fired power plant. IPL has canceled there plans so an expansion of the RPS via this mechanism is no longer a possibility.
Kansas	06/09/09 - Completely new entry for RPS enacted in May 2009. Standard is 10% by 2011 and 20% by 2020.
Maine	07/27/09 - Added information about community RE multiplier of 1.5 enacted as part of L.D. 1075 in June 2009. 04/06/09 - Updated ACP levels for 2009 compliance year. Notices are issued in Jan. or Feb. each year with updated ACP levels.
Maryland	04/06/09 - Added more notes detailing variable ACP levels for industrial process loads and declining SACP (Tier III) schedule. Filled in applicable ACPs current for 2009.
Massachusetts	06/09/09 - Minor updates with Final Regulations. Vintage designation for pre-1998 resources to be considered "new" Class 1 facilities no longer in effect, replaced with provisions for incremental additions and efficiency improvements at existing facilities. Possible customer-sited tier remains unaddressed in Final Rules. 04/29/09 - Updated per emergency rules in effect as of March 31, 2009. Removed former Tier 3 (CHP, coal gasification, etc.) as it does not actually include any renewables and added new Tier 3 for existing MSW.
Michigan	04/10/09 - Revised to clarify that DTE and Consumer's new capacity obligations are not exclusive of % requirements. Production from new facilities counts for % obligation, thus these are not

	separate tiers.
Minnesota	06/09/09 - Revised general notes to indicate that up to 1% solar is now eligible under the former "wind-only" carve-out for Xcel. Thus Tier II is now 25% (total) with at least 24% from wind and up to 1% from solar. This is essentially an eligibility change so it does not affect the % requirements.
Missouri	04/10/09 - Revised note to provide more detail on entities covered, post-2021 compliance treatment
Montana	
Nevada	06/09/09 - Added compliance years 2016 - 2025 to schedule as a result of May 2009 amendments. Schedule through 2015 unchanged, but solar portion increases from 5% to 6% of total beginning in 2016. Total obligation changed from 20% in 2015 to 20% for 2015 - 2019, 22% for 2020 - 2024, and 25% for 2025 and thereafter.
New Hampshire	04/10/09 - updated with revised ACP levels for 2009. Edited load covered to reflect June 2008 amendment exempting municipal utilities from standard, which decreased from 100% to 98.2% based on 2007 EIA data.
New Jersey	06/09/09 - revised ACP level for solar (Tier 3, now $693/MWh) to reflect annual reduction with new compliance year (June 1). 04/10/09 - revised notes for solar (Tier 3) ACPs to fully describe declining 8-year schedule.
New Mexico	10/21/09 - Slight revision to notes. Tier IV was revised per the actual wording of the statute to include all non-wind, non-solar RE as opposed to just biomass and geothermal. Added note to "Existing Renewables" field to indicate that hydro is only eligible if placed in service after July 1, 2007.
New York	04/22/09 - added detail to notes describing ultimate target to further clarify that it does not include EO 111 (0.19%) or the voluntary (1%) green power marketing target.
North Carolina	
Ohio	04/22/09 - added note to clarify that renewables are eligible to participate in the "advanced energy" standard in addition to the specifically identified renewables portion. Also added details about ACP payments to notes and as comment in the ACP/penalty field.
Oregon	08/31/09 - added section to notes describing 20 MW-AC PV (500 kW - 5 MW per system) by 2020 requirement for IOUs. Thus far this detail is not included in schedule as it does not correspond to existing RPS structure, but this can be revisited as necessary. 04/24/09 - revised ACP comments to indicate direction of current discussion taking place.
Pennsylvania	07/27/09 - added note to describe the Tier 1 schedule as a "moving target" effective June 1, 2009. PUC must adjust the Tier 1 % quarterly to account for newly designated Tier 1 resources. 04/24/09 - added 2007/2008 solar (Tier III) ACP per PA AEPS website. Revised note to indicate how the Tier III ACP process works. Also added detail to notes about load covered in 2008, 2009, and 2010.
Rhode Island	07/28/09 - Separate requirement for 90 MW (including 3 MW solar) of long-term contracts by 2013 in State Notes section. For the time being, this requirement is not reflected in the quantitative details. Adjusting for capacity factor, the solar portion amounts to roughly a 0.3% solar requirement based on expected 2013 retail sales. 04/24/09 - updated ACP level with 2009 ACP, issued January 31 each year
Texas	04/24/09 - added noted about exemption for large customers served at transmission voltage in the context of load covered. Added additional fields to define MW mandate compliance schedule
Washington	04/24/09 - added note to indicate best guess for current ACP, as adjusted for inflation.
Wisconsin	
North Dakota	**Voluntary Goals (Details not included here)**
South Dakota	
Utah	
Vermont	
Virginia	

http://apps1.eere.energy.gov/states/maps/renewable_portfolio_states.cfm

Table 45. Dow Jones Venture Source: Total Venture Capital by State for 2000-2009 ($ Millions)

State	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	Average. 00-08
California	$40,266	$14,715	$9,409	$8,540	$10,229	$10,792	$13,214	$14,320	$14,545	$4,133	$15,114
Massachusetts	$9,630	$4,312	$2,640	$2,815	$2,804	$2,781	$2,968	$3,524	$2,958	$1,112	$3,826
Texas	$5,994	$2,602	$1,331	$1,109	$1,040	$1,192	$1,276	$1,213	$1,137	$293	$1,877
New York	$5,744	$1,618	$775	$732	$948	$1,566	$1,701	$1,452	$1,776	$501	$1,812
New Jersey	$2,450	$1,816	$637	$985	$756	$1,043	$730	$593	$606	$267	$1,068
Washington	$2,760	$958	$539	$448	$837	$711	$966	$1,336	$880	$403	$1,048
Colorado	$3,771	$989	$648	$346	$365	$656	$449	$634	$908	$506	$974
Pennsylvania	$2,422	$851	$378	$503	$723	$423	$1,487	$1,032	$631	$226	$939
Maryland	$1,767	$1,058	$721	$378	$662	$420	$633	$533	$686	$67	$762
Virginia	$2,234	$852	$385	$377	$431	$488	$502	$617	$555	$104	$716
Georgia	$1,950	$688	$544	$275	$492	$448	$371	$357	$333	$188	$606
Florida	$1,697	$872	$262	$883	$287	$489	$348	$418	$215	$126	$608
North Carolina	$1,661	$439	$583	$302	$310	$410	$439	$767	$441	$133	$595
Illinois	$1,829	$501	$244	$200	$269	$300	$359	$491	$492	$92	$520
Minnesota	$1,025	$448	$424	$271	$391	$219	$552	$487	$279	$127	$455
Connecticut	$1,391	$407	$253	$199	$198	$188	$230	$237	$134	$97	$360
Utah	$520	$312	$113	$76	$219	$131	$215	$245	$364	$80	$244
Oregon	$800	$206	$191	$87	$145	$124	$96	$266	$171	$54	$234
Ohio	$472	$170	$195	$139	$214	$94	$223	$345	$255	$31	$232
New Hampshire	$588	$274	$187	$165	$110	$113	$127	$125	$208	$66	$211
Arizona	$416	$138	$136	$102	$52	$233	$139	$239	$199	$100	$184
Missouri	$371	$169	$211	$114	$93	$51	$122	$101	$57	$22	$143
Michigan	$275	$108	$74	$86	$114	$43	$168	$92	$183	$58	$127
Tennessee	$231	$103	$137	$199	$80	$109	$72	$112	$82	$12	$125
Withheld	$11	$21	$58	$20	$32	$46	$742	$94	$89	$1	$124
South Carolina	$570	$195	$92	$72	$17	$7	$2	$104	$20	$1	$120
New Mexico	$132	$77	$71	$97	$18	$84	$29	$167	$122	$3	$88
District of Columbia	$380	$155	$7	$56	$70	$19	$52	$22	$30		$88
Indiana	$179	$48	$33	$25	$65	$54	$81	$85	$163	$51	$81
Kentucky	$159	$23	$14	$5	$40	$186	$8	$87	$20	$94	$70
Wisconsin	$125	$74	$63	$74	$57	$49	$75	$55	$55	$4	$60
Delaware	$288	$150	$54			$10		$8	$22	$7	$59
Alabama	$184	$59	$38	$26		$2	$33	$30	$133	$28	$56
Hawaii	$231	$15	$3	$13	$54	$94	$26	$22	$49	$7	$56
Rhode Island	$91	$58	$39	$51	$33	$16	$86	$4	$52	$17	$48
Kansas	$166	$42	$9	$21	$20	$0	$11	$5	$41	$5	$35
Nevada	$20	$37	$18	$23	$76	$48	$5	$56	$4	$15	$32
Nebraska	$85	$43	$45		$6	$3	$13		$16		$23
Louisiana	$87	$10	$7	$3	$5	$23	$11	$18	$5	$13	$19
Mississippi	$20	$28		$4	$4	$35	$36	$18	$22		$18
Oklahoma	$19	$22	$38	$6	$32	$13	$10	$13		$7	$17
Maine	$108	$10	$13	$4		$2	$2	$3	$6	$4	$17
Iowa	$2	$5	$16	$24	$5	$3	$17	$3	$71	$3	$16
Idaho	$9	$2	$11	$54	$14	$27		$13	$4		$15
Vermont	$30	$24	$2	$1	$1	$1	$6	$20	$7	$1	$10
Montana	$20	$2	$2	$5	$1				$28	$6	$6
Arkansas	$1	$1	$4		$4	$15					$3
North Dakota			$7		$10				$4	$0	$2
West Virginia	$3	$1	$2		$3	$1		$6			$2
Wyoming					$2	$3	$7				$1
South Dakota		$1	$1	$4			$1		$1		$1
Virgin Islands											$0
Puerto Rico											$0
Alaska											$0

Seed/Early
Seed Round
First Round

Mid+		
Second Round	Later Stage - 7th	Restart 1
Later Stage - 3rd	Later Stage - 8th	Restart 2
Later Stage - 4th	Later Stage - 9th	Restart 3
Later Stage - 5th	Later Stage - Later	Restart 4
Later Stage - 6th	Mezzanine	Restart 5

http://fis.dowjones.com/products/venturesource.html , Access to the Venture Source Data Base was Graciously Provided by Kirstie Chadwick of UCF's Venture Lab

Venture Source "rounds" as grouped by the authors. The authors choose to only include 1st and 2nd rounds as "Seed/Early" with all else defined as "Mid+" as we believe it provides the most accurate representation of the state of the "funding world".

Table 46. Dow Jones Venture Source: VC in Mid-Late Stage* by State for 2000-2009 ($ Millions)

State	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	Average. 00-08
California	$30,006	$11,562	$7,571	$6,887	$8,227	$8,469	$10,618	$11,140	$12,226	$3,612	$11,856
Massachusetts	$6,949	$3,475	$2,233	$2,274	$2,296	$2,246	$2,372	$2,810	$2,281	$976	$2,993
Texas	$4,000	$1,969	$1,106	$843	$840	$992	$1,054	$977	$876	$233	$1,406
New York	$3,699	$1,189	$643	$640	$775	$1,090	$1,163	$1,151	$1,153	$384	$1,278
Colorado	$3,108	$851	$522	$280	$300	$591	$358	$523	$785	$345	$813
Washington	$2,065	$713	$464	$322	$700	$457	$822	$1,038	$628	$330	$801
New Jersey	$1,403	$1,486	$463	$888	$653	$796	$635	$378	$449	$240	$795
Pennsylvania	$1,664	$722	$298	$452	$473	$332	$1,270	$834	$450	$192	$722
Maryland	$1,085	$964	$570	$296	$556	$283	$435	$439	$601	$60	$581
Virginia	$1,254	$735	$342	$326	$328	$374	$392	$468	$495	$99	$524
Florida	$1,221	$785	$204	$827	$204	$413	$268	$284	$199	$123	$490
Georgia	$1,185	$532	$465	$195	$272	$365	$311	$249	$266	$183	$427
North Carolina	$823	$313	$513	$264	$239	$334	$372	$654	$328	$125	$426
Minnesota	$755	$378	$372	$246	$351	$190	$504	$379	$257	$119	$381
Illinois	$813	$407	$184	$156	$201	$212	$318	$303	$370	$68	$329
Connecticut	$983	$324	$188	$133	$171	$117	$203	$151	$50	$40	$258
Utah	$369	$193	$86	$64	$158	$88	$141	$198	$314	$77	$179
Ohio	$336	$143	$150	$96	$204	$74	$177	$285	$149	$24	$179
Oregon	$532	$183	$158	$52	$90	$104	$94	$243	$121	$43	$175
New Hampshire	$410	$168	$156	$153	$96	$96	$118	$85	$183	$66	$163
Arizona	$265	$95	$128	$62	$48	$216	$115	$178	$152	$84	$140
South Carolina	$562	$179	$92	$63	$13	$4	$2	$90	$20	$1	$114
Withheld		$21	$58	$20		$19	$730	$64	$43		$106
Missouri	$135	$142	$200	$76	$91	$18	$66	$93	$39	$22	$95
Michigan	$179	$59	$71	$73	$113	$30	$129	$49	$106	$25	$90
Tennessee	$159	$47	$91	$162	$63	$64	$66	$29	$42		$80
New Mexico	$126	$65	$38	$91	$5	$63	$25	$128	$95	$1	$71
District of Columbia	$301	$138	$5	$31	$70	$6	$52	$11	$1		$68
Indiana	$123	$40	$27	$16	$42	$22	$40	$52	$153	$2	$57
Kentucky	$124		$12	$3	$40	$185		$34	$17	$93	$46
Wisconsin	$102	$57	$55	$71	$48	$44	$45	$40	$30	$4	$55
Hawaii	$224	$5		$12	$51	$92	$21	$15	$22	$7	$49
Delaware	$113	$150	$54			$5		$5		$5	$36
Rhode Island	$55	$19	$21	$47	$25	$12	$86		$37		$34
Alabama	$85	$22	$29	$26		$2	$30	$29	$23	$28	$27
Nevada	$10	$14	$5	$17	$51	$48	$5	$43		$15	$21
Nebraska	$54	$40	$40		$6		$8				$16
Kansas	$62	$19	$5	$20	$17	$0	$11	$3	$2		$15
Mississippi	$6	$23		$4		$29	$36	$18	$22		$15
Maine	$91	$10	$13	$1			$2		$2		$13
Idaho	$2		$11	$51	$14	$25		$3	$4		$12
Iowa	$2	$5	$9	$24	$5	$3	$17		$31		$11
Oklahoma		$20	$8		$19	$13	$10	$4		$3	$8
Vermont	$30	$11	$0	$0	$1	$1	$3	$12	$5	$0	$7
Montana	$19	$2	$2	$5	$1				$28		$6
Louisiana	$6	$4	$7	$3	$4	$4	$2	$8	$1	$13	$4
Arkansas	$1	$1			$4	$15					$2
West Virginia		$1	$1		$3			$6			$1
North Dakota					$10					$0	$1
Wyoming					$2	$1	$7				$1
South Dakota		$1	$1	$1			$1				$1
Alaska											$0
Virgin Islands											$0
Puerto Rico											$0

Seed/Early
Seed Round
First Round

Mid+		
Second Round	Later Stage - 7th	Restart 1
Later Stage - 3rd	Later Stage - 8th	Restart 2
Later Stage - 4th	Later Stage - 9th	Restart 3
Later Stage - 5th	Later Stage - Later	Restart 4
Later Stage - 6th	Mezzanine	Restart 5

http://fis.dowjones.com/products/venturesource.html, Access to the Venture Source Data Base was Graciously Provided by Kirstie Chadwick of UCF's Venture Lab

Venture Source "rounds" as grouped by the authors. The authors choose to only include 1st and 2nd rounds as "Seed/Early" with all else defined as "Mid+" as we believe it provides the most accurate representation of the state of the "funding world".

Table 47. Dow Jones Venture Source: VC in Early Stage* by State for 2000-2009 ($ Millions)

State	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	Average. 00-08
California	$10,260	$3,153	$1,838	$1,654	$2,002	$2,323	$2,595	$3,179	$2,319	$521	$3,258
Massachusetts	$2,681	$838	$408	$540	$507	$535	$596	$715	$677	$136	$833
New York	$2,045	$429	$132	$92	$173	$476	$538	$301	$623	$117	$534
Texas	$1,994	$633	$225	$266	$200	$200	$222	$236	$261	$59	$471
New Jersey	$1,047	$330	$174	$98	$104	$247	$94	$214	$157	$27	$274
Washington	$695	$245	$75	$125	$136	$254	$144	$298	$253	$73	$247
Pennsylvania	$758	$129	$80	$51	$250	$92	$217	$198	$182	$34	$217
Illinois	$1,016	$95	$60	$44	$68	$88	$41	$188	$122	$24	$191
Virginia	$980	$117	$43	$51	$104	$113	$110	$149	$60	$4	$192
Maryland	$682	$94	$151	$82	$106	$137	$198	$94	$86	$6	$181
Georgia	$765	$156	$79	$81	$219	$83	$60	$109	$67	$5	$180
Colorado	$664	$139	$126	$67	$65	$65	$91	$111	$123	$161	$161
North Carolina	$838	$126	$71	$38	$72	$76	$68	$114	$113	$8	$168
Florida	$476	$87	$58	$55	$83	$77	$80	$134	$16	$4	$118
Connecticut	$408	$83	$65	$66	$28	$71	$28	$87	$84	$57	$102
Minnesota	$270	$70	$52	$24	$40	$29	$47	$108	$22	$9	$74
Utah	$151	$119	$27	$12	$61	$43	$74	$47	$50	$3	$65
Oregon	$269	$23	$34	$35	$55	$20	$2	$23	$50	$11	$57
Ohio	$136	$26	$45	$43	$10	$20	$46	$60	$106	$7	$55
New Hampshire	$179	$106	$31	$12	$14	$18	$9	$40	$26		$48
Missouri	$236	$27	$11	$39	$2	$33	$56	$8	$17		$48
Tennessee	$72	$56	$46	$38	$16	$45	$6	$83	$40	$12	$45
Arizona	$150	$43	$8	$41	$4	$17	$24	$61	$47	$16	$44
Michigan	$96	$49	$3	$13	$1	$13	$39	$44	$77	$34	$37
Indiana	$56	$8	$6	$9	$22	$32	$41	$33	$9	$49	$24
Alabama	$99	$37	$9				$3	$1	$110		$29
Delaware	$175					$6		$4	$22	$2	$23
Kansas	$104	$23	$4	$2	$3			$2	$40	$5	$20
District of Columbia	$79	$17	$2	$25	$1	$13	$0	$11	$29		$20
New Mexico	$6	$12	$33	$6	$13	$21	$4	$39	$27	$3	$18
Withheld	$11				$32	$27	$12	$30	$47	$1	$18
Rhode Island	$36	$39	$18	$3	$8	$4		$4	$15	$17	$14
Wisconsin	$23	$16	$8	$3	$9	$6	$30	$15	$25		$15
Louisiana	$81	$6			$1	$19	$9	$10	$4		$14
Kentucky	$35	$23	$2	$2		$1	$8	$52	$3	$1	$14
Nevada	$10	$23	$13	$6	$25	$0		$13	$4		$10
Oklahoma	$19	$2	$30	$6	$13			$9		$4	$9
Hawaii	$7	$9	$3	$1	$4	$2	$5	$7	$27		$7
Nebraska	$32	$3	$5			$3	$5		$16		$7
South Carolina	$8	$16		$9	$4	$3		$15			$6
Iowa			$7					$3	$40	$3	$5
Maine	$17	$1		$4		$2		$3	$4	$4	$3
Mississi99i	$14	$5			$4	$6					$3
Vermont		$13	$2	$1			$3	$7	$2	$1	$3
Idaho	$7	$2		$3		$2		$10			$3
North Dakota			$7						$4		$1
Montana	$1									$6	$0
South Dakota				$4					$1		$1
West Virginia	$3		$1			$1					$0
Arkansas			$4								$0
Wyoming						$2					$0
Puerto Rico											$0
Virgin Islands											$0
Alaska											$0

Seed/Early
Seed Round
First Round

Mid+		
Second Round	Later Stage - 7th	Restart 1
Later Stage - 3rd	Later Stage - 8th	Restart 2
Later Stage - 4th	Later Stage - 9th	Restart 3
Later Stage - 5th	Later Stage - Later	Restart 4
Later Stage - 6th	Mezzanine	Restart 5

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Venture Source "rounds" as grouped by the authors. The authors choose to only include 1st and 2nd rounds as "Seed/Early" with all else defined as "Mid+" as we believe it provides the most accurate representation of the state of the "funding world".

Table 48. Angel Groups by State with Angel ITC Programs Noted from NGA Data (Circa 2007)

State	Angel ITC	# Angel Groups
CA		18
PA		10
IL		9
NC	Yes	9
MA		8
NY		7
WI	Yes	7
TX		6
FL		5
SC		4
WA		4
OH	Yes	4
MI		4
TN		3
DC		3
NH		3
AZ	Yes	3
CT		2
ID		2
KS	Yes	2
MD		2
NV		2
MT		2
OR	Yes	2
IN	Yes	2
UT		2
NJ	Yes	2
CO		2
AR		1
VA	Yes	1
GA		1
LA	Yes	1
HI	Yes	1
AL		1
KY		1
OK	Yes	1
MO		1
ME	Yes	1
VT	Yes	1
GA		1
CA		1
RI		1
NM	Yes	1
Grand Total		144

http://www.nga.org/Files/pdf/0802ANGELINVESTMENT.PDF

Table 49. State Angel Investment Tax Credits

State	Tax Credit	Rate (%)	Requirements	Span (years)	Cap	Max	Carry (years)	Claims
Hawaii	High Technology Investment Tax Credit	100	Research must be at least 50% of company activity	5	None	$2M credit per business per year	0	1999 to 2002, $36M in 887 claims with $114.4M outstanding
Oregon	University Venture Capital Funds	60		3	$14M aggregate	$50k credit per year	None	Begins in 2006
West Virginia	High Growth Business Investment Tax Credit	50	Maintain investment for 5 years	1	$2M per year for 5 years	$50k per investor; $1M investment per company	4	Began July 1, 2005
Virginia	Qualified Business Investment Credit	50	Must hold equity for 3 years	1	$3M per year prorated	$50k per investor annually	15	Over 5 years, $7.3M credited to 863 claims
Louisiana	Angel Investor Tax Credit	50	More than 50% of company sales are outside the state	5	$5M per year	$1M investment per year per business; and $2M aggregate per business	11	Began January 1, 2005
Kansas	Angel Investor Tax Credit	50	Company < $5M gross revenue and <5 years of operations	1	$2M per year and $20M over 12 years	$50k investment; 5 investments per year	0 - Transferable	Began January 1, 2006
North Dakota	Seed Capital Investment Tax Credit	45	Qualified company is principally in state and engaged in innovation or R&D	3	$2.5M per year	$250k investment per year per investor; $500k investment per business	4	2002 to 2005, $34M invested in 1088 companies by 768 claimants, $9M in credits
Maine	Seed Capital Tax Credit	40	Investment at risk for 5 years	4	$20M aggregate	50% total liability; $200k credit per investment; aggregate $5M per business	15	1992-02 $6.7M claimed at 30 percent; 2003-05 $5.4M claimed at 40 percent
Arizona	Angel Investment Tax Credit	30	Not available to those who already hold > 30% equity	3	$20M over 5 years	$250k aggregate investment per investor per year; $2M credit per business	3	Effective July 1, 2006
Wisconsin	Angel Investor Tax Credit	25	Up to $500k in equity purchases	2	$3M per year; $30M aggregate	$125k credit per investment	0	$3M in 2005; 290 investors
Ohio	Technology Investment Tax Credit	25	Business has < $2.5M in revenue	1	$20M aggregate	investment </= $250k per year; $1.5M investment per company	15	Estimated $1.3M per year
North Carolina	Qualified Business Investment Tax Credit	25	Company gross revenues < $5M in previous fiscal year	1	$6M per year; increased to $7M per year in 2004	$50k credit per year	5	$6M per year claimed in 2002 and 2003
New	Angel	25	High-tech or	1	$750,000	25 percent up to	3	Passed 2007

State	Tax Credit	Rate (%)	Requirements	Span (years)	Cap	Max	Carry (years)	Claims
Mexico	Investment Credit		manufacturing; <100 employees; <$5M gross revenue			$25,000 per company and 2 companies per year		
Oklahoma	Small Business Capital Credit	20	Company spends 50% of investment within 18 months	1	None	$500k investment per year	10	Claims: 2002 $2M; 2003 $3M; 2004 $1M
Iowa	Qualified Business Investment and Seed Capital Tax Credit	20	Credit cannot be claimed until 3 years after investment	1	$10M over 3 years	$50k credit per investment; 5 investments per year	5	$1.8M claimed thru June 2005 since inception in 2002
Indiana	Venture Capital Investment Tax Credit	20	Qualified business	1	$12.5M per year	$500k per year per company	5	Not yet recorded
Vermont	Seed Capital Fund	10	50% firm revenue from out of state	1	$2M aggregate	50% of total liability	4	Began 2005
New Jersey	High-Technology Investment Tax Credit	10	Company has <225 jobs, 75% of which are in the state	1	None	$1M credit per company; $500k credit per investor	15	Not available

http://www.nga.org/files/pdf/0802angelinvestment.pdf

Table 50. Select State Incentives for Renewable Energy, November 2009

State	Property Assessed Clean Energy (PACE)	Net Metering	Interconnection Standards
Alabama			
Alaska		25*	
Arizona		no limit*	
Arkansas		25 / 300	25/300**
California	√	1,000*	no limit
Colorado	√	no limit	10,000
Connecticut		2,000*	20,000
Delaware		25/500/2,000*	
District of Columbia		1,000	10,000
Florida	√	2,000*	2,000**
Georgia		10 / 100	10/100**
Hawaii	√	100	no limit
Idaho			
Illinois	√	40*	10,000
Indiana		10*	no limit
Iowa		500*	
Kansas		25/200*	25/200**
Kentucky		30*	30**
Louisiana	√	25 / 300	25/300**
Maine		660	
Maryland	√	2,000	10,000
Massachusetts		60/1,000/2,000*	no limit
Michigan		150*	no limit
Minnesota		40	10,000
Mississippi			
Missouri		100	100**
Montana		50*	50*
Nebraska	√	25	25**
Nevada		1,000*	20,000
New Hampshire		100	100**
New Jersey		2,000*	2,000**
New Mexico	√	80,000*	80,000
New York	√	25/500/2,000*	2,000
North Carolina	√	1,000*	no limit
North Dakota		100*	
Ohio	√	no limit*	20,000
Oklahoma	√	100*	
Oregon	√	25/2,000*	10,000
Pennsylvania		50/3,000/5,000*	5,000**
Rhode Island		1,650/2,2250/3,500*	
South Carolina			20/100
South Dakota			10,000
Tennessee			
Texas	√		10,000
Utah		25/2,000*	25/2,000**
Vermont	√	250	no limit
Virginia	√	20/500*	20,000
Washington		100	20,000
West Virginia		25	
Wisconsin	√	20*	15,000
Wyoming		25*	25**

- = No data reported. 16 states have authorized PACE legislation and 2 states (HI and FL) permit it based on existing law: CA, CO, FL, HI, IL, LA, OK, MD, NC, NM, NV, NY, OH, OR, TX, VA, VT, WI. 42 States and DC have adopted a net metering policy; * state policy applies to certain utility types only (e.g., investor-owned utilities); Net metering is voluntary in Idaho, South Carolina and Texas. ** Standard only applies to net-metered systems; numbers indicate system capacity limit in kW. Source: www.dsireusa.org

Table 51. State Public Benefits Funds for Renewables (May 2009 Estimated Funding)

State	2009 Funding	Long-Term Funding		
	Amount ($ million)	Amount ($ million)	Years	Rank
California	$ 363.70	$ 4,566.00	1998-2016	1
New Jersey	$ 78.30	$ 647.00	2001-2012	2
Massachusetts	$ 25.00	$ 524.00	1998-2017	3
Connecticut	$ 28.00	$ 444.00	2000-2017	4
Minnesota	$ 19.50	$ 327.00	1999-2017	5
Oregon	$ 13.90	$ 191.00	2001-2017	6
New York	$ 15.70	$ 114.00	1999-2011	7
Illinois	$ 3.30	$ 97.00	1998-2015	8
Wisconsin	$ 7.90	$ 90.00	2001-2017	9
Ohio	$ 3.20	$ 63.00	2001-2010	10
Pennsylvania	$ 0.95	$ 63.00	1999-2010	11
Delaware	$ 3.40	$ 48.00	1999-2017	12
Rhode Island	$ 2.20	$ 38.00	1997-2017	13
Vermont	$ 5.20	$ 33.00	2004-2011	14
Michigan	$ 6.70	$ 27.00	2001-2017	15
Montana	$ 0.75	$ 14.00	1999-2017	16
District of Columbia	$ 2.00	$ 8.80	2004-2012	17
Maine	TBD	$ 0.58	2002-2009	18
Alabama				
Alaska				
Arizona				
Arkansas				
Colorado				
Florida				
Georgia				
Hawaii				
Idaho				
Indiana				
Iowa				
Kansas				
Kentucky				
Louisiana				
Maryland				
Mississippi				
Missouri				34
Nebraska				
Nevada				
New Hampshire				
New Mexico				
North Carolina				
North Dakota				
Oklahoma				
South Carolina				
South Dakota				
Tennessee				
Texas				
Utah				
Virginia				
Washington				
West Virginia				
Wyoming				
TOTAL PBF	**$ 579.70**	**$ 7,295.38**		

- = No data reported. State PBF for Renewables: 16 states & DC: CA, CT, DE, DC, IL, ME, MA, MI, MN, MT, NJ, NY, OH, OR, PA,RI, VT,WI. Source: www.dsireusa.org

Table 52. Center for Venture Research, Angel Activity in the US 2001-2009

						Stages	
Year or Quarters	Total Angel Investment ($ billion)	Number of Ventures	Number of Active Investors	% Industrial or Energy	Job Creation	Seed and Early Capital	Mid+ Capital*
Q1Q2 2009	$9.10	24,500	140,200	13%	N/A	28%	72%
2008	$19.20	55,480	260,500	11%	N/A	46%	54%
2007	$26.00	57,120	258,200	8%	200,000	44%	56%
2006	$25.60	51,000	234,000	6%	201,400	46%	40%
2005	$23.10	49,500	227,000	6%	198,000	55%	43%
2004	$22.50	48,000	225,000	N/A	141,200	N/A	N/A
2003	$18.10	42,000	220,000	N/A	N/A	52%	35%
2002	$15.70	36,000	200,000	N/A	N/A	47%	23%
2001	$30.00	45,000	N/A	N/A	N/A	N/A	N/A
TOTAL	$189.30	408,600					
		Est. Energy		$ 2.01	Est. by Stage	$ 10.12	$ 10.28
		Est. Energy Early Stage ($B)		$ 0.92			
		Est. Energy Mid+ Stage ($B)		$ 0.93			

Source: Center for Venture Research, http://wsbe.unh.edu/cvr

* Note that due to inconsistencies in data reporting that % by stage in 2006 and earlier does not add to 100%

Table 53. State Supported VC Funds from the NASVF

All State Supported VC Funds			Pre-Seed to Early Stage Focus			Seed to Mid+ Stage Focus		
Row Labels	Capital in Millions	# of Funds	State, Focus, Year of Implementation	Capital in Millions	# of Funds	State, Focus, Year of Implementation	Capital in Millions	# of Funds
New Mexico	$536.00	2	Texas	$290.00	1	New Mexico	$536.00	2
Texas	$290.00	1	Pre-Seed to Seed			Seed to Growth		
Ohio	$212.00	2	2005	$290.00	1	1995	$400.00	1
Michigan	$204.00	2	Ohio	$212.00	2	2004	$136.00	1
Oklahoma	$107.20	2	Early Stage Focus			Michigan	$109.00	1
Utah	$106.00	2	2005	$150.00	1	Any		
Iowa	$100.00	1	Pre-Seed, Seed			2007	$109.00	1
Illinois	$83.50	3	2003	$62.00	1	Utah	$106.00	2
Indiana	$70.00	1	Michigan	$95.00	1	All Stages		
Pennsylvania	$68.00	2	Seed to Early			1986	$6.00	1
New Jersey	$65.00	1	2007	$95.00	1	Any		
Connecticut	$60.00	4	Illinois	$83.50	3	2006	$100.00	1
South Carolina	$48.00	1	Seed			Oklahoma	$100.00	1
Arkansas	$47.60	2	1984	$5.50	1	Seed to Mezzanine		
Kentucky	$46.00	2	2006	$3.00	1	1993	$100.00	1
North Dakota	$43.00	2	Early Stage Focus			Iowa	$100.00	1
Louisiana	$38.00	1	2004	$75.00	1	Seed to Later		
Massachusetts	$35.00	1	Indiana	$70.00	1	2005	$100.00	1
Hawaii	$31.00	1	Seed and Early			South Carolina	$48.00	1
Maryland	$30.00	2	2000	$70.00	1	Seed to Late Growth		
Florida	$29.50	1	Pennsylvania	$68.00	2	2007	$48.00	1
Colorado	$23.00	1	Early Stage Focus			Arkansas	$45.00	1
New York	$20.00	1	2000	$8.00	1	Seed to Later		
Georgia	$18.00	1	2006	$60.00	1	2003	$45.00	1
Minnesota	$16.00	1	New Jersey	$65.00	1	Hawaii	$31.00	1
Maine	$12.00	2	Early			Seed to Mezzanine		
Virginia	$9.00	1	2006	$65.00	1	1995	$31.00	1
Delaware	$8.00	2	Connecticut	$60.00	4	Minnesota	$16.00	1
Kansas	$7.40	1	Pre-Seed, Seed, Early			Seed to Expansion		
Rhode Island	$7.00	1	1995	$40.00	1	1998	$16.00	1
Grand Total	$2,370.20	47	1999	$16.50	1	Maine	$3.00	1
			2002	$1.50	1	Any		
			2007	$2.00	1	2000	$3.00	1
			Kentucky	$46.00	2	Delaware	$3.00	1
			Seed and Early			Any		
			2001	$21.00	1	2006	$3.00	1
			2002	$25.00	1	Grand Total	$1,097.00	13
			North Dakota	$43.00	2			
			Early Stage Focus					
			2003	$10.00	1			
			Seed to Early					
			1991	$33.00	1			
			Louisiana	$38.00	1			
			Early to Later					
			1989	$38.00	1			
			Massachusetts	$35.00	1			
			Seed to Early					
			1979	$35.00	1			
			Maryland	$30.00	2			
			Seed to Early					
			1994	$20.00	1			
			2002	$10.00	1			
			Florida	$29.50	1			
			Seed and Early					

			(blank)	$29.50	1			
			Colorado	$23.00	1			
			Seed and Early					
			2005	$23.00	1			
			New York	$20.00	1			
			Seed to Early					
			1982	$20.00	1			
			Georgia	$18.00	1			
			Seed					
			2000	$18.00	1			
			Virginia	$9.00	1			
			Seed Stage					
			2004	$9.00	1			
			Maine	$9.00	1			
			Early to Later					
			1997	$9.00	1			
			Kansas	$7.40	1			
			Seed and Early					
			2000	$7.40	1			
			Oklahoma	$7.20	1			
			Seed					
			2007	$7.20	1			
			Rhode Island	$7.00	1			
			Seed to Early Stage					
			1997	$7.00	1			
			Delaware	$5.00	1			
			Pre-Seed, Seed					
			(blank)	$5.00	1			
			Arkansas	$2.60	1			
			Seed					
			1986	$2.60	1			
			Grand Total	$1,273.20	34			

National Association of Seed and Venture Funds, http://www.nasvf.org/pdfs/VCFundsReport.pdf

Table 54. U.S. State-Supported Venture Capital Funds: National Association of Seed and Venture Funds (NASVF) March 2008

State	Investment Capital in Millions (2)	Fund of Funds	Direct Investing Fund	Year Authorized (1)	Year Began to Invest		Stages of Investment*
New Mexico	$400.0	NMIC Fund of Funds		1994	1995		Seed to Growth
Texas	$290.0		Emerging Technology Fund	2005	2005		Pre-Seed to Seed
Ohio	$150.0	Ohio Capital Fund		2005	2005		Early Stage Focus
New Mexico	$136.0		NMIC Direct Investment Program	2003	2004		Seed to Growth
Michigan	$109.0	21st Century Jobs Fund	21st Century Jobs Fund	2006	2007		Any
Iowa	$100.0	Iowa Fund of Funds		2005	2005		Seed to Later
Oklahoma	$100.0	Oklahoma Capital Investment Board		1991	1993		Seed to Mezzanine
Utah	$100.0	Utah Fund of Funds		2003	2006		Any
Michigan	$95.0	Venture Michigan Fund		2006	2007		Seed to Early
Illinois	$75.0	Technology Development Account		2002	2004		Early Stage Focus
Indiana	$70.0		21st Century Research & Technology Fund	1999	2000		Seed and Early
New Jersey	$65.0	Edison Innovation Funds	Edison Innovation Funds	2006	2006		Early
Ohio	$62.0	Third Frontier Pre-Seed Fund Initiative		2002	2003		Pre-Seed, Seed
Pennsylvania	$60.0	New PA Venture Capital Investment Program		2005	2006		Early Stage Focus
South Carolina	$48.0	South Carolina Venture Capital Fund		2007	2007		Seed to Late Growth
Arkansas	$45.0	Arkansas Institutional Fund		2001	2003		Seed to Later
Connecticut	$40.0		Eli Whitney Fund	1989	1995		Pre-Seed, Seed, Early
Louisiana	$38.0	Venture Capital Match Program		1989	1989		Early to Later
Massachusetts	$35.0		Mass. Technology Development Corporation	1978	1979		Seed to Early
North Dakota	$33.0		North Dakota Development Fund	1991	1991		Seed to Early
Hawaii	$31.0	Hawaii Strategic Development Corporation		1990	1995		Seed to Mezzanine
Florida	$29.5	Florida Opportunity Fund		2007			Seed and Early
Kentucky	$25.0		KSTC Enterprise Fund	2000	2002		Seed and Early
Colorado	$23.0	Venture Capital Authority Fund of Funds		2004	2005		Seed and Early
Kentucky	$21.0	Commonwealth Seed Capital Fund	Commonwealth Seed Capital Fund	2001	2001		Seed and Early
Maryland	$20.0		Maryland Venture Fund	1994	1994		Seed to Early
New York	$20.0		Small Business Technology Investment Fund	1981	1982		Seed to Early
Georgia	$18.0		Seed Capital Fund of	1988	2000		Seed

State	Investment Capital in Millions (2)	Fund of Funds	Direct Investing Fund	Year Authorized (1)	Year Began to Invest		Stages of Investment*
			Georgia				
Connecticut	$16.5		Biotech Facilities		1999		Pre-Seed, Seed, Early
Minnesota	$16.0	RAIN Source Capital	RAIN Source Capital	1998	1998		Seed to Expansion
Maryland	$10.0		TEDCO Fund	1998	2002		Seed to Early
North Dakota	$10.0	New Venture Capital Fund	New Venture Capital Fund	2003	2003		Early Stage Focus
Maine	$9.0		Small Enterprise Growth Fund	1996	1997		Early to Later
Virginia	$9.0		CIT Gap Fund	2003	2004		Seed Stage
Pennsylvania	$8.0	Ben Franklin (BTDA) Venture Investment Program	Ben Franklin (BTDA) Venture Investment Program	2000	2000		Early Stage Focus
Kansas	$7.4		KTEC Seed Fund	1987	2000		Seed and Early
Oklahoma	$7.2		OCAST Seed Capital Fund	1989	2007		Seed
Rhode Island	$7.0		Slater Technology Fund	1997	1997		Seed to Early Stage
Utah	$6.0		UTFC	1984	1986		All Stages
Illinois	$5.5	Finance Authority Technology Development Bridge	Finance Authority Technology Development Bridge	1983	1984		Seed
Delaware	$5.0		Emerging Technologies Pre-Venture Fund	2007			Pre-Seed, Seed
Delaware	$3.0	Venture Capital Program		2005	2006		Any
Illinois	$3.0	Illinois Equity Fund - Angel & Seed Fund		2006	2006		Seed
Maine	$3.0	Venture Capital Revolving Investing Program		2000	2000		Any
Arkansas	$2.6		Seed Capital Investing Program	1985	1986		Seed
Connecticut	$2.0		Seed Fund		2007		Pre-Seed, Seed, Early
Connecticut	$1.5		Bio-Seed Fund		2002		Pre-Seed, Seed, Early
Total Capital	$2,370.2						

1) Year authorized means the year in which the fund could have started investing. In several states, the original legislation required technical corrections. This date is when the authority was in place, including such corrections.
2) Capital = Total capital under management, meaning all monies available for investment and monies currently invested.
National Association of Seed and Venture Funds, http://www.nasvf.org/pdfs/VCFundsReport.pdf

Table 55. ARRA 09 Awards: Various Programs by State

All ARRA 09	
State	Amount
Multi	$2,747,136,237
CA	$497,540,451
MI	$474,069,924
FL	$414,142,173
TX	$361,671,480
IN	$316,320,412
PA	$295,108,001
NV	$208,402,362
MD	$206,353,504
OH	$168,207,386
MS	$163,269,680
NY	$133,912,573
LA	$121,172,851
CO	$120,075,182
ME	$96,050,000
OR	$96,048,944
AZ	$94,531,486
IL	$86,250,504
MA	$80,451,963
VT	$78,316,811
MO	$75,144,058
NM	$58,801,765
SC	$52,706,241
GA	$50,891,724
WI	$38,330,957
HI	$35,408,921
CT	$32,097,332
WA	$31,401,703
KY	$22,668,234
VA	$22,643,838
KS	$19,753,822
TN	$18,598,224
AR	$18,363,831
ID	$18,021,682
UT	$17,782,668
AK	$16,993,447
GU	$16,603,507
NJ	$16,557,234
NH	$15,815,225
WY	$12,088,248
IA	$12,023,488
DE	$9,600,000
NC	$8,477,466
NE	$7,271,994
MN	$6,774,590
OK	$5,883,818
ND	$3,467,728
WV	$1,419,593
MT	$1,228,014
DC	$1,077,500
Total	$7,406,928,776

Smart Grid 09	
State	Amount
Multi	$1,359,748,037
FL	$267,197,537
TX	$257,194,844
PA	$219,486,141
CA	$203,010,487
MD	$200,000,000
NV	$138,000,000
MI	$103,158,878
ME	$95,900,000
AZ	$89,103,844
VT	$68,928,650
LA	$45,572,851
NY	$37,382,908
GA	$35,617,687
MA	$32,056,471
MS	$30,563,967
CO	$24,244,117
IN	$22,075,080
WI	$21,525,946
VA	$20,694,097
KS	$19,753,822
GU	$16,603,507
WA	$15,825,817
NH	$15,815,225
IL	$10,994,000
OR	$9,894,450
OH	$9,731,769
KY	$9,538,234
CT	$9,188,050
TN	$8,648,491
WY	$7,588,248
HI	$5,347,598
IA	$5,000,000
NC	$3,927,899
AR	$2,357,520
NE	$2,271,994
ID	$2,171,710
MN	$1,544,004
MO	$1,527,641
Total	$3,429,191,521

Battery 09	
State	Amount
Multi	$1,044,100,000
MI	$329,600,000
IN	$270,600,000
FL	$95,500,000
SC	$50,100,000
CO	$45,100,000
PA	$40,600,000
OH	$34,100,000
OR	$21,000,000
LA	$20,600,000
AR	$12,600,000
NY	$11,300,000
VT	$9,100,000
CT	$5,000,000
Total	$1,989,300,000

Reg Smart Grid 09	
State	Amount
Multi	$259,536,851
CA	$174,589,024
OH	$75,311,246
NY	$42,777,189
TX	$27,391,797
MO	$23,940,112
MA	$7,629,592
PA	$7,245,523
NM	$1,755,931
Total	$620,177,265

Biomass 09	
State	Amount
MS	$131,134,686
IL	$52,334,592
NM	$50,000,000
FL	$50,000,000
LA	$50,000,000
CA	$45,445,849
OR	$25,000,000
TX	$25,000,000
MO	$25,000,000
HI	$25,000,000
CO	$23,000,000
PA	$21,765,738
OH	$19,980,930
MI	$17,944,902
IA	$2,500,000
Total	$564,106,697

Geothermal 09	
State	Amount
NV	$70,252,935
OR	$40,004,516
Multi	$34,360,371
TX	$25,524,879
CA	$24,481,202
AK	$16,993,447
NY	$13,711,321
CO	$12,099,922
ID	$10,190,110
TN	$9,800,000
NM	$7,045,834
IN	$6,339,591
LA	$5,000,000
NE	$5,000,000
HI	$4,911,330
WY	$4,500,000
CT	$4,414,494
MA	$3,771,546
IL	$3,659,971
ND	$3,467,728
AR	$3,256,311
MN	$2,888,018
OK	$2,883,818
UT	$2,874,020
PA	$2,795,944
MI	$2,752,163
MO	$2,476,400
SC	$2,457,741
WI	$1,805,011
MS	$1,571,027
VA	$1,499,783
NC	$1,298,625
WV	$1,269,595
MT	$1,228,014
DC	$1,077,500
FL	$250,000
OH	$232,596
NJ	$109,999
Total	$338,255,762

Adv Vehicles 09	
State	Amount
Multi	$39,471,927
NY	$28,293,284
CA	$26,276,297
TX	$25,814,251
WI	$15,000,000
WA	$14,999,927
MO	$14,999,905
IL	$14,999,658
NJ	$14,997,240
GA	$14,983,167
MI	$14,970,144
UT	$14,908,648
CT	$13,195,000
KY	$12,980,000
OH	$11,041,500
IN	$10,125,000
MD	$5,924,190
ID	$5,519,862
Total	$298,500,000

ARPA-E 09	
State	Amount
MA	$33,276,106
CA	$20,851,744
OH	$17,511,403
CO	$14,137,549
Multi	$11,919,051
DE	$9,000,000
MO	$7,200,000
IN	$6,733,386
MI	$5,195,805
AZ	$5,133,150
IA	$4,373,488
IL	$3,966,239
NC	$3,111,693
OK	$3,000,000
PA	$2,466,708
MN	$2,200,000
NJ	$1,000,000
Total	$149,076,322

SBIR/STTR 09	
State	Amount
MA	$3,718,248
CA	$2,885,848
CO	$1,493,594
FL	$1,194,636
PA	$747,947
TX	$745,709
DE	$600,000
WA	$575,959
NJ	$449,995
VA	$449,958
MI	$448,032
NY	$447,871
IN	$447,355
MD	$429,314
CT	$299,788
OH	$297,942
IL	$296,044
AZ	$294,492

All ARRA 09	Smart Grid 09	Battery 09	Geothermal 09	Adv Vehicles 09	
				GA	$290,870
				VT	$288,161
				IA	$150,000
				AR	$150,000
				KY	$150,000
				ME	$150,000
				WV	$149,998
				HI	$149,993
				OR	$149,978
				TN	$149,733
				NV	$149,427
				SC	$148,500
				MN	$142,568
				ID	$140,000
				NC	$139,249
				Total	$18,321,209

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* under the list titled, Awards

Table 56. Clean technology Investments by Year

Year	CT Investments (Millions)	Deal #	Average Inv Per Deal
1995	76.7	36	2.1
1996	156.9	46	3.4
1997	143.6	46	3.1
1998	107.3	36	3
1999	202.9	37	5.5
2000	577.8	46	12.6
2001	398.9	61	6.5
2002	388.4	65	6
2003	266.2	59	4.5
2004	444.1	79	5.6
2005	550.1	90	6.1
2006	1,439.00	139	10.4
2007	2,666.30	238	11.2
2008	4,118.90	277	14.9

http://www.nvca.org/index.php?option=com_docman&task=cat_view&gid=89&Itemid=464. Page 38

NORTH AMERICA: In 2008, U.S. companies raised $5.8 billion in 241 disclosed rounds, up 56% from 2007. US companies accounted for 68% of the global total. Canadian companies raised $159 million in 14 disclosed rounds, down 58 percent from 2007. http://Cleantech.com/about/pressreleases/010609.cfm

Figure 22. VC Investments in Florida 2001-2009

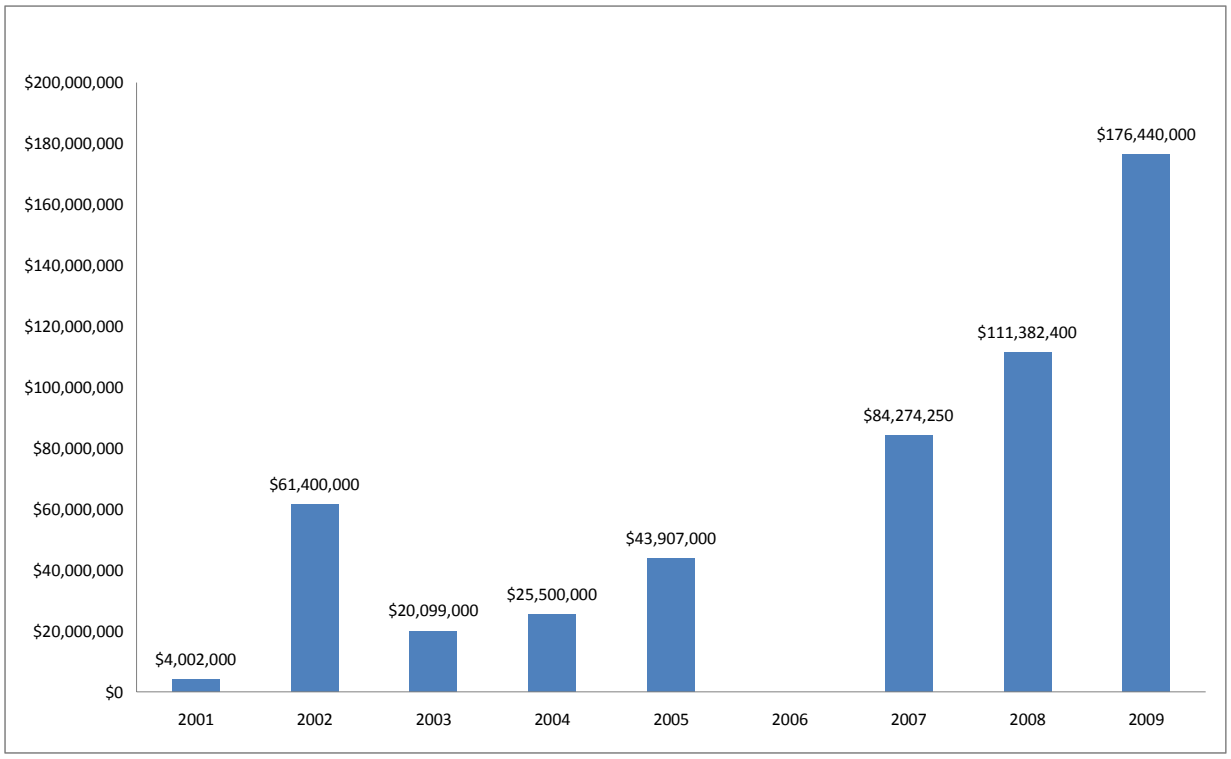

Table 57. Cleantech Network - Deal Flow from 2000-2009: All Stages of Financing and All Cleantech Industries

	2000		2001		2002		2003		2004		2005		2006		2007		2008		2009		Average	
State	Investment	#	Investment	#	Investment	#	Investment	#	Investment	#	Investment	#	Investment	#	Investment	#	Investment	#	Investment	#	Investment	#
California	$243,440,600	19	$220,010,200	23	$169,170,000	30	$302,457,000	36	$228,125,100	42	$452,787,845	55	$1,180,119,170	68	$1,862,508,000	112	$3,440,395,000	137	$2,108,435,000	118	$1,020,744,792	64
Virginia			$5,449,800	2	$7,755,000	4	$4,000,000	2	$18,600,000	4	$15,400,000	4	$52,600,000	4	$70,000,000	5	$468,400,000	7	$1,816,450,000	5	$245,865,480	3.7
Massachusetts	$74,078,900	9	$30,150,000	15	$76,650,000	11	$97,739,000	17	$96,161,400	16	$189,048,587	23	$241,288,000	25	$370,510,000	22	$451,400,000	37	$373,090,000	28	$200,011,589	20
Texas	$29,000,000	2	$4,700,000	3	$61,300,000	5	$42,870,000	9	$36,075,000	11	$57,333,000	10	$278,330,000	15	$253,816,000	20	$512,850,000	14	$284,946,775	26	$156,122,078	12
Colorado	$41,400,000	1			$9,475,000	5	$34,900,000	7	$53,532,000	9	$8,500,000	3	$54,700,000	7	$104,285,000	7	$442,300,000	14	$103,800,000	11	$85,289,200	6.4
Washington	$72,878,000	4	$3,500,000	1	$5,000,000	1	$24,700,000	6	$49,490,000	6	$23,850,000	7	$107,100,000	8	$208,780,000	18	$186,750,000	15	$73,600,000	17	$75,564,800	8.3
Pennsylvania	$19,575,000	4	$23,188,000	3	$21,574,000	5	$7,684,000	7	$4,855,100	7	$9,296,000	8	$57,575,000	8	$67,410,000	6	$189,050,000	11	$309,750,000	6	$70,995,710	6.5
New Jersey			$12,175,300	4	$804,000	2	$27,135,000	6	$27,479,900	6	$300,000	1	$59,250,000	6	$174,587,000	8	$273,640,000	9	$46,650,000	7	$62,202,120	4.9
Florida			$4,002,000	2	$61,400,000	3	$20,099,000	9	$25,500,000	2	$43,907,000	3			$84,274,250	7	$111,382,400	6	$176,440,000	8	$52,700,465	4
Illinois	$13,738,000	4	$18,000,000	3	$10,400,000	6	$18,350,000	9	$18,400,000	4	$28,150,000	8	$20,000,000	2	$250,000	2	$86,900,000	6	$265,000,000	2	$47,918,800	4.6
Connecticut	$67,099,900	4	$1,257,000	2	$13,400,000	3	$41,900,000	4	$4,250,100	1	$26,393,000	5	$5,110,000	3	$28,350,000	5	$214,700,000	4	$2,500,000	3	$40,496,000	3.4
New York	$27,275,000	8	$10,150,000	4	$52,000,000	6	$30,000,000	4	$44,550,000	5	$10,350,000	7	$35,367,471	6	$104,635,000	16	$47,700,000	12	$37,860,000	11	$39,988,747	7.9
Maryland	$5,339,000	2			$941,000	1	$6,000,000	1	$250,000	1	$26,700,000	3	$140,000,000	2	$20,250,000	2	$161,500,000	5	$7,100,000	3	$36,808,000	2
Georgia	$25,000,000	1	$32,500,000	1	$500,000	1	$28,000,000	4	$3,000,000	1	$18,200,200	6	$21,000,000	3	$48,400,000	4	$107,000,000	4	$76,550,000	3	$36,015,020	2.8
Oregon	$2,400,000	1	$22,400,000	2			$7,380,000	2	$9,000,000	1	$1,180,000	2	$11,000,000	2	$46,470,000	3	$205,000,000	3	$21,100,000	5	$32,593,000	2.1
New Hampshire	$20,200,000	1			$16,000,000	3	$20,000,000	1	$6,998,000	2	$25,111,000	1	$44,000,000	5	$1,500,000	1	$105,000,000	5	$65,000,000	3	$30,380,900	2.2
North Carolina	$39,000,200	3	$8,000,000	1	$6,400,000	1	$10,000,000	1	$15,520,000	2	$16,000,000	4	$13,000,000	2	$25,200,000	3	$13,600,000	2	$101,282,000	10	$24,800,220	2.9
New Mexico			$4,815,000	1	$15,530,000	5	$800,000	2	$10,250,000	2	$48,750,000	4	$2,888,000	2	$97,100,000	4	$44,000,000	3			$22,413,300	2.3
Ohio	$10,200,000	1	$3,100,000	1	$6,545,000	3	$17,550,000	5	$2,750,000	2	$17,255,000	5	$11,450,000	4	$15,000,000	3	$127,420,000	9	$4,750,000	5	$21,602,000	3.8
Michigan	$7,990,000	4	$31,527,000	2	$21,200,000	4	$17,200,000	2	$38,300,000	3	$21,768,100	5	$10,000,000	2	$9,000,000	1	$36,750,000	5	$7,308,888	10	$20,104,399	3.8
Arizona	$7,800,000	1			$4,500,000	1			$1,750,000	2	$780,000	1	$18,200,000	4	$41,800,000	5	$21,000,000	1	$82,039,812	9	$17,786,981	2.4
Minnesota	$0	1			$3,000,000	1	$2,442,000	2	$39,800,000	6	$16,650,000	3	$12,000,000	4	$33,500,000	3	$6,000,000	1	$33,546,051	5	$14,693,805	2.6
Iowa											$3,459,084	1	$106,000,000	3	$25,000,000	2					$13,445,908	0.6
Indiana					$35,000,000	4					$31,400,000	2					$26,000,000	1	$11,000,000	1	$10,340,000	0.8
Wisconsin	$5,500,000	1	$4,000,000	1	$17,000,000	1	$15,000,000	1	$8,600,000	1	$1,640,000	1	$20,000,000	4	$23,000,000	2	$1,500,000	1			$9,624,000	1.3
Utah					$100,000	1	$1,400,000	2	$500,000	2					$6,700,000	3	$20,000,000	3	$47,300,000	3	$7,600,000	1.4
Vermont							$12,000,000	1					$2,250,000	1	$10,000,000	1	$40,960,000	5			$6,521,000	0.8
South Carolina							$1,750,000	1					$0	1			$60,000,000	2			$6,175,000	0.4
Missouri	$1,500,000	1			$100,000	1	$3,400,000	2	$4,064,000	1	$8,700,000	2			$8,455,000	2	$15,700,000	2	$12,100,000	2	$5,401,900	1.3
Mississippi							$0	1			$15,940,782	2			$10,000,000	1	$20,000,000	1			$4,594,078	0.5
Hawaii	$6,894,000	1			$2,500,000	2					$3,500,000	1	$3,000,000	1	$0	2	$19,850,000	2			$3,574,400	0.9
Tennessee									$6,000,000	1	$7,000,000	2	$10,646,905	2	$3,775,000	1	$5,000,000	1			$3,242,191	0.7
Idaho			$1,700,000	1			$2,500,000	1	$0	1					$26,859,000	3					$3,105,900	0.6
Nevada					$4,125,000	1							$3,200,000	1	$9,425,000	3	$6,600,000	3	$7,400,000	3	$3,075,000	1.1
Arkansas															$22,000,000	2	$7,500,000	1			$2,950,000	0.3
Rhode Island									$0	1	$150,000	1					$0	1	$26,500,000	3	$2,665,000	0.6
South Dakota					$17,300,000	1													$4,000,000	1	$2,130,000	0.2
Alabama	$502,000	1															$0	1	$20,000,000	2	$2,050,200	0.4
Delaware											$5,500,000	1	$1,000,000	1	$2,190,000	1			$11,000,000	1	$1,969,000	0.4
Kansas			$3,500,100	1					$400,000	1			$12,430,000	1					$0	1	$1,633,010	0.4
Oklahoma									$5,000,000	1					$5,000,000	1			$3,000,000	1	$1,300,000	0.3
Nebraska															$9,700,000	1			$1,500,000	1	$1,120,000	0.2
Wyoming									$1,500,000	1	$3,050,000	3	$6,500,000	1							$1,105,000	0.5
Washington DC					$10,000,000	1															$1,000,000	0.1
Kentucky			$3,550,000	1			$1,500,000	1											$1,000,000	1	$605,000	0.3
Maine	$450,000	2			$500,000	1					$2,998,000	1							$2,000,000	1	$594,800	0.5
West Virginia													$1,000,000	1	$4,500,000	1			$0	1	$550,000	0.3
Montana																	$0	1			$0	0.1
Grand Total	$721,260,600	76	$447,674,400	74	$650,169,000	114	$798,756,000	146	$760,700,600	145	$1,141,047,598	185	$2,541,004,546	199	$3,834,229,250	283	$7,475,847,400	335	$6,143,998,526	317	$2,451,468,792	187

Data from the Cleantech Networks Database http://Cleantech.com/research/databases.cfm. Access to the Cleantech Network Database graciously provided by Kirstie Chadwick of the UCF Venture Lab. The 3 Headings, Environmental, Energy and Industrial were constructs of the author's that summarize the Primary Industries identified in the database as follows: **Energy, Environmental, Industrial,** Energy Efficiency, Agriculture, Manufacturing/Industrial, Energy Generation, Air & Environment, Materials, Energy Infrastructure, Non-Cleantech Focused, Transportation, Energy Storage, Recycling & Waste, Water & Wastewater, The Headings Mid + Stage Financing and Seed and Early Stage Funding are constructs of the authors' that summarize the Finance Stage identified in the database as follows: **Mid + Financing, Seed and Early,** Acquisition/Buyout. First Round, Follow-On, Seed, Mezzanine,, Other, Private Equity**.**

Table 58. Cleantech Network - Deal Flow from 2000-2009: Seed and Early Stage Funding, Energy Industries

	2000		2001		2002		2003		2004		2005		2006		2007		2008		2009		Average	

State	Investment	#	Investment	#	Investment	#	Investment	#	Investment	#	Investment	#	Investment	#	Investment	#	Investment	#	Investment	#	Investment	#
California	$9,000,000	2	$16,290,000	3	$37,020,000	10	$17,150,000	7	$27,410,000	6	$42,067,100	11	$192,370,000	22	$233,620,000	35	$271,970,000	29	$87,250,000	20	$93,414,710	15
Massachusetts	$9,148,000	3	$13,200,000	6	$32,800,000	6	$12,939,000	7	$2,128,500	5	$42,028,387	7	$22,958,000	8	$9,100,000	5	$65,500,000	16	$21,125,000	8	$23,092,689	7
Texas			$1,700,000	1	$30,000,000	2	$12,500,000	2	$6,000,000	2	$33,533,000	6			$44,819,000	5	$18,400,000	4	$54,700,000	4	$20,165,200	3
New York	$13,100,000	3			$600,000	1			$13,000,000	2	$4,850,000	5	$1,067,471	3	$74,750,000	5	$12,500,000	6	$0	3	$11,986,747	3
Colorado					$800,000	1	$12,400,000	4	$17,410,000	3	$5,000,000	1	$48,200,000	4	$4,600,000	2			$24,800,000	2	$11,321,000	2
Iowa													$100,000,000	1	$3,000,000	1					$10,300,000	0
Washington					$5,000,000	1	$16,500,000	3			$20,250,000	5	$0	1	$29,850,000	6	$12,000,000	1	$14,250,000	4	$9,785,000	2
Oregon	$2,400,000	1	$20,000,000	1			$6,000,000	1					$2,000,000	1			$50,000,000	1			$8,040,000	1
Georgia			$32,500,000	1			$15,500,000	1	$3,000,000	1	$2,000,200	1			$5,000,000	1	$15,000,000	1	$500,000	1	$7,350,020	1
Pennsylvania			$16,500,000	1	$13,000,000	2	$2,000,000	1	$539,000	1	$3,575,000	4	$17,500,000	3	$4,000,000	1	$50,000	1	$15,000,000	1	$7,216,400	2
Virginia			$5,449,800	2							$12,000,000	3	$5,000,000	1	$11,500,000	2	$18,000,000	2			$5,194,980	1
New Jersey							$13,000,000	1	$2,880,000	2					$15,000,000	2	$10,500,000	1	$5,750,000	2	$4,713,000	1
Vermont													$2,250,000	1			$37,000,000	1			$3,925,000	0
Michigan					$7,900,000	2					$1,100,000	1			$9,000,000	1	$16,500,000	2	$2,280,000	2	$3,678,000	1
Ohio			$3,100,000	1	$3,000,000	1					$2,730,000	2			$15,000,000	3	$400,000	1	$3,000,000	2	$2,723,000	1
Illinois					$4,400,000	3	$1,900,000	2	$6,100,000	2	$2,600,000	1	$10,000,000	1	$250,000	2	$0	1			$2,525,000	1
North Carolina									$3,000,000	1	$9,000,000	2			$4,700,000	1	$3,600,000	1	$3,000,000	1	$2,330,000	1
New Hampshire					$5,000,000	1							$9,000,000	2			$4,000,000	1	$4,000,000	1	$2,200,000	1
Minnesota	$0	1			$3,000,000	1	$2,275,000	1			$12,500,000	1									$1,777,500	0
South Dakota					$17,300,000	1															$1,730,000	0
Missouri											$3,000,000	1					$12,700,000	1	$300,000	1	$1,600,000	0
Rhode Island																			$15,500,000	2	$1,550,000	0
Connecticut											$500,000	1	$0	1	$10,000,000	1	$4,500,000	1			$1,500,000	0
Wisconsin	$5,500,000	1									$1,640,000	1	$7,500,000	1							$1,464,000	0
Indiana					$14,000,000	1															$1,400,000	0
Alabama																			$12,500,000	1	$1,250,000	0
Florida			$3,000,000	1	$7,000,000	1															$1,000,000	0
Idaho			$1,700,000	1											$8,000,000	1					$970,000	0
Hawaii					$2,500,000	2					$3,500,000	1	$3,000,000	1	$0	1					$900,000	1
Maryland																	$3,500,000	1	$5,000,000	1	$850,000	0
Nevada					$4,125,000	1									$750,000	1	$2,600,000	1			$747,500	0
Delaware											$5,500,000	1									$550,000	0
Oklahoma									$5,000,000	1											$500,000	0
Kentucky			$3,550,000	1																	$355,000	0
Arizona									$1,750,000	2	$780,000	1							$149,812	2	$267,981	1
Utah					$100,000	1			$500,000	1					$2,000,000	2					$260,000	0
New Mexico					$230,000	2	$800,000	2					$1,200,000	1							$223,000	1
Tennessee													$1,646,905	1							$164,691	0
Wyoming									$1,500,000	1											$150,000	0
Washington DC																					$0	0
Kansas																			$0	1	$0	0
Nebraska																					$0	0
Mississippi																					$0	0
West Virginia																					$0	0
Maine																					$0	0
Arkansas																					$0	0
South Carolina																					$0	0
Montana																					$0	0
Grand Total	$39,148,000	11	$116,989,800	19	$187,775,000	40	$112,964,000	32	$90,217,500	30	$208,153,687	56	$423,692,376	53	$484,939,000	78	$558,720,000	73	$269,104,812	59	$249,170,418	45

Data from the Cleantech Networks Database http://Cleantech.com/research/databases.cfm. Access to the Cleantech Network Database graciously provided by Kirstie Chadwick of the UCF Venture Lab. The 3 Headings, Environmental, Energy and Industrial were constructs of the author's that summarize the Primary Industries identified in the database as follows: **Energy, Environmental, Industrial,** Energy Efficiency, Agriculture, Manufacturing/Industrial, Energy Generation, Air & Environment, Materials, Energy Infrastructure, Non-Cleantech Focused, Transportation, Energy Storage, Recycling & Waste, Water & Wastewater, The Headings Mid + Stage Financing and Seed and Early Stage Funding are constructs of the authors' that summarize the Finance Stage identified in the database as follows: **Mid + Financing, Seed and Early,** Acquisition/Buyout. First Round, Follow-On, Seed, Mezzanine,, Other, Private Equity**.**

Table 59. Cleantech Network - Deal Flow from 2000-2009: Mid + Stage Financing, Energy Industry

	2000		2001		2002		2003		2004		2005		2006		2007		2008		2009		Average	
State	Investment	#	Investment	#	Investment	#	Investment	#	Investment	#	Investment	#	Investment	#	Investment	#	Investment	#	Investment	#	Investment	#
California	$177,100,100	5	$107,850,300	7	$3,075,000	2	$35,600,000	5	$83,616,000	15	$137,040,000	14	$795,100,000	27	$917,222,000	48	$2,580,500,000	65	$1,496,235,000	68	$633,333,840	26
Virginia					$755,000	1	$2,000,000	1	$16,600,000	3	$3,400,000	1	$47,600,000	3	$58,500,000	3	$450,400,000	4	$1,816,450,000	5	$239,570,500	2
Massachusetts	$57,725,900	3			$37,000,000	2	$29,475,000	1	$80,000,000	6	$102,990,200	8	$180,110,000	13	$333,340,000	14	$330,600,000	10	$270,340,000	8	$142,158,110	7

Texas	$25,000,000	1	$2,000,000	1	$24,000,000	1	$21,000,000	3	$2,800,000	1	$1,400,000	1	$154,450,000	7	$141,097,000	9	$12,250,000	2	$197,486,775	12	$58,148,378	4
Colorado	$41,400,000	1					$12,500,000	1					$3,500,000	2	$69,625,000	2	$362,500,000	9	$58,000,000	8	$54,752,500	2
Washington	$51,000,000	2					$0	1	$40,900,000	3	$3,600,000	2	$84,700,000	4	$88,630,000	6	$134,750,000	9	$49,500,000	8	$45,308,000	4
Pennsylvania							$2,770,000	2	$3,216,000	3	$5,721,000	3	$35,000,000	2	$50,310,000	4	$74,000,000	5	$264,000,000	2	$43,501,700	2
Illinois					$2,000,000	1					$15,700,000	3	$10,000,000	1			$74,500,000	3	$265,000,000	2	$36,720,000	1
New Jersey			$5,474,900	2			$11,200,000	2	$20,999,900	2	$300,000	1	$56,750,000	3	$122,865,000	4	$64,140,000	6	$40,900,000	5	$32,262,980	3
Maryland	$139,000	1			$941,000	1							$140,000,000	2	$12,500,000	1	$158,000,000	3			$31,158,000	1
Connecticut	$64,600,000	2			$5,000,000	1									$17,100,000	2	$210,200,000	3	$0	2	$29,690,000	1
Oregon							$1,380,000	1	$9,000,000	1	$1,180,000	2	$9,000,000	1	$46,470,000	3	$145,000,000	1	$15,000,000	3	$22,703,000	1
Georgia	$25,000,000	1					$8,000,000	1			$2,000,000	1	$11,000,000	1	$3,000,000	1	$92,000,000	2	$75,000,000	1	$21,600,000	1
Florida					$1,500,000	1	$18,849,000	5	$23,500,000	1	$39,500,000	2			$60,974,250	4	$33,182,400	2	$36,440,000	4	$21,394,565	2
Ohio	$10,200,000	1			$400,000	1					$13,500,000	1	$0	1			$119,300,000	5	$1,500,000	1	$14,490,000	1
New Mexico									$8,000,000	1	$30,000,000	1			$70,000,000	1	$20,000,000	1			$12,800,000	0
New Hampshire					$6,000,000	1							$30,000,000	1			$61,000,000	2	$11,000,000	1	$10,800,000	1
New York	$8,925,000	2	$4,000,000	1									$15,000,000	1	$12,520,000	3	$17,000,000	1	$37,360,000	5	$9,480,500	1
North Carolina													$0	1	$20,500,000	2			$67,000,000	5	$8,750,000	1
Michigan			$25,000,000	1	$7,600,000	1			$29,600,000	2	$7,568,000	2	$5,000,000	1			$0	1	$13	2	$7,476,801	1
Utah																	$20,000,000	1	$47,300,000	3	$6,730,000	0
Minnesota							$167,000	1	$24,800,000	5	$650,000	1	$1,000,000	1	$16,000,000	1			$22,546,051	2	$6,516,305	1
Indiana					$18,500,000	2					$31,400,000	1									$4,990,000	0
Wisconsin			$4,000,000	1	$17,000,000	1							$5,000,000	2	$21,000,000	1					$4,700,000	1
Mississippi							$0	1			$15,940,782	2			$10,000,000	1	$20,000,000	1			$4,594,078	1
Arizona	$7,800,000	1											$8,000,000	1	$8,500,000	2			$10,300,000	2	$3,460,000	1
Iowa															$22,000,000	1					$2,200,000	0
Idaho							$2,500,000	1	$0	1					$18,859,000	1					$2,135,900	0
Nevada													$3,200,000	1	$5,675,000	1	$4,000,000	2	$7,400,000	3	$2,027,500	1
Hawaii																	$19,850,000	2			$1,985,000	0
Kansas													$12,430,000	1							$1,243,000	0
Nebraska															$9,700,000	1			$1,500,000	1	$1,120,000	0
Delaware																			$11,000,000	1	$1,100,000	0
Vermont															$10,000,000	1	$760,000	3			$1,076,000	0
Washington DC					$10,000,000	1															$1,000,000	0
Wyoming											$3,050,000	3	$6,500,000	1							$955,000	0
Missouri															$8,455,000	2					$845,500	0
Alabama																	$0	1	$7,500,000	1	$750,000	0
Oklahoma															$5,000,000	1					$500,000	0
South Dakota																			$4,000,000	1	$400,000	0
Rhode Island																	$0	1			$0	0
Maine																					$0	0
South Carolina																					$0	0
West Virginia																					$0	0
Tennessee																					$0	0
Arkansas																					$0	0
Kentucky																					$0	0
Montana																					$0	0
Grand Total	$468,890,000	20	$148,325,200	13	$133,771,000	17	$145,441,000	26	$343,031,900	44	$414,939,982	49	$1,613,340,000	78	$2,159,842,250	120	$5,003,932,400	145	$4,812,757,839	156	$1,524,427,157	67

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Table 60. Cleantech Network - Deal Flow from 2000-2009: Seed and Early Stage Funding, Environmental Industries

	2000		2001		2002		2003		2004		2005		2006		2007		2008		2009		Average	
State	Investment	#	Investment	#	Investment	#	Investment	#	Investment	#	Investment	#	Investment	#	Investment	#	Investment	#	Investment	#	Investment	#
California			$1,000,000	1	$25,300,000	4	$10,500,000	2	$37,180,100	4	$28,500,000	4	$2,408,222	3	$14,550,000	4	$34,200,000	9	$22,200,000	6	$17,583,832	4
Pennsylvania	$14,400,000	2	$688,000	1	$8,574,000	3	$164,000	1			$0	1			$13,100,000	1	$53,000,000	1	$2,000,000	1	$9,192,600	1
Massachusetts			$11,150,000	3			$14,800,000	2			$14,100,000	2					$6,900,000	3	$14,500,000	2	$6,145,000	1
Washington	$4,000,000	1	$3,500,000	1			$8,200,000	2	$5,590,000	2					$25,000,000	1	$10,000,000	1			$5,629,000	1
New York	$1,500,000	1	$3,000,000	1	$34,900,000	3									$4,965,000	4			$0	1	$4,436,500	1
Indiana																	$26,000,000	1			$2,600,000	0
North Carolina	$3,000,000	1	$8,000,000	1	$6,400,000	1					$7,000,000	2									$2,440,000	1

Texas			$1,000,000	1			$3,700,000	1	$2,750,000	2							$15,700,000	2	$500,000	1	$2,365,000	1
Michigan							$6,200,000	1									$15,000,000	1	$0	2	$2,120,000	0
Illinois	$10,000,000	1			$1,000,000	1	$1,050,000	2	$5,000,000	1	$3,500,000	1									$2,055,000	1
New Mexico					$8,000,000	1					$750,000	1	$1,688,000	1	$7,100,000	1					$1,753,800	0
Colorado					$350,000	2	$10,000,000	2					$3,000,000	1			$0	1			$1,335,000	1
Vermont							$12,000,000	1													$1,200,000	0
Arizona					$4,500,000	1							$0	1					$6,590,000	1	$1,109,000	0
Florida							$500,000	2											$10,000,000	1	$1,050,000	0
Maryland							$6,000,000	1	$250,000	1	$3,500,000	1							$100,000	1	$985,000	0
Minnesota											$3,500,000	1					$6,000,000	1	$0	1	$950,000	0
Missouri	$1,500,000	1			$100,000	1	$3,400,000	2	$4,064,000	1											$906,400	1
Wisconsin													$7,500,000	1							$750,000	0
Connecticut	$2,499,900	2	$332,000	1	$400,000	1	$1,800,000	2													$503,190	1
New Hampshire					$5,000,000	1															$500,000	0
Virginia							$2,000,000	1	$2,000,000	1											$400,000	0
Kansas			$3,500,100	1					$400,000	1											$390,010	0
New Jersey			$800,000	1	$804,000	2	$1,100,000	1													$270,400	0
Kentucky							$1,500,000	1											$1,000,000	1	$250,000	0
Oregon			$2,400,000	1																	$240,000	0
Tennessee											$2,000,000	1									$200,000	0
South Carolina							$1,750,000	1													$175,000	0
Georgia					$500,000	1					$500,000	1									$100,000	0
West Virginia													$1,000,000	1							$100,000	0
Maine	$200,000	1			$500,000	1															$70,000	0
Ohio													$350,000	1					$0	1	$35,000	0
Hawaii															$0	1					$0	0
Arkansas																					$0	0
Delaware																					$0	0
Nebraska																					$0	0
Wyoming																					$0	0
Nevada																					$0	0
Utah									$0	1											$0	0
Rhode Island																					$0	0
Iowa																					$0	0
Idaho																					$0	0
Washington DC																					$0	0
South Dakota																					$0	0
Oklahoma																					$0	0
Mississippi																					$0	0
Alabama																					$0	0
Montana																					$0	0
Grand Total	$37,099,900	10	$35,370,100	13	$96,328,000	23	$84,664,000	25	$57,234,100	14	$63,350,000	15	$15,946,222	9	$64,715,000	12	$166,800,000	20	$56,890,000	19	$67,839,732	16

Data from the Cleantech Networks Database http://Cleantech.com/research/databases.cfm. Access to the Cleantech Network Database graciously provided by Kirstie Chadwick of the UCF Venture Lab. The 3 Headings, Environmental, Energy and Industrial were constructs of the author's that summarize the Primary Industries identified in the database as follows: **Energy, Environmental, Industrial,** Energy Efficiency, Agriculture, Manufacturing/Industrial, Energy Generation, Air & Environment, Materials, Energy Infrastructure, Non-Cleantech Focused, Transportation, Energy Storage, Recycling & Waste, Water & Wastewater, The Headings Mid + Stage Financing and Seed and Early Stage Funding are constructs of the authors' that summarize the Finance Stage identified in the database as follows: **Mid + Financing, Seed and Early,** Acquisition/Buyout. First Round, Follow-On, Seed, Mezzanine,, Other, Private Equity**.**

Table 61. Cleantech Network - Deal Flow from 2000-2009: Mid + Stage Funding, Environmental Industries

	2000		2001		2002		2003		2004		2005		2006		2007		2008		2009		Average	
State	Investment	#	Investment	#	Investment	#	Investment	#	Investment	#	Investment	#	Investment	#	Investment	#	Investment	#	Investment	#	Investment	#
California	$49,250,500	7	$34,769,900	8	$50,300,000	4	$110,200,000	9	$37,484,000	7	$81,382,900	9	$28,240,948	6	$217,000,000	10	$99,650,000	8	$38,000,000	5	$74,627,825	7
Texas					$1,000,000	1			$12,750,000	4	$5,000,000	1	$112,000,000	3	$48,900,000	3	$434,100,000	4	$20,000,000	4	$63,375,000	2
Florida					$52,900,000	1	$750,000	2	$2,000,000	1					$23,300,000	3	$78,200,000	4	$130,000,000	3	$28,715,000	1
Massachusetts	$1,686,000	1	$4,100,000	4	$3,250,000	2	$13,725,000	3	$10,032,900	3	$14,580,000	3	$25,000,000	2	$17,470,000	1	$28,250,000	5	$22,725,000	4	$14,081,890	3
Colorado									$30,000,000	3					$20,000,000	1	$75,900,000	2			$12,590,000	1
North Carolina	$36,000,200	2					$10,000,000	1	$12,520,000	1			$13,000,000	1			$10,000,000	1	$24,282,000	3	$10,580,220	1
New Hampshire	$20,200,000	1					$20,000,000	1	$6,998,000	2			$5,000,000	2					$50,000,000	1	$10,219,800	1
Pennsylvania	$5,000,000	1	$6,000,000	1			$750,000	2	$1,000,100	2			$675,000	2			$59,000,000	3	$28,250,000	1	$10,067,510	1
Washington	$17,878,000	1							$3,000,000	1			$10,000,000	1	$50,300,000	4	$11,500,000	1	$0	1	$9,267,800	1
Connecticut			$925,000	1			$31,600,000	1			$23,738,000	3	$5,110,000	2	$0	1			$2,500,000	1	$6,387,300	1
South Carolina																	$60,000,000	2			$6,000,000	0
Georgia											$8,700,000	2	$10,000,000	2	$40,400,000	2	$0	1			$5,910,000	1
New Mexico					$1,300,000	1					$16,000,000	1			$14,500,000	1	$19,000,000	1			$5,080,000	0
New York	$3,750,000	2	$3,150,000	2	$1,500,000	1	$1,500,000	1	$2,800,000	1			$17,300,000	1	$8,000,000	1	$10,000,000	1			$4,800,000	1
Michigan	$7,990,000	4	$6,527,000	1	$5,700,000	1	$11,000,000	1			$12,000,100	1							$1,800,000	2	$4,501,710	1
New Jersey							$335,000	1					$1,500,000	1	$36,722,000	2					$3,855,700	0
Arkansas															$22,000,000	2	$7,500,000	1			$2,950,000	0
Tennessee									$6,000,000	1	$5,000,000	1	$9,000,000	1			$5,000,000	1			$2,500,000	0
Minnesota									$15,000,000	1			$10,000,000	1							$2,500,000	0
Wisconsin							$15,000,000	1	$8,600,000	1											$2,360,000	0
Illinois							$900,000	1	$7,300,000	1	$350,000	1					$12,400,000	1			$2,095,000	0
Missouri											$5,700,000	1					$3,000,000	1	$11,800,000	1	$2,050,000	0
Maryland											$7,500,000	1			$7,750,000	1	$0	1			$1,525,000	0
Arizona													$8,000,000	1							$800,000	0
Ohio							$7,500,000	1													$750,000	0
Hawaii	$6,894,000	1																			$689,400	0
Utah							$1,000,000	1							$4,700,000	1	$0	2			$570,000	0
West Virginia															$4,500,000	1			$0	1	$450,000	0
Vermont																	$3,200,000	1			$320,000	0
Oregon																			$3,100,000	1	$310,000	0
Maine	$250,000	1																	$2,000,000	1	$225,000	0
Virginia					$2,000,000	2															$200,000	0
Indiana											$0	1									$0	0
Iowa													$0	1							$0	0
Oklahoma																					$0	0
Washington DC																					$0	0
Nebraska																					$0	0
Idaho															$0	1					$0	0
Nevada																					$0	0
Kansas																					$0	0
Rhode Island																					$0	0
Mississippi																					$0	0
Delaware																					$0	0
Wyoming																					$0	0
Kentucky																					$0	0
South Dakota																					$0	0
Alabama																					$0	0
Montana																	$0	1			$0	0
Grand Total	$148,898,700	21	$55,471,900	17	$117,950,000	13	$224,260,000	26	$155,485,000	29	$179,951,000	25	$254,825,948	27	$515,542,000	35	$916,700,000	42	$334,457,000	29	$290,354,155	26

Data from the Cleantech Networks Database http://Cleantech.com/research/databases.cfm. Access to the Cleantech Network Database graciously provided by Kirstie Chadwick of the UCF Venture Lab. The 3 Headings, Environmental, Energy and Industrial were constructs of the author's that summarize the Primary Industries identified in the database as follows: **Energy, Environmental, Industrial,** Energy Efficiency, Agriculture, Manufacturing/Industrial, Energy Generation, Air & Environment, Materials, Energy Infrastructure, Non-Cleantech Focused, Transportation, Energy Storage, Recycling & Waste, Water & Wastewater, The Headings Mid + Stage Financing and Seed and Early Stage Funding are constructs of the authors' that summarize the Finance Stage identified in the database as follows: **Mid + Financing, Seed and Early,** Acquisition/Buyout. First Round, Follow-On, Seed, Mezzanine,, Other, Private Equity**.**

Table 62. Cleantech Network - Deal Flow from 2000-2009: Seed and Early Stage Funding, Industrial Activities

	2000		2001		2002		2003		2004		2005		2006		2007		2008		2009		Average	

State	Investment	#	Investment	#	Investment	#	Investment	#	Investment	#	Investment	#	Investment	#	Investment	#	Investment	#	Investment	#	Investment	#
California	$8,090,000	4	$11,100,000	2	$14,225,000	6	$18,007,000	5	$12,800,000	4	$22,397,245	7	$7,500,000	1	$313,150,000	5	$45,775,000	6	$74,750,000	7	$52,779,425	5
Massachusetts	$2,000,000	1	$1,700,000	2	$3,600,000	1	$18,800,000	3	$0	1	$2,350,000	1	$5,220,000	1	$10,600,000	2	$3,150,000	1	$400,000	2	$4,782,000	2
New York					$15,000,000	1	$10,000,000	1	$250,000	1	$5,500,000	2	$2,000,000	1	$1,200,000	2	$3,200,000	2			$3,715,000	1
Arizona													$2,200,000	1	$33,300,000	3					$3,550,000	0
Texas	$4,000,000	1					$5,500,000	2			$11,000,000	1	$4,670,000	2					$6,000,000	2	$3,117,000	1
Michigan									$8,700,000	1	$1,100,000	1					$5,250,000	1	$3,200,000	1	$1,825,000	0
Connecticut					$8,000,000	1	$8,500,000	1							$1,250,000	1					$1,775,000	0
Minnesota													$1,000,000	2	$15,000,000	1					$1,600,000	0
Indiana					$2,500,000	1													$11,000,000	1	$1,350,000	0
New Mexico			$4,815,000	1	$6,000,000	1			$2,250,000	1											$1,306,500	0
Washington													$2,400,000	1			$8,500,000	2	$1,750,000	1	$1,265,000	0
Illinois	$3,500,000	1			$3,000,000	1	$0	2			$6,000,000	2									$1,250,000	1
Ohio					$3,145,000	1	$1,050,000	2	$750,000	1	$1,025,000	2	$4,000,000	1					$250,000	1	$1,022,000	1
Oregon																	$10,000,000	1			$1,000,000	0
Colorado					$2,125,000	1			$122,000	1					$4,860,000	1	$2,000,000	1			$910,700	0
Georgia							$4,500,000	2											$1,050,000	1	$555,000	0
Pennsylvania							$2,000,000	1	$100,000	1							$3,000,000	1			$510,000	0
New Jersey							$1,500,000	1	$2,600,000	1			$1,000,000	1							$510,000	0
Tennessee															$3,775,000	1					$377,500	0
Wisconsin															$2,000,000	1	$1,500,000	1			$350,000	0
Iowa											$3,459,084	1									$345,908	0
Oklahoma																			$3,000,000	1	$300,000	0
Maryland																			$2,000,000	1	$200,000	0
Florida			$1,002,000	1																	$100,200	0
Alabama	$502,000	1																			$50,200	0
Utah							$400,000	1													$40,000	0
Rhode Island											$150,000	1									$15,000	0
Virginia																					$0	0
Mississippi																					$0	0
Nebraska																					$0	0
Kentucky																					$0	0
New Hampshire																					$0	0
Maine																					$0	0
Washington DC																					$0	0
North Carolina																					$0	0
South Dakota																					$0	0
Idaho																					$0	0
Missouri																					$0	0
Arkansas																					$0	0
Vermont																					$0	0
Delaware																					$0	0
Wyoming																					$0	0
Hawaii																					$0	0
West Virginia																					$0	0
Nevada																					$0	0
Kansas																					$0	0
South Carolina																					$0	0
Montana																					$0	0
Grand Total	$18,092,000	8	$18,617,000	6	$57,595,000	14	$70,257,000	21	$27,572,000	12	$52,981,329	18	$29,990,000	11	$385,135,000	17	$82,375,000	16	$103,400,000	18	$84,601,433	14

Data from the Cleantech Networks Database http://Cleantech.com/research/databases.cfm. Access to the Cleantech Network Database graciously provided by Kirstie Chadwick of the UCF Venture Lab. The 3 Headings, Environmental, Energy and Industrial were constructs of the author's that summarize the Primary Industries identified in the database as follows: **Energy, Environmental, Industrial,** Energy Efficiency, Agriculture, Manufacturing/Industrial, Energy Generation, Air & Environment, Materials, Energy Infrastructure, Non-Cleantech Focused, Transportation, Energy Storage, Recycling & Waste, Water & Wastewater, The Headings Mid + Stage Financing and Seed and Early Stage Funding are constructs of the authors' that summarize the Finance Stage identified in the database as follows: **Mid + Financing, Seed and Early,** Acquisition/Buyout. First Round, Follow-On, Seed, Mezzanine,, Other, Private Equity**.**

Table 63. Cleantech Network - Deal Flow from 2000-2009: Mid + Stage Funding, Industrial Activities

	2000		2001		2002		2003		2004		2005		2006		2007		2008		2009		Average	
Row Labels	Investment	#	Investment	#	Investment	#	Investment	#	Investment	#	Investment	#	Investment	#	Investment	#	Investment	#	Investment	#	Investment	#
California			$49,000,000	2	$39,250,000	4	$111,000,000	8	$29,635,000	6	$141,400,600	10	$154,500,000	9	$166,966,000	10	$408,300,000	20	$390,000,000	12	$149,005,160	8
New Jersey			$5,900,400	1					$1,000,000	1			$0	1			$199,000,000	2			$20,590,040	1
Massachusetts	$3,519,000	1					$8,000,000	1	$4,000,000	1	$13,000,000	2	$8,000,000	1			$17,000,000	2	$44,000,000	4	$9,751,900	1

Texas					$6,300,000	1	$170,000	1	$11,775,000	2	$6,400,000	1	$7,210,000	3	$19,000,000	3	$32,400,000	2	$6,260,000	3	$8,951,500	2
Arizona																	$21,000,000	1	$65,000,000	4	$8,600,000	1
New Hampshire											$25,111,000	1			$1,500,000	1	$40,000,000	2			$6,661,100	0
New York							$18,500,000	2	$28,500,000	1					$3,200,000	1	$5,000,000	2	$500,000	2	$5,570,000	1
Colorado					$6,200,000	1			$6,000,000	2	$3,500,000	2			$5,200,000	1	$1,900,000	1	$21,000,000	1	$4,380,000	1
Washington													$10,000,000	1	$15,000,000	1	$10,000,000	1	$8,100,000	3	$4,310,000	1
Illinois	$238,000	2	$18,000,000	3			$14,500,000	2									$0	1			$3,273,800	1
Ohio							$9,000,000	2	$2,000,000	1			$7,100,000	1			$7,720,000	3			$2,582,000	1
Maryland	$5,200,000	1									$15,700,000	1									$2,090,000	0
Minnesota															$2,500,000	1			$11,000,000	2	$1,350,000	0
New Mexico											$2,000,000	1			$5,500,000	1	$5,000,000	1			$1,250,000	0
Rhode Island									$0	1									$11,000,000	1	$1,100,000	0
North Carolina																			$7,000,000	1	$700,000	0
Connecticut									$4,250,100	1	$2,155,000	1									$640,510	0
Iowa													$6,000,000	1							$600,000	0
Pennsylvania	$175,000	1											$4,400,000	1					$500,000	1	$507,500	0
Michigan													$5,000,000	1					$28,875	1	$502,888	0
Virginia					$5,000,000	1											$0	1			$500,000	0
Georgia											$5,000,000	1									$500,000	0
Florida											$4,407,000	1									$440,700	0
Delaware													$1,000,000	1	$2,190,000	1					$319,000	0
Nevada															$3,000,000	1					$300,000	0
Oregon																			$3,000,000	1	$300,000	0
Maine											$2,998,000	1									$299,800	0
Indiana																					$0	0
Oklahoma																					$0	0
West Virginia																					$0	0
Vermont																					$0	0
Kansas																					$0	0
Wyoming																					$0	0
South Carolina													$0	1							$0	0
Nebraska																					$0	0
South Dakota																					$0	0
Tennessee																					$0	0
Idaho																					$0	0
Utah																					$0	0
Kentucky																					$0	0
Arkansas																					$0	0
Hawaii																					$0	0
Washington DC																					$0	0
Mississippi																					$0	0
Wisconsin																					$0	0
Missouri																					$0	0
Alabama																					$0	0
Montana																					$0	0
Grand Total	$9,132,000	5	$72,900,400	6	$56,750,000	7	$161,170,000	16	$87,160,100	16	$221,671,600	22	$203,210,000	21	$224,056,000	21	$747,320,000	39	$567,388,875	36	$235,075,898	19

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Table 64. Levelized Cost of Energy – Key Assumptions

		Solar PV		Solar Thermal												
	Units	Thin Film Utility	Crystalline Utility(b)	Trough- No Storage(c)	Tower(d)	IGCC(e)	Gas Combined Cycle	Gas Peaking(f)	Coal(g)	Nuclear(h)	Fuel Cell(i)	Biomass Direct	Wind	Geothermal	Landfill Gas	Biomass Cofiring(J)
Net Facility Output	MW	10	10	200	100	580	550	150	600	1,100	2.3	35	100	30	5	2% -20%(k)
EPC Cost	$/kW	$3,500 - $4,000	$6,000 - $5,500	$4,500 - $5,800	$5,000 - $6,300	$2,500 -$3,375	$700 -$875	$500 -$1,150	$1,825 -$3,825	$3,750 -$5,250	$3,000	$2,750 -$3,500	$1,900 -$2,500	$3,000 -$4,000	$1,500 -$2,000	$50 -$500
Owners Cost	$/kW	included	included	included	included	$1,250 -$1,700	$200 -$225	$150 -$350	$725 -$1,525	$2,000 -$2,300	$800	included	included	included	included	included
Total Capital Cost (a)	$/kW	$3,500 - $4,000	$6,000 - $5,500	$4,500 - $5,800	$5,000 - $6,300	$3,750 -$5,075	$900 -$1,100	$650 -$1,500	$2,550 -$5,350	$5,750 -$7,550	$3,800	$2,750 -$3,500	$1,900 -$2,500	$3,000 -$4,000	$1,500 -$2,000	$50 -$500
Fixed O&M	$/kW-yr	$25.00	$25.00	$66.00	$70.00	$26.40 -$28.20	$5.50 -$6.20	$6.80 -$27.00	$20.40 -$31.60	$12.80	$169.00	$83.00	$40.00 -$50.00	—	—	$10.00 -$20.00
Variable O&M	$/MWh	—	—	—	—	$6.80	$2.00 -$3.50	$28.00 -$4.70	$2.00 -$5.60	$11.00	$11.00	$11.00	—	$25.00 -$30.00	$17.00	—
Heat Rate	Btu/kWh	—	—	—	—	8,800 -10,520	6,800 -7,220	10,880 -10,200	8,870 -11,900	10,450	6,240 -7,260	14,500	—	—	13,500	10,000
Capacity Factor	%	23% - 20%	26% -20%	29% -26%	35% - 38%	80%	85% -40%	10%	85%	90%	95%	80%	36% -28%	80% -70%	80%	80%
Fuel Price	$/MMBtu	—	—	—	—	$2.50	$8.00	$8.00	$2.50	$0.50	$8.00	$0.00 -$2.00	—	—	$1.50 -$3.00	$0.00 -$2.00
Construction Time	Months	12	12	24	24	57 -63	36	25	60 -66	69	3	36	12	36	12	12
Facility Life	Years	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20
CO2 Equivalent Emissions	Tons/MWh	—	—	—	—	0.93 -0.11	0.40 -0.42	0.40 -0.42	0.94 -0.13	—	0.36 -0.42	—	—	—	—	—
Investment Tax Credit	%	30%	30%	30%	30%	—	—	—	—	—	30%	—	—	—	—	—
Production Tax Credit	$/MWh	—	—	—	—	—	—	—	—	—	—	$10	$20	$20	$10	—
Levelized Cost of Energy	$/MWh	$96 - $124	$128 - $154	$108 - $145	$90 - $116	$104 -$134	$73 -$100	$221 -$334	$74 -$135	$98 -$126	$115 -$125	$50 -$94	$44 -$91	$42 -$69	$50 -$81	$3 -$37

Source: Lazard Presentation to NARCU Meeting. http://www.narucmeetings.org/Presentations/2008%20EMP%20Levelized%20Cost%20of%20Energy%20-%20Master%20June%202008%20(2).pdf

Note: Assumes 2.5% annual escalation for production tax credit, O&M costs and fuel prices, 40% tax rate, financing with 60% debt at 7% interest rate and 40% equity at 12% cost.

(a) Includes capitalized interest costs during construction.

(b) Left side represents single-axis tracking crystalline; right side represents fixed installation.

(c) Left side represents wet-cooled; right side represents dry-cooled.

(d) Represents a range of solar thermal tower estimates.

(e) High end incorporates 90% carbon capture and compression.

(f) Low end represents assumptions regarding GE 7FA. High end represents assumptions regarding GE LM6000PC.

(g) Based on advanced supercritical pulverized coal. High end incorporates 90% carbon capture and compression.

(h) Does not reflect potential economic impact of federal loan guarantees or other subsidies.

(i) Low end incorporates illustrative economic and efficiency benefits of combined heat and power ("CHP") applications

(j) Represents retrofit cost of host coal plant.

(k) Additional output to a coal facility.

Table 65. Science And Engineering Profiles, by State (2006–2008)

	Employed SEH doctorate holders, 2006[a]		S&E doctorates awarded, 2007		SEH post doctorates in doctorate-granting institutions, 2006		SEH graduate students in doctorate-granting institutions, 2006		Population, 2008		Civilian labor force, 2008		Personal income per capita, 2007		Total federal expenditures, 2007		Federal R&D obligations, 2006		Total R&D performance, 2006		Industry R&D, 2006		Academic R&D, 2007		SBIR awards, 2000–07		Utility patents issued to state residents, 2008		Gross domestic product, 2007	
Location	Total	Rank	Total	Rank	Total	Rank	Total	Rank	Total (000's)	Rank	Total (000's)	Rank	Total (dollars)	Rank	Total ($millions)	Rank	Total ($millions)	Rank	Total ($millions)	Rank	Total ($millions)	Rank	Total ($millions)	Rank	Total	Rank	Total	Rank	Total ($billions)	Rank
United States	620,140	–	31,801	–	49,201	–	542,073	–	308,014	–	155,366	–	38,615	–	2,532,073	–	107,545	–	335,377	–	243,853	–	49,406	–	44,157	–	77,493	–	13,832	–
California	87,370	1	4,283	1	7,550	1	52,480	1	36,757	1	18,392	1	41,805	8	260,422	1	21,157	1	71,335	1	58,424	1	6,733	1	8,818	1	19,181	1	1,813	1
Massachusetts	32,400	4	1,903	4	6,670	2	27,109	4	6,498	15	3,424	14	48,995	4	61,028	14	6,105	4	20,577	2	15,562	3	2,172	6	5,881	2	3,516	5	352	13
Michigan	17,900	12	1,163	8	1,373	9	18,885	9	10,003	8	4,936	8	34,423	34	71,652	9	1,681	19	18,189	3	16,477	2	1,510	11	937	13	2,996	6	382	12
Texas	36,000	3	2,101	3	3,189	4	37,004	3	24,327	2	11,702	2	37,083	23	171,766	2	5,264	5	17,059	4	13,334	5	3,415	3	1,936	6	5,712	2	1,142	2
New Jersey	20,810	8	686	15	692	21	12,903	14	8,683	11	4,497	11	49,511	3	63,972	13	2,111	14	16,259	5	14,606	4	864	18	1,191	10	2,722	8	465	8
Maryland	26,160	6	858	12	1,710	7	14,071	13	5,634	19	2,998	20	46,471	6	70,617	11	12,499	2	14,493	6	3,421	19	2,542	4	2,208	4	1,232	20	269	15
New York	45,850	2	2,560	2	4,182	3	48,022	2	19,490	3	9,680	3	46,364	7	157,789	3	5,225	6	14,366	7	9,518	9	3,965	2	1,826	7	4,885	3	1,103	3
Illinois	24,110	7	1,519	5	1,459	8	25,639	6	12,902	5	6,697	5	41,012	14	88,669	8	1,976	17	13,609	8	10,765	7	1,867	8	688	17	2,741	7	610	5
Washington	16,920	14	594	17	1,203	13	7,423	24	6,549	13	3,477	13	41,203	11	52,455	16	4,039	8	13,585	9	11,320	6	981	14	1,043	12	3,517	4	311	14
Pennsylvania	29,120	5	1,499	6	2,530	5	24,031	7	12,448	6	6,395	6	38,793	20	117,151	5	3,228	9	12,929	10	9,819	8	2,438	5	1,654	9	2,414	10	531	6
Virginia	19,850	10	750	14	931	17	15,605	11	7,769	12	4,125	12	41,727	9	110,105	6	8,882	3	9,867	11	4,816	15	972	15	2,574	3	1,030	22	383	11
Ohio	20,540	9	1,144	9	972	16	21,263	8	11,486	7	5,972	7	34,468	33	105,214	7	2,420	11	9,431	12	6,852	11	1,807	9	1,796	8	2,227	11	466	7
Connecticut	10,330	19	512	21	1,216	12	7,081	25	3,501	30	1,876	28	54,981	2	32,378	28	1,592	20	9,049	13	8,273	10	691	22	697	16	1,356	17	216	23
North Carolina	18,910	11	940	10	1,960	6	14,456	12	9,222	10	4,544	10	33,735	37	65,863	12	1,766	18	7,710	14	5,486	13	1,885	7	634	19	1,841	13	399	9
Minnesota	11,800	18	571	19	1,057	15	15,818	10	5,220	21	2,933	21	41,105	13	40,075	23	1,237	23	7,149	15	6,296	12	637	24	619	20	2,535	9	255	16
Florida	17,630	13	1,231	7	1,359	10	26,317	5	18,328	4	9,231	4	38,417	21	147,091	4	2,319	12	6,339	16	4,139	17	1,546	10	1,062	11	2,046	12	735	4
Colorado	13,150	16	591	18	1,099	14	10,683	19	4,939	22	2,730	22	41,192	12	34,828	27	2,030	16	6,153	17	4,657	16	873	17	2,164	5	1,622	15	236	20
New Mexico	8,300	25	193	34	105	41	4,030	34	1,984	37	959	38	30,706	47	22,418	34	3,100	10	5,789	18	676	34	410	32	672	18	280	36	76	39
Indiana	9,870	21	807	13	840	18	11,293	17	6,377	16	3,230	15	33,215	41	47,254	20	560	28	5,784	19	4,858	14	802	19	314	26	985	23	246	18
Arizona	8,410	24	564	20	495	24	8,190	21	6,500	14	3,133	16	32,833	42	48,012	18	2,056	15	4,760	20	3,590	18	783	20	816	15	1,584	16	247	17
Georgia	12,970	17	898	11	1,230	11	11,535	16	9,686	9	4,848	9	33,499	38	71,079	10	1,251	22	4,440	21	2,786	22	1,389	12	471	23	1,344	19	397	10
Wisconsin	9,530	22	650	16	781	19	9,082	20	5,628	20	3,084	17	36,272	26	38,177	24	636	26	4,132	22	3,020	21	1,067	13	455	24	1,349	18	232	21
Oregon	8,270	26	309	28	320	29	5,107	30	3,790	28	1,958	27	35,143	29	25,242	31	505	30	4,104	23	3,419	20	575	27	543	21	1,781	14	158	26
District of Columbia	13,330	15	331	27	208	35	11,641	15	592	51	333	51	62,484	1	43,475	21	4,092	7	3,762	24	276	42	327	35	113	41	68	47	94	35
Missouri	9,300	23	496	22	671	22	10,751	18	5,912	18	3,012	19	33,964	36	55,564	15	1,225	24	3,650	25	2,675	23	941	16	230	29	615	25	229	22
Alabama	5,900	28	352	25	278	31	7,858	22	4,662	23	2,162	23	32,419	43	47,889	19	2,162	13	3,300	26	1,835	25	655	23	895	14	279	37	166	25
Tennessee	9,980	20	441	23	762	20	7,813	23	6,215	17	3,041	18	33,395	39	51,456	17	1,456	21	3,263	27	1,428	28	761	21	309	27	586	26	244	19
Kansas	4,250	34	259	32	351	28	6,659	26	2,802	34	1,497	31	36,525	24	22,737	32	212	42	2,441	28	2,064	24	376	33	145	36	425	30	117	32
South Carolina	5,910	27	282	30	360	27	3,720	36	4,480	24	2,153	24	31,103	45	37,056	25	371	34	2,164	29	1,396	29	569	28	174	32	395	33	153	28
New Hampshire	2,470	43	124	39	235	32	1,776	46	1,316	42	739	41	41,639	10	9,764	44	372	33	2,121	30	1,774	26	307	36	508	22	477	28	57	43
Rhode Island	3,020	37	192	35	228	33	2,177	41	1,051	44	568	44	39,829	18	9,077	46	616	27	2,000	31	1,330	30	230	40	166	33	218	39	47	46
Utah	5,520	29	296	29	367	26	6,052	28	2,736	35	1,384	32	29,831	49	17,158	36	738	25	1,945	32	1,274	31	413	30	391	25	642	24	106	33
Iowa	4,890	32	427	24	544	23	5,479	29	3,003	31	1,676	30	34,916	32	21,649	35	497	31	1,715	33	1,055	32	587	26	116	39	561	27	129	30
Delaware	3,110	36	147	38	120	40	2,045	44	873	46	443	47	40,112	15	6,234	50	109	48	1,588	34	1,446	27	126	47	184	31	325	35	60	41
Kentucky	4,960	31	267	31	486	25	4,925	31	4,269	26	2,043	26	30,824	46	35,927	26	239	40	1,342	35	839	33	503	29	100	45	413	32	154	27
Louisiana	5,480	30	347	26	311	30	6,131	27	4,411	25	2,079	25	35,100	30	43,036	22	321	36	972	36	367	39	598	25	111	43	260	38	216	24
Idaho	2,840	40	78	46	44	47	2,141	42	1,524	40	755	40	31,804	44	10,946	43	297	38	927	37	625	35	114	49	113	41	1,162	21	51	44
Oklahoma	4,420	33	257	33	162	37	4,444	33	3,642	29	1,748	29	34,997	31	30,686	29	262	39	888	38	474	37	299	37	191	30	417	31	139	29
Nebraska	2,970	38	175	36	218	34	3,324	38	1,783	39	996	37	36,372	25	13,986	41	160	44	840	39	447	38	365	34	72	48	191	40	80	38
Nevada	2,620	42	81	44	101	42	2,554	40	2,600	36	1,373	33	39,853	17	15,474	39	422	32	792	40	535	36	189	41	130	38	375	34	127	31

	Employed SEH doctorate holders, 2006[a]		S&E doctorates awarded, 2007		SEH post doctorates in doctorate-granting institutions, 2006		SEH graduate students in doctorate-granting institutions, 2006		Population, 2008		Civilian labor force, 2008		Personal income per capita, 2007		Total federal expenditures, 2007		Federal R&D obligations, 2006		Total R&D performance, 2006		Industry R&D, 2006		Academic R&D, 2007		SBIR awards, 2000–07		Utility patents issued to state residents, 2008		Gross domestic product, 2007	
Mississippi	3,310	35	174	37	194	36	3,626	37	2,939	32	1,314	36	28,541	51	30,616	30	544	29	758	41	231	44	411	31	79	47	102	43	89	37
Arkansas	2,840	40	91	43	139	38	3,760	35	2,855	33	1,370	34	30,177	48	22,454	33	156	45	572	42	285	41	240	39	138	37	108	42	95	34
West Virginia	2,000	45	103	40	59	45	2,908	39	1,814	38	806	39	29,385	50	17,067	37	301	37	534	43	221	45	167	44	110	44	74	46	58	42
Hawaii	2,850	39	98	41	98	43	2,058	43	1,288	43	654	43	39,242	19	14,062	40	340	35	518	44	155	46	274	38	157	35	77	45	62	40
Vermont	1,690	47	45	49	79	44	757	50	621	50	355	50	37,483	22	5,579	51	106	49	493	45	360	40	115	48	114	40	437	29	25	52
Maine	2,350	44	39	51	0	51	728	51	1,316	41	707	42	33,991	35	11,850	42	226	41	450	46	253	43	137	46	161	34	113	41	48	45
North Dakota	1,380	49	79	45	39	48	1,799	45	641	49	370	48	36,082	27	6,766	49	112	47	316	47	120	47	169	43	55	49	63	48	28	51
Montana	1,990	46	68	47	135	39	1,477	47	967	45	506	45	33,225	40	8,497	47	150	46	307	48	103	48	179	42	240	28	91	44	34	48
Alaska	1,110	50	29	52	0	51	661	52	686	48	357	49	40,042	16	9,378	45	209	43	291	49	49	50	160	45	28	51	20	51	45	47
South Dakota	1,050	51	41	50	19	50	1,292	48	804	47	445	46	35,760	28	8,280	48	76	51	191	50	95	49	82	51	37	50	54	49	34	49
Wyoming	730	52	58	48	49	46	964	49	533	52	293	52	47,047	5	5,355	52	36	52	129	51	27	51	80	52	80	46	35	50	32	50
Puerto Rico	1,690	47	98	41	21	49	4,526	32	3,954	27	1,366	35	13,291	52	16,798	38	99	50	na	na	na	na	107	50	11	52	14	52	89	36

http://www.nsf.gov/statistics/nsf10302/ . †Coefficient of variation > 10% but < 25%. – = no value possible. na = not applicable; data were not collected. S&E = science and engineering; SEH = science, engineering, and health; SBIR = small business innovation research. a Doctorate holders working in U.S. territories other than Puerto Rico and those whose location is unknown are included in total but not broken out separately. Numbers are rounded to nearest 10. Detail may not add to total because of rounding.. NOTES: Ranking and totals are based on data for the 50 states, District of Columbia, and Puerto Rico. Rankings are based on unrounded totals; they do not account for margin of error of estimates from sample surveys. Employed SEH doctorate holders include only recipients of U.S. doctoral degrees. State estimates for employed SEH doctorate holders may have large sampling errors because the source for these data, the Survey of Doctorate Recipients, was not designed to provide a sample for estimates at the state level; these data are classified by the state where the doctorate holder resides, if known; otherwise, data are classified by employer's location.

Source: Prepared by the National Science Foundation/Division of Science Resources Statistics. Data compiled from numerous sources; see the section, "Data Sources for Science and Engineering State Profiles."

Table 66. Electric Energy Price by State - Revenue per Kilowatt Hour (Cents)

State	P.O. ABBR.	2005	2006	2007	3 Year Average	Volatility (StdDev)
United States	**US**	**8.14**	**8.90**	**9.13**	**8.72**	**0.52**
Hawaii	HI	18.33	20.72	21.29	20.12	1.57
New York	NY	13.95	15.27	15.22	14.81	0.75
Connecticut	CT	12.06	14.83	16.45	14.45	2.22
Massachusetts	MA	12.18	15.45	15.16	14.26	1.81
New Hampshire	NH	12.53	13.84	13.98	13.45	0.80
Rhode Island	RI	11.97	13.98	13.12	13.02	1.01
Alaska	AK	11.72	12.84	13.28	12.62	0.80
California	CA	11.63	12.82	12.80	12.42	0.68
Maine	ME	10.57	11.80	14.59	12.32	2.06
New Jersey	NJ	10.89	11.88	13.01	11.93	1.06
Vermont	VT	10.95	11.37	12.04	11.45	0.55
Delaware	DE	9.18	10.13	11.35	10.22	1.09
District of Columbia	DC	7.76	11.08	11.79	10.21	2.15
Texas	TX	9.14	10.34	10.11	9.87	0.64
Maryland	MD	8.13	9.95	11.50	9.86	1.69
Florida	FL	8.76	10.45	10.33	9.85	0.94
Nevada	NV	9.02	9.63	9.99	9.55	0.49
Pennsylvania	PA	8.27	8.68	9.08	8.68	0.41
Louisiana	LA	8.03	8.30	8.39	8.24	0.19
Arizona	AZ	7.79	8.24	8.54	8.19	0.38
Wisconsin	WI	7.48	8.13	8.48	8.03	0.50
Mississippi	MS	7.54	8.33	8.03	7.97	0.40
Michigan	MI	7.23	8.14	8.53	7.97	0.67
Colorado	CO	7.64	7.61	7.76	7.67	0.08
Georgia	GA	7.43	7.63	7.86	7.64	0.21
Ohio	OH	7.08	7.71	7.91	7.57	0.44
North Carolina	NC	7.19	7.53	7.83	7.52	0.32
Illinois	IL	6.95	7.07	8.46	7.49	0.84
New Mexico	NM	7.51	7.37	7.44	7.44	0.07
Oklahoma	OK	6.85	7.30	7.29	7.15	0.26
Alabama	AL	6.46	7.07	7.57	7.03	0.55
Minnesota	MN	6.61	6.98	7.44	7.01	0.41
South Carolina	SC	6.72	6.98	7.18	6.96	0.23
Montana	MT	6.72	6.91	7.13	6.92	0.21
Virginia	VA	6.64	6.86	7.12	6.87	0.24
Iowa	IA	6.69	7.01	6.83	6.84	0.16
Tennessee	TN	6.31	6.97	7.07	6.78	0.42
Kansas	KS	6.55	6.89	6.84	6.76	0.19
Arkansas	AR	6.30	6.99	6.96	6.75	0.39
South Dakota	SD	6.60	6.70	6.89	6.73	0.15
Oregon	OR	6.34	6.53	7.02	6.63	0.35
Missouri	MO	6.13	6.30	6.56	6.33	0.22
Indiana	IN	5.88	6.46	6.50	6.28	0.35
North Dakota	ND	5.92	6.21	6.42	6.18	0.25
Washington	WA	5.87	6.14	6.37	6.13	0.25
Utah	UT	5.92	5.99	6.41	6.11	0.26
Nebraska	NE	5.87	6.07	6.28	6.07	0.20
Kentucky	KY	5.01	5.43	5.84	5.43	0.41
Wyoming	WY	5.16	5.27	5.29	5.24	0.07
West Virginia	WV	5.15	5.04	5.34	5.18	0.15
Idaho	ID	5.12	4.92	5.07	5.04	0.10

Source: U.S. Energy Information Administration, Electric Sales and Revenue, annual..
http://www.eia.doe.gov/cneaf/electricity/esr/esr_sum.html

Table 67. EIA: State Energy Rankings September 2009

		Natural Gas Residential, Sept. 2009 (dollars/ thousand cu ft)		Electricity Residential, Sept. 2009 (cents/kWh)		Total Energy Production, 2007 (trillion Btu)		Electricity Total Net Generation, Sept. 2009 (thousand MWh)		CO^2 Emissions by the Electric Power Industry 2007 (metric tons)
1	Hawaii	44.67	Hawaii	25.49	Texas	11,341.26	Texas	33,735.76	Texas	255,092,183
2	South Carolina	27.29	Connecticut	20.31	Wyoming	10,290.49	Florida	20,651.35	Ohio	130,407,085
3	Delaware	25.83	New York	19.74	Louisiana	6,893.37	California	19,775.26	Pennsylvania	127,888,320
4	Florida	24.23	Massachusetts	17.28	West Virginia	4,145.85	Pennsylvania	16,917.35	Florida	127,662,330
5	Alabama	23.99	Alaska	17.21	Kentucky	3,040.87	Illinois	15,621.10	Indiana	121,724,872
6	Arizona	23.75	New Jersey	16.79	California	2,898.68	Alabama	12,238.65	Illinois	104,619,546
7	Georgia	23.69	Rhode Island	16.14	Pennsylvania	2,683.41	Ohio	11,300.10	Georgia	95,248,726
8	Vermont	22.69	New Hampshire	16.07	New Mexico	2,553.76	Georgia	11,040.92	Kentucky	92,320,191
9	Missouri	21.82	California	15.76	Oklahoma	2,440.75	Arizona	10,720.11	Alabama	87,344,975
10	North Carolina	21.38	Maryland	15.46	Colorado	2,335.33	New York	10,589.64	West Virginia	86,273,654
11	New Hampshire	20.39	Maine	15.38	Alaska	2,051.77	Indiana	8,893.87	Michigan	79,090,202
12	Rhode Island	20.32	Vermont	15.36	Illinois	1,951.19	Michigan	8,701.93	North Carolina	78,533,282
13	Connecticut	19.81	DC	14.48	Alabama	1,503.20	North Carolina	8,613.85	Missouri	77,131,256
14	Virginia	19.73	Delaware	14.45	Montana	1,214.89	South Carolina	8,530.82	California	62,780,179
15	Maryland	19.22	Nevada	13.27	Virginia	1,173.14	Louisiana	7,973.89	Tennessee	60,837,496
16	Pennsylvania	18.96	Michigan	12.89	Utah	1,087.45	Kentucky	7,298.58	Arizona	55,778,500
17	West Virginia	18.92	Texas	12.35	Washington	971.61	Washington	7,259.28	Louisiana	54,289,959
18	Oklahoma	18.74	Florida	12.34	Ohio	901.79	Missouri	7,084.50	New York	53,262,343
19	Oregon	18.33	Wisconsin	12.21	Indiana	885.29	Oklahoma	6,100.92	Oklahoma	51,388,701
20	DC	18	Pennsylvania	11.99	New York	873.21	Virginia	6,042.33	Wisconsin	48,842,014
21	New York	17.84	Illinois	11.48	Kansas	797.05	Tennessee	5,768.88	Virginia	46,721,552
22	Arkansas	17.7	Virginia	11.25	Michigan	757.61	New Jersey	5,432.74	Wyoming	45,705,725
23	Washington	17.35	Arizona	11.17	North Dakota	752.04	Wisconsin	5,019.34	Iowa	43,858,798
24	Ohio	17.11	Ohio	11.15	South Carolina	654.32	Mississippi	4,913.39	Colorado	42,989,936
25	Kansas	16.84	Iowa	10.99	Arkansas	588.7	Oregon	4,447.37	South Carolina	42,107,344
26	Tennessee	16.49	Georgia	10.73	Georgia	550.34	Arkansas	4,441.73	Kansas	38,926,886
27	Nevada	16.05	Alabama	10.73	Arizona	546.42	West Virginia	4,377.30	Utah	38,486,267
28	New Jersey	15.96	Colorado	10.72	North Carolina	533.73	Iowa	4,167.16	Minnesota	37,706,385
29	Texas	15.8	North Carolina	10.62	Florida	524.28	Colorado	4,120.57	North Dakota	31,985,187
30	Louisiana	15.69	Kansas	10.38	Tennessee	484.05	Minnesota	4,099.90	New Mexico	31,452,437
31	Maine	15.44	Oklahoma	10.33	Mississippi	413.32	Wyoming	3,774.28	Maryland	31,165,417
32	Massachusetts	15.41	South Carolina	10.32	Iowa	405.08	Kansas	3,735.97	Arkansas	29,852,236
33	Iowa	14.87	New Mexico	10.28	Oregon	397.43	Utah	3,658.97	Mississippi	27,764,176
34	Michigan	14.13	Mississippi	10.1	New Jersey	360.68	Massachusetts	3,382.14	Massachusetts	25,538,756
35	North Dakota	13.34	Nebraska	9.85	Nebraska	333.95	Nevada	3,250.68	Nebraska	20,645,874
36	Illinois	13.23	Minnesota	9.79	Minnesota	326.2	New Mexico	3,247.56	New Jersey	20,585,235
37	Mississippi	13.05	Arkansas	9.77	Wisconsin	278.14	Maryland	2,923.41	Montana	20,012,990
38	Nebraska	12.99	Indiana	9.74	Maryland	251.29	Nebraska	2,663.16	Nevada	16,778,142
39	Idaho	12.66	Montana	9.3	Connecticut	199.2	Connecticut	2,581.56	Washington	12,651,998
40	New Mexico	12.41	South Dakota	9.28	Maine	153.58	North Dakota	2,526.62	Oregon	10,558,882
41	South Dakota	11.72	Wyoming	9.13	Missouri	153.48	Montana	1,773.09	Connecticut	10,361,669
42	Montana	11.44	Oregon	9.1	New Hampshire	145.94	New Hampshire	1,489.35	Hawaii	8,933,935
43	Wisconsin	11.14	Missouri	9.08	South Dakota	144.29	Maine	1,263.43	Delaware	7,223,767
44	Alaska	10.89	Tennessee	9.03	Idaho	119.35	Idaho	995.38	New Hampshire	6,848,507
45	Indiana	10.82	Utah	8.93	Massachusetts	97.54	Hawaii	922.57	Maine	5,565,587
46	Colorado	10.49	North Dakota	8.69	Vermont	64.48	South Dakota	803.55	Alaska	4,301,706
47	Utah	9.6	Kentucky	8.39	Nevada	58.15	Rhode Island	682.36	South Dakota	3,019,701
48	Minnesota	9.34	Louisiana	8.17	Hawaii	18.12	Vermont	544.69	Rhode Island	2,946,005
49	California	9.1	Washington	7.98	Rhode Island	3.78	Alaska	539.8	Idaho	1,273,975
50	Wyoming	NA	West Virginia	7.96	Delaware	2.35	Delaware	432.56	DC	85,166
51	Kentucky	NA	Idaho	7.75	DC	1.09	DC	0	Vermont	9,980
	United States	**14.36**	**United States**	**12.06**	**U.S. Total:**	**71,353.31**	**U.S. Total:**	**327,069.71**	**U.S. Total:**	**2,516,580,038**

Source: http://tonto.eia.doe.gov/state/state_energy_rankings.cfm, December 24, 2009 Update.

Table 68. Energy Resources: Matrix of Applications

					Location			Dispatch			
		LEVELIZED COST OF ENERGY	CARBON NEUTRAL/ REC POTENTIAL	STATE OF TECHNOLOGY	CUSTOMER LOCATED	CENTRAL STATION	GEOGRAPHY	INTERMITTENT	PEAKING	LOAD-FOLLOWING	BASE-LOAD
Alternative Energy	FUEL CELL	$115-125	?[a]	Emerging/ Commercial	?		Universal				?
	SOLAR PV	$96-154	?	Newly Commercial	?	?	Universal	?	?		
	SOLAR THERMAL	$90-145	?	Emerging		?	Southwest	?	?	?	
	BIOMASS DIRECT	$50-94	?	Mature		?	Universal			?	?
	WIND	$44-91	?	Mature		?	Varies	?			
	GEOTHERMAL	$42-69	?	Commercial/ Evolving		?	Varies				?
	LANDFILL GAS	$50-81	?	Mature		?	Varies				?
Conventional	GAS PEAKING	$221-334	?	Mature	?	?	Universal		?		
	IGCC	$104-134	?[b]	Emerging(c)		?	Co-located or rural				?
	GAS COMBINED CYCLE	$73-100	?	Mature	?	?	Universal			?	?
	COAL	$74-135	?[b]	Mature(c)		?	Co-located or rural				?
	NUCLEAR	$98-126	?	Mature/ Emerging		?	Co-located or rural				?

(a) Qualification for RPS requirements varies by location.
(b) Could be considered carbon neutral technology, assuming carbon capture and compression.
(c) Carbon capture and compression technologies are in emerging stage.
Source: Lazard Presentation to NARCU Meeting
http://www.narucmeetings.org/Presentations/2008%20EMP%20Levelized%20Cost%20of%20Energy%20-%20Master%20June%202008%20(2).pdf
While the levelized cost of energy for Alternative Energy generation technologies is becoming increasingly competitive with conventional generation technologies, direct comparisons must take into account issues such as location (e.g., central station vs. customer-located), dispatch characteristics (e.g., base load and/or dispatchable intermediate load vs. peaking or intermittent technologies), and contingencies such as carbon pricing

Table 69. EIA, 1990 - 2007 Existing Nameplate Capacity by Energy Source and State (Sum of NAMEPLATE CAPACITY (Megawatts)) (EIA-860): Total Electric Power Industry

STATE	ENERGY SOURCE	2000	2001	2002	2003	2004	2005	2006	2007	CAGR 00-07
TX	All Sources	86,948	94,440	101,703	108,367	109,580	109,956	109,666	111,098	3.56%
	Carbon Fuels	80,577	87,095	94,191	100,663	101,801	101,665	100,338	99,964	3.13%
	Nuclear	5,139	5,139	5,139	5,139	5,139	5,139	5,139	5,139	0.00%
	Non-Hydro Renewables	572	1,546	1,712	1,889	1,964	2,477	3,518	5,324	37.53%
	Hydroelectric	661	661	661	676	676	676	673	672	0.24%
	Carbon Fuels % of Total	92.7%	92.2%	92.6%	92.9%	92.9%	92.5%	91.5%	90.0%	
CA	All Sources	54,574	57,556	59,546	62,059	62,225	66,105	67,785	68,522	3.30%
	Carbon Fuels	30,379	33,357	35,181	37,726	37,735	41,568	43,021	43,471	5.25%
	Hydroelectric	10,122	10,118	10,170	9,953	9,970	9,987	9,987	10,032	-0.13%
	Non-Hydro Renewables	9,520	9,526	9,640	9,825	9,943	9,973	10,202	10,442	1.33%
	Nuclear	4,555	4,554	4,554	4,554	4,577	4,577	4,577	4,577	0.07%
	Carbon Fuels % of Total	55.7%	58.0%	59.1%	60.8%	60.6%	62.9%	63.5%	63.4%	
FL	All Sources	45,684	47,483	52,804	55,977	57,511	60,535	60,701	63,145	4.73%
	Carbon Fuels	39,928	42,097	47,144	50,359	51,946	54,986	55,165	57,592	5.37%
	Nuclear	4,110	4,110	4,110	4,110	4,110	4,110	4,110	4,110	0.00%
	Non-Hydro Renewables	1,603	1,234	1,508	1,466	1,399	1,383	1,370	1,387	-2.05%
	Hydroelectric	42	42	42	42	56	56	56	56	4.20%
	Carbon Fuels % of Total	87.4%	88.7%	89.3%	90.0%	90.3%	90.8%	90.9%	91.2%	
IL	All Sources	39,501	44,757	49,863	51,083	47,696	48,155	48,176	48,654	3.02%
	Carbon Fuels	27,736	32,874	37,997	38,884	35,498	35,911	35,935	35,784	3.71%
	Nuclear	11,538	11,626	11,626	11,882	11,882	11,882	11,882	11,882	0.42%
	Non-Hydro Renewables	193	219	219	279	278	325	322	950	25.57%
	Hydroelectric	35	37	22	38	38	38	38	38	1.18%
	Carbon Fuels % of Total	70.2%	73.4%	76.2%	76.1%	74.4%	74.6%	74.6%	73.5%	
PA	All Sources	39,941	41,118	43,534	46,629	49,614	49,399	49,340	49,176	3.02%
	Carbon Fuels	27,797	28,843	31,212	33,959	36,944	36,637	36,634	36,317	3.89%
	Nuclear	9,589	9,600	9,600	9,860	9,860	9,860	9,860	9,860	0.40%
	Non-Hydro Renewables	1,833	1,900	1,947	2,036	2,036	2,126	2,072	2,223	2.79%
	Hydroelectric	723	775	775	775	775	775	775	775	1.00%
	Carbon Fuels % of Total	69.6%	70.1%	71.7%	72.8%	74.5%	74.2%	74.2%	73.9%	
NY	All Sources	38,092	38,934	39,482	40,007	41,159	42,826	43,134	42,769	1.67%
	Carbon Fuels	26,471	27,171	27,602	28,100	29,199	30,730	30,842	30,310	1.95%
	Nuclear	5,508	5,611	5,611	5,611	5,611	5,611	5,611	5,708	0.51%
	Hydroelectric	4,419	4,472	4,564	4,602	4,651	4,648	4,648	4,654	0.74%
	Non-Hydro Renewables	1,693	1,680	1,705	1,695	1,698	1,838	2,033	2,098	3.11%
	Carbon Fuels % of Total	69.5%	69.8%	69.9%	70.2%	70.9%	71.8%	71.5%	70.9%	
GA	All Sources	29,427	31,605	37,176	37,626	38,498	39,792	39,758	39,767	4.40%
	Carbon Fuels	21,552	23,817	29,096	29,746	30,351	31,644	31,611	31,447	5.55%
	Nuclear	4,042	4,042	4,042	4,042	4,042	4,042	4,042	4,042	0.00%
	Hydroelectric	2,215	2,216	2,216	2,016	1,931	1,932	1,932	1,932	-1.93%
	Non-Hydro Renewables	1,618	1,530	1,823	1,823	2,175	2,175	2,175	2,347	5.46%
	Carbon Fuels % of Total	73.2%	75.4%	78.3%	79.1%	78.8%	79.5%	79.5%	79.1%	
OH	All Sources	30,512	31,969	34,208	36,900	36,976	36,725	36,688	36,707	2.68%
	Carbon Fuels	27,968	29,424	31,667	34,357	34,415	34,214	34,110	34,092	2.87%
	Nuclear	2,178	2,178	2,178	2,178	2,237	2,237	2,237	2,237	0.38%
	Non-Hydro Renewables	196	196	193	197	197	147	213	251	3.60%
	Hydroelectric	171	171	171	169	128	128	128	128	-4.05%
	Carbon Fuels % of Total	91.7%	92.0%	92.6%	93.1%	93.1%	93.2%	93.0%	92.9%	
MI	All Sources	28,215	29,309	32,056	33,280	33,370	33,358	32,979	33,037	2.28%
	Carbon Fuels	21,115	22,222	25,037	26,273	26,298	26,272	25,894	25,950	2.99%
	Nuclear	4,251	4,251	4,251	4,251	4,314	4,314	4,314	4,314	0.21%
	Non-Hydro Renewables	2,479	2,476	2,406	2,384	2,384	2,389	2,389	2,400	-0.46%
	Hydroelectric	371	361	363	373	375	384	383	374	0.12%
	Carbon Fuels % of Total	74.8%	75.8%	78.1%	78.9%	78.8%	78.8%	78.5%	78.5%	
AL	All Sources	25,307	25,428	28,577	32,831	33,248	33,228	33,228	33,230	3.97%
	Carbon Fuels	16,501	16,741	19,784	23,829	24,050	23,986	23,960	23,947	5.46%
	Nuclear	5,271	5,270	5,270	5,270	5,270	5,270	5,270	5,270	0.00%
	Hydroelectric	2,961	2,959	2,959	3,159	3,261	3,280	3,280	3,280	1.47%
	Non-Hydro Renewables	575	457	563	572	667	692	718	733	3.53%
	Carbon Fuels % of Total	65.2%	65.8%	69.2%	72.6%	72.3%	72.2%	72.1%	72.1%	
NC	All Sources	25,986	27,780	28,538	29,342	29,023	29,013	29,022	29,654	1.90%
	Carbon Fuels	18,648	20,366	21,108	21,910	21,592	21,539	21,515	22,143	2.48%
	Nuclear	5,182	5,182	5,182	5,182	5,182	5,182	5,182	5,182	0.00%
	Hydroelectric	1,819	1,826	1,826	1,828	1,828	1,828	1,828	1,828	0.07%

STATE	ENERGY SOURCE	2000	2001	2002	2003	2004	2005	2006	2007	CAGR 00-07
	Non-Hydro Renewables	337	407	422	422	422	466	498	502	5.86%
	Carbon Fuels % of Total	71.8%	73.3%	74.0%	74.7%	74.4%	74.2%	74.1%	74.7%	
LA	All Sources	23,714	24,630	28,832	29,088	30,033	29,906	30,108	30,158	3.49%
	Carbon Fuels	20,831	21,812	26,069	26,326	27,060	26,791	26,797	26,788	3.66%
	Nuclear	2,236	2,236	2,236	2,236	2,236	2,236	2,236	2,236	0.00%
	Non-Hydro Renewables	454	391	334	334	546	688	884	943	11.01%
	Hydroelectric	192	192	192	192	192	192	192	192	0.00%
	Carbon Fuels % of Total	87.8%	88.6%	90.4%	90.5%	90.1%	89.6%	89.0%	88.8%	
WA	All Sources	25,719	26,211	26,798	27,522	27,776	28,011	28,351	28,720	1.59%
	Hydroelectric	20,697	20,692	20,702	20,704	20,627	20,660	20,677	20,807	0.08%
	Carbon Fuels	3,153	3,478	4,049	4,671	5,003	5,055	4,950	4,886	6.46%
	Nuclear	1,200	1,200	1,200	1,200	1,200	1,200	1,200	1,200	0.00%
	Non-Hydro Renewables	670	841	846	948	946	1,096	1,524	1,828	15.42%
	Carbon Fuels % of Total	12.3%	13.3%	15.1%	17.0%	18.0%	18.0%	17.5%	17.0%	
AZ	All Sources	16,697	18,347	21,531	26,187	27,259	28,007	28,741	28,730	8.06%
	Carbon Fuels	9,598	11,243	14,423	19,065	20,134	20,868	21,602	21,591	12.28%
	Nuclear	4,210	4,209	4,209	4,209	4,209	4,209	4,209	4,209	0.00%
	Hydroelectric	2,702	2,702	2,699	2,705	2,709	2,718	2,718	2,718	0.08%
	Non-Hydro Renewables	190	194	200	207	207	211	211	211	1.51%
	Carbon Fuels % of Total	57.5%	61.3%	67.0%	72.8%	73.9%	74.5%	75.2%	75.2%	
VA	All Sources	20,854	22,047	21,919	23,041	24,497	24,431	24,415	25,270	2.78%
	Carbon Fuels	13,502	14,655	14,506	15,616	17,075	17,009	16,994	17,023	3.37%
	Nuclear	3,655	3,654	3,654	3,654	3,654	3,654	3,654	3,654	0.00%
	Non-Hydro Renewables	2,955	2,999	3,019	3,030	3,028	3,028	3,026	3,851	3.86%
	Hydroelectric	743	740	740	740	740	740	740	741	-0.04%
	Carbon Fuels % of Total	64.7%	66.5%	66.2%	67.8%	69.7%	69.6%	69.6%	67.4%	
SC	All Sources	19,925	20,914	21,761	22,258	24,117	24,155	24,500	25,078	3.34%
	Carbon Fuels	9,424	10,415	11,262	11,749	13,568	13,558	13,892	14,460	6.31%
	Nuclear	6,799	6,799	6,799	6,799	6,799	6,799	6,799	6,799	0.00%
	Non-Hydro Renewables	2,435	2,435	2,435	2,438	2,438	2,444	2,455	2,455	0.12%
	Hydroelectric	1,266	1,265	1,265	1,271	1,311	1,353	1,353	1,363	1.06%
	Carbon Fuels % of Total	47.3%	49.8%	51.8%	52.8%	56.3%	56.1%	56.7%	57.7%	
TN	All Sources	21,989	22,647	23,021	23,036	23,063	22,969	23,006	22,962	0.62%
	Carbon Fuels	14,262	14,894	15,250	15,265	15,265	15,162	15,162	15,099	0.82%
	Nuclear	3,711	3,711	3,711	3,711	3,711	3,711	3,711	3,711	0.00%
	Hydroelectric	2,420	2,418	2,418	2,418	2,418	2,418	2,418	2,418	-0.01%
	Non-Hydro Renewables	1,595	1,623	1,642	1,642	1,669	1,678	1,715	1,735	1.21%
	Carbon Fuels % of Total	64.9%	65.8%	66.2%	66.3%	66.2%	66.0%	65.9%	65.8%	
MO	All Sources	18,556	20,534	21,563	21,623	21,689	22,075	22,109	22,195	2.59%
	Carbon Fuels	16,221	18,199	19,227	19,287	19,354	19,739	19,770	19,800	2.89%
	Nuclear	1,236	1,236	1,236	1,236	1,236	1,236	1,236	1,236	0.00%
	Non-Hydro Renewables	601	600	600	600	600	600	603	660	1.35%
	Hydroelectric	499	499	499	499	499	499	499	499	0.00%
	Carbon Fuels % of Total	87.4%	88.6%	89.2%	89.2%	89.2%	89.4%	89.4%	89.2%	
NJ	All Sources	18,452	17,729	20,235	20,481	19,876	19,401	20,511	20,154	1.27%
	Carbon Fuels	13,567	13,517	15,382	15,606	14,989	14,515	15,588	15,228	1.66%
	Nuclear	4,151	3,510	4,151	4,151	4,151	4,151	4,151	4,151	0.00%
	Non-Hydro Renewables	721	689	689	711	722	722	760	765	0.85%
	Hydroelectric	13	13	13	13	14	14	13	13	0.00%
	Carbon Fuels % of Total	73.5%	76.2%	76.0%	76.2%	75.4%	74.8%	76.0%	75.6%	
WI	All Sources	13,765	14,503	14,639	14,661	15,143	16,762	16,949	16,976	3.04%
	Carbon Fuels	11,499	12,125	12,245	12,286	12,696	14,293	14,468	14,472	3.34%
	Nuclear	1,583	1,583	1,583	1,583	1,583	1,608	1,608	1,608	0.22%
	Hydroelectric	505	510	513	500	500	507	506	505	0.00%
	Non-Hydro Renewables	178	286	299	294	364	356	367	392	11.94%
	Carbon Fuels % of Total	83.5%	83.6%	83.6%	83.8%	83.8%	85.3%	85.4%	85.2%	
MA	All Sources	13,263	12,970	13,463	15,697	15,718	15,740	15,690	15,299	2.06%
	Carbon Fuels	10,511	10,240	10,651	12,844	12,872	12,889	12,841	12,442	2.44%
	Non-Hydro Renewables	1,823	1,801	1,883	1,918	1,906	1,911	1,911	1,917	0.72%
	Nuclear	670	670	670	670	670	670	670	670	0.00%
	Hydroelectric	259	259	259	266	270	270	268	272	0.70%
	Carbon Fuels % of Total	79.3%	79.0%	79.1%	81.8%	81.9%	81.9%	81.8%	81.3%	
AR	All Sources	10,174	10,622	11,916	14,472	14,472	14,967	15,377	16,462	7.12%
	Carbon Fuels	6,618	7,102	8,367	10,921	10,921	11,415	11,821	12,905	10.01%
	Nuclear	1,845	1,845	1,845	1,845	1,845	1,845	1,845	1,845	0.00%
	Hydroelectric	1,315	1,314	1,309	1,309	1,309	1,309	1,309	1,309	-0.07%
	Non-Hydro Renewables	397	362	397	399	399	399	403	403	0.21%

STATE	ENERGY SOURCE	2000	2001	2002	2003	2004	2005	2006	2007	CAGR 00-07
	Carbon Fuels % of Total	65.0%	66.9%	70.2%	75.5%	75.5%	76.3%	76.9%	78.4%	
MD	All Sources	11,286	12,633	12,653	13,363	13,382	13,382	13,383	13,442	2.53%
	Carbon Fuels	8,656	9,984	10,002	10,774	10,792	10,792	10,792	10,815	3.23%
	Nuclear	1,829	1,829	1,829	1,829	1,829	1,829	1,829	1,829	0.00%
	Hydroelectric	494	494	494	494	494	494	494	527	0.93%
	Non-Hydro Renewables	308	327	327	266	267	267	267	273	-1.71%
	Carbon Fuels % of Total	76.7%	79.0%	79.0%	80.6%	80.6%	80.6%	80.6%	80.5%	
MN	All Sources	10,661	11,620	12,017	12,146	12,230	12,957	13,533	13,984	3.95%
	Carbon Fuels	8,067	9,035	9,413	9,384	9,412	9,976	10,428	10,460	3.78%
	Nuclear	1,737	1,737	1,737	1,737	1,737	1,737	1,737	1,737	0.00%
	Non-Hydro Renewables	650	663	681	839	894	1,058	1,184	1,601	13.74%
	Hydroelectric	207	186	186	186	186	186	186	186	-1.52%
	Carbon Fuels % of Total	75.7%	77.8%	78.3%	77.3%	77.0%	77.0%	77.1%	74.8%	
IA	All Sources	9,559	9,790	9,940	10,691	11,643	11,898	12,008	13,389	4.93%
	Carbon Fuels	8,618	8,636	8,687	9,394	10,283	10,340	10,343	11,394	4.07%
	Non-Hydro Renewables	207	426	524	570	633	830	936	1,185	28.31%
	Nuclear	597	597	597	597	597	597	597	680	1.88%
	Hydroelectric	137	131	131	131	131	131	131	131	-0.64%
	Carbon Fuels % of Total	90.2%	88.2%	87.4%	87.9%	88.3%	86.9%	86.1%	85.1%	
CT	All Sources	6,932	8,440	8,127	8,237	8,694	8,739	8,681	8,561	3.06%
	Carbon Fuels	4,355	5,230	5,558	5,668	6,127	6,171	6,113	5,997	4.68%
	Nuclear	2,163	2,804	2,163	2,163	2,163	2,163	2,163	2,163	0.00%
	Non-Hydro Renewables	269	261	264	264	263	263	263	284	0.78%
	Hydroelectric	144	145	142	142	142	142	143	119	-2.69%
	Carbon Fuels % of Total	62.8%	62.0%	68.4%	68.8%	70.5%	70.6%	70.4%	70.1%	
NE	All Sources	6,146	6,266	6,279	7,012	7,126	7,493	7,497	7,422	2.73%
	Carbon Fuels	4,619	4,738	4,741	5,364	5,476	5,784	5,785	5,712	3.08%
	Nuclear	1,338	1,338	1,338	1,303	1,303	1,303	1,303	1,303	-0.38%
	Hydroelectric	183	183	191	325	327	327	327	327	8.65%
	Non-Hydro Renewables	7	9	11	21	21	81	83	81	41.88%
	Carbon Fuels % of Total	75.2%	75.6%	75.5%	76.5%	76.8%	77.2%	77.2%	77.0%	
NH	All Sources	3,007	3,014	3,620	4,530	4,553	4,553	4,553	4,494	5.91%
	Carbon Fuels	1,164	1,177	1,782	2,692	2,711	2,712	2,662	2,616	12.26%
	Nuclear	1,242	1,242	1,242	1,242	1,242	1,242	1,242	1,242	0.00%
	Hydroelectric	447	447	447	447	447	445	445	445	-0.06%
	Non-Hydro Renewables	155	148	148	148	153	153	203	190	2.95%
	Carbon Fuels % of Total	38.7%	39.1%	49.2%	59.4%	59.5%	59.6%	58.5%	58.2%	
VT	All Sources	1,098	1,089	1,087	1,094	1,094	1,094	1,095	1,090	-0.10%
	Nuclear	563	563	563	563	563	563	563	563	0.00%
	Hydroelectric	309	302	302	299	299	299	299	300	-0.42%
	Carbon Fuels	144	142	140	140	140	140	141	136	-0.81%
	Non-Hydro Renewables	82	82	82	91	91	91	91	91	1.50%
	Carbon Fuels % of Total	13.1%	13.0%	12.9%	12.8%	12.8%	12.8%	12.9%	12.5%	
UT	All Sources	5,476	5,567	6,182	6,252	6,491	6,862	7,075	7,521	4.64%
	Carbon Fuels	5,157	5,268	5,882	5,953	6,144	6,572	6,751	7,215	4.91%
	Hydroelectric	279	260	262	262	262	262	262	262	-0.89%
	Non-Hydro Renewables	42	39	39	39	85	28	63	43	0.34%
	Carbon Fuels % of Total	94.2%	94.6%	95.1%	95.2%	94.7%	95.8%	95.4%	95.9%	
	Nuclear									
ID	All Sources	2,850	3,286	3,307	3,327	3,329	3,459	3,526	3,518	3.05%
	Hydroelectric	2,483	2,479	2,499	2,520	2,521	2,521	2,523	2,516	0.19%
	Carbon Fuels	218	666	666	666	666	786	786	786	20.11%
	Non-Hydro Renewables	149	142	142	142	142	153	217	217	5.52%
	Carbon Fuels % of Total	7.6%	20.3%	20.1%	20.0%	20.0%	22.7%	22.3%	22.3%	
	Nuclear									
DE	All Sources	2,602	2,591	3,528	3,624	3,612	3,520	3,527	3,525	4.43%
	Carbon Fuels	2,286	2,591	3,204	3,299	3,287	3,195	3,195	3,193	4.89%
	Non-Hydro Renewables	316	-	324	324	324	324	331	331	0.66%
	Carbon Fuels % of Total	87.9%	100.0%	90.8%	91.0%	91.0%	90.8%	90.6%	90.6%	
	Nuclear									
	Hydroelectric									
WY	All Sources	6,532	6,673	6,743	6,970	6,970	7,087	7,087	7,036	1.07%
	Carbon Fuels	6,137	6,238	6,306	6,389	6,375	6,381	6,381	6,331	0.45%
	Hydroelectric	288	293	296	296	299	299	299	299	0.54%
	Non-Hydro Renewables	108	141	141	285	297	407	407	407	20.87%
	Carbon Fuels % of Total	94.0%	93.5%	93.5%	91.7%	91.5%	90.0%	90.0%	90.0%	
	Nuclear									

STATE	ENERGY SOURCE	2000	2001	2002	2003	2004	2005	2006	2007	CAGR 00-07
ND	All Sources	4,892	4,882	4,866	4,989	5,029	5,060	5,129	5,346	1.28%
	Carbon Fuels	4,357	4,347	4,331	4,331	4,333	4,333	4,333	4,332	-0.08%
	Hydroelectric	517	517	517	576	614	614	614	614	2.49%
	Non-Hydro Renewables	18	18	18	82	82	114	182	401	55.79%
	Carbon Fuels % of Total	89.1%	89.0%	89.0%	86.8%	86.2%	85.6%	84.5%	81.0%	
	Nuclear									
AK	All Sources	2,328	2,278	2,244	2,126	2,016	2,035	2,049	2,163	-1.04%
	Carbon Fuels	1,936	1,879	1,844	1,726	1,622	1,631	1,648	1,763	-1.33%
	Hydroelectric	392	400	400	400	393	395	398	398	0.22%
	Carbon Fuels % of Total	83.2%	82.5%	82.2%	81.2%	80.5%	80.1%	80.4%	81.5%	
	Nuclear									
	Non-Hydro Renewables	-	-	-	1	1	10	3	3	
OR	All Sources	10,673	11,370	12,274	12,747	12,621	12,740	12,859	13,802	3.74%
	Hydroelectric	8,261	8,240	8,211	8,235	8,236	8,242	8,261	8,261	0.00%
	Carbon Fuels	2,152	2,779	3,686	4,046	3,923	3,915	3,915	4,299	10.39%
	Non-Hydro Renewables	261	353	378	466	463	583	683	1,242	24.96%
	Carbon Fuels % of Total	20.2%	24.4%	30.0%	31.7%	31.1%	30.7%	30.4%	31.1%	
	Nuclear									
KS	All Sources	10,788	11,096	11,210	11,653	11,746	11,904	12,056	12,200	1.77%
	Carbon Fuels	9,550	9,746	9,860	10,301	10,394	10,403	10,454	10,598	1.50%
	Nuclear	1,236	1,236	1,236	1,236	1,236	1,236	1,236	1,236	0.00%
	Hydroelectric	3	2	2	3	3	3	3	3	0.00%
	Carbon Fuels % of Total	88.5%	87.8%	88.0%	88.4%	88.5%	87.4%	86.7%	86.9%	
	Non-Hydro Renewables	-	112	112	113	113	263	363	363	
RI	All Sources	1,385	1,387	1,985	2,011	2,016	2,022	2,024	2,022	5.55%
	Carbon Fuels	1,365	1,365	1,963	1,989	1,995	1,992	1,994	1,992	5.55%
	Non-Hydro Renewables	15	17	17	17	17	26	26	26	8.17%
	Hydroelectric	4	4	4	4	4	4	4	4	0.00%
	Carbon Fuels % of Total	98.6%	98.4%	98.9%	98.9%	99.0%	98.5%	98.5%	98.5%	
	Nuclear									
MT	All Sources	5,083	5,165	5,166	5,209	5,215	5,362	5,588	5,658	1.54%
	Carbon Fuels	2,573	2,656	2,656	2,699	2,699	2,710	2,897	2,898	1.71%
	Hydroelectric	2,500	2,498	2,499	2,499	2,499	2,499	2,529	2,548	0.27%
	Non-Hydro Renewables	11	11	11	11	17	152	162	212	52.60%
	Carbon Fuels % of Total	50.6%	51.4%	51.4%	51.8%	51.8%	50.5%	51.8%	51.2%	
	Nuclear									
SD	All Sources	2,997	2,980	3,019	2,852	2,840	3,035	3,129	3,127	0.61%
	Hydroelectric	1,731	1,730	1,730	1,598	1,598	1,598	1,598	1,598	-1.14%
	Carbon Fuels	1,267	1,246	1,286	1,211	1,199	1,394	1,487	1,486	2.30%
	Carbon Fuels % of Total	42.3%	41.8%	42.6%	42.5%	42.2%	45.9%	47.5%	47.5%	
	Nuclear									
	Non-Hydro Renewables	-	3	3	43	43	43	43	43	
CO	All Sources	8,898	9,356	10,169	11,594	12,475	12,491	12,549	13,735	6.40%
	Carbon Fuels	7,715	8,136	8,940	10,214	11,085	11,099	11,097	11,491	5.86%
	Non-Hydro Renewables	538	576	583	745	751	753	813	1,597	16.82%
	Hydroelectric	646	645	645	636	640	640	640	649	0.07%
	Carbon Fuels % of Total	86.7%	87.0%	87.9%	88.1%	88.9%	88.9%	88.4%	83.7%	
	Nuclear									
IN	All Sources	26,441	26,855	28,499	28,455	29,709	30,073	30,054	30,050	1.84%
	Carbon Fuels	25,648	26,130	27,793	27,695	28,856	29,218	29,186	29,186	1.86%
	Non-Hydro Renewables	703	637	617	671	764	763	776	773	1.37%
	Hydroelectric	89	89	89	89	89	92	92	92	0.47%
	Carbon Fuels % of Total	97.0%	97.3%	97.5%	97.3%	97.1%	97.2%	97.1%	97.1%	
	Nuclear									
HI	All Sources	2,556	2,552	2,509	2,508	2,573	2,589	2,648	2,674	0.65%
	Carbon Fuels	2,319	2,320	2,320	2,316	2,381	2,395	2,423	2,427	0.65%
	Non-Hydro Renewables	211	206	165	169	169	169	201	222	0.73%
	Hydroelectric	27	26	25	23	23	25	25	25	-1.09%
	Carbon Fuels % of Total	90.7%	90.9%	92.5%	92.3%	92.5%	92.5%	91.5%	90.8%	
	Nuclear									
ME	All Sources	4,576	4,568	4,564	4,571	4,466	4,466	4,466	4,522	-0.17%
	Carbon Fuels	3,120	3,090	3,096	3,098	2,991	2,992	2,992	2,993	-0.59%
	Non-Hydro Renewables	733	763	755	755	756	754	754	810	1.44%
	Hydroelectric	723	715	714	718	719	719	719	719	-0.08%
	Carbon Fuels % of Total	68.2%	67.6%	67.8%	67.8%	67.0%	67.0%	67.0%	66.2%	
	Nuclear									
OK	All Sources	14,915	16,063	17,589	19,833	21,197	21,511	21,841	21,901	5.64%

STATE	ENERGY SOURCE	2000	2001	2002	2003	2004	2005	2006	2007	CAGR 00-07
	Carbon Fuels	13,692	14,834	16,360	18,417	19,782	19,882	20,092	20,045	5.60%
	Hydroelectric	771	770	770	778	778	778	778	790	0.35%
	Non-Hydro Renewables	452	459	459	638	638	852	972	1,067	13.05%
	Carbon Fuels % of Total	91.8%	92.3%	93.0%	92.9%	93.3%	92.4%	92.0%	91.5%	
	Nuclear									
KY	All Sources	18,658	19,972	22,055	21,981	22,729	23,455	23,410	23,351	3.26%
	Carbon Fuels	17,877	19,103	21,186	21,111	21,850	22,575	22,528	22,465	3.32%
	Hydroelectric	778	777	777	777	777	777	777	777	-0.02%
	Non-Hydro Renewables	4	92	92	93	102	103	105	108	60.13%
	Carbon Fuels % of Total	95.8%	95.6%	96.1%	96.0%	96.1%	96.2%	96.2%	96.2%	
	Nuclear									
WV	All Sources	15,762	16,574	16,984	16,972	17,274	17,354	17,346	16,986	1.07%
	Carbon Fuels	15,413	16,277	16,621	16,610	16,869	16,964	16,957	16,596	1.06%
	Hydroelectric	254	203	203	203	245	325	325	325	3.58%
	Non-Hydro Renewables	95	95	161	161	161	66	66	66	-5.07%
	Carbon Fuels % of Total	97.8%	98.2%	97.9%	97.9%	97.7%	97.8%	97.8%	97.7%	
	Nuclear									
NM	All Sources	6,067	6,197	6,527	6,923	6,963	7,094	7,826	7,934	3.91%
	Carbon Fuels	5,986	6,115	6,441	6,634	6,613	6,605	7,247	7,354	2.98%
	Non-Hydro Renewables	2	2	7	211	271	411	501	501	120.13%
	Hydroelectric	79	79	79	79	79	79	79	79	0.00%
	Carbon Fuels % of Total	98.7%	98.7%	98.7%	95.8%	95.0%	93.1%	92.6%	92.7%	
	Nuclear									
DC	All Sources	868	868	868	868	868	868	868	868	0.00%
	Carbon Fuels	868	868	868	868	868	868	868	868	0.00%
	Carbon Fuels % of Total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	
	Hydroelectric									
	Nuclear									
	Non-Hydro Renewables	-	-	-	-	-	-	-	-	
NV	All Sources	7,072	7,464	7,494	8,392	9,840	9,841	11,100	11,526	7.23%
	Carbon Fuels	5,810	6,200	6,195	7,093	8,546	8,512	9,756	10,090	8.20%
	Hydroelectric	1,053	1,052	1,052	1,052	1,047	1,047	1,047	1,047	-0.08%
	Non-Hydro Renewables	210	212	247	246	246	281	296	389	9.21%
	Carbon Fuels % of Total	82.2%	83.1%	82.7%	84.5%	86.8%	86.5%	87.9%	87.5%	
	Nuclear									
MS	All Sources	9,661	12,001	14,924	18,600	18,376	18,553	18,541	18,184	9.46%
	Carbon Fuels	8,009	10,356	13,272	16,949	16,774	16,951	16,939	16,582	10.96%
	Nuclear	1,373	1,373	1,373	1,373	1,373	1,373	1,373	1,373	0.00%
	Non-Hydro Renewables	279	273	279	279	229	229	229	229	-2.78%
	Carbon Fuels % of Total	82.9%	86.3%	88.9%	91.1%	91.3%	91.4%	91.4%	91.2%	
	Hydroelectric									

http://www.eia.doe.gov/cneaf/electricity/epa/epa_sprdshts.html, 1990 - 2007 Existing Nameplate and Net Summer Capacity by Energy Source, Producer Type and State (EIA-860)

Table 70. EIA Nameplate Capacity for Carbon Fuels in MW for the Total Electric Power Industry (2000-2007)

State	2000	2001	2002	2003	2004	2005	2006	2007	CAGR 00-07
TX	80,577	87,095	94,191	100,663	101,801	101,665	100,338	99,964	3.1%
FL	39,928	42,097	47,144	50,359	51,946	54,986	55,165	57,592	5.4%
CA	30,379	33,357	35,181	37,726	37,735	41,568	43,021	43,471	5.3%
OH	27,968	29,424	31,667	34,357	34,415	34,214	34,110	34,092	2.9%
PA	27,797	28,843	31,212	33,959	36,944	36,637	36,634	36,317	3.9%
IL	27,736	32,874	37,997	38,884	35,498	35,911	35,935	35,784	3.7%
NY	26,471	27,171	27,602	28,100	29,199	30,730	30,842	30,310	2.0%
IN	25,648	26,130	27,793	27,695	28,856	29,218	29,186	29,186	1.9%
GA	21,552	23,817	29,096	29,746	30,351	31,644	31,611	31,447	5.5%
MI	21,115	22,222	25,037	26,273	26,298	26,272	25,894	25,950	3.0%
LA	20,831	21,812	26,069	26,326	27,060	26,791	26,797	26,788	3.7%
NC	18,648	20,366	21,108	21,910	21,592	21,539	21,515	22,143	2.5%
KY	17,877	19,103	21,186	21,111	21,850	22,575	22,528	22,465	3.3%
AL	16,501	16,741	19,784	23,829	24,050	23,986	23,960	23,947	5.5%
MO	16,221	18,199	19,227	19,287	19,354	19,739	19,770	19,800	2.9%
WV	15,413	16,277	16,621	16,610	16,869	16,964	16,957	16,596	1.1%
TN	14,262	14,894	15,250	15,265	15,265	15,162	15,162	15,099	0.8%
OK	13,692	14,834	16,360	18,417	19,782	19,882	20,092	20,045	5.6%
NJ	13,567	13,517	15,382	15,606	14,989	14,515	15,588	15,228	1.7%
VA	13,502	14,655	14,506	15,616	17,075	17,009	16,994	17,023	3.4%
WI	11,499	12,125	12,245	12,286	12,696	14,293	14,468	14,472	3.3%
MA	10,511	10,240	10,651	12,844	12,872	12,889	12,841	12,442	2.4%
AZ	9,598	11,243	14,423	19,065	20,134	20,868	21,602	21,591	12.3%
KS	9,550	9,746	9,860	10,301	10,394	10,403	10,454	10,598	1.5%
SC	9,424	10,415	11,262	11,749	13,568	13,558	13,892	14,460	6.3%
MD	8,656	9,984	10,002	10,774	10,792	10,792	10,792	10,815	3.2%
IA	8,618	8,636	8,687	9,394	10,283	10,340	10,343	11,394	4.1%
MN	8,067	9,035	9,413	9,384	9,412	9,976	10,428	10,460	3.8%
MS	8,009	10,356	13,272	16,949	16,774	16,951	16,939	16,582	11.0%
CO	7,715	8,136	8,940	10,214	11,085	11,099	11,097	11,491	5.9%
AR	6,618	7,102	8,367	10,921	10,921	11,415	11,821	12,905	10.0%
WY	6,137	6,238	6,306	6,389	6,375	6,381	6,381	6,331	0.4%
NM	5,986	6,115	6,441	6,634	6,613	6,605	7,247	7,354	3.0%
NV	5,810	6,200	6,195	7,093	8,546	8,512	9,756	10,090	8.2%
UT	5,157	5,268	5,882	5,953	6,144	6,572	6,751	7,215	4.9%
NE	4,619	4,738	4,741	5,364	5,476	5,784	5,785	5,712	3.1%
ND	4,357	4,347	4,331	4,331	4,333	4,333	4,333	4,332	-0.1%
CT	4,355	5,230	5,558	5,668	6,127	6,171	6,113	5,997	4.7%
WA	3,153	3,478	4,049	4,671	5,003	5,055	4,950	4,886	6.5%
ME	3,120	3,090	3,096	3,098	2,991	2,992	2,992	2,993	-0.6%
MT	2,573	2,656	2,656	2,699	2,699	2,710	2,897	2,898	1.7%
HI	2,319	2,320	2,320	2,316	2,381	2,395	2,423	2,427	0.7%
DE	2,286	2,591	3,204	3,299	3,287	3,195	3,195	3,193	4.9%
OR	2,152	2,779	3,686	4,046	3,923	3,915	3,915	4,299	10.4%
AK	1,936	1,879	1,844	1,726	1,622	1,631	1,648	1,763	-1.3%
RI	1,365	1,365	1,963	1,989	1,995	1,992	1,994	1,992	5.5%
SD	1,267	1,246	1,286	1,211	1,199	1,394	1,487	1,486	2.3%
NH	1,164	1,177	1,782	2,692	2,711	2,712	2,662	2,616	12.3%
DC	868	868	868	868	868	868	868	868	0.0%
ID	218	666	666	666	666	786	786	786	20.1%
VT	144	142	140	140	140	140	141	136	-0.8%

http://www.eia.doe.gov/cneaf/electricity/epa/epa_sprdshts.html, 1990 - 2007 Existing Nameplate and Net Summer Capacity by Energy Source, Producer Type and State (EIA-860)

Table 71. EIA Net Generation by State by Power Source for All Producers (2000-2007)

State	Energy Source	2000	2001	2002	2003	2004	2005	2006	2007	CAGR 00-07	Gen in MWh
TX	All Sources	307,764,164	295,791,622	288,364,154	283,995,784	298,031,697	312,120,108	318,894,469	321,979,091	0.6%	350,143,071
	Carbon Fuels	268,844,487	255,206,677	248,349,720	246,914,711	252,856,015	267,895,889	269,752,664	269,820,925	0.1%	
	Nuclear	37,555,807	38,162,863	35,618,004	33,437,484	40,435,372	38,232,493	41,264,278	40,955,030	1.2%	
	Non-Hydro Renewables	534,907	1,221,751	3,272,937	2,747,049	3,439,701	4,659,166	7,215,556	9,558,698	51.0%	
	All Hydroelectric	828,963	1,200,331	1,123,492	896,539	1,300,609	1,332,560	661,971	1,644,437	10.3%	
	Carbon % Total	87.35%	86.28%	86.12%	86.94%	84.84%	85.83%	84.59%	83.80%	-0.6%	
PA	All Sources	190,999,658	186,239,275	194,555,562	195,777,789	204,236,443	206,874,000	206,386,678	213,745,076	1.6%	263,416,317
	Carbon Fuels	113,681,687	109,702,349	115,207,357	117,143,846	122,371,462	127,181,924	126,940,361	132,756,452	2.2%	
	Nuclear	73,771,347	73,730,797	76,088,930	74,360,862	77,458,632	76,289,432	75,297,632	77,376,316	0.7%	
	All Hydroelectric	1,879,636	1,034,554	1,552,809	2,607,273	2,469,454	1,521,138	2,145,965	1,513,127	-3.1%	
	Non-Hydro Renewables	1,256,392	1,156,125	1,048,712	926,814	1,251,012	1,170,465	1,304,543	1,376,325	1.3%	
	Carbon % Total	59.52%	58.90%	59.22%	59.84%	59.92%	61.48%	61.51%	62.11%	0.6%	
FL	All Sources	175,565,037	176,640,814	189,593,679	196,310,308	203,718,075	206,285,410	210,170,891	212,033,520	2.7%	301,042,635
	Carbon Fuels	139,865,399	141,661,795	152,431,108	162,101,092	168,959,029	174,003,044	175,224,034	179,344,096	3.6%	
	Nuclear	32,291,345	31,583,404	33,704,230	30,979,481	31,215,576	28,758,826	31,426,349	29,289,289	-1.4%	
	Non-Hydro Renewables	3,321,524	3,247,896	3,274,227	2,967,067	3,278,213	3,257,381	3,317,086	3,245,687	-0.3%	
	All Hydroelectric	86,769	147,718	184,114	262,667	265,258	266,159	203,422	154,446	8.6%	
	Carbon % Total	79.67%	80.20%	80.40%	82.57%	82.94%	84.35%	83.37%	84.58%	0.9%	
IL	All Sources	174,542,440	175,456,043	183,919,275	185,203,498	188,008,854	190,027,915	188,506,520	196,213,061	1.7%	243,848,828
	Nuclear	89,438,049	92,358,477	90,860,108	94,733,036	92,047,323	93,263,001	94,154,140	95,728,845	1.0%	
	Carbon Fuels	84,321,338	82,489,012	92,314,817	89,444,968	94,946,528	95,912,753	93,315,438	99,045,131	2.3%	
	Non-Hydro Renewables	641,422	467,537	615,761	886,997	864,735	723,124	863,670	1,285,359	10.4%	
	All Hydroelectric	141,631	141,017	128,589	138,497	150,268	129,037	173,272	153,727	1.2%	
	Carbon % Total	48.31%	47.01%	50.19%	48.30%	50.50%	50.47%	49.50%	50.48%	0.6%	
CA	All Sources	164,852,052	158,797,801	138,133,722	147,157,533	151,104,848	158,068,800	176,847,385	169,839,430	0.4%	179,505,471
	Carbon Fuels	69,658,751	80,324,873	50,999,150	54,358,539	65,235,630	60,178,018	74,459,997	83,164,398	2.6%	
	All Hydroelectric	39,263,698	25,192,093	30,899,631	35,457,476	33,324,095	39,746,234	48,136,123	27,624,142	-4.9%	
	Nuclear	35,175,505	33,219,520	34,352,340	35,593,789	30,267,887	36,154,898	31,958,621	35,792,490	0.2%	
	Non-Hydro Renewables	21,692,037	19,711,627	21,641,604	20,835,415	21,460,405	22,109,442	22,388,781	23,568,180	1.2%	
	Carbon % Total	42.26%	50.58%	36.92%	36.94%	43.17%	38.07%	42.10%	48.97%	2.1%	
OH	All Sources	147,515,160	140,726,564	146,325,196	145,209,869	147,004,558	155,568,086	153,994,843	153,902,202	0.6%	166,506,600
	Carbon Fuels	130,123,885	124,724,129	134,727,252	136,195,386	130,297,750	140,213,815	136,477,914	137,701,997	0.8%	
	Nuclear	16,781,378	15,463,762	10,864,902	8,475,016	15,950,121	14,802,733	16,846,939	15,764,049	-0.9%	
	All Hydroelectric	583,048	510,785	488,329	510,835	729,876	515,744	631,936	410,436	-4.9%	
	Non-Hydro Renewables	26,849	27,888	244,713	28,632	26,811	35,794	38,054	25,720	-0.6%	
	Carbon % Total	88.21%	88.63%	92.07%	93.79%	88.64%	90.13%	88.62%	89.47%	0.2%	
GA	All Sources	117,607,707	112,412,045	116,749,479	118,785,957	121,780,290	131,358,088	132,531,461	139,674,936	2.5%	192,227,236
	Carbon Fuels	82,822,896	76,713,421	83,584,466	82,035,814	85,224,331	96,004,520	98,365,582	105,221,765	3.5%	
	Nuclear	32,472,935	33,681,769	31,107,735	33,256,649	33,747,705	31,534,259	32,005,810	32,544,998	0.0%	
	All Hydroelectric	2,304,394	1,997,448	2,038,524	3,476,697	2,790,653	3,803,062	2,145,161	1,895,364	-2.8%	
	Carbon % Total	70.42%	68.24%	71.59%	69.06%	69.98%	73.09%	74.22%	75.33%	1.0%	
	Non-Hydro Renewables	(147,346)	(550,303)	(629,414)	(619,295)	(860,245)	(192,974)	(385,435)	(308,841)	11.2%	

State	Energy Source	2000	2001	2002	2003	2004	2005	2006	2007	CAGR 00-07	Gen in MWh
NY	All Sources	113,944,299	120,760,058	119,763,248	119,558,058	122,137,916	130,214,866	128,563,846	131,581,157	2.1%	171,896,555
	Carbon Fuels	56,824,646	56,613,058	54,389,558	53,850,566	56,450,381	60,769,234	57,148,061	61,814,159	1.2%	
	Nuclear	31,507,988	40,394,985	39,617,491	40,679,205	40,640,305	42,443,152	42,223,899	42,452,854	4.4%	
	All Hydroelectric	23,828,181	22,083,913	24,059,560	23,276,717	23,093,802	24,939,184	26,495,890	24,422,154	0.4%	
	Non-Hydro Renewables	793,046	737,583	775,415	839,764	1,140,257	1,282,565	1,939,840	2,123,609	15.1%	
	Carbon % Total	49.87%	46.88%	45.41%	45.04%	46.22%	46.67%	44.45%	46.98%	-0.8%	
NC	All Sources	115,126,471	110,617,459	117,511,815	120,375,870	120,027,450	123,537,812	119,612,533	124,901,825	1.2%	145,311,418
	Carbon Fuels	73,258,482	70,555,331	75,018,588	72,593,772	74,669,503	78,301,385	75,705,248	81,272,576	1.5%	
	Nuclear	39,126,881	37,775,025	39,626,849	40,906,900	40,090,623	39,981,739	39,963,184	40,044,705	0.3%	
	All Hydroelectric	2,299,799	1,861,019	2,446,332	6,447,957	4,808,815	4,802,959	3,464,515	3,111,673	4.4%	
	Non-Hydro Renewables	549,411	426,085	445,220	546,514	536,760	598,234	610,928	609,867	1.5%	
	Carbon % Total	63.63%	63.78%	63.84%	60.31%	62.21%	63.38%	63.29%	65.07%	0.3%	
MI	All Sources	91,323,508	99,466,456	105,482,582	98,936,164	102,168,701	109,167,712	101,233,117	107,813,453	2.4%	146,742,215
	Carbon Fuels	70,477,092	70,639,649	72,162,208	69,008,347	69,542,661	74,298,361	70,041,435	74,485,442	0.8%	
	Nuclear	18,882,432	26,710,782	31,087,454	27,953,563	30,561,961	32,871,574	29,066,165	31,516,953	7.6%	
	Non-Hydro Renewables	563,179	580,450	592,518	663,825	554,749	565,048	637,275	567,153	0.1%	
	All Hydroelectric	347,106	408,738	604,843	293,184	396,346	326,489	449,032	114,662	-14.6%	
	Carbon % Total	77.17%	71.02%	68.41%	69.75%	68.07%	68.06%	69.19%	69.09%	-1.6%	
WA	All Sources	102,814,587	77,136,788	98,385,715	95,746,474	98,555,365	98,439,690	104,953,969	104,328,570	0.2%	107,199,649
	All Hydroelectric	80,160,637	54,674,085	77,984,337	71,698,550	71,490,935	72,031,456	81,990,944	78,825,744	-0.2%	
	Carbon Fuels	13,392,016	13,618,232	10,208,350	15,025,057	16,503,955	16,811,671	11,769,193	14,164,023	0.8%	
	Nuclear	8,605,232	8,250,429	9,048,475	7,614,708	8,981,583	8,242,273	9,328,277	8,108,560	-0.8%	
	Non-Hydro Renewables	656,702	594,042	1,140,020	1,404,867	1,569,074	1,362,763	1,912,654	3,274,755	25.8%	
	Carbon % Total	13.03%	17.65%	10.38%	15.69%	16.75%	17.08%	11.21%	13.58%	0.6%	
AZ	All Sources	88,149,792	89,097,739	92,664,349	92,199,394	102,242,600	99,305,430	101,972,498	111,034,938	3.4%	170,457,696
	Carbon Fuels	49,126,049	52,439,714	54,113,517	54,879,745	65,794,475	66,910,226	70,969,508	77,492,309	6.7%	
	Nuclear	30,380,571	28,724,076	30,861,911	28,581,053	28,112,609	25,807,446	24,012,231	26,782,391	-1.8%	
	All Hydroelectric	8,643,172	7,899,859	7,551,144	7,358,574	6,919,707	6,517,429	6,941,456	6,723,082	-3.5%	
	Non-Hydro Renewables	288,956	310,384	261,741	1,663,611	1,362,369	177,694	197,855	162,567	-7.9%	
	Carbon % Total	55.73%	58.86%	58.40%	59.52%	64.35%	67.38%	69.60%	69.79%	3.3%	
SC	All Sources	90,600,253	87,231,949	94,322,125	91,822,796	94,892,537	99,839,252	96,602,744	100,767,901	1.5%	122,774,689
	Nuclear	50,887,700	49,869,998	53,325,854	50,417,690	51,200,640	53,137,554	50,797,372	53,199,914	0.6%	
	Carbon Fuels	39,261,927	37,172,750	40,734,536	38,925,191	42,156,904	44,647,664	44,710,047	46,783,792	2.5%	
	All Hydroelectric	450,626	189,201	246,213	2,457,824	1,295,747	1,736,967	685,396	344,599	-3.8%	
	Carbon % Total	43.34%	42.61%	43.19%	42.39%	44.43%	44.72%	46.28%	46.43%	1.0%	
	Non-Hydro Renewables	(1,082,006)	(1,035,722)	(1,127,694)	(1,184,722)	(909,844)	(881,608)	(709,970)	(771,017)	-4.7%	
TN	All Sources	92,585,787	93,184,512	92,778,446	88,733,574	94,400,796	93,981,191	91,079,128	92,597,374	0.0%	92,618,897
	Carbon Fuels	61,587,094	58,765,365	58,545,619	54,190,574	56,933,345	58,207,417	59,820,990	59,592,601	-0.5%	
	Nuclear	25,824,858	28,576,431	27,573,925	24,152,580	28,612,271	27,803,108	24,678,777	28,700,371	1.5%	
	All Hydroelectric	5,144,607	5,808,892	6,621,644	10,358,399	8,831,380	7,940,062	6,499,802	4,235,237	-2.7%	
	Carbon % Total	66.52%	63.06%	63.10%	61.07%	60.31%	61.94%	65.68%	64.36%		
	Non-Hydro Renewables	(702,224)	(699,900)	(658,585)	(696,628)	(794,026)	(567,331)	(587,981)	(635,199)	-1.4%	
MO	All Sources	76,283,550	79,216,968	80,835,582	86,885,544	87,247,836	90,478,139	91,283,074	90,745,722	2.5%	125,269,

State	Energy Source	2000	2001	2002	2003	2004	2005	2006	2007	CAGR 00-07	Gen in MWh
											671
	Carbon Fuels	65,810,785	69,942,861	71,192,831	76,664,525	77,712,683	81,133,774	80,850,192	79,727,456	2.8%	
	Nuclear	9,991,845	8,384,240	8,389,629	9,699,589	7,830,693	8,030,577	10,116,660	9,371,955	-0.9%	
	All Hydroelectric	407,825	838,275	1,197,924	398,486	1,595,239	1,245,258	246,766	1,587,799	21.4%	
	Non-Hydro Renewables	(119,000)	(214,268)	(103,806)	(131,048)	224,547	154,462	117,008	441,985	-220.6%	
	Carbon % Total	86.27%	88.29%	88.07%	88.24%	89.07%	89.67%	88.57%	87.86%	0.3%	
VA	All Sources	68,700,446	66,832,391	67,708,252	67,864,352	71,366,913	70,734,634	65,811,901	70,854,654	0.4%	75,036,140
	Carbon Fuels	40,602,746	41,638,975	40,497,030	41,681,793	41,391,399	41,527,072	36,844,679	42,740,082	0.7%	
	Nuclear	28,321,091	25,759,130	27,346,163	24,816,022	28,315,294	27,918,481	27,593,516	27,268,475	-0.5%	
	Carbon % Total	59.10%	62.30%	59.81%	61.42%	58.00%	58.71%	55.98%	60.32%	0.3%	
	All Hydroelectric	(641,586)	(1,227,185)	(1,122,149)	277,543	416,819	50,295	177,446	(378,782)	-7.3%	
	Non-Hydro Renewables	(922,796)	(1,578,606)	(1,001,627)	(409,166)	77,291	(182,037)	28,816	(395,404)	-11.4%	
LA	All Sources	68,692,465	64,385,166	71,863,094	64,668,734	66,414,352	62,252,849	59,631,431	61,257,578	-1.6%	49,518,594
	Carbon Fuels	52,300,669	46,256,761	53,403,754	47,352,962	47,795,239	45,689,587	42,106,464	43,278,376	-2.7%	
	Nuclear	15,795,739	17,336,135	17,305,328	16,126,322	17,079,981	15,676,353	16,735,448	17,077,572	1.1%	
	All Hydroelectric	532,290	732,217	891,441	891,991	1,098,825	810,948	713,215	826,642	6.5%	
	Non-Hydro Renewables	63,767	60,053	262,571	297,459	440,307	75,961	76,304	74,988	2.3%	
	Carbon % Total	76.14%	71.84%	74.31%	73.22%	71.97%	73.39%	70.61%	70.65%	-1.1%	
WI	All Sources	56,232,457	55,734,262	55,125,147	56,795,088	57,490,221	58,380,742	58,287,887	59,690,940	0.9%	66,688,060
	Carbon Fuels	42,520,992	41,782,614	39,874,322	42,311,281	43,196,543	46,306,916	43,867,128	44,665,413	0.7%	
	Nuclear	11,512,078	11,507,078	12,448,813	12,215,463	11,887,849	9,920,991	12,233,515	12,910,319	1.7%	
	All Hydroelectric	1,759,351	1,899,964	2,297,218	1,653,066	1,783,371	1,530,237	1,474,692	1,335,840	-3.9%	
	Non-Hydro Renewables	445,235	544,607	504,794	615,278	622,458	622,598	712,552	779,369	8.3%	
	Carbon % Total	75.62%	74.97%	72.33%	74.50%	75.14%	79.32%	75.26%	74.83%	-0.1%	
MN	All Sources	47,682,932	46,222,020	49,774,496	52,434,774	50,024,711	50,123,599	50,846,591	51,567,219	1.1%	59,639,851
	Carbon Fuels	32,604,522	32,208,532	33,737,860	36,566,755	34,686,548	34,385,026	34,466,990	34,404,752	0.8%	
	Nuclear	12,959,976	11,789,027	13,684,824	13,413,828	13,295,502	12,835,219	13,183,418	13,103,000	0.2%	
	Non-Hydro Renewables	1,434,563	1,579,069	1,587,961	1,732,903	1,436,011	2,267,842	2,728,657	3,506,235	13.6%	
	All Hydroelectric	683,872	645,392	763,851	721,287	606,649	635,512	467,526	553,232	-3.0%	
	Carbon % Total	68.38%	69.68%	67.78%	69.74%	69.34%	68.60%	67.79%	66.72%	-0.4%	
MD	All Sources	47,584,058	46,167,529	44,859,214	48,875,992	48,486,654	48,824,445	45,418,429	46,298,194	-0.4%	44,001,637
	Carbon Fuels	31,677,285	30,997,151	30,691,566	32,154,060	31,013,935	32,061,059	29,108,052	29,931,735	-0.8%	
	Nuclear	13,827,243	13,656,267	12,128,005	13,690,713	14,580,260	14,703,221	13,830,411	14,353,192	0.5%	
	All Hydroelectric	1,732,619	1,183,518	1,660,989	2,646,984	2,507,521	1,703,639	2,104,275	1,652,216	-0.7%	
	Non-Hydro Renewables	346,911	330,593	378,654	384,235	384,938	356,526	375,691	361,052	0.6%	
	Carbon % Total	66.57%	67.14%	68.42%	65.79%	63.96%	65.67%	64.09%	64.65%	-0.4%	
NJ	All Sources	40,931,623	42,726,987	45,492,562	43,138,419	43,818,341	48,057,163	49,765,767	51,248,068	3.3%	77,798,112
	Nuclear	28,578,119	30,469,230	30,865,675	29,709,201	27,081,566	31,391,685	32,567,885	32,010,376	1.6%	
	Carbon Fuels	11,645,198	11,598,869	13,949,102	12,243,691	15,689,742	15,566,708	16,049,484	18,153,858	6.5%	
	Non-Hydro Renewables	694,269	640,887	665,755	1,146,636	1,010,785	1,069,378	1,114,322	1,062,925	6.3%	
	Carbon % Total	28.45%	27.15%	30.66%	28.38%	35.81%	32.39%	32.25%	35.42%	3.2%	
	All Hydroelectric	(126,592)	(123,739)	(133,770)	(80,991)	(250,991)	(253,315)	(264,525)	(248,025)	10.1%	
IA	All Sources	40,138,680	39,250,702	40,969,004	40,518,134	41,684,571	42,662,479	43,884,064	48,230,634	2.7%	67,834,163
	Carbon Fuels									2.2%	

State	Energy Source	2000	2001	2002	2003	2004	2005	2006	2007	CAGR 00-07	Gen in MWh
		34,272,628	34,023,711	34,497,692	34,661,217	34,673,394	35,423,942	35,450,759	39,858,161		
	Nuclear	4,452,884	3,852,722	4,573,958	3,987,657	4,928,948	4,538,313	5,095,442	4,518,875	0.2%	
	Non-Hydro Renewables	509,158	529,116	950,971	1,080,667	1,136,270	1,740,698	2,428,515	2,891,252	28.2%	
	All Hydroelectric	904,010	845,153	946,383	788,593	945,959	959,526	909,348	962,346	0.9%	
	Carbon % Total	85.39%	86.68%	84.20%	85.54%	83.18%	83.03%	80.78%	82.64%	-0.5%	
MA	All Sources	31,862,335	31,742,240	35,187,916	42,157,338	42,560,296	43,744,062	42,789,993	43,899,816	4.7%	79,606,644
	Carbon Fuels	23,975,936	24,717,281	27,528,786	34,599,403	34,111,666	35,683,093	34,001,136	36,870,720	6.3%	
	Nuclear	5,512,255	5,144,033	5,768,766	4,977,955	5,938,600	5,475,057	5,829,658	5,119,789	-1.0%	
	Non-Hydro Renewables	1,321,293	1,186,659	1,025,076	1,515,554	1,516,824	1,544,457	1,455,127	1,131,074	-2.2%	
	All Hydroelectric	352,487	(17,082)	22,487	553,497	494,879	579,812	925,174	(52,315)	-176.1%	
	Carbon % Total	75.25%	77.87%	78.23%	82.07%	80.15%	81.57%	79.46%	83.99%	1.6%	
CT	All Sources	30,215,838	28,112,946	28,899,719	27,226,329	30,390,142	31,605,736	32,478,307	31,124,230	0.4%	32,884,319
	Nuclear	16,365,334	15,427,767	14,918,272	16,078,095	16,539,097	15,562,122	16,589,446	16,386,142	0.0%	
	Carbon Fuels	11,175,426	10,619,244	12,022,058	9,017,894	11,871,682	14,082,571	13,853,677	12,945,883	2.1%	
	Non-Hydro Renewables	2,148,766	1,779,562	1,624,301	1,565,924	1,516,751	1,482,844	1,491,292	1,428,947	-5.7%	
	All Hydroelectric	521,944	286,373	324,887	564,398	470,327	476,546	543,892	347,906	-5.6%	
	Carbon % Total	36.99%	37.77%	41.60%	33.12%	39.06%	44.56%	42.66%	41.59%	1.7%	
NH	All Sources	14,562,235	14,669,118	15,661,615	21,245,461	23,484,117	24,076,390	21,871,840	23,124,728	6.8%	54,585,988
	Nuclear	7,921,880	8,692,743	9,294,617	9,276,288	10,177,573	9,455,885	9,397,856	10,763,884	4.5%	
	Carbon Fuels	4,452,324	4,177,913	4,413,935	9,945,578	11,154,107	11,953,618	10,154,198	9,918,695	12.1%	
	All Hydroelectric	1,244,367	897,883	1,087,979	1,169,528	1,309,895	1,790,729	1,523,637	1,260,733	0.2%	
	Non-Hydro Renewables	943,665	900,579	865,084	854,067	842,541	876,158	796,149	1,181,416	3.3%	
	Carbon % Total	30.57%	28.48%	28.18%	46.81%	47.50%	49.65%	46.43%	42.89%	5.0%	
VT	All Sources	6,264,864	5,445,347	5,436,647	6,021,886	5,443,776	5,686,758	7,059,149	5,822,058	-1.0%	5,081,058
	Nuclear	4,548,065	4,171,120	3,962,616	4,444,152	3,858,020	4,071,547	5,106,523	4,703,728	0.5%	
	All Hydroelectric	1,200,923	868,281	1,098,925	1,147,962	1,166,269	1,189,668	1,497,064	645,081	-8.5%	
	Non-Hydro Renewables	364,426	363,206	362,425	405,136	398,463	413,124	446,316	463,549	3.5%	
	Carbon Fuels	151,450	42,740	12,681	24,636	21,024	12,419	9,246	9,700	-32.5%	
	Carbon % Total	2.42%	0.78%	0.23%	0.41%	0.39%	0.22%	0.13%	0.17%	-31.8%	
SD	All Sources	9,697,337	7,400,743	7,721,958	7,943,837	7,510,214	6,520,769	7,132,243	6,136,605	-6.3%	2,623,425
	All Hydroelectric	5,715,508	3,431,865	4,353,653	4,276,303	3,597,509	3,074,566	3,396,833	2,917,283	-9.2%	
	Carbon Fuels	3,981,829	3,968,007	3,362,262	3,623,285	3,755,027	3,288,078	3,586,388	3,069,278	-3.7%	
	Carbon % Total	41.06%	53.62%	43.54%	45.61%	50.00%	50.42%	50.28%	50.02%	2.9%	
	Nuclear										
	Non-Hydro Renewables	-	871	6,043	44,249	157,678	158,125	149,022	150,044		
OR	All Sources	46,555,628	38,526,634	40,449,642	42,580,911	43,893,771	41,899,838	47,123,713	47,471,409	0.3%	49,220,206
	All Hydroelectric	38,115,630	28,644,556	34,413,167	33,250,332	33,080,819	30,948,345	37,850,297	33,587,439	-1.8%	
	Carbon Fuels	8,278,000	9,706,083	5,573,641	8,851,480	10,158,617	10,184,724	8,308,384	12,597,592	6.2%	
	Non-Hydro Renewables	161,999	175,995	462,834	479,098	654,335	766,769	965,032	1,286,377	34.4%	
	Carbon % Total	17.78%	25.19%	13.78%	20.79%	23.14%	24.31%	17.63%	26.54%	5.9%	
	Nuclear										
AL	All Sources	118,079,367	118,789,017	126,096,636	130,910,429	130,681,647	131,124,893	131,468,576	133,474,823	1.8%	167,589,347
	Carbon Fuels	80,893,173	80,075,572	85,414,923	86,568,609	88,419,637	89,283,946	92,303,947	95,013,582	2.3%	
	Nuclear	31,368,563	30,357,063	31,856,926	31,676,953	31,635,789	31,694,223	31,911,096	34,325,127	1.3%	
	All Hydroelectric									-4.8%	

State	Energy Source	2000	2001	2002	2003	2004	2005	2006	2007	CAGR 00-07	Gen in MWh
		5,817,631	8,356,382	8,824,787	12,664,867	10,626,221	10,144,581	7,251,786	4,136,114		
	Carbon % Total	68.51%	67.41%	67.74%	66.13%	67.66%	68.09%	70.21%	71.18%	0.5%	
	Non-Hydro Renewables	-	-	-	-	-	2,143	1,747	-	#DIV/0!	
DC	All Sources	144,374	123,239	261,980	74,144	36,487	226,042	81,467	75,251	-8.9%	22,438
	Carbon Fuels	144,374	123,239	261,980	74,144	36,487	226,042	81,467	75,251	-8.9%	
	Carbon % Total	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	0.0%	
	All Hydroelectric	-	-	-	-	-	-	-	-	#DIV/0!	
	Nuclear										
	Non-Hydro Renewables	-	-	-	-	-	-	-	-		
RI	All Sources	5,417,107	6,990,151	6,939,068	5,569,002	4,903,803	5,968,058	5,886,328	6,999,781	3.7%	11,267,202
	Carbon Fuels	5,297,001	6,883,392	6,250,253	5,461,213	4,796,816	5,961,324	5,731,506	6,840,660	3.7%	
	Non-Hydro Renewables	115,239	103,616	685,130	101,768	101,526	-	148,913	154,757	4.3%	
	All Hydroelectric	4,867	3,143	3,685	6,021	5,461	6,734	5,909	4,364	-1.5%	
	Carbon % Total	97.78%	98.47%	90.07%	98.06%	97.82%	99.89%	97.37%	97.73%	0.0%	
	Nuclear										
ND	All Sources	31,122,917	30,135,733	31,147,221	31,126,730	29,735,481	31,727,862	30,691,657	31,016,355	0.0%	30,819,421
	Carbon Fuels	29,000,356	28,803,657	29,554,605	29,343,948	27,975,094	30,165,693	28,801,138	29,089,217	0.0%	
	All Hydroelectric	2,122,561	1,332,076	1,592,616	1,723,904	1,545,864	1,341,824	1,521,034	1,305,393	-6.7%	
	Carbon % Total	93.18%	95.58%	94.89%	94.27%	94.08%	95.08%	93.84%	93.79%	0.1%	
	Nuclear										
	Non-Hydro Renewables	-	-	-	58,878	214,523	220,345	369,485	621,745	#DIV/0!	
ID	All Sources	10,969,487	8,362,832	8,845,554	9,520,600	9,940,192	9,926,970	12,537,281	10,710,379	-0.3%	10,245,306
	All Hydroelectric	10,966,695	7,223,127	8,769,321	8,354,034	8,461,655	8,542,121	11,242,372	9,021,690	-2.8%	
	Carbon Fuels	2,792	1,139,705	76,233	1,166,566	1,478,537	1,384,849	1,125,292	1,516,422	145.9%	
	Carbon % Total	0.03%	13.63%	0.86%	12.25%	14.87%	13.95%	8.98%	14.16%		
	Nuclear										
	Non-Hydro Renewables	-	-	-	-	-	-	169,617	172,267	#DIV/0!	
NE	All Sources	29,045,739	30,411,669	31,550,226	30,367,879	31,944,127	31,391,643	31,599,046	32,403,289	1.6%	39,702,308
	Carbon Fuels	18,916,336	20,558,746	20,322,319	21,325,350	20,724,540	21,597,149	21,404,353	20,751,363	1.3%	
	Nuclear	8,628,679	8,726,113	10,122,242	7,996,902	10,241,254	8,801,841	9,002,656	11,041,532	3.6%	
	All Hydroelectric	1,500,724	1,124,122	1,097,486	980,110	913,021	871,473	893,386	347,444	-18.9%	
	Carbon % Total	65.13%	67.60%	64.41%	70.22%	64.88%	68.80%	67.74%	64.04%	-0.2%	
	Non-Hydro Renewables	-	2,688	8,179	65,517	65,312	121,180	298,651	262,949	#DIV/0!	
OK	All Sources	51,403,249	51,257,422	55,188,421	54,023,712	57,211,649	64,532,352	66,701,532	69,048,364	4.3%	119,445,575
	Carbon Fuels	49,253,603	49,041,211	53,378,445	52,377,017	53,896,109	61,208,043	64,481,985	64,299,202	3.9%	
	All Hydroelectric	2,149,646	2,216,211	1,809,976	1,592,225	2,742,797	2,476,536	507,106	2,900,018	4.4%	
	Non-Hydro Renewables	(127,287)	(128,479)	(177,868)	(151,717)	338,865	693,948	1,595,968	1,683,300	-244.6%	
	Carbon % Total	95.82%	95.68%	96.72%	96.95%	94.20%	94.85%	96.67%	93.12%	-0.4%	
	Nuclear										
WY	All Sources	44,831,620	44,112,978	43,108,230	43,313,848	44,409,875	44,733,816	44,388,869	44,609,789	-0.1%	44,200,725
	Carbon Fuels	43,574,674	42,868,705	42,077,285	42,353,815	43,200,213	43,208,177	42,786,492	43,125,484	-0.1%	
	All Hydroelectric	1,011,035	879,111	583,615	593,555	593,147	808,375	843,316	729,424	-4.6%	
	Non-Hydro Renewables	245,911	365,162	447,330	366,478	616,515	717,264	759,061	754,881	17.4%	
	Carbon % Total	97.20%	97.18%	97.61%	97.78%	97.28%	96.59%	96.39%	96.67%	-0.1%	
	Nuclear										
AR	All Sources	41,486,607	44,728,164	44,120,689	46,666,905	48,259,426	44,542,277	49,034,858	51,834,059	3.2%	78,381,666
	Carbon Fuels	27,464,352	27,399,124	26,082,090	29,312,785	29,141,391	27,749,488	32,229,597	33,048,712	2.7%	

State	Energy Source	2000	2001	2002	2003	2004	2005	2006	2007	CAGR 00-07	Gen in MWh
	Nuclear	11,651,772	14,780,789	14,558,884	14,689,416	15,449,851	13,689,571	15,232,577	15,486,102	4.1%	
	All Hydroelectric	2,370,483	2,548,251	3,435,829	2,664,703	3,668,184	3,103,218	1,565,277	3,265,807	4.7%	
	Carbon % Total	66.20%	61.26%	59.12%	62.81%	60.38%	62.30%	65.73%	63.76%	-0.5%	
	Non-Hydro Renewables	-	-	43,886	10,085	24,745	20,702	22,126	63,042	#DIV/0!	
WV	All Sources	90,748,589	80,066,391	92,714,476	92,485,650	87,582,332	91,798,141	92,122,423	92,406,044	0.3%	95,564,907
	Carbon Fuels	90,035,941	79,526,745	92,084,702	91,664,755	86,798,757	90,740,430	90,893,721	91,432,214	0.2%	
	All Hydroelectric	698,216	513,309	598,963	630,353	607,560	891,891	1,048,467	805,854	2.1%	
	Non-Hydro Renewables	14,432	26,337	30,811	190,542	176,015	165,820	180,235	167,976	42.0%	
	Carbon % Total	99.21%	99.33%	99.32%	99.11%	99.11%	98.85%	98.67%	98.95%	0.0%	
	Nuclear										
HI	All Sources	7,190,994	6,904,326	7,913,305	7,044,498	7,249,310	7,194,843	7,389,719	7,435,912	0.5%	7,913,106
	Carbon Fuels	6,518,819	6,362,846	7,502,913	6,490,349	6,971,259	6,904,293	7,015,977	6,913,231	0.8%	
	Non-Hydro Renewables	628,960	491,198	375,552	513,685	220,783	228,229	291,950	468,070	-4.1%	
	All Hydroelectric	43,216	50,282	34,840	40,464	57,268	62,321	81,792	54,611	3.4%	
	Carbon % Total	90.65%	92.16%	94.81%	92.13%	96.16%	95.96%	94.94%	92.97%	0.4%	
	Nuclear										
UT	All Sources	36,267,083	35,534,387	36,557,062	37,992,281	37,571,874	37,401,116	40,419,111	44,415,914	2.9%	64,716,559
	Carbon Fuels	35,364,599	34,873,238	35,881,679	37,372,477	36,927,150	36,431,851	39,481,720	43,713,206	3.1%	
	All Hydroelectric	750,641	508,407	457,732	421,339	449,848	784,463	746,783	538,782	-4.6%	
	Non-Hydro Renewables	156,359	152,742	217,651	198,465	194,876	184,802	190,608	163,925	0.7%	
	Carbon % Total	97.51%	98.14%	98.15%	98.37%	98.28%	97.41%	97.68%	98.42%	0.1%	
	Nuclear										
AK	All Sources	4,937,687	5,416,191	5,471,990	5,673,462	5,866,420	5,946,148	6,068,520	6,226,211	3.4%	9,577,202
	Carbon Fuels	3,935,868	4,069,576	4,032,639	4,090,926	4,368,400	4,481,617	4,844,125	4,933,976	3.3%	
	All Hydroelectric	1,001,819	1,345,665	1,439,351	1,582,536	1,498,020	1,463,942	1,223,607	1,291,223	3.7%	
	Carbon % Total	79.71%	75.14%	73.70%	72.11%	74.46%	75.37%	79.82%	79.25%	-0.1%	
	Nuclear										
	Non-Hydro Renewables	-	950	-	-	-	589	788	1,012		
KS	All Sources	44,780,241	44,708,105	47,171,361	46,532,229	46,777,672	45,857,415	45,516,498	50,113,672	1.6%	61,761,015
	Carbon Fuels	35,704,075	34,296,061	37,650,234	37,264,186	36,273,756	36,599,310	35,164,690	38,581,498	1.1%	
	Nuclear	9,060,834	10,346,651	9,041,702	8,889,667	10,132,736	8,820,945	9,350,269	10,369,136	1.9%	
	All Hydroelectric	15,332	25,561	12,746	12,435	12,547	11,337	9,649	10,501	-5.3%	
	Carbon % Total	79.73%	76.71%	79.82%	80.08%	77.55%	79.81%	77.26%	76.99%	-0.5%	
	Non-Hydro Renewables	-	39,832	466,679	365,939	358,632	425,823	991,890	1,152,538		
MT	All Sources	25,902,731	23,731,809	25,053,476	25,812,715	26,276,718	27,438,230	27,720,001	28,328,723	1.3%	33,453,025
	Carbon Fuels	16,264,441	17,118,337	15,480,805	17,105,635	17,414,499	17,850,881	17,153,870	18,468,611	1.8%	
	All Hydroelectric	9,623,257	6,613,472	9,566,909	8,701,772	8,856,031	9,587,349	10,130,161	9,364,336	-0.4%	
	Non-Hydro Renewables	15,033	-	5,762	5,308	6,188	-	435,970	495,776	64.8%	
	Carbon % Total	62.79%	72.13%	61.79%	66.27%	66.27%	65.06%	61.88%	65.19%	0.5%	
	Nuclear										
KY	All Sources	92,852,619	95,126,405	91,530,410	91,262,846	94,018,350	97,301,597	98,265,542	96,656,490	0.6%	104,139,087
	Carbon Fuels	90,527,941	91,270,897	87,505,661	87,293,122	90,163,841	94,256,342	95,560,637	94,874,050	0.7%	
	All Hydroelectric	2,324,568	3,855,508	4,024,749	3,948,052	3,780,251	2,961,193	2,591,701	1,668,587	-4.6%	
	Non-Hydro Renewables	110	-	-	21,672	74,258	84,062	113,204	113,854	169.6%	
	Carbon % Total	97.50%	95.95%	95.60%	95.65%	95.90%	96.87%	97.25%	98.16%	0.1%	
	Nuclear										
IN	All Sources									-0.3%	

State	Energy Source	2000	2001	2002	2003	2004	2005	2006	2007	CAGR 00-07	Gen in MWh
		123,515,453	118,331,568	121,908,922	115,812,939	117,958,001	121,032,399	121,131,068	121,245,996		117,141,338
	Carbon Fuels	122,839,030	117,671,688	121,409,063	115,303,708	117,428,063	120,574,095	120,467,562	120,606,207	-0.3%	
	All Hydroelectric	588,276	570,692	411,270	423,953	443,721	438,282	489,515	449,936	-3.8%	
	Non-Hydro Renewables	88,146	89,188	88,589	85,278	86,217	20,022	173,991	189,853	11.6%	
	Carbon % Total	99.45%	99.44%	99.59%	99.56%	99.55%	99.62%	99.45%	99.47%	0.0%	
	Nuclear										
CO	All Sources	40,898,076	43,624,618	42,470,949	44,103,108	46,032,708	47,848,613	49,059,960	52,033,428	3.5%	81,376,990
	Carbon Fuels	39,398,485	42,331,855	41,340,316	42,893,441	44,807,863	45,776,268	46,601,200	49,176,320	3.2%	
	All Hydroelectric	1,499,590	1,244,122	988,743	1,058,557	1,002,864	1,293,233	1,590,705	1,561,472	0.6%	
	Non-Hydro Renewables	45,175	(201,942)	(78,374)	(52,530)	30,180	657,049	667,553	1,127,574	58.3%	
	Carbon % Total	96.33%	97.04%	97.34%	97.26%	97.34%	95.67%	94.99%	94.51%	-0.3%	
	Nuclear										
NV	All Sources	33,032,292	31,430,649	29,661,238	29,959,150	35,268,511	38,067,557	29,232,661	30,000,637	-1.4%	25,089,189
	Carbon Fuels	29,232,033	27,717,052	26,266,369	27,136,734	32,355,883	35,102,470	25,831,324	26,700,788	-1.3%	
	All Hydroelectric	2,429,468	2,513,722	2,267,586	1,756,705	1,615,123	1,702,380	2,057,626	2,003,191	-2.7%	
	Non-Hydro Renewables	1,370,791	1,199,874	1,127,283	1,065,711	1,297,504	1,262,707	1,343,711	1,296,658	-0.8%	
	Carbon % Total	88.50%	88.18%	88.55%	90.58%	91.74%	92.21%	88.36%	89.00%	0.1%	
	Nuclear										
ME	All Sources	7,622,211	12,050,331	13,006,923	11,669,546	12,631,044	13,127,649	11,091,215	10,154,992	4.2%	17,301,232
	Carbon Fuels	3,969,537	8,975,801	9,945,796	8,384,480	8,520,382	8,002,613	5,940,678	5,343,431	4.3%	
	All Hydroelectric	2,294,743	1,710,244	1,831,118	2,150,143	2,867,071	3,465,890	3,499,336	3,043,827	4.1%	
	Non-Hydro Renewables	1,357,932	1,364,286	1,230,008	1,134,923	1,243,590	1,659,146	1,651,201	1,767,734	3.8%	
	Carbon % Total	52.08%	74.49%	76.47%	71.85%	67.46%	60.96%	53.56%	52.62%	0.1%	
	Nuclear										
DE	All Sources	5,539,416	6,300,624	5,442,452	6,683,855	6,889,670	7,103,726	6,041,389	7,330,908	4.1%	12,335,607
	Carbon Fuels	5,520,578	6,300,624	5,442,452	6,683,855	6,889,670	7,103,726	6,040,972	7,282,792	4.0%	
	Non-Hydro Renewables	18,838	-	-	-	-	-	417	48,116	14.3%	
	Carbon % Total	99.66%	100.00%	100.00%	100.00%	100.00%	100.00%	99.99%	99.34%	0.0%	
	All Hydroelectric	-	-	-	-	-	-	-	-		
	Nuclear										
NM	All Sources	33,040,224	32,581,161	29,966,484	32,043,466	32,831,418	34,366,798	36,701,583	35,437,121	1.0%	40,359,359
	Carbon Fuels	32,819,071	32,343,841	29,701,893	31,690,032	32,179,006	33,407,175	35,247,936	33,775,904	0.4%	
	All Hydroelectric	221,152	237,320	264,591	170,699	138,947	164,993	198,211	267,978	2.8%	
	Carbon % Total	99.33%	99.27%	99.12%	98.90%	98.01%	97.21%	96.04%	95.31%	-0.6%	
	Nuclear										
	Non-Hydro Renewables	-	-	-	182,735	513,465	794,630	1,255,436	1,393,239		
MS	All Sources	35,299,819	49,827,645	40,127,052	38,666,712	41,898,475	43,322,832	44,340,826	48,144,245	4.5%	85,671,241
	Carbon Fuels	24,605,264	39,903,763	30,067,593	27,764,256	31,665,709	33,243,847	33,912,194	38,785,460	6.7%	
	Nuclear	10,694,555	9,923,882	10,059,459	10,902,456	10,232,766	10,077,846	10,418,586	9,358,784	-1.9%	
	Carbon % Total	69.70%	80.08%	74.93%	71.80%	75.58%	76.74%	76.48%	80.56%	2.1%	
	All Hydroelectric	-	-	-	-	-	-	-	-		
	Non-Hydro Renewables	-	-	-	-	-	1,139	10,046	-		

http://www.eia.doe.gov/cneaf/electricity/epa/epa_sum.html Table 1.1. Net Generation by Energy Source by Type of Producer

Table 72. EIA Net Generation by State For Carbon Fuel Sources for All Producers (2000-2007)

State	2000	2001	2002	2003	2004	2005	2006	2007	CAGR 00-07
TX	268,844,487	255,206,677	248,349,720	246,914,711	252,856,015	267,895,889	269,752,664	269,820,925	0.1%
FL	139,865,399	141,661,795	152,431,108	162,101,092	168,959,029	174,003,044	175,224,034	179,344,096	3.6%
OH	130,123,885	124,724,129	134,727,252	136,195,386	130,297,750	140,213,815	136,477,914	137,701,997	0.8%
PA	113,681,687	109,702,349	115,207,357	117,143,846	122,371,462	127,181,924	126,940,361	132,756,452	2.2%
IN	122,839,030	117,671,688	121,409,063	115,303,708	117,428,063	120,574,095	120,467,562	120,606,207	-0.3%
IL	84,321,338	82,489,012	92,314,817	89,444,968	94,946,528	95,912,753	93,315,438	99,045,131	2.3%
KY	90,527,941	91,270,897	87,505,661	87,293,122	90,163,841	94,256,342	95,560,637	94,874,050	0.7%
WV	90,035,941	79,526,745	92,084,702	91,664,755	86,798,757	90,740,430	90,893,721	91,432,214	0.2%
GA	82,822,896	76,713,421	83,584,466	82,035,814	85,224,331	96,004,520	98,365,582	105,221,765	3.5%
AL	80,893,173	80,075,572	85,414,923	86,568,609	88,419,637	89,283,946	92,303,947	95,013,582	2.3%
MO	65,810,785	69,942,861	71,192,831	76,664,525	77,712,683	81,133,774	80,850,192	79,727,456	2.8%
NC	73,258,482	70,555,331	75,018,588	72,593,772	74,669,503	78,301,385	75,705,248	81,272,576	1.5%
MI	70,477,092	70,639,649	72,162,208	69,008,347	69,542,661	74,298,361	70,041,435	74,485,442	0.8%
CA	69,658,751	80,324,873	50,999,150	54,358,539	65,235,630	60,178,018	74,459,997	83,164,398	2.6%
AZ	49,126,049	52,439,714	54,113,517	54,879,745	65,794,475	66,910,226	70,969,508	77,492,309	6.7%
TN	61,587,094	58,765,365	58,545,619	54,190,574	56,933,345	58,207,417	59,820,990	59,592,601	-0.5%
NY	56,824,646	56,613,058	54,389,558	53,850,566	56,450,381	60,769,234	57,148,061	61,814,159	1.2%
OK	49,253,603	49,041,211	53,378,445	52,377,017	53,896,109	61,208,043	64,481,985	64,299,202	3.9%
LA	52,300,669	46,256,761	53,403,754	47,352,962	47,795,239	45,689,587	42,106,464	43,278,376	-2.7%
CO	39,398,485	42,331,855	41,340,316	42,893,441	44,807,863	45,776,268	46,601,200	49,176,320	3.2%
WI	42,520,992	41,782,614	39,874,322	42,311,281	43,196,543	46,306,916	43,867,128	44,665,413	0.7%
WY	43,574,674	42,868,705	42,077,285	42,353,815	43,200,213	43,208,177	42,786,492	43,125,484	-0.1%
SC	39,261,927	37,172,750	40,734,536	38,925,191	42,156,904	44,647,664	44,710,047	46,783,792	2.5%
VA	40,602,746	41,638,975	40,497,030	41,681,793	41,391,399	41,527,072	36,844,679	42,740,082	0.7%
UT									3.1%

	35,364,599	34,873,238	35,881,679	37,372,477	36,927,150	36,431,851	39,481,720	43,713,206	
KS	35,704,075	34,296,061	37,650,234	37,264,186	36,273,756	36,599,310	35,164,690	38,581,498	1.1%
IA	34,272,628	34,023,711	34,497,692	34,661,217	34,673,394	35,423,942	35,450,759	39,858,161	2.2%
MN	32,604,522	32,208,532	33,737,860	36,566,755	34,686,548	34,385,026	34,466,990	34,404,752	0.8%
NM	32,819,071	32,343,841	29,701,893	31,690,032	32,179,006	33,407,175	35,247,936	33,775,904	0.4%
MS	24,605,264	39,903,763	30,067,593	27,764,256	31,665,709	33,243,847	33,912,194	38,785,460	6.7%
MA	23,975,936	24,717,281	27,528,786	34,599,403	34,111,666	35,683,093	34,001,136	36,870,720	6.3%
MD	31,677,285	30,997,151	30,691,566	32,154,060	31,013,935	32,061,059	29,108,052	29,931,735	-0.8%
ND	29,000,356	28,803,657	29,554,605	29,343,948	27,975,094	30,165,693	28,801,138	29,089,217	0.0%
AR	27,464,352	27,399,124	26,082,090	29,312,785	29,141,391	27,749,488	32,229,597	33,048,712	2.7%
NV	29,232,033	27,717,052	26,266,369	27,136,734	32,355,883	35,102,470	25,831,324	26,700,788	-1.3%
NE	18,916,336	20,558,746	20,322,319	21,325,350	20,724,540	21,597,149	21,404,353	20,751,363	1.3%
MT	16,264,441	17,118,337	15,480,805	17,105,635	17,414,499	17,850,881	17,153,870	18,468,611	1.8%
NJ	11,645,198	11,598,869	13,949,102	12,243,691	15,689,742	15,566,708	16,049,484	18,153,858	6.5%
WA	13,392,016	13,618,232	10,208,350	15,025,057	16,503,955	16,811,671	11,769,193	14,164,023	0.8%
CT	11,175,426	10,619,244	12,022,058	9,017,894	11,871,682	14,082,571	13,853,677	12,945,883	2.1%
OR	8,278,000	9,706,083	5,573,641	8,851,480	10,158,617	10,184,724	8,308,384	12,597,592	6.2%
NH	4,452,324	4,177,913	4,413,935	9,945,578	11,154,107	11,953,618	10,154,198	9,918,695	12.1 %
ME	3,969,537	8,975,801	9,945,796	8,384,480	8,520,382	8,002,613	5,940,678	5,343,431	4.3%
HI	6,518,819	6,362,846	7,502,913	6,490,349	6,971,259	6,904,293	7,015,977	6,913,231	0.8%
DE	5,520,578	6,300,624	5,442,452	6,683,855	6,889,670	7,103,726	6,040,972	7,282,792	4.0%
RI	5,297,001	6,883,392	6,250,253	5,461,213	4,796,816	5,961,324	5,731,506	6,840,660	3.7%
AK	3,935,868	4,069,576	4,032,639	4,090,926	4,368,400	4,481,617	4,844,125	4,933,976	3.3%
SD	3,981,829	3,968,007	3,362,262	3,623,285	3,755,027	3,288,078	3,586,388	3,069,278	-3.7%
ID	2,792	1,139,705	76,233	1,166,566	1,478,537	1,384,849	1,125,292	1,516,422	145.9 %
DC	144,374	123,239	261,980	74,144	36,487	226,042	81,467	75,251	-8.9%
VT	151,450	42,740	12,681	24,636	21,024	12,419	9,246	9,700	-32.5 %

http://www.eia.doe.gov/cneaf/electricity/epa/epa_sum.html, Table 1.1. Net Generation by Energy Source by Type of Producer

Table 73. EIA Net Generation by State For Hydroelectric Sources for All Producers (2000-2007)

State	2000	2001	2002	2003	2004	2005	2006	2007	CAGR 00-07
WA	80,160,637	54,674,085	77,984,337	71,698,550	71,490,935	72,031,456	81,990,944	78,825,744	-0.2%
CA	39,263,698	25,192,093	30,899,631	35,457,476	33,324,095	39,746,234	48,136,123	27,624,142	-4.9%
OR	38,115,630	28,644,556	34,413,167	33,250,332	33,080,819	30,948,345	37,850,297	33,587,439	-1.8%
NY	23,828,181	22,083,913	24,059,560	23,276,717	23,093,802	24,939,184	26,495,890	24,422,154	0.4%
ID	10,966,695	7,223,127	8,769,321	8,354,034	8,461,655	8,542,121	11,242,372	9,021,690	-2.8%
MT	9,623,257	6,613,472	9,566,909	8,701,772	8,856,031	9,587,349	10,130,161	9,364,336	-0.4%
AL	5,817,631	8,356,382	8,824,787	12,664,867	10,626,221	10,144,581	7,251,786	4,136,114	-4.8%
AZ	8,643,172	7,899,859	7,551,144	7,358,574	6,919,707	6,517,429	6,941,456	6,723,082	-3.5%
TN	5,144,607	5,808,892	6,621,644	10,358,399	8,831,380	7,940,062	6,499,802	4,235,237	-2.7%
SD	5,715,508	3,431,865	4,353,653	4,276,303	3,597,509	3,074,566	3,396,833	2,917,283	-9.2%
NC	2,299,799	1,861,019	2,446,332	6,447,957	4,808,815	4,802,959	3,464,515	3,111,673	4.4%
KY	2,324,568	3,855,508	4,024,749	3,948,052	3,780,251	2,961,193	2,591,701	1,668,587	-4.6%
AR	2,370,483	2,548,251	3,435,829	2,664,703	3,668,184	3,103,218	1,565,277	3,265,807	4.7%
ME	2,294,743	1,710,244	1,831,118	2,150,143	2,867,071	3,465,890	3,499,336	3,043,827	4.1%
GA	2,304,394	1,997,448	2,038,524	3,476,697	2,790,653	3,803,062	2,145,161	1,895,364	-2.8%
OK	2,149,646	2,216,211	1,809,976	1,592,225	2,742,797	2,476,536	507,106	2,900,018	4.4%
NV	2,429,468	2,513,722	2,267,586	1,756,705	1,615,123	1,702,380	2,057,626	2,003,191	-2.7%
MD	1,732,619	1,183,518	1,660,989	2,646,984	2,507,521	1,703,639	2,104,275	1,652,216	-0.7%
PA	1,879,636	1,034,554	1,552,809	2,607,273	2,469,454	1,521,138	2,145,965	1,513,127	-3.1%
WI	1,759,351	1,899,964	2,297,218	1,653,066	1,783,371	1,530,237	1,474,692	1,335,840	-3.9%
ND	2,122,561	1,332,076	1,592,616	1,723,904	1,545,864	1,341,824	1,521,034	1,305,393	-6.7%
AK	1,001,819	1,345,665	1,439,351	1,582,536	1,498,020	1,463,942	1,223,607	1,291,223	3.7%
NH	1,244,367	897,883	1,087,979	1,169,528	1,309,895	1,790,729	1,523,637	1,260,733	0.2%
CO	1,499,590	1,244,122	988,743	1,058,557	1,002,864	1,293,233	1,590,705	1,561,472	0.6%
TX	828,963	1,200,331	1,123,492	896,539	1,300,609	1,332,560	661,971	1,644,437	10.3%
VT	1,200,923	868,281	1,098,925	1,147,962	1,166,269	1,189,668	1,497,064	645,081	-8.5%
NE	1,500,724	1,124,122	1,097,486	980,110	913,021	871,473	893,386	347,444	-18.9%
MO	407,825	838,275	1,197,924	398,486	1,595,239	1,245,258	246,766	1,587,799	21.4%
SC	450,626	189,201	246,213	2,457,824	1,295,747	1,736,967	685,396	344,599	-3.8%
IA	904,010	845,153	946,383	788,593	945,959	959,526	909,348	962,346	0.9%
LA	532,290	732,217	891,441	891,991	1,098,825	810,948	713,215	826,642	6.5%
WY	1,011,035	879,111	583,615	593,555	593,147	808,375	843,316	729,424	-4.6%
WV	698,216	513,309	598,963	630,353	607,560	891,891	1,048,467	805,854	2.1%
MN	683,872	645,392	763,851	721,287	606,649	635,512	467,526	553,232	-3.0%
UT	750,641	508,407	457,732	421,339	449,848	784,463	746,783	538,782	-4.6%
OH	583,048	510,785	488,329	510,835	729,876	515,744	631,936	410,436	-4.9%
IN	588,276	570,692	411,270	423,953	443,721	438,282	489,515	449,936	-3.8%
CT	521,944	286,373	324,887	564,398	470,327	476,546	543,892	347,906	-5.6%
MI	347,106	408,738	604,843	293,184	396,346	326,489	449,032	114,662	-14.6%
MA	352,487	(17,082)	22,487	553,497	494,879	579,812	925,174	(52,315)	-176.1%
NM	221,152	237,320	264,591	170,699	138,947	164,993	198,211	267,978	2.8%
FL	86,769	147,718	184,114	262,667	265,258	266,159	203,422	154,446	8.6%
IL	141,631	141,017	128,589	138,497	150,268	129,037	173,272	153,727	1.2%
HI	43,216	50,282	34,840	40,464	57,268	62,321	81,792	54,611	3.4%
KS	15,332	25,561	12,746	12,435	12,547	11,337	9,649	10,501	-5.3%
RI	4,867	3,143	3,685	6,021	5,461	6,734	5,909	4,364	-1.5%
NJ	(126,592)	(123,739)	(133,770)	(80,991)	(250,991)	(253,315)	(264,525)	(248,025)	10.1%
VA	(641,586)	(1,227,185)	(1,122,149)	277,543	416,819	50,295	177,446	(378,782)	-7.3%
DE	-	-	-	-	-	-	-	-	
DC	-	-	-	-	-	-	-	-	
MS	-	-	-	-	-	-	-	-	

http://www.eia.doe.gov/cneaf/electricity/epa/epa_sum.html, Table 1.1. Net Generation by Energy Source by Type of Producer

Table 74. EIA Net Generation by State For Nuclear for All Producers (2000-2007)

State	2000	2001	2002	2003	2004	2005	2006	2007	CAGR 00-07
IL	89,438,049	92,358,477	90,860,108	94,733,036	92,047,323	93,263,001	94,154,140	95,728,845	1.0%
PA	73,771,347	73,730,797	76,088,930	74,360,862	77,458,632	76,289,432	75,297,632	77,376,316	0.7%
SC	50,887,700	49,869,998	53,325,854	50,417,690	51,200,640	53,137,554	50,797,372	53,199,914	0.6%
NY	31,507,988	40,394,985	39,617,491	40,679,205	40,640,305	42,443,152	42,223,899	42,452,854	4.4%
NC	39,126,881	37,775,025	39,626,849	40,906,900	40,090,623	39,981,739	39,963,184	40,044,705	0.3%
TX	37,555,807	38,162,863	35,618,004	33,437,484	40,435,372	38,232,493	41,264,278	40,955,030	1.2%
CA	35,175,505	33,219,520	34,352,340	35,593,789	30,267,887	36,154,898	31,958,621	35,792,490	0.2%
GA	32,472,935	33,681,769	31,107,735	33,256,649	33,747,705	31,534,259	32,005,810	32,544,998	0.0%
AL	31,368,563	30,357,063	31,856,926	31,676,953	31,635,789	31,694,223	31,911,096	34,325,127	1.3%
FL	32,291,345	31,583,404	33,704,230	30,979,481	31,215,576	28,758,826	31,426,349	29,289,289	-1.4%
NJ	28,578,119	30,469,230	30,865,675	29,709,201	27,081,566	31,391,685	32,567,885	32,010,376	1.6%
MI	18,882,432	26,710,782	31,087,454	27,953,563	30,561,961	32,871,574	29,066,165	31,516,953	7.6%
AZ	30,380,571	28,724,076	30,861,911	28,581,053	28,112,609	25,807,446	24,012,231	26,782,391	-1.8%
VA	28,321,091	25,759,130	27,346,163	24,816,022	28,315,294	27,918,481	27,593,516	27,268,475	-0.5%
TN	25,824,858	28,576,431	27,573,925	24,152,580	28,612,271	27,803,108	24,678,777	28,700,371	1.5%
LA	15,795,739	17,336,135	17,305,328	16,126,322	17,079,981	15,676,353	16,735,448	17,077,572	1.1%
CT	16,365,334	15,427,767	14,918,272	16,078,095	16,539,097	15,562,122	16,589,446	16,386,142	0.0%
AR	11,651,772	14,780,789	14,558,884	14,689,416	15,449,851	13,689,571	15,232,577	15,486,102	4.1%
OH	16,781,378	15,463,762	10,864,902	8,475,016	15,950,121	14,802,733	16,846,939	15,764,049	-0.9%
MD	13,827,243	13,656,267	12,128,005	13,690,713	14,580,260	14,703,221	13,830,411	14,353,192	0.5%
MN	12,959,976	11,789,027	13,684,824	13,413,828	13,295,502	12,835,219	13,183,418	13,103,000	0.2%
WI	11,512,078	11,507,078	12,448,813	12,215,463	11,887,849	9,920,991	12,233,515	12,910,319	1.7%
MS	10,694,555	9,923,882	10,059,459	10,902,456	10,232,766	10,077,846	10,418,586	9,358,784	-1.9%
KS	9,060,834	10,346,651	9,041,702	8,889,667	10,132,736	8,820,945	9,350,269	10,369,136	1.9%
NH	7,921,880	8,692,743	9,294,617	9,276,288	10,177,573	9,455,885	9,397,856	10,763,884	4.5%
NE	8,628,679	8,726,113	10,122,242	7,996,902	10,241,254	8,801,841	9,002,656	11,041,532	3.6%
MO	9,991,845	8,384,240	8,389,629	9,699,589	7,830,693	8,030,577	10,116,660	9,371,955	-0.9%
WA	8,605,232	8,250,429	9,048,475	7,614,708	8,981,583	8,242,273	9,328,277	8,108,560	-0.8%
MA	5,512,255	5,144,033	5,768,766	4,977,955	5,938,600	5,475,057	5,829,658	5,119,789	-1.0%
IA	4,452,884	3,852,722	4,573,958	3,987,657	4,928,948	4,538,313	5,095,442	4,518,875	0.2%
VT	4,548,065	4,171,120	3,962,616	4,444,152	3,858,020	4,071,547	5,106,523	4,703,728	0.5%
AK									
ND									
CO									
NM									
UT									
NV									
WV									
IN									
SD									
ID									
DC									
WY									
DE									
ME									
OR									
HI									
KY									
MT									
RI									
OK									

http://www.eia.doe.gov/cneaf/electricity/epa/epa_sum.html, Table 1.1. Net Generation by Energy Source by Type of Producer

Table 75. EIA Net Generation by State For Non-Hydro Renewables for All Producers (2000-2007)

State	2000	2001	2002	2003	2004	2005	2006	2007	CAGR 00-07
CA	20,754,097	20,061,316	21,882,601	21,747,728	22,277,236	21,989,649	22,292,644	23,258,401	1.6%
TX	534,907	1,221,751	3,272,937	2,747,049	3,439,701	4,659,166	7,215,556	9,558,698	51.0%
MN	1,434,563	1,579,069	1,587,961	1,732,903	1,436,011	2,267,842	2,728,657	3,506,235	13.6%
FL	3,321,524	3,247,896	3,274,227	2,967,067	3,278,213	3,257,381	3,317,086	3,245,687	-0.3%
WA	656,702	594,042	1,144,552	1,408,160	1,578,892	1,354,290	1,865,555	3,230,243	25.6%
NY	1,783,483	1,668,103	1,696,639	1,751,570	1,953,428	2,063,296	2,695,996	2,891,989	7.1%
IA	509,158	529,116	950,971	1,080,667	1,136,270	1,740,698	2,428,515	2,891,252	28.2%
PA	1,666,988	1,771,575	1,706,466	1,665,808	1,936,896	1,881,506	2,002,720	2,099,180	3.3%
MA	2,021,657	1,898,008	1,867,877	2,026,483	2,015,150	2,006,100	2,034,025	1,961,621	-0.4%
OK	-	-	-	54,470	572,744	847,773	1,712,441	1,849,144	141.4%
ME	1,357,932	1,364,286	1,230,008	1,134,923	1,243,590	1,659,146	1,651,201	1,767,734	3.8%
MI	1,616,877	1,707,287	1,628,078	1,681,071	1,667,733	1,671,289	1,676,485	1,696,394	0.7%
CT	2,153,134	1,779,562	1,634,502	1,565,942	1,509,036	1,484,497	1,491,292	1,444,302	-5.5%
NM	-	-	-	182,735	513,465	794,630	1,255,436	1,393,239	66.2%
NJ	834,897	782,627	811,555	1,266,518	1,298,024	1,352,085	1,412,923	1,331,859	6.9%
NV	1,370,791	1,199,874	1,127,283	1,065,711	1,297,504	1,262,707	1,343,711	1,296,658	-0.8%
CO	-	48,640	141,890	151,110	221,981	779,112	868,055	1,295,635	72.8%
OR	161,999	175,995	462,834	479,098	654,335	766,769	965,032	1,286,377	34.4%
IL	641,422	467,537	615,761	886,997	864,735	723,124	863,670	1,285,359	10.4%
VA	418,195	661,471	987,208	1,088,993	1,243,402	1,238,786	1,196,260	1,224,879	16.6%
NH	943,665	900,579	865,084	854,067	842,541	876,158	796,149	1,181,416	3.3%
KS	-	39,832	466,679	365,939	358,632	425,823	991,890	1,152,538	75.2%
WI	440,035	544,607	504,794	615,278	622,458	622,598	712,552	779,369	8.5%
WY	245,911	365,162	447,330	366,478	616,515	717,264	759,061	754,881	17.4%
ND	-	-	-	58,878	214,523	220,345	369,485	621,745	80.3%
MT	15,033	-	5,762	5,308	6,188	-	435,970	495,776	64.8%
NC	441,309	426,085	420,045	427,241	458,509	451,729	479,586	472,871	1.0%
HI	628,960	491,198	375,552	513,685	220,783	228,229	291,950	468,070	-4.1%
VT	364,426	363,206	362,425	405,136	398,463	413,124	446,316	463,549	3.5%
SC	-	-	15,522	22,091	239,246	317,067	409,929	439,597	95.2%
MD	346,911	330,593	378,654	384,235	384,938	356,526	375,691	361,052	0.6%
NE	-	2,688	8,179	65,517	65,312	121,180	298,651	262,949	114.7%
IN	88,146	89,188	88,589	85,278	86,217	20,022	173,991	189,853	11.6%
ID	-	-	-	-	-	-	169,617	172,267	1.6%
WV	14,432	26,337	30,811	190,542	176,015	165,820	180,235	167,976	42.0%
UT	151,843	152,742	217,651	198,465	194,876	184,802	190,608	163,925	1.1%
RI	115,239	103,616	685,130	101,768	101,526	-	148,913	154,757	4.3%
SD	-	871	6,043	44,249	157,678	158,125	149,022	150,044	135.9%
KY	110	-	-	21,672	74,258	84,062	113,204	113,854	169.6%
LA	63,767	60,053	262,571	297,459	440,307	75,961	76,304	74,988	2.3%
TN	29,227	33,824	37,258	32,021	23,800	30,604	79,559	69,165	13.1%
MO	73,095	51,592	55,198	122,943	109,222	68,530	69,456	58,512	-3.1%
DE	18,838	-	-	-	-	-	417	48,116	14.3%
AZ	-	34,090	137,777	1,380,021	1,415,809	70,329	49,303	37,156	1.4%
AR	-	-	43,886	-	-	-	7,407	33,438	351.4%
OH	26,849	27,888	244,713	28,632	26,811	35,794	38,054	25,720	-0.6%
GA	7,482	19,407	18,754	16,798	17,601	16,247	14,908	12,808	8.0%
AK	-	950	-	-	-	589	788	1,012	31.1%
DC	-	-	-	-	-	-	-	-	
AL	-	-	-	-	-	2,143	1,747	-	
MS	-	-	-	-	-	1,139	10,046	-	

http://www.eia.doe.gov/cneaf/electricity/epa/epa_sum.html Table 1.1. Net Generation by Energy Source by Type of Producer.

Table 76. ARPA - E

State	Solar	Biomass	Energy Storage	Vehicle Technologies	Oil & Gas	Wind	Geothermal	Building Efficiency	Carbon Capture	Water	Waste Heat Capture	Total
MA	8,085,350	4,565,800	12,299,556			8,325,400						33,276,106
CA		4,989,144	4,000,000	760,705		3,000,000		4,992,651	1,077,992	2,031,252		20,851,744
OH		5,992,697	1,999,447					4,519,259	5,000,000			17,511,403
CO							9,151,300	4,986,249				14,137,549
Multi-state	5,205,706			4,462,162					2,251,183			11,919,051
DE		9,000,000										9,000,000
MO			7,200,000									7,200,000
IN				6,733,386								6,733,386
MI				5,195,805								5,195,805
AZ			5,133,150									5,133,150
IA	4,373,488											4,373,488
IL									2,250,487		1,715,752	3,966,239
NC		3,111,693										3,111,693
OK											3,000,000	3,000,000
PA	1,900,067								566,641			2,466,708
MN	2,200,000											2,200,000
NJ					1,000,000							1,000,000
Total	**21,764,611**	**27,659,334**	**30,632,153**	**17,152,058**	**1,000,000**	**11,325,400**	**9,151,300**	**14,498,159**	**11,146,303**	**2,031,252**	**4,715,752**	**151,076,322**

Table 77. Gap Analysis, FL vs. Top 4: Startups

Rank	State	2002	2003	2004	2005	2006	Grand Total	Average # Startups
1	CA	55	47	35	42	63	242	**48**
2	MA	35	23	35	34	33	160	**32**
3	PA	26	25	26	29	32	138	**28**
4	NY	26	25	29	21	33	134	**27**
5	TX	25	20	18	18	17	98	**20**
6	NC	16	16	21	14	21	88	**18**
7	FL	11	13	15	22	21	82	**16**
8	GA	16	14	20	15	13	78	**16**
9	IL	20	9	17	13	18	77	**15**
10	OH	15	9	17	14	19	74	**15**
11	UT	12	6	11	14	26	69	**14**
12	MI	5	11	23	13	17	69	**14**
13	MD	8	13	12	15	8	56	**11**
14	VA	9	10	12	15	8	54	**11**
15	CO	3	7	11	11	15	47	**9**
16	IN	3	7	10	10	17	47	**9**
17	AZ	8	3	8	10	8	37	**7**
18	IA	5	2	3	11	7	28	**6**
19	OR	2	8	7	7	4	28	**6**
20	KY	5	2	6	7	7	27	**5**
21	WA	2	3	7	4	10	26	**5**
22	SC	0	3	3	6	13	25	**5**
23	WI	4	2	3	6	9	24	**5**
24	TN	2	2	5	4	8	21	**4**
25	MT	2	5	4	3	5	19	**4**
26	AL	4	2	4	6	1	17	**3**
27	NM	1	1	3	5	7	17	**3**
28	MN	6	4	3	1	3	17	**3**
29	MS	3	1	5	4	4	17	**3**
30	MO	2	4	3	3	4	16	**3**
31	NE	3	2	2	3	6	16	**3**
32	OK	3	3	1	3	6	16	**3**
33	AR	5	2	6	3		16	**3**
34	NJ	6	1	0	4	3	14	**3**
35	RI	4	2	4	4	0	14	**3**
36	VT	0	3	3	2	3	11	**2**
37	LA	0	4	1	0	4	9	**2**
38	NH	1	1	1	3	2	8	**2**
39	CT	1	1	2	2	1	7	**1**
40	KS	2	4	1	0	0	7	**1**
41	ME	2	4				6	**1**
42	HI	0	0	0	2	4	6	**1**
43	NV	0	4	1	0	0	5	**1**
44	DE	0	0	3		0	3	**1**
45	ID	0	1	1	0	1	3	**1**
46	SD	1					1	**0**
47	ND	1	0	0	0	0	1	**0**
	Grand Total	**360**	**329**	**402**	**403**	**481**	**1,975**	**395**

Data drawn from AUTM STAAT Website on 8/19/08 http://www.autmsurvey.org/statt/index.cfm

Table 78. Gap Analysis, FL vs Top 4: Active Licenses and Options (ACTLIC)

Rank	State	2002	2003	2004	2005	2006	Grand Total	Average # Act Lic
1	CA	3,060	3,008	3,257	1,784	3,378	**14,487**	**2,897**
2	MA	1,608	1,624	1,675	1,744	1,705	**8,356**	**1,671**
3	MO	1,313	1,559	1,518	1,539	1,798	**7,727**	**1,545**
4	TX	1,235	1,447	1,141	1,690	1,688	**7,201**	**1,440**
5	NC	1,484	1,255	1,344	1,318	1,369	**6,770**	**1,354**
6	NY	1,710	1,047	1,089	1,326	1,195	**6,367**	**1,273**
7	IA	1,235	1,255	1,198	1,028	992	**5,708**	**1,142**
8	MD	892	986	841	1,094	756	**4,569**	**914**
9	PA	713	754	841	985	1,038	**4,331**	**866**
10	WI	680	798	877	1,007	957	**4,319**	**864**
11	GA	712	851	952	852	836	**4,203**	**841**
12	WA	629	699	756	828	975	**3,887**	**777**
13	MI	529	637	695	770	854	**3,485**	**697**
14	IL	617	698	605	614	675	**3,209**	**642**
15	MN	558	589	639	678	720	**3,184**	**637**
16	VA	342	422	550	677	689	**2,680**	**536**
17	FL	413	441	496	635	591	**2,576**	**515**
18	OH	336	421	452	534	586	**2,329**	**466**
19	IN	135	379	549	510	623	**2,196**	**439**
20	OR	306	328	408	447	464	**1,953**	**391**
21	TN	291	290	312	340	363	**1,596**	**319**
22	UT	283	233	219	312	389	**1,436**	**287**
23	NJ	236	238	194	237	288	**1,193**	**239**
24	CO	210	214	203	265	237	**1,129**	**226**
25	AL	176	160	64	329	299	**1,028**	**206**
26	AZ	110	171	198	176	205	**860**	**172**
27	NH	100	107	135	156	171	**669**	**134**
28	NE	86	57	107	174	183	**607**	**121**
29	KS	100	73	123	127	111	**534**	**107**
30	KY	80	79	89	119	135	**502**	**100**
31	SC	77	93	89	107	120	**486**	**97**
32	LA	71	77	76	68	98	**390**	**78**
33	MT	17	66	54	123	126	**386**	**77**
34	ND	70	71	77	72	89	**379**	**76**
35	AR	75	80	98	75		**328**	**66**
36	OK	39	62	67	67	86	**321**	**64**
37	CT	40	50	58	67	68	**283**	**57**
38	MS	42	48	55	61	69	**275**	**55**
39	NM	49	63	54	36	68	**270**	**54**
40	HI	40	87	77		8	**212**	**42**
41	RI	40	50	42	36	6	**174**	**35**
42	VT	21	30	34	34	38	**157**	**31**
43	ID	20	19	31	43	25	**138**	**28**
44	DE	26	23	27		16	**92**	**18**
45	NV	15	15	12	1	19	**62**	**12**
46	ME	5	7				**12**	**2**
47	SD	1					**1**	**0**
	Grand Total	**20,827**	**21,661**	**22,378**	**23,085**	**25,106**	**113,057**	**22,611**

Data drawn from AUTM STAAT Website on 8/19/08 http://www.autmsurvey.org/statt/index.cfm

Table 79. Utility Patents: granted by the U.S. Patent and Trademark Office

State	08 Rank	2006	2007	2008
California	1	22275	19600	19181
Texas	2	6308	5733	5712
New York	3	5628	5006	4885
Washington	4	3286	3228	3517
Massachusetts	5	4011	3510	3516
Michigan	6	3758	3141	2996
Illinois	7	3294	2894	2741
New jersey	8	3171	2693	2722
Minnesota	9	2957	2554	2535
Pennsylvania	10	2842	2500	2414
Ohio	11	2630	2255	2227
Florida	12	2601	2358	2046
North Carolina	13	1974	1745	1841
Oregon	14	2060	1877	1781
Colorado	15	2118	1745	1622
Arizona	16	1705	1571	1584
Connecticut	17	1652	1384	1356
Wisconsin	18	1688	1412	1349
Georgia	19	1487	1310	1344
Maryland	20	1410	1246	1232
Idaho	21	1663	1350	1162
Virginia	22	1094	1004	1030
Indiana	23	1165	1137	985
Utah	24	684	638	642
Missouri	25	721	702	615
Tennessee	26	669	618	586
Iowa	27	666	601	561
New Hampshire	28	602	542	477
Vermont	29	437	472	437
Kansas	30	492	424	425
Oklahoma	31	543	470	417
Kentucky	32	413	429	413
South Carolina	33	577	411	395
Nevada	34	386	367	375
Delaware	35	357	330	325
New Mexico	36	344	286	280
Alabama	37	357	300	279
Louisiana	38	321	262	260
Rhode island	39	269	263	218
Nebraska	40	186	203	191
Maine	41	142	110	113
Arkansas	42	138	113	108
Mississippi	43	119	142	102
Montana	44	121	110	91
Hawaii	45	84	64	77
West Virginia	46	103	106	74
North Dakota	47	66	82	63
South Dakota	48	74	60	54
Wyoming	49	48	54	35
Total		**91702**	**81419**	**79399**

Http://www.uspto.gov/web/offices/ac/ido/oeip/taf/cst_utl.htm

Table 80. Gap Analysis, FL vs Top 4: Academic Patent Applications

Rank	State	2002	2003	2004	2005	2006	Grand Total	Average Pat Apps
1	CA	1,059	1,081	1,447	1,239	2,148	**6,974**	**1,395**
2	PA	446	407	789	742	833	**3,217**	**643**
3	MA	474	486	580	601	679	**2,820**	**564**
4	MD	461	464	565	479	599	**2,568**	**514**
5	NY	507	442	491	600	416	**2,456**	**491**
6	VA	267	326	382	374	453	**1,802**	**360**
7	FL	192	355	428	401	305	**1,681**	**336**
8	TX	311	328	362	376	283	**1,660**	**332**
9	GA	141	210	421	423	391	**1,586**	**317**
10	IL	283	260	291	294	352	**1,480**	**296**
11	NC	283	308	277	178	350	**1,396**	**279**
18	NJ	94	128	126	162	163	**673**	**135**
19	AZ	52	139	233	125	119	**668**	**134**
20	MO	80	106	175	135	153	**649**	**130**
21	UT	102	129	93	139	156	**619**	**124**
22	CO	76	76	113	157	151	**573**	**115**
23	WA	30	96	143	101	129	**499**	**100**
24	IA	78	95	113	117	71	**474**	**95**
25	MN	94	72	83	98	80	**427**	**85**
26	SC	47	52	76	99	92	**366**	**73**
27	KY	50	52	74	87	85	**348**	**70**
28	OR	49	63	77	81	75	**345**	**69**
29	NE	35	73	58	73	60	**299**	**60**
30	NM	47	29	78	56	86	**296**	**59**
31	RI	57	42	58	79	24	**260**	**52**
32	OK	36	24	44	38	92	**234**	**47**
33	HI	41	38	64	21	37	**201**	**40**
34	NH	29	40	38	41	33	**181**	**36**
35	LA	15	36	40	25	64	**180**	**36**
36	CT	24	41	25	30	30	**150**	**30**
37	MT	19	32	26	25	34	**136**	**27**
38	KS	16	19	24	32	42	**133**	**27**
39	DE	29	20	76			**125**	**25**
40	MS	23	26	20	30	24	**123**	**25**
41	AR	33	37	19	28		**117**	**23**
42	VT	16	10	22	37	13	**98**	**20**
43	NV	14	16	21	15	30	**96**	**19**
44	ND	13	5	11	25	26	**80**	**16**
45	ID	8	14	18	11	5	**56**	**11**
46	ME	3	7				**10**	**2**
47	SD							**0**
	Grand Total	**6,453**	**7,024**	**9,225**	**9,057**	**10,144**	**41,903**	**8,381**

Data drawn from AUTM STAAT Website on 8/19/08 http://www.autmsurvey.org/statt/index.cfm

Table 81. Gap Analysis, FL vs Top 4: Disclosures

Rank	State	2002	2003	2004	2005	2006	Grand Total	Average # Disclosures
1	CA	1,828	2,024	2,222	2,073	2,490	**10,637**	**2,127**
2	MA	916	939	1,014	966	1,137	**4,972**	**994**
3	NY	951	773	873	833	881	**4,311**	**862**
4	PA	680	751	829	861	888	**4,009**	**802**
5	TX	818	744	622	811	669	**3,664**	**733**
6	MD	521	520	578	659	621	**2,899**	**580**
7	NC	535	570	568	557	661	**2,891**	**578**
8	FL	422	503	585	639	630	**2,779**	**556**
9	IL	442	469	533	526	650	**2,620**	**524**
10	OH	423	442	555	555	625	**2,600**	**520**
11	GA	361	426	499	566	635	**2,487**	**497**
12	MI	407	404	539	534	555	**2,439**	**488**
13	WI	331	452	459	461	594	**2,297**	**459**
14	VA	402	429	409	444	432	**2,116**	**423**
15	IN	98	301	347	416	528	**1,690**	**338**
16	UT	300	360	319	308	328	**1,615**	**323**
17	WA	271	237	261	305	380	**1,454**	**291**
18	MN	236	218	224	251	230	**1,159**	**232**
19	AZ	208	197	188	222	244	**1,059**	**212**
20	IA	189	210	200	237	209	**1,045**	**209**
21	CO	159	171	205	225	251	**1,011**	**202**
22	MO	169	168	221	215	226	**999**	**200**
23	NJ	147	202	221	190	217	**977**	**195**
24	OR	189	166	190	198	224	**967**	**193**
25	AL	159	201	147	216	209	**932**	**186**
26	TN	147	174	190	177	224	**912**	**182**
27	SC	110	139	139	172	183	**743**	**149**
28	KY	142	95	141	142	157	**677**	**135**
29	LA	71	109	108	85	152	**525**	**105**
30	NE	82	70	98	105	105	**460**	**92**
31	OK	69	95	93	75	101	**433**	**87**
32	NM	57	53	90	79	129	**408**	**82**
33	KS	68	83	47	86	117	**401**	**80**
34	CT	75	83	70	85	67	**380**	**76**
35	RI	69	67	85	109	19	**349**	**70**
36	MS	47	51	67	74	88	**327**	**65**
37	NH	56	56	52	52	70	**286**	**57**
38	AR	57	59	51	61		**228**	**46**
39	HI	34	28	56	46	64	**228**	**46**
40	DE	46	37	63	32	35	**213**	**43**
41	ND	26	19	47	45	35	**172**	**34**
42	ID	30	31	51	28	26	**166**	**33**
43	MT	21	33	33	36	42	**165**	**33**
44	VT	14	24	34	24	43	**139**	**28**
45	NV	22	32	39	2	33	**128**	**26**
46	ME	4	17				**21**	**4**
47	SD	3					**3**	**1**
	Grand Total	**12,412**	**13,232**	**14,362**	**14,783**	**16,204**	**70,993**	**14,199**

Data drawn from AUTM STAAT Website on 8/19/08 http://www.autmsurvey.org/statt/index.cfm

Table 82. Academic R&D Expenditures

Year	2000	2001	2002	2003	2004	2005	2006	2007	2008
California	$4,067,820	$4,428,903	$4,887,918	$5,357,900	$6,012,871	$6,264,908	$6,490,107	$6,733,546	$7,026,354
New York	$2,297,109	$2,481,833	$2,765,484	$3,078,092	$3,351,943	$3,610,287	$3,804,748	$3,964,070	$4,044,815
Texas	$2,037,681	$2,251,839	$2,535,237	$2,764,769	$2,879,129	$3,073,724	$3,270,728	$3,417,082	$3,744,182
Maryland	$1,507,669	$1,653,757	$1,895,382	$2,040,747	$2,268,304	$2,356,905	$2,529,998	$2,542,336	$2,747,001
Pennsylvania	$1,553,216	$1,693,793	$1,913,687	$2,014,842	$2,208,100	$2,367,837	$2,431,403	$2,438,312	$2,604,118
Massachusetts	$1,486,174	$1,578,977	$1,697,182	$1,821,924	$2,000,120	$2,079,548	$2,122,756	$2,171,596	$2,271,757
North Carolina	$1,040,943	$1,139,099	$1,279,377	$1,397,859	$1,446,874	$1,655,844	$1,710,496	$1,885,499	$1,980,833
Illinois	$1,170,905	$1,281,256	$1,441,156	$1,614,270	$1,713,282	$1,771,107	$1,824,223	$1,867,003	$1,972,752
Ohio	$918,241	$996,069	$1,116,116	$1,268,397	$1,319,680	$1,531,614	$1,637,546	$1,807,038	$1,827,042
Michigan	$1,007,910	$1,108,622	$1,233,887	$1,390,083	$1,397,435	$1,456,218	$1,473,199	$1,509,953	$1,593,654
Florida	$851,932	$985,628	$1,085,764	$1,204,592	$1,306,810	$1,448,634	$1,522,099	$1,557,504	$1,591,774
Georgia	$926,749	$989,024	$1,076,706	$1,176,523	$1,222,150	$1,274,410	$1,302,570	$1,388,976	$1,521,486
Wisconsin	$662,080	$729,288	$806,543	$877,800	$956,652	$999,847	$1,039,530	$1,066,688	$1,117,152
Washington	$643,998	$707,761	$784,186	$871,113	$897,326	$901,558	$988,252	$981,229	$1,058,170
Virginia	$553,924	$610,904	$693,668	$776,067	$849,038	$910,163	$946,886	$971,377	$1,052,601
Missouri	$614,028	$678,202	$705,593	$807,075	$841,779	$893,013	$900,202	$941,445	$960,171
Indiana	$509,141	$584,418	$650,718	$725,752	$841,141	$759,622	$823,501	$893,808	$954,188
Colorado	$544,584	$572,950	$645,291	$694,862	$771,359	$825,048	$820,565	$872,576	$924,073
New Jersey	$567,666	$628,040	$690,642	$754,426	$805,135	$865,641	$858,413	$864,678	$876,698
Arizona	$465,777	$500,548	$531,106	$617,978	$650,961	$720,184	$765,434	$782,671	$831,192
Tennessee	$405,291	$428,259	$491,274	$600,004	$658,247	$726,078	$742,923	$761,388	$787,122
Connecticut	$468,708	$499,095	$538,488	$594,507	$649,245	$669,923	$691,998	$691,408	$731,711
Alabama	$428,122	$448,294	$503,470	$550,756	$572,279	$589,860	$601,881	$655,245	$707,801
Minnesota	$418,029	$469,370	$504,398	$517,912	$535,469	$558,259	$605,201	$636,920	$698,920
Louisiana	$409,537	$436,483	$476,785	$514,403	$559,372	$584,336	$552,931	$604,007	$660,139
Oregon	$346,149	$366,023	$386,666	$436,958	$504,802	$536,228	$557,405	$574,521	$594,945
South Carolina	$294,274	$361,404	$399,982	$435,328	$455,964	$487,776	$524,034	$569,347	$576,219
Iowa	$418,263	$439,810	$485,756	$498,669	$531,770	$548,301	$572,623	$586,786	$527,769
Kentucky	$276,986	$298,268	$334,208	$377,635	$424,013	$452,265	$479,282	$503,293	$506,057
Utah	$308,059	$338,127	$359,556	$385,158	$407,327	$400,276	$412,811	$414,690	$425,683
New Mexico	$243,822	$274,209	$292,691	$306,636	$303,922	$361,466	$421,428	$410,375	$416,991
Mississippi	$217,064	$260,991	$289,412	$324,236	$347,563	$353,078	$369,143	$410,637	$406,459
Kansas	$258,452	$268,897	$299,806	$310,111	$332,547	$348,751	$354,376	$375,960	$403,512
Nebraska	$208,480	$241,638	$266,930	$300,540	$325,001	$360,148	$358,858	$364,842	$376,092
District of Columbia	$245,828	$228,110	$260,819	$280,874	$303,049	$302,921	$296,155	$333,222	$369,020
Oklahoma	$252,419	$255,217	$282,062	$295,098	$283,021	$291,697	$298,175	$298,663	$333,230
New Hampshire	$150,982	$196,975	$220,061	$252,210	$277,201	$287,472	$315,394	$307,074	$302,008
Hawaii	$161,300	$156,976	$172,664	$184,602	$241,346	$240,247	$257,478	$274,373	$278,751
Arkansas	$131,868	$142,310	$140,813	$183,908	$182,958	$209,518	$237,233	$240,321	$246,786
Rhode Island	$129,697	$142,625	$163,052	$187,131	$192,326	$199,709	$230,104	$230,281	$236,627
Nevada	$106,154	$115,934	$126,713	$154,515	$163,764	$178,492	$194,459	$192,081	$190,893
Montana	$99,069	$107,744	$122,375	$141,220	$154,726	$170,791	$172,622	$179,137	$185,791
North Dakota	$67,406	$84,574	$106,078	$133,615	$151,710	$149,994	$160,095	$169,468	$180,764
West Virginia	$75,524	$81,880	$100,830	$125,417	$134,961	$146,489	$150,420	$167,208	$170,869
Delaware	$78,126	$79,985	$88,319	$104,650	$114,663	$115,751	$122,001	$125,663	$133,231
Maine	$57,753	$70,969	$75,063	$83,935	$99,108	$96,569	$120,038	$137,425	$128,090
Vermont	$64,762	$76,882	$90,189	$106,581	$115,767	$117,400	$123,608	$115,025	$117,210
Idaho	$73,726	$82,496	$93,323	$105,039	$116,757	$119,871	$111,465	$114,224	$113,482
Alaska	$108,099	$119,199	$128,875	$142,413	$146,465	$153,721	$163,034	$159,991	$111,418
Puerto Rico	$74,529	$63,755	$70,286	$78,410	$86,514	$100,235	$104,077	$106,852	$100,401
South Dakota	$27,589	$32,498	$38,449	$49,977	$58,583	$67,012	$72,790	$81,544	$91,797
Wyoming	$43,094	$41,632	$41,632	$60,054	$60,054	$83,449	$89,414	$79,700	$74,720
Virgin Islands	$3,310	$8,645	$13,981	$15,762	$17,874	$16,735	$17,495	$17,842	$18,099
Guam	$4,130	$3,752	$4,571	$6,989	$9,458	$8,531	$7,604	$7,059	$6,106
Total	**$30,084,148**	**$32,823,937**	**$36,405,220**	**$40,100,324**	**$43,257,915**	**$45,799,461**	**$47,751,211**	**$49,553,959**	**$51,908,726**

http://webcaspar.nsf.gov/index.jsp?subHeader=WebCASPARHome

Table 83. NSF Research by State in Disciplines w/ Cleantech Implications, 2008

State	R&D in 000's	Note
California	2,904,907	***Academic Disciplines in Figures Above are*** *Aeronautical and Astronautical, Agricultural Sciences, Atmospheric Biological Sciences, Chemical Engineering, Chemistry, Civil Engineering, Earth Sciences, Electrical Engineering, Mechanical Engineering, Metallurgical and Materials Engineering, Oceanography, Other Engineering, Other Environmental Sciences, Physics*
New York	1,933,004	
Texas	1,906,263	
Massachusetts	1,366,223	
Maryland	1,362,368	
Pennsylvania	1,074,674	
Georgia	914,358	
Illinois	909,232	
North Carolina	904,826	
Ohio	854,166	
Florida	828,172	
Michigan	798,649	
Virginia	651,059	
Indiana	551,005	
New Jersey	546,820	
Wisconsin	531,621	
Colorado	513,763	
Washington	505,202	
Arizona	439,749	
Missouri	439,106	
Tennessee	428,792	
Louisiana	370,208	
Alabama	336,294	
Oregon	324,362	
South Carolina	319,451	
Connecticut	295,053	
Kansas	294,318	
Minnesota	274,725	
Mississippi	267,955	
Utah	260,698	
Iowa	258,575	
New Mexico	248,615	
Kentucky	243,778	
Nebraska	230,655	
Oklahoma	225,214	
Arkansas	161,274	
Nevada	158,332	
Montana	144,326	
New Hampshire	131,376	
North Dakota	124,102	
Hawaii	121,605	
Rhode Island	120,247	
Delaware	99,053	
West Virginia	97,375	
Idaho	91,218	
Maine	87,480	
District of Columbia	68,902	
Alaska	65,748	
South Dakota	60,848	
Wyoming	58,613	
Vermont	56,090	
Puerto Rico	41,902	
Guam	4,115	
Virgin Islands	-	
Grand Total	**26,006,466**	

http://webcaspar.nsf.gov/index.jsp?subHeader=WebCASPARHome

Table 84. Scientist and Engineers Plotted Against R&D for top R&D States

All US States					All States (Ex CA, MI, NY)			
Rank	State	S&E	R&D		Rank	State	S&E	R&D
1	California	87,370	71,335		1	Massachusetts	32,400	20,577
2	Massachusetts	32,400	20,577		2	Texas	36,000	17,059
3	Michigan	17,900	18,189		3	New Jersey	20,810	16,259
4	Texas	36,000	17,059		4	Maryland	26,160	14,493
5	New Jersey	20,810	16,259		5	Illinois	24,110	13,609
6	Maryland	26,160	14,493		6	Washington	16,920	13,585
7	New York	45,850	14,366		7	Pennsylvania	29,120	12,929
8	Illinois	24,110	13,609		8	Virginia	19,850	9,867
9	Washington	16,920	13,585		9	Ohio	20,540	9,431
10	Pennsylvania	29,120	12,929		10	Connecticut	10,330	9,049
11	Virginia	19,850	9,867		11	North Carolina	18,910	7,710
12	Ohio	20,540	9,431		12	Minnesota	11,800	7,149
13	Connecticut	10,330	9,049		13	Florida	17,630	6,339
14	North Carolina	18,910	7,710		14	Colorado	13,150	6,153
15	Minnesota	11,800	7,149		15	New Mexico	8,300	5,789
16	Florida	17,630	6,339		16	Indiana	9,870	5,784
17	Colorado	13,150	6,153		17	Arizona	8,410	4,760
18	New Mexico	8,300	5,789		18	Georgia	12,970	4,440
19	Indiana	9,870	5,784		19	Wisconsin	9,530	4,132
20	Arizona	8,410	4,760		20	Oregon	8,270	4,104

http://www.nsf.gov/statistics/nsf10302/

Figure 23. Working PhD S&E vs R&D: Top 20 R&D States (Including Outliers CA, MI, NY)

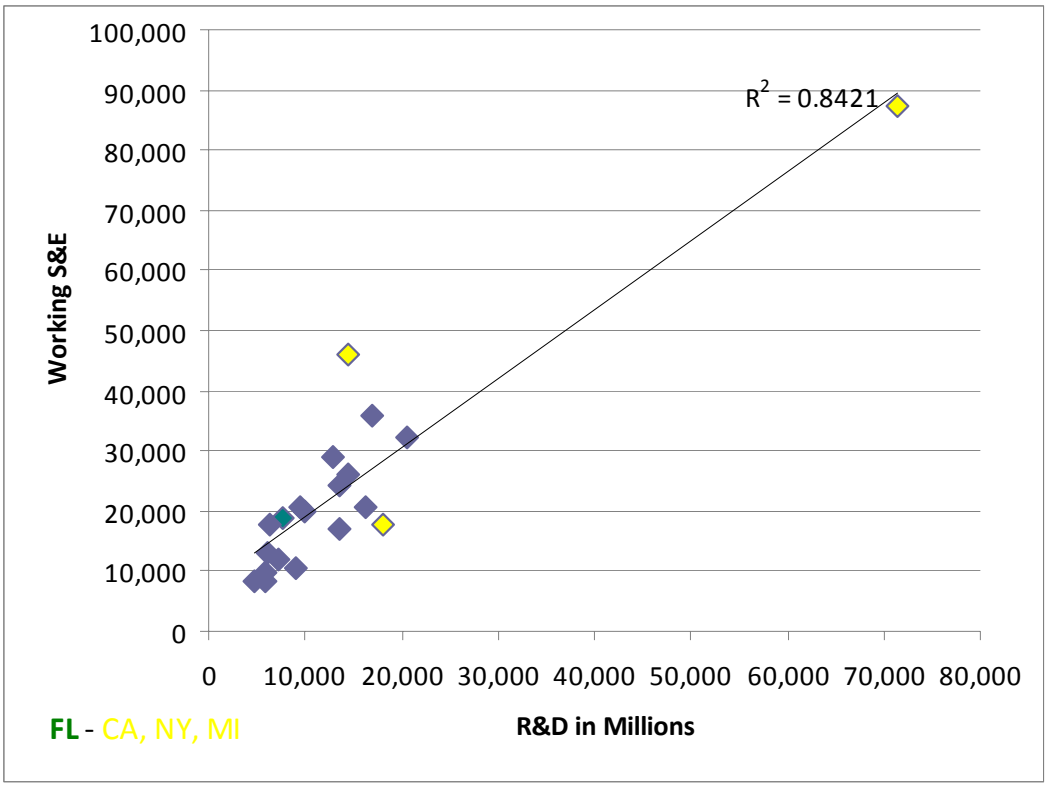

Figure 24. Working PhD S&E vs R&D: Top 20 R&D States (Excluding Outliers CA, MI, NY)

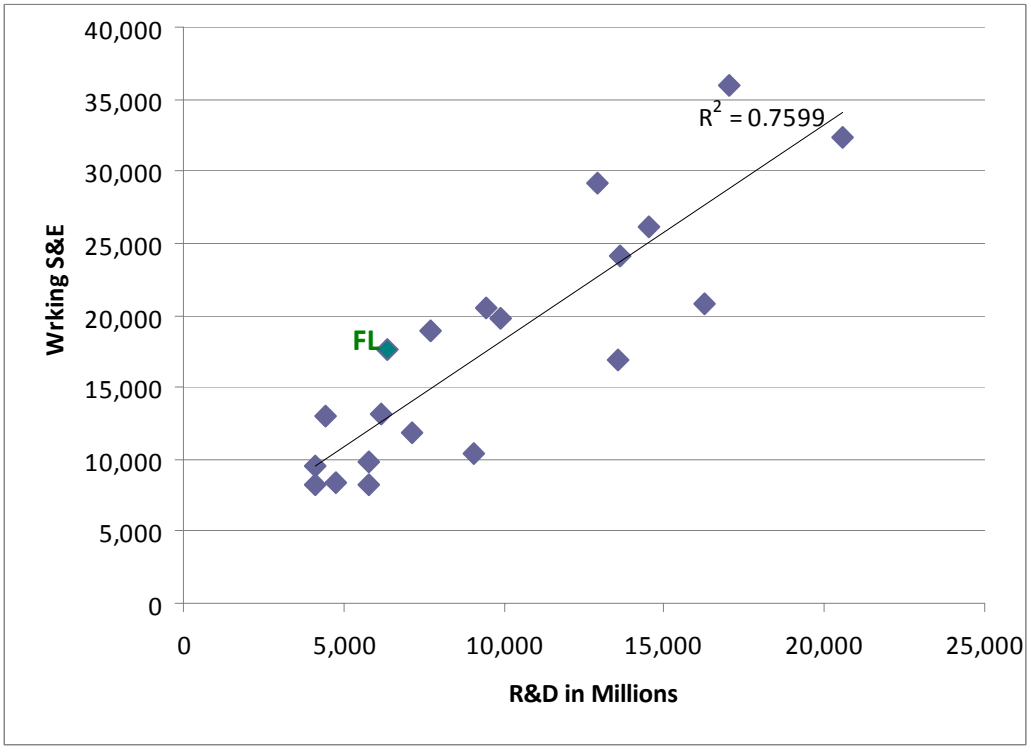

Table 85. PhD Scientists and Engineers Employed by State

Location	Total	Rank
United States	620,140	–
California	87,370	1
New York	45,850	2
Texas	36,000	3
Massachusetts	32,400	4
Pennsylvania	29,120	5
Maryland	26,160	6
Illinois	24,110	7
New Jersey	20,810	8
Ohio	20,540	9
Virginia	19,850	10
North Carolina	18,910	11
Michigan	17,900	12
Florida	17,630	13
Washington	16,920	14
District of Columbia	13,330	15
Colorado	13,150	16
Georgia	12,970	17
Minnesota	11,800	18
Connecticut	10,330	19
Tennessee	9,980	20
Indiana	9,870	21
Wisconsin	9,530	22
Missouri	9,300	23
Arizona	8,410	24
New Mexico	8,300	25
Oregon	8,270	26
South Carolina	5,910	27
Alabama	5,900	28
Utah	5,520	29
Louisiana	5,480	30
Kentucky	4,960	31
Iowa	4,890	32
Oklahoma	4,420	33
Kansas	4,250	34
Mississippi	3,310	35
Delaware	3,110	36
Rhode Island	3,020	37
Nebraska	2,970	38
Hawaii	2,850	39
Idaho	2,840	40
Arkansas	2,840	40
Nevada	2,620	42
New Hampshire	2,470	43
Maine	2,350	44
West Virginia	2,000	45
Montana	1,990	46
Vermont	1,690	47
Puerto Rico	1,690	47
North Dakota	1,380	49
Alaska	1,110	50
South Dakota	1,050	51
Wyoming	730	52

http://www.nsf.gov/statistics/nsf10302/

Table 86. Venture Capital Firms Listed in "Capital Vector" Database

Unique Firms with Principal Office in State with a Primary Interest in one or more Cleantech Fields*		All VC Firms with Principal Office in the State	
State	**VC Firms**	**State**	**Total**
CA	67	CA	471
NY	24	NY	264
TX	23	MA	174
MA	17	IL	107
CT	10	TX	79
CO	7	PA	68
IL	6	CT	61
NJ	5	OH	42
PA	5	NJ	39
DC	5	VA	38
MD	5	CO	35
NC	4	FL	33
FL	3	MD	32
WV	2	WA	30
MI	2	NC	29
HI	2	MN	25
NM	2	MI	24
GA	2	GA	21
TN	2	UT	16
VA	2	DC	16
LA	2	WI	14
WI	2	TN	13
SD	1	KS	11
UT	1	AZ	10
OR	1	MO	9
AZ	1	IN	9
OH	1	IA	7
NH	1	AL	7
Grand Total	205	OR	7
		NH	7
		NM	7
*Includes Companies Investing in 1 or More of the following Fields		KY	6
Energy	163	RI	5
Cleantech	37	DE	5
Environmental	13	OK	5
Transportation	13	HI	5
Natural Resources	7	LA	4
Physical Sciences	1	NV	4
		MS	3
		WV	2
		VT	2
	ME	2	
		WY	2
		AR	2
		ID	2
		ND	2
		SC	1
		Grand Total	**1757**

http://www.capitalvector.com/

Table 87. Gap Analysis, FL vs Top 4: Academic Licensing Managers by State

Rank	State	2002	2003	2004	2005	2006	Total	Average # FTE
1	CA	85	102.5	91	77	122	**477**	**95**
2	NY	51	40.6	45.5	47	45	**229**	**46**
3	MA	43	45.1	39.86	47.13	46.4	**222**	**44**
4	TX	48	42.5	36	46	41.7	**214**	**43**
5	IL	29	30.5	31.5	31.5	34.5	**157**	**31**
6	OH	21	24.03	31.8	32.8	31.3	**141**	**28**
7	PA	25	24	25	27.5	33.7	**135**	**27**
8	FL	22	23.5	24.1	23.5	29.48	**123**	**25**
9	MD	20	20.63	22.8	24.8	20.1	**109**	**22**
10	NC	18	20.43	22.5	20.6	25	**107**	**21**
11	WI	20	19.5	19.5	21.6	22.85	**103**	**21**
12	MI	19	18.7	18.3	19	20.5	**95**	**19**
13	WA	15	15.5	19.5	23.35	20.4	**93**	**19**
14	GA	14	15.5	17.5	20	22	**89**	**18**
15	UT	12	13.25	14.5	16.75	17.6	**74**	**15**
16	MN	10	10	9.25	12.25	18.25	**60**	**12**
17	IN	6	10	14	16	13.5	**60**	**12**
18	VA	11	10.25	11.25	12.25	13.35	**58**	**12**
19	OR	9	11.46	11.78	12.35	12.25	**57**	**11**
20	IA	11	10.8	11.3	11	10.8	**55**	**11**
21	CO	8	7.95	11.9	10.7	14.2	**53**	**11**
22	MO	9	8.5	11.75	10.75	11.15	**51**	**10**
23	NJ	9	9	9	12	11	**50**	**10**
24	TN	8	10.25	10	9.25	9	**46**	**9**
25	AL	8	2.5	9	10	9.5	**39**	**8**
26	AZ	5	6	9	9	9	**38**	**8**
27	KS	7	6.6	7	4.7	5.6	**31**	**6**
28	SC	5	4.4	6.25	6.6	7.6	**30**	**6**
29	LA	5	5.5	6	6	7.35	**29**	**6**
30	NM	4	5.5	6	5	6.75	**27**	**5**
31	OK	6	5	5	6	5	**27**	**5**
32	NE	7	4.5	6	5.3	4.5	**27**	**5**
33	KY	4	6	5.6	5	5	**26**	**5**
34	HI	6	5	5	5	5	**26**	**5**
35	CT	3	4	4	4	5	**20**	**4**
36	MS	3	3	3.5	5	5	**20**	**4**
37	RI	3	4	4	5	2	**18**	**4**
38	NH	3	3	3	3	3	**15**	**3**
39	MT	2	2.5	3.5	3.5	2.4	**14**	**3**
40	DE	2	2	2	2	2	**10**	**2**
41	AR	3	2.5	2	3		**10**	**2**
42	VT	1	1	1	2	2	**7**	**1**
43	ND	1	1	1.5	1.75	1.75	**7**	**1**
44	NV	1	1	1	1	3	**7**	**1**
45	ID	1	2	1	1	1	**6**	**1**
46	ME	1	0.5				**1**	**0**
47	SD	0					**0**	**0**
	Total	**598**	**621.95**	**650.94**	**678.93**	**738.48**	**3,288**	**658**

Data drawn from AUTM STAAT Website on 8/19/08 http://www.autmsurvey.org/statt/index.cfm

Table 88. Gap Analysis, FL vs Top 4: Patent Expenses to Protect Academic Intellectual Property

Rank	State	2002	2003	2004	2005	2006	Grand Total	Average Lgl Fees
1	CA	30,765,276	33,133,910	30,502,597	33,399,201	37,690,894	**165,491,878**	**33,098,376**
2	MA	16,366,427	16,368,668	18,272,858	19,223,547	20,887,629	**91,119,129**	**18,223,826**
3	NY	17,738,415	10,391,149	12,870,726	13,946,442	14,705,891	**69,652,623**	**13,930,525**
4	PA	7,433,185	8,987,376	11,060,394	9,312,472	13,298,552	**50,091,979**	**10,018,396**
5	NC	6,465,987	8,852,056	9,336,821	8,383,137	10,680,958	**43,718,959**	**8,743,792**
6	TX	8,153,201	7,425,501	6,847,500	8,114,503	7,283,350	**37,824,055**	**7,564,811**
7	MI	5,687,415	6,490,237	7,167,605	8,005,435	8,136,761	**35,487,453**	**7,097,491**
8	IL	4,522,137	6,135,800	6,717,134	8,197,818	9,021,156	**34,594,045**	**6,918,809**
9	MD	5,490,982	5,413,366	7,362,684	7,311,908	8,168,849	**33,747,789**	**6,749,558**
10	FL	4,836,486	6,598,840	6,212,500	7,891,239	7,772,098	**33,311,163**	**6,662,233**
11	WI	4,536,046	5,084,163	6,226,537	7,313,269	7,712,678	**30,872,693**	**6,174,539**
12	GA	4,729,473	5,331,325	5,415,186	5,448,295	5,744,094	**26,668,373**	**5,333,675**
13	IA	3,234,465	3,483,615	4,476,053	5,314,191	5,060,248	**21,568,572**	**4,313,714**
14	OH	2,827,103	3,088,599	2,755,765	5,093,575	5,663,514	**19,428,556**	**3,885,711**
15	IN	1,081,262	3,841,368	4,056,847	3,655,963	3,883,779	**16,519,219**	**3,303,844**
16	MO	3,076,695	2,821,038	2,768,136	3,366,287	4,387,619	**16,419,775**	**3,283,955**
17	MN	2,987,363	3,210,937	2,564,221	3,077,860	3,182,622	**15,023,003**	**3,004,601**
18	WA	2,866,998	2,927,122	2,032,409	3,397,650	3,688,396	**14,912,575**	**2,982,515**
19	VA	2,443,003	2,340,987	2,923,159	3,587,618	3,473,613	**14,768,380**	**2,953,676**
20	AL	1,843,214	2,238,504	3,482,940	2,637,650	3,125,675	**13,327,983**	**2,665,597**
21	UT	2,163,118	2,477,221	2,321,632	2,636,618	3,293,558	**12,892,147**	**2,578,429**
22	TN	2,027,596	2,372,544	2,345,319	2,964,245	3,135,593	**12,845,297**	**2,569,059**
23	AZ	1,563,067	1,633,612	2,207,557	2,120,531	1,505,138	**9,029,905**	**1,805,981**
24	OR	1,336,868	1,714,703	1,875,951	1,588,958	1,882,589	**8,399,069**	**1,679,814**
25	NJ	1,052,314	1,212,665	1,210,617	1,853,441	1,892,210	**7,221,247**	**1,444,249**
26	NE	1,368,058	976,956	928,320	1,004,489	1,215,292	**5,493,115**	**1,098,623**
27	KY	748,476	982,844	849,296	1,478,486	1,329,057	**5,388,159**	**1,077,632**
28	CO	964,611	842,894	1,016,721	1,226,159	1,232,402	**5,282,787**	**1,056,557**
29	SC	656,363	897,892	989,878	990,033	985,085	**4,519,251**	**903,850**
30	NM	693,321	827,735	927,085	723,910	973,782	**4,145,833**	**829,167**
31	KS	703,033	797,368	756,174	834,183	1,012,962	**4,103,720**	**820,744**
32	OK	513,382	624,925	725,476	758,613	1,315,168	**3,937,564**	**787,513**
33	LA	619,692	578,025	873,160	511,882	1,311,331	**3,894,090**	**778,818**
34	CT	619,623	731,288	650,351	561,000	717,771	**3,280,033**	**656,007**
35	NH	536,512	535,525	543,275	649,271	925,965	**3,190,548**	**638,110**
36	AR	543,037	1,112,414	827,515	672,790		**3,155,756**	**631,151**
37	RI	507,494	646,284	643,235	652,422	168,216	**2,617,651**	**523,530**
38	MS	240,643	423,532	390,229	511,780	555,844	**2,122,028**	**424,406**
39	VT	282,391	332,009	0	672,798	470,511	**1,757,709**	**351,542**
40	MT	181,039	403,860	362,038	310,436	272,460	**1,529,833**	**305,967**
41	ID	183,100	169,438	350,898	322,960	305,605	**1,332,001**	**266,400**
42	ND	123,389	110,333	197,878	374,529	429,200	**1,235,329**	**247,066**
43	HI	184,900	278,110	160,265	334,825	164,290	**1,122,390**	**224,478**
44	NV	165,352	171,744	240,628	12,840	393,921	**984,485**	**196,897**
45	DE	204,112	246,526	338,379	0	0	**789,017**	**157,803**
46	ME	0	100,000				**100,000**	**20,000**
47	SD	0					**0**	**0**
	Total	**155,266,624**	**165,365,008**	**174,783,949**	**190,445,259**	**209,056,326**	**894,917,166**	**178,983,433**

Data drawn from AUTM STAAT Website on 8/19/08 http://www.autmsurvey.org/statt/index.cfm

Table 89. Academic Faculty and Students: Data Built by Institution from Carnegie Foundation for Previous FRC Report

State	Tot Faculty	Rank	R&D 2007 *	Rank	Tot Ten Faculty	Rank	Student Count	Inst Count	Stu/Faculty	Rank
California	34,920	1	$6,163,831	1	19,920	1	601,644	31	17	33
New York	28,346	2	$3,920,892	2	18,543	2	375,008	34	13	15
Texas	27,881	3	$3,402,621	3	17,336	3	498,832	31	18	36
Pennsylvania	19,926	4	$2,408,775	5	10,189	5	235,913	12	12	6
Massachusetts	18,724	5	$2,026,011	6	8,824	10	200,233	18	11	3
Florida	16,792	6	$1,545,209	10	9,375	7	350,651	14	21	45
Illinois	14,450	7	$1,837,557	8	9,109	9	193,503	11	13	16
Ohio	14,398	8	$1,799,990	9	10,450	4	282,576	14	20	42
Michigan	14,268	9	$1,498,070	11	9,230	8	256,856	9	18	37
North Carolina	13,926	10	$1,871,257	7	9,407	6	182,091	11	13	13
Virginia	10,702	11	$967,420	15	6,793	12	176,853	11	17	30
Missouri	10,090	12	$938,759	16	4,913	16	115,965	8	11	5
Maryland	9,970	13	$2,424,077	4	5,597	13	89,356	8	9	2
Indiana	9,641	14	$798,804	19	6,894	11	191,999	5	20	43
Georgia	9,212	15	$1,378,685	12	5,170	15	111,701	10	12	7
Tennessee	8,694	16	$758,631	21	5,488	14	112,963	8	13	12
Colorado	8,051	17	$870,360	17	4,080	20	109,757	5	14	19
New Jersey	6,953	18	$856,333	18	4,397	17	87,014	6	13	8
Wisconsin	6,920	19	$1,058,841	13	4,036	21	105,277	7	15	24
Louisiana	6,392	20	$590,427	25	4,101	19	95,135	7	15	23
Alabama	6,059	21	$652,379	23	4,349	18	100,750	7	17	31
Washington	5,808	22	$973,168	14	2,975	27	78,890	3	14	18
Oregon	5,627	23	$568,672	27	2,084	35	70,791	5	13	9
Utah	5,059	24	$412,512	30	3,102	25	77,092	3	15	25
Minnesota	5,012	25	$624,149	24	2,876	28	66,099	1	13	14
Iowa	4,912	26	$583,856	26	3,061	26	67,969	3	14	20
Connecticut	4,826	27	$681,228	22	2,593	32	38,368	3	8	1
Arizona	4,787	28	$782,671	20	3,464	22	110,045	3	23	49
Kentucky	4,432	29	$496,782	29	3,232	24	68,402	4	15	26
South Carolina	4,392	30	$564,345	28	3,259	23	73,287	5	17	32
Oklahoma	4,356	31	$297,077	36	2,704	30	69,554	4	16	28
Kansas	4,214	32	$373,427	33	2,695	31	66,127	3	16	27
Nebraska	3,842	33	$364,842	34	2,801	29	53,727	2	14	22
Mississippi	3,725	34	$407,530	32	2,519	33	60,828	5	16	29
Arkansas	3,099	35	$239,704	38	2,222	34	60,270	6	19	41
New Mexico	2,518	36	$409,292	31	1,600	37	44,104	3	18	34
West Virginia	2,372	37	$163,114	42	1,619	36	43,341	3	18	39
Idaho	1,940	38	$114,224	47	1,440	38	44,384	3	23	48
Nevada	1,886	39	$148,858	44	1,319	40	44,641	2	24	50
Hawaii	1,850	40	$274,373	37	1,347	39	23,624	2	13	10
Rhode Island	1,761	41	$228,856	39	1,220	41	23,817	2	14	17
New Hampshire	1,493	42	$307,074	35	1,151	42	20,854	2	14	21
Montana	1,453	43	$178,291	40	1,087	43	27,460	3	19	40
North Dakota	1,432	44	$169,244	41	861	45	25,086	2	18	35
Delaware	1,325	45	$125,663	46	1,016	44	24,098	2	18	38
Alaska	1,211	46	$158,904	43	813	46	25,081	2	21	44
Vermont	1,088	47	$113,195	48	603	49	12,239	1	11	4
South Dakota	1,052	48	$74,986	50	672	48	22,958	3	22	46
Maine	1,016	49	$130,934	45	759	47	22,365	2	22	47
Wyoming	1,007	50	$79,700	49	567	50	12,875	1	13	11
Grand Total	**383,810**		**$47,815,600**		**233,862**		**5,852,453**	**350**	**15**	
Top 5 R&D	Students	1,911,630	Stu/Faculty	Faculty	129,797	14.72784				

Information from Florida Research Consortium Study. Source Data Carnegie Foundation.
http://classifications.carnegiefoundation.org/

* Data is driven by institution and for purposes of the FRC study, data on smaller institutions with less than $3M in research expenditures ere excluded. Thus, this data will not foot with data presented on other tables in this report, but is accurate for the purpose used.

Table 90. Renewable Portfolio Standards by State: RPS Requirement (% of Total Electric Load)

State	Solar	Photovoltaic	Landfill Gas	Wind	Biomass	Hydroelectric	Geothermal	Anaerobic	Fuel Cells	MSW	CHP/Cogen	Tidal Energy	Wave	Ocean Therm.	Hydrogen	Other	%	By	Additional Requirements/Notes
Mandatory RPS																			
HI	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	40%	2030	Subject to revisions every 5 years
CA	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	33%	2020	20% by 2010
ME	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	30%	2000	Increase renewables by 10% by 2017 (MSW & hydro ineligible)
CT	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	27%	2020	20% from Class I, 3% Class I or II, and 4% Class III renewables
IL	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	25%	2025	75% must be from wind
MN	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	25%	2025	30% by 2020 for Xcel Energy, of which at least 25% wind
NV	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	25%	2025	5% solar carve-out through 2015, 6% thereafter
OH	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	25%	2025	At least half must be from in-state facilities; IOUs only
OR	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	25%	2025	10% for small utilities; 5% for smallest utilities
NY	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	24%	2013	25% of which 1% to be met w/ voluntary green power sales
NH	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	23.80%	2025	Separate portfolio standards by class of renewables
NJ	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	22.50%	2021	max 2.5% from Class II
CO	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	20%	2020	10% for co-ops & large munis; 4% must be solar (IOUs only)
DC	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	20%	2020	Heavily skewed toward Tier I renewables
DE	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	20%	2019	Subject to amendments after 2014; 2% must be from PV
KS	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	20%	2020	10% by 2011; 15% by 2016 (based on peak capacity demand)
MD	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	20%	2022	Additional requirement for 2.5% from Tier II renewables thru 2018
NM	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	20%	2020	10% by 2020 for coops
PA	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	18%	2020	8% Tier I and 10% Tier II (includes non-renewables)
RI	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	16%	2019	
AZ	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	15%	2025	By 2012, >30% must be met w/ distributed energy
MA	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	15%	2020	1% p.a. increase in Class I RE after 2020 w/o stated expiration
MO	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	15%	2021	IOUs only; 0.3% solar by 2021
MT	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	15%	2015	
WA	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	15%	2020	
NC	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	12.50%	2021	10% by 2018 for coops & munis
MI	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	10%	2015	Also requires 1,100 MW of new renewable capacity
WI	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	10%	2015	Requirement varies by utility; 10% by 2015 is a goal

State	Solar	Photovoltaic	Landfill Gas	Wind	Biomass	Hydroelectric	Geothermal	Anaerobic	Fuel Cells	MSW	CHP/Cogen	Tidal Energy	Wave	Ocean Therm.	Hydrogen	Other	%	By	Additional Requirements/Notes
TX	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	5,880 MW	2015	At least 500 MW from source other than wind
IA	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	105 MW	1983	Obligation already met
Voluntary RPS																			
UT	✓	✓	✓	✓	✓	✓	✓	✓			✓	✓	✓	✓	✓		25%	2025	Required only to the extent that it is "cost-effective"
VA	✓	✓	✓	✓	✓	✓	✓	✓		✓		✓	✓				25%	2025	
SD	✓	✓	✓	✓	✓	✓	✓	✓		✓					✓		20%	2025	
VT	✓	✓	✓	✓	✓	✓	✓	✓	✓								15%	2025	Interim goal of 20% by July 1, 2017
MO	✓	✓	✓	✓	✓	✓	✓	✓							✓		10%	2015	IOUs only
ND	✓	✓	✓	✓	✓	✓	✓	✓							✓	✓	10%	2015	
WV	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	~	~	~	~	✓	10%	2015	25% standard incl. alternative resources too (e.g., clean coal)
FL	✓	✓	✓	✓	✓	✓	✓	✓		✓							110MW		Voluntary with Rate Recovery OK

Source: Database of State Incentives for Renewables and Efficiency (DSIRE), EPA, EEI.

* Fuel cells using renewable fuels only.

Table 91. Private Equity-Backed Mergers and Acquisitions by Year ($Millions)

Year	# Total	# Known	Price	Average
1980	1	0	$0	$0
1981	1	1	$218	$218
1982	1	0	$0	$0
1983	3	0	$0	$0
1984	5	2	$644	$322
1985	9	4	$282	$71
1986	17	4	$215	$54
1987	21	8	$854	$107
1988	32	16	$1,580	$99
1989	35	20	$2,071	$104
1990	27	12	$596	$50
1991	33	13	$1,039	$80
1992	91	60	$4,293	$72
1993	121	76	$6,141	$81
1994	136	89	$9,972	$112
1995	162	109	$16,348	$150
1996	193	146	$37,024	$254
1997	270	202	$65,423	$324
1998	324	233	$91,567	$393
1999	353	259	$223,151	$862
2000	376	249	$125,327	$503
2001	406	203	$39,597	$195
2002	359	187	$24,019	$128
2003	326	146	$14,561	$100
2004	383	210	$25,171	$120
2005	448	223	$41,470	$186
2006	502	221	$48,895	$221
2007	549	238	$76,547	$322
2008	473	155	$26,018	$168
Average from 2000-2008			**$46,845**	**$216**

Note: Private Equity includes venture capital, buyouts, mezzanine, and other private equity financed companies. Therefore, data.
http://www.nvca.org/index.php?option=com_docman&task=cat_view&gid=89&Itemid=464

Table 92. Private Equity Backed Acquisitions by Industry (2000-2008)

	2000	2001	2002	2003	2004	2005	2006	2007	2008	Average 06-08
Industrial/Energy	$3,022	$3,116	$3,809	$1,634	$6,014	$8,614	$16,866	$8,318	$6,517	$6,434
Software	$22,039	$3,258	$1,944	$4,169	$4,631	$5,045	$5,299	$5,773	$4,452	$6,290
Telecommunications	$17,540	$7,670	$7,116	$326	$2,159	$1,241	$2,794	$4,978	$2,043	$5,096
Financial Services	$1,505	$3,566	$1,538	$256	$10	$1,005	$938	$1,370	$1,813	$1,333
Biotechnology	$1,972	$540	$2,540	$660	$816	$4,855	$1,765	$5,513	$1,776	$2,271
Media and Entertainment	$6,733	$738	$1,112	$285	$2,260	$5,259	$9,239	$7,902	$1,650	$3,909
Business Products and Services	$2,258	$245	$142	$154	$1,269	$486	$1,859	$3,459	$1,537	$1,268
Retailing/Distribution	$5,663	$2,408	$178	$1,636	$703	$0	$690	$3,894	$878	$1,783
Networking and Equipment	$18,902	$5,525	$751	$877	$526	$2,346	$819	$947	$782	$3,497
Computers and Peripherals	$2,569	$357	$59	$64	$756	$270	$285	$610	$769	$638
Consumer Products and Services	$1,375	$568	$1,540	$1,432	$1,101	$4,166	$1,642	$19,369	$760	$3,550
Semiconductors	$5,243	$1,564	$563	$415	$612	$214	$922	$896	$677	$1,234
Medical Devices and Equipment	$481	$993	$1,011	$548	$1,295	$3,063	$2,312	$4,328	$643	$1,630
Healthcare Services	$286	$602	$1,020	$85	$706	$1,717	$2,398	$1,801	$614	$1,025
IT Services	$31,248	$866	$670	$1,809	$1,848	$2,079	$520	$2,643	$538	$4,691
Electronics/Instrumentation	$4,491	$7,582	$27	$21	$221	$72	$3	$3,689	$472	$1,842
Other	$0	$0	$0	$190	$245	$1,039	$545	$1,055	$100	$353

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Table 93. Venture Backed IPO's, Total Offering Size ($ Millions)

	2000	2001	2002	2003	2004	2005	2006	2007	2008	Avg 00-08
Computers and Peripherals	$606	$0	$55	$0	$84	$7	$0	$108	$188	$116
Healthcare Services	$192	$535	$72	$52	$108	$67	$0	$113	$164	$145
Software	$4,019	$365	$155	$289	$2,050	$505	$576	$1,242	$62	$1,029
Medical Devices and Equipment	$759	$610	$300	$53	$844	$327	$714	$1,241	$57	$545
Biotechnology	$4,085	$335	$331	$440	$1,436	$782	$855	$1,315	$0	$1,064
Business Products and Services	$683	$0	$0	$97	$324	$464	$0	$828	$0	$266
Consumer Products and Services	$414	$185	$39	$157	$250	$103	$77	$202	$0	$159
Electronics/Instrumentation	$274	$41	$500	$0	$0	$0	$0	$0	$0	$91
Financial Services	$104	$490	$201	$322	$699	$755	$197	$0	$0	$308
Industrial/Energy	$1,317	$522	$158	$0	$367	$21	$257	$580	$0	$358
IT Services	$1,711	$0	$90	$0	$90	$122	$191	$344	$0	$283
Media and Entertainment	$1,499	$0	$207	$65	$1,699	$352	$798	$184	$0	$534
Networking and Equipment	$3,361	$135	$0	$0	$138	$0	$427	$453	$0	$502
Other	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Retailing/Distribution	$275	$0	$0	$65	$62	$28	$139	$496	$0	$118
Semiconductors	$1,591	$122	$0	$332	$2,218	$594	$125	$636	$0	$624
Telecommunications	$4,730	$150	$0	$152	$1,040	$358	$719	$2,583	$0	$1,081

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Table 94. Venture Backed IPO's

Year	# IPO's	Offer Amt in $M
1980	59	$664
1981	97	$1,068
1982	39	$577
1983	196	$3,770
1984	83	$1,005
1985	76	$1,293
1986	153	$3,423
1987	126	$2,318
1988	54	$846
1989	65	$1,223
1990	70	$1,396
1991	157	$4,923
1992	195	$7,204
1993	219	$6,683
1994	167	$4,671
1995	205	$8,147
1996	272	$11,482
1997	138	$4,826
1998	78	$3,782
1999	269	$20,823
2000	265	$25,618
2001	41	$3,490
2002	22	$2,109
2003	29	$2,023
2004	94	$11,378
2005	57	$4,485
2006	56	$5,075
2007	86	$10,326
2008	6	$470
Average 00-08		$7,219

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Table 95. Historical Clean Energy Patents by State

State Name	2002	2003	2004	2005	2006	2007	2008	2009	TOTAL	Avg 02-08
Michigan	93	112	123	105	97	113	90	64	**797**	**105**
California	60	52	78	44	55	60	67	73	**489**	**59**
New York	43	51	46	39	60	60	76	41	**416**	**54**
Connecticut	31	30	36	38	49	23	25	13	**245**	**33**
Texas	9	16	21	20	34	17	26	12	**155**	**20**
Illinois	23	17	27	25	13	17	19	9	**150**	**20**
Massachusetts	9	7	12	12	15	20	9	28	**112**	**12**
New Jersey	6	16	13	9	14	9	13	7	**87**	**11**
Florida	13	12	11	11	13	10	7	8	**85**	**11**
Washington	13	6	18	6	13	7	13	8	**84**	**11**
Minnesota	5	6	7	5	14	18	10	6	**71**	**9**
Ohio	6	7	6	8	7	12	10	12	**68**	**8**
Delaware	6	8	7	7	7	6	9	5	**55**	**7**
Oregon	6	5	6	7	8	6	7	2	**47**	**6**
Colorado	4	5	4	5	6	6	4	6	**40**	**5**
Wash. D.C.	5	5	4	5	5	8	4	4	**40**	**5**
New Mexico	1	6	5	6	6	3	3	7	**37**	**4**
Pennsylvania	1	3	4	6	4	4	8	4	**34**	**4**
Arizona	0	7	4	5	3	3	3	3	**28**	**4**
Maryland	4	5	2	7	1	3	0	1	**23**	**3**
North Carolina	6	2	0	1	0	2	3	7	**21**	**2**
Virginia	3	0	1	2	0	5	9	1	**21**	**3**
Tennessee	3	1	1	1	7	3	1	2	**19**	**2**
Wisconsin	3	0	3	5	3	2	3	0	**19**	**3**
Nevada	1	0	1	6	2	4	3	1	**18**	**2**
Georgia	3	1	2	3	1	3	3	1	**17**	**2**
Missouri	1	2	0	1	5	4	2	2	**17**	**2**
Oklahoma	1	3	0	2	0	2	4	1	**13**	**2**
Kansas	0	1	0	1	3	3	2	2	**12**	**1**
Hawaii	0	2	0	3	3	2	1	0	**11**	**2**
Utah	4	0	4	2	0	0	1	0	**11**	**2**
Louisiana	4	2	1	0	0	2	0	1	**10**	**1**
Vermont	0	0	0	0	3	3	2	1	**9**	**1**
Wyoming	0	3	2	1	1	1	1	0	**9**	**1**
Indiana	0	1	0	2	0	1	2	2	**8**	**1**
Iowa	2	1	0	0	1	0	0	4	**8**	**1**
Nebraska	0	3	0	1	0	0	4	0	**8**	**1**
Rhode Island	1	0	1	0	0	0	4	1	**7**	**1**
New Hampshire	0	2	1	1	0	1	1	0	**6**	**1**
South Carolina	0	1	0	0	1	1	1	1	**5**	**1**
Kentucky	0	0	0	1	1	0	1	0	**3**	**0**
Maine	0	1	0	1	1	0	0	0	**3**	**0**
North Dakota	0	1	0	1	0	1	0	0	**3**	**0**
West Virginia	0	0	0	1	1	1	0	0	**3**	**0**
Alaska	0	0	0	1	0	0	1	0	**2**	**0**
Idaho	1	0	0	0	0	0	1	0	**2**	**0**
Mississippi	0	0	2	0	0	0	0	0	**2**	**0**
Montana	0	1	0	1	0	0	0	0	**2**	**0**
Alabama	0	0	0	1	0	0	0	0	**1**	**0**
Arkansas	0	0	0	0	0	1	0	0	**1**	**0**
South Dakota	0	0	0	0	1	0	0	0	**1**	**0**

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Source: http://cepgi.typepad.com/heslin_rothenberg_farley_/. Data provided by Victor A. Cardona, Heslin Rothenberg Farley & Mesiti P.C, 5 Columbia Circle, Albany, NY 12203, phone (518)-452-5600, fax (518)-452-5579, vac@hrfmlaw.com, Website: http://www.hrfmlaw.com , www.Cleantechintellectualproperty.com, www.cleanenergypatentgrowthindex.com

Table 96. Capacity Added, All Producer for Non-Hyrdro Renewables (2000-2009)

State	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	Total	Avg.
Texas		755	163	240	4	594	851	1,787	2,960	2,495	9,848	985
Iowa	2	81	98	49	176	200	104	51	1,776	685	3,222	322
Washington	2	177	48	34		158	428	390	204	365	1,805	180
California	83	119	179	196	136	66	244	122	176	392	1,712	171
Oregon		118	86	41		75	104	476	254	523	1,676	168
Minnesota	4	89	23	264	38	102	143	563	349	78	1,654	165
New York	12	36		3		141	196	71	307	580	1,345	135
Colorado	7	40		162	14		60	558	236	189	1,265	126
Illinois	12		1	52	8	55	2	644	171	315	1,259	126
North Dakota			4	62		43	74	167	420	444	1,213	121
Wyoming	18	50	1		252	3			388	423	1,135	114
Oklahoma				176		258	41	215		362	1,051	105
Kansas		112				150	100		452	199	1,013	101
Indiana	5		108	5	3	6		9	531	314	981	98
Pennsylvania	10	34	3	109			79	118	86	399	837	84
New Mexico			4	204		200	90	0	2	100	600	60
Wisconsin	11	38	6	4	8	3	13	9	348	56	496	50
Montana							145		126	104	375	38
West Virginia			66						264		330	33
Missouri							37	23	108	150	318	32
Nevada			7			30	3	125	27	125	315	32
Utah							3	12	19	218	253	25
Maine					1		16	56	8	131	210	21
South Dakota		3		41			17		51	78	189	19
Florida	11			2			78	41	14	39	185	19
Idaho				0		75		3	55	33	166	17
Michigan	1	3	1	2			1	3	127	27	165	17
Nebraska		1	14			59	2	2	0	81	159	16
Ohio		28	0	4	4				82	8	125	13
Arizona	0	11	0	2		2	1		24	68	107	11
Kentucky		89	1	9		1	2	3		2	106	11
Hawaii	16						41	35	2	5	98	10
Virginia		25		14	16			16	14	6	92	9
Tennessee	2				27		50	8			86	9
New Jersey		23	1		3	2	14	20	12	11	85	9
Georgia				10	25		3				39	4
Alabama				19				0	18		37	4
New Hampshire							9			26	35	3
Massachusetts	10	1			6	3	2	5	2	5	34	3
Maryland		4		4			3	5	2	10	28	3
South Carolina		2		1		6	6		6	5	26	3
North Carolina			5				1	4	7	8	26	3
Louisiana						7		15	0		22	2
Vermont						5		2		5	11	1
Rhode Island					9					2	11	1
Delaware							7				7	1
Alaska			0			0	1		0	5	6	1
Arkansas							5				5	0
Connecticut									3		3	0
Mississippi									0		0	0
Grand Total	**206**	**1,837**	**818**	**1,708**	**729**	**2,243**	**2,974**	**5,555**	**9,629**	**9,066**	**34,765**	**3,476**

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Table 97. Capacity Added, All Producers for Carbon Fuel Sources (2000-2009)

State	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	Total	Avg.
Texas	5,599	8,259	6,527	5,667	3,167	1,364	274	960	1,033	4,570	37,418	3,742
Florida	1,047	1,085	7,554	3,977	1,850	3,757	352	2,230	726	4,266	26,843	2,684
California		2,744	2,924	4,847	681	3,473	2,200	369	917	1,748	19,903	1,990
Illinois	1,977	3,985	5,556	918	167	525		9	7	200	13,343	1,334
Georgia	2,512	2,041	4,163	2,180	568	1,377					12,840	1,284
Arizona		1,602	3,333	4,376	1,325	622	760		186	400	12,604	1,260
Pennsylvania	88	1,296	2,469	3,454	2,581	776					10,664	1,066
Alabama	857	864	2,781	4,619	99				688		9,908	991
Mississippi	891	2,147	1,538	3,832	84	84	819				9,394	939
Louisiana	1,078	604	4,845	575	1,013	101	101	58		33	8,407	841
Ohio	1,168	1,249	2,446	3,227	47		3				8,140	814
Oklahoma	654	1,448	1,511	2,040	1,344	4			340	135	7,476	748
South Carolina	591	394	1,797	411	2,064			675	600		6,532	653
Nevada	598	380		903	1,353	118	1,551		1,461	10	6,374	637
Arkansas		410	1,314	2,670			746	1,089			6,229	623
New York	7	564	541	123	1,750	1,975	520	0	40	350	5,871	587
Indiana	1,707	445	914	883	1,320	402	14				5,685	568
Michigan	291	1,099	2,711	21	1,176		52	8			5,357	536
Wisconsin	568	699	76	122	756	1,710	70	4	1,047		5,052	505
Virginia	891	875	114	1,122	1,461		2		357	179	5,002	500
North Carolina	1,059	1,445	799	594		11	27	631	3	161	4,731	473
Massachusetts		945	957	2,642	6			12	5	116	4,682	468
Minnesota	1	975	580	23	27	401	387	525	1,022	650	4,590	459
Colorado	371	303	1,032	1,009	794			394	247	279	4,429	443
Kentucky	27	1,207	1,487		796	525				278	4,320	432
New Jersey	434	242	1,796	383	29		1,186		5	100	4,175	418
Missouri	570	1,876	1,077	235	19	353	6	13			4,148	415
Iowa	318	15	26	20	1,454	109	8	851		180	2,979	298
Washington		149	672	593	284				965		2,664	266
Tennessee	1,266	718	376			2					2,362	236
New Mexico	150	54	88	194		74	650	312	749		2,271	227
Oregon		606	819	395				405			2,225	222
Kansas	205	252	39	467	29	17	94	153	406	340	2,002	200
Connecticut		8	1,090		578	5	49	86	40	101	1,957	196
Nebraska	118	96		560	119	305	1			663	1,862	186
Utah	7	34	397	4	168		577	534			1,721	172
Maine	868	751					5				1,623	162
New Hampshire	7	7	1,506	1							1,521	152
West Virginia		861	344								1,205	121
Maryland	13	10	13	800	11	22			30		898	90
Rhode Island	273	1	598		6		2				879	88
Delaware		100	672								772	77
Idaho		402				173			170		744	74
South Dakota			43		8	205	94		95		444	44
Wyoming	40	40	68	88					90		326	33
Hawaii	199		39		46	15	10	5			313	31
Alaska	37	11	11	7	2	11	10	222			311	31
Montana				43		2	171				215	22
Vermont								8			8	1
North Dakota		2	4								6	1
Grand Total	**26,483**	**43,298**	**67,646**	**54,023**	**27,179**	**18,516**	**10,739**	**9,552**	**11,229**	**14,759**	**283,423**	**28,342**

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Table 98. Capacity Added, All Producers for Hydro Sources (2000-2009)

State	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	Total
Georgia			328	62	62	26					478
West Virginia		80									80
California		40	2					5	0		46
Florida		15	15	15							44
Alaska	0	6	0			2			3	15	26
New York				10				13	0		22
Vermont									16	0	16
Colorado	3				4	1		8			16
Washington							14				14
Utah									12		12
Idaho			0		3	1	2	3			9
Illinois		8									8
Montana					8						8
South Carolina							6				6
Maine	2				1						3
Massachusetts	0	2					1		0		3
Hawaii						2		0			2
Ohio			0		2						2
Arizona				1							1
Virginia	1										1
Oregon									1	0	1
Iowa			0								0
North Carolina	0								0		0
Michigan						0					0
Texas										0	0
Minnesota										0	0
Wisconsin			0								0
New Hampshire	0										0
Grand Total	**7**	**150**	**345**	**87**	**79**	**32**	**23**	**28**	**32**	**15**	**798**

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Table 99. Capacity Added, All Producers for All Fuel Sources (2000-2009)

Row Labels	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	Total	Average
Texas	5,599	9,014	6,690	5,906	3,171	1,957	1,124	2,747	3,993	7,065	47,266	3,939
Florida	1,058	1,099	7,569	3,993	1,850	3,757	430	2,272	740	4,305	27,072	2,256
California	83	2,903	3,104	5,042	817	3,538	2,444	496	1,093	2,140	21,661	1,805
Illinois	1,989	3,993	5,557	969	174	580	2	653	178	515	14,610	1,217
Georgia	2,512	2,041	4,491	2,252	655	1,402	3				13,356	1,113
Arizona	0	1,612	3,333	4,379	1,325	624	761		210	468	12,712	1,059
Pennsylvania	98	1,330	2,471	3,563	2,581	776	79	118	86	399	11,501	958
Alabama	857	864	2,781	4,638	99			0	706		9,945	829
Mississippi	891	2,147	1,538	3,832	84	84	819		0		9,394	783
Oklahoma	654	1,448	1,511	2,216	1,344	262	41	215	340	497	8,526	711
Louisiana	1,078	604	4,845	575	1,013	108	101	73	0	33	8,429	702
Ohio	1,168	1,277	2,446	3,231	53		3		82	8	8,267	689
New York	19	600	541	136	1,750	2,116	716	84	347	931	7,238	603
Nevada	598	380	7	903	1,353	148	1,553	125	1,488	135	6,689	557
Indiana	1,712	445	1,022	889	1,323	408	14	9	531	314	6,666	555
South Carolina	591	396	1,797	412	2,064	6	12	675	606	5	6,564	547
Minnesota	5	1,065	603	287	65	503	530	1,088	1,371	728	6,243	520
Arkansas		410	1,314	2,670			751	1,089			6,234	520
Iowa	320	96	124	68	1,630	309	112	902	1,776	865	6,202	517
Colorado	381	343	1,032	1,171	811	1	60	960	483	468	5,710	476
Wisconsin	579	737	82	126	765	1,713	83	13	1,395	56	5,548	462
Michigan	292	1,102	2,712	23	1,176	0	53	11	127	27	5,523	460
Virginia	892	900	114	1,137	1,478		2	16	371	185	5,095	425
North Carolina	1,059	1,445	804	594		11	28	635	10	170	4,756	396
Massachusetts	11	947	957	2,642	12	3	2	17	7	121	4,719	393
Washington	2	326	720	627	284	158	442	390	1,169	365	4,482	374
Missouri	570	1,876	1,077	235	19	353	43	36	108	150	4,466	372
Kentucky	27	1,296	1,488	9	796	526	2	3		280	4,427	369
New Jersey	434	265	1,797	383	32	2	1,200	20	17	111	4,260	355
Oregon		724	905	436		75	104	881	254	523	3,901	325
Kansas	205	364	39	467	29	167	194	153	858	539	3,015	251
New Mexico	150	54	92	398		274	740	312	751	100	2,871	239
Tennessee	1,268	718	376		27	2	50	8			2,448	204
Nebraska	118	97	14	560	119	365	4	2	0	744	2,021	168
Utah	7	34	397	4	168		581	546	31	218	1,985	165
Connecticut		8	1,090		578	5	49	86	43	101	1,960	163
Maine	870	751			2		21	56	8	131	1,836	153
West Virginia		941	410						264		1,615	135
New Hampshire	7	7	1,506	1			9			26	1,555	130
Wyoming	58	90	69	88	252	3			478	423	1,461	122
North Dakota		2	8	62		43	74	167	420	444	1,219	102
Maryland	13	14	13	804	11	22	3	5	32	10	927	77
Idaho		402	0	0	3	248	2	6	225	33	920	77
Rhode Island	273	1	598		15		2			2	890	74
Delaware		100	672				7				779	65
South Dakota		3	43	41	8	205	110		146	78	633	53
Montana				43	8	2	316		126	104	598	50
Hawaii	215		39		46	17	50	40	2	5	413	34
Alaska	37	17	12	7	2	14	11	222	3	20	343	29
Vermont						5		10	16	5	35	3
Grand Total	**26,696**	**45,284**	**68,808**	**55,818**	**27,987**	**20,791**	**13,736**	**15,136**	**20,889**	**23,841**	**318,986**	**26,582**

Access to Ventyx Database Graciously Provided by FP&L Group. http://www1.ventyx.com/velocity/vs-overview.asp

Figure 25. United States Annual Average Wind Power

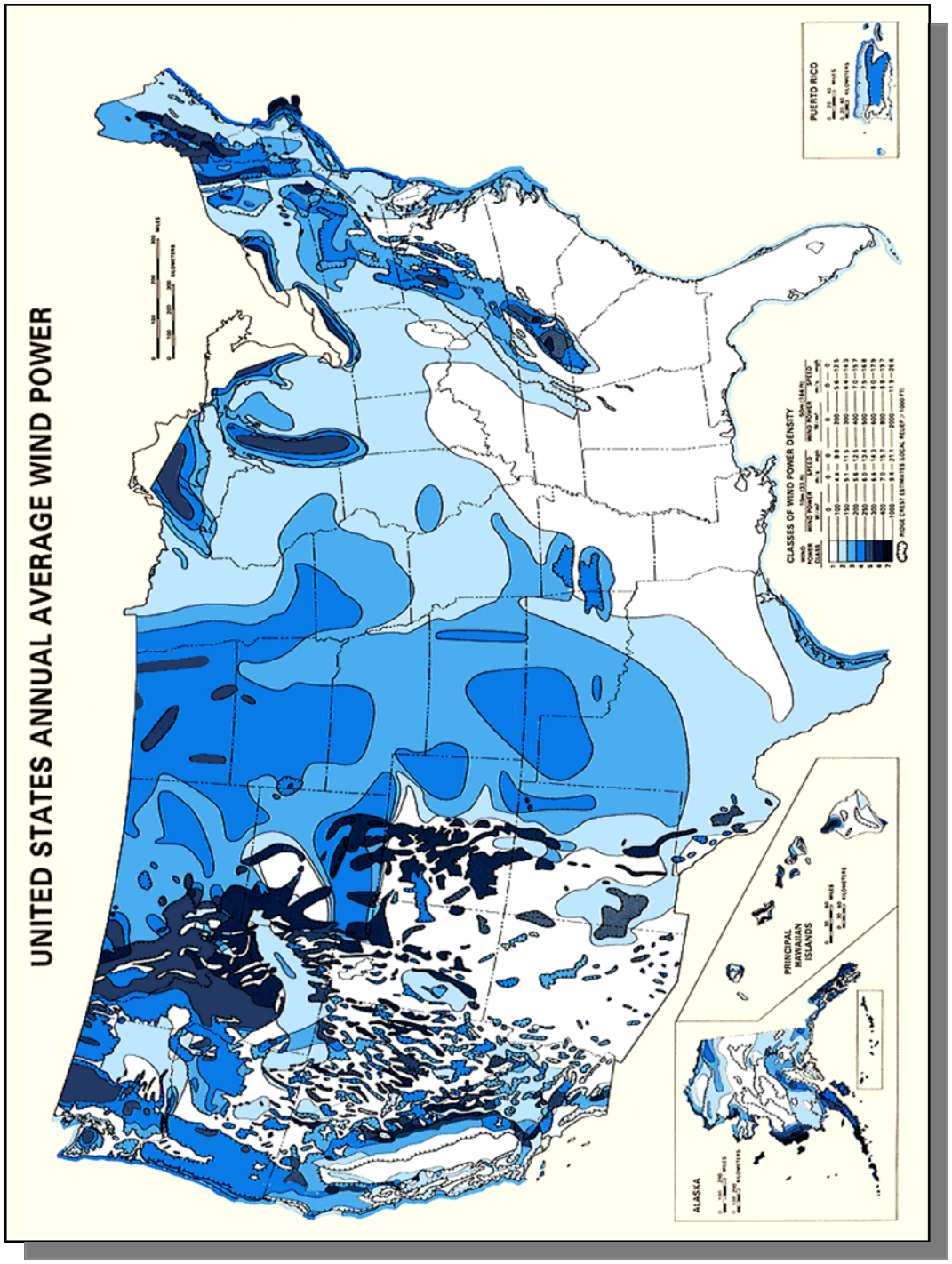

Table 100. Capacity Additions for Non Hydro-Renewables, Southern Co, Progress Energy, TECO, FP&L Group

Fuel Source	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	Total
Texas											
Wind		521				327	607	364	398	80	2,295
Iowa											
Wind			98						640		738
North Dakota											
Wind				62		32	69	167	189	170	687
Colorado											
Wind								201	200	174	575
Oklahoma											
Wind				102		107	41				249
New Mexico											
Wind				204							204
California											
Wind				146	34						180
Washington											
Wind		177									177
Wyoming											
Wind					144						144
Pennsylvania											
Wind	10	24		95							129
Oregon											
Wind		83	36								120
Kansas											
Wind		112									112
Minnesota											
Wind							99				99
South Dakota											
Wind				41					51		92
Wisconsin											
Wind		30								54	84
West Virginia											
Wind			66								66
Florida											
Solar										25	25
Grand Total	**10**	**947**	**200**	**648**	**178**	**465**	**815**	**732**	**1,477**	**502**	**5,974**

Access to Ventyx Database Graciously Provided by FP&L Group. http://www1.ventyx.com/velocity/vs-overview.asp

Table 101. Capital Expenditures at Shareholder Owned Public Utilities ($ Billion) *

2003	2004	2005	2006	2007	2008	Average
$43.00	$41.07	$48.37	$59.86	$74.06	$84.15	$58.42

http://www.eei.org/whatwedo/DataAnalysis/IndusFinanAnalysis/Pages/QtrlyFinancialUpdates.aspx

The EEI Financial Analysis group tracks and analyzes a wide range of industry financial metrics covering 69 U.S. shareholder-owned electric utility companies. These 69 companies include 58 electric utility holding companies whose stocks are traded on major U.S. stock exchanges and 11 electric utility subsidiaries of non-utility or foreign companies.

* Data includes Generation, Transmission, Facilities and Equipment

Appendix B: Federal Cleantech Incentives Through 2009

The table below illustrates all the federal tax credit incentives available through the ARRA.

	§ 45 Production Tax Credits (PTCs)	§ 48 Energy Tax Credit (ETCs)	§ 48 ETCs in Lieu of § 45 PTCs	Cash grants in lieu of § 48 ETCs or § 45 PTCs	§ 48C Advanced Energy Project Tax Credit
Wind	✓	Small wind	✓	✓ + Small wind	✓
Closed-loop biomass	✓		✓	✓	
Open-loop biomass	✓		✓	✓	
Geothermal	✓	Includes geothermal heat pumps	✓	✓ + Includes geothermal heat pumps	✓
Solar	✓	✓	✓	✓	✓
Small irrigation power	✓		✓	✓	
Landfill gas	✓		✓	✓	
Trash combustion	✓		✓	✓	
Hydropower/marine and hydrokinetic	✓		✓	✓	
Fuel cell		✓		✓	✓
Microturbine		✓		✓	✓
Combined heat and power (cogeneration) systems		✓		✓	
Other renewable sources					✓
Energy storage systems for electric vehicles					✓
Electric grids for transmission of renewable energy					✓
CO_2 capture and sequestration					✓
Renewable fuel refining and blending					✓
Energy conservation technology production					✓
New plug-in electric vehicles and components					✓
Other advanced energy property designed to reduce greenhouse gas emissions					✓

Cleantech Loan Guarantees available through ARRA 2009:

	Loan guarantees
Renewable energy systems	✓
Facilities that manufacture components for renewable energy systems	✓
Transmission systems and upgrades	✓
Pilot-scale advanced biofuels	✓

Select Department of Energy Cleantech Incentives

	Stimulus bill funding	DOE grants	DOE spending	DOE state and local funding
Energy-efficiency and conservation grants	$3.2B			✓
Weatherization assistance programs	$5.0B			✓
State renewable-energy and energy-efficiency programs	$3.1B			✓
Advanced battery manufacturing grants	$2.0B	✓		
Applied energy research, development, demonstration and deployment activities • Biomass • Geothermal • Alternative-fueled vehicles pilot grant program	$2.5B ($800M) ($400M) ($300M)	TBD ✓ ✓ ✓	TBD	 ✓
Transportation electrification	$400M			
Energy-efficient appliance rebate program and Energy Star	$300M	TBD	TBD	
Electricity delivery and energy reliability, including smart-grid programs	$4.0B	✓		
Western Area Power Authority (WAPA) transmission infrastructure	$3.26B		✓	
Fossil energy and R&D (including carbon sequestration)	$3.4B	✓		
Advanced Research Projects Agency — Energy ("ARPA-E")	$400M		✓	
Environmental cleanup	$6.0B		✓	
Scientific research	$1.6B		✓	

Other government department and agency Cleantech incentives available through ARRA 2009

Department or agency	Program	Stimulus bill funding	Grants	Department and agency spending	State and local funding
Environmental Protection Agency	Environmental cleanup and remediation	$900M	✓	✓	✓
Environmental Protection Agency	Diesel emission reduction	$300M	✓		✓
Department of Defense	Variety of energy-efficiency programs	$4.76B		✓	
General Services Administration	Energy-efficient vehicle procurement	$300M		✓	
General Services Administration	Green buildings	$4.5B		✓	
Department of the Interior	Variety of improvement programs, including energy efficiency	$884M		✓	
Department of Housing and Urban Development	Includes public housing energy-efficiency programs	$2.25B			✓
Department of Transportation	Public transportation energy efficiency and emissions reduction	$100M			✓
Department of Labor	Green jobs training	$537.5M		✓	
Department of Veterans Affairs	Includes energy projects	$1.05B		✓	
Department of Education	Includes energy-efficiency projects	$60M			✓

Source: Grant Thornton: Navigating the Cleantech Stimulus, an executive checklist, pp. 14-15..

Appendix C: Cleantech Incentive Programs Offered by the State of Florida

The state of Florida offers two types of production incentive:

1. Renewable Energy Production Tax Credit which is a corporate tax credit of $0.01/kWh for electricity produced from 1/1/2007 through 6/30/2010. The program specifies no maximum for individual projects but it has a maximum of $5 million per state fiscal year for all credits under this program while unused credit may be carried forward for up to 5 years.[147]
2. Renewable Energy Technologies Investment Tax Credit which is a corporate tax credit of 75% of all capital costs, operation and maintenance costs, and research and development costs. The maximum incentive varies by application and unused amount may be carried forward and used in tax years beginning 1/1/2007 and ending 12/31/2012 even though the tax credit provision expires on June 30, 2010.[148]

The Gainesville Regional Utilities and the Orlando Utilities Commission offer two production incentives for renewable energy:

1. The Gainesville Regional Utilities - Solar Feed-In-Tariff which is a twenty-year contract structured as $0.32/kWh for building- or pavement-mounted systems of any size or for ground-mounted systems with a capacity of 25 kW or less or $0.26/kWh for free-standing systems with capacity greater than 25 kW.[149]
2. The Orlando Utilities Commission - Pilot Solar Programs which is a five-year agreement with automatic renewal offering a production incentive of $0.03/kWh for solar thermal and $0.05/kWh for PV.[150]

Other incentives offered in the state of Florida are the following:

1. Miami-Dade County - Targeted Jobs Incentive Fund which offers developers of Solar Thermal Electric, Photovoltaics, CHP/Cogeneration systems up to $9,000 per new job created as long as the project is a new-to-market or expanding project.
2. City of Tallahassee Utilities - Solar and Efficiency Loans which a utility loan program offering residential consumers 5% interest rate for a 5-year term eligible efficiency and renewable technologies, except for Solar PV technology which is a 10-year term.[151]
3. Clay Electric Cooperative, Inc - Energy Conservation Loans for residential consumers varying from $1,000 to $5,000 (or $7,500 for metal roofs) at an interest rate of 8% (or 11%) with a monthly loan payment of $100.[152]

Jesper Lindgaard Christensen**,** Greens Rush In?: Cleantech Venture Capital Investments – Prospects or Hype? June 2009. See also New York City Investment

Fund: Cleantech: A New Engine of Economic Growth for New York State, page 3, January 2007; and Forum for the Future, 2006: Clean Capital - Financing

[149] Florida was one states in the United States who have considered Feed-In—Tariff legislation or regulation. Other states include Hawaii, Illinois, Indiana, Maine, Massachusetts, Michigan, Minnesota, New Jersey, New York, Oregon, Rhode Island, Virginia, Washington and Wisconsin. http://www.nrel.gov/docs/fy09osti/45549.pdf.

United States who have considered Feed-In—T

ariff legislation or regulation. Other states

include Hawaii, Illinois, Indiana, Maine, Mas

4. Clay Electric Cooperative, Inc - Solar Thermal Loans for residential consumers varying from $1,000 to $5,000 at an interest rate of 8% (or 11%) with a monthly loan payment of $100.[153]
5. Gainesville Regional Utilities- Low-Interest Energy Efficiency Loan Program which offers residential consumers using solar technologies for energy efficiency $1,000 to $10,000 loans at 3% for a term of up to 5 years.[154]
6. Orlando Utilities Commission - Residential Solar Loan Program which offers up to $20,000 for PV and up to $7,500 for Solar Water Heater (SWH) at an interest rate varying from 0 to 5.5% depending on technology and loan term.[155]
7. Solar Energy System Incentives Program which offers a maximum incentive for residential PV system of $20,000 and non-residential PV system of $100,000; residential SWH receive an incentive of $500 and non-residential and multi-family receive $5,000 while Solar Pool Heaters receive $100. The program budget varied from $2.5 million in the FY 2006-2007, $3.5 million for 2007-2008 and $5 million for 2008-2009. This program is expected to expire June 20, 2010.[156]
8. Solar Energy Systems Equipment Sales Tax Exemption for Solar Water Heat, Solar Space Heat, Photovoltaics and Solar Pool Heating effective 07/01/1997.
9. Renewable Energy Equipment Sales Tax Exemption for Renewable Fuel Vehicles, Fuel Cells, Other Alternative Fuel Vehicles, Refueling Stations, Ethanol and Biodiesel. The program started on July 1, 2006 and is expected to expire on July 1, 2010.[157]
10. Other programs include PACE financing and several utility rebate programs.[158]

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sachusetts, Michigan, Minnesota, New Jersey, N
ew York, Oregon, Rhode Island, Virginia, Washington and Wisconsin.
(http://www.nrel.gov/docs/fy09osti/45549.pd
f)

[156] Florida Legislature FL HB 7135 CHAPTER 2008-227

[156] http://masstech.org/cleanenergy/energy/glossaryA
toC.htm

[157] http://www.mofa.go.jp/j_info/japan/video/pamph.html

[158] The inclusion of Nuclear energy in the clean energy definition is controversial. Clean energy is energy that is produced without burning fossil fuels. Examples include wind, hydro-electricity and, controversially, nuclear power. The reason for this definition is that Nuclear energy produces no greenhouse gas emissions but it still uses uranium (and sometimes plutonium) which is a natural resource like gas and oil. (http://www.ehow.com/about_4579290_nuclear-energy-renewable-nonrenewable.html)

[158] http://www.egreenideas.com/glossary.php?group=r

[158] http://www.businessdictionary.com/definition/energy-efficiency.html

[158] Furthermore, Most of what is defined as energy efficiency is in fact energy intensity: "Most of what is defined as energy efficiency is actually energy intensity. Energy intensity is the ratio of energy consumption to some measure of demand for energy services—what we call a demand indicator. However, at best, energy-intensity measures are a rough surrogate for energy efficiency. This is because energy intensity may mask structural and behavioral changes that do not represent "true" efficiency improvements such a shift away from energy-intensive industries." (http://www.eia.doe.gov/emeu/efficiency/definition.htm)

[158] Various studies have estimated a timeframe for exhaustion of fossil fuels ranging from 10 – 150 years.

[158] http://www.greentechmedia. See Faire Study.

[158] Vote Solar Initiative. www.votesolar.org

[158] USA Today, July 15, 2009, citing Solar Survey Study by CSA International.

[158] Bioenergy at UF/IAFS PowerPoint. August 12, 2008. Mary Duryea

[158] Southern Bioenergy Roadmap, Southeast Agriculture & Forestry Energy Resources

Appendix D: Leading Public Financing Tools and Mechanisms[159]

As explained above, private capital has not been sufficient to support the growth of Cleantech projects. Federal, state and local government incentive programs have played an important role in raising confidence in the financial viability of clean technologies and at the same time reducing the perceived high risk associated with Cleantech projects. Those programs include the following:

Program Category	Program Description	Major Program Strengths	Major Program Weaknesses
Rebates	Rebates	▪Support market transformation ▪Adjustable ▪Provide upfront capital ▪Low administrative burden	▪Create rebate dependency ▪Can be economically inefficient ▪Not linked to project performance
Performance-Based Incentives	Performance-Based Incentives	▪Economically Efficient ▪Reduces Risk and Motivates Quality Installations ▪Sustainable ▪Leverage Private Capital	▪No upfront support ▪Declining Time Value of Money ▪Ongoing System Tracking
Grants	Grants	▪Focused Solicitations ▪Project selectivity ▪Adjustable ▪Leverage Private Capital ▪Support Demonstration Projects ▪Program Publicity	▪Excessive Awards ▪Fewer Awardees ▪High Administrative Costs ▪No Guarantee of Project Results
Loan Programs	Direct Loans	▪Reduce upfront cost barriers ▪Improve upon standard ▪Can offer below-market interest rates ▪Longer repayment terms ▪Increase market confidence	▪Require high initial capital ▪Require high administrative costs ▪May impact tax credit
	Matching loans	▪Preservation of capital ▪Can be at below-market interest rates ▪Can offer more flexible repayment terms than private lenders ▪Reduce risk and Increase market confidence ▪Low admin. Costs	▪Reliance on private lenders ▪May impact tax credit
	Interest Rate Buy-down	▪State subsidizes interest rate offered by private lenders ▪State needs not fund the capital ▪State does not bear project risk ▪State partners (not compete) with private lenders	▪Reliance on outside lenders ▪Outside lenders bear underwriting risks ▪May impact tax credit
	Linked Deposits	▪Similar to interest rate buy-down ▪Limited cost to state ▪Limited administrative costs and oversight ▪No legislation needed	▪Reliance on outside lenders ▪Require active marketing
Program Category	**Program Description**	**Major Program Strengths**	**Major Program Weaknesses**
	PAYS® or "Pay as You Save"	▪Remove up-front cost and long payback barriers ▪Reduce ownership risk	▪Administratively complex ▪May require legislation and regulatory approval ▪Require high capital due long loan repayment periods
	LEASES	▪Avoid upfront cost barriers ▪Used with other incentives ▪Increase leveraging	▪Transfer difficulties
	Loan Guarantees	▪Lower administrative requirements ▪Leverage private capital ▪Leverage state funds ▪Build lender confidence ▪Support innovative projects	▪Provide no upfront capital ▪Reliance on private lenders ▪Default risk ▪Narrow target market
RPS Set-aside and	RPS set-aside and	▪Drive technology deployment	▪No upfront support

Alliance (SAFER) UF/IFAS publication: http://www.saferalliance.net.

[159] http://tonto.eia.doe.gov/state/state_energy_profiles.cfm?sid=FL#overview

[159] Personal Communication. Ted Kury, Public Utility Research Center. August 18, 2009

[159] EIA Assumptions Report: 2009. http://www.eia.doe.gov/oi

Program Category	Program Description	Major Program Strengths	Major Program Weaknesses
RECs	RECs	▪Provide technology-specific support ▪Reduce need for rebates ▪Reduce administrative burden	▪Need long-term support ▪Aggregators of RECs gain
Feed-In Tariffs	FITs	▪Support market transformation ▪Adaptable ▪Build Investor confidence ▪Sustainable ▪Economically efficient ▪Wide participation Low administrative costs	▪Require regulatory review ▪Price setting challenges ▪Regulatory complexity ▪No upfront capital support ▪Supply uncertainty ▪long-term monitoring and revisions
State Tax Incentives	State Tax incentives	▪Easy to administer ▪Easy to modify	▪Insufficient tax liability ▪Impact on state revenue
	Sales Tax Exemptions	▪Easy to administer	▪Not a strong incentive▪▪▪
	Property Tax Exemptions	▪Easy to administer ▪Does not raise tax burden	▪Not a strong incentive

Source: Charles Kubert and Mark Sinclair: Distributed Renewable Energy Finance and Policy Toolkit, Clean Energy States Alliance, December 2009.

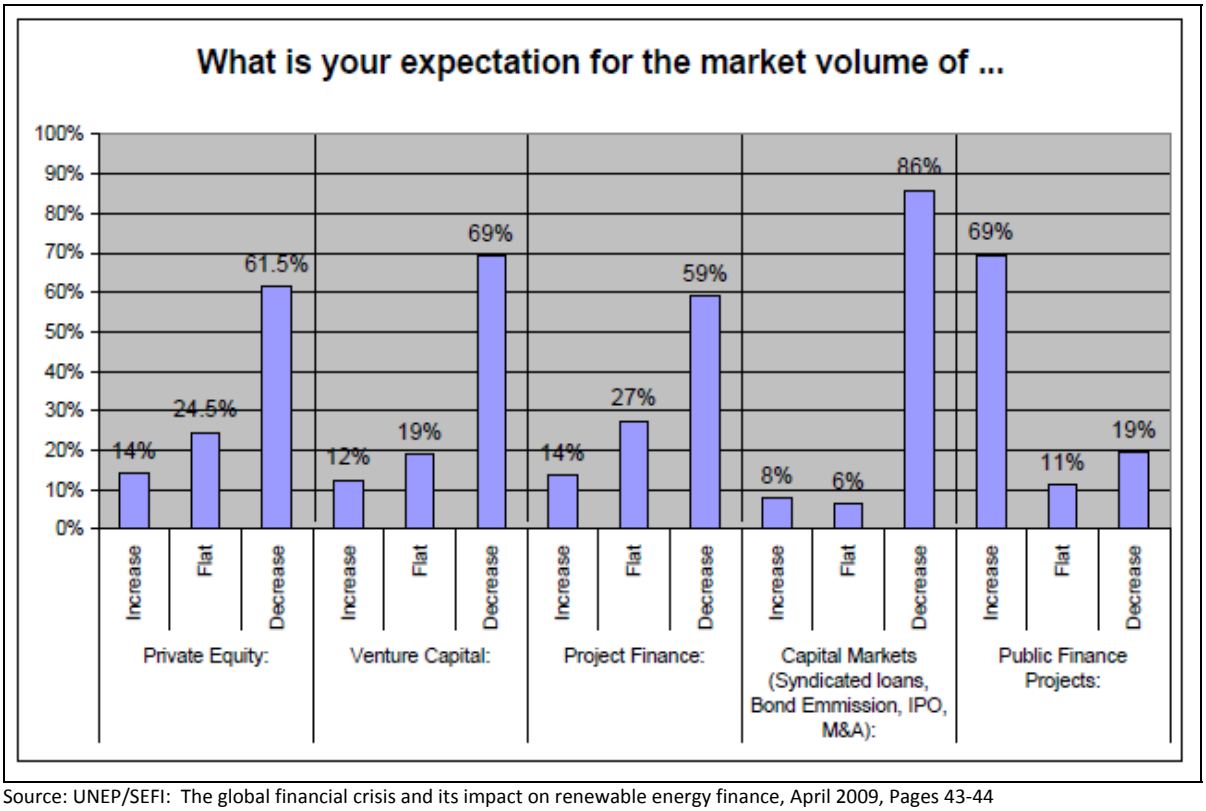
Appendix E: Expectations of Cleantech Developers

A survey was administered to judge the impact of the current global recession on project finance. The following are the results of the survey for selected questions.

Asked what will happen to project finance (in the next two years) due to banks having less liquidity, the majority of respondents believe that renewable energy projects will be negatively affected by the downturn in lending due to liquidity problems – 38% of the respondents predict a strong decrease and 49% a slight decrease in project finance.

In addition, the survey confirms that banks are asking higher upfront fees and requiring that the proportion of debt to equity be low in order to avoid taking on higher risks.

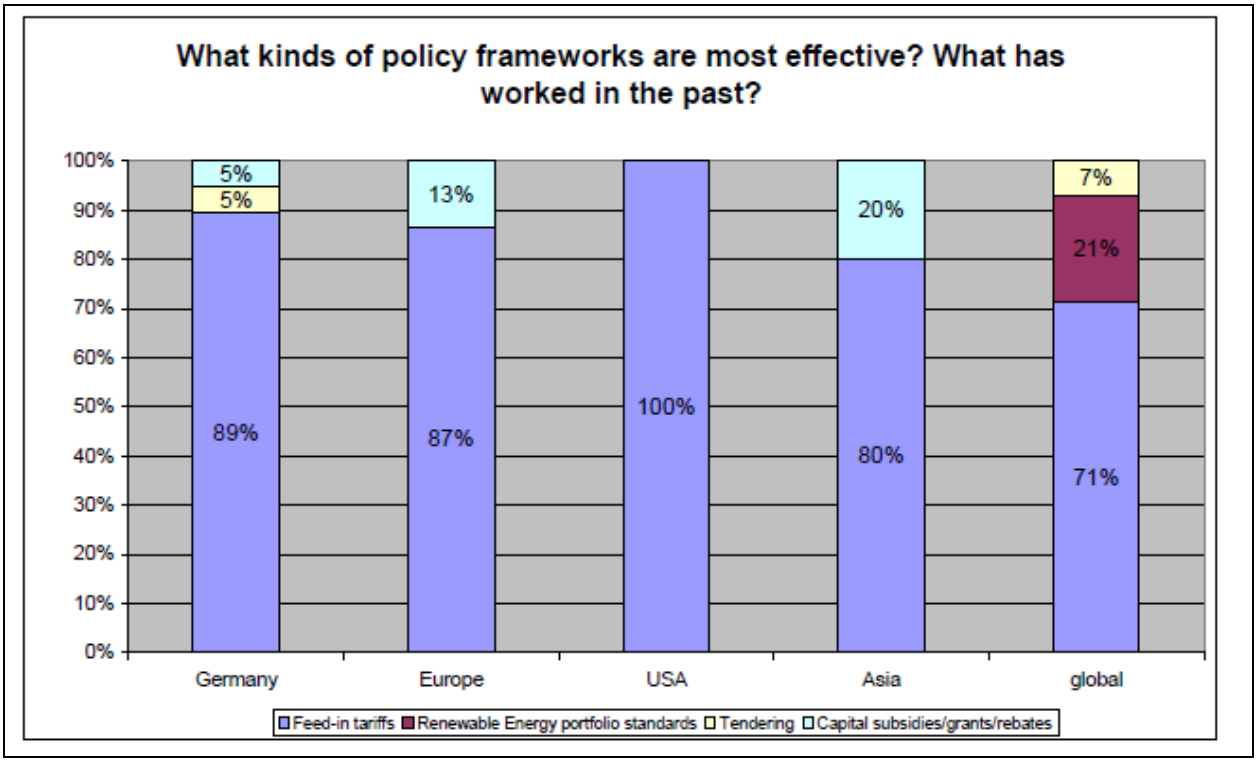
When asked about their expectation for the market volume of private equity, venture capital, project finance, capital markets, and public finance, the great majority of respondents expect all types of commercial finance to decrease in market volume, including 59% who expect project finance to decrease and 86% who expect capital markets to decline while only 19% expect that public finance projects will decline. The results are illustrated in the figure below.



Source: UNEP/SEFI: The global financial crisis and its impact on renewable energy finance, April 2009, Pages 43-44

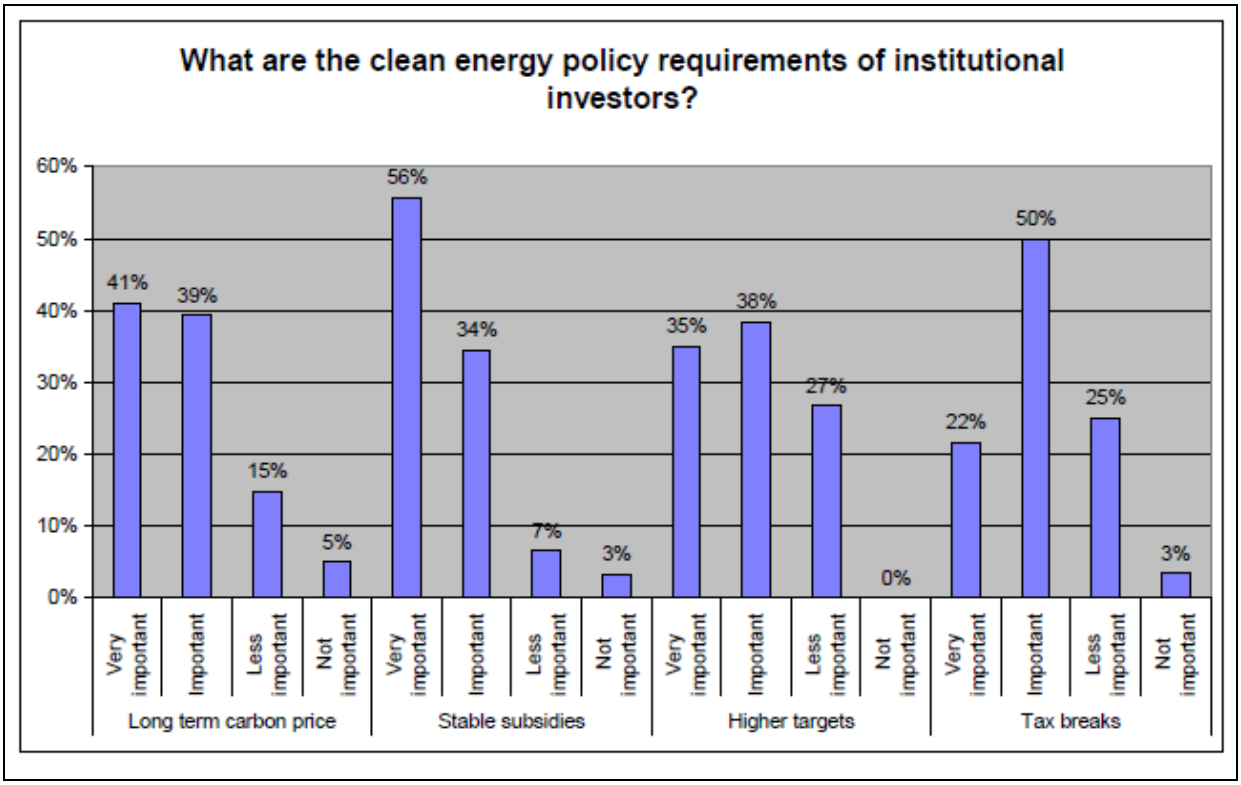
Current investment volumes indicate a move away from financial investors as the main source of capital towards corporate and governments.

Asked what kind of policy framework is the most effective one in promoting renewable energy, the majority of the respondents (81%) indicate that they believe Feed-in-Tariffs are the most effective policy frameworks. Only 10% see capital subsidies/grants as the right tool and only 5% think Renewable Energy Portfolios Standards are effective and have worked in the past.



Source: Id, Page 54

The survey participants were asked which policies institutional investors require when investing in renewables. They were given four kinds of policies: long-term carbon price, stable **subsidies, higher targets, tax breaks**. Of the 80% who answered, 60% of the respondents think all four tools are either important or very important for institutional investors. The figure below illustrates their responses.



Source: Id, p. 62.

The fact that tax breaks is the lowest ranked instrument may be linked to the negative experience with the US production tax credit (PTC), which expired three times in five years.

Appendix F: Energy Recovery Stimulus Grant Awardees by State

State	Program Office	Project	Type	Announced	Awarded	Spent
AK	EERE	Geothermal Demonstrations	Competitive Grant	$12,376,568	$0	$0
AK	EERE	EGS Technology R&D	Competitive Grant	$2,154,238	$0	$0
AK	EERE	Validation of Innovative Exploration Technologies	Competitive Grant	$4,616,879	$0	$0
AK	EERE	EE Conservation Block Grant Program - Formula	Formula Grant	$26,206,400	$18,410,100	$50,000
AK	EERE	Weatherization Assistance Program	Formula Grant	$18,142,580	$18,142,580	$0
AK	EERE	State Energy Program	Formula Grant	$28,232,000	$28,232,000	$0
AK	EERE	EE Appliance Rebate Programs	Formula Grant	$658,477	$65,800	$0
AK	OE	State Assistance on Electricity Policies	Formula Grant	$767,493	$0	$0
AK	OE	Enhancing State and Local Governments Energy Assurance	Formula Grant	$262,969	$262,969	$0
AK Total				**$93,417,604**	**$65,113,449**	**$50,000**
AL	EERE	Ground Source Heat Pumps	Competitive Grant	$5,000,000	$0	$0
AL	EERE	Industrial Assessment Centers and Plant Best Practices	Competitive Grant	$470,000	$0	$0
AL	EERE	EE Conservation Block Grant Program - Formula	Formula Grant	$31,748,000	$31,068,970	$0
AL	EERE	Weatherization Assistance Program	Formula Grant	$71,800,599	$71,800,599	$2,774,138
AL	EERE	State Energy Program	Formula Grant	$55,570,000	$55,570,000	$162,584
AL	EERE	EE Appliance Rebate Programs	Formula Grant	$4,472,947	$447,300	$0
AL	EERE	Hydroelectric Facility Modernization Program	Competitive Grant	$6,000,000	$0	$0
AL	OE	Smart Grid Investment Grant Program (EISA 1306)	Competitive Grant	$164,527,160	$0	$0
AL	OE	State Assistance on Electricity Policies	Formula Grant	$868,824	$0	$0
AL	OE	Enhancing State and Local Governments Energy Assurance	Formula Grant	$627,742	$627,742	$0
AL Total				**$341,085,272**	**$159,514,611**	**$2,936,722**
AR	EERE	Ground Source Heat Pumps	Competitive Grant	$3,256,311	$0	$0
AR	EERE	Enabling Fuel Cell Market Transformation	Competitive Grant	$1,290,464	$1,290,464	$0
AR	EERE	EE Conservation Block Grant Program - Formula	Formula Grant	$20,117,400	$15,292,300	$0
AR	EERE	Weatherization Assistance Program	Formula Grant	$48,114,415	$48,114,415	$2,716,849
AR	EERE	State Energy Program	Formula Grant	$39,416,000	$39,416,000	$139,042
AR	EERE	EE Appliance Rebate Programs	Formula Grant	$2,739,657	$274,000	$0
AR	EERE	Battery Manufacturing	Competitive Grant	$12,600,000	$0	$0
AR	EERE	Hydroelectric Facility Modernization Program	Competitive Grant	$450,000	$0	$0
AR	OE	Smart Grid Investment Grant Program (EISA 1306)	Competitive Grant	$2,357,520	$0	$0
AR	OE	State Assistance on Electricity Policies	Formula Grant	$822,779	$822,779	$0

State	Program Office	Project	Type	Announced	Awarded	Spent
AR	OE	Enhancing State and Local Governments Energy Assurance	Formula Grant	$461,990	$461,990	$0
AR Total				**$131,626,536**	**$105,671,948**	**$2,855,891**
AS	EERE	EE Conservation Block Grant Program - Formula	Formula Grant	$9,593,500	$0	$0
AS	EERE	Weatherization Assistance Program	Formula Grant	$719,511	$719,511	$62,464
AS	EERE	State Energy Program	Formula Grant	$18,550,000	$18,550,000	$123,322
AS	EERE	EE Appliance Rebate Programs	Formula Grant	$100,000	$10,000	$0
AS Total				**$28,963,011**	**$19,279,511**	**$185,786**
AZ	FE	Industrial Carbon Capture and Storage Applications	Competitive Grant	$70,500,000	$39,000,000	$0
AZ	EERE	National Geothermal Database, Resource Assessment and Classification System	Competitive Grant	$15,799,947	$0	$0
AZ	EERE	EE Conservation Block Grant Program - Formula	Formula Grant	$72,722,900	$0	$0
AZ	EERE	Weatherization Assistance Program	Formula Grant	$66,091,428	$0	$0
AZ	EERE	State Energy Program	Formula Grant	$55,447,000	$60,479,200	$579,608
AZ	EERE	EE Appliance Rebate Programs	Formula Grant	$6,236,718	$66,091,428	$1,769,624
AZ	EERE	High-Penetration Solar Deployment	Competitive Grant	$3,717,000	$55,447,000	$311,390
AZ	EERE	Transportation Electrification	Competitive Grant	$99,800,000	$623,700	$0
AZ	SC	Energy Frontier Research Centers	Competitive Grant	$27,020,000	$27,020,000	$145,841
AZ	OE	Smart Grid Investment Grant Program (EISA 1306)	Competitive Grant	$94,095,594	$0	$0
AZ	OE	State Assistance on Electricity Policies	Formula Grant	$915,679	$0	$0
AZ	OE	Enhancing State and Local Governments Energy Assurance	Formula Grant	$796,410	$796,410	$0
AZ	ARPA-E	Advanced Research Projects Agency - Energy (ARPA-E)	Competitive Grant	$10,338,856	$0	$0
AZ Total				**$452,981,532**	**$210,457,738**	**$2,806,463**
CA	EM	ETEC Recovery Act Project	Contract	$54,175,000	$15,875,000	$240,587
CA	EM	SLAC Recovery Act Project	Contract	$7,925,000	$7,925,000	$2,021,926
CA	FE	Industrial Carbon Capture and Storage Applications	Competitive Grant	$22,134,026	$0	$0
CA	FE	Expand and Extend Clean Coal Power Initiative Round III	Competitive Grant	$308,000,000	$50,000,000	$0
CA	EERE	Lab Call for Facilities and Equipment	Competitive Grant	$15,900,000	$0	$0
CA	EERE	Enhance and Accelerate FEMP Service Functions to the Federal Government	Admin	$1,400,000	$1,480,556	$73,780
CA	EERE	Geothermal Demonstrations	Competitive Grant	$26,999,430	$0	$0
CA	EERE	EGS Technology R&D	Competitive Grant	$19,003,699	$3,789,000	$110,997
CA	EERE	Validation of Innovative Exploration Technologies	Competitive Grant	$4,040,375	$0	$0
CA	EERE	Enabling Fuel Cell Market Transformation	Competitive Grant	$4,315,583	$0	$0
CA	EERE	Combined Heat and Power	Competitive	$84,337,759	$0	$0

State	Program Office	Project	Type	Announced	Awarded	Spent
		(CHP), District Energy Systems, Waste Heat Recovery Implementation and Deplo	Grant			
CA	EERE	Industrial Assessment Centers and Plant Best Practices	Competitive Grant	$100,000	$0	$0
CA	EERE	EE Conservation Block Grant Program - Formula	Formula Grant	$355,592,700	$196,683,081	$11,047,997
CA	EERE	Weatherization Assistance Program	Formula Grant	$185,811,061	$185,811,061	$2,992,192
CA	EERE	State Energy Program	Formula Grant	$226,093,000	$226,093,000	$0
CA	EERE	EE Appliance Rebate Programs	Formula Grant	$35,266,866	$3,526,700	$0
CA	EERE	Concentrating Solar Power	Competitive Grant	$2,113,108	$1,933,011	$0
CA	EERE	PV Systems Development	Competitive Grant	$7,660,000	$5,899,489	$1,654,861
CA	EERE	High-Penetration Solar Deployment	Competitive Grant	$21,481,607	$0	$0
CA	EERE	Wind Energy Technology R&D and Testing	Competitive Grant	$400,383	$0	$0
CA	EERE	Transportation Electrification	Competitive Grant	$45,900,000	$0	$0
CA	EERE	Clean Cities AFV Grant Program	Competitive Grant	$31,867,908	$0	$0
CA	EERE	Commercial Vehicle Integration (SuperTruck) and Advanced Combustion Engine R&D	Competitive Grant	$5,500,000	$5,500,000	$0
CA	EERE	Hydroelectric Facility Modernization Program	Competitive Grant	$4,450,000	$0	$0
CA	SC	Energy Frontier Research Centers	Competitive Grant	$28,372,362	$28,372,362	$99,550
CA	SC	Advanced Light Source User Support Building	Contract	$14,682,000	$14,682,000	$6,173,544
CA	SC	Linac Coherent Light Source Ultrafast Science Instruments MIE	Contract	$33,600,000	$33,600,000	$3,591,752
CA	SC	Linac Coherent Light Source Ultrafast Science Instruments MIE	Contract	$5,908,000	$5,908,000	$143,450
CA	SC	Light Source Improvements	Contract	$13,100,000	$13,100,000	$146,610
CA	SC	Advanced Networking Initiative	Contract	$61,979,000	$61,979,000	$126,400
CA	SC	Computational Partnerships (SciDAC-e)	Contract	$4,000,000	$4,000,000	$14,786
CA	SC	Magellan Distributed Computing and Data Initiative	Contract	$16,384,000	$16,384,000	$22,613
CA	SC	Bioenergy Research Center Capital Equipment	Contract	$4,039,000	$4,039,000	$1,614
CA	SC	Joint Genome Institute	Contract	$13,122,000	$13,122,000	$2,129,952
CA	SC	Advanced Plasma Acceleration Facility MIE	Contract	$30,000,000	$30,000,000	$1,456,798
CA	SC	Research and Infrastructure augmentation at universities in the HEP program	Contract	$270,000	$270,000	$0
CA	SC	Advanced technology R&D augmentation	Contract	$201,000	$201,000	$60,872
CA	SC	Enhanced AIP funding at NP user facilities	Contract	$1,880,000	$1,880,000	$155,224
CA	SC	Nuclear Data Program Initiative	Contract	$1,700,000	$1,700,000	$78,221
CA	SC	Nuclear Science Workforce	Contract	$1,287,000	$1,287,000	$20,856

State	Program Office	Project	Type	Announced	Awarded	Spent
CA	SC	DIII-D Facility Upgrades	Contract	$10,460,000	$10,460,000	$1,016,118
CA	SC	Enhanced operation of Major Fusion Facilities	Contract	$2,875,000	$2,875,000	$1,159,446
CA	SC	High Energy Density Laboratory Plasma, Matter in Extreme Conditions (MEC) Instrument Project	Contract	$19,973,000	$19,973,000	$163,470
CA	SC	High Energy Density Laboratory Plasma, NDCX-II	Contract	$11,000,000	$11,000,000	$486,824
CA	SC	Plasma Science Centers	Contract	$5,785,861	$5,785,861	$0
CA	SC	SLI Construction	Contract	$29,301,000	$29,301,000	$3,934,818
CA	SC	General Plant Project funding across all SC laboratories	Contract	$38,100,000	$38,100,000	$2,701,106
CA	SC	Energy Sciences Fellowships and Early Career Awards	Contract	$120,000	$120,000	$0
CA	OE	Smart Grid Investment Grant Program (EISA 1306)	Competitive Grant	$203,010,487	$8,081,973	$648,575
CA	OE	State Assistance on Electricity Policies	Formula Grant	$1,686,869	$1,686,869	$0
CA	OE	Enhancing State and Local Governments Energy Assurance	Formula Grant	$3,572,526	$3,572,526	$0
CA	ARPA-E	Advanced Research Projects Agency - Energy (ARPA-E)	Competitive Grant	$20,851,744	$58,000	$23,695
CA Total				**$2,047,728,353**	**$1,066,054,489**	**$42,498,634**
CO	Treasury	1603 Grants in leiu of Tax Credits	Competitive Grant	$157,809	$0	$0
CO	EERE	Fundamental Research in Key Program Areas	Competitive Grant	$5,000,000	$57,876	$0
CO	EERE	Management and Oversight (EE Program Direction)	Admin	$7,751,369	$7,751,369	$2,366,102
CO	EERE	Buildings and Appliance Market Transformation	Competitive Grant	$2,898,500	$2,898,500	$1,846,945
CO	EERE	Community Renewable Energy Deployment	Competitive Grant	$527,468	$527,468	$92,283
CO	EERE	Integrated Biorefinery Research Expansion	Competitive Grant	$13,500,000	$13,432,500	$376
CO	EERE	Renewable Energy and Supporting Site Infrastructure	Competitive Grant	$100,700,000	$86,660,000	$834,057
CO	EERE	Lab Call for Facilities and Equipment	Competitive Grant	$2,000,000	$0	$0
CO	EERE	NWTC Upgrades	Competitive Grant	$10,000,000	$9,950,000	$635
CO	EERE	Enhance and Accelerate FEMP Service Functions to the Federal Government	Admin	$5,496,000	$4,013,687	$167,177
CO	EERE	Energy, Water & Emissions Reporting and Tracking System	Competitive Grant	$2,500,000	$2,000,000	$107,762
CO	EERE	Geothermal Demonstrations	Competitive Grant	$1,047,714	$1,200,000	$0
CO	EERE	EGS Technology R&D	Competitive Grant	$4,272,186	$525,000	$9,216
CO	EERE	Validation of Innovative Exploration Technologies	Competitive Grant	$7,055,315	$0	$0
CO	EERE	Ground Source Heat Pumps	Competitive Grant	$7,887,629	$0	$0
CO	EERE	Enabling Fuel Cell Market Transformation	Competitive Grant	$1,072,330	$0	$0
CO	EERE	EE Conservation Block Grant Program - Formula	Formula Grant	$42,765,600	$36,643,400	$253,607
CO	EERE	Weatherization Assistance	Formula Grant	$79,531,213	$81,762,213	$6,141,733

State	Program Office	Project	Type	Announced	Awarded	Spent
		Program				
CO	EERE	State Energy Program	Formula Grant	$49,222,000	$50,222,000	$327,366
CO	EERE	EE Appliance Rebate Programs	Formula Grant	$4,739,253	$473,900	$0
CO	EERE	Concentrating Solar Power	Competitive Grant	$467,500	$0	$0
CO	EERE	PV Systems Development	Competitive Grant	$15,435,869	$15,700,000	$117,034
CO	EERE	High-Penetration Solar Deployment	Competitive Grant	$13,498,218	$1,000,000	$2,126
CO	EERE	Wind Energy Technology R&D and Testing	Competitive Grant	$982,821	$0	$0
CO	EERE	Battery Manufacturing	Competitive Grant	$45,145,534	$0	$0
CO	EERE	Transportation Electrification	Competitive Grant	$4,999,834	$0	$0
CO	EERE	Investigation of intermediate ethanol blends, optimization of E-85 engines, and development of transportation infrastructure	Competitive Grant	$5,000,000	$4,536,594	$509,861
CO	EERE	Hydroelectric Facility Modernization Program	Competitive Grant	$1,179,827	$0	$0
CO	SC	Energy Frontier Research Centers	Competitive Grant	$8,033,952	$8,033,952	$89,875
CO	SC	Plasma Science Centers	Contract	$241,380	$241,380	$9,000
CO	OE	Smart Grid Regional and Energy Storage Demonstration Project (EISA 1304)	Competitive Grant	$4,841,647	$4,841,647	$0
CO	OE	Smart Grid Investment Grant Program (EISA 1306)	Competitive Grant	$24,244,117	$510,000	$112,727
CO	OE	State Assistance on Electricity Policies	Formula Grant	$875,889	$0	$0
CO	OE	Enhancing State and Local Governments Energy Assurance	Formula Grant	$653,209	$653,209	$0
CO	ARPA-E	Advanced Research Projects Agency - Energy (ARPA-E)	Competitive Grant	$14,137,549	$153,000	$77,112
CO Total				**$487,861,732**	**$333,787,695**	**$13,064,994**
CT	Treasury	1603 Grants in leiu of Tax Credits	Competitive Grant	$2,578,717	$0	$0
CT	EERE	EGS Technology R&D	Competitive Grant	$4,267,521	$0	$0
CT	EERE	Validation of Innovative Exploration Technologies	Competitive Grant	$5,000,000	$0	$0
CT	EERE	Ground Source Heat Pumps	Competitive Grant	$146,973	$0	$0
CT	EERE	Advanced Materials RD&D in Support of EERE Needs to Advance Clean Energy Technologies and Energy-Intensive Process R&D	Competitive Grant	$884,022	$884,022	$0
CT	EERE	EE Conservation Block Grant Program - Formula	Formula Grant	$24,575,400	$20,262,500	$488,300
CT	EERE	Weatherization Assistance Program	Formula Grant	$64,310,502	$64,310,502	$4,793,859
CT	EERE	State Energy Program	Formula Grant	$38,542,000	$38,542,000	$860
CT	EERE	EE Appliance Rebate Programs	Formula Grant	$3,359,341	$335,900	$0
CT	EERE	Battery Manufacturing	Competitive Grant	$5,000,000	$0	$0
CT	EERE	Clean Cities AFV Grant	Competitive	$13,195,000	$0	$0

State	Program Office	Project	Type	Announced	Awarded	Spent
		Program	Grant			
CT	OE	Smart Grid Investment Grant Program (EISA 1306)	Competitive Grant	$9,188,050	$0	$0
CT	OE	State Assistance on Electricity Policies	Formula Grant	$839,241	$839,241	$0
CT	OE	Enhancing State and Local Governments Energy Assurance	Formula Grant	$521,250	$521,250	$0
CT	ARPA-E	Advanced Research Projects Agency - Energy (ARPA-E)	Competitive Grant	$2,251,183	$0	$0
CT Total				**$174,659,200**	**$125,695,415**	**$5,283,019**
DC	EM	Program Direction - EM - Defense Environmental Management	Admin	$25,635,000	$850,000	$0
DC	EM	Program Direction - EM - Non-Defense Environmental Management	Admin	$2,415,000	$0	$0
DC	EM	Program Direction - EM - Uranium Enrichment D&D Fund	Admin	$1,950,000	$0	$0
DC	EERE	Management and Oversight (EE Program Direction)	Admin	$2,843,598	$2,843,598	$15,363
DC	EERE	Ground Source Heat Pumps	Competitive Grant	$1,077,500	$0	$0
DC	EERE	EE Conservation Block Grant Program - Formula	Formula Grant	$9,593,500	$2,985,000	$73,519
DC	EERE	Weatherization Assistance Program	Formula Grant	$8,089,022	$21,125,687	$0
DC	EERE	State Energy Program	Formula Grant	$22,022,000	$26,972,000	$6,480
DC	EERE	EE Appliance Rebate Programs	Formula Grant	$567,845	$56,800	$0
DC	EERE	Hydroelectric Facility Modernization Program	Competitive Grant	$1,000,000	$0	$0
DC	SC	Enhanced utilization of Isotope facilities	Contract	$10,000,000	$10,000,000	$10,000,000
DC	SC	R&D on Alternative Isotope Production Techniques	Contract	$4,617,000	$4,617,000	$4,617,000
DC	OE	Smart Grid Investment Grant Program (EISA 1306)	Competitive Grant	$149,400,000	$20,000	$0
DC	OE	State Assistance on Electricity Policies	Formula Grant	$765,085	$0	$0
DC	OE	Enhancing State and Local Governments Energy Assurance	Formula Grant	$254,302	$2,954,302	$0
DC	OE	Program Direction - OE	Admin	$1,000,000	$1,000,000	$332,040
DC	DA	Departmental Administration	Admin	$3,962,490	$3,962,490	$476,170
DC	ARPA-E	Advanced Research Projects Agency - Energy (ARPA-E)	Competitive Grant	$2,006,563	$2,006,563	$6,563
DC Total				**$247,198,905**	**$79,393,440**	**$15,527,135**
DE	EERE	Modify Integrated Biorefinery Solicitation Program for Pilot and Demonstration Scale Biorefineries	Competitive Grant	$12,643	$12,643	$7,570
DE	EERE	Industrial Assessment Centers and Plant Best Practices	Competitive Grant	$125,000	$0	$0
DE	EERE	EE Conservation Block Grant Program - Formula	Formula Grant	$15,918,700	$11,243,500	$40,000
DE	EERE	Weatherization Assistance Program	Formula Grant	$13,733,668	$13,733,668	$335,859
DE	EERE	State Energy Program	Formula Grant	$24,231,000	$24,231,000	$48,452

State	Program Office	Project	Type	Announced	Awarded	Spent
DE	EERE	EE Appliance Rebate Programs	Formula Grant	$837,704	$83,800	$0
DE	EERE	PV Systems Development	Competitive Grant	$3,000,000	$2,275,000	$12,934
DE	EERE	High-Penetration Solar Deployment	Competitive Grant	$3,000,000	$0	$0
DE	SC	Energy Frontier Research Centers	Competitive Grant	$17,500,000	$17,500,000	$0
DE	OE	State Assistance on Electricity Policies	Formula Grant	$772,254	$772,254	$0
DE	OE	Enhancing State and Local Governments Energy Assurance	Formula Grant	$280,109	$280,109	$0
DE	ARPA-E	Advanced Research Projects Agency - Energy (ARPA-E)	Competitive Grant	$13,462,162	$0	$0
DE Total				**$92,873,240**	**$70,131,974**	**$444,815**
FL	EERE	Modify Integrated Biorefinery Solicitation Program for Pilot and Demonstration Scale Biorefineries	Competitive Grant	$12,643	$12,643	$0
FL	EERE	Fundamental Research in Key Program Areas	Competitive Grant	$4,941	$4,941	$0
FL	EERE	Management and Oversight (EE Program Direction)	Admin	$7,000	$7,000	$7,000
FL	EERE	Ground Source Heat Pumps	Competitive Grant	$250,000	$0	$0
FL	EERE	EE Conservation Block Grant Program - Formula	Formula Grant	$168,886,300	$93,925,640	$1,080,900
FL	EERE	Weatherization Assistance Program	Formula Grant	$175,984,474	$175,984,474	$8,437,509
FL	EERE	State Energy Program	Formula Grant	$126,089,000	$126,089,000	$3,570,125
FL	EERE	EE Appliance Rebate Programs	Formula Grant	$17,585,466	$1,758,500	$0
FL	EERE	High-Penetration Solar Deployment	Competitive Grant	$6,399,957	$0	$0
FL	EERE	Battery Manufacturing	Competitive Grant	$95,500,000	$0	$0
FL	OE	Smart Grid Investment Grant Program (EISA 1306)	Competitive Grant	$267,197,537	$0	$0
FL	OE	State Assistance on Electricity Policies	Formula Grant	$1,217,160	$0	$0
FL	OE	Enhancing State and Local Governments Energy Assurance	Formula Grant	$1,881,676	$1,881,676	$0
FL Total				**$861,016,154**	**$399,663,874**	**$13,095,534**
GA	EM	SRS D&D, Soil & Groundwater Activities Site-wide Recovery Act Project	Contract	$2,597,000	$2,597,000	$0
GA	EERE	Modify Integrated Biorefinery Solicitation Program for Pilot and Demonstration Scale Biorefineries	Competitive Grant	$37,633	$37,633	$10,764
GA	EERE	Fundamental Research in Key Program Areas	Competitive Grant	$5,010	$5,010	$0
GA	EERE	Management and Oversight (EE Program Direction)	Admin	$30,379	$30,379	$0
GA	FE	Geologic Sequestration Training and Research Grant Program	Competitive Grant	$1,161,000	$0	$0
GA	EERE	Industrial Assessment Centers and Plant Best Practices	Competitive Grant	$605,000	$0	$0
GA	EERE	EE Conservation Block Grant Program - Formula	Formula Grant	$67,187,600	$53,102,236	$516,962

State	Program Office	Project	Type	Announced	Awarded	Spent
GA	EERE	Weatherization Assistance Program	Formula Grant	$124,756,312	$124,756,312	$25,547,657
GA	EERE	State Energy Program	Formula Grant	$82,495,000	$82,495,000	$136,108
GA	EERE	EE Appliance Rebate Programs	Formula Grant	$9,293,167	$0	$0
GA	EERE	Clean Cities AFV Grant Program	Competitive Grant	$14,983,167	$0	$0
GA	EERE	Hydroelectric Facility Modernization Program	Competitive Grant	$500,000	$0	$0
GA	OE	Smart Grid Investment Grant Program (EISA 1306)	Competitive Grant	$36,755,747	$0	$0
GA	OE	State Assistance on Electricity Policies	Formula Grant	$996,874	$0	$0
GA	OE	Enhancing State and Local Governments Energy Assurance	Formula Grant	$1,088,694	$1,088,694	$65
GA Total				**$342,492,583**	**$264,112,264**	**$26,211,556**
GU	EERE	EE Conservation Block Grant Program - Formula	Formula Grant	$9,593,500	$1,119,297	$12,837
GU	EERE	Weatherization Assistance Program	Formula Grant	$1,119,297	$19,098,000	$169,514
GU	EERE	State Energy Program	Formula Grant	$19,098,000	$16,600	$0
GU	EERE	EE Appliance Rebate Programs	Formula Grant	$166,426	$0	$0
GU	OE	Smart Grid Investment Grant Program (EISA 1306)	Competitive Grant	$16,603,507	$0	$0
GU Total				**$46,580,730**	**$20,233,897**	**$182,351**
HI	EERE	Modify Integrated Biorefinery Solicitation Program for Pilot and Demonstration Scale Biorefineries	Competitive Grant	$25,285	$25,285	$3,612
HI	EERE	EE Conservation Block Grant Program - Formula	Formula Grant	$15,068,200	$15,068,200	$0
HI	EERE	Weatherization Assistance Program	Formula Grant	$4,041,461	$4,041,461	$471,614
HI	EERE	State Energy Program	Formula Grant	$25,930,000	$25,930,000	$47,372
HI	EERE	EE Appliance Rebate Programs	Formula Grant	$1,235,985	$123,600	$0
HI	EERE	Wind Energy Technology R&D and Testing	Competitive Grant	$750,000	$0	$0
HI	EERE	Hydroelectric Facility Modernization Program	Competitive Grant	$600,000	$0	$0
HI	OE	Smart Grid Investment Grant Program (EISA 1306)	Competitive Grant	$5,347,598	$5,548,585	$0
HI	OE	State Assistance on Electricity Policies	Formula Grant	$782,834	$782,834	$0
HI	OE	Enhancing State and Local Governments Energy Assurance	Formula Grant	$318,196	$318,196	$0
HI Total				**$54,099,559**	**$51,838,161**	**$522,598**
IA	EERE	Modify Integrated Biorefinery Solicitation Program for Pilot and Demonstration Scale Biorefineries	Competitive Grant	$12,643	$12,643	$0
IA	EERE	Management and Oversight (EE Program Direction)	Admin	$50,000	$50,000	$10,675
IA	EERE	EE Conservation Block Grant Program - Formula	Formula Grant	$21,149,600	$13,376,900	$186,900
IA	EERE	Weatherization Assistance Program	Formula Grant	$80,834,411	$80,834,411	$2,975,374
IA	EERE	State Energy Program	Formula Grant	$40,546,000	$40,546,000	$4,054,600
IA	EERE	EE Appliance Rebate Programs	Formula Grant	$2,880,857	$288,100	$0

State	Program Office	Project	Type	Announced	Awarded	Spent
IA	EERE	Investigation of intermediate ethanol blends, optimization of E-85 engines, and development of transportation infrastructure	Competitive Grant	$11,269	$11,269	$0
IA	SC	General Plant Project funding across all SC laboratories	Contract	$1,710,000	$1,710,000	$171,878
IA	OE	Smart Grid Investment Grant Program (EISA 1306)	Competitive Grant	$5,000,000	$0	$0
IA	OE	State Assistance on Electricity Policies	Formula Grant	$826,530	$0	$0
IA	OE	Enhancing State and Local Governments Energy Assurance	Formula Grant	$475,493	$475,493	$0
IA	ARPA-E	Advanced Research Projects Agency - Energy (ARPA-E)	Competitive Grant	$4,373,488	$0	$0
IA Total				**$157,870,291**	**$137,304,816**	**$7,399,427**
ID	EM	INL D&D Recovery Act Project	Contract	$217,875,000	$217,875,000	$39,344,515
ID	EM	INL TRU Waste Recovery Act Project	Contract	$130,000,000	$130,000,000	$34,198,102
ID	EM	INL Buried Waste Recovery Act Project	Contract	$120,000,000	$119,300,000	$16,860,287
ID	EERE	Management and Oversight (EE Program Direction)	Admin	$346,280	$346,280	$122,128
ID	EERE	Lab Call for Facilities and Equipment	Competitive Grant	$5,000,000	$0	$0
ID	EERE	Enhance and Accelerate FEMP Service Functions to the Federal Government	Admin	$500,000	$500,000	$28,940
ID	EERE	EGS Technology R&D	Competitive Grant	$4,702,100	$1,953,000	$125,238
ID	EERE	Validation of Innovative Exploration Technologies	Competitive Grant	$3,772,560	$0	$0
ID	EERE	National Geothermal Database, Resource Assessment and Classification System	Competitive Grant	$6,330,000	$2,569,253	$0
ID	EERE	Ground Source Heat Pumps	Competitive Grant	$4,000,000	$0	$0
ID	EERE	Industrial Assessment Centers and Plant Best Practices	Competitive Grant	$350,000	$0	$0
ID	EERE	Advanced Materials RD&D in Support of EERE Needs to Advance Clean Energy Technologies and Energy-Intensive Process R&D	Competitive Grant	$1,000,000	$1,850,000	$160,579
ID	EERE	EE Conservation Block Grant Program - Formula	Formula Grant	$17,295,200	$14,975,357	$125,719
ID	EERE	Weatherization Assistance Program	Formula Grant	$30,341,929	$30,341,929	$2,764,966
ID	EERE	State Energy Program	Formula Grant	$28,572,000	$28,572,000	$2,808,969
ID	EERE	EE Appliance Rebate Programs	Formula Grant	$1,462,054	$146,200	$0
ID	EERE	Clean Cities AFV Grant Program	Competitive Grant	$5,519,862	$0	$0
ID	SC	Nuclear Science Workforce	Contract	$1,742,000	$1,742,000	$18,480
ID	OE	Smart Grid Investment Grant Program (EISA 1306)	Competitive Grant	$49,171,710	$0	$0
ID	OE	State Assistance on Electricity Policies	Formula Grant	$788,840	$0	$0
ID	OE	Enhancing State and Local Governments Energy	Formula Grant	$339,814	$339,814	$4,331

State	Program Office	Project	Type	Announced	Awarded	Spent
		Assurance				
ID	ARPA-E	Advanced Research Projects Agency - Energy (ARPA-E)	Competitive Grant	$3,000	$3,000	$2,387
ID Total				**$629,112,349**	**$550,513,833**	**$96,564,641**
IL	EM	ANL Recovery Act Project	Contract	$98,500,000	$79,000,000	$3,311,975
IL	EM	Program Direction - EM - Defense Environmental Management	Admin	$305,550	$305,550	$18,094
IL	FE	Industrial Carbon Capture and Storage Applications	Competitive Grant	$6,588,540	$0	$0
IL	FE	Geologic Sequestration Training and Research Grant Program	Competitive Grant	$1,094,000	$0	$0
IL	EERE	Modify Integrated Biorefinery Solicitation Program for Pilot and Demonstration Scale Biorefineries	Competitive Grant	$108,000	$133,285	$20,616
IL	EERE	Management and Oversight (EE Program Direction)	Admin	$352,384	$352,384	$215,806
IL	EERE	Lab Call for Facilities and Equipment	Competitive Grant	$8,800,000	$0	$0
IL	EERE	EGS Technology R&D	Competitive Grant	$5,500,000	$1,620,000	$18,408
IL	EERE	Ground Source Heat Pumps	Competitive Grant	$3,985,095	$0	$0
IL	EERE	Industrial Assessment Centers and Plant Best Practices	Competitive Grant	$636,000	$0	$0
IL	EERE	Advanced Materials RD&D in Support of EERE Needs to Advance Clean Energy Technologies and Energy-Intensive Process R&D	Competitive Grant	$1,475,269	$4,532,436	$148,542
IL	EERE	EE Conservation Block Grant Program - Formula	Formula Grant	$112,175,600	$81,586,745	$368,864
IL	EERE	Weatherization Assistance Program	Formula Grant	$242,526,619	$242,526,619	$1,595,271
IL	EERE	State Energy Program	Formula Grant	$101,321,000	$101,321,000	$0
IL	EERE	EE Appliance Rebate Programs	Formula Grant	$12,378,644	$1,237,900	$0
IL	EERE	Concentrating Solar Power	Competitive Grant	$1,711,240	$0	$0
IL	EERE	High-Penetration Solar Deployment	Competitive Grant	$7,695,000	$0	$0
IL	EERE	Wind Energy Technology R&D and Testing	Competitive Grant	$749,877	$0	$0
IL	EERE	Transportation Electrification	Competitive Grant	$39,200,000	$0	$0
IL	EERE	Clean Cities AFV Grant Program	Competitive Grant	$14,999,658	$0	$0
IL	EERE	Wind Energy Consortia between Institutions of Higher Learning and Industry	Competitive Grant	$11,998,339	$0	$0
IL	SC	Energy Frontier Research Centers	Competitive Grant	$20,591,912	$20,591,912	$45,249
IL	SC	Linac Coherent Light Source Ultrafast Science Instruments MIE	Contract	$4,448,000	$4,448,000	$86,876
IL	SC	Light Source Improvements	Contract	$7,900,000	$7,900,000	$27,466
IL	SC	Computational Partnerships (SciDAC-e)	Contract	$3,125,000	$3,125,000	$0
IL	SC	Magellan Distributed Computing and Data Initiative	Contract	$16,384,000	$16,384,000	$849,994

State	Program Office	Project	Type	Announced	Awarded	Spent
IL	SC	NOvA MIE	Contract	$14,936,000	$14,936,000	$1,138,972
IL	SC	Superconducting Radio Frequency R&D	Contract	$44,672,000	$44,672,000	$21,774
IL	SC	Fermilab GPP augmentation	Contract	$25,000,000	$25,000,000	$1,202,720
IL	SC	Advanced technology R&D augmentation	Contract	$8,821,000	$8,821,000	$384,462
IL	SC	Long Baseline Neutrino Experiment	Contract	$9,000,000	$9,000,000	$110,523
IL	SC	Enhanced AIP funding at NP user facilities	Contract	$9,860,000	$9,860,000	$60,670
IL	SC	Nuclear Data Program Initiative	Contract	$244,000	$244,000	$0
IL	SC	Nuclear Science Workforce	Contract	$4,260,000	$4,260,000	$1,629
IL	SC	General Plant Project funding across all SC laboratories	Contract	$15,100,000	$15,100,000	$2,853,051
IL	SC	Energy Sciences Fellowships and Early Career Awards	Contract	$130,000	$130,000	$0
IL	OE	Smart Grid Investment Grant Program (EISA 1306)	Competitive Grant	$10,994,000	$0	$0
IL	OE	Smart Grid Regional and Energy Storage Demonstration Project (EISA 1304)	Competitive Grant	$5,405,583	$5,405,583	$0
IL	OE	State Assistance on Electricity Policies	Formula Grant	$1,078,840	$0	$0
IL	OE	Enhancing State and Local Governments Energy Assurance	Formula Grant	$1,383,754	$1,383,754	$0
IL	ARPA-E	Advanced Research Projects Agency - Energy (ARPA-E)	Competitive Grant	$3,966,239	$34,000	$15,986
IL Total				**$879,401,143**	**$703,911,168**	**$12,496,948**
IN	EERE	Ground Source Heat Pumps	Competitive Grant	$6,339,591	$0	$0
IN	EERE	Combined Heat and Power (CHP), District Energy Systems, Waste Heat Recovery Implementation and Deplo	Competitive Grant	$63,207,986	$0	$0
IN	EERE	EE Conservation Block Grant Program - Formula	Formula Grant	$42,613,900	$32,913,200	$250,000
IN	EERE	Weatherization Assistance Program	Formula Grant	$131,847,383	$131,847,383	$2,252,132
IN	EERE	State Energy Program	Formula Grant	$68,621,000	$68,621,000	$0
IN	EERE	EE Appliance Rebate Programs	Formula Grant	$6,118,331	$611,800	$0
IN	EERE	Battery Manufacturing	Competitive Grant	$370,800,000	$0	$0
IN	EERE	Transportation Electrification	Competitive Grant	$6,100,000	$39,200,000	$0
IN	EERE	Clean Cities AFV Grant Program	Competitive Grant	$10,125,000	$0	$0
IN	SC	Energy Frontier Research Centers	Competitive Grant	$30,374,136	$30,374,136	$137,933
IN	OE	Smart Grid Investment Grant Program (EISA 1306)	Competitive Grant	$39,346,818	$0	$0
IN	OE	State Assistance on Electricity Policies	Formula Grant	$912,534	$0	$0
IN	OE	Enhancing State and Local Governments Energy Assurance	Formula Grant	$785,088	$785,088	$0
IN	ARPA-E	Advanced Research Projects Agency - Energy (ARPA-E)	Competitive Grant	$6,733,386	$0	$0
IN Total				**$783,925,154**	**$304,352,607**	**$2,640,065**

State	Program Office	Project	Type	Announced	Awarded	Spent
KS	EERE	Modify Integrated Biorefinery Solicitation Program for Pilot and Demonstration Scale Biorefineries	Competitive Grant	$12,643	$12,643	$0
KS	FE	Industrial Carbon Capture and Storage Applications	Competitive Grant	$3,440,000	$0	$0
KS	EERE	Validation of Innovative Exploration Technologies	Competitive Grant	$2,400,509	$0	$0
KS	EERE	EE Conservation Block Grant Program - Formula	Formula Grant	$23,803,300	$19,543,137	$300,658
KS	EERE	Weatherization Assistance Program	Formula Grant	$56,441,771	$56,441,771	$4,117,649
KS	EERE	State Energy Program	Formula Grant	$38,284,000	$38,284,000	$654,355
KS	EERE	EE Appliance Rebate Programs	Formula Grant	$2,688,559	$268,900	$0
KS	EERE	Investigation of intermediate ethanol blends, optimization of E-85 engines, and development of transportation infrastructure	Competitive Grant	$11,031	$11,031	$0
KS	OE	Smart Grid Investment Grant Program (EISA 1306)	Competitive Grant	$19,753,822	$0	$0
KS	OE	State Assistance on Electricity Policies	Formula Grant	$821,422	$821,422	$0
KS	OE	Enhancing State and Local Governments Energy Assurance	Formula Grant	$457,104	$457,104	$0
KS Total				**$148,114,161**	**$115,840,008**	**$5,072,662**
KY	EM	Paducah Recovery Act Project	Contract	$78,800,000	$78,800,000	$2,148,873
KY	EM	Program Direction - EM - Defense Environmental Management	Admin	$228,612	$228,612	$0
KY	EERE	Modify Integrated Biorefinery Solicitation Program for Pilot and Demonstration Scale Biorefineries	Competitive Grant	$12,643	$12,643	$9,743
KY	EERE	Management and Oversight (EE Program Direction)	Admin	$2,979	$2,979	$2,979
KY	EERE	Industrial Assessment Centers and Plant Best Practices	Competitive Grant	$349,976	$0	$0
KY	EERE	EE Conservation Block Grant Program - Formula	Formula Grant	$25,382,500	$23,446,900	$16,442
KY	EERE	Weatherization Assistance Program	Formula Grant	$70,913,750	$70,913,750	$547,616
KY	EERE	State Energy Program	Formula Grant	$52,533,000	$52,533,000	$170,730
KY	EERE	EE Appliance Rebate Programs	Formula Grant	$4,096,206	$409,600	$0
KY	EERE	Clean Cities AFV Grant Program	Competitive Grant	$12,980,000	$0	$0
KY	EERE	Investigation of intermediate ethanol blends, optimization of E-85 engines, and development of transportation infrastructure	Competitive Grant	$11,096	$11,096	$0
KY	OE	Smart Grid Investment Grant Program (EISA 1306)	Competitive Grant	$9,538,234	$0	$0
KY	OE	State Assistance on Electricity Policies	Formula Grant	$858,816	$858,816	$0
KY	OE	Enhancing State and Local Governments Energy Assurance	Formula Grant	$591,715	$591,715	$0
KY Total				**$256,299,527**	**$227,809,111**	**$2,896,383**

State	Program Office	Project	Type	Announced	Awarded	Spent
LA	EERE	Modify Integrated Biorefinery Solicitation Program for Pilot and Demonstration Scale Biorefineries	Competitive Grant	$25,285	$25,285	$0
LA	EERE	Fundamental Research in Key Program Areas	Competitive Grant	$5,057	$5,057	$0
LA	FE	Industrial Carbon Capture and Storage Applications	Competitive Grant	$4,650,000	$0	$0
LA	EERE	Geothermal Demonstrations	Competitive Grant	$5,000,000	$0	$0
LA	EERE	Combined Heat and Power (CHP), District Energy Systems, Waste Heat Recovery Implementation and Deplo	Competitive Grant	$29,958,106	$0	$0
LA	EERE	Industrial Assessment Centers and Plant Best Practices	Competitive Grant	$444,293	$0	$0
LA	EERE	EE Conservation Block Grant Program - Formula	Formula Grant	$33,750,900	$25,178,220	$76,363
LA	EERE	Weatherization Assistance Program	Formula Grant	$50,657,478	$50,657,478	$4,028,431
LA	EERE	State Energy Program	Formula Grant	$71,694,000	$71,694,000	$86,668
LA	EERE	EE Appliance Rebate Programs	Formula Grant	$4,232,020	$423,200	$0
LA	EERE	High-Penetration Solar Deployment	Competitive Grant	$1,575,858	$0	$0
LA	EERE	Battery Manufacturing	Competitive Grant	$20,600,000	$0	$0
LA	OE	Smart Grid Investment Grant Program (EISA 1306)	Competitive Grant	$45,572,851	$0	$0
LA	OE	State Assistance on Electricity Policies	Formula Grant	$862,424	$862,424	$0
LA	OE	Enhancing State and Local Governments Energy Assurance	Formula Grant	$604,703	$604,703	$0
LA Total				**$269,632,975**	**$149,450,367**	**$4,191,462**
MA	EERE	Modify Integrated Biorefinery Solicitation Program for Pilot and Demonstration Scale Biorefineries	Competitive Grant	$50,570	$50,570	$19,345
MA	EERE	Management and Oversight (EE Program Direction)	Admin	$27,899	$27,899	$23,366
MA	FE	Industrial Carbon Capture and Storage Applications	Competitive Grant	$2,157,507	$0	$0
MA	EERE	Geothermal Demonstrations	Competitive Grant	$910,997	$0	$0
MA	EERE	EGS Technology R&D	Competitive Grant	$3,771,546	$0	$0
MA	EERE	Enabling Fuel Cell Market Transformation	Competitive Grant	$1,138,884	$0	$0
MA	EERE	Industrial Assessment Centers and Plant Best Practices	Competitive Grant	$500,000	$0	$0
MA	EERE	EE Conservation Block Grant Program - Formula	Formula Grant	$42,350,200	$30,924,050	$219,915
MA	EERE	Weatherization Assistance Program	Formula Grant	$122,077,457	$122,077,457	$16,378,601
MA	EERE	State Energy Program	Formula Grant	$54,911,000	$54,911,000	$14,852
MA	EERE	EE Appliance Rebate Programs	Formula Grant	$6,234,595	$623,500	$0
MA	EERE	Concentrating Solar Power	Competitive Grant	$1,909,754	$0	$0
MA	EERE	PV Systems Development	Competitive Grant	$3,277,428	$2,700,649	$89,703

State	Program Office	Project	Type	Announced	Awarded	Spent
MA	EERE	High-Penetration Solar Deployment	Competitive Grant	$4,768,669	$0	$0
MA	EERE	Wind Energy Technology R&D and Testing	Competitive Grant	$499,886	$0	$0
MA	EERE	Transportation Electrification	Competitive Grant	$4,354,135	$0	$0
MA	EERE	Large Wind Turbine Blade Testing Facility	Competitive Grant	$24,752,779	$24,752,779	$0
MA	EERE	Hydroelectric Facility Modernization Program	Competitive Grant	$1,350,000	$0	$0
MA	SC	Energy Frontier Research Centers	Competitive Grant	$35,000,000	$35,000,000	$29,289
MA	SC	Alcator C-Mod Facility Upgrades (MIT)	Contract	$4,960,000	$4,960,000	$0
MA	SC	Enhanced operation of Major Fusion Facilities	Contract	$935,000	$935,000	$0
MA	SC	Plasma Science Centers	Contract	$2,215,000	$2,215,000	$0
MA	OE	Smart Grid Investment Grant Program (EISA 1306)	Competitive Grant	$35,778,357	$12,417,092	$571,346
MA	OE	Enhancing State and Local Governments Energy Assurance	Formula Grant	$796,207	$796,207	$3,812
MA	ARPA-E	Advanced Research Projects Agency - Energy (ARPA-E)	Competitive Grant	$33,276,106	$0	$0
MA Total				**$388,003,976**	**$292,391,203**	**$17,350,229**
MD	EM	Program Direction - EM - Defense Environmental Management	Admin	$1,750,016	$1,750,016	$539,125
MD	FE	Program Direction - FE	Admin	$170,616	$170,616	$0
MD	EERE	Modify Integrated Biorefinery Solicitation Program for Pilot and Demonstration Scale Biorefineries	Competitive Grant	$25,285	$25,285	$19,015
MD	EERE	Management and Oversight (EE Program Direction)	Admin	$4,911,286	$4,911,286	$1,458,214
MD	EERE	Enhance and Accelerate FEMP Service Functions to the Federal Government	Admin	$2,287,599	$2,187,599	$6,666
MD	EERE	EGS Technology R&D	Competitive Grant	$1,381,611	$0	$0
MD	EERE	Industrial Assessment Centers and Plant Best Practices	Competitive Grant	$350,000	$0	$0
MD	EERE	EE Conservation Block Grant Program - Formula	Formula Grant	$52,295,100	$16,643,973	$360,490
MD	EERE	Weatherization Assistance Program	Formula Grant	$61,441,745	$66,091,745	$1,304,281
MD	EERE	State Energy Program	Formula Grant	$51,772,000	$53,572,000	$428,591
MD	EERE	EE Appliance Rebate Programs	Formula Grant	$5,405,259	$540,500	$0
MD	EERE	PV Systems Development	Competitive Grant	$150,000	$150,000	$34,120
MD	EERE	High-Penetration Solar Deployment	Competitive Grant	$150,000	$0	$0
MD	EERE	Wind Energy Technology R&D and Testing	Competitive Grant	$275,610	$0	$0
MD	EERE	Battery Manufacturing	Competitive Grant		$272,267	$0
MD	EERE	Clean Cities AFV Grant Program	Competitive Grant	$5,924,190	$0	$0
MD	EERE	Investigation of intermediate ethanol blends, optimization of E-85 engines, and	Competitive Grant	$44,820	$44,820	$0

State	Program Office	Project	Type	Announced	Awarded	Spent
		development of transportation infrastructure				
MD	SC	Computational Partnerships (SciDAC-e)	Contract	$258,820	$258,820	$0
MD	OE	Smart Grid Investment Grant Program (EISA 1306)	Competitive Grant	$200,000,000	$4,400,000	$0
MD	OE	State Assistance on Electricity Policies	Formula Grant	$893,591	$0	$0
MD	OE	Enhancing State and Local Governments Energy Assurance	Formula Grant	$716,898	$716,898	$0
MD	OE	Interoperability Standards and Framework (EISA 1305)	Formula Grant	$10,000,000	$10,000,000	$10,000,000
MD	DA	Departmental Administration	Admin	$15,862,124	$15,862,124	$3,928,019
MD	ARPA-E	Advanced Research Projects Agency - Energy (ARPA-E)	Competitive Grant	$40,560	$40,560	$0
MD Total				**$416,107,130**	**$177,638,509**	**$18,078,521**
ME	Treasury	1603 Grants in leiu of Tax Credits	Competitive Grant	$40,441,471	$0	$0
ME	EERE	Combined Heat and Power (CHP), District Energy Systems, Waste Heat Recovery Implementation and Deplo	Competitive Grant	$19,094,239	$0	$0
ME	EERE	EE Conservation Block Grant Program - Formula	Formula Grant	$11,535,900	$1,214,000	$87,300
ME	EERE	Weatherization Assistance Program	Formula Grant	$41,935,015	$41,935,015	$3,970,536
ME	EERE	State Energy Program	Formula Grant	$27,305,000	$27,305,000	$4,000,000
ME	EERE	EE Appliance Rebate Programs	Formula Grant	$1,263,098	$126,300	$0
ME	EERE	High-Penetration Solar Deployment	Competitive Grant	$2,886,782	$0	$0
ME	EERE	Wind Energy Consortia between Institutions of Higher Learning and Industry	Competitive Grant	$12,000,000	$0	$0
ME	EERE	Hydroelectric Facility Modernization Program	Competitive Grant	$750,000	$0	$0
ME	OE	Smart Grid Investment Grant Program (EISA 1306)	Competitive Grant	$95,900,000	$0	$0
ME	OE	State Assistance on Electricity Policies	Formula Grant	$783,554	$783,554	$0
ME	OE	Enhancing State and Local Governments Energy Assurance	Formula Grant	$320,789	$320,789	$0
ME Total				**$254,215,848**	**$71,684,658**	**$8,057,836**
MI	FE	Industrial Carbon Capture and Storage Applications	Competitive Grant	$3,400,000	$0	$0
MI	EERE	Modify Integrated Biorefinery Solicitation Program for Pilot and Demonstration Scale Biorefineries	Competitive Grant	$25,285	$25,285	$18,074
MI	EERE	Management and Oversight (EE Program Direction)	Admin	$19,567	$19,567	$18,152
MI	EERE	Ground Source Heat Pumps	Competitive Grant	$2,752,163	$0	$0
MI	EERE	Enabling Fuel Cell Market Transformation	Competitive Grant	$2,400,000	$2,400,000	$304,223
MI	EERE	Industrial Assessment Centers and Plant Best Practices	Competitive Grant	$115,000	$0	$0
MI	EERE	EE Conservation Block Grant Program - Formula	Formula Grant	$77,742,100	$49,236,457	$2,261,180

State	Program Office	Project	Type	Announced	Awarded	Spent
MI	EERE	Weatherization Assistance Program	Formula Grant	$243,398,975	$243,398,975	$4,003,223
MI	EERE	State Energy Program	Formula Grant	$82,035,000	$82,035,000	$45,641
MI	EERE	EE Appliance Rebate Programs	Formula Grant	$9,597,969	$959,800	$0
MI	EERE	PV Systems Development	Competitive Grant	$149,975	$149,975	$0
MI	EERE	High-Penetration Solar Deployment	Competitive Grant	$149,975	$0	$0
MI	EERE	Wind Energy Technology R&D and Testing	Competitive Grant	$1,906,725	$0	$0
MI	EERE	Battery Manufacturing	Competitive Grant	$1,134,304,482	$168,047,258	$0
MI	EERE	Transportation Electrification	Competitive Grant	$140,980,000	$2,500,000	$0
MI	EERE	Clean Cities AFV Grant Program	Competitive Grant	$14,970,144	$0	$0
MI	EERE	Investigation of intermediate ethanol blends, optimization of E-85 engines, and development of trans	Competitive Grant	$1,975,207	$1,975,207	$0
MI	SC	Energy Frontier Research Centers	Competitive Grant	$19,500,000	$19,500,000	$75,515
MI	OE	Smart Grid Investment Grant Program (EISA 1306)	Competitive Grant	$103,158,878	$0	$0
MI	OE	State Assistance on Electricity Policies	Formula Grant	$1,004,971	$0	$0
MI	OE	Enhancing State and Local Governments Energy Assurance	Formula Grant	$1,117,842	$1,117,842	$0
MI	ARPA-E	Advanced Research Projects Agency - Energy (ARPA-E)	Competitive Grant	$5,195,805	$0	$0
MI Total				**$1,845,900,063**	**$571,365,366**	**$6,726,008**
MN	Treasury	1603 Grants in leiu of Tax Credits	Competitive Grant	$28,019,520	$0	$0
MN	EERE	Modify Integrated Biorefinery Solicitation Program for Pilot and Demonstration Scale Biorefineries	Competitive Grant	$12,643	$12,643	$10,545
MN	EERE	Fundamental Research in Key Program Areas	Competitive Grant	$4,907	$4,907	$0
MN	EERE	Management and Oversight (EE Program Direction)	Admin	$39,838	$39,838	$19,788
MN	FE	Industrial Carbon Capture and Storage Applications	Competitive Grant	$1,597,899	$0	$0
MN	EERE	EGS Technology R&D	Competitive Grant	$1,550,018	$0	$0
MN	EERE	Ground Source Heat Pumps	Competitive Grant	$1,338,000	$0	$0
MN	EERE	Industrial Assessment Centers and Plant Best Practices	Competitive Grant	$349,985	$0	$0
MN	EERE	EE Conservation Block Grant Program - Formula	Formula Grant	$38,484,100	$36,392,900	$3,348,392
MN	EERE	Weatherization Assistance Program	Formula Grant	$131,937,411	$131,937,411	$7,325,732
MN	EERE	State Energy Program	Formula Grant	$54,172,000	$54,172,000	$247,729
MN	EERE	EE Appliance Rebate Programs	Formula Grant	$5,008,803	$500,900	$0
MN	EERE	PV Systems Development	Competitive Grant	$1,193,275	$900,000	$15,660
MN	EERE	High-Penetration Solar Deployment	Competitive Grant	$3,193,275	$0	$0

State	Program Office	Project	Type	Announced	Awarded	Spent
MN	EERE	Wind Energy Technology R&D and Testing	Competitive Grant	$626,086	$0	$0
MN	EERE	Wind Energy Consortia between Institutions of Higher Learning and Industry	Competitive Grant	$12,000,000	$0	$0
MN	SC	NOvA MIE	Contract	$40,064,000	$40,064,000	$3,159,675
MN	SC	Smart Grid Investment Grant Program (EISA 1306)	Competitive Grant	$1,544,004	$0	$0
MN	SC	State Assistance on Electricity Policies	Formula Grant	$883,060	$0	$0
MN	OE	Enhancing State and Local Governments Energy Assurance	Formula Grant	$678,986	$678,986	$0
MN	ARPA-E	Advanced Research Projects Agency - Energy (ARPA-E)	Competitive Grant	$2,200,000	$0	$0
MN Total				**$324,897,810**	**$264,703,585**	**$14,127,521**
MO	EERE	Modify Integrated Biorefinery Solicitation Program for Pilot and Demonstration Scale Biorefineries	Competitive Grant	$12,643	$12,643	$0
MO	EERE	Management and Oversight (EE Program Direction)	Admin	$15,674	$15,674	$12,877
MO	EERE	Ground Source Heat Pumps	Competitive Grant	$2,476,400	$0	$0
MO	EERE	Enabling Fuel Cell Market Transformation	Competitive Grant	$1,072,330	$1,072,330	$0
MO	EERE	Enabling Fuel Cell Market Transformation	Competitive Grant	$1,290,464	$0	$0
MO	EERE	EE Conservation Block Grant Program - Formula	Formula Grant	$43,779,300	$27,431,143	$412,378
MO	EERE	Weatherization Assistance Program	Formula Grant	$128,148,027	$128,148,027	$3,908,632
MO	EERE	State Energy Program	Formula Grant	$57,393,000	$57,393,000	$22,758
MO	EERE	EE Appliance Rebate Programs	Formula Grant	$5,671,999	$567,200	$0
MO	EERE	PV Systems Development	Competitive Grant	$150,000	$150,000	$0
MO	EERE	High-Penetration Solar Deployment	Competitive Grant	$150,000	$0	$0
MO	EERE	Wind Energy Technology R&D and Testing	Competitive Grant	$398,005	$0	$0
MO	EERE	Transportation Electrification	Competitive Grant	$15,000,000	$0	$0
MO	EERE	Clean Cities AFV Grant Program	Competitive Grant	$14,999,905	$0	$0
MO	OE	Smart Grid Investment Grant Program (EISA 1306)	Competitive Grant	$1,527,641	$0	$0
MO	OE	State Assistance on Electricity Policies	Formula Grant	$900,677	$0	$0
MO	OE	Enhancing State and Local Governments Energy Assurance	Formula Grant	$742,406	$742,406	$0
MO	ARPA-E	Advanced Research Projects Agency - Energy (ARPA-E)	Competitive Grant	$7,200,000	$0	$0
MO Total				**$280,928,471**	**$215,532,423**	**$4,356,645**
MP	EERE	EE Conservation Block Grant Program - Formula	Formula Grant	$9,593,500	$0	$0
MR	EERE	State Energy Program	Formula Grant	$18,651,000	$18,651,000	$31,187
MP	EERE	Weatherization Assistance Program	Formula Grant	$795,206	$795,206	$26,492
MP	EERE	EE Appliance Rebate Programs	Formula Grant	$100,000	$10,000	$0

State	Program Office	Project	Type	Announced	Awarded	Spent
MP Total				**$29,139,706**	**$19,456,206**	**$57,679**
MS	FE	Industrial Carbon Capture and Storage Applications	Competitive Grant	$1,500,000	$0	$0
MS	EERE	Ground Source Heat Pumps	Competitive Grant	$1,571,027	$0	$0
MS	EERE	Industrial Assessment Centers and Plant Best Practices	Competitive Grant	$500,000	$0	$0
MS	EERE	EE Conservation Block Grant Program - Formula	Formula Grant	$17,257,400	$15,795,400	$878,867
MS	EERE	Weatherization Assistance Program	Formula Grant	$49,421,193	$49,421,193	$7,030,740
MS	EERE	State Energy Program	Formula Grant	$40,418,000	$40,418,000	$143,053
MS	EERE	EE Appliance Rebate Programs	Formula Grant	$2,819,512	$282,000	$0
MS	OE	Smart Grid Investment Grant Program (EISA 1306)	Competitive Grant	$30,563,967	$0	$0
MS	OE	State Assistance on Electricity Policies	Formula Grant	$824,901	$824,901	$0
MS	OE	Enhancing State and Local Governments Energy Assurance	Formula Grant	$469,626	$469,626	$0
MS Total				**$145,345,626**	**$107,211,120**	**$8,052,660**
MT	EERE	Ground Source Heat Pumps	Competitive Grant	$1,228,014	$0	$0
MT	EERE	EE Conservation Block Grant Program - Formula	Formula Grant	$15,550,600	$12,637,913	$0
MT	EERE	Weatherization Assistance Program	Formula Grant	$26,543,777	$26,543,777	$720,413
MT	EERE	State Energy Program	Formula Grant	$25,855,000	$25,855,000	$404,815
MT	EERE	EE Appliance Rebate Programs	Formula Grant	$928,228	$92,800	$0
MT	EERE	Wind Energy Technology R&D and Testing	Competitive Grant	$398,966	$0	$0
MT	OE	State Assistance on Electricity Policies	Formula Grant	$774,659	$774,659	$0
MT	OE	Enhancing State and Local Governments Energy Assurance	Formula Grant	$288,765	$288,765	$0
MT Total				**$71,568,009**	**$66,192,914**	**$1,125,228**
NC	FE	Industrial Carbon Capture and Storage Applications	Competitive Grant	$1,332,179	$0	$0
NC	EERE	Modify Integrated Biorefinery Solicitation Program for Pilot and Demonstration Scale Biorefineries	Competitive Grant	$63,213	$63,213	$29,005
NC	EERE	Fundamental Research in Key Program Areas	Competitive Grant	$5,719	$5,719	$0
NC	EERE	Management and Oversight (EE Program Direction)	Admin	$20,507	$20,507	$17,814
NC	EERE	Ground Source Heat Pumps	Competitive Grant	$1,298,625	$0	$0
NC	EERE	Industrial Assessment Centers and Plant Best Practices	Competitive Grant	$140,000	$0	$0
NC	EERE	EE Conservation Block Grant Program - Formula	Formula Grant	$58,303,400	$37,517,770	$1,407,000
NC	EERE	Weatherization Assistance Program	Formula Grant	$131,954,536	$131,954,536	$3,086,021
NC	EERE	State Energy Program	Formula Grant	$75,989,000	$75,989,000	$0
NC	EERE	EE Appliance Rebate Programs	Formula Grant	$8,848,616	$884,900	$0
NC	EERE	Concentrating Solar Power	Competitive Grant	$719,260	$0	$0

State	Program Office	Project	Type	Announced	Awarded	Spent
NC	EERE	High-Penetration Solar Deployment	Competitive Grant	$3,008,826	$0	$0
NC	EERE	Wind Energy Technology R&D and Testing	Competitive Grant	$741,754	$0	$0
NC	EERE	Battery Manufacturing	Competitive Grant	$49,200,000	$0	$0
NC	EERE	Clean Cities AFV Grant Program	Competitive Grant	$12,975,388	$0	$0
NC	EERE	Hydroelectric Facility Modernization Program	Competitive Grant	$12,955,643	$0	$0
NC	SC	Energy Frontier Research Centers	Competitive Grant	$17,500,000	$17,500,000	$451,000
NC	SC	Computational Partnerships (SciDAC-e)	Contract	$320,502	$320,502	$12,000
NC	OE	Smart Grid Investment Grant Program (EISA 1306)	Competitive Grant	$403,927,899	$0	$0
NC	OE	State Assistance on Electricity Policies	Formula Grant	$985,065	$985,065	$0
NC	OE	Enhancing State and Local Governments Energy Assurance	Formula Grant	$1,046,182	$1,046,182	$0
NC	ARPA-E	Advanced Research Projects Agency - Energy (ARPA-E)	Competitive Grant	$3,111,693	$0	$0
NC Total				**$784,448,007**	**$266,287,394**	**$5,002,840**
ND	FE	Expand and Extend Clean Coal Power Initiative Round III	Competitive Grant	$100,000,000	$11,079,600	$118,000
ND	EERE	Geothermal Demonstrations	Competitive Grant	$3,467,728	$25,266,330	$2,202,828
ND	EERE	EE Conservation Block Grant Program - Formula	Formula Grant	$13,746,900	$24,585,000	$107,274
ND	EERE	Weatherization Assistance Program	Formula Grant	$25,266,330	$61,500	$0
ND	EERE	State Energy Program	Formula Grant	$24,585,000	$0	$0
ND	EERE	EE Appliance Rebate Programs	Formula Grant	$615,481	$0	$0
ND	OE	State Assistance on Electricity Policies	Formula Grant	$766,350	$766,350	$0
ND	OE	Enhancing State and Local Governments Energy Assurance	Formula Grant	$258,858	$258,858	$0
ND Total				**$168,706,647**	**$62,017,638**	**$2,428,102**
NE	EM	Program Direction - EM - Defense Environmental Management	Admin	$846,000	$846,000	$170,990
NE	EM	Program Direction - EM - Non-Defense Environmental Management	Admin	$80,000	$80,000	$0
NE	EM	Program Direction - EM - Uranium Enrichment D&D Fund	Admin	$200,000	$200,000	$0
NE	EERE	Ground Source Heat Pumps	Competitive Grant	$5,000,000	$0	$0
NE	EERE	EE Conservation Block Grant Program - Formula	Formula Grant	$19,218,500	$11,761,200	$108,820
NE	EERE	Weatherization Assistance Program	Formula Grant	$41,644,458	$41,644,458	$1,982,384
NE	EERE	State Energy Program	Formula Grant	$30,910,000	$30,910,000	$0
NE	EERE	EE Appliance Rebate Programs	Formula Grant	$1,711,147	$171,100	$0
NE	EERE	Wind Energy Technology R&D and Testing	Competitive Grant	$380,398	$0	$0
NE	OE	Smart Grid Investment Grant	Competitive	$2,271,994	$0	$0

State	Program Office	Project	Type	Announced	Awarded	Spent
		Program (EISA 1306)	Grant			
NE	OE	Enhancing State and Local Governments Energy Assurance	Formula Grant	$363,635	$363,635	$0
NE Total				**$60,981,674**	**$85,976,393**	**$2,262,194**
NE	EERE	Management and Oversight (EE Program Direction)	Admin	$16,429	$16,429	$12,148
NH	EERE	EE Conservation Block Grant Program - Formula	Formula Grant	$12,522,900	$11,477,500	$0
NH	EERE	Weatherization Assistance Program	Formula Grant	$23,218,594	$23,218,594	$2,349,759
NE	EERE	State Energy Program	Formula Grant	$25,827,000	$25,827,000	$80,266
NH	EERE	EE Appliance Rebate Programs	Formula Grant	$1,262,477	$126,200	$0
NH	OE	Smart Grid Investment Grant Program (EISA 1306)	Competitive Grant	$15,815,225	$0	$0
NH	OE	State Assistance on Electricity Policies	Formula Grant	$783,538	$783,538	$0
NH	OE	Enhancing State and Local Governments Energy Assurance	Formula Grant	$320,729	$320,729	$0
NH Total				**$79,766,892**	**$61,769,990**	**$2,442,173**
NJ	EERE	Fundamental Research in Key Program Areas	Competitive Grant	$5,165	$5,165	$0
NJ	EERE	Management and Oversight (EE Program Direction)	Admin	$129,090	$129,090	$59,345
NJ	EERE	Ground Source Heat Pumps	Competitive Grant	$109,999	$0	$0
NJ	EERE	Industrial Assessment Centers and Plant Best Practices	Competitive Grant	$350,000	$0	$0
NJ	EERE	EE Conservation Block Grant Program - Formula	Formula Grant	$75,468,200	$42,722,650	$199,600
NJ	EERE	Weatherization Assistance Program	Formula Grant	$118,821,296	$118,821,296	$10,700,633
NJ	EERE	State Energy Program	Formula Grant	$73,643,000	$73,643,000	$0
NJ	EERE	EE Appliance Rebate Programs	Formula Grant	$8,330,740	$833,100	$0
NJ	EERE	Clean Cities AFV Grant Program	Competitive Grant	$14,997,240	$0	$0
NJ	EERE	Hydroelectric Facility Modernization Program	Competitive Grant	$750,000	$0	$0
NJ	SC	DIII-D Facility Upgrades	Contract	$688,000	$688,000	$10,833
NJ	SC	NSTX Facility Upgrades	Contract	$7,034,000	$7,034,000	$332,988
NJ	SC	Enhanced operation of Major Fusion Facilities	Contract	$1,090,000	$1,090,000	$947,593
NJ	SC	PPPL GPP	Contract	$5,000,000	$5,000,000	$121,205
NJ	SC	Plasma Science Centers	Contract	$289,656	$289,656	$0
NJ	OE	Smart Grid Investment Grant Program (EISA 1306)	Competitive Grant	$18,700,000	$0	$0
NJ	OE	State Assistance on Electricity Policies	Formula Grant	$971,307	$0	$0
NJ	OE	Enhancing State and Local Governments Energy Assurance	Formula Grant	$996,658	$996,658	$0
NJ	ARPA-E	Advanced Research Projects Agency - Energy (ARPA-E)	Competitive Grant	$1,000,000	$0	$0
NJ Total				**$328,374,351**	**$251,252,615**	**$12,372,197**
NM	EM	LANL Non-Defense Recovery Act Project	Contract	$14,775,000	$14,775,000	$1,389,152
NM	EM	Title X Uranium/Thorium	Contract	$8,406,226	$8,406,226	$8,406,226

State	Program Office	Project	Type	Announced	Awarded	Spent
		Reimbursement Program				
NM	EM	WIPP Recovery Act Project	Contract	$172,375,000	$170,553,000	$22,842,354
NM	EM	LANL Defense D&D Recovery Act Project	Contract	$64,200,000	$64,200,000	$2,785,142
NM	EM	LANL Defense Soil and Groundwater Recovery Act Project	Contract	$132,800,000	$132,800,000	$3,810,693
NM	EM	Program Direction - EM - Defense Environmental Management	Admin	$316,000	$316,000	$0
NM	FE	Geologic Sequestration Training and Research Grant Program	Competitive Grant	$1,077,000	$0	$0
NM	EERE	Management and Oversight (EE Program Direction)	Admin	$930,828	$930,828	$330,474
NM	EERE	Lab Call for Facilities and Equipment	Competitive Grant	$4,200,000	$0	$0
NM	EERE	Enhance and Accelerate FEMP Service Functions to the Federal Government	Admin	$500,000	$500,000	$115,637
NM	EERE	Geothermal Demonstrations	Competitive Grant	$1,999,990	$0	$0
NM	EERE	EGS Technology R&D	Competitive Grant	$7,373,459	$2,641,200	$31,447
NM	EERE	Validation of Innovative Exploration Technologies	Competitive Grant	$4,995,844	$0	$0
NM	EERE	EE Conservation Block Grant Program - Formula	Formula Grant	$22,272,500	$10,214,100	$0
NM	EERE	Weatherization Assistance Program	Formula Grant	$26,855,604	$26,855,604	$1,070,105
NM	EERE	State Energy Program	Formula Grant	$31,821,000	$31,821,000	$1,396,040
NM	EERE	EE Appliance Rebate Programs	Formula Grant	$1,903,927	$190,400	$0
NM	EERE	Wind Energy Technology R&D and Testing	Competitive Grant	$272,816	$0	$0
NM	EERE	Hydroelectric Facility Modernization Program	Competitive Grant	$4,558,344	$0	$0
NM	SC	Energy Frontier Research Centers	Competitive Grant	$3,391,282	$3,391,282	$56,688
NM	SC	Linac Coherent Light Source Ultrafast Science Instruments MIE	Contract	$3,290,000	$3,290,000	$132
NM	SC	Advanced Networking Initiative	Contract	$450,000	$450,000	$0
NM	SC	Computational Partnerships (SciDAC-e)	Contract	$683,739	$683,739	$54,757
NM	SC	Advanced technology R&D augmentation	Contract	$223,000	$223,000	$30,432
NM	SC	PHENIX Forward Vertex Detector MIE full funding (RHIC at BNL)	Contract	$1,033,000	$1,033,000	$18,786
NM	SC	Nuclear Science Workforce	Contract	$3,103,000	$3,103,000	$18,822
NM	SC	DIII-D Facility Upgrades	Contract	$75,000	$75,000	$0
NM	SC	Plasma Science Centers	Contract	$625,000	$625,000	$0
NM	OE	State Assistance on Electricity Policies	Formula Grant	$800,578	$0	$0
NM		Enhancing State and Local Governments Energy Assurance	Formula Grant	$382,070	$382,070	$0
NM	ARPA-E	Advanced Research Projects Agency - Energy (ARPA-E)	Competitive Grant	$58,000	$58,000	$39,455

State	Program Office	Project	Type	Announced	Awarded	Spent
NM Total				**$515,748,207**	**$477,517,449**	**$42,396,342**
NV	EM	NTS Recovery Act Project	Contract	$44,325,000	$44,325,000	$8,945,815
NV	EM	ETEC Recovery Act Project	Contract	$38,300,000	$38,300,000	$38,300,000
NV	EM	Hanford Central Plateau D&D Recovery Act Project	Contract	$298,337	$298,337	$199,586
NV	EERE	Management and Oversight (EE Program Direction)	Admin	$62,467	$62,467	$39,268
NV	EERE	Geothermal Demonstrations	Competitive Grant	$18,006,000	$0	$0
NV	EERE	EGS Technology R&D	Competitive Grant	$2,213,575	$0	$0
NV	EERE	Validation of Innovative Exploration Technologies	Competitive Grant	$42,794,359	$0	$0
NV	EERE	EE Conservation Block Grant Program - Formula	Formula Grant	$32,529,800	$27,312,802	$0
NV	EERE	Weatherization Assistance Program	Formula Grant	$37,281,937	$37,281,937	$804,635
NV	EERE	State Energy Program	Formula Grant	$34,714,000	$34,714,000	$48,405
NV	EERE	EE Appliance Rebate Programs	Formula Grant	$2,494,779	$249,500	$0
NV	EERE	Battery Manufacturing	Competitive Grant	$28,400,000	$0	$0
NV	OE	Smart Grid Investment Grant Program (EISA 1306)	Competitive Grant	$138,000,000	$5,724,709	$0
NV	OE	State Assistance on Electricity Policies	Formula Grant	$816,274	$0	$0
NV	OE	Enhancing State and Local Governments Energy Assurance	Formula Grant	$438,573	$438,573	$0
NV Total				**$420,675,100**	**$188,707,325**	**$48,337,709**
NY	Treasury	1603 Grants in leiu of Tax Credits	Competitive Grant	$74,648,828	$0	$0
NY	EM	BNL Recovery Act Project	Contract	$42,355,000	$42,355,000	$12,934,278
NY	EM	SPRU Recovery Act Project	Contract	$51,775,000	$51,775,000	$1,958,894
NY	EM	West Valley Recovery Act Project	Contract	$73,875,000	$73,875,000	$5,434,592
NY	EM	Program Direction - EM - Non-Defense Environmental Management	Admin	$179,184	$179,184	$40,681
NY	FE	Industrial Carbon Capture and Storage Applications	Competitive Grant	$2,634,876	$0	$0
NY	EERE	Modify Integrated Biorefinery Solicitation Program for Pilot and Demonstration Scale Biorefineries	Competitive Grant	$12,643	$12,643	$9,792
NY	EERE	Management and Oversight (EE Program Direction)	Admin	$115,000	$115,000	$113,949
NY	EERE	EGS Technology R&D	Competitive Grant	$10,925,071	$772,800	$13,204
NY	EERE	Ground Source Heat Pumps	Competitive Grant	$2,786,250	$0	$0
NY	EERE	Enabling Fuel Cell Market Transformation	Competitive Grant	$10,869,217	$7,602,486	$2,182,194
NY	EERE	EE Conservation Block Grant Program - Formula	Formula Grant	$175,665,400	$140,126,200	$1,040,700
NY	EERE	Weatherization Assistance Program	Formula Grant	$394,686,513	$394,686,513	$42,315,547
NY	EERE	State Energy Program	Formula Grant	$123,110,000	$123,110,000	$0
NY	EERE	EE Appliance Rebate Programs	Formula Grant	$18,700,327	$1,870,000	$0
NY	EERE	PV Systems Development	Competitive	$3,011,129	$2,275,000	$23,726

State	Program Office	Project	Type	Announced	Awarded	Spent
			Grant			
NY	EERE	High-Penetration Solar Deployment	Competitive Grant	$7,441,232	$0	$0
NY	EERE	Wind Energy Technology R&D and Testing	Competitive Grant	$697,769	$0	$0
NY	EERE	Battery Manufacturing	Competitive Grant	$38,600,000	$0	$0
NY	EERE	Clean Cities AFV Grant Program	Competitive Grant	$28,293,284	$0	$0
NY	SC	Energy Frontier Research Centers	Competitive Grant	$33,327,638	$33,327,638	$172,910
NY	SC	National Synchrotron Light Source II	Contract	$150,000,000	$150,000,000	$18,812,076
NY	SC	Linac Coherent Light Source Ultrafast Science Instruments MIE	Contract	$5,569,000	$5,569,000	$0
NY	SC	Light Source Improvements	Contract	$3,000,000	$3,000,000	$0
NY	SC	Computational Partnerships (SciDAC-e)	Contract	$686,024	$686,024	$0
NY	SC	Advanced technology R&D augmentation	Contract	$55,000	$55,000	$1,615
NY	SC	Long Baseline Neutrino Experiment	Contract	$6,000,000	$6,000,000	$151,907
NY	SC	PHENIX Silicon Vertex MIE full funding (RHIC at BNL)	Contract	$250,000	$250,000	$96,997
NY	SC	PHENIX Forward Vertex Detector MIE full funding (RHIC at BNL)	Contract	$967,000	$967,000	$0
NY	SC	Enhanced AIP funding at NP user facilities	Contract	$8,000,000	$8,000,000	$248,370
NY	SC	Nuclear Science Workforce	Contract	$1,808,000	$1,808,000	$46,967
NY	SC	SLI Construction	Contract	$18,673,000	$18,673,000	$157,415
NY	SC	General Plant Project funding across all SC laboratories	Contract	$18,500,000	$18,500,000	$4,189,156
NY	OE	Smart Grid Investment Grant Program (EISA 1306)	Competitive Grant	$173,553,807	$5,631,110	$0
NY	OE	State Assistance on Electricity Policies	Formula Grant	$1,246,777	$1,246,777	$0
NY	OE	Enhancing State and Local Governments Energy Assurance	Formula Grant	$1,988,289	$1,988,289	$0
NY	ARPA-E	Advanced Research Projects Agency - Energy (ARPA-E)	Competitive Grant	$8,000	$8,000	$4,297
NY Total				**$1,484,014,258**	**$1,094,464,664**	**$89,949,267**
OH	EM	Portsmouth Recovery Act Project	Contract	$118,200,000	$118,200,000	$6,817,908
OH	EM	Mound Operable Unit 1 Recovery Act Project	Contract	$19,700,000	$19,700,000	$0
OH	EM	Program Direction - EM - Non-Defense Environmental Management	Admin	$474,013	$474,013	$118,888
OH	FE	Industrial Carbon Capture and Storage Applications	Competitive Grant	$5,086,568	$0	$0
OH	EERE	Modify Integrated Biorefinery Solicitation Program for Pilot and Demonstration Scale Biorefineries	Competitive Grant	$12,643	$12,643	$9,293
OH	EERE	Management and Oversight (EE Program Direction)	Admin	$2,811	$2,811	$2,811
OH	EERE	Ground Source Heat Pumps	Competitive Grant	$232,596	$0	$0

State	Program Office	Project	Type	Announced	Awarded	Spent
OH	EERE	Combined Heat and Power (CHP), District Energy Systems, Waste Heat Recovery Implementation and Deplo	Competitive Grant	$315,170,099	$0	$0
OH	EERE	Industrial Assessment Centers and Plant Best Practices	Competitive Grant	$489,977	$0	$0
OH	EERE	EE Conservation Block Grant Program - Formula	Formula Grant	$84,183,300	$56,170,375	$803,000
OH	EERE	Weatherization Assistance Program	Formula Grant	$266,781,409	$266,781,409	$35,708,033
OH	EERE	State Energy Program	Formula Grant	$96,083,000	$96,083,000	$329,853
OH	EERE	EE Appliance Rebate Programs	Formula Grant	$11,020,370	$1,102,000	$0
OH	EERE	Battery Manufacturing	Competitive Grant	$34,100,000	$0	$0
OH	EERE	Clean Cities AFV Grant Program	Competitive Grant	$11,041,500	$0	$0
OH	OE	Smart Grid Investment Grant Program (EISA 1306)	Competitive Grant	$67,201,906	$0	$0
OH	OE	State Assistance on Electricity Policies	Formula Grant	$1,042,758	$0	$0
OH	OE	Enhancing State and Local Governments Energy Assurance	Formula Grant	$1,253,864	$1,253,864	$0
OH	ARPA-E	Advanced Research Projects Agency - Energy (ARPA-E)	Competitive Grant	$17,511,403	$0	$0
OH Total				**$1,049,588,217**	**$559,780,115**	**$43,789,786**
OK	EM	Title X Uranium/Thorium Reimbursement Program	Contract	$17,689,057	$17,689,057	$17,689,057
OK	FE	Geologic Sequestration Training and Research Grant Program	Competitive Grant	$1,253,000	$0	$0
OK	EERE	Modify Integrated Biorefinery Solicitation Program for Pilot and Demonstration Scale Biorefineries	Competitive Grant	$50,570	$50,570	$37,983
OK	EERE	Fundamental Research in Key Program Areas	Competitive Grant	$5,135	$5,135	$0
OK	EERE	Management and Oversight (EE Program Direction)	Admin	$30,240	$30,240	$26,347
OK	EERE	EGS Technology R&D	Competitive Grant	$2,399,999	$0	$0
OK	EERE	Ground Source Heat Pumps	Competitive Grant	$483,819	$0	$0
OK	EERE	Industrial Assessment Centers and Plant Best Practices	Competitive Grant	$105,000	$0	$0
OK	EERE	EE Conservation Block Grant Program - Formula	Formula Grant	$38,423,800	$21,168,796	$0
OK	EERE	Weatherization Assistance Program	Formula Grant	$60,903,196	$60,903,196	$2,770,232
OK	EERE	State Energy Program	Formula Grant	$46,704,000	$46,704,000	$29,681
OK	EERE	EE Appliance Rebate Programs	Formula Grant	$3,494,731	$349,500	$0
OK	SC	Computational Partnerships (SciDAC-e)	Contract	$589,092	$589,092	$0
OK	OE	Smart Grid Investment Grant Program (EISA 1306)	Competitive Grant	$130,000,000	$0	$0
OK	OE	State Assistance on Electricity Policies	Formula Grant	$842,838	$0	$0
OK	OE	Enhancing State and Local Governments Energy Assurance	Formula Grant	$534,197	$534,197	$0

State	Program Office	Project	Type	Announced	Awarded	Spent
OK	ARPA-E	Advanced Research Projects Agency - Energy (ARPA-E)	Competitive Grant	$3,000,000	$0	$0
OK Total				**$306,508,674**	**$148,023,783**	**$20,553,300**
OR	Treasury	1603 Grants in leiu of Tax Credits	Competitive Grant	$141,352,929	$0	$0
OR	EERE	Geothermal Demonstrations	Competitive Grant	$816,100	$0	$0
OR	EERE	Validation of Innovative Exploration Technologies	Competitive Grant	$3,825,973	$0	$0
OR	EERE	EE Conservation Block Grant Program - Formula	Formula Grant	$34,651,500	$27,033,064	$32,343
OR	EERE	Weatherization Assistance Program	Formula Grant	$38,512,236	$38,512,236	$2,204,204
OR	EERE	State Energy Program	Formula Grant	$42,182,000	$42,182,000	$127,166
OR	EERE	EE Appliance Rebate Programs	Formula Grant	$3,636,443	$363,600	$0
OR	EERE	Concentrating Solar Power	Competitive Grant	$1,172,000	$0	$0
OR	EERE	High-Penetration Solar Deployment	Competitive Grant	$400,000	$0	$0
OR	EERE	Battery Manufacturing	Competitive Grant	$21,000,000	$0	$0
OR	EERE	Transportation Electrification	Competitive Grant	$22,200,000	$0	$0
OR	EERE	Hydroelectric Facility Modernization Program	Competitive Grant	$600,000	$0	$0
OR	OE	Smart Grid Investment Grant Program (EISA 1306)	Competitive Grant	$29,471,776	$0	$0
OR	OE	State Assistance on Electricity Policies	Formula Grant	$846,603	$846,603	$0
OR	OE	Enhancing State and Local Governments Energy Assurance	Formula Grant	$547,749	$547,749	$0
OR Total				**$341,215,309**	**$109,485,252**	**$2,363,713**
PA	Treasury	1603 Grants in leiu of Tax Credits	Competitive Grant	$101,366,626	$0	$0
PA	FE	Program Direction - FE	Admin	$31,042	$31,042	$31,042
PA	FE	Industrial Carbon Capture and Storage Applications	Competitive Grant	$1,249,314	$0	$0
PA	EERE	Modify Integrated Biorefinery Solicitation Program for Pilot and Demonstration Scale Biorefineries	Competitive Grant	$12,643	$12,643	$0
PA	EERE	Management and Oversight (EE Program Direction)	Admin	$24,535	$24,535	$8,456
PA	EERE	Ground Source Heat Pumps	Competitive Grant	$1,682,920	$0	$0
PA	EERE	Enabling Fuel Cell Market Transformation	Competitive Grant	$6,102,941	$0	$0
PA	EERE	Industrial Assessment Centers and Plant Best Practices	Competitive Grant	$493,000	$0	$0
PA	EERE	EE Conservation Block Grant Program - Formula	Formula Grant	$102,508,400	$74,351,300	$276,885
PA	EERE	Weatherization Assistance Program	Formula Grant	$252,793,062	$252,793,062	$16,791,753
PA	EERE	State Energy Program	Formula Grant	$99,684,000	$99,684,000	$0
PA	EERE	EE Appliance Rebate Programs	Formula Grant	$11,943,732	$1,194,400	$0
PA	EERE	PV Systems Development	Competitive Grant	$1,874,939	$1,497,153	$15,487
PA	EERE	High-Penetration Solar Deployment	Competitive Grant	$5,374,939	$0	$0

State	Program Office	Project	Type	Announced	Awarded	Spent
PA	EERE	Wind Energy Technology R&D and Testing	Competitive Grant	$750,000	$0	$0
PA	EERE	Battery Manufacturing	Competitive Grant	$40,580,800	$0	$0
PA	EERE	Hydroelectric Facility Modernization Program	Competitive Grant	$1,000,000	$0	$0
PA	SC	Energy Frontier Research Centers	Competitive Grant	$21,000,000	$21,000,000	$82,311
PA	SC	DIII-D Facility Upgrades	Contract	$326,158	$326,158	$0
PA	OE	Smart Grid Investment Grant Program (EISA 1306)	Competitive Grant	$233,184,232	$0	$0
PA	OE	State Assistance on Electricity Policies	Formula Grant	$1,067,287	$1,067,287	$0
PA	OE	Enhancing State and Local Governments Energy Assurance	Formula Grant	$1,342,164	$1,342,164	$0
PA	ARPA-E	Advanced Research Projects Agency - Energy (ARPA-E)	Competitive Grant	$2,466,708	$0	$0
PA Total				**$886,859,442**	**$453,323,744**	**$17,205,934**
PR	EERE	EE Conservation Block Grant Program - Formula	Formula Grant	$33,977,000	$19,204,700	$0
PR	EERE	Weatherization Assistance Program	Formula Grant	$48,865,588	$48,865,588	$0
PR	EERE	State Energy Program	Formula Grant	$37,086,000	$37,086,000	$0
PR	EERE	EE Appliance Rebate Programs	Formula Grant	$3,793,774	$379,400	$0
PR	OE	Enhancing State and Local Governments Energy Assurance	Formula Grant	$562,794	$562,794	$0
PR Total				**$124,285,156**	**$106,098,482**	**$0**
RI	EERE	Combined Heat and Power (CHP), District Energy Systems, Waste Heat Recovery Implementation and Deplo	Competitive Grant	$100,081,146	$0	$0
RI	EERE	EE Conservation Block Grant Program - Formula	Formula Grant	$14,599,200	$13,148,400	$0
RI	EERE	Weatherization Assistance Program	Formula Grant	$20,073,615	$20,073,615	$0
RI	EERE	State Energy Program	Formula Grant	$23,960,000	$23,960,000	$0
RI	EERE	EE Appliance Rebate Programs	Formula Grant	$1,008,198	$100,800	$0
RI	OE	State Assistance on Electricity Policies	Formula Grant	$776,783	$776,783	$0
RI	OE	Enhancing State and Local Governments Energy Assurance	Formula Grant	$296,413	$296,413	$0
RI Total				**$160,795,355**	**$58,356,011**	**$0**
SC	EM	SRS D&D P & R Areas Recovery Act Project	Contract	$478,400,000	$478,400,000	$46,671,833
SC	EM	SRS D&D M & D Areas Recovery Act Project	Contract	$104,000,000	$104,000,000	$2,958,764
SC	EM	SRS D&D, Soil & Groundwater Activities Site-wide Recovery Act Project	Contract	$292,000,000	$289,403,000	$66,337,546
SC	EM	SRS TRU & Solid Waste Recovery Act Project	Contract	$541,000,000	$539,600,000	$163,654,445
SC	EM	Liquid Waste Tank Infrastructure	Contract	$200,000,000	$200,000,000	$1,965,167
SC	EERE	Liquid Waste Tank Infrastructure	Contract	$200,000,000	$0	$0
SC	EERE	Fundamental Research in Key Program Areas	Competitive Grant	$640,000	$0	$0

State	Program Office	Project	Type	Announced	Awarded	Spent
SC	EERE	Management and Oversight (EE Program Direction)	Admin	$97,500	$97,500	$47,891
SC	EERE	Ground Source Heat Pumps	Competitive Grant	$2,457,741	$0	$0
SC	EERE	Advanced Materials RD&D in Support of EERE Needs to Advance Clean Energy Technologies and Energy-Intensive Process R&D	Competitive Grant	$300,000	$80,000	$2,434
SC	EERE	EE Conservation Block Grant Program - Formula	Formula Grant	$31,623,100	$26,354,978	$1,061,734
SC	EERE	Weatherization Assistance Program	Formula Grant	$58,892,771	$58,892,771	$8,739,278
SC	EERE	EE Appliance Rebate Programs	Formula Grant	$4,298,227	$50,550,000	$185,823
SC	EERE	High-Penetration Solar Deployment	Competitive Grant	$1,005,000	$429,800	$0
SC	EERE	Battery Manufacturing	Competitive Grant	$50,140,000	$0	$0
SC	SC	Energy Frontier Research Centers	Competitive Grant	$1,100,000	$1,100,000	$23,673
SC	OE	State Assistance on Electricity Policies	Formula Grant	$864,183	$864,183	$0
SC	OE	Enhancing State and Local Governments Energy Assurance	Formula Grant	$611,034	$611,034	$0
SC Total				**$1,967,429,556**	**$1,750,383,266**	**$291,648,588**
SD	EERE	Modify Integrated Biorefinery Solicitation Program for Pilot and Demonstration Scale Biorefineries	Competitive Grant	$25,285	$25,285	$20,473
SD	EERE	EE Conservation Block Grant Program - Formula	Formula Grant	$15,099,300	$12,754,500	$91,336
SD	EERE	Weatherization Assistance Program	Formula Grant	$24,487,296	$24,487,296	$571,166
SD	EERE	State Energy Program	Formula Grant	$23,709,000	$23,709,000	$45,815
SD	EERE	EE Appliance Rebate Programs	Formula Grant	$771,599	$77,200	$0
SD	OE	Smart Grid Investment Grant Program (EISA 1306)	Competitive Grant	$9,608,970	$0	$0
SD	OE	State Assistance on Electricity Policies	Formula Grant	$770,498	$770,498	$0
SD Total				**$74,471,948**	**$61,823,779**	**$728,790**
TN	EM	Oak Ridge Defense Y-12 D&D Recovery Act Project	Contract	$327,000,000	$324,999,998	$27,164,423
TN	EM	Oak Ridge Defense ORNL D&D Recovery Act Project	Contract	$151,110,000	$111,363,000	$9,765,462
TN	EM	Oak Ridge Defense TRU Waste Recovery Act Project	Contract	$80,000,000	$78,000,000	$6,423,377
TN	EM	ORP Recovery Act Project	Contract	$326,035,000	$380,000	$269,944
TN	EM	Hanford Central Plateau D&D Recovery Act Project	Contract	$451,831	$451,831	$0
TN	EM	Title X Uranium/Thorium Reimbursement Program	Contract	$722,792	$722,792	$722,792
TN	EM	Oak Ridge UE D&D Funded Recovery Act Project	Contract	$118,200,000	$118,200,000	$10,570,951
TN	EM	Oak Ridge Non-Defense Recovery Act Project	Contract	$20,281,200	$20,281,200	$2,654,782
TN	EM	Program Direction - EM - Defense Environmental Management	Admin	$475,700	$475,700	$297,116
TN	EM	Program Direction - EM - Non-	Admin	$150,415	$150,415	$0

State	Program Office	Project	Type	Announced	Awarded	Spent
		Defense Environmental Management				
TN	EM	Program Direction - EM - Uranium Enrichment D&D Fund	Admin	$475,000	$475,000	$0
TN	EERE	Modify Integrated Biorefinery Solicitation Program for Pilot and Demonstration Scale Biorefineries	Competitive Grant	$691,689	$691,689	$63,058
TN	EERE	Fundamental Research in Key Program Areas	Competitive Grant	$5,210,000	$715,055	$15,344
TN	EERE	Management and Oversight (EE Program Direction)	Admin	$6,594,867	$6,594,867	$1,196,850
TN	EERE	Lab Call for Facilities and Equipment	Competitive Grant	$54,900,000	$0	$0
TN	EERE	Enhance and Accelerate FEMP Service Functions to the Federal Government	Admin	$2,175,000	$2,175,000	$69,910
TN	EERE	EGS Technology R&D	Competitive Grant	$6,075,000	$1,920,000	$5,187
TN	EERE	Ground Source Heat Pumps	Competitive Grant	$4,800,000	$0	$0
TN	EERE	Industrial Assessment Centers and Plant Best Practices	Competitive Grant	$2,575,000	$1,224,800	$0
TN	EERE	Advanced Materials RD&D in Support of EERE Needs to Advance Clean Energy Technologies and Energy-Intensive Process R&D	Competitive Grant	$3,351,861	$18,100,000	$578,110
TN	EERE	EE Conservation Block Grant Program - Formula	Formula Grant	$42,243,200	$48,668,383	$231,157
TN	EERE	Weatherization Assistance Program	Formula Grant	$99,112,101	$110,912,101	$2,764,662
TN	EERE	State Energy Program	Formula Grant	$62,482,000	$62,482,000	$0
TN	EERE	EE Appliance Rebate Programs	Formula Grant	$5,962,990	$3,096,300	$307,233
TN	EERE	High-Penetration Solar Deployment	Competitive Grant	$935,000	$0	$0
TN	EERE	Wind Energy Technology R&D and Testing	Competitive Grant	$1,414,680	$0	$0
TN	EERE	Battery Manufacturing	Competitive Grant	$34,300,000	$0	$0
TN	EERE	Transportation Electrification	Competitive Grant	$13,403,440	$13,403,440	$0
TN	EERE	Investigation of intermediate ethanol blends, optimization of E-85 engines, and development of transportation infrastructure	Competitive Grant	$4,500,000	$5,000,000	$597
TN	SC	Linac Coherent Light Source Ultrafast Science Instruments MIE	Contract	$5,785,000	$5,785,000	$0
TN	SC	Computational Partnerships (SciDAC-e)	Contract	$3,750,000	$3,750,000	$0
TN	SC	Advanced Computer Architectures	Contract	$2,500,000	$2,500,000	$1,237
TN	SC	Leadership Computing Upgrade	Contract	$19,900,000	$19,900,000	$0
TN	SC	Bioenergy Research Center Capital Equipment	Contract	$5,362,000	$5,362,000	$117,673
TN	SC	Knowledgebase R&D	Contract	$3,188,000	$3,188,000	$98,083
TN	SC	Fundamental Neutron Physics Beamline MIE at SNS full	Contract	$600,000	$600,000	$567,944

State	Program Office	Project	Type	Announced	Awarded	Spent
		funding (ORNL)				
TN	SC	Enhanced AIP funding at NP user facilities	Contract	$2,500,000	$2,500,000	$2,338
TN	SC	Nuclear Science Workforce	Contract	$4,380,000	$4,380,000	$9,094
TN	SC	DIII-D Facility Upgrades	Contract	$180,000	$180,000	$0
TN	SC	SLI Construction	Contract	$60,568,000	$60,568,000	$6,290,085
TN	SC	General Plant Project funding across all SC laboratories	Contract	$9,999,000	$9,999,000	$427,944
TN	SC	OSTI Technology Infrastructure	Contract	$700,000	$700,000	$35,018
TN	SC	Energy Sciences Fellowships and Early Career Awards	Contract	$700,000	$700,000	$0
TN	OE	Smart Grid Investment Grant Program (EISA 1306)	Competitive Grant	$120,216,097	$1,370,000	$92,532
TN	OE	State Assistance on Electricity Policies	Formula Grant	$908,408	$908,408	$0
TN	OE	Enhancing State and Local Governments Energy Assurance	Formula Grant	$770,233	$770,233	$0
TN	ARPA-E	Advanced Research Projects Agency - Energy (ARPA-E)	Competitive Grant	$380,000	$380,000	$326,880
TN Total				**$1,618,015,504**	**$1,054,024,212**	**$71,069,783**
TX	Treasury	1603 Grants in leiu of Tax Credits	Competitive Grant	$114,071,646	$0	$0
TX	EM	Title X Uranium/Thorium Reimbursement Program	Contract	$10,898	$10,898	$10,898
TX	FE	Industrial Carbon Capture and Storage Applications	Competitive Grant	$16,871,947	$0	$0
TX	FE	Geologic Sequestration Training and Research Grant Program	Competitive Grant	$995,000	$0	$0
TX	EERE	Modify Integrated Biorefinery Solicitation Program for Pilot and Demonstration Scale Biorefineries	Competitive Grant	$101,140	$101,140	$65,974
TX	EERE	Management and Oversight (EE Program Direction)	Admin	$1,369	$1,369	$1,369
TX	EERE	Geothermal Demonstrations	Competitive Grant	$1,499,288	$0	$0
TX	EERE	EGS Technology R&D	Competitive Grant	$14,292,189	$0	$0
TX	EERE	Validation of Innovative Exploration Technologies	Competitive Grant	$5,000,000	$0	$0
TX	EERE	National Geothermal Database, Resource Assessment and Classification System	Competitive Grant	$5,250,000	$0	$0
TX	EERE	Ground Source Heat Pumps	Competitive Grant	$250,000	$0	$0
TX	EERE	Combined Heat and Power (CHP), District Energy Systems, Waste Heat Recovery Implementation and Deplo	Competitive Grant	$71,000,000	$0	$0
TX	EERE	Industrial Assessment Centers and Plant Best Practices	Competitive Grant	$132,000	$0	$0
TX	EERE	EE Conservation Block Grant Program - Formula	Formula Grant	$208,931,400	$153,100,721	$801,420
TX	EERE	Weatherization Assistance Program	Formula Grant	$326,975,732	$326,975,732	$1,021,605
TX	EERE	State Energy Program	Formula Grant	$218,782,000	$218,782,000	$234,050

State	Program Office	Project	Type	Announced	Awarded	Spent
TX	EERE	EE Appliance Rebate Programs	Formula Grant	$23,340,967	$2,334,100	$0
TX	EERE	High-Penetration Solar Deployment	Competitive Grant	$5,982,405	$0	$0
TX	EERE	Clean Cities AFV Grant Program	Competitive Grant	$38,114,079	$0	$0
TX	SC	Energy Frontier Research Centers	Competitive Grant	$13,108,718	$13,108,718	$0
TX	OE	Smart Grid Investment Grant Program (EISA 1306)	Competitive Grant	$258,209,258	$0	$0
TX	OE	State Assistance on Electricity Policies	Formula Grant	$1,370,056	$0	$0
TX	OE	Enhancing State and Local Governments Energy Assurance	Formula Grant	$2,432,068	$2,432,068	$0
TX Total				**$1,326,722,160**	**$716,846,746**	**$2,135,316**
UT	EM	Moab Recovery Act Project	Contract	$108,350,000	$108,350,000	$6,450,149
UT	FE	Industrial Carbon Capture and Storage Applications	Competitive Grant	$1,302,497	$0	$0
UT	EERE	EGS Technology R&D	Competitive Grant	$7,375,481	$0	$0
UT	EERE	Validation of Innovative Exploration Technologies	Competitive Grant	$4,640,110	$0	$0
UT	EERE	EE Conservation Block Grant Program - Formula	Formula Grant	$28,035,300	$21,720,850	$545,400
UT	EERE	Weatherization Assistance Program	Formula Grant	$37,897,203	$37,897,203	$3,009,416
UT	EERE	State Energy Program	Formula Grant	$35,362,000	$35,362,000	$87,253
UT	EERE	EE Appliance Rebate Programs	Formula Grant	$2,625,513	$262,600	$0
UT	EERE	High-Penetration Solar Deployment	Competitive Grant	$3,377,840	$0	$0
UT	EERE	Clean Cities AFV Grant Program	Competitive Grant	$14,908,648	$0	$0
UT	OE	Smart Grid Investment Grant Program (EISA 1306)	Competitive Grant	$53,890,000	$0	$0
UT	OE	State Assistance on Electricity Policies	Formula Grant	$819,747	$0	$0
UT	OE	Enhancing State and Local Governments Energy Assurance	Formula Grant	$451,075	$451,075	$0
UT Total				**$299,035,414**	**$204,043,728**	**$10,092,218**
VA	EM	Title X Uranium/Thorium Reimbursement Program	Contract	$400,000	$400,000	$0
VA	EM	Program Direction - EM - Defense Environmental Management	Admin	$1,571,866	$1,571,866	$1,039,006
VA	FE	Program Direction - FE	Admin	$48,000	$48,000	$0
VA	EERE	Management and Oversight (EE Program Direction)	Admin	$68,315	$68,315	$16,494
VA	EERE	EGS Technology R&D	Competitive Grant	$1,499,783	$0	$0
VA	EERE	Enabling Fuel Cell Market Transformation	Competitive Grant	$7,295,000	$7,295,000	$0
VA	EERE	EE Conservation Block Grant Program - Formula	Formula Grant	$60,719,900	$38,697,700	$0
VA	EERE	Weatherization Assistance Program	Formula Grant	$94,134,276	$94,134,276	$8,885,370
VA	EERE	State Energy Program	Formula Grant	$70,001,000	$70,001,000	$89,682
VA	EERE	EE Appliance Rebate Programs	Formula Grant	$7,454,197	$745,400	$0
VA	EERE	Concentrating Solar Power	Competitive	$625,000	$0	$0

State	Program Office	Project	Type	Announced	Awarded	Spent
			Grant			
VA	EERE	High-Penetration Solar Deployment	Competitive Grant	$3,206,108	$0	$0
VA	EERE	Transportation Electrification	Competitive Grant	$720,000	$0	$0
VA	EERE	Clean Cities AFV Grant Program	Competitive Grant	$8,605,100	$0	$0
VA	SC	Computational Partnerships (SciDAC-e)	Contract	$747,980	$747,980	$0
VA	SC	Advanced technology R&D augmentation	Contract	$1,948,000	$1,948,000	$5,000
VA	SC	Advance funding of 12 GeV CEBAF Upgrade	Contract	$65,000,000	$65,000,000	$2,738,220
VA	SC	Enhanced AIP funding at NP user facilities	Contract	$2,760,000	$2,760,000	$34,859
VA	SC	TJNAF Infrastructure Investments	Contract	$10,000,000	$10,000,000	$302,363
VA	SC	Lattice Quantum ChromoDynamics Computing	Contract	$4,965,000	$4,965,000	$156,682
VA	SC	Nuclear Science Workforce	Contract	$1,834,000	$1,834,000	$6,193
VA	OE	Smart Grid Investment Grant Program (EISA 1306)	Competitive Grant	$20,694,097	$0	$0
VA	OE	State Assistance on Electricity Policies	Formula Grant	$948,022	$948,022	$0
VA	OE	Enhancing State and Local Governments Energy Assurance	Formula Grant	$912,836	$3,212,836	$0
VA	DA	Departmental Administration	Admin	$675,000	$675,000	$156,447
VA Total				**$366,833,480**	**$305,052,395**	**$13,430,316**
VI	EERE	EE Conservation Block Grant Program - Formula	Formula Grant	$9,593,500	$9,593,500	$0
VI		Weatherization Assistance Program	Formula Grant	$1,415,429	$1,415,429	$141,542
VI		State Energy Program	Formula Grant	$20,678,000	$20,678,000	$443,174
VI		EE Appliance Rebate Programs	Formula Grant	$104,052	$10,400	$0
VI Total				**$31,790,981**	**$31,697,329**	**$584,716**
VT	EERE	EE Conservation Block Grant Program - Formula	Formula Grant	$10,323,300	$10,323,300	$50,000
VT		Weatherization Assistance Program	Formula Grant	$16,842,576	$16,842,576	$0
VT		State Energy Program	Formula Grant	$21,999,000	$21,999,000	$5,313
VT		EE Appliance Rebate Programs	Formula Grant	$596,089	$59,600	$0
VT		Wind Energy Technology R&D and Testing	Competitive Grant	$683,388	$0	$0
VT		Battery Manufacturing	Competitive Grant	$9,090,000	$0	$0
VT	OE	Smart Grid Investment Grant Program (EISA 1306)	Competitive Grant	$68,928,650	$0	$0
VT		State Assistance on Electricity Policies	Formula Grant	$765,835	$765,835	$0
VT		Enhancing State and Local Governments Energy Assurance	Formula Grant	$257,003	$257,003	$0
VT Total				**$129,485,841**	**$50,247,314**	**$55,313**
WA	EM	ORP Recovery Act Project	Contract	$325,655,000	$325,655,000	$31,820,788
WA	EM	Hanford River Corridor D&D Recovery Act Project	Contract	$442,265,000	$442,265,000	$38,009,690
WA	EM	Hanford Central Plateau D&D	Contract	$739,369,832	$739,369,832	$98,863,931

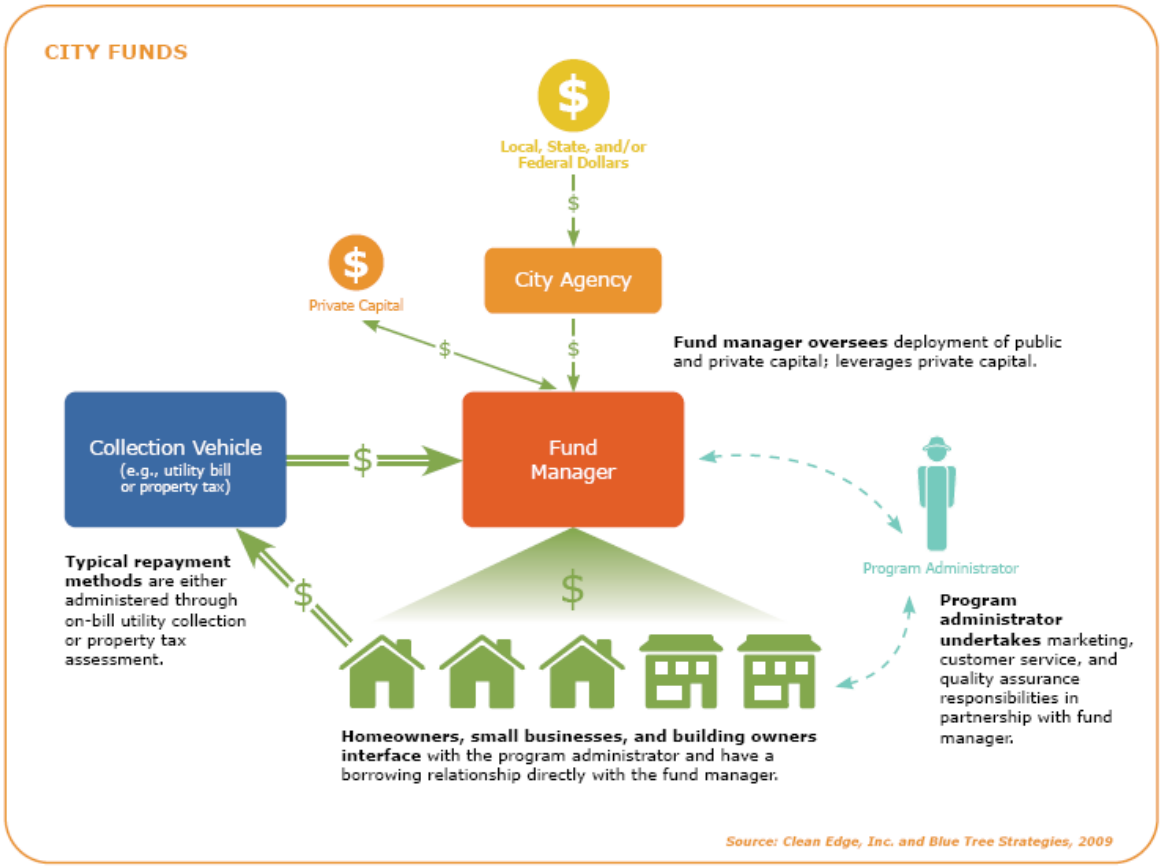
State	Program Office	Project	Type	Announced	Awarded	Spent
		Recovery Act Project				
WA	EM	Hanford Central Plateau Soil and Groundwater Recovery Act Project	Contract	$145,780,000	$145,780,000	$17,162,762
WA	EM	Hanford TRU Waste Recovery Act Project	Contract	$228,520,000	$228,520,000	$33,927,904
WA	EM	Hanford River Corridor Soil and Groundwater Recovery Act Project	Contract	$77,815,000	$77,815,000	$3,917,840
WA	EM	Title X Uranium/Thorium Reimbursement Program	Contract	$667,475	$667,475	$667,475
WA	EM	Program Direction - EM - Defense Environmental Management	Admin	$970,261	$970,261	$0
WA	FE	Industrial Carbon Capture and Storage Applications	Competitive Grant	$21,254,500	$20,000,000	$562,710
WA	FE	Geologic Sequestration Training and Research Grant Program	Competitive Grant	$995,000	$746,250	$0
WA	EERE	Modify Integrated Biorefinery Solicitation Program for Pilot and Demonstration Scale Biorefineries	Competitive Grant	$55,285	$55,285	$34,966
WA	EERE	Fundamental Research in Key Program Areas	Competitive Grant	$3,650,000	$3,650,000	$7,442
WA	EERE	Enhance and Accelerate FEMP Service Functions to the Federal Government	Admin	$2,000,000	$2,000,000	$58,142
WA	EERE	EGS Technology R&D	Competitive Grant	$3,960,000	$696,000	$15,004
WA	EERE	Validation of Innovative Exploration Technologies	Competitive Grant	$10,000,000	$0	$0
WA	EERE	Enabling Fuel Cell Market Transformation	Competitive Grant	$8,458,431	$8,458,431	$2,334,604
WA	EERE	Combined Heat and Power (CHP), District Energy Systems, Waste Heat Recovery Implementation and Deplo	Competitive Grant	$75,000,000	$0	$0
WA	EERE	Industrial Assessment Centers and Plant Best Practices	Competitive Grant	$500,000	$0	$0
WA	EERE	EE Conservation Block Grant Program - Formula	Formula Grant	$58,841,200	$33,868,060	$718,375
WA	EERE	Weatherization Assistance Program	Formula Grant	$59,545,074	$59,545,074	$2,216,191
WA	EERE	State Energy Program	Formula Grant	$60,944,000	$60,944,000	$657,199
WA	EERE	EE Appliance Rebate Programs	Formula Grant	$6,283,775	$628,400	$0
WA	EERE	PV Systems Development	Competitive Grant	$1,634,631	$136,387	$0
WA	EERE	High-Penetration Solar Deployment	Competitive Grant	$1,934,361	$0	$0
WA	EERE	Wind Energy Technology R&D and Testing	Competitive Grant	$399,616	$0	$0
WA	EERE	Clean Cities AFV Grant Program	Competitive Grant	$14,999,927	$0	$0
WA	EERE	Hydroelectric Facility Modernization Program	Competitive Grant	$5,483,133	$0	$0
WA	SC	Energy Frontier Research Centers	Competitive Grant	$1,200,000	$1,200,000	$5,865
WA	SC	Computational Partnerships (SciDAC-e)	Contract	$860,000	$860,000	$13,624
WA	SC	ARM Climate Research Facility Initiative	Contract	$60,000,000	$60,000,000	$6,327,372

State	Program Office	Project	Type	Announced	Awarded	Spent
WA	SC	Integrated Assessment Research	Contract	$4,860,000	$4,860,000	$73,073
WA	SC	Environmental Molecular Sciences Laboratory	Contract	$60,000,000	$57,742,000	$8,090,056
WA	SC	General Plant Project funding across all SC laboratories	Contract	$4,000,000	$4,000,000	$240,125
WA	OE	Smart Grid Investment Grant Program (EISA 1306)	Competitive Grant	$35,825,817	$880,000	$162,796
WA	OE	State Assistance on Electricity Policies	Formula Grant	$916,929	$916,929	$0
WA	OE	Enhancing State and Local Governments Energy Assurance	Formula Grant	$800,910	$800,910	$9,851
WA Total				**$2,465,445,157**	**$2,283,030,294**	**$245,897,785**
WI	EERE	Management and Oversight (EE Program Direction)	Admin	$29,983	$29,983	$0
WI	EERE	Enhance and Accelerate FEMP Service Functions to the Federal Government	Admin	$26,926	$26,926	$0
WI	EERE	Ground Source Heat Pumps	Competitive Grant	$1,479,887	$0	$0
WI	EERE	Combined Heat and Power (CHP), District Energy Systems, Waste Heat Recovery Implementation and Deplo	Competitive Grant	$30,656,168	$0	$0
WI	EERE	Industrial Assessment Centers and Plant Best Practices	Competitive Grant	$350,000	$0	$0
WI	EERE	EE Conservation Block Grant Program - Formula	Formula Grant	$38,540,400	$25,817,100	$0
WI	EERE	Weatherization Assistance Program	Formula Grant	$141,502,133	$141,502,133	$4,162,846
WI	EERE	State Energy Program	Formula Grant	$55,488,000	$55,488,000	$35,015
WI	EERE	EE Appliance Rebate Programs	Formula Grant	$5,399,857	$540,000	$0
WI	EERE	Battery Manufacturing	Competitive Grant	$299,200,000	$299,143,157	$0
WI	EERE	High-Penetration Solar Deployment	Competitive Grant	$5,343,052	$0	$0
WI	EERE	Wind Energy Technology R&D and Testing	Competitive Grant	$422,266	$0	$0
WI	EERE	Clean Cities AFV Grant Program	Competitive Grant	$15,000,000	$0	$0
WI	SC	Advanced Networking Initiative	Contract	$1,125,000	$1,125,000	$0
WI	SC	Computational Partnerships (SciDAC-e)	Contract	$1,651,135	$1,651,135	$0
WI	SC	Bioenergy Research Center Capital Equipment	Contract	$4,099,000	$4,099,000	$0
WI	SC	Plasma Science Centers	Contract	$543,103	$543,103	$0
WI	OE	Smart Grid Investment Grant Program (EISA 1306)	Competitive Grant	$21,525,946	$0	$0
WI	OE	State Assistance on Electricity Policies	Formula Grant	$893,448	$0	$0
WI	OE	Enhancing State and Local Governments Energy Assurance	Formula Grant	$716,382	$716,382	$3,862
WI Total				**$623,992,686**	**$530,681,919**	**$4,201,723**
WV	FE	Industrial Carbon Capture and Storage Applications	Competitive Grant	$647,272	$269,000	$5,173
WV	FE	Program Direction - FE	Admin	$875,000	$875,000	$0
WV	EERE	Modify Integrated Biorefinery	Competitive	$37,928	$37,928	$18,361

State	Program Office	Project	Type	Announced	Awarded	Spent
		Solicitation Program for Pilot and Demonstration Scale Biorefineries	Grant			
WV	EERE	Fundamental Research in Key Program Areas	Competitive Grant	$5,721	$5,721	$0
WV	EERE	Management and Oversight (EE Program Direction)	Admin	$4,890,263	$4,890,263	$740,756
WV	EERE	Lab Call for Facilities and Equipment	Competitive Grant	$13,900,000	$0	$0
WV	EERE	EGS Technology R&D	Competitive Grant	$1,269,595	$0	$0
WV	EERE	Industrial Assessment Centers and Plant Best Practices	Competitive Grant	$636,000	$500,000	$0
WV	EERE	EE Conservation Block Grant Program - Formula	Formula Grant	$14,003,800	$13,583,000	$329,600
WV	EERE	Weatherization Assistance Program	Formula Grant	$37,583,874	$37,583,874	$3,343,402
WV	EERE	State Energy Program	Formula Grant	$32,746,000	$32,746,000	$0
WV	EERE	EE Appliance Rebate Programs	Formula Grant	$1,740,925	$174,100	$0
WV	EERE	Transportation Electrification	Competitive Grant	$6,900,000	$0	$0
WV	OE	State Assistance on Electricity Policies	Formula Grant	$796,248	$796,248	$0
WV	OE	Enhancing State and Local Governments Energy Assurance	Formula Grant	$366,482	$366,482	$0
WV	OE	Program Direction - OE	Admin	$320,000	$320,000	$13,171
WV Total				**$116,719,108**	**$92,147,616**	**$4,450,463**
WY	EM	Title X Uranium/Thorium Reimbursement Program	Contract	$39,460	$39,460	$39,460
WY	FE	Geologic Sequestration Training and Research Grant Program	Competitive Grant	$1,896,000	$0	$0
WY	EERE	EE Conservation Block Grant Program - Formula	Formula Grant	$12,308,800	$10,694,200	$54,000
WY	EERE	Weatherization Assistance Program	Formula Grant	$11,195,471	$11,195,471	$0
WY	EERE	State Energy Program	Formula Grant	$24,941,000	$24,941,000	$0
WY	EERE	EE Appliance Rebate Programs	Formula Grant	$511,078	$51,100	$0
WY	OE	Smart Grid Investment Grant Program (EISA 1306)	Competitive Grant	$7,588,248	$0	$0
WY	OE	State Assistance on Electricity Policies	Formula Grant	$763,577	$763,577	$0
WY	OE	Enhancing State and Local Governments Energy Assurance	Formula Grant	$248,874	$248,874	$0
WY Total				**$59,453,048**	**$47,894,222**	**$54,000**

Appendix G: PACE Model

This model, the financing elements and a comparison of some current programs are illustrated in the following figure and tables:



Source: Ron Pernick and Clint Wilder, Clean Edge Inc.: Five Emerging U.S. Public Finance Models: Powering Clean-Tech Economic Growth and Job Creation, October 2009.
http://www.cleanedge.com/reports/pdf/FiveEmerging_US_PublicFinanceModels_2009.pdf

Financing Program Elements

SOURCES OF CAPITAL	FINANCING MECHANISM	COLLECTION MECHANISM	ENHANCE-MENTS	ELIGIBLE MEASURES	UNDERWRIT-ING CRITERIA	SECURITY INTERESTS
Banks	Personal loan (secured or unsecured)	Amortized payment bill	Reduced interest rates	Energy efficiency	Debt to income ratio	Unsecured
Public benefit charge or added to rate base	Mortgage / home equity (secured to real estate)	Lease payment	Stretched underwriting criteria	Renewables	FICO score	UCC fixture filing
Utility general funds	Line of credit (secured or unsecured)	On utility bill	Guarantees	Other home improvements	Utility bill payment history	Mechanics lien
Federal, state or local govt funds	Lease	On property tax bill	Loan loss or late payment reserves		Tax payment history	Other lien on real estate
Municipal bonds	Retail installment contract	Performance contract bills	Rebates		Other	Lien on other property (car, boat, etc)
Manufacturers	Special tax or assessment levied	Buy kWh or therms	Tax credits			Disconnection for non-payment
Pension funds	Tariffed installation program		Subsidized transaction costs			
Housing or economic dev finance agency	Performance contract		Aggregation			
Qualified energy conservation bonds	Power purchase agreement		Environmental or carbon credits			
Other 3rd party						

Source: How to Guide for PACE Programs, page 12.
http://rael.berkeley.edu/files/berkeleysolar/HowTo.pdf

CASE STUDY COMPARISON CHART

	PROGRAM LAUNCHED	POPULATION DENSITY HOUSING UNITS % RENTAL UNITS	MEDIAN FAMILY INCOME	SOURCE OF CAPITAL	FINANCING MECHANISM	COLLECTION MECHANISM	ELIGIBLE MEASURES	CREDIT REQUIREMENTS	SECURITY	RATE TERM MAX AMT	WHO PROCESSES APPLICATION?	LOCAL GOVT STAFF	RESULTS AS OF AUGUST 2009
BERKELEY, CALIFORNIA	Nov 2008	110,000 pp 9,800 pp/sqmi 46,600 units 54% rental units	$86K	"Micro" bond sold to financial partner	Special tax (Mello-Roos)	Property tax bill	Solar PV (pilot)	Clear title & good property tax payment history	Senior lien on property	7.75% 20 years $37,500	Third party	1.25 FTE	38 projects $28,000 ave/ per $1M committed
PALM DESERT, CALIFORNIA	Oct 2008	51,000 pp 1,600 pp/sqmi 33,500 units 34% rental units	$70K	City's general fund for Phase I, then Redevelopment Agency bonds, now seeking a financing partner for Phase III	Assessment (AB 811)	Property tax bill	Energy efficiency, solar thermal, solar PV	Clear title & good property tax payment history	Senior lien on property	7% up to 20 years No max	City staff	1.5 FTE	206 projects $36,000 ave/ per $7.5M committed
BOULDER COUNTY, COLORADO	April 2009	300,000 pp 400 pp/sqmi 123,000 units 34% rental units	$84K	County issues bonds	Assessment (HB 08-1350)	Property tax bill	Energy efficiency and variety of renewables	Clear title & good property tax payment history	Senior lien on property	Varies (6.68% for 1st round) 15 years $50,000	County staff with third party support	1-2 FTE	393 projects $19,000 ave/ per $7.5M committed
BABYLON, NEW YORK	August 2008	220,000 pp 4,100 pp/sqmi 74,000 units 20% rental units	$84K	Municipal solid waste revolving fund	Assessment (amended solid waste code)	Separate bill, transfers to property tax bill if delinquent	Energy efficiency, solar thermal, solar PV	Clear title & good property tax payment history	Senior lien on property	3% term varies $12,000	City staff	3 FTE	169 projects $7,100 ave/ per $1.2M committed

Source: How to Guide for PACE Programs, page 12.
http://rael.berkeley.edu/files/berkeleysolar/HowTo.pdf

Appendix H: Economic Impact and Success Stories

Different bullets on the impact of green business on jobs etc in California:

- Between 1995 and 2008, green businesses increased 45 percent in number. Employment in these businesses grew 36 percent while total jobs in the state expanded only 13 percent. Even in rural areas with a smaller economic base, green jobs are growing faster than the overall economy. Just between 2007 and 2008, green jobs grew five percent while total jobs dropped one percent.
- In Green Transportation, total employment expanded by 152 percent, but as a percentage of total, employment in alternative fuel businesses increased the most from 40 to 48 percent.
- Employment in Water & Wastewater swelled by 3.5 times in Water Conservation and by 68 percent in Research & Testing.
- Energy Generation has grown with gusto across California in both number of companies and jobs. From 1995 to 2008, employment expanded 61 percent by nearly 10,000 jobs. In some regions, employment more than doubled over this period. Solar makes up the bulk of this segment and also witnessed the strongest growth (63%).

Green Transport

- Since 1995 employment in Green Transportation has increased 152 percent while total state employment rose only 13 percent.
- Green jobs in Transportation are primarily in Motor Vehicles & Equipment and Alternative Fuels. However, employment in Alternative Fuels has grown faster at 201 percent representing 48 percent of all jobs in Transportation. Vehicles & Equipment expanded robustly by 111 percent over the period. Employment in Green Logistics surfaced only in the Bay Area and grew remarkably by 1144 percent since 1995.
- With nearly 43,000 jobs in 2008, Air & Environment is the largest of California's green segments. From 1995 to 2005, the number of Air & Environment jobs remained fairly steady, hovering around 35,000. However, since 2005, the number of green jobs in this segment has increased 24 percent.

- 🕮 Net metering, interconnection standards, renewable portfolio standards, tax incentives, renewable energy access laws, and generation-disclosure laws are the most commonly implemented renewable energy policies within the U.S. states.
- 🕮 Net metering, tax incentives, and renewable portfolio standards were the most commonly added state renewable energy policies during the past year.
- 🕮 As more policies are implemented on various levels, policymakers must pay increasing attention to the interactions between federal and state policies, as well as between policies of different types.
- 🕮 Time-lag analysis also reveals that states that had implemented net-metering legislation in 2005 had significantly more renewable energy generation in 2007 (in terms of total generation, as a percent of total electricity generation, and per capita) than states without the policy.
- 🕮 An analysis is conducted to determine the effectiveness of best practice design elements for three individual policies: RPS, net metering, and interconnection. Some of the features of a well-designed RPS policy are found to significantly contribute to renewable energy development when looked at individually; however, none of them can be combined into a model that adequately predicts any of the renewable energy generation indicators.
- 🕮 There are many contextual factors, other than policy, that affect renewable energy development. These include – but are not limited to – resource and technology availability, the economic context, land-use and public-perception issues, transmission availability, institutional structures, and financing.
- 🕮 Understanding the contextual factors within which policy will be set is essential to defining the most appropriate policy features.
- 🕮 The complex and changing interactions between contextual factors, and between these factors and policy measures, necessitates flexibility and creativity in policy design.
- 🕮 As of May 2009, 29 states and the Ditrict of Columbia have renewable portfolio standards, while five additional states and Guam have renewable portfolio goals. States with this policy are shown in here:

- California is the first state to adopt green building standards. The wind power industry, according to the American Wind Energy Association, currently employs some 50,000 Americans and added 10,000 new jobs in 2007."
- Boston, MA was one of the first U.S. cities to impose LEED green building standards on all new developments over 50,000 square feet, whether public or private.
- Chicago, IL is one of the first cities to offer residential and commercial developers an expedited permitting process (30 days instead of 100) and a free design review (which can run from $5,000 to $50,000) if they build with green standards.
- New York City leads in green building square footage.
- Portland, OR leads in number of green buildings and certified green
- architects and designers per capita. San Francisco, CA adopted the strictest codes so far, requiring green building for any residential construction over 75 feet and any commercial buildings over 5,000 square feet.
- Scottsdale, AZ is the first U.S. city to adopt the Gold Standard for green buildings.
- If ocean energy is properly harnessed, Florida could become a net exporter of energy. Within a decade, ocean energy production could mean an increase of about 35,000 new jobs in Florida, and within 20 to 30 years it could account for about 100,000 new jobs.

Economic Impact: New Jersey

In October 2008, New Jersey's Energy Master Plan (EMP) was created to guide the development of green energy infrastructure in New Jersey. There are also comprehensive statewide and national initiatives to redirect the workforce system in support of this new and emerging industry. The EMP targets a 20 percent decrease in energy consumption by 2020. It also projects the creation of approximately 20,000 jobs during the same period, due in large part to a $33 billion infrastructure investment.[160]

[160] http://www.bdb.org/clientuploads /PDFs/CleanEnergyIncentives.pdf.

Table 102. Employment in New Jersey's Green Industries: Average Annual Employment, 2009

Green Industry		Number Of Firms	Average Annual Employment	Share Of Total Green Employment
Energy Efficiency	Building Installation	8,735	60,857	30.4%
	Residential Construction	7,268	24,905	12.4%
	Commercial And Industrial Construction	1,138	12,712	6.3%
	Building And Equipment Manufacturing	122	3,885	1.9%
	Total, Energy Efficiency	**17,263**	**102,359**	**55.3%**
Renewable Energy	Biofuel Energy	158	7,082	3.5%
	Solar Energy	453	14,247	7.1%
	Wind	439	12,501	6.2%
	Thermal, Hydraulic And Other Renewable Energy	1,127	30,550	15.2%
	Total, Renewable Energy	**2,177**	**64,381**	**32.1%**
Environmental Remediation		**1,250**	**17,428**	**8.7%**
Transportation		**75**	**7,713**	**3.8%**
Total, All Green Industries		**20,764**	**191,888**	**100%**

Source: http://lwd.dol.state.nj.us/labor/lpa/pub/studyseries/njgreen.pdf.

Success story: PA [161]

The Fairless Hills site, once the home of a steel industry complex, is now a renewable energy manufacturing success story. Several companies with close ties to wind, solar or biofuel energy are located on the site. The Commonwealth of Pennsylvania designed an incentive package for each renewable energy manufacturing facility at the KIPC through the Governor's Action Team, a committee of economic development professionals that serves as a single point of contact for businesses considering locating or expanding in Pennsylvania. The team works with domestic and international businesses, site consultants, and investors on projects possessing significant investment and job creation opportunities. The two largest renewable energy tenants on the site are Gamesa Wind US LLC, a wind turbine manufacturer, and AE Polysilicon, a producer of the raw material, polysilicon, used in the manufacturing of photovoltaic solar panels. [162]

The success of FL into Solar

"…On average, on a bright sunny day, the sun shines approximately 1,000 watts of energy per square meter of the planet's surface, if we captured all of this energy into photovoltaic

[161] Ryan Wiser, Mark Bolinger and Troy Gagliano 2002
[161] Ing, E. 2002
161 The AR
R

panels, or large modules of panels, we will have enough solar powered energy to easily run our homes."[163]

Solar Energy: Florida Is Poised to Become a Leader, But It Must Act Soon

Solar power in the Sunshine State has exploded in the past three years, providing millions of dollars in new projects and hundreds of jobs even as most of Florida's economy withered.

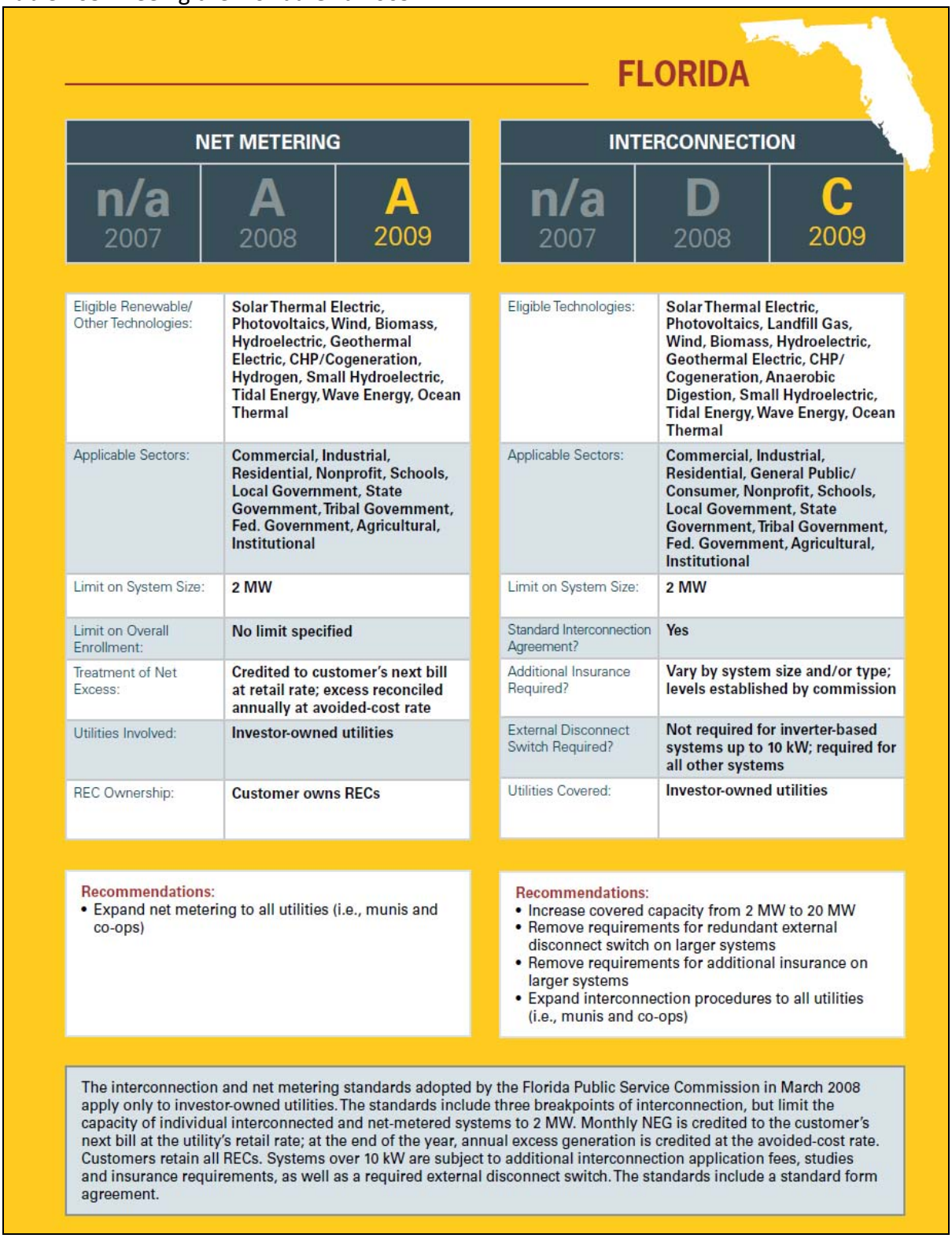
The state's planned investment in solar energy crossed the $1 billion mark last week with the announcement of Florida Power & Light's 75-megawatt Babcock Ranch project, billed as the largest photovoltaic array in the world. FPL has three other large solar plants already under construction. Small solar installations have tripled in less than three years, and Progress Energy customers recently surpassed 1 megawatt of solar installed. Nearly 250 megawatts of solar projects have been announced statewide.[164]

Like the nation as a whole, Florida's appetite for energy appears insatiable. As one of the largest economies in the world, the energy required to fuel the state's economic engine is significant. At the same time, the U.S. solar industry is at an opportune crossroad and Florida is uniquely positioned to take advantage of public and governmental encouragement to reach beyond the historical dependency of the U.S. on fossil fuel. With 100 Megawatts (MW) currently under construction, and 11 MW breaking ground on May 27, 2009, 1 Florida will quickly become the second-largest producer of electricity from the sun in the nation (California is the largest). This is a once-in-a-generation opportunity to attract a new, clean-tech industry to the state, bringing with it new jobs, taxpayer advantages, and critical forward thinking energy policy.[165]

A extends until 2014 tax credits for renewable energy that had previously been scheduled to e
xpire and by providing $6 billion worth of loan guarantees authorized by the Energy Policy Act of 2005 for renewable electricity development. T
hese loan guarantees are expected to stimulate the deployment of convent.

Appendix I: Freeing the Florida Grid 2009

Table 103. Freeing the Florida Grid 2009



Source: James Rose and Shaun Chapman: **Freeing The Grid -** Best and Worst Practices in State Net Metering Policies and Interconnection Procedures, 2009 Edition, November 2009. Available as a free download: www.freeingthegrid.org

Appendix J: Federal Loan Guarantee

The ARRA extends until 2014 tax credits for renewable energy that had previously been scheduled to expire and by providing $6 billion worth of loan guarantees authorized by the Energy Policy Act of 2005 for renewable electricity development. These loan guarantees are expected to stimulate the deployment of conventional renewable and transmission technologies and innovative biofuels technologies. For renewable projects to qualify they must be under construction by September 30, 2011.[166]

Figure 26. Federal Loan Guarantees for Commercial Technology Renewable Energy Generation Projects Under the Financial Institution Partnership Program

Application Deadline
Part I submissions may be filed at any time prior to the filing of a Part II submission and will be reviewed on a continuous basis. Deadlines for each of the ten rounds of review for Part II submissions are listed in the table below. Earlier round Part II submissions will enjoy a first mover's advantage in terms of order of priority of review. ***Please note:*** *Important information regarding registration and other pre-submission requirements are included in the loan guarantee solicitation announcement (the "Solicitation"). Please refer to the Solicitation for details.*

Round	Part II Submission
1	Nov 23, 2009
2	Jan 7, 2010
3	Feb 22, 2010
4	Apr 8, 2010
5	May 24, 2010
6	July 8, 2010
7	Aug 23, 2010
8	Oct 7, 2010
9	Nov 22, 2010
10	Jan 6, 2011

Award Instrument: Loan guarantee agreement
Total Funding Available
$750,000,000 available to pay the credit subsidy costs of loan guarantees which could support as much as $4,000,000,000-$8,000,000,000 in lending to eligible projects
Program Description
This Solicitation under the newly created Financial Institution Partnership Program ("FIPP") invites the submission of applications for loan guarantees under Title XVII of the Energy Policy Act of 2005 ("Energy Policy Act") from the Department of Energy ("DOE") in support of debt financing for renewable energy systems, including incremental hydropower, that generate electricity or thermal energy using commercial technologies and commence construction by September 30, 2011 ("Commercial Technology Renewable

[166] Energy Information Administration, *An Updated Annual Energy Outlook 2009 Reference Case*, April 2009.

Energy Generation Projects").

Eligible Lender-Applicant

The applicant under this Solicitation must be a financial institution, or one of a group of financial institutions chosen to represent them for the purpose of the commercial project ("Lender-Applicant"). The Lender-Applicant must qualify and serve as "Lead Lender" as defined in Attachment J of this Solicitation by demonstrating its experience originating, underwriting, and servicing loans for comparable commercial projects. The Lender-Applicant and other participating financial institutions, as applicable, will be required to share in a significant amount of the risk of the loan on a pari-passu basis with the DOE as guarantor. The Lender-Applicant and other participating financial institutions, as applicable, are expected to evaluate and receive credit approval for the loan in accordance with standard internal credit policies and procedures for comparable senior debt transactions without DOE guarantee.

Project Requirements

Projects supported by funding under this Solicitation must meet the following requirements:

- The project commences construction on or before September 30, 2011;
- Whether structured on a project finance or corporate finance basis, the project has a credit rating from a nationally recognized rating agency of at least a credit rating equivalent of "BB" from Standard & Poor's or Fitch or "Ba2" from Moody's, as evaluated without the benefit of any DOE guarantee or any other credit support which would not be available to the DOE;
- The project utilizes a commercial technology; however, the technology utilized is not required to be an innovative technology, as required in other DOE Loan Guarantee Program solicitations; and
- The project meets all applicable requirements of Title XVII of the Energy Policy Act (including Section 1705 but excluding Section 1703), the Recovery Act, and this Solicitation, including all Attachments.

The following is a non-exclusive list of project types illustrative of Commercial Technology Renewable Energy Generation Projects:

- Wind facility
- Closed-loop biomass facility
- Open-loop biomass facility
- Geothermal facility
- Landfill gas facility
- Trash-to-energy facility
- Hydropower facility, including incremental hydropower
- Solar facility

Application Process

The application process is staged in two consecutive submissions, each organized into six identical sections:

- **Part I:** A Lender-Applicant's Part I submission is expected to provide the DOE with a summary level description of the project, project eligibility, financing strategy, and progression to date in critical path schedules. The DOE's preliminary assessment of the Part I submission will help each Lender-Applicant "self-select" whether to proceed with the cost and effort of completing a full application, including Part II.
- **Part II:** A Lender-Applicant's Part II submission is expected to provide the DOE with due diligence information requirements and include updated and complete project information.

Fees

Applicants may be charged the following non-refundable fees to cover the administrative expenses of the DOE's Section 1705 Loan Guarantee Program:

Fee	Amount

Application Fee	$50,000, payable by the Lender-Applicant	$12,500 (25%) due with Part I
		$37,500 (75%) due with Part II
Facility Fee	0.5% of guaranteed amount, payable by the Lender-Applicant	20% upon signing of Term Sheet
		80% at closing
Maintenance Fee	Anticipated $10,000 to $25,000 each year, payable by the Borrower each year in advance, commencing upon the closing date of the Loan Guarantee Agreement, in the amount specified in the Loan Guarantee Agreement	
Credit Subsidy Cost	DOE anticipates that it will directly pay, subject to the availability of funds, the Credit Subsidy Cost at or before the closing for eligible projects	

Figure 27. Federal Loan Guarantees for Projects that Employ Innovative Energy Efficiency, Renewable Energy, and Advanced Transmission and Distribution Technologies

Application Deadline

Deadlines for each of the seven scheduled rounds of rolling submissions are included below. ***Please note:*** *Important information regarding registration and other pre-submission requirements are included in the loan guarantee solicitation announcement (the "Solicitation"). Please refer to the Solicitation for details.*

Round	Part I Submission	Part II Submission
1	Sept 14, 2009	Nov 13, 2009
2	Oct 22, 2009	Jan 15, 2010
3	Dec 23, 2009	Mar 12, 2010
4	Feb 18, 2010	May 14, 2010
5	Apr 22, 2010	July 19, 2010
6	June 24, 2010	Sept 17, 2010
7	Aug 24, 2010	Dec 31, 2010

Award Instrument: Loan or loan guarantee agreement

Total Funding Available

$8,500,000,000 is made available to guarantee an estimated $30,000,000,000 in loans. Further, $2,500,000,000 is made available to pay for credit subsidy costs of loan guarantees made for Section 1705 Eligible Projects (described below) as authorized by the American Recovery and Reinvestment Act of 2009 ("Recovery Act").

Program Description

The Solicitation invites the submission of applications for loan guarantees under the Energy Policy Act of 2005 ("Energy Policy Act") from the Department of Energy ("DOE") in support of debt financing for projects in the United States ready for commercial deployment that employ energy efficiency, renewable energy, and advanced transmission and distribution technologies.

General Eligibility Requirements

The Solicitation makes $8,500,000,000 available for projects ready for commercial deployment in the proximate future that meet the general eligibility requirements under Section 1703 of the Energy Policy Act. These eligibility requirements call for projects which:

- Avoid, reduce, or sequester air pollutants or anthropogenic emissions of greenhouse gases;
- Employ new or significantly improved technology as compared to commercial technologies in

service in the United States at the time a term sheet is issued by the DOE;

- Employ technology not in general use in the commercial marketplace in the United States at the time a term sheet is issued by the DOE;
- Provide a reasonable prospect of repayment of the principal and interest of the guaranteed portion of the obligation and other project debt, which, when combined with the amounts available to the borrower from other sources, will be sufficient to carry out the project;
- Have available a minimum of six months operating and performance data, including 1,000 to 2,000 hours of operation data, obtained from demonstration project;
- Fit any of nine technology categories, which include categories for (1) alternative fuel vehicles, (2) biomass, (3) efficient electricity transmission, distribution and storage, (4) energy efficient building technologies and applications, (5) geothermal, (6) hydrogen and fuel cell technologies, (7) energy efficiency projects, (8) solar, and (9) wind and hydropower;
- Propose debt guaranteed by DOE of no more than 80% of total project costs and no other proposed federal financing;
- Include a significant equity investment in the project; and
- Otherwise comply with Section 1703 of the Energy Policy Act as implemented by regulations set forth in Part 609 under chapter II of title 10 of the Code of Federal Regulations ("Final Regulations").

Section 1705 Eligible Projects

The Solicitation makes $2,500,000,000 available to cover the credit subsidy costs of projects that meet the following specific eligibility requirements under Section 1705 of the Energy Policy Act as amended by the Recovery Act, in addition to meeting the general eligibility requirements described above:

- Commencement of construction on or before September 30, 2011;
- Creation or retention of jobs in the United States;
- Inclusion in any of three technology categories, which include limited categories for (1) renewable energy systems projects, (2) electric power transmission systems projects, and (3) leading edge biofuels projects; and
- Compliance with Section 1705 of the Energy Policy Act, as amended.

Application Process

The application process is staged in two consecutive submissions, each organized into six identical sections:

- **Part I:** An applicant's Part I submission is expected to provide the DOE with a summary level description of the project, project eligibility, financing strategy, and progression to date in critical path schedules.
- **Part II:** An applicant's Part II submission is expected to provide the DOE with due diligence information requirements and include updated and complete project information.

Fees

Applicants may be charged the following fees to cover the administrative expenses of the DOE's Loan Guarantee Program:

Loan Guarantee Amount	Application Fee		Facility Fee		Maintenance Fee	Credit Subsidy Fee
Less than $150,000,000	$75,000	$18,750 (25%) due with Part I	1% of the guaranteed amount	20% due at term sheet execution	Anticipated $50,000 - $100,000 each year Either payable each year in	TBD and due in full at or before closing May be covered by DOE if 1705
		$56,250 (75%) due with Part II		80% due at closing		
$150,000,000-$500,000,000	$100,000	$25,000 (25%) due with Part I	$375,000 plus 0.75%	20% due at term sheet		

			of the guaranteed amount	execution	advance or payable at closing in lump sum, if specified in loan guarantee agreement	Eligible Project
		$75,000 (75%) due with Part II		80% due at closing		
More than $500,000,000	$125,000	$31,250 (25%) due with Part I	$1,625,000 plus 0.55% of the guaranteed amount	20% due at term sheet execution		
		$93,750 (75%) due with Part II		80% due at closing		

Figure 28. Federal Loan Guarantees for Electric Power Transmission Infrastructure Investment Projects

Application Deadlines

Deadlines are included below. ***Please note****: Important information re registration and other pre-submission requirements are included in the loan guarantee solicitation announcement (the "Solicitation"). Please refer to the Solicitation for details.*

Deadline	Date
Part I Submissions Due	September 14, 2009
First Round Part II Submission Due	October 26, 2009
Second Round Part II Submission Due	December 10, 2009
Third & Final Round Part II Submission Due	January 25, 2010

Award Instrument: Loan or loan guarantee agreement

Total Funding Available: Total amount available not specified; $750,000,000 available for credit subsidy costs (see "Fees" below)

Program Description

This Solicitation invites the submission of applications for loan guarantees under Title XVII of the Energy Policy Act of 2005 ("Energy Policy Act") from the Department of Energy ("DOE") in support of debt financing for large transmission infrastructure projects in the United States that use commercial technologies and begin construction by September 30, 2011. The DOE's Loan Guarantee Program is subject to regulations set forth in Part 609 under chapter II of title 10 of the Code of Federal Regulations (see "Final Regulations"; see also "Proposed Amendments").

Eligibility Requirements

The Solicitation makes $750,000,000 available for credit subsidy costs, provided by the American Recovery and Reinvestment Act of 2009 ("Recovery Act"), of projects that meet the following general eligibility requirements:

- The project commences construction on or before September 30, 2011;
- The project creates or retains jobs in the United States;
- The project utilizes a commercial technology;
- The project cannot be financed from private sources on standard commercial terms;
- The project meets at least one of the following criteria: (1) the project involves new or upgraded lines of at least 100 miles of 500 kilovolts (kV) or higher or 150 miles of 345 kV; (2) the project has at least 30 miles of transmission cable under water; (3) the project has a high voltage direct current (DC) component; (4) the project is a major interregional connector; (5) the project is designated as a National Interest Electric Transmission Corridor by DOE under the Energy Policy Act of 2005, Pub. L. No. 109-58; **(6) the project is associated with offshore generation, such as open ocean wave energy, ocean thermal, or offshore wind;** (7) the project mitigates a substantial reliability risk for a major population center; or (8) the project involves a set of improvements to an integrated system within a state or region that together aggregate new or upgraded lines of at least 100 miles of 500 kilovolts (kV) or higher or 150 miles of 345 kV;
- The project meets all applicable requirements of Title XVII of the Energy Policy Act (including Section 1705) as implemented by the Final Regulations; and
- The project meets all applicable requirements of the Recovery Act.

Application Process

The application process is staged in two consecutive submissions, each organized into six identical sections:

- **Part I**: An applicant's Part I submission is expected to provide the DOE with a summary level description of the project, project eligibility, financing strategy, and progression to date in critical path schedules.
- **Part II**: An applicant's Part II submission is expected to provide the DOE with due diligence information requirements and include updated and complete project information.

Fees

Applicants may be charged the following fees to cover the administrative expenses of the DOE's Loan Guarantee Program:

Fee	Amount	
Application Fee	$800,000	$200,000 (25%) due with Part I
		$600,000 (75%) due with Part II
Facility Fee	0.5% of guaranteed amount	
Maintenance Fee	Anticipated $200,000 to $400,000 each year, payable each year in advance or at closing in lump sum, if specified in loan guarantee agreement	
Credit Subsidy Cost	DOE anticipates that it will directly pay, subject to the availability of funds, the Credit Subsidy	

DOE Loan Guarantee Program Sites

- Loan Guarantee Program Site: http://www.lgprogram.energy.gov/
- Final Rule Establishing the Loan Guarantee Program (10 CFR Part 609)
- Proposed Rule Amending 10 CFR Part 609
- Suggestions for Strong Loan Guarantee Applications

Loan Guarantee Program Awards to date:

- Loan Guarantee Program - Red River Environmental Projects - $245 million
- Loan Guarantee Program - Nordic Wind Power - $16 million
- Loan Guarantee Program - Beacon Power - $43 million
- Loan Guarantee Program - Solyndra - $535 million

Appendix K: Economic Development Study Scoping Document

The FECC envisions contracting with the Florida Energy Systems Consortium (FESC) to conduct a comprehensive review of all existing statutory incentives supporting the deployment of energy efficiency and renewable energy, as well as, analysis of renewable portfolio standard and mechanisms to attract venture capitalists.

I. Current Incentive Mix
   a. ISSUE #1 – ***Consult with*** the Office of Tourism Trade and Economic Development (OTTED), Enterprise Florida (EFI), and the Florida Energy and Climate Commission (FECC) to develop an overview of Florida's current clean energy incentives (week 1)
      i. ***Task*** - Inventory all economic incentives that impact the clean energy sector in Florida
         1. ***Must Consider*** - Total amount of State funds allocated to each incentive and the incentive's annual use
         2. ***Must Consider*** – Describe each incentive's interaction with similar Federal incentives (i.e. – State offers a solar rebate, Federal government offers income tax credit)
   b. ISSUE #2 – ***Evaluate*** the success of State's investment into clean technology sector [SB 888/HB7135]
      i. ***Task*** - Analyze the intended economic impact of each incentive program and then measure the actual impact, as well as, recent legislation that enables cost recovery mechanisms such as the 110MWs in HB 7135
         1. ***Must consider*** - How many projects are underway, where are they in their deployment, how many jobs, impact to state GDP, private capital leveraged
      ii. ***Task*** – Develop standard measurement criteria and compare among programs
         1. ***Must Consider*** – Benchmarking performance/impact against similar types of programs or programs with similar objectives in other jurisdictions or analogous industries/sectors
      iii. ***Task*** – EFI and OTTED administer broad based economic development programs that prequalify the clean energy sector. Analyze the programs and see how well they cater to clean sector companies. For example, many EFI incentives are contingent on the amount of jobs created and capital invested. EFI staff has noted that clean technology companies often meet the capital investment prong but not the jobs created prong.
   c. ISSUE #3 – ***Task*** - Inventory Florida's incentives that target energy efficiency and demand side management. Identify federal, state and local incentives targeting the deployment of energy efficiency and renewable energy products (EE/RE).
      i. ***Must Consider*** – Florida Energy Efficiency and Conservation Act (FEECA)
      ii. ***Must Consider*** – Programs offered by local utilities, cities, and counties
      iii. ***Must Consider*** – Federal incentives for the deployment of EE/RE products

II. Barriers to Commercialization and Project Finance
   d. ISSUE #4 – Identify Florida's university, business and financial resources to determine barriers to commercializing intellectual property and deploying clean technology businesses
      i. ***Task*** - Present analysis of stages of resources and capital necessary to progress business from inception to full scale deployment. Identify each stage, comment on the availability of each stage in Florida, outline what resources are available,

and recommend how the state can create programs to bolster each stage. Strong emphasis should be places on the business and financial resources available or needed in the State.

1. ***Must Consider*** – Period 1: Research and Development Transition – what resources are available to transition clean technology intellectual property (IP) into the market
    a. ***Identify and consult*** with FESC to determine what clean technology areas the university system is focusing its research and development efforts on within the clean technology sector and identify core strengths and weaknesses
    b. ***Identify and consult*** with state incubation network (Public & Private), technology transfer offices, early stage industry partnership programs
    c. ***Identify and consult*** with Federal sources to determine what loans/grants/programs are available – Small Business Administration, OTTED
2. ***Must Consider*** – Period 2: Early Capital
    a. ***Identify and consult*** with Federal and local funding sources and determine what loans/grants/programs are available
    b. ***Identify and consult*** with Florida's angel investor community (private donors) and venture capital community
3. ***Must Consider*** – Period 3: Mid/Late Capital
    a. ***Identify and consult*** with Federal and local funding sources and determine what loans/grants/programs are available
    b. ***Identify and consult*** with Florida's venture capital community, industry, State Board of Administration, private equity groups
4. ***Must Consider*** – Period 4: Project Finance for clean technology projects
    a. ***Identify and consult*** with EFI, OTTED, industry representatives
    b. ***Identify and Consult*** with public and private (in and out of state) venture capital and private equity groups focused on clean technology, investment banks, and strategic leaders

ii. ***Task*** - The FECC wants to know who is involved at each stage, issues/challenges in each stage unique to Florida as compared to other states, models from other states or Florida that the state should consider.

iii. ***Task –*** Identify the businesses operating in the clean technology sector and the impact that they have had in the sector

1. ***Identify and consult*** with existing businesses in the State that operate within the clean technology sector
2. ***Identify and consult*** with businesses that have been attracted to other states that operate within the clean technology sector. Determine why the company chose against Florida or why the company didn't consider Florida for investment.

III. Regulatory Changes

e. ISSUE #5 – Analyze the potential economic impact of a Renewable Portfolio Standard (RPS)

i. ***Task*** – Analyze the potential economic impact that a RPS would bring to Florida.

1. ***Must Consider*** – Job creation, growth in state GDP, local tax base growth versus the cost to ratepayers.

a. ***Identify and consult*** with clean technology project contractors in Florida and other jurisdictions to assess benefits resulting from the actual implementation of clean technology projects

2. ***Must Consider*** – differences between various state programs, including breakdown of RPS among different renewable energy industries/sectors
3. ***Must Consider*** – The economic disadvantages of not having a state RPS if a federal standard is adopted
4. ***Must Consider*** – Performance of renewable mandate programs in other states or foreign jurisdictions.

IV. Recommendations

f. Specific Recommendations

i. ***Task*** – Recommend to the Florida Legislature whether the state should (1) renew the current incentives "as-is" (2) renew the current incentives with technical changes and review of funding levels, or (3) allow the current incentives to sunset

ii. ***Task*** - Recommend to the Florida Legislature how to cater non-sunseting existing incentives to the clean technology sector

iii. ***Task*** - Recommend to the Florida Legislature a portfolio of programs to decrease financial barriers to clean sector technology commercialization

1. ***Must Consider*** - Programs in states with success commercializing clean technology, including but not limited to, Iowa, Michigan, California, and Massachusetts

iv. ***Task*** – Recommend to the Florida Legislature whether to pursue a RPS

1. ***Must Consider*** - Programs in states where a RPS lead to net economic growth in the state's clean technology economic sector

v. ***Task*** – Recommend to the Florida Legislature effective demand side incentives

1. ***Must Consider*** - Programs in states with success deploying demand side incentives (e.g., PACE model)

General

- The FECC would like an analysis of issues 1-5 and specific recommendations as outlined above
- The FECC envisions that this study's recommendations will be considered for a future regular session of the Florida Legislature. In addition to providing a report, the FECC expects FESC to testify to the legislature concerning the study's findings and explain the rational behind the recommendations.
- Please make recommendations based on roughly the current annual budget allocated to the clean energy sector. In addition, make recommendations if funding was moderately and then significantly increased.

Proposed PI/CO-PI's at FESC:

📖 University of Florida; Florida Energy Systems Consortium (UF FESC) Industry Programs Director

📖 Florida State University; Center for Economic Forecasting and Analysis (FSU CEFA)

University of Florida; Public Utility Research Center (UF PURC).