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Recent State Actions Promoting Alternative Energy

Executive Summary

In the last several years energy prices have been subject to considerable volatility. While prices declined following a late summer peak, prices of petroleum, natural gas and heating oil increased in 2006, according to the U.S. Energy Information Administration (EIA).¹ Further, EIA forecasts energy demand will grow at an average rate of 1.1 percent per year through 2030.

Given recent energy price unpredictability and anticipated longer-term growth in energy demand, governors are leading efforts to conserve energy resources while actively seeking to diversify supplies by expanding renewable resources, including energy generated from solar, wind, hydropower, geothermal and biomass. In addition to providing protection against price volatility, these efforts can also reduce greenhouse gas emissions.

Today, most governor-initiated energy programs involve State Energy Offices (SEOs). These cabinet- or agency-level entities, supported by U.S. Department of Energy's Office of Energy Efficiency and Renewable Energy, play an important role designing and implementing governors' policies on efficiency and renewable energy.

The National Governors Association *Center for Best Practices* reviewed state energy programs to identify how states promote, administer, finance and implement state energy efficiency and renewable energy policies. This *Issue Brief* describes a number of state energy programs, and includes case studies of six states - Minnesota, Nevada, New Mexico, New York, Pennsylvania and Washington state.² Despite diverse climates, geography, and energy resources, governors of these and other states use a number of common tools and approaches when implementing energy policy, including:

- setting renewable portfolio standards;
- establishing renewable fuels standards for transportation and heating fuels;
- setting standards for energy use by government (e.g., buildings and fleets);
- establishing financing mechanisms for advanced energy programs;
- measuring and monitoring energy savings and environmental benefits; and
- implementing comprehensive state energy plans that combine many of the above elements.

Background

Energy use in the United States is expected to reach a record high of more than 102 quadrillion British Thermal Units (Btu) for all of 2007. The U.S. Energy Administration (EIA) forecasts energy demand will increase at an average rate of 1.1 percent per year through 2030, reaching 131.2 quadrillion Btu (see box to the right). The vast majority, more than 85 percent, of current and future energy use is projected to come from traditional fossil fuel resources, primarily petroleum, natural gas and coal, with nuclear and renewable energy comprising smaller shares of U.S. energy generation.³

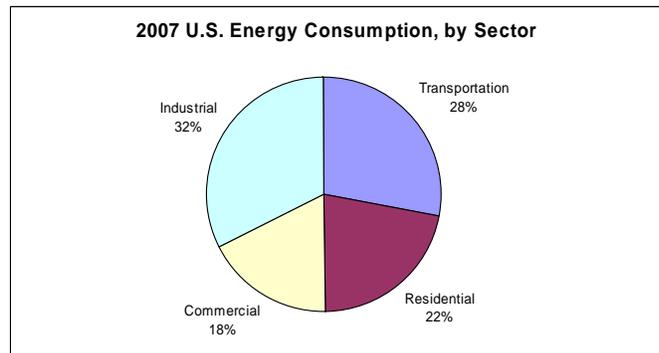
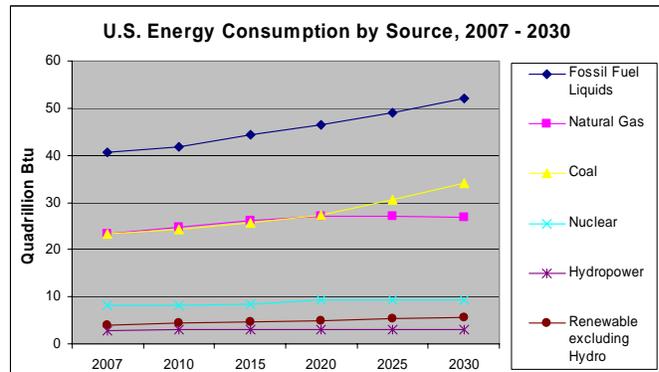
A useful lens through which to view energy consumption is a breakdown of economic sector use. While the transportation sector (automobiles, trucks, buses, motorcycles, trains, subways and other rail vehicles, aircraft, and ships, barges, and other waterborne vehicles) currently is the second largest sector by energy consumption (industry is the largest, see box to the right) it is projected to lead future growth in energy demand. Currently the transportation sector accounts for two-thirds of U.S. oil consumption and 27 percent of total U.S. energy demand. By 2030, transportation's share of energy use will increase to more than 35 percent of U.S. energy demand, according to the EIA. Since the transportation sector currently depends on petroleum for more than 95 percent of fuels, growth in sector demand is likely to mean continued U.S. dependence on oil and oil imports.

In light of the growing demand for oil and energy, states are taking a number of steps to conserve energy and develop energy (and oil) alternatives. Viewed broadly across the states, these programs tend to share the following characteristics:

- They emphasize using less energy, through sector-based efficiency measures;
- They encourage the use of petroleum alternatives, such as ethanol and biofuels; and
- They attempt to achieve reductions in greenhouse gas emissions, chiefly carbon dioxide (CO₂), as a co-benefit.

The Potential for Alternative Energy

One way states can address energy price and market variances while reducing greenhouse gas (GHG) emissions is through energy efficiency and conservation. A synthesis of 11 national studies, including five conducted by U.S. Department of Energy (DOE) national laboratories, demonstrates significant potential for offsetting projected growth in U.S. energy consumption through expanded energy efficiency and conservation. The estimated economic potential energy savings for electricity represent a potential reduction of 1.2 percent per year, which, if achieved, would offset much of projected growth in U.S. electricity demand during the next two decades, eliminating the annual need for over 100 million barrels of oil per year and reduce nearly 30 million metric tons of GHG emissions.⁴ In **Texas**, for example, a March 2007 analysis found that expanded energy efficiency policies could mitigate 17.5 percent of forecasted electricity consumption by 2023 and offset nearly one-third of *peak* summer electricity demand.



Renewable energy, in the form of electricity and fuels, can also play an important role in meeting U.S. energy demand. According to the EIA, total generated energy from renewable energy sources will increase from 6.5 quadrillion Btu in 2005 to 10.2 quadrillion Btu in 2030, because of improved technology, higher fossil fuel prices, and extended tax credits.^{5,6} Of this, 1.2 quadrillion Btu will be renewable fuels, primarily ethanol for gasoline blending.

There may be greater potential for renewable energy to offset conventional energy resources. A recent study concluded that the U.S. can meet 20 percent of its electricity needs in 2020 from wind, biomass, geothermal and solar.⁷ If achieved, this would represent a 5 percent reduction in oil consumption, saving the equivalent of 400 million barrels of oil per year. For example, a new report concluded that **Florida's** indigenous renewable energy sources could reduce the state's projected electricity demand by almost 35 percent over a 15-year period.⁸ Florida Governor Charlie Crist, in fact, proposed \$68.25 million in his 2008 budget to support the use of renewable energy and fuels, including transportation biofuels and residential solar power.

By diversifying energy resources, states hope to reduce long-term demand for oil while supporting environmentally sustainable economic growth. For example, fostering research on photovoltaic energy systems or the manufacture of advanced wind turbines as well as the use of new energy-efficient building materials, biomass and advanced coal, can create new jobs, revitalize markets, and lead to quantifiable reductions in GHG emissions.

Tools to Promote Efficiency and Renewable Energy

Governors and their state energy officials increasingly are developing tools and programs to implement energy efficiency and expand renewable energy. The main approaches used by states are:

- setting renewable portfolio standards;
- establishing renewable fuels standards for transportation and heating fuels;
- setting standards for energy use by government (e.g., buildings and fleets);
- establishing financing mechanisms to support advanced energy programs;
- measuring and monitoring energy savings and environmental benefits; and
- implementing comprehensive state energy plans that combine many of the above elements.

Many of these state tools and programs advance energy efficiency and renewable energy implemented by State Energy Offices (SEOs), which manage or otherwise support comprehensive gubernatorial energy programs (see box below). A number of states and their SEOs also are establishing broader energy efficiency programs to reduce consumption in the industrial, commercial, and residential sectors.¹ Appendix A describes in detail the structure of six SEOs, defining the role in energy policy formulation for each.

¹ While a full review of these broad and complex energy efficiency programs, markets and technologies is beyond the scope of this paper, it is clear that cost-effective opportunities exist for states to advance energy efficiency and conservation.

Understanding U.S. Oil Consumption

Currently the U.S. uses over 7.6 billion barrels* of petroleum a year (bbl/yr) and imports over 60 percent of this (4.5 bbl/yr). Most oil imports are consumed by the transportation sector with stationary sectors – residential, commercial, industry – using less than 2.5 bbl/yr.

The U.S. Energy Information Administration expects the use of alternative transportation fuels, such as ethanol and biodiesel, to grow from 4 billion gallons in 2005 to 14.6 billion gallons in 2030. If achieved, this would offset only 8 percent of U.S. gasoline consumption.

A barrel of oil is equal to 42 gallons and contains the energy equivalent of 5,800,000 British Thermal Units (Btu). A Btu of energy is the equivalent of 1 match.

Source: U.S. Energy Information Administration, 2007.

Setting Renewable Portfolio Standards

By 2030, total U.S. electricity use is projected to increase from 3.8 million MW in 2005 to 5.5 million MW in 2030, an average annual rate of 1.5 percent. Partially in response to this growing demand, states are often seeking new sources of generated electricity. Perhaps the most widely utilized state mechanism to advance the generation and use of renewable electricity is a renewable portfolio standard (RPS). State RPSs require that a share of state-financed power comes from renewable resources including biofuels, wind, solar, or geothermal.⁹ Currently there are 22 states plus the **District of Columbia** with RPS policies in place, and **Illinois** and **Vermont** have set voluntary targets for the use of renewable electricity. Collectively these states account for over 42 percent of U.S. electricity sales.

State RPSs typically are created by an executive order or regulation and typically tout environmental benefits from greater use of ‘green’ (low emission, clean and renewable) energy resources.¹⁰ However, states list a variety of energy resources – including clean coal or efficiency – under their RPS targets (in those cases it is often called an *alternative* portfolio standard).

Currently, 11 percent of the electricity used in **Minnesota** is derived from renewable energy resources.¹¹ This includes nearly 900 megawatt-hours (MW) of installed wind capacity, making Minnesota is a national leader in both renewable energy production and use. In his 2006 state-of-the-state address, Minnesota Governor Tim Pawlenty announced his “25 by 25” energy program, which set a goal that 25 percent of state energy produced and used in Minnesota be derived from renewable sources by 2025. The governor further supported this program by signing legislation in early 2007 requiring that state utilities produce 25 percent of their power from renewable energy. If this target is met, Minnesotans ultimately will use 5,000 MW electricity from renewable energy produced from wind turbines, biomass, hydrogen and solar power, more than eight times current use. Xcel Energy, which supplies half of the electricity used in Minnesota, must provide 30 percent of its electricity from renewable sources by 2020.

For much of the past 20 years, **Nevada** has been the nation’s fastest growing state and has seen energy use rise accordingly with a new demand projected to be close to 2,000 MW over the coming decade. The state has begun tapping its rich renewable energy resources to meet these current and anticipated future energy needs.¹² The state has the third-highest solar energy potential in the United States and the potential for 50,589,000 MW of wind-generated electricity (ranking third in the Western U.S.).¹³

Given these energy resources, Nevada’s RPS emphasizes solar energy resources.¹⁴ In four of the last five legislative sessions, the Nevada state legislature passed bills adopting and aggressively expanding the RPS, going from small targets, (e.g., 2 percent) to the current requirement that 15 percent of retail electricity sales in 2015 be derived from renewable sources. Besides solar, qualifying energy sources include, biomass, geothermal, and waterpower (but also allows for credit from energy efficiency and alternative energy sources). Notably, the Nevada RPS includes a 5 percent

The Role of State Energy Offices

SEOs were first established by the U.S. Congress in response to the nation’s energy crisis, brought on by the oil embargo of the early 1970s. SEOs work hand-in-hand with governors, state agencies and private entities to design and implement comprehensive state energy initiatives. While staff size and activities vary, SEOs are responsible for:

- Advising governors on energy issues;
- Demonstrating new energy initiatives;
- Deploying cost-effective technologies;
- Providing financial support; and
- Communicating the value of efficiency and renewable energy to the public

State Energy Offices (SEOs) are supported by the U.S. Department of Energy’s (U.S. DOE) State Energy Program (SEP), which is housed under the Office of Energy Efficiency and Renewable Energy (EERE)’s. The US DOE’s SEP program is funded by an annual appropriation from Congress.

Source: US Department of Energy, Office of Energy Efficiency and Renewable Energy.

solar set-aside requirement (see box to the right). An amendment also was added allowing RPS energy credits for the reverse polymerization of waste tires, a process that converts used tires into light crude oil.¹⁵ Additionally, the RPS allows for 25 percent of the target to be met using certain energy efficiency programs, at least half of which must be residential energy-saving measures.

Utilities also play an important role in designing and managing state RPSs. In 2006 the state's two utilities, the Nevada Power Company and Sierra Pacific Power Company, submitted their first RPS compliance plans to the PUC, which tracks progress towards renewable energy production targets (as required under the RPS). The most recent annual compliance appraisal showed almost 1,800 MW of new renewable energy capacity projections – primarily solar energy – and projected an increase in the utilities' renewable energy budgets to \$7 million annually, an increase of nearly 200 percent.

In February 2007, Nevada Governor Jim Gibbons issued an executive order bolstering the state's RPS. The order streamlined the permitting process for developing renewable energy projects in Nevada in part by establishing the SEO as the central contact point and offering resources for renewable energy related permitting issues in the state.¹⁶

In **New Mexico**, the creation a state RPS in 2002 was paired with the creation of a Clean Energy Council. Since its creation, Governor Bill Richardson, the Council and the legislature have worked together to continually strengthen the renewable energy target. The RPS lists renewable energy resources as those generated by solar, wind, hydropower, geothermal, fuel cell and biomass. At its inception, the RPS was slated to increase by 1 percent annually until it reached 10 percent. Under the law, public electric and gas utilities also must produce 20 percent of their power from renewable resources by 2025. In March 2007, Governor Richardson signed Senate Bill 418, which grew the state's RPS by requiring investor-owned utilities to generate 15 percent renewable energy by 2015 and 20 percent by 2020.¹⁷ The law also requires rural electric cooperatives to generate 10 percent renewable energy by 2020. Governor Richardson also signed House Bill 188, which created a state Renewable Energy Transmission Authority that will help New Mexico export solar, wind and other renewable energy to other states and outside markets.

New York also launched a process to enact a statewide RPS in 2002 that was designed by the Public Service Commission (PSC).¹⁸ The RPS went into effect on January 1, 2006, requiring 25 percent of electricity sold in New York by 2013 to be renewable, with two tiers of eligible resources.

The main tier includes:

- wind;
- hydroelectric;
- biomass (wood or herbaceous farm residue or harvested wood);
- biogas, (methane, manure digestion);
- liquid biofuel; and
- ocean or tidal power facilities.

A second tier of energy sources emphasizes smaller, on-site technologies such as:

What is a Solar-Set Aside?

A solar set-aside is a requirement that a specific percentage of a state's renewable energy generation must come from photovoltaic (solar cells) resources. Often a solar set-aside in a state renewable portfolio standard is coupled with an annual target and includes incentives or rebates for utilities and consumers installing solar equipment or adopting solar cell technologies. To meet solar set-asides, some states allow their public utility commissions to purchase renewable energy credits in lieu of actual solar-powered electricity generation.

Source: Renewable Energy Policy Project, 2006.

- fuel cells;
- solar photovoltaic; and
- wind.

Analysis by the New York State Energy Research and Development Authority (NYSERDA) predicted that by 2013 New York's RPS program would offset wholesale energy costs in New York by \$362 million because of reduced dependence on fossil fuels. NYSEDA estimates also show that full implementation of the RPS will reduce nitrogen oxide (NOx) by 6.8 percent, sulfur dioxide (SO₂) by 5.9 percent, and carbon dioxide (CO₂) emissions by 7.7 percent. Further, a 2003 study funded by NYSEDA concluded efficiency and renewable energy could be expected to reduce New York's annual electricity generation requirements by 19,939 gigawatt-hours (GW) by 2012 and by more than 27,244 GW by 2022, which represents 12.7 percent and 16.1 percent, respectively, of expected state requirements over that timeframe. The study also reported that by 2022 up to 45 percent of renewable energy in the RPS would be considered competitive with conventional electric generation.¹⁹

The hallmark of **Pennsylvania's** renewable energy programs is the Commonwealth's Alternative Energy Portfolio Standard (AEPS). In 2004, Governor Edward Rendell signed legislation establishing a statewide AEPS requiring 18 percent of the electricity sold in Pennsylvania be from renewable and indigenous resources. By separating eligible energy sources into renewable as well as native commonwealth energy resources, Pennsylvania's AEPS stand outs among the nation's "renewable" portfolios standards.

Under the AEPS, companies in Pennsylvania must obtain 8 percent of the power they sell at retail from Tier I energy resources and 10 percent from Tier II energy resources.

- Under Tier 1, traditional renewable sources are required to reach 8 percent by 2020. Qualifying resources include: wind power, photovoltaic energy, low-impact hydropower, geothermal, biologically-derived methane gas, fuel cells, biomass energy, and coal-mine methane (methane found in coal seams).
- The AEPS standard for Tier II is slightly more aggressive, requiring 10 percent of statewide energy production by 2020 to be from state-specific energy resources not conventionally considered renewable.²⁰ These energy resources are: distributed generation systems, municipal solid waste, pulping wood manufacturing products, combined coal-gasification technology, poultry farm waste and waste coal. Also, while not traditionally considered renewable, state research indicates that there are 10,000 megawatt-hours of power from indigenous waste coal – a mixture of leftover coal particles, ash and other silt. Tier II also allows credit for generation from hydropower and energy efficiency.

Governor Rendell bolstered the AEPS by promoting indigenous renewable energy production through Executive Order 2005-08²¹, which launched the Governor's Renewable Agricultural Energy Council (AEC) and added a Governor's liaison to the agricultural community. Co-chaired by the Secretaries of Agriculture and DEP, this new entity has supported public-private partnerships that expand Pennsylvania's renewable energy infrastructure.

Establishing Renewable Fuels Standards

States are further diversifying domestic energy sources in the transportation sector by adopting a renewable fuels standard (RFS). An RFS establishes a minimum percentage content of renewable fuel that refiners must introduce into a state's gasoline and diesel supplies by a certain date, which includes a phase-in period. As part of a RFS, states often look to foster economic growth by expanding biofuels markets. On July 5, 2006, **Missouri** Governor Matt Blunt signed legislation requiring gasoline sold in Missouri to contain 10 percent ethanol (known as E-10) by 2008. An

economic analysis by the University of Missouri estimated that the RFS will encourage 350 million gallons of in-state ethanol production creating a \$348 million boost to Missouri's economy. Along with Missouri, **California, Hawaii, Iowa, Minnesota, and Washington state** have adopted an RFS.

To reduce greenhouse gas emissions and reduce reliance on foreign oil, **California** Governor Arnold Schwarzenegger issued an executive order establishing a Low Carbon Fuel Standard for transportation fuels sold in California. By 2020, the standard will reduce the carbon intensity of California's passenger vehicle fuels by at least 10 percent by 2020. This is expected to replace 20 percent of the state's on-road gasoline consumption with lower-carbon fuels, more than triple the size of the renewable fuels market and place more than 7 million alternative fuel or hybrid vehicles on California's roads. The order directs the Secretary for Environmental Protection to coordinate the actions of the California Energy Commission, the University of California and other state agencies to develop a draft compliance schedule aimed at meeting the carbon fuel target.²²

Minnesota has demonstrated a commitment to enhancing its use of renewable fuels, and in 2005 Governor Tim Pawlenty called for state gasoline to contain 20 percent ethanol and 5 percent of diesel fuel to be replaced with biodiesel starting in 2013.²³ The Governor also proposed and signed legislation establishing the nation's most aggressive Renewable Fuels Standard (RFS).²⁴ As the chair of the Governors' Ethanol Coalition (GEC)²⁵, a bipartisan group of 31 governors devoted to the advancement of ethanol use by states, Governor Pawlenty has worked to advance the idea of an RFS throughout the Midwestern U.S. In 2005, when he served as chair of GEC, the Governor called on GEC member states to replace 10 percent of their gasoline use with ethanol by 2010. As chairman of the Midwestern Governors Association, Governor Pawlenty asked fellow Midwestern governors to promote the increased production and consumption of renewable fuels by appointing their top energy policy experts to a multi-state working group focused on realizing the opportunity of biofuels to increase energy independence, stimulate economic development and reduce air pollution.

Washington Governor Chris Gregoire signed legislation in April 2006 establishing a statewide Renewable Fuel Standard (RFS).²⁶ The RFS requires that by 2008 at least 2 percent of all gasoline sold in Washington be ethanol and that at least 2 percent of all diesel fuel sold in the state be biodiesel. These requirements increase to 10 percent for ethanol and 5 percent for biodiesel after officials from the Department of Agriculture and Ecology determine if there is enough in-state indigenous feedstock and processing capacity to meet such a requirement.²⁷ Further, the RFS directs all state agencies to use a 20 percent biodiesel blend in state-operated vehicles and public ferries beginning June 1, 2009. To help the Department of Agriculture and SEO develop implementation rules, Governor Gregoire also created a Biofuel Advisory Committee. According to the National Biodiesel Board, the new law should create demand for 20 million gallons/year of biodiesel in the state of Washington.²⁸

Setting Standards on Government Energy Use

In their 2007 state-of-state addresses, 47 governors highlighted the environment, energy and natural resources, 45 discussed their efforts to develop energy resources, and 39 mentioned new proposals to pursue alternative sources of energy, including wind, solar, hydro, and bio-fuels. Such initiatives provide the opportunity for government energy and environmental leadership-by-example and often demonstrate the fiscal benefits of energy efficiency, resource conservation, and the development of advanced and clean energy technologies.

In **Colorado**, the state's greening government initiative has led to the installation of energy efficient lighting by the Colorado Department of Public Health and Environment, saving \$100,000 annually and reducing energy usage by 1.3 million kilowatt-hours.²⁹ In his 2007 state-of-state address, Governor Bill Ritter announced measures likely to further

reduce government energy use. In April 2007, Governor Ritter issued an executive order setting standards to establish state government as a model for energy management. The order set goals of 20 percent reduction in energy use in state buildings and a 25 percent reduction in petroleum use by the state fleet. The order also requires continual reassessments of these goals through performance contracting.

Minnesota Governor Tim Pawlenty has issued two executive orders aimed at increasing the energy efficiency of government facilities. Executive Order 04-08³⁰ requires all state agencies to reduce air pollution by purchasing energy-efficient office equipment and appliances and by conserving energy in state buildings. Executive Order 05-16³¹ requires state agencies to reduce energy usage in state owned buildings by 10 percent and to implement specific operational changes including energy efficient procurement strategies. Executive Order 05-16 also calls on state agencies to reduce gasoline use by 50 percent and diesel use by 25 percent by 2015. For both executive orders the SEO is the primary implementing authority.

The Governor also issued Executive Order 06-03³² directing Minnesota departments and employees to increase the use of E-85 fuel (85 percent ethanol blended with 15 percent gasoline) and biodiesel in all state-owned flexible-fuel vehicles. Along with the executive order, the Governor established a Smart Fleet Committee to pursue new public E-85 refueling facilities and to support biodiesel use at public retail outlets throughout the state.

The **Nevada** State Energy Office (NSOE) manages key energy efficiency provisions in the former governor's published plan "Nevada Energy Conservation Plan for State Government."³³ This State Government Plan, which remains in place, addresses both total energy usage and peak energy demand (when energy usage levels are highest) in state government buildings and other facilities and includes 10-year property tax abatement of up to 50 percent for energy efficient building upgrades. NSOE is charged with implementing the new state building standards.³⁴

In 2006, Governor Bill Richardson issued Executive Order 2006-001,³⁵ requiring energy efficient practices for all public buildings in **New Mexico**. Specifically, all state agencies and colleges are required to adopt the U.S. Green Building Council's Leadership in Energy and Environmental Design (LEED) Green Building Rating System with any new building or renovation over 15,000 square feet required to meet the LEED Silver Certification.³⁶ The New Mexico SEO is responsible for drafting energy efficiency measures for all state school buildings.³⁷ New Mexico also has pledged to reduce its greenhouse gases (GHG) by 4 percent annually and in support of this effort became, in late 2006, the first state to join the Chicago Climate Exchange, which monitors and tracks progress over time for entities reducing GHG.

To bolster the state's RPS, New Mexico Governor Richardson signed Executive Order 2005-049³⁸ calling on all cabinet-level state agencies, public schools and institutions of higher learning to obtain 15 percent of their total transportation fuel requirements from renewable fuels, such as ethanol and biodiesel. The executive order requires that by 2010, 75 percent of state vehicles acquired annually be capable of operating on alternative fuels including those derived from renewable resources.

On June 10, 2001, **New York's** Executive Order 111 was issued³⁹ directing state agencies to be more energy efficient and environmentally aware; it required state agencies to reduce energy consumption by 35 percent by 2010 (relative to 1990) in any buildings they own, lease or operate. The executive order applied to all public entities the New York governor has authority over, including state agencies and departments. NYSERDA also was directed to issue a set of implementation guidelines within six months and created an Advisory Council on State Energy Efficiency with the president of NYSERDA serving as the Council's Chair. This program is one of the nation's most stringent energy conservation targets among state governments.

In addition to its long-standing public sector energy conservation targets, New York was the first state to offer a Green Building Tax Credit designed to promote more energy-efficient building design. Here, NYSERDA is responsible for assisting the Department of Environmental Conservation (DEC) with technical aspects of the program and provides financial assistance to New York builders and developers who want to “go green.”⁴⁰ In 2005, NYSERDA received \$25 million for this program, doubling its original budget allocation. Also in 2005 former New York Governor George Pataki issued Executive Order 142 requiring state agencies to phase-in the use of renewable heating and transportation fuels. The executive order tasked NYSERDA with the development of an implementation plan to ensure at least 10 percent of the diesel fuel consumed by state vehicles and 5 percent of heating oil in New York public buildings by 2012 be biodiesel.⁴¹

In 2004 **Pennsylvania** Governor Edward Rendell signed Executive Order 2004-12,⁴² Energy Management and Conservation in the Commonwealth, establishing a central energy strategy to ensure efficient energy management and conservation in public facilities. Pennsylvania was the first in the nation to require that 10 percent of its electricity needs for commonwealth buildings be met with green energy, and that 25 percent of the public fleet be efficient hybrid electric vehicles by 2011. The state also boasts ‘the greenest’ facilities in the nation, in terms of meeting LEED standards.⁴³

Pennsylvania also has supported energy efficiency in government facilities through the Governor’s Green Government Council (GGGC).⁴⁴ The GGGC program, co-chaired by the Secretaries of the DEP and General Services Administration, requires executive agencies and other agencies participating voluntarily to develop a “Green Plan” outlining the actions the entity will take on the path to incorporate sustainable practices into its planning, operations, policymaking, and regulatory functions. The goal of the Green Plan is ‘continuous improvement’ in emissions from government activities, until zero facility emissions to air, land or water is achieved. The Council is chaired jointly by the Secretaries of the DEP and General Services. The GGGC requires green teams be established within each agency responsible for leadership, policy coordination, management facilitation and implementation of the agency’s greening initiatives. The GCCC reports to the Governor annually, summarizing progress towards its goals.

In March 2006, a newly enacted law in the state of **Washington** made it the first state to require that state buildings meet LEED certification. The law requires that all public facilities or new construction projects larger than 5,000 gross square feet that receive state capital funding meet the U.S. Green Building Council's silver standard and states that all schools in Washington be constructed to the silver standard or the Washington sustainable school design protocol. The requirements will be phased in for schools and state agencies over the next two years.⁴⁵

Federal Funding for State Energy Programs

The U.S. Department of Energy's Office of Energy Efficiency and Renewable Energy's (DOE EERE) supports state energy programs through its State Energy Program (SEP). SEP funding is distributed by DOE's Office of EERE to all U.S. states via an annual appropriation from Congress. This funding – representing a significant source of state energy efficiency and renewable energy funding – is distributed according to a formula based on a number of factors, including a state's: population, climate conditions, and energy consumption.

In fiscal year 2006 all U.S. states received a total of \$34 million in SEP energy efficiency and renewable energy funding – with specific allotments ranging between \$400,000 and \$1 million. All 50 states provide a 20 percent match, but in practice states often further supplement SEP funding with state monies (e.g., petroleum violation escrow funds, general funds, and project-specific grants).¹ The SEP also offers states a Special Project funding pool that awards competitive energy project grants which vary by state interest and application.

A 2003 report by Oak Ridge National Laboratory found that every \$1 of SEP funds generated \$7.22 in annual energy cost savings and returned \$10.71 in private resources.

Source: US Department of Energy, Office of Energy Efficiency and Renewable Energy.

Financing Alternative Energy Programs

By incorporating a growing array of funding mechanisms, states are playing an increasingly critical role in energy investment and financing. Significant funding for state energy efficiency and renewable energy programs comes from the U.S. Department of Energy's (DOE) Office of Energy Efficiency and Renewable Energy (EERE)'s State Energy Program (SEP) subject to an annual appropriation from Congress.⁴⁶ In addition to direct funding for energy efficiency programs, states also rely on using loans, grants, tax credits and incentives to support the financing of new energy efficiency and renewable energy programs. In some cases, governors are creating public-private partnerships – agreements that use public resources to attract private capital – as a means to finance energy efficiency and renewable energy programs.

Public Benefit Funds

One such tool, public benefit funds (PBF) are popular mechanisms used by states to pay for energy conservation efforts (also known as system benefit charges or SBC). Currently 26 states have PBF, which are fees added to state consumer utility bills, typically on the order of \$0.03 to \$0.05 per kilowatt-hour (kW). The fees are collected, pooled and re-distributed – in most cases, by state utilities or the SEO – for statewide “public benefit” programs, often low-income energy assistance and weatherization.⁴⁷

In 2007, **Colorado** Governor Bill Ritter established a Clean Energy Fund for the purposes of promoting energy efficiency, renewable energy and technology transfer for development of the new energy economy in Colorado. The fund is financed through a transfer of \$7M/year from gaming impact funds and will be administered by the Governor's Energy Office.

Since 2001 the **Nevada** Public Utility Commission (PUC), which regulates state utilities, has been collecting a tax assessment on residential and commercial customers of the state's seven regulated utilities. Known as the Universal Energy Charge, this payment is redistributed through the Nevada Fund for Energy Assistance and Conservation (NFEAC) to support energy conservation measures mostly in the form of low-income weatherization assistance for Nevada residents.

Beginning in 2006, **New Mexico** law required public electric and gas utilities to implement cost-effective energy-reduction programs for businesses and consumers. The energy efficiency programs are funded by a tax on electricity consumers which cannot exceed 1.5 percent of the annual energy bill or \$75,000 per year. If the state's three investor-owned utility programs reach this threshold, close to \$20 million would be added to state's energy efficiency program annually. These funds would then be returned to the consumer in the form of new conservation initiatives.

Upon taking office in 1998, former **New York** Governor George Pataki used his executive authority to enhance energy efficiency programs in New York, building the state budget for energy efficiency programs to over \$436.3 million.⁴⁸ One of Governor Pataki's first energy initiatives was shifting responsibilities for managing the state's energy efficiency program, New York Energy Smart, to NYSERDA. Funded by a SBC on the state's investor-owned utilities, NYSERDA now manages Energy Smart's \$150 million annual energy conservation budget - representing 2,700 projects and 38 separate programs - while supporting research, development and deployment of advanced energy technologies.⁴⁹

In 2004, electric and gas utilities in **Pennsylvania** spent nearly \$240 million on low-income energy efficiency programs.⁵⁰ This funding, generated from a charge on consumer electricity use, was notable because it required the

state's regulated utilities to continue their existing low-income rate assistance and energy efficiency programs after the state electricity restructuring.

Loans, Grants and Tax Incentives

In **Oklahoma** the SEO, known as the Department of Commerce Office of Community Development, was authorized by Governor Brad Henry to design and implement a low-interest revolving loan for both private and non-profit organizations that are offering financial assistance for the acquisition of alternative fuel vehicles or alternative fuel vehicle conversions.

In addition to financing innovative and statewide energy partnerships, states spend over \$1 billion on direct grants, loans and tax credit programs, often targeting energy efficiency improvements or small-scale renewable projects. Often these are aimed at the residential or commercial sectors. The **Minnesota** Energy Investment Loan Program is an \$8 million revolving loan program that covers capital costs of up to 50 percent for energy conservation measures on existing buildings. The loan principal is then refunded to the state coffers through the energy cost savings. Projects with continued energy savings, such as lighting retrofits, are most common.⁵¹

So-called green pricing programs are offered by all Minnesota's electric utilities allowing customers the opportunity to purchase renewable electricity. Governor Tim Pawlenty has supported a comprehensive set of renewable energy financing mechanisms that provide property and sales tax exemptions as well as production incentives and low interest loans.⁵² Examples include:

- a 10-year production incentive of 1.5¢/kW for on-farm anaerobic manure digesters;
- a personal property and sales tax exemption for wind energy systems less than 2 MW;
- a utility loan program that funds upfront costs of community-based wind projects; and
- rebates of up to \$2,000 for grid-connected solar-electric systems.

Nevada also offers tax credits for development of in-state solar energy resources. For example, beyond the 5 percent RPS solar set aside, solar producers earn 1.4 credits for every 1.0 kW of solar electricity produced. Former Governor Kenny Guinn bolstered the RPS by issuing a Renewable Energy Producers Property Tax Abatement that gives renewable energy producers a 50 percent tax cut over 10 years for new or expanded businesses that generate at least 10 kW of electricity. Renewable energy financing in Nevada is also encouraged through the state's "SolarGenerations" program, which gives state tax rebates for grid-connected PV installations on residences, small businesses, public buildings, and schools.

To finance rural energy needs in Nevada, the governor announced that the NSOE would partner with the Nevada Rural Development Council⁵³ to develop and promote the use of renewable energy resources in rural businesses and communities by:

- conducting an educational outreach program to help ranchers, farmers, and other rural businesses identify cost savings benefits;
- identifying incentives that are applicable to renewable energy use or the adoption of useful energy efficiency and conservation measures; and
- locating sources of financial assistance and establishing links to rural partners.

New Mexico Governor Bill Richardson worked with the state legislature to enact the Energy Efficiency and Renewable Energy Bonding Act (the Energy Act) in April 2005, which established up to \$20 million in bonds for state agencies, universities, and public schools to fund and implement energy renovations at existing facilities. The bonds are available for most energy efficiency measures, including combined heat and power (CHP)⁵⁴ systems, cooling, and lighting, and are repaid using the energy cost savings.

A Renewable Energy Bond Act passed in 2005 made New Mexico the first U.S. state to pass a solar energy bonding act. The Act provides \$20 million in tax-exempt bonds to be used by universities and public schools adding renewable energy generation and allows the university or public school to keep 10 percent of the savings as an incentive to participate. The Bond requires that by 2010, the SEO identify the onsite renewable energy generation necessary to ensure the Energy Act becomes revenue neutral.⁵⁵

New Mexico has a number of other financing programs supporting solar energy and other renewable energy resources. These include:

- a 30 percent solar development tax deduction for any new solar energy system;
- a renewable energy production tax credit, which leverages corporate resources by cost-sharing low-emission energy generating technologies;
- a renewable energy production tax credit for partnerships with at least a 5 percent ownership in qualified renewable energy generators (e.g., wind farm);
- tax deductions for biomass-related equipment or materials purchased to produce biopower; and
- a ‘feed-in incentive’⁵⁶ allowing renewable energy to be sold to state utilities at market rates.

In **New York**, NYSERDA and the governor’s office also collaborate on the design of financial incentives to encourage the use of alternative fuels, including ethanol, biodiesel and hydrogen. Examples include:

- eliminating state taxes on renewable transportation fuels (e.g., ethanol and biodiesel);
- expanding renewable fuel stations through the use of a \$5 million gas station grant program;
- providing \$20 million for the development of a public-private funded cellulosic ethanol plant;
- creating a \$500,000 incentive for planning, constructing and operating biodiesel refineries; and
- allowing a 15-cent tax credit per gallon of renewable fuel produced.

Pennsylvania’s Keystone Home Energy Loan Program (HELP) is a low-interest loan program to improve the efficiency of Pennsylvania homes, to fund heating and cooling systems, upgrades to windows, doors, insulation, siding, lighting and ceiling fans. Funded by the Pennsylvania Treasury Department, the loan has a 10-year repayment term and variable interest rates, depending on the homeowner’s annual income.

Governor Edward Rendell also has kept in place several programs initiated by former governors. These include two renewable energy financing mechanisms: the Alternative Fuels Incentive Grant⁵⁷ (AFIG) Program and the Pennsylvania Energy Harvest Grant Program (PEHG).⁵⁸ Established in 1992, the programs help stimulate the production and use of renewable fuels in the state and, under Governor Rendell, receive \$3 to \$4 million annually from the commonwealth general fund. Specifically:

- AFIG funds are used to pay down the incremental cost of biodiesel or E-85, to install refueling equipment, and it provides reimbursement of up to 5-cents per gallon annually for up to 12.5 million gallons of biodiesel or ethanol produced in Pennsylvania if it is used as a transportation fuel; and
- PEHG aims to build markets for advanced and renewable energy technologies eligible for the Alternative Portfolio Standard by funding development technologies for biomass, wind, solar, small-scale hydroelectric, landfill methane, energy efficiency, coal-bed methane and waste coal. Since it began in 2003, the PEHG has awarded \$10 million and leveraged another \$26.7 million in private funds.

In addition, Governor Rendell has appointed a Renewable Energy Advisory Committee within the Department of Agriculture. Comprised of legislators and private sector farmers, this expert committee aims to advise Pennsylvania on synergies between renewable energy and farming, specifically emphasizing new markets for state crops.

In **Washington state**, energy efficiency upgrades are done using energy performance contracting. Expert, publicly-certified private energy contractors conduct free energy efficiency upgrades and are paid out of the resulting energy cost savings. Projects occur at public facilities, including schools and state buildings.⁵⁹ Under Governor Chris Gregoire, the state's Energy Saving Performance Contract program is being expanded to all levels of government. The program is an example of a public-private partnership, managed and financed by the General Services Administration, which is expected to bolster a growing private energy conservation industry in the Pacific Northwest. Projects include:

- interior and exterior lighting;
- boiler replacement and repair of steam distribution systems;
- high-efficiency heating and air conditioning (HVAC) systems;
- light emitting diode (LED) traffic light systems; and
- wastewater treatment plant pumps and motors, and swimming pool systems.

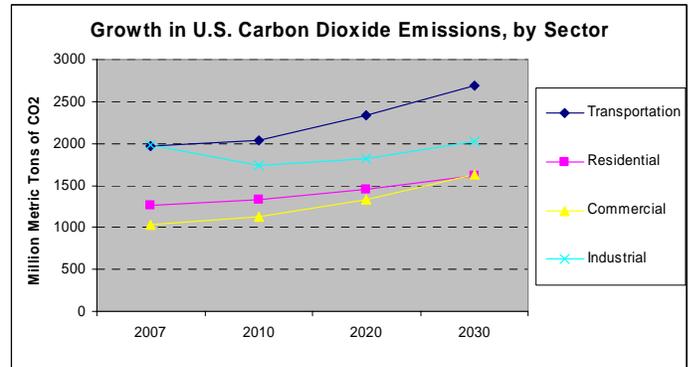
In 2006 Washington enacted legislation requiring both investor-owned and consumer-owned electric utilities to develop an integrated resource plan. This means that utilities must evaluate and rank their generating resource mix and develop a plan identifying improvements in the generation, transmission, distribution, and use of electricity that help meet current and future electricity needs.

Under Governor Gregoire, the Washington bio-energy industry has received a series of state-funded incentives designed to foster production of state-based bio-energy resources.⁶⁰ These and other bio-energy funding programs are managed by the Washington Department of Agriculture. In particular, these funding programs include:

- Energy Freedom Loans,⁶¹ which are 10-year loans (with 1 percent interest rates) that fund bio-energy projects with matching funds for at least half of the total project cost. Currently, five biodiesel plants and two anaerobic digesters, which convert livestock waste into methane fuel, are slated to receive \$17.5 million in Energy Freedom Loans;
- Sales tax exemptions for labor and services related to the installation of bio-energy equipment and for capital sales of energy producing machinery with at least a 200 watts generating capacity;
- Tax breaks for renewable energy companies located in or relocating to Washington. The tax break is greater if companies locate in economically depressed areas of the state; and
- Low-interest loans for converting farm crops and waste into energy that covers production, including construction, equipment (e.g., seed crushers, anaerobic digesters) and facilities.

Measuring State Energy Benefits

Increasingly, economic and environmental co-benefits – multiple benefits that result from a single policy measure – are cited by states as part of the rationale for implementing advanced energy programs. Currently there are significant state and federal efforts underway to quantify these benefits in a manner that identifies successful strategies while ensuring policymakers and the public understand the potential for such benefits. According to a report from the Consortium for Energy Efficiency, the combined national electric and gas efficiency programs helped avoid the emission of more than 30.3 million metric tons of CO₂ into the atmosphere in 2005.⁶²



Often at the behest of governors, SEOs are looking to better identify and evaluate co-benefits to better account for their air quality, health or economic benefits, in addition to their potential to mitigate GHG emissions. To quantify these co-benefits, SEOs are using advanced economic methods and models to demonstrate short- and long-term benefits from state advanced energy programs.

Each year the **Minnesota** public utilities commission submits a report to the state energy office describing its energy efficiency programs and quantifying its energy, air pollution and fiscal benefits. In turn, the SEO must release a biannual state report to the Governor and state agencies on renewable energy use, production and development in Minnesota. These mandatory, data-intensive reports are key drivers of the SEO's efforts to monitor Minnesota's state energy programs. In 2005, the SEO reported that over 23,000 Minnesota consumers purchased approximately 78,000,000 kilowatt-hours of green electricity, a 30 percent increase from the report released three years earlier.⁶³ The latest SEO data indicate that renewable energy production in Minnesota comes from three sources: wind (23.19 percent), hydropower (27.41 percent) and biomass (49.40 percent).⁶⁴ These reports confirm that Minnesota's state-owned utilities produced 2.6 percent of their energy using renewable sources in 2003, which offset more than 10 tons of greenhouse gases (GHG) and 320 pounds of mercury. Governor Pawlenty reported that the state's ethanol industry generates more than \$1.3 billion in economic activity and creates 5,300 jobs in Minnesota.⁶⁵

As part of the State Energy Plan, **Nevada's** governor and the Nevada State Office of Energy (NSOE) provided a framework for the collection and analysis of energy data. Projections by NSOE found that implementation of former Governor Kenny Guinn's 14 priority energy efficiency policies by 2020 could reduce state electricity use by 22 percent, natural gas use by 19 percent, and save over 5 billion gallons of water per year by 2020. These priority policies could also save 8,730 GW of electricity per year, 3,640 MW of summer peak demand, and over 16 billion cubic feet of natural gas by 2020. The NSOE estimates the State Energy Plan could save almost \$5 billion in energy costs over the next 15 years.⁶⁶

A 2003 economic-impact model assessment of the state's renewable energy usage – 3.9 percent of Nevada's electricity consumption is from renewable sources – shows that 850 Nevada jobs arise either directly or indirectly from the state's renewable energy generation. According to the work by NSOE's Renewable Energy Task Force, if the current proportion of renewable energy consumed remains constant the annual impact on GSP averages \$124 million annually in nominal dollars through 2035. If 15 percent of electric needs come from renewable energy generated within the state, over 5,000 jobs can be attributed to the industry along with an average annual GSP effect of \$665 million through 2035.⁶⁷

At the 2004 annual meeting of the Western Governors' Association (WGA) the governors endorsed a resolution calling for 30,000 MW of clean energy development by 2015. While chair of WGA, **New Mexico** Governor Bill Richardson called for the development of 4,000 to 6,000 megawatt-hours (MW) of wind energy⁶⁸ and 700 to 1,300 MW of solar and biomass energy in New Mexico.⁶⁹ If this is achieved, benefits will include:

- \$5 billion in new economic development, focusing on rural New Mexico;
- \$250 million per year of consumer savings;
- 250 billions gallons of water savings; and
- 18 tons of nitrous oxides (NO_x) emissions avoided.

Analysis funded by the New Mexico SEO shows the state's solar bonding act could save utilities \$46 million over the 20-year life of the bond. After the bond is paid off, the net revenue returned to state coffers could be as much as \$18 million.⁷⁰ In addition, in late December 2006, a public-private group of stakeholders provided Governor Richardson with 69 recommendations to reduce the state's greenhouse gases. Preliminary analyses indicate that if all measures were achieved, New Mexico would reduce its GHG by 267 million metric tons over the 2007-2013 timeframe, saving an estimated \$2 billion through energy efficiency measures alone.

During his tenure, **New York** Governor George Pataki emphasized the quantitative evaluation of a number of statewide EE/RE programs. Notably, New York's system benefit charge for energy conservation saves approximately 1,700 GW in annual electricity usage while creating almost 4,500 jobs. Through 2005, cumulative emission reduction benefits from the SBC-funded programs equaled 1,500 tons of nitrogen oxides (NO_x), 2,700 tons of sulfur dioxide (SO₂), and 1.2 million tons of carbon dioxide (CO₂).⁷¹

Over the next decade, all of Governor Edward Rendell's energy initiatives are estimated to add 6,000 state jobs⁷² while **Pennsylvania's** AEPS is expected to decrease traditional state petroleum use by 18 percent. By the AEPS 15th year, avoided emissions are estimated to be 6.5 millions tons of CO₂, 50,000 tons of SO₂ and over 14,000 tons of NO_x. Related benefits include the creation of up to 4,000 MW of new wind deployment over twenty years, along with 3,500 more jobs and a \$9 billion increase in projected gross state production.⁷³

As of August 2006, PEDA and the SEO have awarded \$15 million in grants and loans for 41 clean energy projects. These leverage an additional \$200 million in private investment and are estimated to create 1,558 permanent and construction jobs. Specifically, operating a new waste coal plant will produce 600 permanent positions, with another 100 created by plant construction.

The **Washington** SEO supported recent work by the Northwest Power Council⁷⁴ (the Council) that evaluated energy resource use and potential in the Northwestern U.S. The Council's "5th Power Plan"⁷⁵ concludes that conservation has saved Washington 2,000 MW in energy needs over the past 20 years, the equivalent of the needs of two cities the size of Seattle. Further, projections show that an additional 3,000 MW of savings from energy conservation are achievable by 2020, allowing the state's full future energy load, in theory, to be met from energy efficiency.⁷⁶ In addition to energy conservation, a recent WSU renewable energy study found that between 1,960 and 4,330 jobs will be created over the next decade from the state's solar industry. The study notes that many of these jobs will be distributed across both the urban and rural sectors of Washington's economy.⁷⁷

Implementing Comprehensive State Energy Plans

A significant number of states are developing comprehensive state energy plans that include broad targets relating to the deployment and use energy efficiency and renewable energy programs and tools. In **Illinois**, Governor Rod R. Blagojevich released a long-term energy plan to reduce Illinois' dependence on foreign oil by giving consumers alternatives to the high cost of gasoline, stabilizing energy prices and providing Illinois farmers access to new markets for energy crops. The plan established a goal of replacing 50 percent of Illinois' energy supply with indigenous fuels by 2017 in the process creating 30,000 new state jobs over that time.⁷⁸

In April 2006, **Michigan** Governor Jennifer M. Granholm issued Executive Directive 2006-2⁷⁹ calling for the development of a comprehensive state energy plan that outlines actions to provide affordable, reliable, safe, and clean electricity for citizens and businesses. The plan also calls for recommendations from the Michigan Public Service Commission (PUC)⁸⁰ concerning how best to ensure the state can meet its energy needs, keep electric rates competitive and continue the growth of Michigan's alternative energy industry.

For many states creating a state energy plan results in reorganization of agencies and assignment of new staff duties. By executive order, **Georgia** Governor Sonny Perdue charged the Georgia Environmental Facilities Authority (GEFA) to assemble stakeholders to develop a long-term, comprehensive state energy strategy. In conjunction, Governor Perdue announced appointments to the Governor's Energy Policy Council that will work with the Georgia Environmental Facilities Authority (GEFA) to oversee the development of the State Energy Strategy, producing a state report outlining near-term and future energy policy priorities.⁸¹

In **Rhode Island**, Governor Donald L. Carcieri signed an executive order creating Rhode Island's first Chief Energy Advisor to the Governor; this person will be in charge of coordinating state energy policy and overseeing the State Energy Office. The Governor's Advisor also will be responsible for enacting a five-point energy agenda that includes securing new energy resources and conducting an energy audit of state government operations.⁸²

Required by state statute, the **Nevada** NSOE's biennial state energy assessment is delivered to the governor and legislature and acts as the state's energy roadmap.⁸³ It includes sector-specific resource assessments and updates on the state's Comprehensive State Energy Plan, (the State Energy Plan), a set of goals for improving statewide energy efficiency. Additional input to Nevada's energy programs is provided by the Department of Emergency Management, which prescribes energy policies for the statewide allocation of fuel and fuel supply.

Former Nevada⁸⁴ Governor Kenny Guinn also tasked the NSOE with developing and maintaining the State Energy Plan that included broad implementation goals for energy measures, notably the expanded use of private sector services to develop energy technologies that improve weatherization of buildings and other residential energy efficiency measures. In January 2005, the governor released a follow-up "Nevada Energy Efficiency Strategy,"⁸⁵ which offers 14 specific options for reducing peak electricity and natural gas demand through greater energy efficiency. The priority policies call for:

- adopting energy savings standards for utilities;
- stimulating natural gas utility programs;
- updating building energy codes;
- adopting appliance efficiency standards; and
- increasing funding for low-income home weatherization and energy efficiency upgrades at schools.

The **New York** State Energy Planning Board is responsible for creating and updating the State Energy Plan.⁸⁶ The Board is comprised of directors of NYSERDA and the state's Public Service Commission⁸⁷ (PSC), which regulates the state's utilities, sets rates and traditionally has been responsible for overseeing state energy regulatory policy and state agencies. New York's "2002 State Energy Plan and Final Environmental Impact Statement" (the Energy Plan)^{88,89} formalized specific state energy and environmental goals⁹⁰ including:

- supporting the operation of the state's energy and transportation system infrastructures by stimulating economic growth and technology development;
- increasing energy diversity in all sectors of the New York state economy through greater use of energy efficiency technologies, alternative and renewable energy resources; and
- promoting and achieving a cleaner and healthier environment.

In December 2002, February 2004, and February 2005, the staffs of the New York Energy Planning Board agencies released memoranda updates citing progress towards implementing recommendations contained in the Energy Plan.⁹¹

In April 2007 New York Governor Eliot Spitzer announced a comprehensive plan for reducing energy costs that focuses on energy efficiency, conservation, and investment in renewable energy sources. The plan sets a goal of reducing electricity use in New York 15 percent by the year 2015, through new energy efficiency programs. The state's Public Service Commission will work with the public to design a menu of options which are likely to include new appliance standards and building codes, investments in state renewable energy projects, and the creation of an expedited review process for new wind power projects.⁹²

Conclusion

When considering energy programs, governors must take into account a number of variables to adequately address state energy needs. In response to economic, security and environmental concerns related to energy, governors increasingly are asking state energy offices to expand traditional programs and to advance new energy efficiency and renewable energy agendas.

Almost all state energy efficiency and renewable energy programs established by governors involve ‘back-and-forth’ communication among governors’ energy policy advisors, state energy officials and relevant state agencies. State energy offices (SEOs) are being called upon more and more by governors to design, implement and evaluate renewable portfolio standards, energy conservation programs and green energy technologies.

Based on this review of states energy programs and policies, it is clear that SEOs are becoming increasingly sophisticated in supporting governors as states plan, implement and evaluate advanced energy programs. This often includes the following elements:

- **gubernatorial leadership** through the use of executive orders or mandates promoting energy efficiency and renewable energy tools, such as renewable portfolio or fuel standards;
- **funding mechanisms** that integrate federal and state public funds with private resources to facilitate adoption of clean energy programs;
- **quantitative evaluation procedures** to ensure economic and environmental co-benefits are counted and accounted for when implementing advanced energy technologies; and
- **communication** among governors’ staff, energy offices and state agencies on technical and policy mechanisms to support the design and implementation of state energy programs.

As energy needs continue to climb, governors are taking an increasingly comprehensive and collaborative approach, with support from their state energy offices, to research, develop, finance and implement environmentally sustainable state energy policies.

Appendix A

The Role of the Governor and the State Energy Office – Six Case Studies

Background

State energy offices (SEOs) are key players in governor-initiated programs to bolster state indigenous energy resources. Staffed by policy and technical experts, SEOs typically are either cabinet level agencies, dedicated energy offices or are housed in various state agencies, including Departments of Environment, Transportation, Economic Development, and Commerce.⁹³ Increasingly, state energy office staffs also are being integrated into gubernatorial offices, resulting in SEOs becoming more intimately involved in designing, implementing and evaluating new energy programs.

Whether or not they are part of the governor's office, SEOs also are being called upon to use new tools to design and implement advanced programs and also serve as important communication links between governors' advisors and relevant state agencies during the evaluation and implementation of gubernatorial renewable energy and energy efficiency initiatives (see box below).

State Energy Office Case Studies

Below we review six SEOs in **Minnesota, Nevada, New Mexico, New York, Pennsylvania** and **Washington state**. For each case study we include the physical location within state government of each SEO, highlight unique responsibilities of the energy office and provide examples of how each supports governors' efforts to advance state energy efficiency and renewable energy policy.

Established in 1974, the **Minnesota** state energy office (SEO) supports the governor's energy efficiency and renewable energy initiatives through research, analysis and facilitation of policy development. While Governor Tim Pawlenty also has an energy, environment and natural resource

The Location of State Energy Offices

State energy offices traditionally exist as either a separate entity or as part of a state agency. Under former Governor Jeb Bush, the **Florida** Energy Office was located in the Department of Environmental Protection and is responsible for managing all federal energy programs delegated to the state. In **Connecticut**, the SEO is part of the Office of Policy and Management and is tasked with implementing Governor M. Jodi Rell's energy goals, including energy management services for all state agencies. In **Maryland** the SEO was moved from Department of Housing and Community Development to the Department of Natural Resources before being promoted to cabinet level status, as the Maryland Energy Administration (MEA). Under former Governor Robert L. Ehrlich, Jr. the MEA coordinated state agency efforts to attract biofuel industries.

SEOs also may be part of governors' offices. In states where this is the case, SEO directors serve as energy advisors to the governor. For example, in October 2006, **Kentucky** Governor Ernie Fletcher released a plan for developing Kentucky's indigenous state energy resources called the "State Energy Blueprint" and moved the Office of Energy Policy from the Commerce Department to the Governor's office, renaming it the Governor's Office of Energy Policy. Similarly, in **Colorado**, former Governor Bill Owens housed the Governor's Office of Energy Management and Conservation directly and added energy experts to his staff to support new energy initiatives on woody biomass and energy technology financing. Another approach is used in **Utah**, where SEO functions were separated and distributed between several state agencies. The Governor's Office coordinates energy policy and the Utah Geological Survey is operating the SEO while specific programs are dispersed among relevant state agencies

Source: US Department of Energy, Office of Energy Efficiency and Renewable Energy.

policy advisor, in practice, the senior SEO officials also function as the governor's advisors for key energy initiatives, which are classified into four program areas:

- energy efficiency and conservation;
- electricity use;
- natural gas use; and
- transportation fuel programs.

The SEO is part of the Minnesota Department of Commerce⁹⁴ and--under Governor Tim Pawlenty-- Minnesota's Deputy Commissioner of Commerce manages the state's energy efficiency programs. These include the Minnesota Energy Information Office (one of nation's most comprehensive energy efficiency data centers),⁹⁵ low-income heating assistance programs, and utility regulation. The governor also appoints an Assistant Commissioner for Renewable Energy and Advanced Energy Technology who works with state agencies to integrate renewable energy priorities into concrete legislative and policy proposals on behalf of Governor Pawlenty. The SEO also is responsible for evaluation of new energy technologies (e.g., hydrogen, solar, etc.).

Both SEO commissioners work closely with other state agencies, formally and informally. All of Minnesota's state agency directors meet every four to six weeks to discuss the Governor's "25 by 25" goals. This cross-fertilization of staff ensures renewable energy considerations are integrated into all salient state programs.⁹⁶ Further, a physical reorganization of the SEO creates sound energy policy because utility regulators and energy policy staff work in the same location.⁹⁷

Core funding for Minnesota's SEO staff and programs comes from annual federal SEP grants. These important SEP monies are bolstered by state public utility fees and used to support specific SEO energy programs. Additionally, SEP funds leverage support for research and development of energy initiatives, such as wind studies and grants for biodigesters, which often come from Minnesota's general fund or private sources. Minnesota's SEO also is unique among U.S. states in collecting and distributing funding for energy efficiency from fees on public utility bills.

As an offshoot of its integrated energy programs and staff, the **Minnesota** state energy office closely tracks and evaluates its energy programs. In fact, it is one of only a handful of states where an independent public utilities commission (PUC) is responsible, along with the Department of Commerce, for monitoring progress on state energy efficiency programs.⁹⁸ A state statute requires energy utilities in Minnesota to devote a percentage of their operating revenues to energy efficiency projects through the Conservation Improvement Program (CIP). Current data show gas utilities invest 0.5 percent, electric utilities invest 1.5 percent, and nuclear plants invest 2 percent of their gross operating revenues on energy conservation measures.⁹⁹

By statute in **Nevada** the governor appoints the director of the Nevada State Office of Energy (NSOE) who manages state EE/RE programs and is responsible for providing short- and long-term technical expertise to the executive branch. As such, the NSOE director served as former Governor Kenny Guinn's energy policy advisor and communicated frequently with both the Governor and his chief of staff. Beyond serving as the governor's energy advisor, the Director of the NSOE is responsible for energy reporting, including production of an annual forecast of Nevada's future energy demand as well as a more detailed biennial report, mentioned earlier. As with most states, Nevada's energy programs are primarily funded by SEP dollars. NSOE makes an effort to combine SEP funds with petroleum escrow dollars to support specific energy projects.

Since taking office in 2002, **New Mexico** Governor Bill Richardson has supported a slate of energy-related programs, hiring energy experts and establishing councils to support clean energy industries, address climate change and advance energy efficiency and conservation. The Governor also has increased the allocation of state fiscal resources to expand tax credits, grants and loans aimed at developing New Mexico's considerable solar energy potential.

In New Mexico, the state energy office is the Energy Conservation and Management Division (ECMD) located in the Energy, Minerals and Natural Resources Department. The ECMD is responsible for energy efficiency and renewable energy technology development, and for deploying new programs on solar, wind, geothermal, biomass and alternative transportation fuels. The ECMD also provides technical assistance on energy efficiency and renewable energy programs to state agencies, tribes, educational institutions and the public. Its staff includes a Special Assistant for Renewable Energy who is appointed by Governor Richardson and tasked with implementing his Clean Energy Initiative. That person also works with the cabinet secretary and serves as lead energy lobbyist for the executive branch. Additional gubernatorial staff includes Governor Richardson's Science Advisor who evaluates advanced energy technologies such as the potential for creating biofuels from algae.

The Governor's Clean Energy Initiative is the umbrella under which New Mexico's EE/RE programs reside. The Initiative includes both a 'lead by example' component addressing state government operations and facilities, as well as public outreach agenda centered on a public education campaign touting the health and economic benefits of clean energy. According to staff, both programs are included among Governor Richardson's 2007 legislative priorities.¹⁰⁰

In support of his Clean Energy Initiative, the New Mexico governor signed Executive Order 2004-019¹⁰¹ establishing the New Mexico Clean Energy Council (the Council). In addition to making clean energy recommendations to the governor, the Council meets regularly with investors, companies, and researchers to identify public-private partnership opportunities between state agencies and clean energy businesses. According to SEO officials, this Council is the type of working group favored by Governor Richardson and is designed to be a long-standing expert entity reporting to him annually with recommended changes or improvements to state energy programs.¹⁰² Governor Richardson has established a number of Clean Energy Task Forces, divided into the following priority topics:

- Solar Power;
- Green Buildings;
- Distributed Solar Technology;
- Electricity Transmission;
- Utility Energy Efficiency; and
- Renewable Fuels.

Former **New York**¹⁰³ former Governor George Pataki promoted both energy efficiency and renewable energy by redistributing funding sources for energy efficiency outreach; he also fostered the production and use of renewable transportation fuels. A National Renewable Energy Laboratory study found that generating capacity from renewable energy in New York currently ranked 16th among U.S. states, with 4 percent of state energy generated from non-hydro sources.¹⁰⁴

In New York the governor works closely with the state energy office – the New York State Energy Research and Development Authority (NYSERDA) – and is responsible for appointing its president. Created in 1975 by the New York State Legislature, NYSEDA is one of the nation's largest energy offices. NYSEDA's primary funding¹⁰⁵ comes from an assessment on the intrastate sales of New York's investor-owned electric and gas utilities, including the

New York Power Authority, the state's nonprofit energy corporation that sells power to state agencies, and the Long Island Power Authority, which is that municipality's electric utility.¹⁰⁶ A 2003 study funded by NYSERDA indicates that efficiency measures are likely to have an increasing impact on state energy demands in the future.¹⁰⁷

Under former Governor Pataki, representatives of the New York State Energy Planning Board met annually with state assembly leaders to identify energy priorities for upcoming legislative sessions. Following these meetings, the governor would send a 'call letter' to the legislature and state agencies formally identifying that year's upcoming gubernatorial energy initiatives. According to NYSERDA staff, this process of open communication facilitated efficient state energy planning.¹⁰⁸

Pennsylvania leads states east of the Mississippi in the deployment of wind energy, producing nearly 135 megawatt-hours of electricity and has built the nation's first waste-coal-to-diesel plant which will be capable of supplying 40 million gallons per year of clean-burning diesel fuel.¹⁰⁹ Pennsylvania Governor Edward G. Rendell has been a leading advocate for reducing dependence on foreign oil and has touted the development of Pennsylvania's indigenous energy issues as both a means to reduce petroleum dependence and to promote economic development and job growth.

During his tenure Governor Rendell has decentralized the commonwealth's energy office and simultaneously expanded Pennsylvania's energy policy expertise by adding staff, creating task forces and councils, and, when necessary, advancing regulations and executive orders. Specific energy policies and programs are housed under the Department of Environmental Protection (DEP), via the Office of Energy and Technology Deployment (OETD), the latter of which was afforded renewed funding by the governor. As such, OETD is the de-facto state energy office, assessing new energy and environmental technologies. Its staff collaborates with citizen's groups, businesses, trade organizations, and local governments.

Governor Rendell's revitalization of Pennsylvania's energy programs has instilled expert energy staff into a wide array of state agencies and offices, including the Secretaries of DEP and OETD and the appointment of a Deputy Chief of Staff with energy expertise. According to interviews with state officials, Rendell consistently looks to appoint deputy level senior managers with specific environmental or business acumen in keeping with his emphasis on renewable and indigenous energy development as a stimulant for state economic growth.¹¹⁰ In implementing his efficiency and renewable energy priorities, the governor also grants his senior agency staff broad discretion. For example, he has sent his DEP Secretary and other high-ranking officials on overseas trips to identify wind, solar and other international renewable energy companies that are considering opening U.S. offices. Governor Rendell is often directly involved, especially when it comes to attracting and recruiting clean, green technologies or expanding indigenous energy production. The governor has a working knowledge of energy issues and will often make phone calls or attend meetings aimed at recruiting renewable or advanced technology energy companies to Pennsylvania.¹¹¹

Governor Rendell also has created or substantially increased the responsibilities of entities with authority for financing clean energy. In 2004 he issued Executive Order 2004-5¹¹² empowering the Pennsylvania Energy Development Authority (PEDA) to "enhance Pennsylvania's energy diversity and energy security, and to stimulate economic development and job creation in Pennsylvania," empowering PEDA with the ability to use a variety of financial tools--including tax credits, incentives and loans--to provide assistance for implementing clean energy projects.¹¹³ To date PEDA has leveraged projects cumulatively worth \$1 billion¹¹⁴ and now has authority to fund the governor's five core energy policy objectives:

- energy security and diversity;

- cleaner energy production;
- economic growth through the use of indigenous resources;
- energy efficiency technological advances; and
- public support for clean energy.

Each year, the state of **Washington** spends \$9 billion on oil imports. Since taking office in 2004, Governor Chris Gregoire has promoted the use of plentiful indigenous agricultural energy resources as a way of offsetting these oil imports as an economic opportunity for the state.¹¹⁵

The Department of Community, Trade & Economic Development serves as Washington's State Energy Office (SEO) coordinating closely with the state Utilities and Transportation Commission. The SEP was a cabinet level agency until 1996 when it was dispersed among various state agencies.¹¹⁶ The Washington SEO works closely with the governor's energy advisor as well as with the Northwest Power and Conservation Council (NWPCC),¹¹⁷ a large regional energy planning council responsible for technical rankings of current energy needs and for estimating future energy resources in the Northwestern U.S.

According to state officials, energy stakeholders in Washington have met regularly for over 10 years, to discuss energy efficiency and renewable energy policy design and implementation in Washington. When the legislature is in session these *ad hoc* meetings become more formalized, often happening on a weekly basis, and depending on the policies being discussed, include representatives from the public utilities commission, the NWPCC, and the Facility Siting Council. Recent additional stakeholders include representatives from the Department of Agriculture (DOA), which, under Governor Gregoire, manages loan programs for biofuel processing facilities and is working with the state Department of Revenue and Taxation's Division on Weights and Measures to certify a renewable fuel standard.

Beyond taking the lead in the *ad hoc* energy working group, the SEO must produce a biennial report to the legislature and governor updating state leadership on energy programs and providing guidance or suggestions for new energy initiatives. For example, the most recent incarnation of this document proposed state standards for 13 different energy efficient products, reviewed electric utility planning, provided trends related to rising prices for petroleum, natural gas, and electricity, reviewed analytical and stakeholder efforts to reduce greenhouse gas emissions, and summarized emerging economic development opportunities resulting from production of indigenous biofuels, particularly biodiesel.¹¹⁸

The Washington SEO is different from that in many states in that it is first-and-foremost a policy office. Funded by SEP dollars, it also collaborates with Washington State University (WSU) to produce analyses necessary for state energy policy decisions. As such, WSU takes the lead on quantifying Washington's energy use and production trends, responses to energy disruptions and long-term energy cost planning. It also operates an energy information hotline that provides callers with resources on state energy conservation measures as well as other energy programs, such as geothermal development, biofuels and co-generation.

Beyond sharing funding and duties with WSU, the Department of Energy's SEP program funds for the SEO are typically combined with other state funding. For example, Governor Gregoire's 2007-2009 budget provides up to \$4 million to support farmers' efforts to develop long-term alternative energy sources by turning crops, manure waste, and biomass waste into energy.¹¹⁹

Endnotes

- * This *Issue Brief* was researched and written by Greg Dierkers with editorial assistance from Kara Colton, John Ratliff and Darren Springer at NGA. In addition, comments were provided by Michelle New of NASEO and U.S. Department of Energy. Support for this document was provided by the U.S. Department of Energy's Office of Energy Efficiency and Renewable Energy.
- ¹ Energy Information Administration, U.S. Department of Energy, "Weekly U.S. Retail Gasoline Prices, Regular Grade, Dollars per Gallon [online], Washington, D.C., 2004 [cited 28 September 2006]. Available at: <http://www.eia.doe.gov/oil_gas/petroleum/data_publications/wrgp/mogas_home_page.html>.
- ² While not a comprehensive list of energy efficiency and renewable energy programs, these states ensure a geographical balance as well as an equal balance of states with a Republican governor and a Democratic governor. We have also attempted to choose states focused on encouraging or developing or leveraging a specific energy resource found within their borders, for example ethanol in Minnesota and solar in Nevada.
- ³ The U.S. Energy Information Administration, U.S. Department of Energy, 2030 Annual Energy Outlook, [online], [cited January. 8, 2007] Available at: <<http://www.eia.doe.gov/emeu/steo/pub/contents.html>>.
- ⁴ The Technical, Economic and Achievable Potential for Energy-Efficiency in the U.S. – A Meta-Analysis of Recent Studies. Steven Nadel, Anna Shipley and R. Neal Elliott American Council for an Energy-Efficient Economy, 2004. Note: The economic savings potential excludes measures that are not cost-effective, where cost-effective typically is based on life-cycle economics assuming specific energy prices and discount rates.
- ⁵ The U.S. Energy Information Administration, U.S. Department of Energy, 2030 Annual Energy Outlook, [online], [cited January. 8, 2007] Available at: <<http://www.eia.doe.gov/emeu/steo/pub/contents.html>>.
- ⁶ The U.S. Energy Information Administration, U.S. Department of Energy, 2030 Annual Energy Outlook, [online], [cited January. 8, 2007] Available at: <<http://www.eia.doe.gov/emeu/steo/pub/contents.html>>.
- ⁷ Potential Savings from National Energy Standards, Union of Concerned Scientists and Tellus Institute, 2004.
- ⁸ The U.S. Energy Information Administration, U.S. Department of Energy, 2030 Annual Energy Outlook, [online], [cited March 4th, 2007] Available at: <<http://www.eia.doe.gov/emeu/aer/txt/stb0809.xls>>.
- ⁹ Energy Information Administration, U.S. Department of Energy, Annual Energy Outlook 2005 with Projections to 2030, Washington, D.C., January 2006. [cited 29 October 2006] Available at: <www.eia.doe.gov/oiaf/aeo/>.
- ¹⁰ U.S. Department of Energy, Energy Efficiency and Renewable Energy, State Partnerships and Activities: State Energy Alternatives, August 30th, 2006. [cited 31 October 2006] Available at: <http://www.eere.energy.gov/state_energy_program/project_brief_detail.cfm/pb_id=257>.
- ¹¹ Energy Information Administration, U.S. Department of Energy, "Annual Energy Outlook 2005 with Projections to 2030", Washington, DC January 2006. Available at: <www.eia.doe.gov/oiaf/aeo/>.
- ¹² See, <<http://www.census.gov/Press-Release/www/releases/archives/population/006142.html>>.
- ¹³ Riddel, Mary, The Potential Economic Impact of Nevada's Renewable Energy Resources, Center for Business and Economic Research, University of Nevada, Las Vegas, 2003.
- ¹⁴ See the text of the Renewable Portfolio Standard, developed by the Nevada Renewable Portfolio Standard, Public Utilities Commission, 2004. <http://www.puc.state.nv.us/Renewable/REPSNevada_files/frame.htm>.
- ¹⁵ See the Nevada State Energy Conservation Plan, Renewable Energy and Energy Conservation Task Force, Available at: <<http://dem.state.nv.us/EnergyPlan/plangovsltr.shtml>>.
- ¹⁶ For the press release of Governor Jim Gibbons Executive Order see, "Governor Signs Executive Order Encouraging the Development of Renewable Energy," February 2007, see <<http://gov.state.nv.us/PressReleases/2007/2007-02-16-RenewableEnergy.htm>>.
- ¹⁷ For the Press Release from the Office of Governor Bill Richardson, "Governor Bill Richardson Enacts Landmark Clean Energy Bills to Create Jobs, Keep Air Clean," March 2007, See <<http://www.governor.state.nm.us/press.php?id=373>>.
- ¹⁸ New York Public Service Commission, State Energy Planning Documents, [cited 29 October 2006], Available at: <<http://www.dps.state.ny.us/03e0188.htm#about>>.
- ¹⁹ NYSERDA study found that 45 percent of renewable energy technical potential would be considered competitive with conventional electric generation by 2012

- ²⁰ For the full text of Pennsylvania Governor Ed Rendell's press release, Pennsylvania Redoubling Its Purchase Of Green Electricity, Issued August 29, 2006, see <http://www.dgs.state.pa.us/dgs/lib/dgs/green_energy_purchase.doc>.
- ²¹ See the full text of Pennsylvania Governor Ed Rendell's Executive Order, 2005-08 Governor's Renewable Agricultural Energy Council, Issued September 20, 2005. See, <<http://www.oa.state.pa.us/oac/cwp/view.asp?A=351&Q=204284>>.
- ²² For the full text of California Governor Arnold Schwarzenegger's Executive Order, Issued January 9, 2007, see <<http://gov.ca.gov/index.php?/press-release/5074/>>.
- ²³ See the full text of the House Bill 16 [online] [cited 18 October 2006] <<http://www.minnesotavotes.org/2005-HF-216>>.
- ²⁴ According to the SEO, in 2004 Minnesota used nearly 400 million gallons of ethanol.
- ²⁵ Minnesota Governor Tim Pawlenty, News Release, "Governor Pawlenty calls on states to increase use of renewable fuels, enact "e-10 by 2010," [online] press release, September 28, 2005 [cited 18 October 2006] Available at: <<http://www.ethanol-gec.org/09-26-2005.htm>>.
- ²⁶ For information on the Washington Renewable Fuel Standard, see Governor Chris Gregoire, Press Release, "Governor Gregoire Signs Bill Making Washington First in Nation to Require Alternative Fuels," March, 16, 2006 [online] [cited 1 November 2006] Available at: <<http://www.governor.wa.gov/news/news-view.asp?pressRelease=276&newsType=1>>.
- ²⁷ The Washington Renewable Fuels Standard applies only if the state has the indigenous agricultural resources needed (for biodiesel) and as long as ozone levels do not exceed air quality standards (for ethanol). For more information, see <<http://www.discovery.org/scripts/viewDB/filesDB-download.php?command=download&id=870>>.
- ²⁸ Biodiesel in Washington: A Snapshot, Kim Lyons, Washington State University, May 2005 [cited 3 November 2006] Washington Community Trade and Economic Development Energy Policy Division Available at: <<http://cted.wa.gov/DesktopModules/CTEDPublications/CTEDPublicationsView.aspx?tabID=0&ItemID=3180&Mid=863&wversion=Staging>>.
- ²⁹ National Governors Association (NGA), "Issue Brief: 2004 State of the State Analysis—The Governors Speak" [online], Washington, D.C., 2004 [cited 25 August 2005]. Available at: <<http://www.nga.org/portal/site/nga/menuitem.6c9a8a9ebc6ae07eee28aca9501010a0/?vgnnextoid=3b038566cf5f1110VgnVCM1000001a01010aRCRD&vgnnextchannel=759b8f2005361010VgnVCM1000001a01010aRCRD>>.
- ³⁰ See the full text of Minnesota Governor Tim Pawlenty's Executive Order 32, issued April 22, 2004, at: [online], [cited 29 October 2006] Available at: <<http://www.moea.state.mn.us/lc/ippat/04-08-executiveorder.pdf>>.
- ³¹ See the full text of Minnesota Governor Tim Pawlenty's Executive Order 16, issued November 10, 2005, [cited 29 October 2006] Available at: <http://www.admin.state.mn.us/pmd/energy/2-1_exec_order_05-16.htm>.
- ³² Minnesota Governor Tim Pawlenty, News Release, "Governor Pawlenty Signs Executive Order Increasing Use Of Renewable Fuels By State Agencies," [online] press release, March 10, 2006 [cited 18 October 2006] Available at: <http://www.governor.state.mn.us/priorities/governorsorders/executiveorders/2006/march/PROD005613.html?BV_SessionID=@@2097236358.1178132536@@@&BV_EngineID=ccccaddkljhkiicfjkcnndfifdgon.0>.
- ³³ The Nevada Conservation Plan for State Government and Energy Conservation Task Force, Nevada Division of Energy Management [online] <<http://dem.state.nv.us/energyconservationplanforstategovt.htm>>.
- ³⁴ Effective July 1, 2007, NSOE is must adopt guidelines for all of Nevada's public buildings, which will require public buildings over 20,000 square feet occupied by Nevada state agencies to complete a "lifecycle analysis" estimating the cost to construct, operate, and maintain the building over its practical lifetime and identify energy conservation measures with payback of 10 years or less.
- ³⁵ See the full text of New Mexico's Executive Order 2006-001, July 2006 [cited 18 October 2006] <http://www.dsireusa.org/library/includes/incentive2.cfm?Incentive_Code=NM11R&state=NM&CurrentPageID=1&RE=1&EE=1>.
- ³⁶ LEED-certified buildings must meet design, construction, and operation standards for site development, water savings, energy efficiency, materials selection, and indoor environmental quality.
- ³⁷ See the New Mexico Executive Order on Green Buildings, January 16, 2006. See, <http://www.governor.state.nm.us/orders/2006/EO_2006_001.pdf>.
- ³⁸ See the full text of New Mexico Governor Bill Richardson's Executive Order 32, issued April 22, 2004, at <http://www.governor.state.nm.us/orders/2005/EO_2005_049.pdf>.

- ³⁹ See the full text of the New York Governor George Pataki's Executive Order, "Green and Clean State Buildings and Vehicles [cited 29 October 2006] Available at: <www.nyserda.org/programs/exorder111orig.asp>.
- ⁴⁰ New York Department of Environmental Conservation, Green Buildings Initiative, Program Status, [cited 29 October 2006], Available at: <<http://www.dec.state.ny.us/website/ppu/grnbldg/index.html>>.
- ⁴¹ NYSERDA supports deployment initiatives for the renewable fuels, including the installation of renewable fuel pumps at 27 New York State Thruway travel plazas, and expanded use of biodiesel (a renewable diesel fuel made from soybeans) in transit buses, school buses and heavy duty vehicles.
- ⁴² See the full text of Pennsylvania Governor Ed Rendell's Executive Order 2004-12 at: <<http://www.oa.state.pa.us/oac/cwp/view.asp?A=351&Q=196122>>.
- ⁴³ Personal communication with Pennsylvania Office of Energy and Technology Deployment Secretary Daniel J. Desmond, December 19th, 2006.
- ⁴⁴ See the full text of Pennsylvania Governor Ed Rendell's Green Government Council, <<http://www.gggc.state.pa.us/gggc/site/default.asp>>.
- ⁴⁵ Legislative and regulatory update, June 2006. <<http://dvnewsmaker.digivis.com/issa/index.jsp?pageType=3&layoutType=1&id=1654&articleObjectName=com.issa.article.Article>>.
- ⁴⁶ On June 29th, the Senate Appropriations Committee approved \$49.5 million in fiscal year 2007 SEP funding.
- ⁴⁷ U.S. Department of Energy, Energy Efficiency and Renewable Energy, State Partnerships and Activities: State Energy Alternatives, August 30th, 2006. [cited 31 October 2006] Available at: <http://www.eere.energy.gov/states/alternatives/system_benefits.cfm>.
- ⁴⁸ Energy Information Administration, U.S. Department of Energy, "State Energy Data 2003: Consumption, Table S3" Available at: <http://www.eia.doe.gov/emeu/states/sep_sum/html/sum_btu_tot.html>.
- ⁴⁹ Energy Efficiency and Renewable Energy Resource Development Potential in New York State, Final Report, August 2003, Volume One. Available at: <http://www.nyserda.org/Energy_Information/energy_state_plan.asp>.
- ⁵⁰ See summary text of Pennsylvania's Low-Income Restructuring Legislation and Implementation. [online] Available, at <<http://www.liheap.ncat.org/dereg/states/pennsylvania.htm>>.
- ⁵¹ While renewable energy projects are eligible as of fall 2006 this program has funded energy efficiency measures.
- ⁵² Minnesota Department of Commerce, Energy Center, Renewable and Efficiency Incentives. [online] [cited 23 October 2006] Available at: <<http://www.state.mn.us/portal/mn/jsp/content.do?id=-536881350&subchannel=-536881511&sc2=null&sc3=null&contentid=536885915&contenttype=EDITORIAL&programid=536885394&agency=Commerce>>.
- ⁵³ The Nevada Regional Development Council supports development of the state's rural economy.
- ⁵⁴ Combined heat and power (CHP) is a term for a power plant designed to produce both heat and electricity from a single heat source. Often, CHP uses waste heat from power generation to heat local buildings.
- ⁵⁵ See the full text of the Energy Efficiency and Renewable Energy Bonding Act (House Bill 32) at <http://www.dsireusa.org/library/includes/incentive2.cfm?Incentive_Code=NM07F&state=NM&CurrentPageID=1>.
- ⁵⁶ A feed-in incentive is utility or state guarantee to purchase renewable energy at a fixed price.
- ⁵⁷ For an overview of Pennsylvania's Alternative Fuels Incentive Grant (AFIG) Program, see, <<http://www.depweb.state.pa.us/enintech/cwp/view.asp?a=1412&q=502176>>.
- ⁵⁸ For an overview of Pennsylvania's Energy Harvest Program, see <<http://www.depweb.state.pa.us/energy/cwp/view.asp?a=1374&q=483024>>.
- ⁵⁹ For more information on the Department of General Services Administration and Washington's Energy Performance Contracting, see [online] <<http://www.ga.wa.gov/EAS/epc/convinced.htm>>.
- ⁶⁰ The governor's 2006 supplemental budget included \$17.5 million in tax credits and production incentives to spur the state biofuel industries, as well as \$225,000 for research into bioenergy markets.
- ⁶¹ For information on the Energy Freedom Loans, see Press Release from the Office of Governor Christine Gregoire, "Governor Gregoire Announces Energy Freedom Loan Awards: \$6.75 million in low-interest loans awarded to Washington bioenergy projects," July 13, 2006 [online] [cited 1 November 2006] Available at: <<http://agr.wa.gov/News/2006/EnergyFreedomLoanAwardsJuly2006.htm>>.

- ⁶² U.S. energy efficiency programs, A \$2.6 Billion Industry. State-by-State Energy-Efficiency Budgets, Consortium for Energy Efficiency, 2006.
- ⁶³ Minnesota Department of Commerce, Green Pricing Sales Data, April 2006. [online] [cited 23 October 2006] Available at: www.commerce.state.mn.us
- ⁶⁴ Energy Policy and Conservation Report, Minnesota Department of Commerce, 2004. [online] [cited 23 October 2006] Available at: http://www.state.mn.us/mn/externalDocs/Commerce/Quadrennial_Report_2004_071404102049_2004-QuadReport.pdf.
- ⁶⁵ Minnesota Governor Tim Pawlenty, News Release, "Policy Keynote Address by Minnesota Governor Tim Pawlenty to the 10th Annual National Ethanol Conference," [online] press release, February 9, 2005 [cited 18 October 2006] Available at: http://www.ethanol-gec.org/speeches/pawlenty_keynote2-9-05.htm.
- ⁶⁶ Nevada Energy Efficiency Strategy, January 12, 2005. See, http://www.swenergy.org/media/pr2005_0112.pdf.
- ⁶⁷ <http://energy.state.nv.us/transportation/taskforce/Executive%20SummaS%20Only%20Final.doc>.
- ⁶⁸ For comparison, the United States currently has 9,148 MW of wind energy capacity
- ⁶⁹ Most of this clean energy would be developed for export, since estimates show New Mexico requires only 3,000 to 4,000 MW of capacity to meet its own energy needs.
- ⁷⁰ Overview of Solar Energy Tax Credits in New Mexico, Available at: <http://www.emnrd.state.nm.us/ecmd/SolarTaxCredits/SolarTaxCredits.htm>.
- ⁷¹ New York Energy Smart Program Evaluation and Status Report, Final Report to the System Benefits Charge Advisory Group, May 2005. [cited 28 October 2006] Available at: http://www.nyserda.org/Energy_Information/05sbcreport.asp.
- ⁷² The Honorable Kathleen A. McGinty, Secretary, Pennsylvania Department of Environmental Protection Testimony on Waste Coal Incentives before the Senate Environmental Resources and Energy Committee September 8, 2004. [Cited 20 October 2006] Available at: <http://www.depweb.state.pa.us/dep/cwp/view.asp?a=3&q=474575>.
- ⁷³ Presentation to 2005 Clean Air Innovations Conference, "Introduction to Pennsylvania Clean Air Innovations" by Eric Thumma, Director Bureau of Energy, Innovations, and Technology Deployment, Pennsylvania Department of Environmental Protection. [cited 3 November 2006] Available at: <http://www.epa.gov/ttn/airinnovations/2005conference/Wed2/4-EricThumma.pdf>.
- ⁷⁴ The Northwest Council develops a 20-year electric power plan that will guarantee adequate and reliable energy at the lowest economic and environmental cost to the Northwest. [online] Available at: <http://www.nwcouncil.org/about/Default.htm>.
- ⁷⁵ The Fifth Northwest Electric Power and Conservation Plan, May 2005 [online] [cited 1 November 2006] Available at: <http://www.nwcouncil.org/energy/powerplan/plan/Default.htm>.
- ⁷⁶ Personal communication with Tony Usibelli, Washington State Energy Office, October 31, 2006.
- ⁷⁷ Nelson, Mike, Director, "The Washington Solar Electric Industry: Sunrise or Sunset? A closing window of opportunity," Washington State University, Solar Energy Program. [online] Cited 19 October 2006 Available at: <http://www.energy.wsu.edu/documents/renewables/sunrisesunset.pdf>.
- ⁷⁸ See the full text of the Illinois Governor Rod Blagojevich's Press Release, "Gov. Blagojevich unveils ambitious energy independence plan" [cited 24 November 2006] Available at: <http://www.illinois.gov/PressReleases/ShowPressRelease.cfm?SubjectID=2&RecNum=5200>.
- ⁷⁹ See the full text of the Michigan Governor Jennifer Granholm's Executive Directive, "Green and Clean State Buildings and Vehicles" [cited 29 October 2006] Available at: <http://www.michigan.gov/gov/0,1607,7-168-23442-140333--,00.html>.
- ⁸⁰ A regulatory body in every state in the U.S. that governs public utilities within its jurisdiction such as electricity, gas, oil, sewer, water, transportation and telephone service. Some states call it the Public Service Commission (PSC).
- ⁸¹ See the full text of the Georgia Governor Sonny Perdue's Press Release, "Governor Announces Development of Statewide Energy Strategy" [cited 24 November 2006] Available at: <http://www.gov.state.ga.us/press/2006/press1076.shtml>.
- ⁸² See the full text of the Rhode Island Governor Donald Carcieri's Press Release, "Carcieri Creates New Office To Coordinate State Energy Policy" [cited 24 November 2006] Available at: <http://www.governor.ri.gov/documents/energy-agenda-rel.pdf>.
- ⁸³ Personal communication with Neill Dimmick, Director, Nevada State Energy Office, December 28th, 2006.
- ⁸⁴ Since drafting this Issue Brief, a new governor has been elected. However, the energy efficiency and renewable energy policies should remain in place, along with new ones intended to build upon past EE/RE implementation and development.
- ⁸⁵ See the full text of former Nevada Governor Kenny Guinn's Press Release, Governor Guinn Announces Nevada Energy Efficiency Strategy. [cited 20 October 2006] Available at: http://gov.state.nv.us/pr/2005/PR_01-12ENERGY.htm.

- ⁸⁶ New York State Energy Research and Development Authority, State Energy Planning, December 2005. [cited 20 October 2006] Available at: <http://www.nysesda.org/Energy_Information/energy_state_plan.asp>.
- ⁸⁷ The New York Public Service Commission regulates the state's electric, gas, steam, telecommunications, and water utilities and is charged by law with responsibility for setting rates and ensuring adequate service is provided by New York's utilities. [cited 31 October 2006] Available at: <<http://www.dps.state.ny.us/>>.
- ⁸⁸ New York State Energy Research and Development Authority, State Energy Planning, December 2005. [cited 20 October 2006] Available at: <http://www.nysesda.org/Energy_Information/energy_state_plan.asp>.
- ⁸⁹ The Energy Planning Board agencies were the New York State Energy Research and Development Authority, New York State Department of Transportation, New York State Public Service Commission, New York State Department of Economic Development, and New York State Department of Environmental Conservation.
- ⁹⁰ State Energy Plan - 2005 Annual Report and Activities Update, Energy Coordinating Work Group, Memorandum, March 2006. [cited 22 October 2006]. Available at: <http://www.nysesda.org/Energy_Information/sep_annual_report.pdf>.
- ⁹¹ Ibid
- ⁹² See the full text of New York Governor Elliot Spitzer's Press Release. Available at: <http://www.state.ny.us/governor/press/0419071.html>
- ⁹³ For more information, including a table with the location of all fifty state energy offices, see the National Association of State Energy Officials
- ⁹⁴ In the mid-1990s the SEO was integrated into the Minnesota Department of Commerce.
- ⁹⁵ See the full text of Minnesota Governor Tim Pawlenty's Press Release, Available at: <<http://www.state.mn.us/portal/mn/jsp/home.do?agency=Commerce>>.
- ⁹⁶ Personal communication with Janet Streff, Manager of the State Energy Office, MN Department of Commerce, October 16th, 2006.
- ⁹⁷ Personal communication with Edward Garvey, Manager of the State Energy Office, MN Department of Commerce, January 4th, 2006.
- ⁹⁸ Utilities Response to Minnesota Department of Commerce's Renewable Energy Objective, 2004. Available at: <http://www.state.mn.us/mn/externalDocs/Commerce/REO_Attachments_H113_012805100732_AttachmentH1-13.pdf>.
- ⁹⁹ Ibid
- ¹⁰⁰ Personal communication with Fernando Martinez, Director, New Mexico State Energy Office, December 28th, 2006.
- ¹⁰¹ "Strategic Plan for the Energy, Minerals and Natural Resources Department," [online], September 2005 [cited 18 October 2006] <http://www.emnrd.state.nm.us/main/documents/EMNRD2006_007.pdf>.
- ¹⁰² Personal communication with Fernando Martinez, Director, New Mexico State Energy Office, December 28th, 2006.
- ¹⁰³ Since drafting this Issue Brief, a new governor has been elected. However, the energy efficiency and renewable energy policies should remain in place, along with new ones intended to build upon past EE/RE implementation and development.
- ¹⁰⁴ Full renewable energy breakdown includes: hydroelectric (89 percent), biomass: 9 percent, wind, 0.07 percent and minimal solar energy. Available at: <http://www.eere.energy.gov/states/state_specific_statistics.cfm/state=NY#consumption>.
- ¹⁰⁵ While not fully subject to annual state budget appropriations, NYSEDRA also receives DOE EE/RE federal grants and voluntary contributions from private corporations.
- ¹⁰⁶ The New York Power Authority is the country's largest state-owned power organization selling electricity to government agencies; to community-owned electric systems and rural electric cooperatives; to job-producing companies; to private utilities for resale, and to neighboring states, under federal requirements. [cited 31 October 2006] Available at: <<http://www.nypa.gov/default.htm>>. The Long Island Power Authority (LIPA) is Long Island's primary electric service provider and is operated as a non-profit entity. [cited 31 October 2006] Available at: <<http://www.lipower.org/>>.
- ¹⁰⁷ A NYSERDA study found that 45 percent of renewable energy technical potential would be considered competitive with conventional electric generation by 2012
- ¹⁰⁸ Personal communication with Christine Benedict, NYSERDA, October 19th, 2006.
- ¹⁰⁹ If all 72 billion tons of known coal reserves in the commonwealth were liquefied it would be equivalent to approximately 40 years of the nation's petroleum imports.
- ¹¹⁰ Personal communication with Pennsylvania Department of Environmental Protection Secretary Kathleen McGinty, December 14th, 2006.

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- ¹¹¹ Personal communication with Pennsylvania Office of Energy and Technology Deployment Secretary Daniel J. Desmond, December 19th, 2006.
- ¹¹² See the full text of Pennsylvania Governor Ed Rendell's Executive Order 2004-5 at: www.oa.state.pa.us/oac/cwp/view.asp?A=351&Q=184845
- ¹¹³ In 1982 the Pennsylvania Energy Development Authority and Emergency Powers Act established PEDDA as independent public financing authority to enhance Pennsylvania's energy diversity and energy security, and to stimulate economic development and job creation in Pennsylvania,
- ¹¹⁴ Personal communication with Pennsylvania Department of Environmental Protection Secretary Kathleen McGinty, December 14th, 2006.
- ¹¹⁵ Biomass Feedstock Availability in the United States: 1999 State Level Analysis, Oak Ridge National Laboratory, Oak Ridge, TN, January, 2000, <<http://bioenergy.ornl.gov/resourcedata/index.html>>.
- ¹¹⁶ Personal communication with Tony Usibelli, Assistant Director, Washington Department of Community, Trade & Economic Development, September, 26th and October 30th, 2006.
- ¹¹⁷ The Council develops a 20-year electric power project to help ensure adequate and reliable energy to the Northwest at the lowest economic and environmental cost. See, <<http://www.nwcouncil.org/about/Default.htm>>.
- ¹¹⁸ State of Washington 2005 Biennial Energy Report, Issues and Analysis for the Washington State Legislature and Governor, January 2005. Prepared by the Energy Policy Division Washington State Department of Community, Trade and Economic Development Cited January 8, 2007, [online] <http://www.cted.wa.gov/_CTED/documents/ID_1872_Publications.pdf>.
- ¹¹⁹ For more information on Governor Christine Gregoire's budget, see, [online] Cited January 4th, 2007. <www.ofm.wa.gov/budget07/highlights/assets/pdf/sections/07_environment.pdf>.