2-10-09 Pathway to a Comprehensive Statewide Energy Plan

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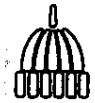


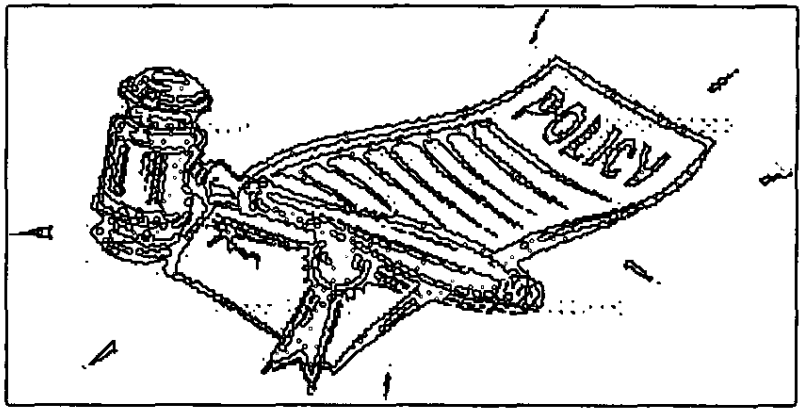
State Energy Policy

Developing an Energy Strategy

Kate Marks
Energy Program Director
National Conference of State Legislatures

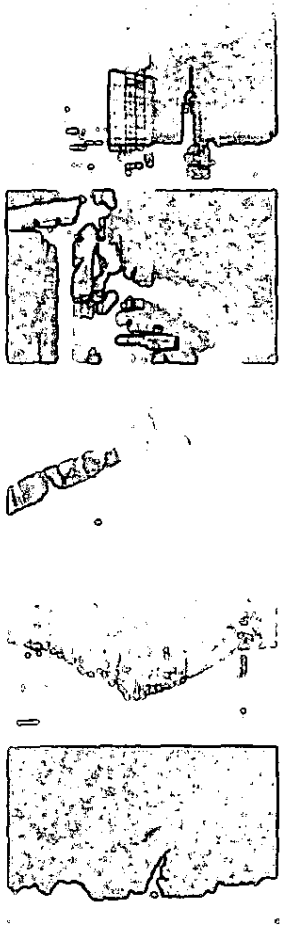
State Case Studies

- Process followed
- Structure of task force
- Objectives of the policy
- Topics covered
- Metrics and Results



What topics do states address?

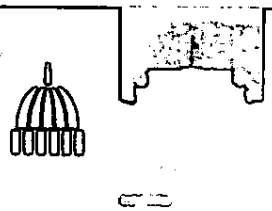
- Petroleum
- Natural gas
- Coal
- Fuel diversity
- Transportation
- Economic development
- Coalbed methane
- Electricity reliability
- Security
- Transmission



- Net energy balance
- Imports vs. exports
- Energy efficiency and conservation
- Wind
- Biomass
- Ethanol
- Solar
- Oil
- Electric utilities

Goals and Objectives

- Improve the public health and environmental quality
- Promote wise land use
- Ensure energy reliability and security
- Implement strategies supportive of a sound economy
- Develop an achievable sustainable energy strategy
- Implement a strategy by which the state can lead by example
- Improved mobility of people and goods
- Low-cost, reliable, and sustainable energy, produced in-state to the fullest extent possible



Goals and Objectives

- Dependable, efficient, and economical statewide energy systems capable of supporting the needs of the people
- Increased energy self-sufficiency where the ratio of indigenous to imported energy use is increased
- Reduce the ratio of energy consumption to economic activity
- Increase the use of cost effective renewable resources
- Expand forested areas to ensure a future supply of wood fuel and reduce atmospheric carbon dioxide
- Maintain low-cost energy

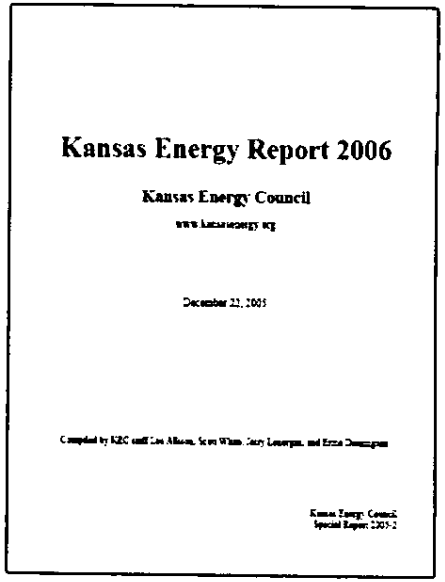
KANSAS

Process and Structure

- Est. by Gov. Sebelius in 2004, in Executive Order 04-05
- Kansas Energy Council
  - Large and diverse group
  - Governor expanded the council to include additional sectors
- Council divided into standing committees
- Council participants paid their own way and used their own time

KANSAS

Report and Recommendations


Kansas Energy Report 2006

Kansas Energy Council

www.kansasenergy.org

December 22, 2005

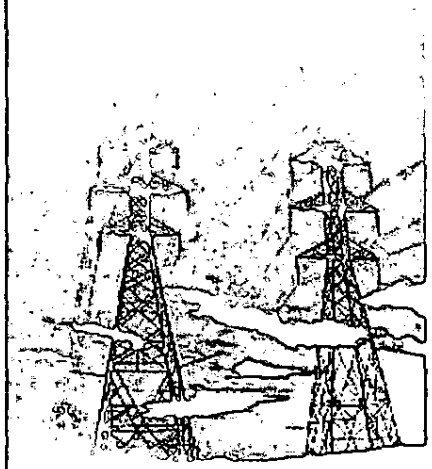
Compiled by KEC staff Lee Allison, Scott White, Jerry Lonergan, and Ernie Dunnigan

Kansas Energy Council
Special Report 2005-2

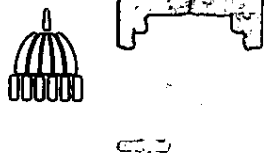
- Legislative (5), Executive (3), and agency (4) recommendations
- Included short- and long-term goals
- Comprehensive policy
  - Considered entire energy profile
- Updated on a staggered basis
- Budget allocated for staff time = $100K

KANSAS

Results and Lessons Learned



- Passed ethanol, efficiency, electricity transmission bills
- Increased federal funding
- Developed a transmission authority



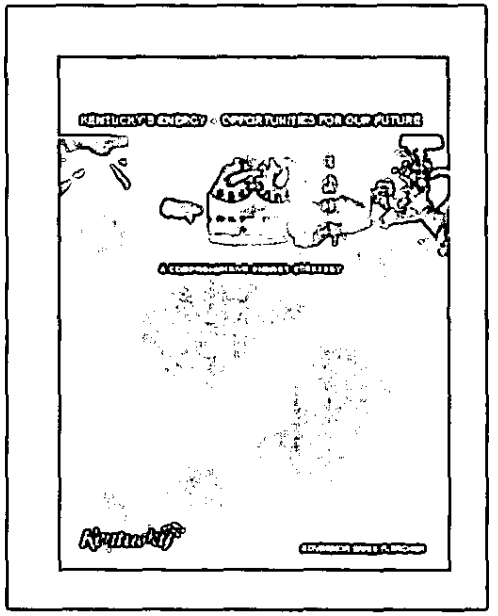
Keep in mind...

"We're doing this for the next generation, not the next election."

Rep. Tanya Pullin (KY)
House Chair, Energy Committee

KENTUCKY

Report and Recommendations

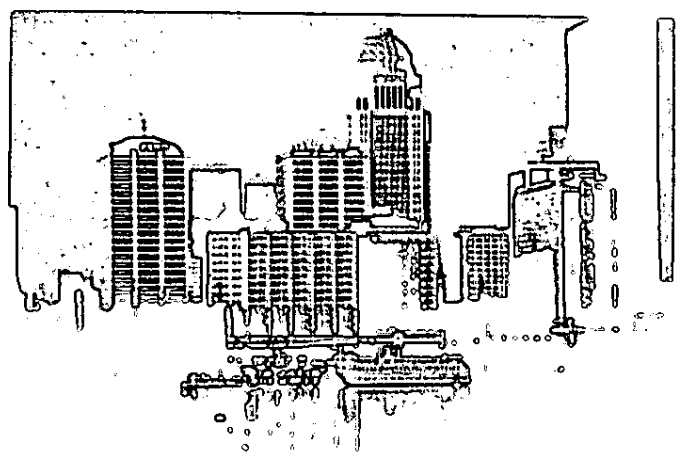


- Report is a 'guiding' policy
  - Less than 40 pages
- 54 recommendations
- Governor has passed 8 executive orders based on recommendations
- 2-3 recommendations per session are introduced to legislature

KENTUCKY

Process and Structure

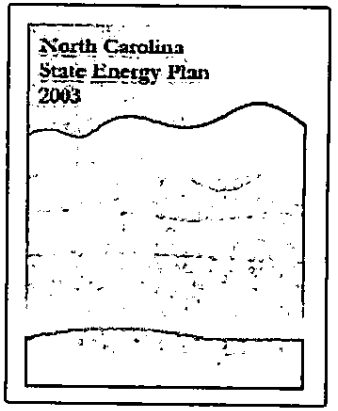
- "Took no time and no money"
- Bipartisan - Enthusiasm from both sides
- Energy Policy Task force
  - 7 members
- Public input
- *General* policy



NORTH CAROLINA

Energy Policy Working Group

- Held nine days of expert sessions
- Input from over 25 stakeholders affected by energy consumption and supply
- Public input
- Created draft set of recommended policies and programs to the Energy Policy Council



NORTH CAROLINA

Report and Recommendations

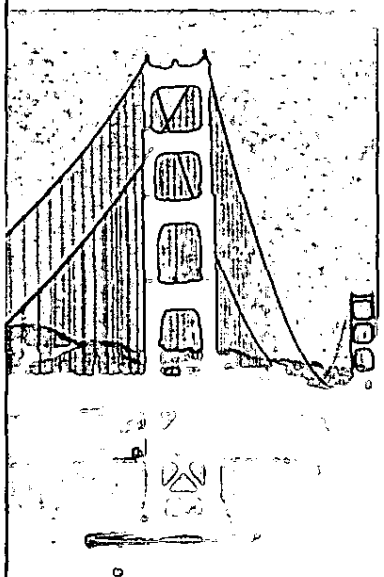
- The Council approved 93 measures to develop an energy plan.
  - Recommended 15 key legislative, regulatory, and administrative policies for action that year
- Energy plan:
  - Directs State Energy Office activities
  - Makes recommendations to utilities
  - Makes requests to general assembly
    - Develop an RPS
    - Investigate public benefits fund

NORTH CAROLINA

- State Energy Office and Appalachian State University Energy Center staff compiled the plan
- Plan involves a significant follow-up effort
  - SEO reports quarterly to the council
  - Revise the plan annually
- Funding proposals to the State Energy Office must be consistent with energy plan

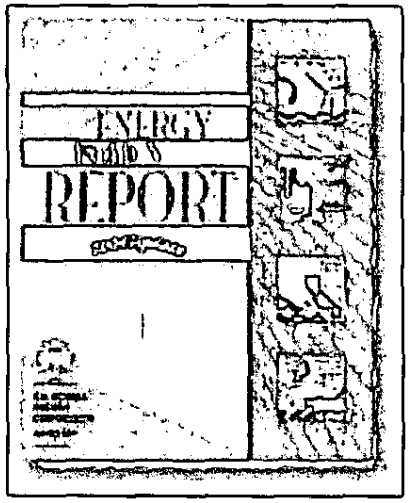
CALIFORNIA

Process and Structure



- IEPR Committee
  - 2 of the 5 commissioners comprise the committee
- 2-year process
- Public input – 60 hearings around the state
- Legislative and expert input – 140 organizations
- Governor's office reviews report and sends to the legislature

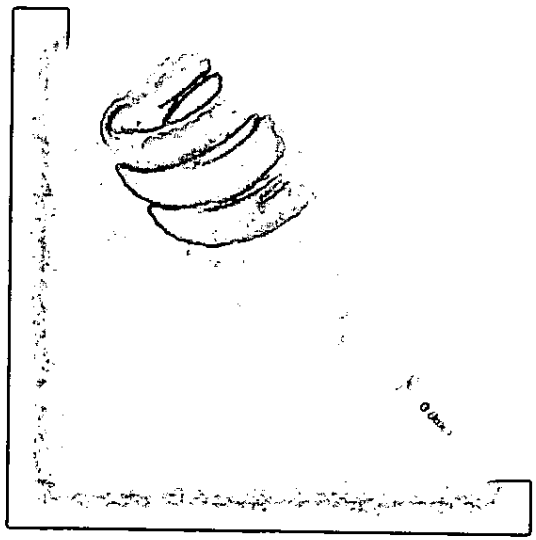
CALIFORNIA



Report and Recommendations

- Integrated Energy Policy Report (IEPR) required by statute every 2 years
- Full-time staff at CEC develop report
- Forecast and recommendation report
- Consultant cost: $2 million

IDAHO



- Established an interim committee in 2006 through a concurrent resolution
- Objectives: Ensure reliable, low-cost energy supply, protect the environment, and promote economic growth

Lessons Learned and Next Steps

General Principles

- Create a 'guiding', or *flexible*, policy
  - Use legislation or executive orders to address specifics
- Timeframe:
  - Policy development typically takes 3-24 months
- Adopt specific goals that the recommendations in the policy will help to achieve
- Create a capacity for analysis
- Determine frequency of policy updates (~ 2 yrs)
- Give the policy "teeth"

Lessons Learned and Next Steps

General Process

- Review state energy statistics and trends
- Involve state government leadership
- Consult national, state, and local organizations and experts
- Use state agency expertise and give the agency the tools it needs to operate effectively
- Involve the public
- Track progress

Contact Information

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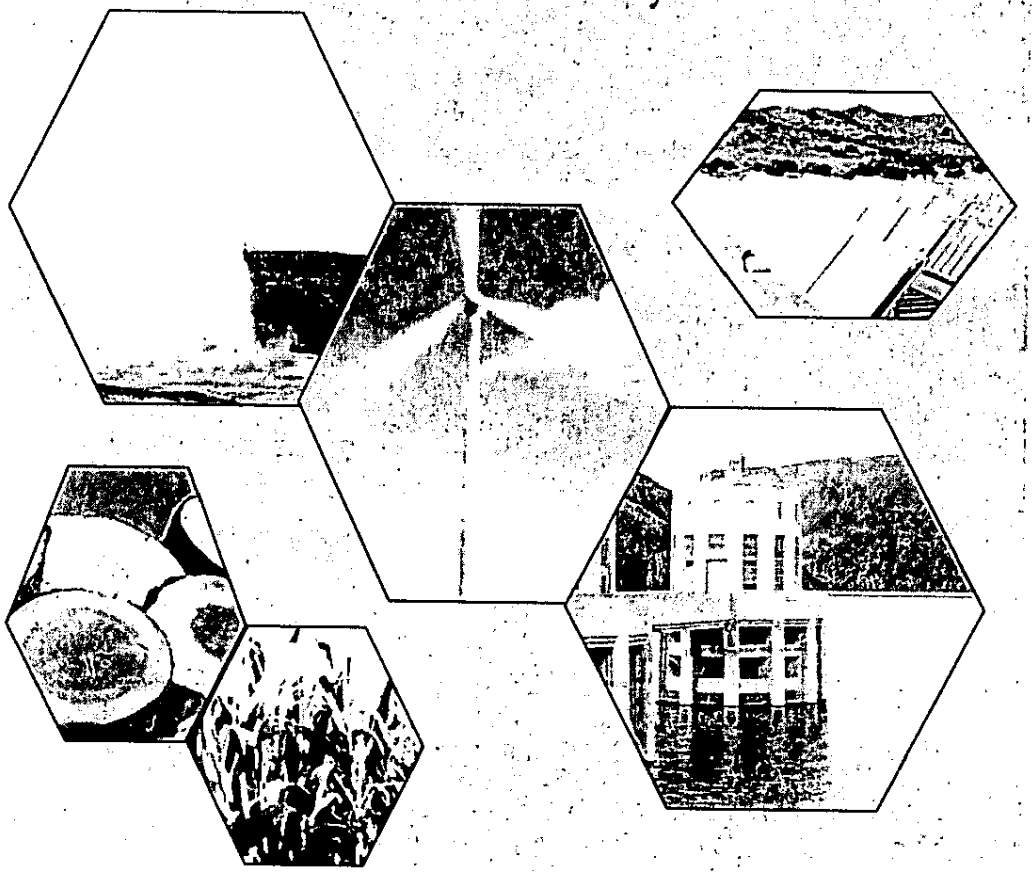
NATIONAL CONFERENCE *of* STATE LEGISLATURES

The Forum for America's Ideas

State Renewable Portfolio Standards

A Review and Analysis



State Renewable Portfolio Standards
A Review and Analysis

by
Matthew H. Brown
Jennifer A. DeCesaro

NATIONAL CONFERENCE
of STATE LEGISLATURES
The Forum for America's Ideas

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June 2005

The National Conference of State Legislatures is the bipartisan organization that serves the legislators and staffs of the states, commonwealths and territories.

NCSL provides research, technical assistance and opportunities for policymakers to exchange ideas on the most pressing state issues and is an effective and respected advocate for the interests of the states in the American federal system. Its objectives are:

- To improve the quality and effectiveness of state legislatures.
- To promote policy innovation and communication among state legislatures.
- To ensure state legislatures a strong, cohesive voice in the federal system.

The Conference operates from offices in Denver, Colorado, and Washington, D.C.

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Mr. Brown is responsible for advising state legislators on such issues as electric industry regulation, energy security, renewable energy, state energy planning, energy efficiency and alternative fuel vehicles. Mr. Brown has authored or co-authored numerous publications on energy and environmental issues, including a recent primer on energy and air quality issues, numerous publications on electricity regulation and several on renewable energy. Mr. Brown also has conducted numerous other related analyses on energy regulation, energy security and related policies. He has testified before more than 35 state legislative bodies on energy issues—often focusing on renewable energy technology and policy—and has worked closely with many state legislatures on their state energy policies. He also works extensively with other energy policy organizations' and general energy audiences on these and other energy-related issues.

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Executive Summary

Beginning in the late 1990s, many state policymakers began to express their concern that their state's energy mix had become too dependent on out-of-state fossil energy sources. These policymakers saw the economic benefits they could derive from building new in-state energy resources. Many also thought their states would benefit from the environmental attributes of renewable energy resources. As a result, the states began to adopt a renewable portfolio standard—commonly called an RPS. As of mid-2005, 19 states plus the District of Columbia have adopted a renewable portfolio standard.

In its early years this standard dictated that any electricity retailer in the state generate some part of its power from renewable energy. As it developed, portfolio standards began to rely on a new system of tradable renewable energy credits to guarantee and verify compliance. Through this credit system, each retailer needs to accumulate enough credits to demonstrate that it had met the portfolio standard's goals. One credit is equal to one megawatthour of renewable electricity. Thus, if a retailer's obligation was to comply by using 1,000 megawatt hours of electricity from renewable energy, the retailer could either generate renewable power on its own or it could buy it from another company.

As renewable portfolio standards developed, a number of similar questions began to appear in state after state. These were as follows.

- *What resources qualify toward meeting the RPS?*

  Typically, solar, wind, geothermal and small hydroelectric qualify. States do not always allow large hydro, certain kinds of biomass or other technologies like fuel cells from hydrogen to qualify, however. One state—Pennsylvania—allows waste coal to qualify for its advanced energy portfolio standard.

•*How large should the RPS be, and how quickly should it be phased in?*

The size of the RPS varies a great deal, from only 2 percentage points of the total state's generation to as high as 25 percent in the case of New York. The RPS is always phased in over a period of several years.

•*How will regulated utilities recover their costs?*

In some cases, but not all, the RPS will impose additional costs on utilities or their customers. Most state laws and regulations allow utilities to recover any additional costs related to complying with the portfolio standard, but some also place restrictions on cost recovery. A few use other funds, called public benefit funds, to reimburse utilities for any additional costs of the RPS.

• *Will out-of-state resources qualify for the state's RPS?*

Most states allow renewable energy generated from out of state to qualify for the RPS. Some place restrictions on qualification, saying that the energy must be delivered to the state or that the energy must be delivered to the regional system operator that, in turn, feeds electricity into the state.

•*Can companies use their green pricing programs to qualify toward their RPS obligations?*

Only Arizona currently allows utilities to use their green pricing programs (programs through which customers voluntarily pay a little extra each month to subsidize utility renewable energy investments) to help meet the renewable energy goals of the RPS. In general, states have concluded that green pricing programs are voluntary and are designed to allow customers to help utilities pay for investments they are not otherwise required to make.

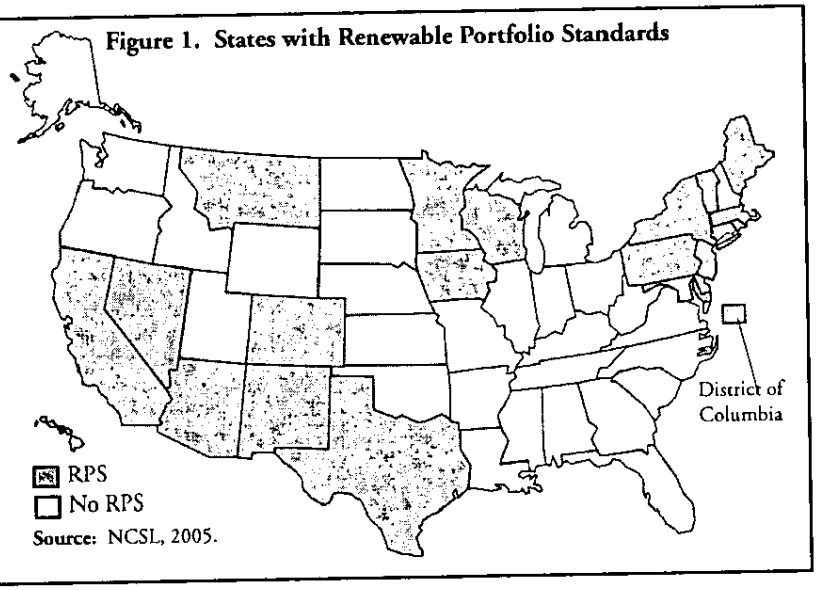
The experience with renewable portfolio standards is somewhat limited to date; many are in the early years of a multi-year phase-in. States can begin to derive some early lessons from the experience thus far, however. The document concludes with a discussion of these lessons.

INTRODUCTION

The United States generates its electricity with gas, coal, nuclear power, some oil, and some renewable energy such as wind, hydroelectric power, solar power, biomass or geothermal energy. Coal, gas, hydropower and nuclear energy dominate that mix, and probably will continue to do so for the foreseeable future. Renewable energy's currently small proportion of the total is increasing rapidly, but from a very small base. As state policymakers seek to speed up the growth in renewable energy, one of the most common policies under consideration is a renewable portfolio standard (RPS).

The renewable portfolio standard is a flexible mandate that requires power retailers to put renewable energy into the mix of fuels they use to generate electricity. In its most basic form, the portfolio standard places a requirement on utilities, saying they must build or buy a certain amount of renewable energy capacity each year. In practice, most portfolio standards have developed into more complex and nuanced policies. Twenty states and the District of Columbia now have such a standard as shown in figure 1.

Figure 1. States with Renewable Portfolio Standards



Source: NCSL, 2005.

This document describes how portfolio standards work and answers the major questions that state policymakers ask about their design. With 19 laws[1] in place around the country, a body of experience now is available that can instruct policymakers on the design of these standards.

This document is divided into several sections:

1. A discussion of what the RPS accomplishes and fails to de well;
2. Cost of the RPS and cost recovery for the RPS;
3. A description of what resources qualify for these standards;
4. The structure, size and phase-in of these standards;
5. A discussion of who administers the RPS;
6. Applicability of and exemptions from the RPS;
7. How out-of-state resources qualify;
8. A discussion of tradable renewable energy credits;
9. The overlap between green pricing programs and the RPS; and
10. Lessons from the RPS.

This document is not designed to analyze the advantages or disadvantages of a renewable portfolio standard, but to provide background to help states determine whether an RPS suits its resources, needs and priorities. Table 1 summarizes the major arguments for and against the portfolio standard.

Table 1. Portfolio Standards Pros and Cons

Proponents Say	Opponents Say
The RPS can save customers money or, at the very least can add an element of stability to electricity rates, since most renewable "fuel" is free. The capital cost of wind energy is competitive with that of coal plants.	The cost of renewable energy lies in its high capital cost, which can be as much as twice the cost of the lowest cost natural gas-fired power plants. It is possible to lock in fuel prices for natural gas.
Renewable energy can contribute to energy security by helping the country become more energy independent and, at the same time, by protecting the environment.	Renewable energy helps energy security but must be considered in the context of domestic resources such as coal or natural gas.
Wind energy is predictable, to a point. Techniques for day ahead and hour ahead projections of wind output at a particular location have improved substantially. So long as wind is well integrated with the rest of the electric system acting as a backup, wind can work well. When wind makes up around 15 percent of electricity generation, typical integration costs are around one-half cent per kilowatt hour (kWh). Solar installed in southwestern regions of the country has a production profile that closely matches the peak energy needs in those regions. Biomass, geothermal and hydroelectric power are not intermittent and can be baseload.	Wind energy is intermittent and that intermittency adds cost to wind power plants. Power companies need to be able to lock in a predictable supply of power.
The RPS presents a market-based approach to integrating valuable new renewable resources into the electric system. Perfect markets do not exist in the delivery of electric energy services. Utilities traditionally have little or no experience with such technologies. Thus, RPS policies help overcome market barriers.	An RPS is a mandate that adds complexity and new regulatory burdens to an already heavily regulated industry.
The RPS requires the power sector to adopt new technologies and to learn about and integrate those new technologies. They are ready for the marketplace, but many utility systems are not accustomed to them.	The RPS may force power systems to adopt new technologies before they are really ready. Renewable energy does not always fit into the existing system and, in some cases may need new transmission infrastructure.
The RPS diversifies the fuel mix the country uses to generate electricity. Fuel diversity can stabilize prices and alleviate the effects of supply disruptions.	Government mandates have failed in the past and can actually increase costs and risks.

Source: NCSL, 2005.

What Does the RPS Accomplish?

Depending on the area of the country, the RPS tends to produce a great deal of utility-scale wind development, landfill gas development, and some geothermal energy development. States can tailor the RPS so that, outside its simplest form, it can encourage other types of technologies such as solar, small-scale wind or fuel cells. In New England, the RPS is encouraging development of fluidized bed biomass systems.

Renewable energy project developers like the RPS because it guarantees a market for their product. The RPS creates certainty, and that certainty gives developers the confidence to make investments in resource assessment, to negotiate lease agreements with landowners, and to apply for permits. It gives them the certainty they need to make an investment and, in turn, helps developers secure financing.

As a policy tool, the RPS does a good job of using market forces to drive down prices for new renewable energy sources. Rather than set a floor price or offer a subsidy for green power, it creates a market and then drives developers to compete on price to supply that market.

What Does the RPS Fail to Do Well?

The RPS is not always the best policy tool to encourage small-scale or distributed energy technologies. In most cases, it has been designed to encourage large, utility-scale projects. Some states, such as Colorado, tailored their RPS to encourage small-scale renewable energy projects, but the results from that effort are not yet available.[2]

Unless it is designed to do so, the RPS is not the best policy to encourage higher-cost technologies. In general, it promotes competition among renewable energy technologies and results in large supplies of least-cost technologies. Several states, including New Jersey, have developed different percentage goals for different technologies. This approach creates a market for

both types of technologies and does not allow one technology to dominate. (The tiered technology approach is discussed further in the following section.)

How Much Does an RPS Cost?

Renewable portfolio standards may cost ratepayers additional money, or they may save money. This depends on several factors, including the region of the country and the design of the portfolio standard. There are several factors to consider.

- Higher requirements may equal higher costs if technology and investments are not able to keep up with the requirements of the portfolio standard.

- Regions with higher quality renewable resources may see cost reductions as the result of an RPS. Those with poorer resources may see cost increases. New Jersey, for example, does not have the near-term potential to develop the same amount of renewable resources that Colorado does, and, although Colorado has estimated that its RPS will result in cost decreases for electricity customers, New Jersey predicts that it will see cost increases of more than $11 per customer per year as the RPS reaches its targets.

- Regions that currently rely heavily on more expensive nonrenewable resources such as natural gas may see cost reductions.

- The design of the standard influences cost. A standard that asks for the lowest cost renewable energy technologies will be less expensive than one that requires carve-outs for specific, higher cost resources such as solar power. A higher goal for the less mature-and possibly more expensive-technology will make the standard more expensive.

- Cost is difficult to measure. Most renewables have no fuel cost and, as a result, can ensure price stability into the future, even if they may cost a bit more at first. There is some value to this price stability, although it is difficult to quantify. Fossil fuel-based generation faces risks from fuel price increases and future environmental regulation.

Table 2 demonstrates the results of several cost studies of renewable portfolio standards in various parts of the country. In general, the studies showed neither dramatic cost increases nor dramatic savings. Savings or cost increases all were within 0.5 percent of the existing rates, approximately $3.50 per year for the typical household. New Jersey was the exception to this rule, with a substantially higher cost estimate.

Table 2. Cost Impacts of Renewable Portfolio Standards

State	Author(s) of Study	Incremental Target Year	Overall Rate Impacts	Average Effect on Residential Bill
California	UCS/SEA/ LaCapra	41,000 GWh* (2010)	Savings: 0.5% in 2010	Savings:$3.50 per year in 2010
Colorado	Binz	4,500 GWh (2020)	Savings: 0.5% expected value	Savings: $2.40 per year expected value
Washington	Tellus et al.	14,300 GWh (2023)	No impact	No effect
Minnesota	Wind	6,300 GWh (2010)	Savings: 0.7% on average	Savings: $4.60 per year on average
Iowa	Wind	4,400 GWh (2015)	Savings: 0.3% on average	Savings: $3.40 per year on average
Wisconsin	UCS/SEA/ LaCapra	7,500 GWh (2013)	Cost: 0.6% on average after 2010	Cost: $3.30 per year on average after 2010
Pennsylvania	Black and Veatch	17,000 GWh (2015)	Cost: 0.46% on average	Cost: $3.50 per year on average
New Jersey	CEEEP/ Rutgers	15,500 GWh (2020)	Cost: 3.7% in 2020	Cost: $33 per year in 2020
New York	DPS/SEA/ LaCapra	12,000 GWh (2013)	Cost: 0.32% in 2009	Cost: $3 per year in 2009

* GWh = 1,000 MW

Source: Lawrence Berkeley National Laboratory, 2004.

Cost Recovery

The deployment of new renewable energy resources and supporting transmission infrastructure can be costly, and the method used by utilities to recover those costs can be an important issue for any state that still regulates some or all of its utilities' electricity rates. Even in states that restructured their utility industry, cost recovery methods can be controversial if the utilities continue to operate under a rate cap—meaning they cannot raise their electricity rates. States can address cost recovery in several ways. In some states, legislation specifically guarantees that they can recover their costs-eventually, if not immediately; in others, certain categories of costs are specified that utilities can or cannot recover. A third approach describes the mechanism through which utilities can recover their costs (such as a surcharge on utility rates for all customers).

- Arizona lets utilities use its system benefit fund (a fund established and financed through a small charge that every utility customer pays) to pay for additional costs that the RPS imposes on them.

- California's utility commission will set a benchmark price for renewable energy purchases. The system benefit fund will cover costs over this benchmark price. As of early 2005, the utility commission had not yet set the benchmark price, although it is likely to be based on an estimate of long-term market prices for renewable energy.

- Connecticut's distribution utilities (those that serve Connecticut customers with power they buy from other companies that own power plants) have a guarantee that they will recover the costs of the first 100 megawatt (MW) of renewable energy they purchase.

- Maryland and the District of Columbia guarantee that their utilities will be able to recover their prudently incurred costs, including compliance fees (those fees that companies pay as an alternative to buying renewable energy). The mechanism would be an additional fee placed on all customers' bills. Maryland specifies that compliance fees are recoverable only if the commission determines that compliance fees represent the least cost way to meet the standard, if the utilities' renewable energy supplier fails to meet its obligations, or if Tier I resources are unavailable.

- Legislation in Nevada, New Jersey, New Mexico, Rhode Island and Wisconsin specifies that utilities can recover costs related to the RPS if the commission determines that they are prudent and reasonable. In Nevada, contracts entered into between renewable energy providers and a Nevada utility and approved by the Nevada Public Utilities Commission are deemed prudent by statute for purpose of cost recovery. Conversely, New Mexico's statute stipulates that utilities can recover reasonable costs related to interconnecting the renewable energy generators with the power grid. This legislation adds that the utilities can defer recovery of their costs by tracking the costs in an account, and that those deferred costs can accrue interest until they are actually placed into the rate base. Rhode Island adds that the distribution utilities may recover their costs for supporting the New England credit trading program. (A later section of this paper addresses credit trading.)

Cost Caps on the RPS

Many states try to limit the effects of the costs of the RPS on individual consumers. They do this in several ways, including explicit caps on potential increases in consumers' bills or through indirect ways such as alternative compliance mechanisms and penalties, all of which are described below.

Colorado is one state that sets an explicit cost cap with a requirement that the portfolio standard not result in an additional charge of more than $.50 per residential customer per month. The cost cap in Colorado may create some difficulties as the state attempts to meet its 0.4 percent solar energy goal. Installation of solar energy tends to cost in the range of $8,000 to $9,000 per Kilowatt (kW), compared to a typical cost of approximately $1,000 to $1,200 for wind energy. The interaction of the cost cap and the solar requirement may create challenges for the state.

Massachusetts,[3] New Jersey, and Rhode Island give an option to comply with the RPS by paying a fee of $.05 per kWh; Connecticut's fee is $05.5, instead of purchasing either tradable renewable energy credits (RECs) or entering into a contract to buy renewable energy. In Maryland, compliance fees are $.02 per kWh for Tier 1 resources and $.015 for Tier 2 resources. The funds from these alternative compliance mechanisms in Connecticut, Maryland, Massachusetts and New Jersey go into a fund to support other clean energy projects.

Montana requires all non-restructured utilities to comply with the standard as long as the per kilowatt hour cost of the renewable generation does not exceed the cost of power from other generating sources by more than 15 percent. A public utility that does not comply with the standard may be assessed an administrative penalty of $10 for each megawatt hour of renewable energy credits they fail to procure.

What Qualifies as Renewable?

States make many distinctions about which resources count toward the renewable portfolio standard. They distinguish not only among the technologies that qualify as renewable, but also the size of the qualifying system and other characteristics of the system.

In the majority of states that have an RPS, all renewable generation meets the renewable standard, whether or not it existed prior to adoption of the standard. Thus, if a state had a 20 percent standard such as California's, then any existing renewable resources qualify, but companies would need to acquire new resources to come up to the 20 percent standard. Just six states address this point.

- Hawaii allows the use of all preexisting renewables to meet the RPS.
- Maryland places a limit on the use of preexisting renewables.
- Massachusetts does not allow preexisting renewables to count toward the RPS; all resources must be new. However, the Department of Energy Resources may provide a preexisting plant with a waiver that qualifies any increased output over a defined annual baseline as "new.
- Montana does not allow most preexisting renewables to count towards the RPS—all qualifying resources must have commenced operations after January 1, 2005.
- Two of the remaining three states—Rhode Island and Wisconsin—allow preexisting facilities to account for only a certain percentage of each year's requirements. In Rhode Island, for example, no more than 2 percent of each year's requirements can be met with pre-1998 resources. Texas allows retail electric providers to use pre-1999 resources to offset some of their RPS obligation if they have preexisting supply agreements.

The size of the qualifying renewable energy system is a question only for hydroelectric power. States that include hydroelectric power in their standard usually limit the size of the system that qualifies. Finally, five states—Connecticut, Maryland, New Jersey, New York and Pennsylvania—and the District of Columbia, separate the qualifying technologies into two tiers. The rationale for having two tiers is not outlined in any state's RPS language. However, those included in the first tier tend to be less environmentally intrusive than those in the second tier, which usually include large-scale hydroelectric power and waste-to-energy facilities. States usually have different percentage goals for each tier. This is described in greater detail below.

Qualifying Technologies

Every renewable technology has its own definition and a unique set of policy issues. This section describes each technology and its relationship to the RPS.

Biomass

In the most general sense, biomass is plant matter such as trees, grasses, agricultural crops and residues or other biological materials, such as municipal solid waste and sewage sludge. Biomass power plants burn this material as fuel or convert it into liquid or gaseous forms to produce electricity, among other things. Some state definitions of biomass are more broad and may include landfill gas, municipal waste and digester gases from municipal wastewater treatment facilities.

Because biomass is one of the more complex renewable technologies, it consistently raises a number of policy issues. These include:

- Whether all the qualifying biomass resources included in the definition of biomass are truly renewable.

- What is the emissions profile of biomass? Biomass is unusual among the renewables in that it releases some emissions into the air. As a general rule, these emissions (especially of sulfur) are very low and are subject to the same regulations as all other power plants. Biomass power plants generate the same amount of carbon dioxide as fossil fuel plants, but as new trees or crops grow, they remove carbon dioxide from the atmosphere. As long as plants are continuously replenished to make

a feedstock for biomass energy, the biomass power plants are carbon neutral, meaning that they release zero net carbon dioxide emissions.

- Because of the abundance of biomass energy resources, the advanced stage of many biopower technologies, and the prevalence of landfill gas facilities, biomass has the potential in some states to dominate the resources that supply a state's RPS.

These policy discussions often result in laws that distinguish between desirable and less desirable kinds of biomass. Some states exclude certain categories of biomass (such as wood waste that has been treated with chemical preservatives) from the RPS altogether. Others place the biomass they feel is less desirable into Tier II.

Every state with a renewable portfolio standard includes biomass in its definition of a renewable energy resource. It is what is included in the definition of biomass that varies from state to state, however. Six states—Arizona, California, Iowa, Maine, Texas and Wisconsin—do not further define the biomass resource or generating system. The remaining states and the District of Columbia further define biomass.

Some of those states that further define biomass have an all-inclusive definition and some differentiate among resources. The definition of biomass in Colorado, Minnesota, Nevada, New Mexico and Rhode Island is comprehensive and includes agricultural wastes, wood wastes, energy crops, landfill methane, biogas, municipal wastes, industrial digester gases and neat biodiesel.[4]

In contrast, Hawaii differentiates among biomass resources and includes only the biomass portion of municipal solid waste, biofuels or fuels derived entirely from organic sources in its definition of biomass. Hawaii allows landfill gas and waste-to-energy to qualify for the RPS, but does not define them as biomass.

Vermont focuses its biomass definition on methane and other flammable gases produced by the decay of sewage treatment plant and landfill wastes and the anaerobic digestion of agricultural products, byproducts or wastes. Excluded from this definition are all forms of solid waste, with the exception of agricultural and silvicultural wastes.

Montana is another state that differentiates among biomass resources and includes landfill or farm-based methane gas, gas produced from wastewater treatment, and "low-emission, nontoxic biomass" based on dedicated energy crops, animal wastes, or solid organic fuels from wood, forest, or field residues. Not included in this definition are wood pieces that have been treated with chemical preservatives such as creosote, pentachlorophenol, or copper-chroma-arsenic.

In Connecticut, a biomass facility may include biomass gasification plants that use as fuel biomass that regenerates or that, when used, will not deplete the resource. The state places these biomass facilities in Class I or Class II, based on the date that operations began. If the facility began operation after July 1, 1998, and has a nitrogen oxides emission rate of less than .075 pounds per million Btu of heat input, it is in Class I; facilities in operation prior to July 1, 1998, with a nitrogen oxides emission rate of .2 pounds per million Btu of heat input or less, are in Class II. Connecticut does not include methane gas from landfills in the biomass definition, but includes it as a Class I resource. Connecticut's NOx emission limit of 0.075 pounds per million Btu is an important criterion. Class I biomass resources must not emit more than .0075 pounds per million Btu of NOx.

Maryland identifies qualifying biomass as nonhazardous organic material available on a renewable or recurring basis. The state specifically excludes from this category unsegregated[5] solid waste, post-consumer waste paper, and invasive exotic plant species. Tier I includes all qualifying biomass, as well as methane from anaerobic digesters or wastewater treatment plants; Tier II includes the incineration of poultry litter and waste-to-energy technologies.

Biomass is included only in New Jersey's Class I renewables. Included in the definition are methane gas, bioenergy crops and wood wastes.

New York is another state that includes biomass only in one tier. Eligible biomass resources included in the Main Tier of New York's RPS are waste-to-energy facilities. The Main Tier[6] also includes biogas and liquid biofuels. The Customer-Sited Tier includes no biomass technologies.

Pennsylvania includes biomass in both Tier I and Tier II. The Tier I definition of biomass includes agricultural wastes, wood wastes, sustainable crops and biomass portions of municipal solid waste. Also included in Tier I, but not in the definition of biomass, are landfill methane, biogas and liquid biofuels. Tier II resources include wood pulp and wood manufacturing byproducts.

The District of Columbia defines qualifying biomass as agricultural wastes, wood wastes and cofired biomass.[7] Tier I includes all qualifying biomass, while Tier II includes waste-to-energy technologies.

Fuel Cells

Hydrogen is the simplest and most plentiful element, yet it does not occur naturally as a gas. Some type of conversion process must separate the hydrogen from another element, such as from oxygen in water. This process requires an energy source, such as a wind turbine, solar cell or fossil fuel. Once the hydrogen is separated, a fuel cell passes hydrogen through a membrane to produce electricity, heat and water. Often compared to a battery—both convert the energy produced by a chemical reaction into usable electric power—a fuel cell will produce electricity as long as fuel (hydrogen) is provided and will never lose its charge. Hydrogen fuel cell technology shows a great deal of promise, but is still new and relatively untested.

Some states permit fuel cells to qualify as a renewable technology that can help meet the portfolio standard requirements. States that classify resources by tiers always class fuel cells as a Tier I resource. Two issues arise consistently when states discuss fuel cells, however:

- Fuel cell technologies still are in the early stages of development and their potential to penetrate the renewables market is small; and
- A state can specify that the fuel cells need to be powered by renewable resources; without this specification, a fuel cell powered by fossil fuels may receive credit in a state's RPS.

Thirteen states include some form of fuel cell technology in their RPS. Seven of the states—California, Hawaii, Massachusetts, Montana, New Jersey, Rhode Island and Wisconsin—and the District of Columbia qualify the fuel cell definition by requiring that the fuel cells use renewable resources. New Mexico states that the fuel cell may not be fossil fueled. Maryland specifically requires that the fuel cell use methane or qualifying biomass resources.

Hawaii is unique in that it addresses the potential for a fuel cell to be powered simultaneously by both renewable and nonrenewable energy sources, but only the renewable portion receives credit for the RPS. Pennsylvania states that the energy source for the fuel cell must be obtained without combustion.

Three states—Connecticut, Maine and New York—do not further qualify the requirements of the fuel cell.

Geothermal

Geothermal energy—the earth's heat—is the thermal energy contained in the rocks and fluids in the earth's crust. In most areas, this heat reaches the surface in a very diffuse state. Due to a variety of geological processes, some areas—including substantial portions of many western states—are underlain by high-temperature geothermal resources, which have tremendous potential for producing electricity. Geothermal power plants use well-established technology but have a high initial cost (mostly because developers usually have to drill a significant number of exploratory wells before they locate an effective underground resource. There is no fuel cost once developers find the resource, however. Geothermal resources are based in nature and geothermal plants have capacity factors as high as 97 percent, higher than any other generation resource.

Certain issues consistently arise when states discuss geothermal resources.

- Although most geothermal power plants are considered to be a completely clean source of energy, certain air emissions may be associated with the operation of certain types of geothermal plants. Flash steam geothermal plants convert ("flash") hot water in an open process into steam to drive turbines. This process exposes the minerals and gases in the geothermal fluid to the above-ground atmosphere. The nitrogen oxide and sulfur dioxide emissions associated with flash steam geothermal plants result from capturing and incinerating the hydrogen sulfide that occurs naturally in some geothermal resources. The chemical composition of each geothermal reservoir is unique, but certain compounds such as arsenic and boron may be commonly found in these resources due to their volcanic nature. In a flash steam plant, these minerals may pose a hazard that must be addressed.

- Many newer geothermal plants use a modern binary geothermal process, where the geothermal fluids pass through a heat exchanger and never expand in the open above-ground atmosphere. In these binary plants, neither nitrogen oxide and sulfur dioxide emissions nor hazardous mineral deposits pose a problem, since binary plants are completely closed loop systems; the geothermal fluids are re-injected into the reservoir to be reheated and reused.

- Various siting issues may be associated with geothermal facilities. The initial resource exploration can be intrusive if numerous test wells are drilled into the ground. Once developers locate an adequate resource and they situate the geothermal power facility directly over that fuel source, it requires no additional land. In scenic areas, developers build the geothermal facility with a low height profile and use various mitigation measures to reduce intrusion on the visual landscape.

- Potential water quality issues arise in development of a geothermal well. Geothermal water contains higher concentrations of dissolved minerals than do cold groundwater aquifers. To prevent mixing geothermal water and groundwater, developers cement pipe or casing into the ground.

- The availability of the geothermal resource varies geographically. Geothermal resources that are capable of generating electricity exist in most western states including, Texas. No eastern states have resources that are capable of generating geothermal electricity.

- Some western states with a significant geothermal resource may find that geothermal energy takes a considerable share of the total renewable resource standard, potentially overwhelming some other resources.

Thirteen states—California, Colorado, Hawaii, Maine, Maryland, Montana, Nevada, New Jersey, New Mexico, Pennsylvania, Rhode Island, Texas and Wisconsin—and the District of Columbia, include geothermal resources in their definitions of what qualifies as renewable resource within the portfolio standard. Rhode Island does not directly refer to geothermal but, rather, to "the heat of the earth." Although some eastern states include geothermal in their definitions of renewable energy, they will not see development of geothermal electric power plants because they lack geothermal resources. Such states could, however, see geothermal heat pumps, which use the constant temperature a few feet below ground level to help pump warm air in winter or cool air in summer into a building or a home; heat pumps do not generate electricity.

Hydroelectric

Hydroelectric power is generated by the power of moving—but not necessarily falling—water. A pumped storage hydroelectric plant produces energy during peak demand periods using water pumped into an elevated reservoir during off-peak periods. When a facility uses both pumped reservoir

water and natural current flow, it is referred to as a combined pumped-storage hydroelectric plant. Low-impact hydropower facilities minimize the environmental impacts—river flows, water quality, and threatened and endangered species—of their facilities, which does not necessarily mean that they are small in scale.

Hydroelectric is a well-established technology: therefore, its issues also are well established. They include the following.

- Hydropower facilities can affect a large geographic area. The storage reservoirs can inundate large areas of forest, farmland, wildlife habitats, scenic areas and even towns, especially as part of larger projects with greater power generation. In addition, dams can cause significant changes in river ecosystems, both upstream and downstream.

- Operating hydropower facilities have had detrimental effects on fish populations, some of which are endangered or threatened species. Dam operators use mitigation efforts such as fish ladders and screens around turbine blades to lessen the severity of these effects, but the controversy over fish dominates discussion of hydropower policy, particularly in the Pacific Northwest.

- Because so many hydropower facilities—both large and small—are in operation and have paid off much of their capital costs, the technology potentially could take over the RPS unless states restrict the requirement by specifying that only new facilities qualify or by specifying that only facilities below a certain size qualify.

- Particularly with drought in the Pacific Northwest the output from hydropower plants is unpredictable.

Only four states do not include hydroelectric power as a qualifying renewable energy source in their portfolio standards. The 16 that include hydroelectric power do so at varying levels. Table 3 outlines the qualifications in each participating state.

Five of the states that include hydroelectric power in the RPS—Hawaii, Maine, Nevada, New Mexico and Texas—do not place restrictions on the types of facilities that qualify as renewable.

Table 3. State RPS Qualifying Hydroelectric Resources	
State/Jurisdiction	**Qualifying Hydroelectric Resource**
California	Small hydroelectric generation of 30 MW or less owned by an electrical corporation as of the enactment.
Colorado	Hydroelectricity with a nameplate rating of 30 MW or less.
Connecticut	Run-of-the-river hydroelectric power facilities with a generation capacity of 5 MW or less that does not cause an appreciable change in river flow that began operations after effective date.
Maryland	In Tier I, small hydroelectric power plants of less than 30 MW in capacity; in Tier II, hydroelectric power other than pump storage generation.
Minnesota	Hydroelectric power plants with a capacity of less than 60 MW.
Montana	Hydroelectric projects that do not require a new appropriation, diversion, or impoundment of water and that has a nameplate rating of 10 megawatts or less.
Nevada	Small hydroelectric generation of 30 MW or less.
New Jersey	Included only in Class II at hydroelectric generation facilities of 30 MW or less.
New York	Hydroelectric power plant upgrades and hydroelectric plants of under 30 MW without storage impoundments.
Pennsylvania	Low-impact hydroelectric in Tier I and large-scale hydroelectric (including pumped storage) in Tier II.
Rhode Island	Small hydroelectric generation of 30 MW or less.
Vermont	Hydroelectric facility with a generating capacity of 200 MW or less.
District of Columbia	In Tier II, hydroelectric power other than pumped storage generation.
Source: NCSL, 2005.	

Ocean Energy

New technologies to harness the movement and heat of the ocean are in the early stages of penetrating the renewable energy market. One such technology uses wave movement to drive an electrical generator; the power then is transported to shore via an underwater cable. Ocean thermal energy conversion technologies use the ocean's natural thermal gradient—the fact that the ocean's layers of water have different temperatures—to drive a power-

producing cycle. Technology also can harness tidal currents using offshore underwater devices that resemble wind turbines.

The world's oceans cover more than 70 percent of the earth's surface, giving them the potential to become one of the world's major power sources. In spite of this, there are issues associated with their inclusion in a state's RPS, including the following.

- Ocean conversion technologies are in the early stages of development, and their potential to penetrate the renewables market is so small at this time that they might be overlooked.

- Because of the off-shore nature of these technologies, their potential effect on the ocean's fisheries and surfers could prompt opposition.

Coastal states—California, Connecticut, Hawaii, Maine, Massachusetts, New Jersey, New York, Rhode Island and Texas—and the District of Columbia include ocean resources in their definitions of qualifying renewable energy technologies. Those that have tiered resource classifications include these technologies in the first tier. Identified resources include ocean waves, tidal current and ocean thermal energy conversion. Although Wisconsin, is not a coastal state, it borders Lake Michigan and includes tidal or wave action resources as qualifying technologies.

Solar

Solar technologies harness the sun's energy to provide heat, light, hot water and electricity. Photovoltaic (solar cell) systems convert sunlight directly into electricity. Concentrating solar systems use the sun's heat to run a generator to produce electricity.

Although solar technologies are widely accepted, there are issues associated with their inclusion in RPS policies, including the following.

- Solar technologies are commercially available, yet they rarely have been deployed on a large, utility-scale level. Without specific set-asides in a state's RPS policy, solar technologies are unlikely to benefit from the RPS.

- Large-scale solar installations require a considerable amount of open space, which could result in potential siting issues.

- If solar generators that are not connected to the power grid qualify for the RPS, how are they tracked?

- Because solar system output varies with season and daily solar intensity (even though a photovoltaic system will provide some energy on a completely overcast day), solar energy production may not be entirely constant or predictable. This is usually a significant problem only in extremely rainy climate zones.

- Solar facilities cost considerably more than most other renewable resources and can drive up the cost of an RPS.

Every RPS allows solar resources to qualify. States with tiered resource structures include it in the first tier. Five states—Arizona, Colorado, Nevada,[8] New Jersey and Pennsylvania—set aside a specific percentage of their RPS goal solely for solar resources. These setasides recognize the high initial cost of solar and thereby ensure a market is created for solar development.

Wind

Fossil and nuclear generators create steam that spins a turbine to generate electricity; wind turbine blades connect to a shaft that spins the turbine to generate electricity. For utility-scale wind, a large number of high-capacity turbines are connected to a single point of control to form a wind plant or wind farm. Homeowners, farmers and ranchers in windy areas typically use small wind systems for off-grid electricity generation, water pumping or other applications.

Although wind energy produces no air or water pollution and poses no threat to public safety, it does face obstacles, including the following.

- The best wind sites often are far from major load centers and require significant transmission investment to develop.

- A public perception that the land between turbines is occupied and cannot be used for other purposes. In fact, wind turbines themselves occupy only a small fraction of this land area, and the rest can be used for gazing, agriculture, or other purposes or left in its natural state.

- Its effect on wildlife–especially bird and bat populations–whether endangered species are affected, and whether wind energy may contribute to habitat degradation or loss maybe a problem.

- Concerns exist about the visual effect of wind turbines and their effect on property values and tourism.

- Because the wind does not blow all the time, its intermittency can affect the integration of utility-scale wind facilities onto the grid.

- Wind technology is widely accepted and cost-effective; because of this, utility-scale wind facilities have the potential to dominate a state's RPS to the exclusion of other renewable technologies.

As is the case with solar, wind technologies are included in every RPS. In those states that have tiered resource structures, wind is included in the first tier. New York is the exception; here, it is included in both the Main Tier and Customer-Sited Tier. No state distinguishes between the types of wind technologies that qualify, i.e., small and utility-scale.

Other Resources

Additional resources and technologies are identified in the definitions of qualifying renewables in five states (see table 4).

Table 4. Other Qualifying Resources in State RPS	
State	**Other Qualifying Resources**
Connecticut	Low-emission advanced renewable energy conversion technologies included in the Tier I classification.
Hawaii	Includes an assortment of alternative energy sources such as solar and heat pump water heating; seawater air conditioning district cooling systems; solar air conditioning and ice storage; quantifiable energy conservation measures; and the use of waste heat from cogeneration and CHP (combined heat and power) facilities, excluding fossil-fueled qualifying facilities.
Massachusetts	Hydrogen from renewable energy resources and technologies.
Montana	The renewable energy fraction from the "eligible renewable resources" of electricity production from a multiple-fuel process with fossil fuels.
Nevada	Allows for "qualified energy recovery process." That is defined as a system with a nameplate capacity[9] of not more than 15 MW that converts the otherwise lost energy from: (a) The heat from exhaust stacks or pipes used for engines or manufacturing or industrial processes; or (b) The reduction of high pressure in water or gas pipelines before the distribution of the water or gas, to generate electricity if the system does not use additional fossil fuel or require a combustion process to generate such electricity. The term does not include any system that uses energy, lost or otherwise, from a process that has as its primary purpose the generation of electricity, including, without limitation, any process involving engine-driven generation or pumped hydrogeneration.
Pennsylvania	Incorporates a range of other resources and technologies, including waste coal, coal mine methane, demand-side management and distributed generation.
Texas	Specifically excludes all fossil fuels and waste products from fossil fuels. Indirectly, this excludes fuel cells that rely on hydrogen extracted from natural gas or any other fossil fuel.
Vermont	No form of nuclear is considered renewable. Qualifying SPEED resources are contracts for in-state resources in the SPEED program that meet the definition of new renewable energy, whether or not renewable energy credits are attached. Nonqualifying SPEED resources are contracts for in-state resources in the SPEED program that are fossil-fuel based, combined heat and power facilities. At least 20 percent of the facility's fuel's total recovered energy must be thermal and at least 13 percent must be electricity. The design system efficiency must be at least 65 percent, and the facility must meet air quality standards established by the Agency of Natural Resources.
Source: NCSL, 2005.	

Structure, Size and Phase-In of RPS

The size of the RPS—usually measured in a percentage of electric generation or electric capacity or energy—typically is one of its most important parts. Whether energy or capacity is used as the measure of the size of the RPS is an important factor. California and Nevada, for example, use energy as the RPS measure. Iowa, Minnesota and Texas use capacity as the RPS measure. For example, Texas requires 2,000 MW of renewable generation capacity by 2009. If this RPS requirement is met from wind with a 30 percent capacity factor, it could be less than the energy equivalent renewable output of only 800 MW of geothermal in Nevada with a 97 percent capacity factor. Thus, absolute percentages are not necessarily an accurate measure of the relative magnitude of a state RPS requirement.

Most states phase in their requirements over several years. Table 5 illustrates the size of the RPS in the 19 states and the District of Columbia, with a standard in place. They range from a low of 1.1 percent in Arizona to a high of 25 percent is in New York, with varying degrees in between. Again, these percentages must be compared in the context of whether they are an energy requirement or a capacity requirement.

Table 5. State RPS Requirements

State/ Jurisdiction	Title of Standard	Renewable Energy Requirement	Deadline
Arizona	Environmental Portfolio Standard	1.1%	2012
California	Renewables Portfolio Standard	20%	2010
Colorado	Renewable Energy Requirement	10%	2015
Connecticut	Renewables Portfolio Standard	10%	2010
Hawaii	Renewable Portfolio Standard	20%	2020
Iowa	Alternative Energy Law	105 MW - 2%	1999
Maine	Renewables Portfolio Standard	30%	2000
Maryland	Renewable Energy Portfolio Standard and Credit Trading	7.5%	2019
Massachusetts	Renewable Energy Portfolio Standard	4%	2009
Minnesota	Xcel Energy Wind and Biomass Generation Mandate	1,125 MW wind 125 MW biomass	2010 N/A
Montana	Montana Renewable Power Production and Rural Economic Development Act	15%	2015
Nevada	Renewable Energy Portfolio Standard	15%	2013
New Jersey	Renewables Portfolio Standards	6.5%	2008
New Mexico	Renewables Portfolio Standard	10%	2011
New York	Renewable Portfolio Standard	25%	2013
Pennsylvania	Alternative Energy Portfolio Standard	18%	2020
Rhode Island	Renewable Energy Standard	16%	2019
Texas	Goal for Renewable Energy	2,000 MW	2009
Vermont	Renewable Energy, Efficiency, Transmission and Vermont's Energy Future	10% of 2005 retail electricity sales	2012
Wisconsin	Renewable Portfolio Standard	2.2%	2011
District of Columbia	Renewables Portfolio Standard	11%	2022

Source: NCSL, 2005.

States approach the timeline for meeting the RPS target in various ways. The majority has an annual or biannual incremental increase, often 1 percent, until a particular year. A handful of states have a five-year increase, and Colorado has uneven increases; of 3.6 percent and 10 percent. Most of the remaining states do not identify specific incremental increases; instead, they identify only the final target date.

Vermont's SPEED Program

Vermont approached the RPS in a unique way by creating the sustainably priced energy enterprise development (SPEED) program. By January 1, 2007, the Vermont Public Service Board is required to establish SPEED, which is intended to encourage the development of renewable energy projects and long-term contracts for renewable energy. Prior to January 1, 2012, the Public Service Board is required to determine the amount of qualifying SPEED resources that have come into service or that are projected to come into service between January 1, 2005, and January 1, 2013. If the SPEED resources exceed total statewide growth in demand between 2005 and 2012 or if they exceed 10 percent of the total statewide load for 2005, the RPS will not be in force. If the established goal had not been met, the RPS will go into effect one year following the board's determination.

Those states with tiered resource classifications tend to have a yearly increase for Tier I resources, while Tier II resources are either given one target or long-range incremental increases.

The deadline for meeting the standards in two states—Iowa and Maine—has passed; in fact, Maine met the standard with hydroelectric and biomass before the RPS passed, and Iowa exceeded its standard using wind. Texas will probably meet its 2009 goal by the end of 2005. The remaining of the states still faces deadlines, which range from 2007 to 2020. Massachusetts is the only state that has neither a fixed target date nor a percentage. The state has a 4 percent requirement by 2009 that will continue to increase by 1 percent per year until the state Division of Energy Resources ends the increases.

Oversight and Review of RPS

Four states—Hawaii, Maryland, Rhode Island and Vermont—call for additional review of the RPS.

Hawaii RPS Study

The Hawaii Legislature passed a renewable portfolio standard during its 2004 legislative session. Senate Bill 2474 (Hi. Rev. Stat. Ann. §§269-91 – 269-95) required the public utilities commission (PUC) to conduct a renewable portfolio standards study. By December 1, 2006, the PUC must develop a utility ratemaking structure to provide incentives that encourage Hawaii's electric utility companies to use the state's renewable energy resources to meet the RPS. The PUC is to look at allowances for deviation from the standards if the utilities cannot meet them effectively.

In addition to its own study, the PUC must contract with the University of Hawaii's Natural Energy Institute to conduct independent studies about projected standards for five and 10 years beyond the current standards. The institute also will look at the capability of the state's utility companies to achieve the RPS in a cost-effective manner, factoring in the effect on rates, reliability, cost of renewable energy resources and technologies, and environmental impacts.

The PUC will revise the RPS if the study indicates in conflict with the standards established in the 2004 legislation. The PUC will update the Legislature prior to the start of the 2009 session and every five years thereafter.

Maryland RPS Review

The Maryland General Assembly passed an RPS—Senate Bill 869, Md. Code Ann. §§7-700 – 7-710—during the 2004 legislative session. Included is a requirement that the Public Service Commission (PSC) provide a status report to both the governor and the General Assembly by December 1, 2009. The status report will include a review of the RPS implementation; the availability of, and the price effect on, Tier I renewable energy sources; the amount of compliance fees that electricity suppliers pay; and the subsequent use of those fees to create new Tier I renewable energy sources.

The PSC must conduct a review of the RPS before January 1, 2016, and report to the governor and General Assembly by January 1, 2017. This review will evaluate the environmental and economic effects of the standard, including the effect of Tier II renewable sources. The PSC will develop recommendations for the continuation of the RPS for both Tier I and Tier II sources and include the classification of resources in tiers, alterations to

the tier system, and whether the tiers should continue, and if so, at what percentages.

Rhode Island RPS Review

The Rhode Island Public Utilities Commission (PUC) must determine the adequacy of renewable energy supplies to meet the increase in percentage requirements to go into effect in 2011 and then again in 2015. If the PUC determines that inadequate supply exists, it may delay the implementation of the scheduled percentage increases for one year or may recommend to the General Assembly a revised schedule of percentage increases.

Vermont RPS Report

The Vermont Public Service Board must file a report with the Senate committees on Natural Resources and Energy and on Finance and the House committees on Natural Resources and Energy and on Commerce before December 30, 2007, and again before December 20, 2009. The report should include:

- The total cumulative load growth in Vermont from 2005 through the end of the year preceding the date the report is due;
- A report on the tradable renewable energy credit market, including prices;
- A report on the SPEED program;
- A summary of contracts held or projects developed by Vermont retail electricity providers;
- An estimate of potential effects on rates, economic development and jobs if the renewable energy target is met and if it is not met;
- An assessment of the supply portfolios of Vermont retail electricity providers;
- An assessment of the energy efficiency and renewable energy markets; and
- Any recommendations for statutory change, including recommendations for rewarding utilities that make substantial investments in SPEED resources.

ADMINISTRATION OF THE RPS

In almost all cases, a state's Corporation Commission, Public Utilities Commission, Public Service Commission or Public Utilities Board oversees administration of the RPS. A number of the commissions are left with the traditional powers of regulatory oversight and enforcement. However, a state may choose to grant the commission additional penalty authority to include levying fines for noncompliance with the RPS. A commission may verify compliance with the RPS through annual compliance filings by a load-serving entity. The Massachusetts energy agency the Division of Energy Resources (DOER), administers the RPS; this includes rulemaking and compliance verification. The ultimate penalty authority, however, is delegated to the D T E (PUC); this includes suspension or revocation of license to sell electricity at retail in Massachusetts.

Although legislation leaves the administration of the RPS in the hands of the commission, the rulemakings usually involve various entities that have expertise in different areas. In Pennsylvania, for example, the Energy and Technology Development Office determines resource eligibility, while the PUC outlines the trading and tracking system for the renewable energy credits as well as the interconnection and net metering standards. The Massachusetts RPS is administered by DOER, the energy agency, including rule making and compliance verification, but the ultimate penalty authority is delegated to the DTE (PUC) as suspension or revocation of license to sell electricity at retail in Massachusetts.

Applicability and Exemptions

Every RPS in place today outlines some specific applicability requirements. The Iowa RPS, for example, was applicable only to investor-owned utilities (IOU); New Jersey specifically calls for electric power suppliers to comply; Pennsylvania requires rural electric cooperatives to offer energy efficiency programs to customers; and the New Mexico PRC requires rural cooperatives to offer a voluntary green power tariff if their wholesale suppliers make these

renewable resources available, but does not require them to meet renewable energy requirements. Wisconsin is the one state that requires IOUs, municipal utilities and rural cooperatives to comply with the RPS. Minnesota's RPS is unique in that it applies to only one utility, Xcel Energy; all other utilities must demonstrate "good faith efforts."

Just as there are applicability requirements, there also are exemptions to compliance with an RPS. Almost every state with an RPS exempts municipal utilities and rural electric cooperatives from compliance. In a handful of states, however, this is not the case. In Colorado, for example, municipal utilities and rural cooperatives may self-certify their compliance if they have an equivalent RPS in place. Colorado also provides a compliance exemption for utilities that have less than 40,000 customers, and the state allows utilities to ask their customers for an exemption from the RPS on a one meter, one vote basis. Hawaii requires its cooperative on the island of Kauai to comply with the standard. Connecticut, a state with tiered qualifying resources, uses these tiers to exempt suppliers of solely Class II resources from compliance with the RPS. Montana exempts restructured utilities and cooperatives from the renewable energy standard. However, cooperatives with 5,000 or more customers must implement a renewable energy standard that recognizes the legislature's intent to encourage new renewable energy production and rural economic development. Vermont exempts retail electricity providers that demonstrate compliance with the standard would impair the provider's ability to meet the public's need for energy services after safety concerns are addressed at the lowest present value life cycle cost, including environmental and economic costs.

Unique exemptions in other states include:

- Those exempt from electric restructuring;
- Electricity customers under a rate cap;
- Public power agencies;
- Load serving entities under restructuring rate freezes or stranded cost recovery; and
- Municipal utilities, unless they open their markets to retail competition.

Qualification of Resources Built out of State

State policymakers tend to focus on the RPS for many reasons, but one of the most important is that it encourages people to build renewable energy projects in state. Policymakers want the economic development that comes

with the RPS. Many also want the other benefits that come with an RPS, including the environmental effects of renewable energy and the lower overall fuel price risk and higher energy security. For many people, however, the in-state economic development benefits are crucial. The RPS can be a tool to encourage developers to build in the state that has the RPS policy.

Some legal and practical issues exist, however, that may limit a state's ability to place a preference on in-state resources.

The Legal Background

Beginning in the 1920s, the U.S. Supreme Court began to interpret the Commerce Clause of the U.S. Constitution in ways that essentially precluded states from imposing barriers to commerce with other states. During the last 100 years, the courts have developed a long and extensive case history that makes it very difficult for a state to require that its residents purchase only products that are made in the state. Such a requirement would place an "undue" burden on interstate commerce that would make it difficult for companies based outside the state to sell their products to state residents.

The same arguments will likely follow for electricity, although no court case has specifically tested the application of the Commerce Clause to state renewable energy portfolio standards. In general, it seems clear that it would violate the courts' interpretation of the Commerce Clause to require that utilities buy power from in-state generators.

Since this requirement of RPS policies has not been challenged in the courts, states include language in their policies that restrict, or partially restrict, renewable energy production to in-state resources. Some states do not go so far as to require that the renewable power plant be in-state, but do require proof that the power plant is delivering electricity into the state.

- Arizona requires that electricity produced by landfill gas, wind and biomass be generated within the state. It also states that out-of-state solar power is eligible only if it is used by Arizona customers.

- California requires that the renewable generation be delivered into California for California customers' use.

- Nevada and Texas allow renewables to be located out of state if a dedicated transmission line brings them into the state. In Nevada,

that transmission line cannot be shared with more than one other nonrenewable energy generator.

- Massachusetts requires that off-grid generators and those located on the customer side of the meter be located in the state. All other generators either must be located in the ISO-New England control area or deliver their output into that control area.

- Rhode Island requires that small-scale, off-grid generators that are located on the customer side of the meter be located in the state.

- Massachusetts requires that off-grid generators and those located on the customer side of the meter be located in the state. All other generators either must be located in the ISO-New England control area or deliver their output into that control area.

Instead of disqualifying out-of-state resources outright, at least one state attempts to finesse the issue simply by offering extra credit to certain types of resources. (The utilities earn 1 credit per unit of every other resource) Colorado's law gives 1.25 credits to in-state resources; out-of-state resources would qualify for only one credit toward meeting the standard. Because this policy also sets up a preference for a resource that is not available to an out-of-state company, it could possibly raise the same constitutional issues as an outright prohibition on using out-of-state resources to satisfy the RPS standard. The final question, then, is whether it is worthwhile for any company or state to take these issues to the courts.

Legal or Not, Is it Helpful to Disqualify Out-of-State Resources?

Two policy goals conflict with one another in the determination whether to require in-state renewable resources. The first addresses economic development that results from new renewable energy projects inside the state. A new wind project, for example, generates tax revenue for local governments, new jobs, and annual revenues of about $2,500 per megawatt for landowners who host the wind turbines. There is little question that most state policymakers prefer that a renewable energy standard attract jobs and revenues into state.

On the other hand, restricting the portfolio standard to in-state resources can increase the cost of the standard if better renewable resources exist outside the state. Arizona's wind resources might be good, but Colorado's resources are

better. It might be less expensive to let the market decide whether it makes sense to import renewable energy from far away or to build it in-state.

Renewable Energy Credits and Location of Resources

Many states do not require that an electricity retailer actually have a contract for a physical supply of renewable energy; instead they allow the retailer to buy tradable renewable energy credits. These credits could be generated inside or outside the state, or state laws could require that eligible credits be generated within a certain geographic region. Maryland, for example, requires that such credits be generated in the geographic region surrounding Maryland.[10] Texas, on the other hand, requires that such credits be generated inside the state or by a generator that is directly connected to Texas.

What Are Tradable Renewable Energy Credits?

When a wind, solar, biomass, geothermal or other renewable energy power plant generates electricity, a meter tracks how many megawatt hours or kilowatt hours of power it generates. The generator earns money by selling these megawatt hours. Renewable energy generators now can earn more money by selling another product, tradable renewable energy credits (RECs). An REC is a certificate that documents the generation of renewable energy; each REC demonstrates that someone produced 1 megawatt-hour or a kilowatt-hour of electricity from renewable energy. That certificate can be retired or can be sold to companies that need to comply with voluntary renewable energy goals or government mandates but that choose not to build or buy the renewable resources directly.

How Do RECs Work?

Using a wind farm as an example, details of REC operation are shown below.

1. A wind farm generates electricity, and a meter measures how much it generates. The meter can take the measurement in many places, but might do so at the substation where the power from the wind farm enters the electric grid, so that measurement would incorporate any losses that occur between the wind farm and the point where it enters the grid.

2. The meter sends the information to a central administrator that automatically records the megawatt hours generated, and assigns each megawatt hour a unique identification code. That code identifies where and when the megawatt hour of renewable energy was generated.

3. The central administrator puts the information on a Web site or electronic bulletin board in an account for the generator. The REC now can be tracked electronically if it is traded, used or retired. Again, one REC is equal to one megawatt hour of renewably generated electricity.

4. Different parties can see online the credits that are available. Under some models, the central administrator brokers deals between buyers and sellers of these credits, or the central administrator could simply record such deals as the buyers and sellers report them. Under the second model, the central administrator does not act as a broker, but only as a facilitator or an information hub that tracks the use, trading or retirement of RECs.

5. This system creates tradable renewable energy credits that allow the participants to prove they have acquired enough credits to meet their obligations under a portfolio standard or to meet voluntary goals. The system also ensures that a credit for a MWh is used appropriately and is not counted more than once.

6. Renewable energy producers that sell the tradable renewable credits are left with energy that lacks any renewable attributes. Any claim that the remaining energy has renewable attributes is deceptive and may attract the interest of state consumer protection enforcers.

What Policies Do RECs Support?

RECs support mandatory portfolio standards by providing a method by which companies that do not meet the requirements can comply by purchasing credits.

RECs also support voluntary green pricing programs by giving companies a way to meet their own goals. A voluntary green pricing program is one in which companies make a voluntary commitment to buy a certain percentage of their electricity from green energy. In Colorado, for example, Xcel Energy offers its customers an opportunity to pay $2.50 extra for 100 kWh blocks of wind-powered electricity. Xcel has chosen to sign power purchase agreements to buy power from wind farms. An alternative way for Xcel to meet its obligations would be to purchase RECs on the market.

State governments can use RECs to satisfy their internal goals for purchasing green power. For example, Rhode Island is purchasing 1,650 RECs per year for five years in order to partly offset the electric load from the State House. States can use estimated emission reductions from renewable energy measures and include them in state implementation plans (SIP). A SIP details how a state will meet an air quality standard in a nonattainment area. Electric sector projects that result in quantifiable emission reductions at fossil fuel-fired electric generating facilities and improve air quality in nonattainment

areas can qualify for SIP credit. The U.S. Environmental Protection Agency (EPA) has issued guidance that encourages states to increase the generation of electricity from renewable resources.

Where Are Credit Trading and Tracking Programs Being Used?

People in most of the country can buy tradable credits, but formal tracking systems are relatively new. Such systems exist in places where voluntary green pricing programs are becoming more popular and in places that have mandatory renewable energy portfolio requirements. Tracking systems exist—or will shortly be established—to cover New England, New York, the PJM area (Pennsylvania, New Jersey, Maryland, Delaware, Washington, D.C.), the upper great plains, Texas, and the full western region of the country.

Overlap Between Green Pricing Programs and Renewable Portfolio Standards

Green pricing refers to programs that almost all utilities offer through which their customers can pay a small amount of extra money to buy "green" power, or power generated from renewable energy resources. Colorado's Xcel Energy offers a green pricing program that it calls Windpower. Through this program, customers can pay an extra $2.50 each month for 100 kWh of wind power. If a customer wants to cover all her energy usage with wind power and that customer uses 700 kWh per month, the customer would pay and extra $17.50 per month. In general, it has been established that these green power purchases are in addition to what the utility would otherwise be doing to meet its regulatory mandates—but for the customer's voluntary green power purchase, the utility would not be buying, generating or supporting the wind or other renewable energy project. As a result, in every state except for Arizona, green power programs do not count towards utility's renewable energy obligations.

LESSONS FROM THE RENEWABLE PORTFOLIO STANDARD

✓ *Have realistic expectations of what the RPS can accomplish.*

In its simplest form, the RPS is a good policy to support the least expensive and large-scale renewable resources such as landfill gas, geothermal and wind. It is possible, although more complex and costly, to add additional measures within the RPS to stimulate other technologies such as solar power and fuel cells.

✓ *Recognize that long-term contracts are important to renewable energy producers, since renewables benefit by having a long time to recover their high initial capital costs.*

✓ *Be certain that goals are achievable.*

Renewable energy capacity is large, but not limitless. This is especially true in eastern states that attempt to limit the geographic scope of qualifying renewable resources and thus make it potentially difficult to meet the higher renewable resource goals in the later years of the standard. States may wish to consider not only their own requirements, but those of neighboring states, paying particular attention to any in-state or other geographic requirements placed on the portfolio standard. Goals should incorporate a realistic assessment of how long it takes to plan for and construct renewable energy facilities.

✓ *Be realistic about the interaction of cost caps and the requirements of the RPS.*

Colorado has a 1 percent per customer per month cost cap, but may have difficulty remaining within the bounds of that cost cap because it also has a 0.4 percent solar set-aside within the portfolio standard. Utilities are required to subsidize solar systems with a payment of at least $2 per watt; the cost of a fully installed solar system costs between $8 and $9 per

watt. It might be difficult to meet the solar set-aside requirement and still remain within the bounds of the 1 percent cost cap.

✓ ***Be clear about whether the portfolio standard will allow existing renewable resources to qualify or whether only new resources will qualify.***

Maine had more than achieved its 30 percent portfolio standard goal by the time it had enacted its legislation because its existing stock of renewable energy capacity qualified under the standard and exceeded 30 percent. Pennsylvania is addressing whether existing hydroelectric power plants should qualify or whether the standard should include only new plants.

✓ ***Be clear about the definition of qualifying resources.***

Both biomass and hydroelectric power have complex definitions. When crafting resource definitions, especially for biomass and hydroelectric power, it is important to be either extremely specific or intentionally general. An explicit definition lets the rulemaking body know that the resources outlined in the legislative definition are those that need to be included in the rules. A general definition, sometimes consisting of just one word, gives the rulemaking authority the discretion to identify eligible qualifying resources.

✓ ***Consider and define whether and how to let non-electric resources—such as geothermal heat pumps or energy efficiency—qualify.***

Hawaii gives credit in its portfolio standard for energy efficiency measures. No states explicitly allow geothermal heat pumps to qualify, although it would be possible to do so. These resources need to be measured carefully and verified if they are to count as qualifying resources. They also have the potential to overwhelm other resources if the standard does not limit them.

✓ ***Be careful about in-state qualification requirements.***

Some states attempt to require that the renewables be built in-state. Some states attempt to define a larger—but still restricted—geographic boundary in which the renewable energy project must operate. Some of these requirements may be contrary to Commerce Clause restrictions and may limit available, low-cost renewable resources.

✓ ***Provide the regulators some flexibility in how the RPS is implemented.***

Legislators rely on the RPS to be a market-based solution to the expansion of renewable energy development in their states. This makes it important that regulators have the capacity to respond quickly to the market and its changes. Regulators can use this flexibility when setting alternative compliance payment increments.

✓ ***Address how solar photovoltaics and other renewable resources located off the grid will count toward meeting the portfolio standard.***

New Jersey requires that the systems have an automated meter attached to them that measures the amount of electrical energy produced from the solar array. Inspectors verify that energy reported as generated is actually generated in order to qualify for renewable Energy Credits.

✓ ***Clarify who owns the renewable energy attributes for purposes of owning and selling renewable energy credits.***

Since tradable renewable energy credits (REC) may become an important part of the renewable energy financing picture and because these RECs are valuable, it may be important to clarify who owns them. If a utility subsidizes them or if taxpayers or ratepayers subsidize the utility to build renewable energy facilities, who owns the RECs? Is there a way to split ownership of the RECs? Is it too administratively burdensome to split ownership of such RECs? Should states specify in law who owns the credits?

✓ ***Clarify the relationship between renewables secured through green pricing programs and renewables secured because of renewable portfolio standards.***

Arizona is the only state that currently allows the utilities to count their purchases of renewable energy that are supported by voluntary payments to help them meet their obligations under the renewable portfolio standard. Other states have chosen to draw a division between these two programs because green pricing programs are generally understood to be voluntary programs that support purchases the utility or energy retailer would not make, but for the customer's voluntary payment.

✓ ***Be careful when crafting legislation that outlines the mechanisms for the renewable energy credit trading program.***

Trading programs generally have moved beyond individual state borders and now increasingly function at a regional level. If legislators place too many restrictions on the trading program they will not function as effectively as they might with more flexibility.

✓ ***Allow regulators the authority to set the alternative compliance payment (ACP) price.***

In New Jersey and other states, companies can pay an alternative compliance payment instead of actually buying RECs or installing renewable energy. If an ACP is set in legislation, the mechanism does not allow response to market forces in market time; the legislature may be required either to change the price or give regulators the authority to do so. For example, the New Jersey Public Utilities Board (PUB) sets the ACP annually, looking forward to the REC market for the upcoming year. The authority of the PUB protects against a few people controlling too much of the market or limited availability of RECs. As with REC trading programs, the setting of the ACP price benefits from a regional approach rather than an individual state approach.

✓ ***Understand that the more complex the RPS structure, the more difficult the standard may be to meet. Standards that include provisions such as set-asides for certain technologies, tiers, complicated and convoluted cost recovery and tracking mechanisms add complexity which can add cost and create difficulty in compliance.***

Vermont's RPS is unlike any of the 20 others. It addresses additional issues, including:

- Small-scale distributed generation and energy efficiency;
- Standards for interconnection of distributed generation to the energy grid;
- Advocacy for a regional electricity reliability policy;
- Electric grid planning at least cost;
- Investigation of the regional potential for energy conservation and efficiency programs; and
- Commercial building energy standards.

National Conference of State Legislatures

NOTES

1. States have adopted portfolio standards through a variety of means; Colorado through ballot measure, New York and Arizona through committee order and the remainder through legislation.

2. Many small projects may qualify in Massachusetts. Perhaps the logic is backward——smaller projects may enjoy the RPS if barriers to small project deployment, such as interconnection, are removed.

3. For the Massachusetts RPS, the $.05 fee changes annually, according to changes in the Consumer Price Index. Accordingly, the payment for 2005 is $05.3.

4. Neat biodiesel refers to a 100 percent biodiesel fuel that is not blended with traditional diesel.

5. Unsegregated waste includes all wastes, whether chemically treated or not. Unsegregated waste has a far different emissions profile than untreated waste.

6. New York defines its tiers differently from some states. The Main Tier consists primarily of medium to large-scale electric generation facilities that are expected to compete against each other. The Customer-Sited Tier includes "behind the meter" facilities sited on customers' premises that generally are not economically competitive with Main Tier facilities.

7. Cofired biomass refers to biomass mixed and burned with coal to generate electricity.

8. Nevada specifically provides additional credit—a 2.4 multiplier—for installation of distributed solar photovoltaic systems. This multiplier is intended to reflect the added benefits from the installation of distributed renewable generation that does not incur line losses and provides local distribution system support.

9. Nameplate capacity refers to a power plant's maximum ability to generate electricity under ideal conditions.

10. Maryland specifies that credits must come from 1) the regional transmission organization, PJM; 2) a state adjacent to PJM; or 3) a control area adjacent to PJM if the energy is delivered into PJM.

State Renewable Portfolio Standards

A Review and Analysis

States began to develop renewable portfolio standards in the 1990s in an attempt to build new in-state energy resources, benefit from the environmental attributes of renewable energy resources, and lessen their dependence on fossil energy resources.

Early standards dictated that any electricity retailer in the state generate some part of its power from renewable energy sources, which may include solar, wind, geothermal, biomass and small hydroelectric. As the standards developed, a new system of tradable renewable energy credits also developed to guarantee and verify compliance.

This book describes state experiences with renewable portfolio standards to date and discusses some lessons learned.

National Conference of State Legislatures
The Forum for America's Ideas

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Electric Market Overview: Renewables

Federal Energy Regulatory Commission • Market Oversight @ FERC.gov

Renewable Energy Portfolio Standards (RPS)

28 States and D.C. have an RPS

WA: 15% by 2020

OR: 25% by 2025; small utilities 5-10%

ID: Priority to DR, EE, and in-state RE

CA: 20% by 2010; goal: 33% by 2020

NV: 20% by 2015; solar 5% per year

UT: 20% by 2025

CO: 20% by 2020; co-ops & munis 10%; includes 4% solar

AZ: 15% by 2025; includes 30% DG

NM: 20% by 2020; co-ops 10%

TX: 5,880 MW by 2015; goal: 10,000 MW by 2025

HI: 20% by 2020; *proposed increase to 40%* by 2030 agreed to for 2009 session

AK: issued Energy Report

MT: 15% by 2015

ND: 10% by 2015

SD: 10% by 2015

NE: studying RPS

KS: goal - 20% wind by 2020; introduced RPS bill

MN: 25% by 2025
Xcel 30% by 2020

IA: 105 MW in RPS
goal: 1,000 MW wind by '11

MO: 15% by 2021; at least 2% solar

OK: Studying an RPS

AR: Utility IRPs to include RE

WI: 10% by 2015

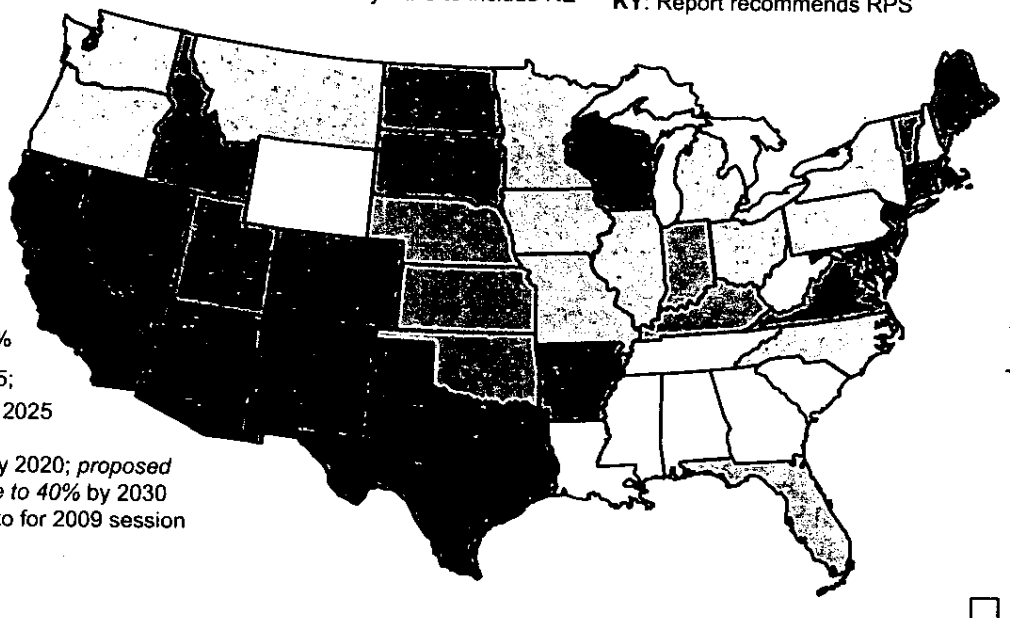
IL: 25% by 2025

MI: 10% by 2015, and new RE capacity: 1,100 MW by 2015

OH: 12.5% by 2025; 0.5% solar

IN: 2 bills introduced

KY: Report recommends RPS



ME: 40% by 2017
goal: 3 GW wind by 2020

NH: 23.8% BY 2025

VT: 25% by 2025

MA:15% by 2020; goal: 250 MW solar by 2017

RI: 16% by 2019

CT: 23% Class I/II by 2020
4% Class III by 2010

NY: 25% by 2013

PA: 8% Tier I, 10% Tier II by 2020; 0.5% solar set-aside

NJ: 22.5% by 2020; 2% solar

DE: 20% by 2019, with 2% solar

DC: 20% by 2020, with 0.4% solar

MD: 20% by 2022, with 2% solar

VA: 12% by 2022

TVA: 50% of generation from zero- or low-carbon sources by 2020*

NC: 12.5% by 2021
co-ops & munis: 10% by 2018

FL: draft RPS to legislature: 20% by 2020

- RPS
- Strengthened/ amended RPS
- Voluntary standards or goals
- Proposed RPS or studying RPS
- Other renewable energy goal

Updates at: http://www.ferc.gov/market-oversight/mkt-electric/overview/elec-ovr-rps.pdf

Notes: Alaska has no RPS; TVA's "Renewable Energy and Clean Energy Assessment" is not a state policy: the Public Power Authority called for 50% of generation from zero- or low-carbon sources by 2020.
Abbreviations: DG: distributed generation; DR: demand response; EE: energy efficiency; IRP: integrated resource plan, RE: renewable energy.
Sources: Derived from data in: EEI, EIA, LBNL, PUCs, State legislative tracking services, Database of State Incentives for Renewables and Efficiency, Pew Center, and the Union of Concerned Scientists.

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Renewable Energy Portfolio Standards

- **A Renewable Portfolio Standard (RPS)** requires a percent of energy sales or installed capacity to come from renewable resources.
- **29** states – including D.C. – have renewable energy standards.
- **Six** have renewable goals without financial penalties: KS, ND, SD, UT, VT and VA.
- **Six** states proposed RPS bills or released studies that propose including more RE in state resources: FL, IN, KS (bills) and AK, KY, NE (state energy reports).
  - **Florida's PSC** sent its draft RPS to the legislature in response to an April 2008 legislative requirement. The legislature will decide how to proceed.
  - **Indiana's** House introduced two bills for an RPS in January. A traditional one has a 20% by 2020 target; the other creates two compliance tiers. An RPS bill did not pass last year.
  - **Kansas** introduced an RPS bill, with a 20% by 2020 target based on a utility's average peak load (in MW) for 2016-18. (Jan 14)
  - **Alaska** issued "Sustainable Energy for Alaskans" as a guide for communities to review local energy sources including in-river hydro, wind, solar, wave, tidal, biomass, and geothermal, in addition to traditional resources. It does not recommend state action or set a RE goal. (Jan 7)
  - **Nebraska's** "*Interim 2009 Energy Plan*" supports enacting an RPS and stresses EE, RE, and Nebraska's commitment to nuclear power. A final report will identify regulatory and statutory activities following the comment period, which closed Jan 23.

OVERVIEW OF 2008 RPS DEVELOPMENTS:

- **Three states passed a new RPS:** Ohio, Michigan, and Missouri. Ohio's and Michigan's were by state legislation; Missouri's was the third RPS to pass by ballot (after Colorado and Washington state).
- **Five jurisdictions amended or strengthened** existing standards: Washington, D.C.; Maryland; Massachusetts; Minnesota; and New Hampshire.
- **Four states** with an existing goal or RPS strengthened them: ME, VT, CA, HI. Maine enacted an installed wind goal. Vermont increased its goal to 25% RE by 2025. California's goal, set by Executive Order, is to increase RE to 33% by 2020. Hawaii set a goal of 40% of energy from renewable sources by 2030.
- **Four states** adopted a voluntary RPS or renewable goal: SD, UT, KS, and FL. South Dakota (Feb) and Utah (April) enacted goals without non-compliance penalties. An MOU between the Governor and Kansas utilities created its goal. Florida's goal, via Executive Order, is for utilities to produce 20% from RE; the PSC sent a draft RPS to the legislature on Jan 30.
- Kentucky and Oklahoma are working to establishing a renewable standard by legislation in 2009. In 2008, OK passed a bill allowing recovery of wind-related transmission costs.
- **Sixteen** states include energy efficiency in their RPS or renewable goals. Several issued major energy plans or draft plans with goals encompassing renewable energy, energy efficiency, and greenhouse gas reduction, including Kentucky, New Jersey, New York, and Vermont.

Abbreviations: EE: Energy Efficiency; MOU: Memorandum of Understanding; PSC: Public Service Commission; RE: renewable energy; RPS: Renewable Portfolio Standard

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