

An Inventory of State Renewable Energy Standards

Many states have established goals for the generation of electricity from renewable fuels—wind, solar, biomass, and other sources. This information brief lists, by state:

- which utilities are subject to renewable standards;
- the renewable energy technologies that can be used;
- the numerical targets for renewable energy sales; and
- miscellaneous issues in various state laws.

Why States Have Renewable Energy Standard Laws

The generation of electricity from renewable fuels—wind, solar, biomass, and other sources—exhibits some advantages compared to electricity produced from fossil fuels. These include:

- lower rates of emission of air pollutants and greenhouse gases;
- smaller scale, decentralized, on-site applications less subject to disruption and threats of terrorism;
- resources that are “free” and inexhaustible public goods (wind and solar);
- resources that are “homegrown” (biomass), and, consequently, allow a larger proportion of energy expenditures to remain in the community to boost economic development; and
- resources that do not require significant foreign policy expenditures to insure their continued supply at reasonable prices.

Many of these advantages, however, also carry the disadvantage of not being reflected in market prices for these forms of energy. As a result, since the 1970s, states and the federal government have granted subsidies to promote the growth of these energy sources so that their advantages

may be realized (and to counterbalance subsidies provided to fossil fuels). This strategy was designed not only to reduce the price of renewables to consumers, but also to increase the demand for these newer technologies to the point where significant economies of scale could be exploited in the manufacture of their components (solar panels, wind turbines), in order to further reduce their cost.

While the generation of electricity from these sources has increased significantly, renewables have not achieved, in the minds of many, a level of market penetration commensurate with what would result if all the benefits listed above were embodied in market prices. In the 1990s, state legislatures began to enact laws mandating numerical targets for the proportion of electricity sales to be generated from renewable energy sources in the future.

Summary of State Tables

As of 2005, 21 states and the District of Columbia have established targets, known as Renewable Portfolio Standards (RPS) or Renewable Energy Standards (RES). The following tables summarize the basic features of these state policies.

Table 1 reports which utilities—investor-owned (IOUs), municipal utilities, and electric cooperatives—are subject to the standards. In most states, the standards are mandatory. In Illinois, the standards are voluntary. In Minnesota, only Xcel Energy is required to meet the standards; other utilities are required to make a “good faith effort” to comply. The Minnesota Public Utilities Commission (PUC) has issued a stringent set of standards it will use to gauge utility compliance with this directive.

Table 2 lists the renewable energy technologies that are eligible to be counted toward the targets in each state. Eligible technologies generally reflect those available to states as a result of their location. For example, states with more sunshine—California, Nevada, Arizona, Texas, Hawaii—allow more solar technologies to qualify, while technologies utilizing ocean conditions are popular in coastal states.

Table 3 shows that the states with the most ambitious goals are Nevada, California, and Hawaii, which have 20 percent targets in 2015, 2017, and 2020, respectively. While the numerical targets of Maine and New York are higher, they call for little *additional* development: none in Maine’s case, and only 6 percent for New York, which currently generates 19 percent of its electricity from large-scale hydropower.

Minnesota’s 10 percent goal by 2015 is the most ambitious among the four Midwestern states that have passed RES laws, but four other states—Pennsylvania, Nevada, Hawaii, and Montana—have higher targets in 2010, and California, Rhode Island, and the District of Columbia require utilities to meet higher targets after 2015.

Finally, Table 4 catalogues some miscellaneous provisions of these laws. Six states award “extra credit” toward the targets to certain technologies as a way to accelerate their development. Twelve states allow utilities that fall short of targets to make up the shortfall by purchasing credits from other utilities; in Minnesota, the PUC has authority to allow credit trading. Seven states allow utilities short of their target to make compliance payments to the state, and five

states require such utilities to pay monetary penalties. Montana, Texas, and Connecticut have established per kilowatt-hour penalty rates, while six other states allow or require the PUC to determine the penalty amount. In nine states, including Minnesota, the PUC is given some flexibility to delay or waive the target in a given year if sufficient renewable energy supplies are unavailable at a reasonable price or if reliability is affected.

Table 1
Utilities Subject to State Renewable Energy Standards

Arizona	All regulated utilities
California	All IOUs; electricity service providers included in 2006. Munis must self-implement.
Colorado	All utilities with more than 40,000 customers. Municipal/co-op customers can vote to include or exempt their utilities.
Connecticut	IOUs only
Delaware	All utilities, including those choosing not to be regulated. Sales to industrial customers w/peak load > 1,500 kWh are exempt.
District of Columbia	All utilities
Hawaii	All utilities
Illinois	All utilities, but standards are voluntary
Iowa	IOUs only
Maine	All utilities
Maryland	All utilities. Sales above 300 million kWh to a single industrial process customer are exempt.
Massachusetts	All utilities
Minnesota	Required only for Xcel Energy; other utilities must demonstrate “good faith effort” to meet objectives.
Montana	IOUs only. Other utilities with more than 5,000 customers must implement RES based on legislative intent.
Nevada	IOUs only
New Jersey	All utilities
New York	IOUs only, except New York Power Authority and Long Island Power Authority
Pennsylvania	IOUs only; distribution companies exempt until end of restructuring cost-recovery period.
Rhode Island	All utilities except Block Island Power Co. and Pascoag Utility District
Texas	All utilities
Wisconsin	All utilities

IOU: Investor-owned utility; Munis: Municipal utilities
 Sources: Interstate Renewable Energy Council, *DSIRE database*, www.dsireusa.org; Union of Concerned Scientists, Table C-1, *State Minimum Renewable Electricity Requirements (as of June 2005)*, www.ucsusa.org/clean_energy/clean_energy_policies/clean-energy-policies-and-proposals.html; individual state statutes.

Table 2
Eligible Renewable Energy Technologies

	AZ	CA	CO	CT	DE	D.C.	HI	IL	IA	ME	MD	MA	MN	MT	NV	NM	NJ	NY	PA	RI	TX	WI
Wind	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x ³
Hydropower		x ¹	x ²	x	x ¹	x	x	x	x	x	x ¹		x ³	x ²	x ¹	x	x	x ¹	x ⁴	x ¹	x	x
Solar Photovoltaic	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Solar Thermal Electric	x			x	x	x	x	x		x	x	x	x	x	x	x			x		x	x
Solar Space Heat							x								x				x		x	
Solar Thermal Process Heat							x								x				x		x	
Solar Water Heat	x														x				x		x	
Geothermal Electric		x	x		x	x					x			x	x	x	x		x	x	x	x
Biomass	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Landfill Gas	x	x	x	x	x	x	x	x			x				x	x	x	x	x	x	x	x
Anaerobic Digestion		x	x		x		x				x			x	x	x	x		x	x	x	
Municipal Solid Waste		x ⁵		x		x	x		x	x	x		x		x		x		x			
Fuel Cells (Renewable Fuels)		x	x	x	x		x			x	x	x		x		x	x	x	x	x		x
Tidal Energy		x		x	x	x				x	x	x					x	x		x	x	x

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	AZ	CA	CO	CT	DE	D.C.	HI	IL	IA	ME	MD	MA	MN	MT	NV	NM	NJ	NY	PA	RI	TX	WI
Wave Energy		x		x	x	x	x				x	x					x	x		x	x	x
Ocean Thermal		x		x	x	x	x				x	x						x		x	x	
CHP/ Cogeneration				x			x	x		x									x			
Other							x ⁶	x ⁷					x ⁸		x ⁹			x ¹⁰	x ¹¹		x ¹²	

1. 30 MW or less
 2. 10 MW or less
 3. 60 MW or less
 4. Low-impact hydropower, as certified by the Low-Impact Hydropower Institute and American Rivers, Inc.
 5. Waste must be converted to a clean-burning fuel using a noncombustion thermal process.
 6. Geothermal heat pumps, hydrogen, ice storage, liquid biofuels (ethanol, methanol, biodiesel)
 7. Other sources of environmentally preferable energy
 8. Hydrogen
 9. Utility-subsidized, energy-efficiency measures installed at customer site after 1/1/05; microwave reduction of waste tires (not combustion)
 10. Methane from sewage gas and manure digesters, liquid biofuels (ethanol, methanol, biodiesel)
 11. Coalmine and biologically derived methane, waste coal, coal gasification, large hydropower, pulping process, and wood manufacturing byproducts
 12. Geothermal heat pumps

Sources: Interstate Renewable Energy Council, *DSIRE database*, www.dsireusa.org; Union of Concerned Scientists, Table C-1, *State Minimum Renewable Electricity Requirements (as of June 2005)*, www.ucsusa.org/clean_energy/clean_energy_policies/clean-energy-policies-and-proposals.html; individual state statutes.

Table 3
 State Percentage Targets for Renewable Electricity Sales

	AZ ¹	CA	CO	CT ²	DE	D.C. ³	HI	IL ⁴	IA ⁵	ME ⁶	MD ⁷	MA ⁸	MN ⁹	MT	NV ¹⁰	NJ ¹¹	NM	NY ¹²	PA ¹³	RI	TX ¹⁴	WI	
2001	0.2									30													0.5
2002	0.4																						
2003	0.6	¹⁵					7					1											0.85
2004	0.8			4								1.5											
2005	1			4.5			8					2	1		6								1.2
2006	1.05			5							3.5	2.5	2				5						
2007	1.1		3	5.5	1	4		2				3	3		9		6		5.7	3	2,280 MW	1.55	
2008				8	1.5			3			4.5	3.5	4	5		6.5	7		6.2	3.5			
2009				9	2			4				4	5		12		8		6.7	4	3,272 MW	1.9	
2010				10	2.75		10	5			5.5		6	10			9		7.2	4.5			
2011			6		3.5			6					7		15		10		9.7	5.5	4,264 MW	2.2	
2012					4.25	6.6		7			6.5		8						10.2	6.5			
2013					5			8					9		18			25	10.7	7.5	5,256 MW		
2014					5.75						7.5								11.2	8.5			
2015			10		6.5		15						10	15	20				11.7	10	5,880 MW		

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2016					7.25	8.2					8.5								14.2	11.5		
2017		20			8														14.7	13		
2018					9						9.5								15.2	14.5		
2019					10						7.5								15.7	16		
2020							20												18			
2021																						
2022						11.4																

1. Solar thermal electric and photovoltaics must provide 60% of the standard.
2. Up to 3% may be from Class II resources: waste-to-energy, certain types of biomass, and hydropower.
3. Hydropower and MSW may comprise up to 2.5% in 2007-2012, 1.5% in 2017, 0% in 2022. Solar: 0.005% in 2007, 0.066% in 2012, 0.192% in 2017, 0.386% in 2022.
4. Standards are goals, not mandates. Wind must provide 75% of the standard.
5. Iowa requires IOUs to purchase 105 MW from renewable resources, accounting for under 2% of retail electricity sales of those utilities.
6. Maine currently generates more than 30 percent of its electricity from renewable sources.
7. Tier 2 resources—hydropower and MSW—must comprise 2.5% in 2006-2018, after which the requirement sunsets.
8. The proportion of renewable electricity generated/purchased must increase by 1% annually after 2009 until the state suspends this requirement.
9. Xcel Energy must develop 1,125 MW wind and 110 MW biomass. Other utilities must make “good faith effort” to achieve standards.
10. Solar energy must provide 5%.
11. Up to 2.5% may be provided from MSW and hydropower < 30 MW that meets environmental standards. In 2008, 0.16% must be from solar photovoltaics.
12. Currently, 19% of New York’s electricity is generated from renewable resources, mostly from large-scale hydropower.
13. Tier I sources (wind, biomass, small hydropower, photovoltaics, geothermal, fuel cells, methane) must provide 1.5% in 2007, and increase by 0.5% each year, to 8% in 2020, including 0.0013% from photovoltaics in 2007 and 0.5% in 2020. Tier II sources (MSW, large-scale hydropower, distributed generation, waste coal, demand-side management, etc.) must provide 4.2% in 2007 and 10% in 2020.
14. The 2015 mandate represents an estimated 5% of total retail electricity sales in that year. 500 MW is to be generated from sources other than wind.
15. The proportion of renewable electricity generated or purchased must, beginning in 2003, increase by at least 1% annually.

Sources: Interstate Renewable Energy Council, *DSIRE database*, www.dsireusa.org; Union of Concerned Scientists, Table C-1, *State Minimum Renewable Electricity Requirements (as of June 2005)*, www.ucsusa.org/clean_energy/clean_energy_policies/clean-energy-policies-and-proposals.html; individual state statutes.

Table 4 State Renewable Energy Standards: Miscellaneous Provisions					
State	Multiple Credit for Selected Resources ¹	Credit Trading	Compliance Payments Permitted	Penalties for Noncompliance	Flexibility of Requirements
Arizona	1.5: solar electric power plant or distributed generation Add .5 for in-state manufacturing/materials content				
California				At PUC's discretion	
Colorado	1.25: in-state generation	X		PUC must develop	
Connecticut		X		5.5¢/kWh	PUC can delay compliance up to 2 years if requirements can't be reasonably met
Delaware	3.0: solar electric, fuel cells 1.5: in-state wind	X	2.5¢/kWh; may increase to 5¢/kWh for utilities failing to meet standard for any 4 years		In 2010-14, PSC can ask legislature to speed or slow schedule. After 2014, PSC can decelerate, if compliance payments meet 30% or more of standard for 3 consecutive years. PSC can accelerate if credit price is below given threshold for 2 consecutive years.

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State	Multiple Credit for Selected Resources ¹	Credit Trading	Compliance Payments Permitted	Penalties for Noncompliance	Flexibility of Requirements
District of Columbia		X	30¢/kWh: solar 1¢/kWh: hydropower, MSW 2.5¢/kWh: other sources		
Hawaii					PUC can grant temporary waiver if requirements can't be met at or below avoided cost
Illinois		Participation allowed in regional trading system established by federal government or RTOs		May be considered for utilities which formally agree to meet goal, but then drop out	
Iowa					
Maine				License revocation or monetary penalties	Standard can be met by averaging over 2 or more years
Maryland	1.2: methane installed before 2009 1.2: wind installed in 2005	X	1.5¢/kWh: hydropower, MSW 2¢/kWh: other sources		

Table 4
State Renewable Energy Standards: Miscellaneous Provisions

State	Multiple Credit for Selected Resources ¹	Credit Trading	Compliance Payments Permitted	Penalties for Noncompliance	Flexibility of Requirements
	1.1: wind installed 2006-08 2.0: solar		Industrial process load: 0.8¢/kWh in 2008, declining to 0.2¢/kWh in 2017		
Massachusetts		X	5.3¢/kWh		
Minnesota		At PUC's discretion			Xcel's requirement may be waived temporarily if implementation affects reliability or is not economic
Montana		X		1¢/kWh, not recoverable in rates	PUC may grant temporary waiver under certain conditions
Nevada	2.4: photovoltaics, plus additional 0.15 if distributed generation 1.15: other on-site generation 0.7: microwave reduction of waste tires			PUC may impose fine ≥ incremental cost of acquiring renewable electricity above utility's overall cost per kWh	PUC may grant exemption if insufficient supply of electricity from renewables was available to utility
New Jersey		Solar only	30¢/kWh: solar 5¢/kWh: other sources		

Table 4 State Renewable Energy Standards: Miscellaneous Provisions					
State	Multiple Credit for Selected Resources ¹	Credit Trading	Compliance Payments Permitted	Penalties for Noncompliance	Flexibility of Requirements
New Mexico	3: solar 2: all sources except wind and hydropower	X			Utilities exempt if rate increase exceeds 1% in 2006, or more than 0.2%/year through 2011
New York					
Pennsylvania		X	4.5¢/kWh Twice avg. market value for solar credits		PUC can modify requirements if resources are not reasonably available
Rhode Island		X	5¢/kWh		
Texas		X		Lesser of 5¢/kWh or twice avg. cost of credits traded	
Wisconsin		X		Up to \$500,000	
1. Figures in this column represent the percentage credit granted toward fulfillment of the state's RES for each percentage point of retail electricity sales generated by a specific technology.					
Sources: Interstate Renewable Energy Council, <i>DSIRE database</i> , www.dsireusa.org ; Union of Concerned Scientists, Table C-1, <i>State Minimum Renewable Electricity Requirements (as of June 2005)</i> , www.ucsusa.org/clean_energy/clean_energy_policies/clean-energy-policies-and-proposals.html ; individual state statutes.					

For more information about energy regulation, visit the utility regulation area of our web site, www.house.mn/hrd/issinfo/pututil.htm.