

ALTERNATIVE/RENEWABLE ENERGY REVIEW

WINTER 2005



The various renewable energy sectors (biomass, wind, solar, PV) are all experiencing growth and are expected to continue to grow. Many industry experts agree that the primary driver for the growth is the enactment of **Renewable Portfolio Standards** ("RPS"), now in place in 18 states (six states have implemented RPS in the past twelve months alone) and at least three additional states are considering implementing such standards.

Each state RPS program is unique but all address similar basic tenets:

- what type of project/fuel qualify as renewable,
- the goal of the program (i.e. what percentage of the state's retail load and the phase-in schedule),
- the manner utilities are responsible for achieving the goal (for example whether **Renewable Energy Credits** ("RECs") are permitted to satisfy the goal), and
- penalties for non-compliance.

Renewable Portfolio Standards as of January 2005

State	Goal	Tradable RECs?
Arizona	1.1% by 2007	no
California	20% by 2017	no
Colorado	10% by 2015	planned
Connecticut	6% by 2009	yes
Hawaii	20% by 2020	no
Iowa	2% by 2000	no
Maine	30% by 2000	yes
Maryland	7.5% by 2019	yes
Massachusetts	4% by 2009	yes
Minnesota	19% by 2015	yes
Nevada	15% by 2013	yes
New Jersey	6.5% by 2008	yes
New Mexico	10% by 2011	yes
New York	24% by 2013	no
Pennsylvania	18% by 2020	yes
Rhode Island	16% by 2019	yes
Texas	2880 MW by 2009	yes
Wisconsin	2.2% by 2011	yes

In addition to increased growth of renewable energy projects in each of these states, an active trading market for RECs has or is emerging. The chart to the left outlines the existing RPS standards as well as status of REC markets in various states in place as of January 2005.

All state REC programs are in various stages of development. RECs allow the environmental attribute to be separated from the electricity commodity resulting in renewable energy projects having two separate revenue streams. REC prices are driven by supply and demand. State REC tracking systems also in varying degrees of development will regulate the transfer of RECs to prevent the same RECs from being sold to multiple buyers.

The ownership of the REC is also an issue that has been hotly contested — does the renewable project generator automatically own the REC or does it convey to the purchaser of the electricity under traditional PPAs? *FERC* has ruled that this is an issue that must be decided on the state level. However, while leaving it up to the states, the *FERC* ruling seemed to suggest that the REC is really the property of the renewable energy project rather than the utility.

traders such as **Evolution Markets**, among others, creating a forum for the trades. Developers have not yet found lenders who will support long-term debt based on RECs given the short-term nature of existing REC sale contracts (often five years or less), but most in the industry believe that this will change in 2005 as the markets mature. The chart to the right illustrates some recent market prices for RECs and the real economic impact that these can have for a project.

Sample REC Pricing

State	REC Price/MWh
California	\$38
Massachusetts	\$49
New Jersey	\$49
Texas	\$12
Connecticut	\$35
Pennsylvania	\$7

Source: Evolution Markets LLC

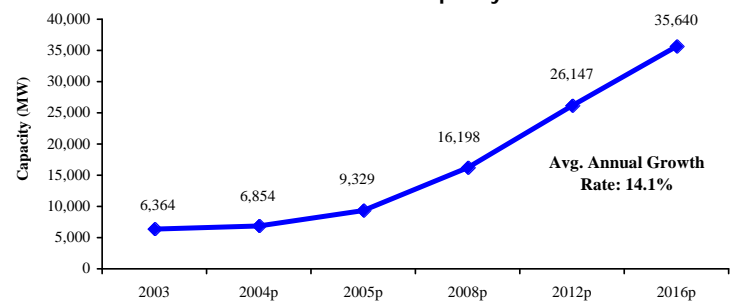
Numerous research organizations have forecasted the growth of renewables as a result of the institution of RPS in the U.S. The *Union of Concerned Scientists* estimates that existing RPS standards will result in approximately 22,000 MW of new renewable energy being developed by 2017. The chart to the right outlines the expected growth in various sectors of renewables according to *Platts*.

Projected Renewable Energy Growth

Non-Hydro Renewables	Total Capacity (MW)		Avg. Annual Growth Rate
	Actual 2003	Projected 2016	
Wind	6,364	35,640	14.1%
Solar Photovoltaics	132	740	14.2%
Wood & Wood Waste	6,549	6,768	0.3%
Geothermal	2,990	4,477	3.2%
Municipal Solid Waste	2,869	2,272	-1.8%
Landfill Gas Generation	1,077	2,206	5.7%
Solar Thermal Generation	354	704	5.4%
Other Biomass Projects	325	314	-0.3%
Total	20,660	53,121	7.5%

Source: Platts

Installed Wind Power Capacity 2003 - 2016



Source: Platts Analytics

Wind Construction on the Go...

One estimate of the number of MWs of wind power that were delayed while waiting for the *PTC* legislation to pass in 2004 totals 2,000 MW. Others are even higher. Now that the *PTC* has passed (albeit only through 2005 as of today), many projects are now under construction or are in late stages of development. *Platts* predicts the increase in wind generation MWs over the next several years to be as illustrated in the graph above and to the right.

Industry consolidation is taking place — **AES Corp.**, on the heels of its minority investment in **U.S. Wind Force**, announced the acquisition of **SeaWest Holdings**. Additionally, **PPM Energy** recently announced the acquisition of **Atlantic Renewable Energy**, which joins two very active players.

In addition, the table to the right outlines some of the projects that have been announced after the passage of the *PTC* mid-year last year and confirms the growth potential for the industry.

Developer / Business Description	Off-Take	Capital Costs (\$ MM)	Capacity (MW)
SeaWest Holdings Inc. (AES Corp.) <i>Buffalo Gap wind farm near Abilene, TX</i>	NA	\$165.0	120
West Energy Systems Technologies <i>Wind farm off the Louisiana coast</i>	Off-shore liquefied natural gas storage well	\$80.0	50
U.S. Wind Force <i>Two-phase wind farm near Franklin, WV</i>	4 Undisclosed Potential Parties	NA	200
U.S. Wind Force <i>Wind farm in Grant County, WV</i>	NA	NA	250
MidAmerican Energy <i>Two Iowa wind projects</i>	NA	\$323.0	310
Atlantic Renewable Energy <i>Flat Rock Wind Power project in New York</i>	NA	\$360.0	300
DKR Development <i>Lone Star wind farm project in Sweetwater, TX</i>	NA	\$500.0	400
Exergy Development <i>Fossil Wind Gulch Park LLC wind power project</i>	Idaho Power	NA	10
Columbia Energy Partners <i>Ta-My-Y-Slah wind project in Arlington, OR</i>	PacifiCorp	\$120.0	104
Columbia Energy Partners <i>Mar-Lu wind project near Arlington, OR</i>	Local Utilities	NA	5
Western Wind / Clean Power Income Fund <i>Grand Manan Island wind farm project</i>	New Brunswick Power	\$22.0	20
FPL Energy <i>Callahan Divide wind farm in Taylor County, TX</i>	Several Unidentified Buyers	NA	114
FPL Energy <i>Wind farm in Custer County, OK</i>	Public Service Co. of Oklahoma	NA	106
SaskPower <i>Rushlake Creek wind farm near Swift Current</i>	NA	\$194.2	150
Illinois Wind Energy <i>Crescent Ridge wind farm in Bureau County, IL</i>	Commonwealth Edison	\$55.0	50
Illinois Wind Energy <i>Wind farm in Dodge County, WI</i>	WE Energies	NA	54
Illinois Wind Energy <i>Three new wind farms in IL, WI, IN (2006)</i>	NA	NA	NA
Freedom Wind Energy <i>Wind farm project in Cambria County, PA</i>	Marketers or Retail Customers	NA	100-400
Invenergy Wind of Chicago <i>Forward Wind Energy Center near Brownsville, WI</i>	Alliant Energy (50-100 MW)	NA	200
Invenergy Wind, LLC <i>Wheatland, MT wind farm near Judith Gap</i>	NorthWestern Corp.	\$150.0	150
Sea Breeze Energy Inc. <i>Wind farm on Vancouver Island</i>	NA	\$553.0	450
PPM Energy <i>Klondike-II wind farm in OR & Trimont wind project in MN</i>	Great River Energy (MN)	\$200.0	175
AMP-Ohio / Green Mountain Energy <i>Utility-scale wind farm</i>	Bowling Green / Other communities	\$9.0	7
Blue Sky Wind LLC <i>Hopkins Ridge wind project in WA</i>	Puget Sound Energy	\$200.0	150
Zilkha Renewable Energy <i>Wild Horse wind farm project in eastern WA</i>	Puget Sound Energy	NA	230

M&A Activity

M&A activity in the energy industry continues as is evident in the chart below which highlights activity in the past six months.

Date Effective	Target Name / Business Description	Acquirer Name / Business Description	Enterprise Value (\$ MM)	Capacity (MW)
Pending	SeaWest Holdings Inc. <i>Operator and developer of wind power projects</i>	AES Corporation <i>Owens and operates electric power generation facilities</i>	\$60.0	570
Pending	USGen New England, Inc. <i>Bear Swamp and Fife Brook hydroelectric plants</i>	Brascan Power / Emera Inc. <i>50-50 partnership between hydroelectric operators</i>	\$92.0	599
Pending	Blue Sky Wind LLC <i>Hopkins Ridge wind project in WA</i>	Puget Sound Energy <i>Washington-based public utility company</i>	\$200.0	150
Pending	USGen New England, Inc. <i>41 hydro plants in NH, VT, and MA</i>	TransCanada Corporation <i>Natural gas transmission and power generation company</i>	\$505.0	567
Pending	Panda Energy International <i>Gas-fired, combined-cycle plant in Roanoke Rapids, NC</i>	Dominion Virginia Power <i>Power generation and oil and natural gas exploration / production</i>	\$100.7	181
Pending	Mirant Corp. <i>Coyote Springs-2 gas-fired power plant in Oregon</i>	Avista Corp. (Remaining 50% stake) <i>Diversified energy services company</i>	\$62.5	280
Pending	Zilkha Renewable Energy <i>Wild Horse wind farm project in eastern Washington</i>	Puget Sound Energy <i>Washington-based public utility company</i>	NA	230
Pending	Exelon Corp. <i>Sithe Energies/Independence assets (9 total plants)</i>	Dynegy Inc. <i>Operator of power generation facilities</i>	\$1,054.0	1,377
Pending	Atlantic Renewable Energy Corp. <i>Richmond, VA based wind generator/developer</i>	PPM Energy <i>Wind development and marketing unit of ScottishPower</i>	NA	162
12/23/04	Kohlberg Kravis Roberts & Co. <i>Two-thirds of holdings in DPL (Ohio Dayton Power & Light)</i>	Lehman Brothers <i>Diversified provider of capital markets products and banking services</i>	\$81.4	NA
12/16/04	El Paso Merchant Energy <i>Two qualifying facility plants in CO and PA</i>	Northern Star Generation LLC <i>Operator of electric power generation facilities</i>	\$123.0	580
12/15/04	Homeland Renewable Energy, LLC <i>Fibrominn LLC's poultry litter-fired power plant in MN</i>	PowerMinn 9090, LLC <i>Sale-leaseback and debt financing transaction</i>	\$202.0	55
12/15/04	Allegheny Energy Supply <i>Lincoln generating facility in Manhattan, IL</i>	ArLight Capital Partners <i>Energy focused private equity firm</i>	\$175.1	672
12/1/04	NRG Energy, Inc. <i>Kendall power plant in Minooka, IL</i>	LS Power Associates, LP <i>NJ-based distributor and generator of electricity</i>	\$449.4	1,160
11/30/04	NUI Corporation <i>Seller / distributor of natural gas</i>	AGL Resources Inc. <i>Natural gas distributor</i>	\$722.2	NM
11/29/04	NRG Energy / Dynegy Joint Venture <i>Chesapeake, VA gas-fired power generation facility</i>	Dominion Virginia Power <i>Power generation and oil and natural gas exploration / production</i>	\$197.0	310
11/29/04	Multitrade of Pittsylvania Co. <i>Wood-burning generating facility in Hurt, Va</i>	Dominion Virginia Power <i>Power generation and oil and natural gas exploration / production</i>		80
11/17/04	CrossCountry Energy <i>Enron's North American natural gas pipeline business</i>	GE Energy Financial Services / Southern Union Co. <i>Private equity arm of GE Capital / Diversified natural gas services</i>	\$2,450.0	7,400 mi. of pipe
10/12/04	NEO Corp./NRG <i>12 landfill gas-fired plants in CA, MN, NJ and NH</i>	Algonquin Power Income Fund <i>Electrical energy investment trust</i>	\$13.3	34
9/29/04	Reservoir Capital Group <i>Sithe North America assets (11 plants)</i>	Exelon Corp. (Remaining stake in Sithe business) <i>Producer and wholesale marketer of electricity</i>	\$97.0	775
9/28/04	Dynegy Inc. <i>50% interest in natural gas-fired peaking plant in Hartwell, GA</i>	Centennial Energy Resources LLC (50% stake) <i>Development services for electricity generation services</i>	NA	310
9/28/04	Reliant Energy <i>71 hydroelectric plants and Carr Street Generating Station (a fossil-fueled, combined-cycle cogen plant)</i>	Brascan Power <i>Asset management focused on real estate and power generation</i>	\$874.0	776
9/2/04	US Wind Force <i>Privately-held developer of wind projects in the Eastern U.S.</i>	AES Corporation <i>Owens and operates electric power generation facilities</i>	<i>Undisclosed Minority Equity Stake</i>	
9/1/04	El Paso Corp. gas-fired merchant plants <i>Bayonne, Camden and Newark Bay, NJ facilities</i>	Newmarket Power <i>Joint venture between MMC Energy and Morris Energy</i>	NA	443
8/30/04	National Energy Resource Co. <i>Middlesex, NJ landfill gas facility</i>	GE Structured Finance (90% stake) <i>Private equity/venture arm of GE Capital</i>	NA	21
8/24/04	NRG Energy (LSP Energy LP) <i>Batesville, MS natural gas-fired generating facility</i>	Complete Energy Partners <i>Acquirer, owner and operator of power generation assets</i>	\$327.6	837
Spring 2004	Covanta Corp. <i>Two landfill gas facilities</i>	US Renewable, LLC <i>Investor in renewable energy projects</i>	NA	10


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Representative Transactions



has sold *Greentree & Dorchester Gas Producers* to **American Landfill Gas**


December 2004



Fairness Opinion for the divestiture of *Highland Propane* to **ENERGY**

June 2004

\$13,000,000



acquired the assets of **McCommas Bluff**

July 2003


\$48,500,000



Sold to **Upstate Energy Inc.**, a subsidiary of **National Fuel Gas Company**

June 2003


\$16,700,000



Private Placement of Equity led by **Sterling Venture Partners Cordova Ventures**

September 2002


\$98,000,000



Sold to **U.S. Energy Systems, Inc.** and **Cinergy Solutions**

May 2001

\$55,000,000



Placement of senior secured note to refinance existing debt

March 2000


\$17,000,000



Sold a systems integrator to **Integrated Electrical Services, Inc.**

1999

\$13,500,000



Sale of Biomass-to-Energy to **KTI, Inc.**

1998

\$46,000,000



Sold seven plant biomass-to-energy company to **Trigen Energy, inc.**

1998