

Green Power Marketing in the United States: A Status Report (Ninth Edition)

Lori Bird and Blair Swezey

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November 2006

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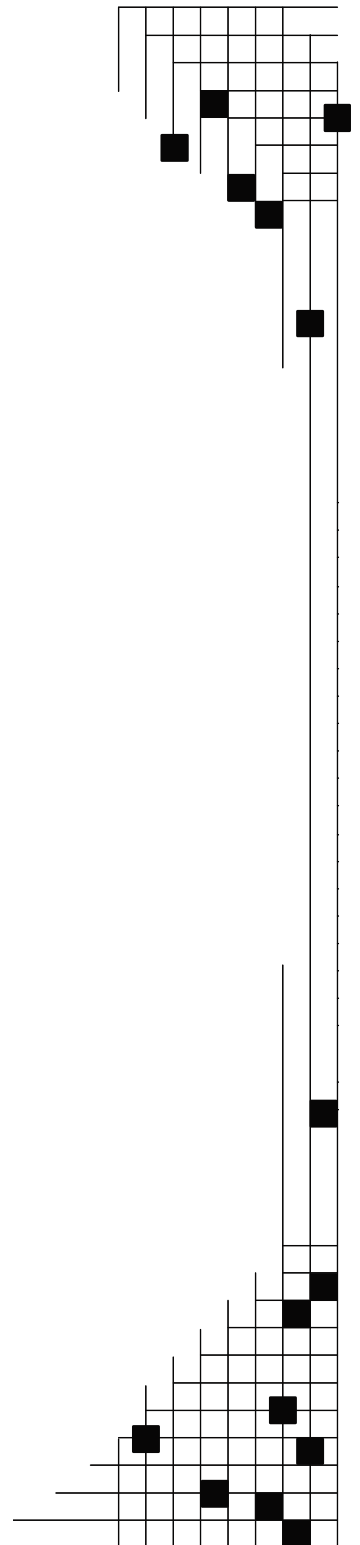
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Introduction

Voluntary consumer decisions to purchase electricity supplied from renewable energy sources represent a powerful market support mechanism for renewable energy development. Beginning in the early 1990s, a small number of U.S. utilities began offering “green power” options to their customers.¹ Since then, these products have become more prevalent, both from traditional utilities and from marketers operating in states that have introduced competition into their retail electricity markets. Today, more than half of all U.S. electricity customers have an option to purchase some type of green power product from a retail electricity provider.

Currently, more than 600 utilities, or about 20% of utilities nationally, offer green power programs to customers. These programs allow customers to purchase some portion of their power supply as renewable energy—almost always at a higher price—or to contribute funds for the utility to invest in renewable energy development. The term “green pricing” is typically used to refer to these utility programs offered in regulated or noncompetitive electricity markets.

In states with competitive (or restructured) retail electricity markets, electricity customers can often purchase electricity generated from renewable sources by switching to an alternative electricity supplier that offers green power. In some of these states, default utility electricity suppliers offer green power options to their customers in conjunction with competitive green power marketers.² To date, nearly a dozen states that have opened their markets to retail competition have experienced some green power marketing activity. Through the combination of utility green pricing and competitive retail markets, green power is available to most electricity customers living in 44 out of the 50 U.S. states (**Figure 1**).

Finally, regardless of whether they have access to a green power product from their retail power provider, any consumer can purchase green power through renewable energy certificates (RECs), which represent the “attributes” of electricity generated from renewable energy-based projects. Consumers in competitive markets can also support renewable energy development through REC purchases without having to switch to an alternative electricity supplier. Today, several dozen companies actively market RECs to residential or business customers throughout the United States.

This report documents green power marketing activities and trends in the United States. First, we present aggregate green power sales data for all voluntary purchase markets across the United States. The next two sections provide summary data on (1) utility green pricing programs offered in regulated electricity markets and (2) green power marketing activity in competitive electricity markets and green power sold to voluntary purchasers in the form of RECs. These are followed by a discussion of key market trends and issues. The final section offers conclusions and observations. The data presented in this report are based on figures provided to NREL by utilities and independent renewable energy marketers.³

¹ The term “green power” generally refers to electricity supplied in whole or in part from renewable energy sources, such as wind and solar power, geothermal, hydropower, and various forms of biomass.

² Under these programs, consumers can purchase renewable energy from independent renewable energy marketing companies without switching their electricity service from the default or standard offer service provider.

³ Green power market data for previous years are available in Bird and Swezey (2005a), Bird and Swezey (2004), Bird and Swezey (2003), Swezey and Bird (2000), Swezey and Bird (1999).

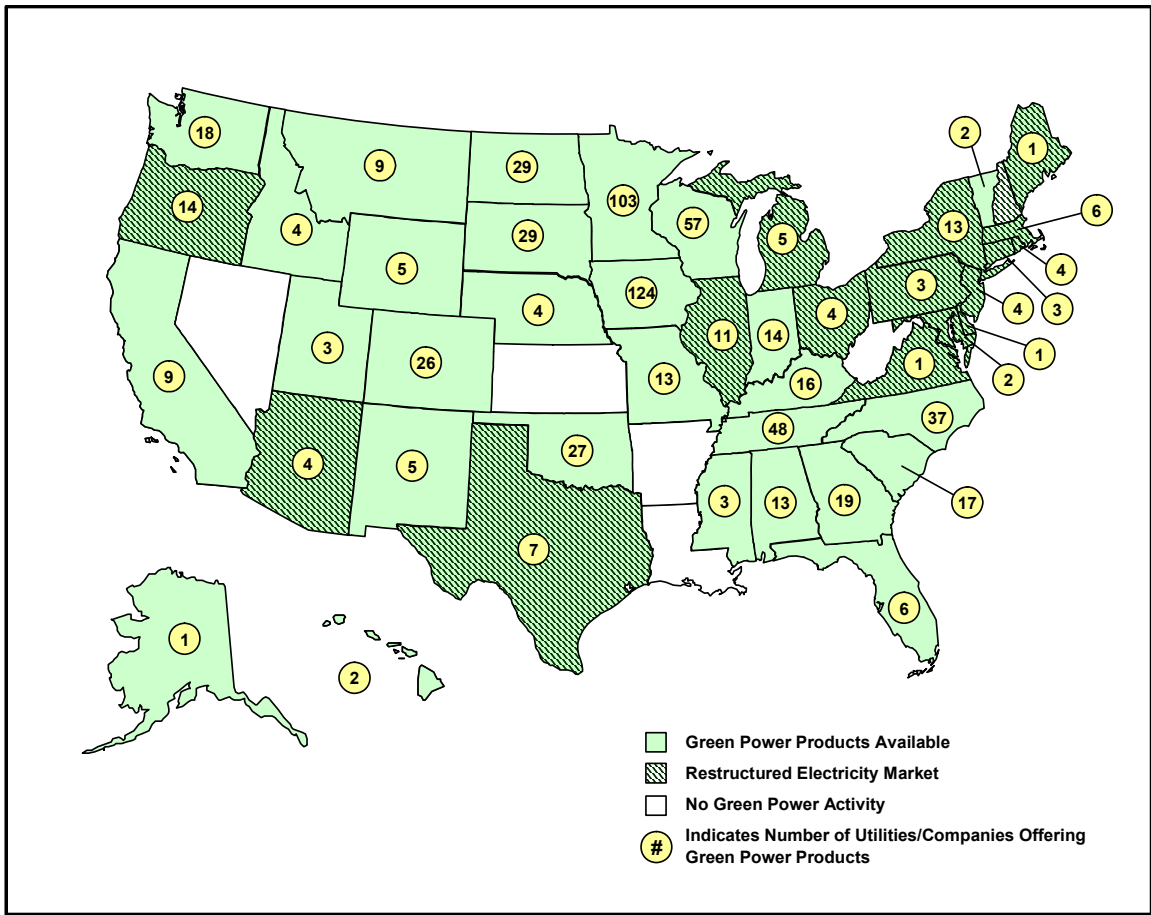


Figure 1: Number of Utilities and Electricity Suppliers Offering Green Power Options by State

Green Power Market Summary and Trends

Green Power Sales

Overall, retail sales of renewable energy in voluntary purchase markets totaled 8.5 billion kilowatt-hours (kWh) in 2005, or about 0.2% of total U.S. electricity sales.⁴ This include sales of renewable energy derived from both “new” and “existing” renewable energy sources, with most sales supplied from new sources.⁵ Wind energy provided 61% of green power sales, followed by biomass energy sources, including landfill gas (27%), hydropower (6%), geothermal (5%), and solar (1%) (**Figure 2**). Based on the sales and pricing data presented in this report, we estimate the market value of green power sales in 2005 to be from \$50 million to \$70 million.

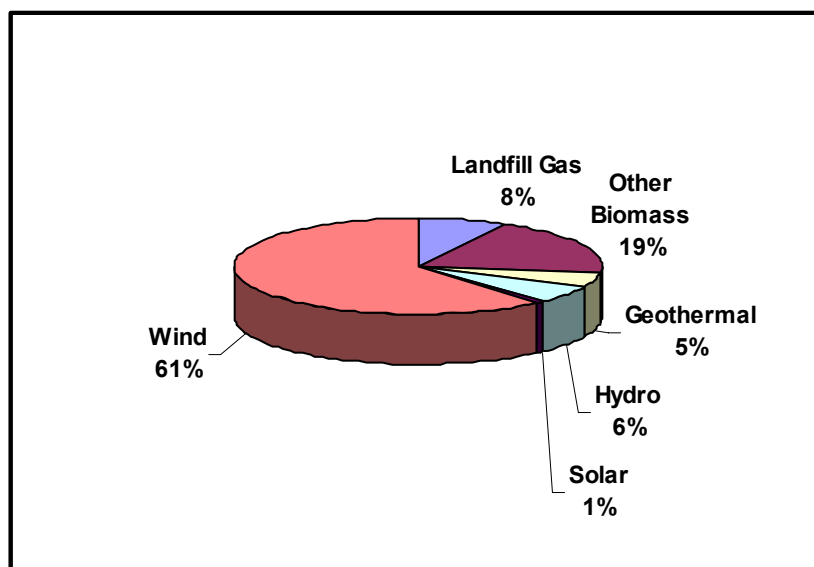


Figure 2: Estimated Green Power Sales by Renewable Energy Source, 2005

Green power sales increased by 37% on an energy basis in 2005, following growth of about 60% in 2004 (**Table 1**). REC sales more than doubled in 2005, while sales through utility green pricing programs also exhibited strong annual growth of more than 30%.⁶ However, sales in competitive markets fell by about 20%, because rising costs associated with supplying customers with renewable electricity service caused some marketers to lose or turn back customers to

⁴ U.S. electricity sales totaled 3,660 billion kWh in 2005, according to the U.S. Energy Information Administration (EIA). See <http://www.eia.doe.gov/cneaf/electricity/epa/epat7p2.html>.

⁵ With green power, a distinction is often made based on the vintage of the renewable energy generator. The green power industry generally follows the *Green-e* national standard, which defines a “new” renewable generation facility as one placed in operation or repowered on or after January 1, 1997. An “existing” generation facility, therefore, is one placed in service before January 1, 1997. For more information on the *Green-e* national standard, see http://www.green-e.org/ipp/national_standard.html.

⁶ The REC sales figures reflect sales to end use customers separate from electricity. RECs bundled with electricity and sold to end use customers through utility green pricing programs or in competitive electricity markets are counted in these other categories.

default service (see the competitive markets discussion). REC markets now represent nearly half of industry sales, replacing competitive markets as the dominant market sector.

The year 2005 marked the first year that the majority of green power sales were made to nonresidential customers, representing 65% of sales, up from about 45% in 2004 (**Table 2**). In fact, during 2005, nonresidential sales doubled, while sales to residential customers declined by 14%. Although sales to residential customers through utility green pricing programs increased in 2005, losses in some competitive markets, such as Pennsylvania and Virginia, led to the overall decline in residential sales. Nearly all REC sales were to nonresidential customers, while residential customers played a larger role in green pricing programs and competitive markets, where they accounted for more than 60% of renewable energy sales (**Table 3**).

At the end of 2005, sales of renewable energy in voluntary markets represented a generating capacity equivalent of about 2,500 MW, with more than 2,000 MW from new renewable energy sources (**Table 4**). Since 2000, the amount of renewable energy capacity serving green power markets has increased more than 10-fold (see **Appendix A**).

Table 1: Estimated Green Power Sales by Market Sector, 2003-2005*
(millions of kWh)

Market Sector	2003	2004	2005	% Change 2004/2003	% Change 2005/2004
Utility Green Pricing	1,280	1,840	2,450	44%	33%
Competitive Markets	1,900	2,650	2,150	39%	-19%
REC Markets	660	1,720	3,890	161%	126%
Retail Total	3,840	6,210	8,490	62%	37%

*Includes sales of new and existing renewable energy.

Table 2: Estimated Green Power Sales by Customer Segment, 2004 and 2005
(millions of kWh)

Customer Segment	2004	2005	% Change
Residential	3,480	2,980	-14%
Nonresidential	2,740	5,510	101%
Total*	6,210	8,490	37%
% Nonresidential	44%	65%	--

*Totals may not add due to rounding.

Table 3: Estimated Green Power Sales by Customer Segment and Market Sector, 2005
(millions of kWh)

Customer Segment	Green Pricing	Competitive Markets	REC Markets	Total
Residential	1,610	1,330	40	2,980
Nonresidential	840	820	3,840	5,510
Total	2,450	2,150	3,890	8,490
% Residential	66%	62%	1%	35%

Note: Totals may not add due to rounding.

Table 4: Estimated Renewable Energy Capacity Supplying Green Power Markets, 2005
(megawatts)

Market	Total Renewables Capacity	New Renewables Capacity
Utility Green Pricing	800	740
Competitive Markets/RECs	1,710	1,300
Total	2,510	2,040

According to EIA, about 9,000 MW of new renewable energy capacity was installed in the United States between 1997 and the end of 2005; thus, voluntary green power markets provide support for 22% of new renewable energy capacity additions, nationally.⁷ Much of the remaining renewable energy generation from recent capacity additions is used for compliance with state renewable portfolio standards or other policy mandates, separate from voluntary green power markets.

Customer Participation

In 2005, nearly 600,000 electricity customers nationally purchased green power products through regulated utility companies, from green power marketers in a competitive market setting, or in the form of RECs (**Table 5**).⁸ In aggregate, utility green pricing programs have shown steady growth in customers over time as the number of utility programs has increased and as existing

⁷ Excluding capacity losses over the period, 8,980 MW of new renewable energy capacity came online from 1997 through 2005. Data from EIA *Renewable Energy Annual* reports, various years, http://www.eia.doe.gov/cneaf/solar/renewables/page/rea_data/rea_sum.html with 2005 data derived from projections contained in the EIA *Annual Energy Outlook 2006* http://www.eia.doe.gov/oiaf/aeo/aeoref_tab.html.

⁸ It is important to note that there is greater uncertainty in our customer estimates for competitive and REC markets because of data limitations. For more detailed estimates by state for 2003 and 2004, see data from U.S. EIA 2006a in **Appendix C**. Generally, our estimates are consistent with the EIA estimates when adjusted for customers in Ohio who participate in community aggregations. We exclude these customers from our estimates because they purchase products with very low renewable energy content (1% to 2%).

programs have grown. On the other hand, competitive markets have been less consistent. While green power sales have grown in Texas and some Northeast states, other markets have failed altogether—notably in California, Connecticut, and most recently Pennsylvania. While REC customers represent a small fraction of the total customer base, REC sales represent nearly half of all green power sales and have grown dramatically in recent years as a result of a number of very large purchases (see **Appendix B** for a list of top green power purchasers).

Average participation rates among utility green pricing programs increased slightly to 1.5% in 2005, with a median value of 1.0%; top performing programs have achieved rates ranging from 4% to 15%. Competitive markets have experienced green power customer penetration rates ranging from 1% to 2% in states where the market has been conducive to retail competition.

Table 5: Estimated Cumulative Green Power Customers by Market Segment, 2000-2005

	2000	2001	2002	2003	2004	2005
Utility Green Pricing	130,000 ^a	170,000 ^a	230,000 ^a	270,000	330,000	390,000
Competitive Markets	>160,000 ^b	>110,000 ^b	~150,000	>170,000 ^c	>140,000 ^c	>180,000
REC Markets	--	--	< 10,000	< 10,000	< 10,000	< 10,000
Retail Total	>290,000	>280,000	~390,000	~450,000	~480,000	~580,000
% Change	n/a	-3%	39%	15%	7%	21%

^a Estimates have been adjusted downward from those originally reported in Bird and Swezey (2003) because of program participation revisions made by the Los Angeles Department of Water and Power.

^b Includes only customers purchasing *Green-e* certified green power products, as reported by the Center for Resource Solutions (2001; 2002).

^c Estimates have been adjusted from those originally reported in Bird and Swezey (2005a) based on data available in U.S. EIA 2006a (see **Appendix C**).

Utility Green Pricing Programs

The number of utilities offering green pricing has grown steadily in recent years—today, more than 600 investor-owned, public, and cooperative utilities in 36 states offer green pricing programs (**Figure 3**). **Appendix D** provides a list of utilities offering green pricing while **Appendix E** provides detailed program information.⁹ Because a number of small municipal or cooperative utilities offer programs developed by their power suppliers, the number of distinct green pricing programs is about 130. Since 1999, between 10 and 25 new programs have been added each year. Initially, some portion of the growth in utility green power offerings was attributable to the threat of retail market competition, while more recent growth has been spurred by state laws requiring utilities to offer green pricing.¹⁰ In addition, a number of utilities have expanded their programs as customer demand has grown.

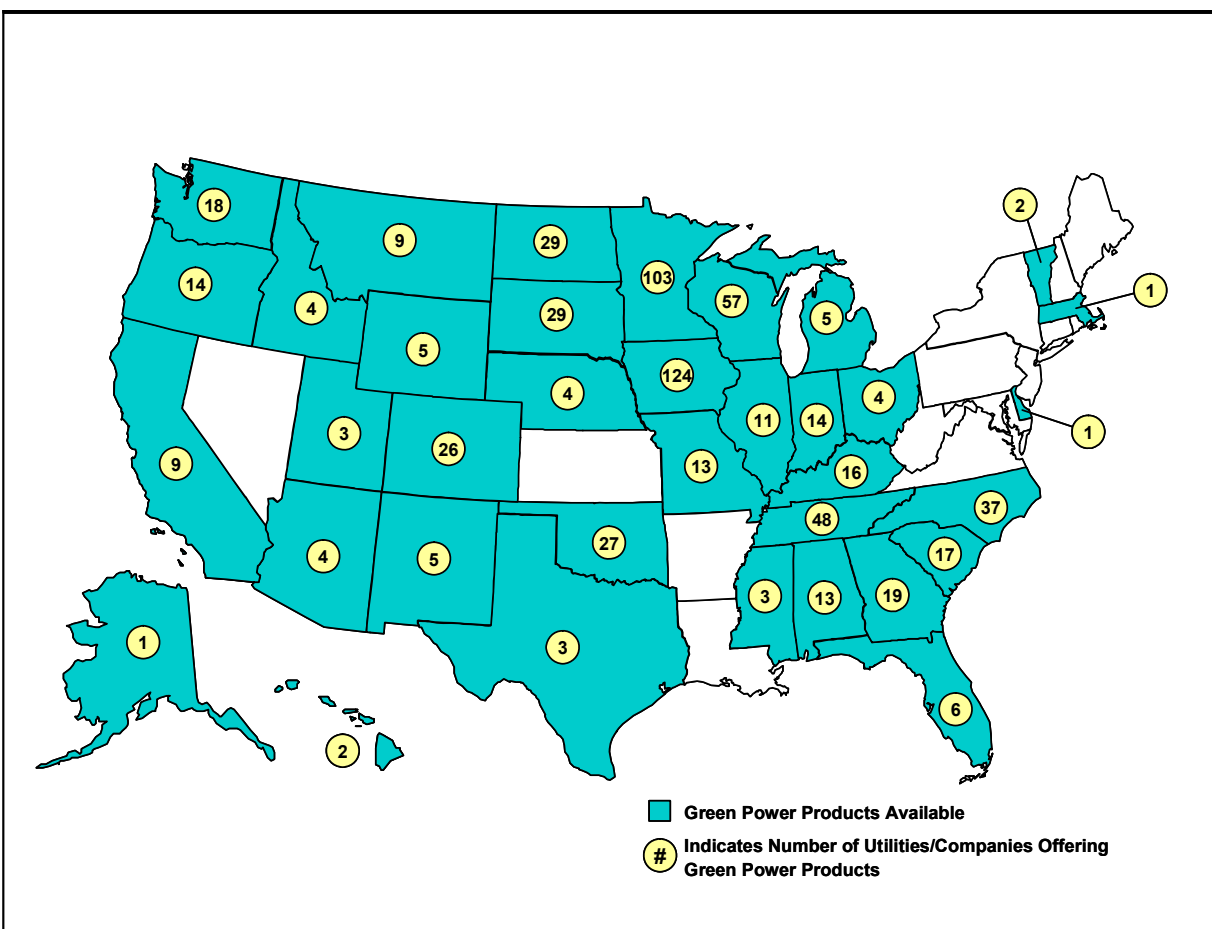


Figure 3: U.S. Map of Utility Green Pricing Activities

⁹ For an up-to-date list of utilities with green pricing programs, see the U.S. Department of Energy’s Green Power Network Web site at <http://www.eere.energy.gov/greenpower/markets/pricing.shtml?page=1>.

¹⁰ These states include Iowa, Minnesota, Montana, New Mexico, Oregon, and Washington.

Products and Pricing

Typically, green pricing programs are structured so that customers can either purchase green power for a certain percentage of their electricity use (often called “percent-of-use products”) or in discrete amounts or blocks at a fixed price (“block products”), such as a 100-kWh block. Most utilities offer block products but may also allow customers to purchase green power for their entire monthly electricity use. Utilities that offer percent-of-use products generally allow residential customers to elect to purchase 25%, 50%, or 100% of their electricity use as renewable energy, while a few offer fractions as small as 10%. Under these types of programs, larger purchasers, such as businesses, can often purchase green power for a smaller fraction of their electricity use.

In 2005, the price differentials charged in green pricing programs ranged from -0.67¢/kWh to as much as 17.6¢/kWh , with a mean of 2.36¢/kWh and a median of 2.0¢/kWh (**Table 6**). Programs that feature solar-based products represent the high end of the range.

Table 6: Price Differential Charged for Utility Green Power Products (¢/kWh)

	1999	2000	2001	2002	2003	2004	2005
Average	2.15	3.48	2.93	2.82	2.62	2.45	2.36
Median	2.00	2.50	2.50	2.50	2.00	2.00	2.00
Range	0.4-5.0	(0.5)-20.0	0.9-17.6	0.7-17.6	0.6-17.6	0.33-17.6	(0.67)-17.6
Lowest Premium Programs*	0.4-2.5**	(0.5)-2.5	1.0-1.5	0.7-1.5	0.6-1.3	0.33-1.0	(0.67)-0.91
No. of Programs Represented	24	50	60	80	91	101	104

*Represents the 10 utility programs with the lowest price premiums for new renewable energy sources. In 2001, a discrepancy exists between the low end of the range for all programs and the Top 10 programs, because the program with the lowest premium (0.9¢/kWh) was either selling some existing renewables or had not installed any new renewable capacity for its program.

**Data for April 2000.

Source: Bird and Brown (2006a)

The average price premium has dropped at an annual average rate of about 8% since 2000 (**Figure 4**). Some of this reduction can be attributed to lower market costs for renewable energy supplies. Also, increases in the price of natural gas have narrowed the price gap between renewables and gas-fired generation alternatives, which has led to lower initial premiums for many new programs but has also reduced the effective premiums in programs that exempt participating customers from fuel-related price increases.¹¹ In addition, a number of utilities have lowered their premiums over time to reflect changing market conditions (see **Appendix F**).

¹¹ Some utilities periodically adjust the green power premium to reflect changes in the cost of fossil fuels used for electricity generation. Other utilities offer a fixed-rate green power product. In either case, when fuel prices increase, the effective green power premium falls. Utilities offering fixed-rate green power options or other types of fuel-price exemptions include Austin Energy, Alliant Energy, Clallum County PUD, Edmond Electric, Eugene Water and Electric Board, Green Mountain Power, Holy Cross Energy, Madison Gas & Electric, OG&E Electric Services, We Energies, and Xcel Energy.

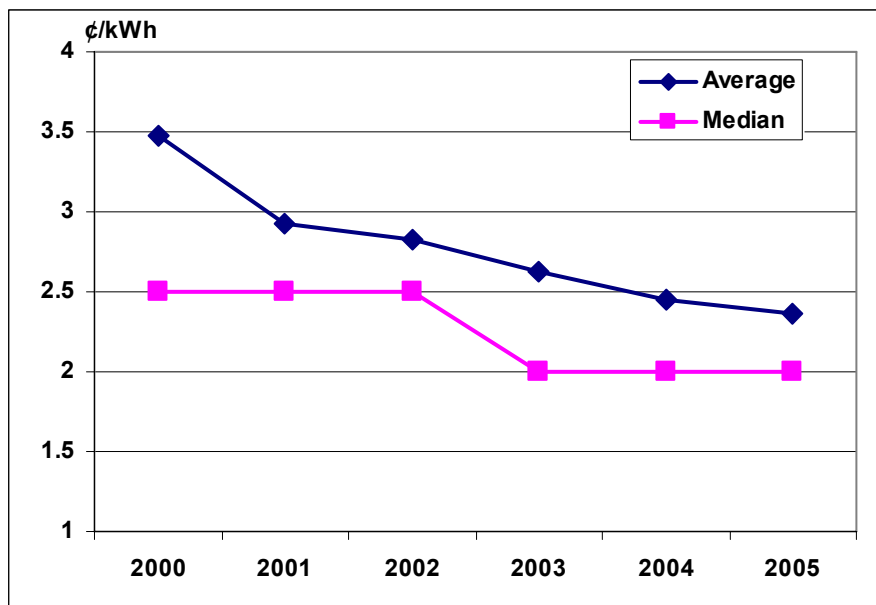


Figure 4: Trend in Utility Green Pricing Premiums, 2000–2005

A growing number of utilities also offer lower premiums for bulk green power purchases by larger nonresidential customers.¹² In these programs, the premium charged to nonresidential customers can range from 0.5¢/kWh to 2¢/kWh less than the residential green energy premium. A number of these bulk purchase rates have been introduced in recent years to help utilities compete against low-priced REC offerings.

Green Pricing Sales

Utility green pricing sales continue to exhibit strong growth (**Figure 5**). Collectively, utilities in regulated electricity markets sold more than 2.4 billion kWh of green power to retail customers through green pricing programs in 2005. Green power sales to all customer classes increased by 33% in 2005, compared to growth rates in excess of 40% in the past several years (**Table 7**). Sales growth is attributed to both continued expansion of the green power customer base as well as larger purchases by nonresidential customers.

Renewable energy sold through green pricing programs in 2005 represents an equivalent renewable energy generation capacity of nearly 800 MW, with more than 740 MW from new renewable energy resources (**Table 8**). Wind, solar, and landfill gas are the renewable resources most commonly used for utility programs, with wind energy representing the largest portion of the total capacity. **Appendix A** presents estimates of new capacity serving green pricing programs in previous years.

¹² These include Continental Cooperative Services/Soyland, Midstate Electric Cooperative, utilities participating in the NC Green Power Program, PacifiCorp, Portland General Electric, Puget Sound Energy, Salt River Project, We Energies, and Wisconsin Public Power Inc.

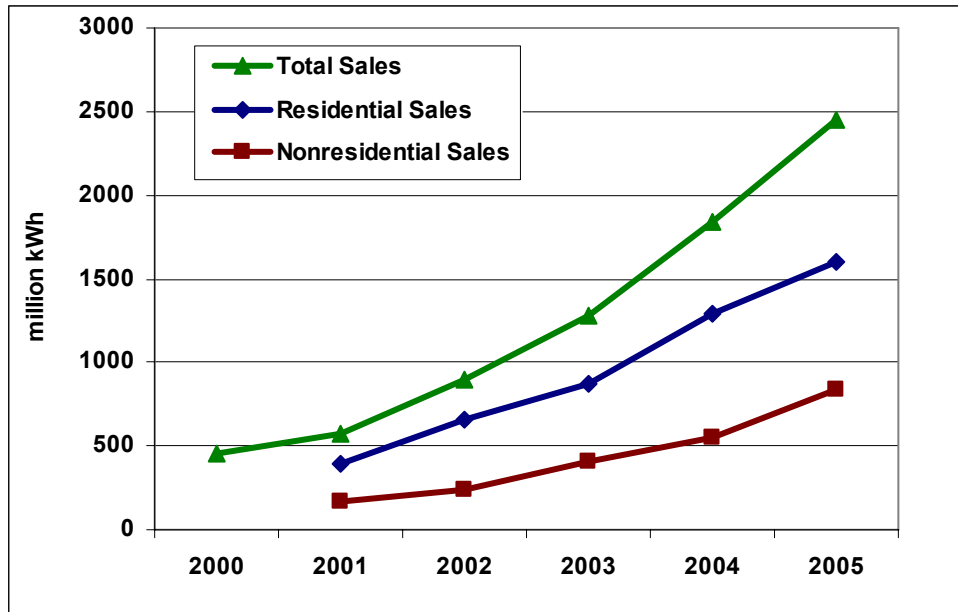


Figure 5: Utility Green Pricing Sales, 2000-2005

Table 7: Annual Sales of Renewable Energy through Utility Green Pricing Programs (millions of kWh)

	2000	2001	2002	2003	2004	2005
Sales to Residential Customers	---	400	661	874	1,295	1,606
Sales to Nonresidential Customers	---	173	234	410	544	842
Total Sales to All Customers	454	573	895	1,284	1,839	2,448
% Annual Growth in Total Sales	---	26%	56%	43%	43%	33%
% Nonresidential of Total Sales	---	30%	26%	32%	30%	34%

*Sales information by customer segment not available for 2000.

Source: Bird and Brown (2006a)

Table 8: Renewable Energy Sources Supplying Utility Green Pricing Programs, 2005

	Landfill Gas	Digesters	Wood	Geo-thermal	Hydro	Solar	Wind	Total
Sales (MWh)	323,000	28,000	63,000	72,000	97,000	6,000	1,859,000	2,448,000
% of Total Sales	13%	1%	3%	3%	4%	<1%	76%	100%
% New Sales	59%	100%	88%	4%	12%	100%	99%	87%
Capacity Factor*	90%	90%	80%	90%	50%	20%	30%	n/a
Total MW	41	4	9	9	22	3	707	796
MW New RE	24	4	8	<1	3	3	702	744

* Capacity factors are derived from EPRI/DOE 1997 and EIA 2006b to reflect a blend of technologies installed over time and in areas with varying resource quality.

Customer Participation

At the end of 2005, nearly 400,000 customers were participating in utility green pricing programs nationwide, including more than 11,000 nonresidential customers.¹³ From 1999 to 2005, the number of customer participants increased nearly six-fold, with growth rates in recent years ranging from 16% to 35%.

Table 9 delineates residential and nonresidential customer participation in utility green pricing programs over time. The vast majority of participants are residential customers; nonresidential customers accounted for only 3% of all participants in 2005. However, nonresidential participation is growing at a faster rate than residential participation, which is having a significant positive impact on overall sales volume because of the larger size of nonresidential purchases.

Table 9: Estimated Cumulative Number of Customer Participants in Utility Green Pricing Programs

Customer Segment	1999	2000	2001	2002	2003	2004	2005
Residential	n/a*	131,000	166,300	224,500	258,700	323,700	383,400
Nonresidential	n/a*	1,700	2,500	3,900	6,500	8,100	11,300
Total	66,900	132,700	168,800	228,400	265,000	331,800	394,700
% Total Annual Growth	n/a	98%	27%	35%	16%	25%	19%
% Residential Growth	n/a	n/a	27%	35%	15%	25%	18%
% Nonresidential Growth	n/a	n/a	47%	56%	67%	25%	40%

*Information on residential and nonresidential participants is not available for 1999.

Source: Bird and Brown (2006a)

At the end of 2005, the average participation rate in utility green pricing programs among eligible utility customers was 1.5%, with a median of 1% (**Table 10**). These industry-wide rates have shown very little change in recent years. The overall lack of improvement in participation rates results from a number of factors, including a lack of customer awareness of the green power program,¹⁴ customer unwillingness to pay a premium for green power, customer uncertainty regarding the actual benefits of the program, and varied levels of interest among utilities in marketing and promoting the program (Holt and Holt 2004, Swezey and Bird 2001). However, the top performing programs continue to show improvement, with participation rates ranging from about 5% to nearly 14% in 2005, compared to a range of 3% to 6% in 2002.

In 2005, utilities reported that an average of 6.5% and a median of 5.1% of customers dropped out of green pricing programs, reversing a trend of increasing attrition rates during the past several years (Bird and Brown, 2006a). This finding is somewhat surprising in a year in which customers throughout the country faced higher electricity and energy prices. Although the reason

¹³ NREL received participant and sales data for about 70% of utility green pricing programs in 2005, including all of the major programs. The remaining programs, which are smaller in size, do not have a large impact on overall participant numbers.

¹⁴ A number of utilities have reported that only 20% to 30% of their customers are aware that a green power option is offered.

for the increase in customer retention is not clear, this finding suggests that customers are “sticky” and maintain participation in green power programs despite other energy cost increases.

Table 10: Customer Participation Rates in Utility Green Pricing Programs by Year

Participation Rate	1999	2000	2001	2002	2003	2004	2005
Average	0.9%	1.2%	1.3%	1.2%	1.2%	1.3%	1.5%
Median	0.8%	0.7%	0.7%	0.8%	0.9%	1.0%	1.0%
Top 10 programs	2.1%– 4.7%*	2.6%– 7.3%	3.0%– 7.0%	3.0%– 5.8%	3.9%– 11.1%	3.8%– 14.5%	4.6%– 13.6%

*Data for April 2000

Source: Bird and Brown (2006a)

Competitive Green Power and REC Markets

About one-third of U.S. states have restructured their electricity markets to introduce retail service competition. Currently, electricity consumers in the following states can purchase competitively marketed green power: Connecticut, Maine, Maryland, Massachusetts, New Jersey, New York, Pennsylvania, Rhode Island, Texas, and Virginia, as well as the District of Columbia (**Figure 6** and **Appendix G**).^{15,16}

Initially, buying green power in competitive retail markets entailed switching service from the incumbent utility to a green power supplier. However, with few exceptions, green power marketers have found it difficult to compete or to persuade customers to switch suppliers. As a remedy, a number of states now require default suppliers (which are often the incumbent distribution utilities) to offer green power options to their customers. These suppliers typically provide customers with a choice of several products offered by competing green power marketers. In addition, several utility suppliers have voluntarily teamed with a single green power marketer to offer a green power option to their customers. Utility/marketer partnership programs are now offered in Connecticut, Massachusetts, New Jersey, New York, Pennsylvania, and Rhode Island.

RECs provide another alternative to switching electricity suppliers. Also known as “green tags” or tradable renewable certificates (TRCs), RECs represent the “green” attributes of renewable energy generation and can be sold separately from commodity electricity. REC-based products may be supplied from a variety of renewable energy sources throughout the country and sold to customers nationally; or they may be supplied from renewable energy sources in a particular region or locality and marketed as such to local customers. More than 20 companies offer certificate-based green power products to retail customers via the Internet, and a number of other companies market RECs solely to commercial and industrial customers (**Appendix H**).¹⁷

RECs are also sold in the wholesale market and are frequently used by utilities and marketers who bundle the RECs with commodity electricity to sell green power to retail customers. In fact, RECs are used to supply most of the programs in which default suppliers have teamed with green power marketers. Thus, it can be difficult to distinguish REC products from other green power offerings. This is particularly true when REC products are supplied from renewable sources located in the same region in which they are marketed.

¹⁵ For an up-to-date list of products offered by competitive green power marketers, see the U.S. Department of Energy’s Green Power Network Web site at <http://www.eere.energy.gov/greenpower/markets/marketing.shtml?page=1>

¹⁶ We do not include Oregon and Ohio in this list. In Oregon, only large commercial and industrial customers are able to switch to competitive green power providers; residential and small commercial customers have access to green power options offered by the incumbent utilities, which we categorize as green pricing. In Ohio, at least one green power marketer supplied customers of municipal aggregation groups with a “cleaner energy” product, but the renewable energy content was very low (this offer was terminated at the end of 2005). Green power is not offered more broadly in the Ohio market.

¹⁷ For an up-to-date list of companies offering REC-based green power products, see the U.S. Department of Energy’s Green Power Network Web site at: <http://www.eere.energy.gov/greenpower/markets/certificates.shtml?page=1>

require its partners to purchase new renewables to meet its minimum purchase criteria, starting in 2007.¹⁹

The price premium charged for competitive market products depends on several factors such as the price of standard offer or default service, the availability of incentives to green power marketers or suppliers, and the cost of renewable energy generation available in the regional market. Some marketers charge prices close to or even below the default market price; others offer fixed-price products at a premium, which provide customers with protection against increasing prices for a specified period of time, usually one year.

Competitively marketed green power products generally carry a price premium of between 1¢/kWh and 2.5¢/kWh, although offerings range from discounts to a premium of about 10¢/kWh. During 2005, a number of marketers were forced to increase the price premiums for their products as a result of market conditions. The renewable energy sources most commonly used to supply competitive green power offerings are wind, landfill gas, and small or low-impact hydropower, while a number of products also contain a small amount of solar energy. Higher-priced products often contain a larger fraction of new renewable energy content or more desirable resources, such as new wind and solar.

Similar to competitively marketed products, retail prices charged for REC products typically range from about 1¢/kWh to 2.5¢/kWh for residential and small commercial customers. In most cases, larger customers are able to negotiate lower prices. Nearly all REC products are sourced from new renewable energy generation projects, which is a requirement of both *Green-e* certification and the EPA Green Power Partnership. Purchasers often seek certification out of concerns over “double counting” or because RECs are generally not subject to regulatory scrutiny.

Wind energy is the most commonly used renewable energy source for RECs, although some REC products feature other renewable energy sources or blends of renewable sources, such as biomass (typically from bio-methane sources) and solar.

Customer Participation

Based on data received from green power marketers, we estimate that as many as 200,000 retail customers were purchasing green power from competitive suppliers or as RECs at the end of 2005 (**Table 11**). This number includes about 60,000 participants in utility/marketer programs available in competitive markets. The number of customers participating in utility/marketer programs doubled during 2005 as these programs, most only recently launched, have begun to gain traction.

In competitive markets, the vast majority of customers purchasing green power are residential customers. Of the 200,000 retail customers, fewer than 10,000 purchase REC products. While most of the REC purchasers are also residential customers, the vast majority of REC sales are made to nonresidential customers due to the much larger purchase sizes.

¹⁹ See <http://www.epa.gov/greenpower>.

Table 11: Estimated Cumulative Number of Customers Purchasing RECs or Green Power from Competitive Marketers, 2002-2004

	2002	2003	2004	2005
Competitive Markets	~150,000	~170,000*	<140,000*	>180,000
RECs	<10,000	<10,000	<10,000	<10,000
Total	<160,000	~180,000	<150,000	~190,000
% Change	n/a	13%	-17%	27%

*Estimates are revised from those reported in Bird and Swezey (2005a) based on EIA data (EIA 2006a); see **Appendix C**. Customer numbers in competitive markets for 2003 were increased from the 150,000 originally reported to 170,000, and 2004 customer numbers were adjusted downward from the 180,000 originally reported to 140,000.

During 2005, most of the customer gains resulted from utility/marketer partnership programs in the Northeast. These gains were tempered by losses, particularly in Pennsylvania and Virginia, where marketers struggled to provide electricity service to consumers amidst adverse market conditions and increasing costs. For example, one marketer ceased offering electricity generation service to its 30,000 customers in late 2005, citing adverse market rules and conditions that increased its operating costs. The company instead began offering a REC-based product supplied from national renewable energy resources, but likely suffered losses when turning back its customers to default electricity service.²⁰

Green Power Sales

An estimated 6 billion kWh of renewable energy was sold to retail customers by competitive and REC marketers in 2005 (**Table 12**). This figure includes renewable energy from both existing and new sources as well as that sold to customers in products that contain only a small percentage of renewable energy.

About 2.2 billion kWh of the total was sold as a bundled green power product in competitive electricity markets—nearly a 20% decline from 2004. As noted earlier, the decline in sales in competitive markets occurred as a result of adverse market conditions and increasing costs of serving customers with electricity in states such as Pennsylvania and Virginia. The competitive market sales figure includes renewable energy sales through default utility/marketer programs or individual utility/marketer partnership in competitive markets, which amounted to approximately 290 million kWh in 2005. Retail REC sales more than doubled in 2005, reaching 3.9 billion kWh. All of the growth in REC sales is attributable to the nonresidential sector.

²⁰ Green Mountain Energy Company News Release, October 11, 2005, “Green Mountain Energy Company Introduces New Renewable Energy Product in Pennsylvania.”

http://www.greenmountain.com/about/press_events/prviewer.jsp?dbId=18, accessed November 10, 2006.

Green Mountain quit the Ohio market at the same time, citing the Federal Energy Regulatory Commission's implementation of Seams Elimination Charge Adjustment and its resulting litigation, in addition to unexpected charges associated with the start of Midwest Independent Transmission System Operator Inc.'s Day II energy markets (see *Austin Business Journal* article, October 26, 2005

http://www.bizjournals.com/austin/stories/2005/10/24/daily30.html?from_rss=1).

**Table 12: Retail Sales of Renewable Energy in Competitive Markets and RECs
(million kWh)**

	2003	2004	2005	% Change 2005/2004
Competitive Markets				
Residential	n/a	2,140	1,330	-38%
Nonresidential	n/a	510	820	61%
Subtotal	1,900	2,650	2,150	-19%
% Residential		81%	62%	
RECs				
Residential	n/a	40	40	0%
Nonresidential	n/a	1,690	3,840	127%
Subtotal	660	1,720	3,890	126%
% Residential		2%	1%	
Total Sales	2,560	4,370	6,040	38%

n/a = not available

Totals may not add due to rounding.

Table 12 also delineates green power sales by customer segment. In 2005, about 60% of green power sales in competitive markets were to residential customers, down from 80% in 2004. In contrast, nearly all REC sales were to nonresidential customers. Generally, nonresidential customers find REC products attractive because of their flexibility and the greater potential for cost savings,²¹ whereas residential customers may not be aware that RECs are available or may not understand them. For commercial and institutional customers that operate facilities in multiple locations across the country, RECs may also provide a more efficient green power sourcing solution than working with utilities in each individual utility territory.²²

In 2005, renewable energy sold in competitive markets or as RECs represented an equivalent renewable energy capacity of more than 1,700 MW, with more than 1,300 MW of this total coming from new renewable energy resources (**Table 13**). Wind energy supplied 55% of sales, followed by biomass (26%), hydropower—often from small or low-impact installations—(7%), landfill gas (6%), geothermal (6%), and solar (1%).

²¹ RECs can provide cost savings when they are sourced from renewable energy projects in more favorable resource locations and because the electricity need not be delivered directly to the customer, which lowers transaction costs.

²² For example, the EPA Green Power Partnership reports that the majority of its top 25 partners purchase RECs (**Appendix B**). See <http://www.epa.gov/greenpower/>. In addition, the Green Power Market Development Group promotes the purchase of RECs among its members. See <http://www.thegreenpowergroup.org/>.

Table 13: Renewable Energy Sources Supplying Competitive and REC Markets, 2005

	Biomass	Landfill Gas	Geo-thermal	Hydro	Solar	Wind	Total
MWh Sales	1,542,000	342,000	340,000	431,000	66,000	3,318,000	6,040,000
% of Total Sales	26%	6%	6%	7%	1%	55%	100%
Estimated % New	10%	75%	1%	10%	100%	95%	n/a
Capacity Factor*	80%	90%	90%	50%	20%	30%	n/a
Total MW	220	43	43	98	38	1,263	1,706
MW New RE	22	33	1	10	38	1,200	1,302

* Capacity factors are derived from EPRI/DOE 1997 and EIA 2006b to reflect a blend of technologies installed over time and in areas with varying resource quality.

Market Trends and Issues

Taken as a whole, the voluntary green power market continues to exhibit strong growth. However, green power markets do not operate in isolation from other markets and are also impacted by both state and federal policy initiatives and changes. In this section, we briefly describe a number of market and policy developments that will have an important influence on the future of green power markets.

Product Pricing

Utility Green Pricing

As noted previously, green power price premiums have been falling over time due to a combination of higher prices for conventional fuels and lower renewable energy costs. Nationally, the average premium charged in green pricing programs has fallen from 3.48¢/kWh in 2000 to 2.36¢/kWh in 2005. Clearly, when the cost differential between renewable and conventional generation is narrowed, green power becomes a more attractive purchase option.

Several utilities exempt their green power customers from rate adjustments caused by changes in the prices of nonrenewable generation fuels. For three of these utilities, rising natural gas prices caused the green power price differential to turn negative at the end of 2005, that is, green power customers were actually paying less for their power than base rate customers.²³ This situation led to a “run on the bank” which exhausted the green power supplies of two of the three utilities.

And three other utilities²⁴ offer a fixed-rate green power product, which also provides customers with protection from fuel price changes. The most successful of these programs is the *GreenChoice* program offered by Austin Energy, which in 2005 accounted for nearly 20% of all green power sales by the nation’s utilities. The utility signs 10-year, fixed-price wind energy supply contracts and likewise requires its customers to commit to a 10-year green power purchase. The program has proven extremely popular with larger commercial customers who, in addition to buying renewable energy, are able to lock in a hedge against future fossil energy price volatility. *GreenChoice* customers have also seen the utility’s base rates rise above those charged for green power.

Why don’t more utilities offer fixed-rate green power products or fuel-price exemptions? Utilities are generally risk averse and are concerned that customers will drop the green power service and leave the utility with “stranded” investment in renewable energy projects. Many utilities (and their regulators) strictly avoid any cross-subsidization between green power customers and other customer classes. The Austin Energy model works, in large measure, because the utility and city are willing to accept these risks. On the other hand, the great success of the Austin program clearly shows that customers place a high value on the fixed-price characteristic of the product.²⁵

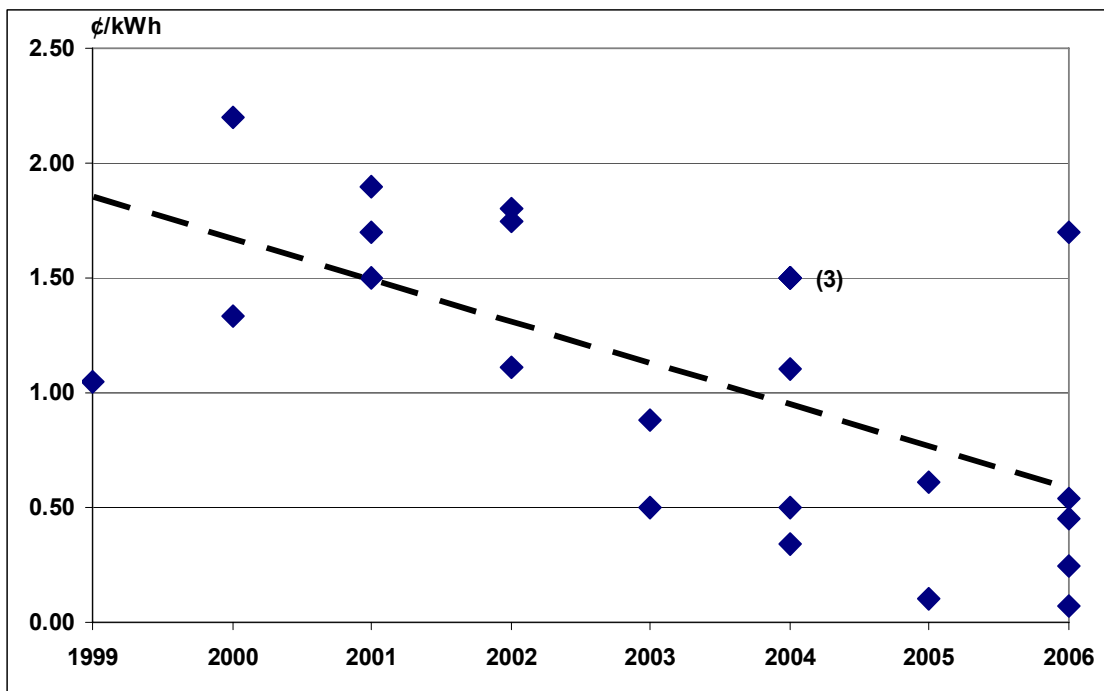
²³ The three utilities are Edmund Electric (Okla.), OG&E Electric Services (Okla.), and Xcel Energy (Colorado program).

²⁴ The three utilities are Austin Energy (Tex.), Eugene Water and Electric Board (Ore.), and Clallum County Public Utility District (Wash.).

²⁵ A forthcoming NREL report will provide a detailed examination of fixed-rate green power products.

Renewable Energy Certificates

Increasingly, REC sales have come to dominate the green power market. In particular, large national-scale companies and organizations find RECs to be an attractive green power option because of the greater flexibility they offer in cost and procurement. Because RECs can be derived from renewable energy projects located anywhere in the country, there is a greater level of competition among suppliers, which exerts downward pressure on prices. **Figure 7**, compiled from a very limited sample of publicly available data on large REC purchases, shows that similar to green pricing, REC prices have declined considerably in recent years.²⁶ REC prices tend to be lower than utility green pricing premiums, again owing to a greater level of competition among suppliers and the existence of a national marketplace for RECs. In fact, published market data for October 2006 shows a price range of from 0.15¢/kWh to 0.9¢/kWh for non-solar voluntary REC offers (**Table 14**).



Note: In 2004, there were three publicly announced REC deals priced at 1.50¢/kWh.

Figure 7: Trend in Green Power Purchase Contract Prices

²⁶ Several caveats must be offered on the price data presented in **Figure 7**. First, no attempt has been made to control for renewable fuel type, e.g., wind, landfill gas, or small hydro, or for product quality, e.g., products supplied from 100% “new” projects vs. product blends sourced from new and existing projects. Second, the regional mix of purchases for which price data is available may not be representative of the nation as a whole. The type of buyer, e.g., public agency vs. private company, and the quantity purchased can also be important. In the latter case, customers likely are able to negotiate more favorable pricing for larger purchase amounts. Finally, whether a purchase consists of local/regional RECs or national RECs can affect the price—national RECs are generally more plentiful and available at very low prices whereas customers may face higher prices for local/regional RECs because of more limited supply and sourcing options.

Table 14: Voluntary REC Offers and Pricing, October 2006

→ PRODUCT	→ GENERATION	→ REGION	→ TERM	→ VOLUME (MWh)	→ BID	→ OFFER
New TRC	wind	National	2006	50,000	\$1.25	\$1.75
New TRC	wind	WECC	2007-2008	25,000	\$3.00	\$4.50
New TRC	wind	National	2007-2008	100,000	\$1.60	\$2.10
New TRC	wind	CA	2008	150,000	\$5.00	\$8.00
New TRC	geothermal	WECC	2007-2010	200,000	\$5.00	\$9.00
New TRC	biomass	National	2007	50,000	\$1.00	\$1.50

Source: Evolution Markets Inc., "Monthly Market Update: REC Markets," October 2006.
<http://www.evomarkets.com/resources/index.php?xp1=1&type=mmu>

Whether REC prices will continue to fall is an open question. Because of global demand pressures, market prices for wind turbines and solar modules have been rising, increasing the cost of some new renewable energy projects. However, costs are also rising for construction of new power plants utilizing conventional fuels, perhaps negating any near-term impact on REC prices. Competition for RECs could also heat up as RPS policies proliferate and compliance requirements ramp up. Nevertheless, REC prices remain low currently and early indications are that 2006 will be another year of significant growth in green power sales. For example, in October 2006, the EPA Green Power Partnership announced that total annual renewable energy purchase commitments among its partners had risen to more than 7 billion kWh, up from about 4 billion kWh at the end of 2005.²⁷

Utility/Marketer Partnerships

As noted previously, utility green pricing programs, on average, have achieved participation rates of about 1.5%. And under the most favorable market conditions, competitive green power marketers have garnered about 1% to 2% of retail customers. Meanwhile, the most successful green power programs have achieved participation rates of from 5% to 15%.

In recent years, a number of utilities have turned to partnering with independent, third-party renewable energy marketers to design and promote their green power programs or to enhance the effectiveness of existing programs. Today, more than 25 utilities either voluntarily team with marketers to offer green power options or do so under legal or regulatory requirements. Several states also require default electricity suppliers to offer green power options in conjunction with competitive marketers. These programs provide access to retail green energy products in restructured markets where none may otherwise exist.

A recent review showed that strategic partnerships between utilities and marketers can be an effective approach to marketing green power in both regulated and restructured electricity markets (Bird and Brown, 2006b). Such partnerships leverage the program design, sales, and resource procurement experience of marketers and the utility's service reputation and access to

²⁷ "EPA's Green Power Top-25 Announced: Wells Fargo Joins List as Top Corporation," EPA News Release, October 3, 2006.
<http://yosemite.epa.gov/opa/admpress.nsf/a8f952395381d3968525701c005e65b5/390b6eff78f77da6852571fc00611971!OpenDocument>

customers. In states with competitive electricity markets, partnerships between default suppliers and marketers provide greater choices for residential and small commercial customers, who may otherwise be hesitant to switch suppliers. Partnerships also create greater incentives for success because marketers have a vested financial interest in maximizing customer participation and green power sales.

Interaction with Energy and Environmental Policies

Renewable Portfolio Standards

Voluntary green power markets represent a market-based mechanism for increasing renewable energy development through consumer demand while renewable portfolio standards (RPS) represent a policy mandate.²⁸ An RPS requires electricity providers to supply a certain quantity or percentage of their delivered energy from renewable energy sources. RPS policies have been adopted in 21 states and the District of Columbia through legislative action, regulatory order, or ballot initiative.

Depending on the design, an RPS policy can either support or limit the voluntary market for renewable energy. Most important is whether or not renewable electricity used for voluntary green power programs should be counted towards the RPS requirement. By counting voluntary purchases, suppliers may have an easier time meeting the RPS requirements and at a lower overall cost. On the other hand, counting voluntary market sales toward RPS compliance undermines one of the fundamental tenets of these markets, which is that voluntary purchases support renewable energy development that is additional to policy mandates for which all customers share the cost.

Most states with an RPS policy have determined that voluntary green power purchases should not be counted toward RPS compliance. For example, Minnesota statutes require the state's utilities to both offer their customers the opportunity to purchase some or all of their energy from renewable energy sources and to make good-faith efforts to generate or otherwise secure enough electricity from qualifying renewable energy technologies to represent 10% of total retail electric sales by 2015. In considering how to integrate these two policies, the Minnesota Public Utilities Commission determined that counting green pricing sales toward the renewable energy objectives was not consistent with the public interest or other state energy policies that seek to encourage renewable energy development.

However, in Texas, a 2005 law that increased the state's RPS included a section that requires all renewable energy capacity in the state to count toward RPS compliance. If implemented, this could have a deleterious effect on voluntary market sales from Texas-based renewable energy projects. Most voluntary market customers expect their purchases to be additional to any policy requirements. In fact, such "additionality" is a primary requirement of the *Green-e* certification program as well as for membership in the EPA Green Power Partnership.

²⁸ Generally, RPS policies do include some market-based mechanisms, such as requiring renewable energy developers to compete for power supply contracts and employing renewable energy credit trading.

In many cases, voluntary green power programs have preceded establishment of a state RPS mandate. Voluntary green power markets have raised public awareness of and support for renewables, provided utilities with experience in the operation and grid integration of renewable energy technologies, and built new constituencies for renewable energy among rural landowners and farmers, all of which have provided key arguments and support for RPS policy adoption. Many renewable energy project developers support continuation of both markets to provide revenue options and reduce the risk of holding unutilized renewable energy generation.²⁹

Carbon Emissions Policies

While renewable energy purchases provide a number of benefits, many consumer purchases have been motivated, at least in part, by their greenhouse gas benefits. Currently, green power purchasing is one accessible and relatively easy way for consumers, companies and organizations to reduce their carbon footprints. Most utilities and marketers that offer green power promote their products by touting the greenhouse gas benefits. Likewise, many purchasers point to the carbon reduction benefits of their green power purchases in news releases and other promotional materials.

Carbon control policies have the potential to substantially impact voluntary markets for renewable energy. Carbon regulation is now emerging in the Northeast under the Regional Greenhouse Gas Initiative (RGGI) and in California as a result of recently adopted legislation (AB32). There is increased discussion about carbon regulation at the national level as well. Both RGGI and California plan to implement cap-and-trade programs to achieve carbon reductions, similar to the successful national sulfur dioxide (SO₂) cap-and-trade system developed under the Clean Air Act Amendments of 1990 to address acid rain.

Under a carbon cap-and-trade program, the ability for renewable energy generation sources to affect carbon emissions levels will depend on the program design; for example, whether renewable generation sources are allocated allowances that can be retired or are otherwise considered in setting the level of the cap. This, in turn, will impact the claims that renewable energy generators and marketers can make with respect to carbon reductions. If cap-and-trade programs are designed such that voluntary green power purchases do not lead to overall carbon emission reductions, this will limit the greenhouse gas benefit claims of purchasers and pose a challenge for green power marketers.

The design of emerging regulatory programs to reduce carbon emissions will thus have important implications for the operation and perhaps even the viability of voluntary renewable energy markets in the future.³⁰ In the meantime, a growing number of companies and organizations are marketing carbon-offset products to help consumers reduce their carbon footprints, covering everything from offsetting the carbon emissions associated with personal car and air travel to “greening” the electricity used at business conferences. Carbon offsets face many of the same issues and challenges of definition, verification and certification as green

²⁹ “Supplying Green Power in Compliance and Voluntary Markets,” Presentation by Barrett Stambler, PPM Energy, at the Tenth National Green Power Marketing Conference, Austin, Texas, October 26, 2005.

<http://www.eere.energy.gov/greenpower/conference/10gpmc05/stambler.pdf>

³⁰ A forthcoming NREL report will provide a detailed examination of the implications of emerging carbon markets and policies on voluntary renewable energy markets.

power; in fact verification of carbon offsets is more challenging than for green power because of the wide array of offset activities.

Carbon-offset products can be both a threat and opportunity for green power. If offset products include renewable energy as a component, then this market will provide a stimulus for renewable energy development. On the other hand, there are any number of alternative measures that could qualify as carbon offsets, which creates competition for green power as a carbon reduction strategy.³¹

Is Green Power Simply an Evolutionary Step in Renewable Energy Development?

Finally, when, if ever, does premium-priced green power become unnecessary? Most new green power today is being supplied by wind energy, which is arguably becoming more widely cost competitive with conventional electricity supplies. Should customers continue to pay a premium for green power once it becomes cost competitive? For example, when Minnkota Power Cooperative, which serves 11 distribution cooperatives in Minnesota and North Dakota, recently lowered the premium charged for its *Infinity Wind Energy* program from 1.5¢/kWh to 0.5¢/kWh, one distribution utility—Nodak Electric—decided to drop the premium-priced program altogether and include the wind energy in base rates.³²

Some argue that green pricing should be focused on renewable energy technologies that are furthest from market competitiveness and thus need additional financial support, such as solar energy. And many believe that an RPS is a fair and effective policy for accelerating renewable energy development and sharing the cost of that development among all consumers. On the other hand, there are an abundance of customers who want to support renewable energy beyond the minimum deployment levels called for in an RPS, which is typically from 10% to 20% of total electricity supply. For example, many customers, including large Fortune 500 companies, choose to offset 100% of their power usage with green power and are willing to pay more for that opportunity.

Voluntary green power markets continue to play an important role in educating the public about renewable energy sources and options. And there is ample evidence that voluntary markets encourage new renewable energy development as well as support and build on RPS markets by providing an additional market outlet and revenue source for renewable energy project output.

³¹ The ClimateBiz Web site notes that “there are three main types of projects that produce offsets: projects that prevent the release of CO₂, projects that reduce non-CO₂ greenhouse gases, and projects that sequester carbon in vegetation or soil.”

See http://www.climatebiz.com/sections/backgrounder_detail.cfm?UseKeyword=Carbon%20Offsets

³² See “Wind subscription cost eliminated” in *Nodak Neighbor* customer newsletter (July/August 2006).
<http://www.nodakelectric.com/pdf/JulyAug%202006%20NN.pdf>

Conclusions and Observations

The green power market continues to exhibit strong growth and provide an important demand-driven stimulus for renewable energy development. Green power markets provide an additional revenue stream for renewable energy projects, and raise consumer awareness of the benefits of renewable energy. Based on this review, we have identified the following market trends:

- In 2005, retail sales of renewable energy in voluntary purchase markets totaled 8.5 billion kWh, representing a capacity equivalent of 2,500 MW of renewable energy, including 2,000 MW from new renewable energy sources. The latter figure corresponds to 22% of the total renewable energy capacity additions since 1997; thus, green power purchases are providing support for a significant fraction of new renewable energy projects, nationally.
- Wind energy provided 61% of green power sales in 2005, followed by biomass energy sources (27%), hydropower (6%), geothermal (5%), and solar (1%).
- Total market sales increased by 37% in 2005. Much of this growth was driven by REC sales to nonresidential consumers, which more than doubled during 2005. As a result, commercial and institutional REC markets now represent nearly half of total green power market sales, surpassing sales in competitive electricity markets and utility green pricing programs.
- Utility green pricing programs in regulated electricity markets continued to show steady growth, with sales increasing by 33% in 2005. However, a relatively small number of utility programs continue to dominate sales and customer numbers. This suggests that stronger performance is possible with effective program design and implementation, and dedicated marketing strategies but also that many programs are not achieving their full potential.
- Competitive markets continued to exhibit volatility, with sales declining nearly 20% during 2005. Difficulties posed by market rules and conditions, as well as the continuing challenge of convincing customers to switch electricity providers, has led marketers to shift away from delivered renewable electricity products toward marketing REC products as well as to pursue partnerships with default suppliers to supply and market green power. Despite the losses in competitive markets, programs in which marketers have teamed with default suppliers doubled in terms of both sales and customers during 2005, showing that utility/marketer partnerships hold promise for future growth.
- Overall, the number of customers purchasing green power increased modestly, with gains in utility green pricing programs and utility/marketer programs offsetting losses elsewhere in competitive retail markets.
- In 2005, for the first time, a majority of green power sales (65%) were made to nonresidential customers. Overall, nonresidential sales doubled while sales to residential customers declined by 14% because of losses in competitive retail markets. The growing dominance of nonresidential sales is a departure from the early history of green power markets when most products and programs were oriented toward residential customers. Looking forward, demand by the nonresidential sector appears to be increasing and will likely continue to drive future voluntary market growth.
- Utility green pricing premiums have continued to fall, owing to a combination of higher prices of conventional generation fuels and lower renewable resource costs. In fact, a number of programs that exempt customers from fossil fuel costs saw the price of green power fall below conventional electricity prices, which necessitated customer waiting lists. Wholesale REC prices have also fallen in some markets, contributing to REC sales growth.

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Appendix A

Estimates of New Renewable Energy Capacity Serving Green Power Markets, 2000-2004

Prior to 2005, estimates of the capacity serving green power markets were made based on renewable energy projects used to serve green power programs, rather than derived from renewable energy sales. Therefore, the 2005 estimated capacity is not directly comparable to capacity estimates from previous years. However, the two approaches yield relatively consistent results.

Bird and Swezey (2005b) provide details on the derivation of capacity estimates for years 2004 and earlier. **Table A-1** presents estimates of the cumulative new renewable energy capacity serving voluntary markets from 2000 to 2004. A brief description of the methodology is included below.

Table A-1: Estimated Cumulative New Renewable Energy Capacity Supplying Green Power Markets, 2000-2004* (megawatts)

Market	2000	2001	2002	2003	2004
Utility Green Pricing	77	221	279	510	706
Competitive Markets/RECs	90	542	695	1,126	1,528
Total**	167	764	974	1,636	2,233

*Data not directly comparable with Table 4.

**Totals may not add due to rounding.

Source: Bird and Swezey (2005b).

The 2004 and earlier estimates of capacity serving green power markets focus on *new* renewable resources used to serve green power customers. New renewable resources are defined as projects or portions of projects built specifically to serve green power customers or recently constructed projects that are used to supply green power customers and meet the regional *Green-e* standards for new renewables. The estimates do not include pre-existing renewable energy projects used for green power supply or capacity used to meet state RPS requirements or other renewable energy mandates.

These estimates generally include the entire capacity of a given renewable energy project irrespective of whether the output has been fully subscribed by green power purchasers, e.g., if a utility or developer completed a project before the entire output was sold to prospective customers. Thus, the estimates may include some capacity for which a green power buyer was not yet secured. However, in cases where a portion of a project is used to meet a renewable energy mandate, only the remainder of the project is counted.

Appendix B

Table B-1: Top 25 Purchasers in the U.S. EPA Green Power Partnership, September 2006

Rank	Organization	Green Power Usage (kWh)	% of Total Electricity	Organization Type	Resources
1	U.S. Air Force	1,043,558,000	11%	Government (Federal)	Biomass, Geothermal, Wind
2	Wells Fargo & Co.	550,000,000	42%	Banking	Wind
3	Whole Foods Market	463,128,000	100%	Retail	Biomass, Geothermal, Small-hydro, Solar, Wind
4	U.S. EPA	329,880,185	100%	Government (Federal)	Biogas, Biomass, Geothermal, Wind
5	Johnson & Johnson	306,418,000	30%	Manufacturing	Biomass, Small-hydro, Solar, Wind
6	Starbucks	185,000,000	20%	Food, Food Services	Wind
7	DuPont Co.	170,000,000	4%	Chemical	Biomass
8	U.S. DOE	165,063,000	3%	Government (Federal)	Biomass, Geothermal, Wind
9	Vail Resorts	152,000,000	100%	Tourism, Recreation	Wind
10	HSBC N.A.	124,544,000	35%	Banking	Wind
11	University of Pennsylvania	112,000,000	29%	Education (Higher)	Wind
12	World Bank Group	106,762,000	100%	Non-Profit	Wind
13	IBM Corp.	93,725,000	3%	Manufacturing	Solar, Wind
14	Sprint Nextel	87,600,000	47%	Telecommunications	Wind
15	Safeway Inc.	87,000,000	2%	Retail	Wind
16	Commonwealth of Pennsylvania	79,801,000	8%	Government (State)	Wind
17	The Tower Companies	79,000,000	100%	Real Estate	Wind
18	U.S. GSA	76,366,800	33%	Government (Federal)	Biogas, Wind
19	California State University System	75,435,000	13%	Education (Higher)	Biomass, Geothermal, Wind
20	Staples	71,600,588	14%	Retail	Biogas, Biomass, Solar, Wind
21	City of Austin	65,454,000	54%	Government (Muni)	Biogas, Wind
22	City of San Diego	65,400,000	25%	Government (Muni)	Biogas, small-hydro, solar
23	NatureWorks LLC	59,000,000	59%	Manufacturing	Wind
24	FedEx Kinko's	54,690,033	20%	Retail	Various
25	Duke University	54,075,000	31%	Education (Higher)	Small-hydro, Wind

Source: U.S. EPA Green Power Partnership <http://www.epa.gov/greenpower/partners/top25.htm>

Appendix C

Table C-1: Estimated U.S. Green Power Customers by State, 2003 and 2004

State	Electric Industry Participants 2004 ^a	Participating Customers			2003 Total
		2004 ^p			
		Residential	Nonresidential	Total	
Alabama	2	735	20	755	
Alaska					
Arizona	3	5,701	91	5,792	5,934
Arkansas					
California	12	59,158	2,932	62,090	62,279
Colorado	23	39,389	777	40,166	44,194
Connecticut					
Delaware	2	8	7	15	
District of Columbia	2	4,994	228	5,222	4,824
Florida	3	11,053	23	11,076	218
Georgia	14	3,223	18	3,241	3,895
Hawaii	3	3,965	40	4,005	3,579
Idaho	6	4,173	110	4,283	2,508
Illinois	3	31		31	8
Indiana	8	1,313	26	1,339	1,091
Iowa	50	7,239	74	7,313	5,785
Kansas					
Kentucky	11	502	11	513	118
Maine	1		8	8	5
Maryland	2	14,985	193	15,178	14,356
Massachusetts	3	2,741	125	2,866	1
Michigan	7	1,319	57	1,376	1,346
Minnesota	90	22,803	255	23,058	20,255
Mississippi	2	79	2	81	7
Missouri	7	392	6	398	261
Montana	6	398	9	407	49
Nebraska	5	4,017	54	4,071	4,171
Nevada	2	493	5	498	285
New Hampshire					
New Jersey	3	1,575	336	1,911	1,816
New Mexico	7	8,031	430	8,461	5,774
New York	3	1,272	213	1,485	134
North Carolina	15	6,024	242	6,266	3,913
North Dakota	11	4,666	21	4,687	1,792
Ohio	3	407,051	47,458	454,509	428,849
Oklahoma	7	9,342	195	9,537	6,758
Oregon	12	52,655	1,247	53,902	42,139
Pennsylvania	3	36,299	29	36,328	74,676
Rhode Island	2	1,469	36	1,505	
South Carolina	8	1,842	234	2,076	1,725
South Dakota	8	460	13	473	624
Tennessee	1	6,216	307	6,523	1
Texas	4	62,331	6,049	68,380	68,611
Utah	3	13,660	407	14,067	15,480
Vermont	1	868	31	899	
Virginia	2	3,418	20	3,438	4,639
Washington	19	27,554	555	28,109	16,858
West Virginia					
Wisconsin	56	28,607	592	29,199	26,595
Wyoming	6	2,743	53	2,796	1,573
Total	403	864,794	63,539	928,333	877,126

^a Includes entities with green pricing programs in more than one state.

^p = Preliminary

Note: Nonresidential may include some customers for whom no customer class is specified. Blank cells indicate no data was reported for the state or the number of customers in a class was zero. Totals may not sum due to rounding.

Source: Energy Information Administration, Renewable Energy Annual (2004 Edition). June 2006.

http://www.eia.doe.gov/cneaf/solar.renewables/page/rea_data/rea_sum.html Data from Form EIA-861, "Annual Electric Power Industry Report."

Appendix D

Table D-1: Utilities Offering Green Pricing Programs in 2005

<p>Investor-Owned Utilities</p> <p>Alabama Power Company Alliant Energy Arizona Public Service Avista Utilities Central Vermont Public Service Dominion NC Power Duke Power El Paso Electric Florida Power & Light Company Green Mountain Power Gulf Power Hawaiian Electric Idaho Power Company Indianapolis Power & Light Company Madison Gas & Electric MidAmerican Energy Minnesota Power Northwestern Energy OG&E Electric Services Otter Tail Power Company PacifiCorp* Portland General Electric Progress Energy PSI Energy/Cinergy Public Service of New Mexico Puget Sound Energy Tampa Electric Company Tucson Electric Power Company UniSource Energy Services Upper Peninsula Power Company We Energies Wisconsin Public Service Corporation Xcel Energy</p> <p>Electric Cooperatives</p> <p>Basin Electric Power Cooperative* Boone Electric Cooperative Continental Cooperative Services/Soyland Corn Belt Power Cooperatives Dairyland Power Cooperative* Deseret Power East Kentucky Power Cooperative* Farmers Electric Cooperative Georgia Electric Membership Corporation* Golden Valley Electric Association Great River Energy* Holy Cross Energy Hoosier Energy* Lower Valley Energy Midstate Electric Cooperative Minnkota Power Cooperative* Orcas Power & Light Cooperative Oregon Trail Electric Cooperative PNGC Power* Park Electric Cooperative Peninsula Light Company Southern Montana Electric G&T Cooperative Tri-State Generation and Transmission Assoc.* Vigilante Electric Cooperative Wabash Valley Power Association* Western Farmers Electric Cooperative Yampa Valley Electric Association</p>	<p>Federal</p> <p>Tennessee Valley Authority*</p> <p>Municipals/Other Public Utilities</p> <p>City of Alameda AMP Ohio Anaheim Public Utilities City of Ashland Austin Energy Benton County PUD City of Bowling Green Burbank Water and Power Cedar Falls Utilities Chelan County PUD Clallum County PUD Clark Public Utilities Colorado Springs Utilities Columbia River PUD Concord Municipal Light Plant Cowlitz PUD ElectriCities Emerald People's Utility District Eugene Water & Electric Board Gainesville Regional Utilities Grant County PUD Grays Harbor PUD Iowa Association of Municipal Utilities* Keys Energy Services Lansing Board of Water and Light Lewis County PUD Lincoln Electric System Los Alamos Department of Public Utilities Los Angeles Department of Water and Power Mason County PUD No. 3 Missouri River Energy Services* Moorhead Public Service Muscatine Power and Water City of Naperville City of New Smyrna Beach Oklahoma Municipal Power Authority Omaha Public Power District Pacific County PUD #2 Pasadena Water & Power City of Palo Alto Utilities Platte River Power Authority* Roseville Electric Sacramento Municipal Utility District City of St. Charles City of St. George Energy Services Department Salt River Project City Public Service of San Antonio Santee Cooper* Seattle City Light Silicon Valley Power Snohomish County PUD Southern Minnesota Municipal Power Agency* City Utilities of Springfield Tacoma Power City of Tallahassee Traverse City Light & Power Waverly Light & Power Wisconsin Public Power Inc.*</p> <p>*denotes program offered through multiple utilities or distribution cooperatives</p>
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Appendix E

Table E-1: Utility Green Pricing Programs, November 2006

State	Utility Name	Program Name	Type	Start Date	Premium
AL	Alabama Electric Cooperative: Central Alabama Electric Cooperative, Coosa Valley Electric Cooperative, Dixie Electric Cooperative, South Alabama Electric Cooperative, Southern Pine Electric Cooperative, Tallapoosa River Electric Cooperative, Wiregrass Electric Cooperative	Green Power Choice	landfill gas	2006	2.0¢/kWh
AL	Alabama Power Company	Renewable Energy Rate	biomass co-firing (wood)	2003/2000	6.0¢/kWh
AL	TVA: City of Athens Electric Department, Cullman Electric Coop, Cullman Power Board, Decatur Utilities, Florence Utilities, Hartselle Utilities, Huntsville, Joe Wheeler EMC, Muscle Shoals Electric Board, Scottsboro Electric Power Board, Sheffield Utilities, Tuscumbia Electric Department	Green Power Switch	landfill gas, PV, wind	2000	2.67¢/kWh
AK	Golden Valley Electric Association	Sustainable Natural Alternative Power (SNAP)	various local projects	2005	Contribution
AZ	Arizona Public Service	APS Solar Partners Program	central PV	1997	17.6¢/kWh
AZ	Salt River Project	EarthWise Energy	central PV, wind, landfill gas, small hydro, geothermal	1998/2001	3.0¢/kWh
AZ	Tri-State Generation & Transmission: Columbus Electric Cooperative, Inc.	Renewable Resource Power Service	wind, hydro	2001	1.25¢/kWh
AZ	Tucson Electric	GreenWatts	landfill gas, PV	2000	10¢/kWh
AZ	UniSource Energy Services	GreenWatts	PV	2004	10¢/kWh
CA	Anaheim Public Utilities	Green Power for the Schools	PV	2002	Contribution
CA	Anaheim Public Utilities	Green Power for the Grid	wind, landfill gas	2002	1.5¢/kWh
CA	Burbank Water and Power	Clean Green Support	various	2001	1.0¢/kWh
CA	Los Angeles Department of Water and Power	Green Power for a Green LA	wind, landfill gas	1999	3.0¢/kWh
CA	PacifiCorp: Pacific Power	Blue Sky Block	wind	2000	1.95¢/kWh
CA	Palo Alto Utilities/3 Phases Energy Services	Palo Alto Green	wind, PV	2003/2000	1.5¢/kWh
CA	Pasadena Water & Power	Green Power	wind	2003	2.5¢/kWh
CA	Roseville Electric	Green Roseville	wind, PV	2005	1.5¢/kWh
CA	Sacramento Municipal Utility District	Greenergy	wind, landfill gas, hydro, PV	1997	1.0¢/kWh or \$6/month
CA	Silicon Valley Power / 3 Phases Energy Services	Santa Clara Green Power	wind, PV	2004	1.5¢/kWh

State	Utility Name	Program Name	Type	Start Date	Premium
CO	Colorado Springs Utilities	Green Power	wind	1999	3.0¢/kWh
CO	Holy Cross Energy	Local Renewable Energy Pool	small hydro, PV	2002	2.33¢/kWh
CO	Holy Cross Energy	Wind Power Pioneers	wind	1998	1.5¢/kWh
CO	Platte River Power Authority: Estes Park, Fort Collins Utilities, Longmont Power & Communications, Loveland Water & Power	Wind Energy Premium	wind	1999	1.0¢/kWh - 2.5¢/kWh
CO	Tri-State Generation & Transmission: Chimney Rock Public Power District, Delta-Montrose Electric Association, Empire Electric Association, Inc., Gunnison County Electric Association, Inc., High West Energy, Inc., Highline Electric Association, K.C. Electric Association, Inc., La Plata Electric Association, Inc., Morgan County Rural Electric Association, Mountain Parks Electric, Inc., Mountain View Electric Association, Inc., Poudre Valley Rural Electric Association, Inc., San Isabel Electric Association, Inc., San Luis Valley Rural Electric Cooperative, Inc., San Miguel Power Association, Inc., Sangre de Cristo Electric Association, Inc., Southeast Colorado Power Association, United Power, Inc., White River Electric Association, Inc., Y-W Electric Association, Inc. (20 of 44 coops offer program)	Renewable Resource Power Service	wind, hydro	1998	1.25¢/kWh
CO	Xcel Energy	Renewable Energy Trust	PV	1993	Contribution
CO	Xcel Energy	WindSource	wind	1997	-0.67¢/kWh
CO	Yampa Valley Electric Association	Wind Energy Program	wind	1999	3.0¢/kWh
DE	Delaware Electric Cooperative	Renewable Energy Rider	landfill gas	2006	0.2¢/kWh
FL	Alabama Electric Cooperative: Gulf Coast Electric Cooperative	Green Power Choice	landfill gas	2006	2.0¢/kWh
FL	City of Tallahassee/Sterling Planet	Green for You	biomass, PV	2002	1.6¢/kWh
FL	City of Tallahassee/Sterling Planet	Green for You	PV only	2002	11.6¢/kWh
FL	Florida Power & Light / Green Mountain Energy	Sunshine Energy	biomass, wind, PV	2004	0.975¢/kWh
FL	Gainesville Regional Utilities	GRUgreen Energy	landfill gas, wind, PV	2003	2.0¢/kWh
FL	Keys Energy Services / Sterling Planet	GO GREEN: USA Green	wind, biomass, PV	2004	1.60¢/kWh
FL	Keys Energy Services / Sterling Planet	GO GREEN: Florida Ever Green	solar hot water, PV, biomass	2004	2.75¢/kWh
FL	Tampa Electric Company (TECO)	Tampa Electric's Renewable Energy Program	PV, biomass co-firing (wood)	2000	5.0¢/kWh
FL	Utilities Commission City of New Smyrna Beach	Green Fund	local PV projects	1999	Contribution

State	Utility Name	Program Name	Type	Start Date	Premium
GA	Georgia Electric Membership Corporation (31 of 42 coops offer program): Altamaha, Amicalola, Canoochee, Carroll, Cobb, Coastal Electric, Coweta-Fayette, Diverse Power, Flint Energies, GreyStone Power, Grady, Habersham, Hart, Irwin, Jackson, Jefferson Energy, Little Ocmulgee, Mitchell, Ocmulgee, Planters, Rayle, Sawnee, Slash Pine, Snapping Shoals, Southern Rivers Energy, Sumter, Three Notch, Tri-County, Upson, Walton and Washington EMCs	Green Power EMC	landfill gas, PV in schools	2001	2.0¢/kWh-3.3¢/kWh
GA	Georgia Power	Green Energy	landfill gas	2006	4.5¢/kWh
GA	TVA: Blue Ridge Mountain Electric Membership Corporation, North Georgia Electric Membership Corporation	Green Power Switch	landfill gas, PV, wind	2000	2.67¢/ kWh
HI	Hawaiian Electric	Sun Power for Schools	PV in schools	1997	Contribution
HI	Kauai Island Utility Cooperative	Green Rate	distributed renewable energy systems	TBD	TBD
ID	Avista Utilities	Buck-A-Block	wind	2002	0.33¢/kWh
ID	Idaho Power	Green Power Program	various	2001	0.98¢/kWh
ID	PacifiCorp: Utah Power	Blue Sky	wind	2003	1.95¢/kWh
ID	Vigilante Electric Cooperative	Alternative Renewable Energy Program	wind	2003	1.1¢/kWh
IL	CCS/Soyland and Community Energy, Inc. (8 of 11 coops offer program): Adams Electric Co-op, Coles-Moultrie Electric, Eastern Illini Electric, McDonough Power, Menard, Rural Electric Convenience Co-op, Shelby Electric, Spoon River Electric Co-op	EcoEnergy	wind	2005	3.0¢/kWh
IL	City of Naperville / Community Energy	Renewable Energy Option	wind, small hydro, PV	2005	2.5¢/kWh
IL	City of St. Charles/ComEd and Community Energy, Inc.	TBD	wind, landfill gas	2003	Contribution
IL	Dairyland Power Cooperative: Jo-Carroll Energy/Elizabeth	Evergreen Renewable Energy Program	landfill gas, biogas, hydro, wind	1997	1.5¢/kWh
IN	Hoosier Energy (5 of 17 coops offer program): Southeastern Indiana REMC, South Central Indiana REMC, Utilities District of Western Indiana REMC, Decatur County REMC, Daviess-Martin County REMC	EnviroWatts	landfill gas	2001	2.0¢/kWh-4.0¢/kWh
IN	Indianapolis Power & Light	Green Power Option	wind	1998	0.35¢/kWh
IN	PSI Energy/Cinergy	Green Power Rider	wind, PV, landfill gas, digester gas	2001	Contribution
IN	Wabash Valley Power Association (7 of 27 coops offer program): Boone REMC, Hendricks Power Cooperative, Kankakee Valley REMC, Miami-Cass REMC, Tipmont REMC, White County REMC, Northeastern REMC	EnviroWatts	landfill gas	2000	0.9¢/kWh-1.0¢/kWh
IA	Alliant Energy	Second Nature	landfill gas, wind	2001	2.0¢/kWh

State	Utility Name	Program Name	Type	Start Date	Premium
IA	Associated Electric Cooperative, Inc.: Access Energy Cooperative, Chariton Valley Electric Cooperative, Southern Iowa Electric Cooperative	varies by utility	biomass, wind	2003	2.0¢/kWh- 3.5¢/kWh
IA	Basin Electric Power Cooperative: Lyon Rural, Harrison County, Nishnabotna Valley Cooperative, Northwest Rural Electric Cooperative, Western Iowa	Prairie Winds	wind	2000	0.5¢/kWh
IA	Cedar Falls Utilities	Harvest the Wind	wind	2000	2.5¢/kWh
IA	Central Iowa Power Cooperatives (all 12 coops/1 muni): Maquoketa Valley Electric Cooperative, Eastern Iowa REC, East-Central Iowa REC, Linn County REC, Pella, TIP Rural Electric Cooperative, Clarke Electric Cooperative, Midland Power Cooperative, Guthrie County REC, Farmers Electric Cooperative, Southwest Iowa REC, Consumer Energy, South Iowa Municipal Electric Cooperative Association	Wind Power	wind	2006	1.5¢/kWh- 2.5¢/kWh
IA	Corn Belt Power Cooperatives (5 of 11 coops offer program): Butler County REC, Franklin REC, Grundy County REC, Humboldt County REC, Sac County REC	Energy Wise Renewables	wind	2003	1.5¢/kWh
IA	Dairyland Power Cooperative: Allamakee-Clayton/Postville, Hawkeye Tri-County/Cresco, Heartland Power/Thompson & St. Ansgar	Evergreen Renewable Energy Program	hydro, wind, landfill gas, biogas	1998	3.0¢/kWh
IA	Farmers Electric Cooperative	Green Power Project	biodiesel, wind	2004	Contribution
IA	Iowa Association of Municipal Utilities (84 of 137 munis offer program) Afton, Algona, Alta Vista, Aplington, Auburn, Bancroft, Bellevue, Bloomfield, Breda, Brooklyn, Buffalo, Burt, Callender, Carlisle, Cascade, Coggon, Coon Rapids, Corning, Corwith, Danville, Dayton, Durant, Dysart, Earlville, Eldridge, Ellsworth, Estherville, Fairbank, Farnhamville, Fontanelle, Forest City, Gowrie, Grafton, Grand Junction, Greenfield, Grundy Center, Guttenberg, Hopkinton, Hudson, Independence, Keosauqua, La Porte City, Lake Mills, Lake View, Laurens, Lenox, Livermore, Maquoketa, Marathon, McGregor, Milford, Montezuma, Mount Pleasant, Neola, New Hampton, Ogden, Orient, Osage, Panora, Pella, Pocahontas, Preston, Readlyn, Rockford, Sabula, Sergeant Bluff, Sibley, Spencer, Stanhope, State Center, Stratford, Strawberry Point, Stuart, Tipton, Villisca, Vinton, Webster City, West Bend, West Liberty, West Point, Westfield, Whittimore, Wilton, Winterset	Green City Energy	wind, biomass, PV	2003	Varies by utility
IA	MidAmerican Energy	Renewable Advantage	wind	2004	Contribution

State	Utility Name	Program Name	Type	Start Date	Premium
IA	Missouri River Energy Services: Alton, Atlantic, Denison, Fontanelle, Hartley, Hawarden, Kimballton, Lake Park, Manilla, Orange City, Paullina, Primghar, Remsen, Rock Rapids, Sanborn, Shelby, Sioux Center, Woodbine	RiverWinds	wind	2003	2.0¢/kWh-2.5¢/kWh
IA	Muscatine Power and Water	Solar Muscatine	PV	2004	Contribution
IA	Waverly Light & Power	Iowa Energy Tags	wind	2001	2.0¢/kWh
IA	Waverly Light & Power	Green Power Choice	wind	2003	Contribution
KY	East Kentucky Power Cooperative: Blue Grass Energy, Clark, Cumberland, Fleming-Mason, Grayson, Inter-County Energy, Jackson, Licking Valley, Nolin, Owen Electric, Salt River, Shelby, South Kentucky	EnviroWatts	landfill gas	2002	2.75¢/kWh
KY	TVA: Bowling Green Municipal Utilities, Franklin Electric Plant Board	Green Power Switch	landfill gas, PV, wind	2000	2.67¢/kWh
MA	Concord Municipal Light Plant (CMLP)	Green Power	hydro	2004	3.0¢/kWh
MI	Lansing Board of Water and Light	GreenWise Electric Power	landfill gas, small hydro	2001	3.0¢/kWh
MI	Traverse City Light and Power	Green Rate	wind	1996	2.0¢/kWh
MI	Upper Peninsula Power Company	NatureWise	wind, landfill gas and animal waste methane	2004	4.0¢/kWh
MI	We Energies	Energy for Tomorrow	wind, landfill gas, hydro	2000	2.04¢/kWh
MN	Alliant Energy	Second Nature	landfill gas, wind	2002	2.0¢/kWh
MN	Austin Utilities, Owatonna Public Utilities, Rochester Public Utilities	SolarChoice	local PV systems	2006	Contribution
MN	Basin Electric Power Cooperative; Minnesota Valley Electric Coop, Sioux Valley Southwestern	Prairie Winds	wind	2002	0.5¢/kWh
MN	Central Minnesota Municipal Power Agency: Blue Earth, Delano, Glencoe, Granite Falls, Janesville, Kenyon, Lake Crystal, Madelia, Mt. Lake, New Ulm, Sleepy Eye, Springfield, Truman, and Windom	Green Energy Program	wind, landfill gas	2000	1.5¢/kWh-2.5¢/kWh
MN	Dairyland Power Cooperative: Freeborn-Mower Cooperative / Albert Lea, People's / Rochester, Tri-County / Rushford	Evergreen Renewable Energy Program	hydro, wind, landfill gas, biogas	1998	1.5¢/kWh

State	Utility Name	Program Name	Type	Start Date	Premium
MN	Great River Energy (all 28 coops offer program): Agralite, Arrowhead, BENCO Electric, Brown County Rural Electric, Connexus Energy, Co-op Light & Power, Crow Wing Power, Dakota Electric Association, East Central Electric Association, Federated Rural Electric, Goodhue County, Itasca Mantrap Cooperative, Kandiyohi Power Cooperative, Lake Country Power, Lake Region Electric Cooperative, McLeod Cooperative Power, Meeker Cooperative Light & Power, Mille Lacs Electric Cooperative, Minnesota Valley, Nobles Cooperative Electric, North Itasca, Redwood Electric Cooperative, Runestone Electric, South Central Electric Association, Stearns Electric, Steele-Waseca, Todd-Wadena, Wright-Hennepin Electric	Wellspring Renewable Wind Energy Program	wind	1998	1.55¢/kWh- 2.0¢/kWh
MN	Minnesota Power	WindSense	wind	2002	2.5¢/kWh
MN	Minnkota Power Cooperative: Beltrami, Clearwater Polk, North Star, PKM, Red Lake, Red River, Roseau, Wild Rice, Thief River Falls	Infinity Wind Energy	wind	1999	0.5¢/kWh
MN	Missouri River Energy Services: Adrian, Alexandria, Barnesville, Benson, Breckenridge, Detroit Lakes, Elbow Lake, Henning, Jackson, Lakefield, Lake Park, Luverne, Madison, Moorhead, Ortonville, St. James, Sauk Centre, Staples, Wadena, Westbrook, Worthington	RiverWinds	wind	2002	2.0¢/kWh- 2.5¢/kWh
MN	Moorhead Public Service	Capture the Wind	wind	1998	1.5¢/kWh
MN	Otter Tail Power Company	TailWinds	wind	2002	1.6¢/kWh
MN	Southern Minnesota Municipal Power Agency (all 18 munis offer program): Fairmont Public Utilities, Wells Public Utilities, Austin Utilities, Preston Public Utilities, Spring Valley Utilities, Blooming Prairie Public Utilities, Rochester Public Utilities, Owatonna Public Utilities, Waseca Utilities, St. Peter Municipal Utilities, Lake City Utilities, New Prague Utilities Commission, Redwood Falls Public Utilities, Litchfield Public Utilities, Princeton Public Utilities, North Branch Water and Light, Mora Municipal Utilities, Grand Marais Public Utilities	SMMPA Wind Power	wind	2000	1.0¢/kWh
MN	Xcel Energy	WindSource	wind	2003	2.0¢/kWh
MS	TVA: City of Oxford, North East Mississippi Electric Power Assocation, Starkville Electric System	Green Power Switch	landfill gas, PV, wind	2000	2.67¢/kWh

State	Utility Name	Program Name	Type	Start Date	Premium
MO	Associated Electric Cooperative, Inc.: Black River Electric Cooperative, Boone Electric Cooperative, Callaway Electric Cooperative, Co-Mo Electric Cooperative, Crawford Electric Cooperative, Cuivre River Electric Cooperative, Howell-Oregon Electric Cooperative, Intercounty Electric Cooperative, Laclede Electric Cooperative, Lewis County Rural Electric Cooperative, Macon Electric Cooperative, White River Valley Electric Cooperative	varies by utility	biomass, wind	2003	2.0¢/kWh- 3.5¢/kWh
MO	City Utilities of Springfield	WindCurrent	wind	2000	5.0¢/kWh
MT	Basin Electric Power Cooperative: Lower Yellowstone	Prairie Winds	wind	2000	0.5¢/kWh
MT	Northwestern Energy	E+ Green	wind, PV	2003	2.0¢/kWh
MT	Park Electric Cooperative	Green Power Program	various renewables	2002	1.02¢/kWh
MT	Southern Montana Electric Generation and Transmission Cooperative (5 coops offer program): Fergus Electric, Yellowstone Valley, Bear Tooth Electric, Mid Yellowstone, and Tongue River	Environmentally Preferred Power	wind, hydro	2002	1.05¢/kWh
MT	Tri-State Generation & Transmission: Big Horn Rural Electric Company	Renewable Resource Power Service	wind, hydro	2001	1.25¢/kWh
MT	Vigilante Electric Cooperative	Alternative Renewable Energy Program	wind	2003	1.1¢/kWh
NE	Lincoln Electric System	LES Renewable Energy Program	wind	1998	4.3¢/kWh
NE	Omaha Public Power District	Green Power Program	landfill gas, wind	2002	3.0¢/kWh
NE	Tri-State Generation & Transmission: Chimney Rock Public Power District, High West Energy, Inc., Highline Electric Association, Midwest Electric Cooperative Corporation, Niobrara Electric Association, Inc., Northwest Rural Public Power District, Panhandle Rural Electric Membership, Roosevelt Public Power District, Wheat Belt Public Power District	Renewable Resource Power Service	wind, hydro	2001	1.25¢/kWh
NM	El Paso Electric	Renewable Energy Tariff	wind	2003	3.19¢/kWh
NM	Los Alamos Department of Public Utilities	Green Power	wind	2005	1.8¢/kWh
NM	Public Service of New Mexico	PNM Sky Blue	wind	2003	1.8¢/kWh

State	Utility Name	Program Name	Type	Start Date	Premium
NM	Tri-State Generation & Transmission: Central New Mexico Electric Cooperative, Inc., Chimney Rock Public Power District, Columbus Electric Cooperative, Inc., Continental Divide Electric Cooperative, Inc., Jemez Mountains Electric Cooperative, Inc., Kit Carson Electric Cooperative, Inc., Mora-San Miguel Electric Cooperative, Northern Rio Arriba Electric Cooperative, Otero County Electric Cooperative, Inc., Sierra Electric Cooperative, Inc., Socorro Electric Cooperative, Inc., Southwestern Electric Cooperative, Inc., Springer Electric Cooperative, Inc.	Renewable Resource Power Service	wind, hydro	2001	1.25¢/kWh
NM	Xcel Energy	WindSource	wind	1999	3.0¢/kWh
NC	Dominion North Carolina Power	NC GreenPower	biomass, hydro, landfill gas, PV, wind	2003	2.5¢-4.0¢/kWh
NC	Duke Energy	NC GreenPower	biomass, hydro, landfill gas, PV, wind	2003	2.5¢-4.0¢/kWh
NC	ElectriCities: Town of Apex, Town of Cornelius, Fayetteville PWC, Town of Granite Falls, City of High Point, City of Kinston, City of Laurinburg, City of Lexington, City of Monroe, City of New Bern, City of Newton, City of Shelby, City of Statesville, City of Washington	NC GreenPower	biomass, hydro, landfill gas, PV, wind	2003	2.5¢-4.0¢/kWh
NC	NC Electric Cooperatives (19 of 27 coops offer program): Albemarle EMC, Blue Ridge Electric Membership Corp., Brunswick Electric Membership Corp., Carteret Craven Electric Coop., Central Electric Membership Corporation, Edgecombe-Martin County Electric Membership Corp., EnergyUnited, Four County Electric Membership Corp., Haywood Electric Membership Corp., Jones-Onslow Electric Membership Corp., Lumbee River Electric Membership Corporation, Pee Dee Electric Membership Corp., Piedmont Electric Membership Corp., Randolph Electric Membership Corp., Roanoke Electric Membership Corp., Rutherford Electric Membership Corporation, Tri-County Electric Membership Corp., Union Power Cooperative, Wake Electric Membership Corp.	NC GreenPower	biomass, hydro, landfill gas, PV, wind	2003	2.5¢-4.0¢/kWh
NC	Progress Energy / CP&L	NC GreenPower	biomass, hydro, landfill gas, PV, wind	2003	2.5¢-4.0¢/kWh
NC	TVA: Mountain Electric Cooperative	Green Power Switch	landfill gas, PV, wind	2000	2.67¢/kWh
ND	Basin Electric Power Cooperative: Oliver Mercer Electric Coop, Mor-gran-sou Electric Coop, KEM Electric Coop, North Central Electric Coop, Verendrye, Capital, Northern Plains, Dakota Valley, Burke Divide, Montrail Williams, McKenzie Electric Coop, West Plains,	PrairieWinds	wind	2000	0.5¢/kWh

State	Utility Name	Program Name	Type	Start Date	Premium
	Slope Electric Coop				
ND	Minnkota Power Cooperative: Cass County Electric, Cavalier Rural Electric, Northern Municipal Power Agency (12 municipals)	Infinity Wind Energy	wind	1999	0.5¢/kWh
ND	Missouri River Energy Services: City of Lakota	RiverWinds	wind	2002	2.0¢/kWh- 2.5¢/kWh
OH	American Municipal Power-Ohio / Green Mountain Energy: City of Bowling Green, Cuyahoga Falls, Wyandotte	Nature's Energy	small hydro, landfill gas, wind	2003	1.3¢/kWh- 1.5¢/kWh
OH	Buckeye Power	EnviroWatts	landfill gas	2006	2.0¢/kWh
OK	Associated Electric Cooperative, Inc.: Central Rural Electric Cooperative	varies by utility	biomass, wind	2003	2.0¢/kWh- 3.5¢/kWh
OK	OG&E Electric Services	OG&E Wind Power	wind	2003	-0.246¢/kWh
OK	Oklahoma Municipal Power Authority: Tonkawa, Altus, Frederick, Okeene, Prague Municipal Utilities and Edmond Electric	Pure & Simple	wind	2004	1.8¢/kWh (-0.45¢/kWh Edmond)
OK	Western Farmers Electric Cooperative (19 of 19 coops offer program): Alfalfa Electric Cooperative, Caddo Electric Cooperative, Canadian Valley Electric Cooperative, Choctaw Electric Cooperative, Cimmaron Electric Cooperative, Cotton Electric Cooperative, East Central Oklahoma Electric Cooperative, Harmon Electric Cooperative, Kay Electric Cooperative, Kiamichi Electric Cooperative, Kiwash Electric Cooperative, Northfork Electric Cooperative, Northwestern Electric Cooperative, Oklahoma Electric Cooperative, People's Electric Cooperative, Red River Valley Rural Electric Cooperative, Rural Electric Cooperative, Southeastern Electric Cooperative, Southwest Rural Electric Cooperative	WindWorks	wind	2004	0.5¢/kWh
OR	City of Ashland/Bonneville Environmental Foundation	Renewable Pioneers	PV, wind	2003	2.0¢/kWh
OR	Columbia River PUD	Choice Energy	wind	2005	1.5¢/kWh
OR	Emerald People's Utility District/Green Mountain Energy	Choose Renewable Electricity	wind, geothermal	2003	1.2¢/kWh
OR	Eugene Water & Electric Board	EWEB Wind Power	wind	1999	0.91¢/kWh
OR	Idaho Power	Green Power Program	various	2001	0.98¢/kWh
OR	Midstate Electric Cooperative	Environmentally-Preferred Power	wind	1999	2.5¢/kWh
OR	Oregon Trail Electric Cooperative	Green Power	wind	2002	1.5¢/kWh
OR	PacifiCorp: Pacific Power	Blue Sky QS (Commercial Only)	wind	2004	Sliding scale depending on size

State	Utility Name	Program Name	Type	Start Date	Premium
OR	PacifiCorp: Pacific Power	Blue Sky Block	wind	2000	1.95¢/kWh
OR	PacifiCorp: Pacific Power / 3 Phases Energy Services	Blue Sky Usage	wind, biomass, PV	2002	0.78¢/kWh
OR	PacifiCorp: Pacific Power / 3 Phases Energy Services	Blue Sky Habitat	wind, biomass, PV	2002	0.78¢/kWh + \$2.50/mo. donation
OR	Pacific Northwest Generating Cooperative: Central Electric Cooperative, Clearwater Power, Consumers Power, Douglas Electric Cooperative, Umatilla Electric Cooperative (5 of 16 coops offer program)	Green Power	landfill gas	1998	1.8¢/kWh-2.0¢/kWh
OR	Portland General Electric / Green Mountain Energy	Green Source	existing geothermal, hydro, new wind	2002	0.8¢/kWh
OR	Portland General Electric / Green Mountain Energy	Healthy Habitat	existing geothermal, hydro, new wind	2002	0.8¢/kWh + \$2.50/mo. donation
OR	Portland General Electric Company	Clean Wind for Medium to Large Commercial & Industrial Accounts	wind	2003	1.7¢/kWh
OR	Portland General Electric Company	Clean Wind Power	wind	2002	1.75¢/kWh
SC	Santee Cooper: Aiken Electric Cooperative, Berkeley Electric Cooperative, Blue Ridge Electric, Coastal Electric Cooperative, Edisto Electric Cooperative, Fairfield Electric Cooperative, Horry Electric Cooperative, Laurens Electric Cooperative, Lynches River Electric Cooperative, Marlboro Electric Cooperative, Mid-Carolina Electric Cooperative, Palmetto Electric Cooperative, Pee Dee Electric Cooperative, Santee Electric Cooperative, Tri-County Electric Cooperative, York Electric Cooperative	Green Power Program	landfill gas	2001	3.0¢/kWh
SD	Basin Electric Power Cooperative: Bon Homme-Yankton Electric Assn., Central Electric Cooperative Association, Charles Mix Electric Association, City of Elk Point, Clay-Union Electric Corporation, Codington-Clark Electric Cooperative, Dakota Energy Cooperative, Douglas Electric Cooperative, FEM Electric Association, H-D Electric Cooperative, Kingsbury Electric Cooperative, Lyon-Lincoln Electric Cooperative, McCook Electric Cooperative, Northern Electric Cooperative, Oahe Electric Cooperative, Renville-Sibley Coop. Power Assn., Sioux Valley Southwestern Electric Coop, Southeastern Electric Coop, Union County Electric Cooperative, Whetstone Valley Electric Cooperative, Black Hills Electric Coop, LaCreek Electric Coop, West River Power Association, Butte Electric Coop, Cherry Todd Electric Coop, Moreau Grand, Grand Electric Cooperative, Rosebud	Prairie Winds	wind	2000	0.5¢/kWh

State	Utility Name	Program Name	Type	Start Date	Premium
SD	Missouri River Energy Services: City of Vermillion	RiverWinds	wind	2002	2.0¢/kWh-2.5¢/kWh
SD	Tri-State Generation & Transmission: Niobrara Electric Association, Inc.	Renewable Resource Power Service	wind, hydro	2001	1.25¢/kWh
TN	TVA: Alcoa Electric Department, Appalachian Electric Cooperative, Athens Utility Board, Bristol Tennessee Electric System, Caney Fork Electric Cooperative, City of Maryville Electric Department, Clarksville Department of Electricity, Cleveland Utilities, Clinton Utilities Board, Cookeville Electric Department, Cumberland Electric Membership Corporation, Dickson Electric Department, Duck River Electric Membership Corporation, Elizabethton Electric System, EPB (Chattanooga), Erwin Utilities, Fayetteville Public Utilities, Gibson Electric Membership Corporation, Greeneville Light and Power System, Harriman Utility Board, Johnson City Power Board, Jackson Energy Authority, Knoxville Utilities Board, LaFollette Utilities Board, Lawrenceburg Power System, Lenoir City Utilities Board, Loudon Utilities, McMinnville Electric System, Memphis Light, Gas & Water, Meriwhether Lewis Electric Cooperative, Middle Tennessee Electric Membership Corporation, Morristown Power System, Mountain Electric Cooperative, Murfreesboro Electric Department, Nashville Electric Service, Newport Utilities, Oak Ridge Electric Department, Paris Board of Public Utilities, Plateau Electric Cooperative, Powell Valley Electric Cooperative, Pulaski Electric System, Sequachee Valley Electric Cooperative, Sevier County Electric System, Springfield Department of Electricity, Sweetwater Utilities Board, Tullahoma Utilities Board, Upper Cumberland Electric Membership Corporation, Volunteer Energy Cooperative	Green Power Switch	landfill gas, PV, wind	2000	2.67¢/kWh
TX	Austin Energy (City of Austin)	GreenChoice	wind, landfill gas	2000/1997	-0.134¢/kWh
TX	City Public Service of San Antonio	Windtricity	wind	2000	3.0¢/kWh
TX	El Paso Electric Company	Renewable Energy Tariff	wind	2001	1.92¢/kWh
UT	City of St. George	Clean Green Power	wind, small hydro	2005	2.95¢/kWh
UT	Deseret Power	GreenWay	various	2004	1.95¢/kWh
UT	PacifiCorp: Utah Power	Blue Sky	wind	2000	1.95¢/kWh
UT	Tri-State Generation & Transmission: Empire Electric Association, Inc.	Renewable Resource Power Service	wind, hydro	2001	1.25¢/kWh
VT	Central Vermont Public Service	CVPS Cow Power	biogas	2004	4.0¢/kWh
VT	Green Mountain Power	CoolHome / CoolBusiness	wind, biomass	2002	Contribution

State	Utility Name	Program Name	Type	Start Date	Premium
VT	Green Mountain Power	Greener Mountain Power	various renewables	2006	4.097¢/kWh
WA	Avista Utilities	Buck-A-Block	wind	2002	0.33¢/kWh
WA	Benton County Public Utility District	Green Power Program	landfill gas, wind, hydro	1999	Contribution
WA	Chelan County PUD	Sustainable Natural Alternative Power (SNAP)	PV, wind, micro hydro	2001	Contribution
WA	Clallam County PUD	Clallam County PUD Green Power Program	landfill gas	2001	0.69¢/kWh
WA	Clark Public Utilities	Green Lights	PV, wind	2002	1.5¢/kWh
WA	Cowlitz PUD	Renewable Resource Energy	wind, PV	2002	2.0¢/kWh
WA	Grant County PUD	Alternative Energy Resources Program	wind	2002	2.0¢/kWh
WA	Grays Harbor PUD	Green Power	wind	2002	3.0¢/kWh
WA	Lewis County PUD	Green Power Energy Rate	wind	2003	2.0¢/kWh
WA	Mason County PUD No. 3	Mason Evergreen Power	wind	2003	1.0¢/kWh
WA	Orcas Power & Light	Go Green	wind, hydro	1999	3.5¢/kWh
WA	Pacific County PUD	Green Power	landfill gas	2002	1.05¢/kWh
WA	PacifiCorp: Pacific Power	Blue Sky	wind	2000	1.95¢/kWh
WA	Peninsula Light	Green by Choice	wind, hydro, biogas	2002	2.0¢/kWh
WA	Puget Sound Energy	Green Power Plan	wind, PV, biogas	2002	2.0¢/kWh
WA	Seattle City Light	Seattle Green Power	PV, biogas	2002	Contribution
WA	Seattle City Light	Green Up	wind	2005	1.5¢/kWh
WA	Snohomish County Public Utility District	Planet Power	wind	2002	2.0¢/kWh
WA	Tacoma Power	EverGreen Options	wind	2000	1.2¢/kWh
WI	Alliant Energy	Second Nature	wind, landfill gas	2000	2.0¢/kWh
WI	Dairyland Power Cooperative: Barron Electric, Bayfield/ Iron River, Chippewa / Cornell Valley, Clark / Greenwood, Dunn / Menomonie, Eau Claire / Fall Creek, Jackson / Black River Falls, Jump River / Ladysmith, Oakdale, Pierce-Pepin / Ellsworth, Polk-Burnett / Centuria, Price / Phillips, Richland, Riverland / Arcadia, St. Croix / Baldwin, Scenic Rivers / Lancaster, Taylor / Medford, Vernon / Westby	Evergreen Renewable Energy Program	hydro, wind, landfill gas, biogas	1998	1.5¢/kWh
WI	Great River Energy: Head of the Lakes	Wellspring Renewable Wind Energy Program	wind	1997	1.45¢/kWh-2.0¢/kWh
WI	Madison Gas & Electric	Wind Power Program	wind	1999	3.3¢/kWh
WI	We Energies	Energy for Tomorrow	landfill gas, PV, hydro, wind	1996	1.37¢/kWh

State	Utility Name	Program Name	Type	Start Date	Premium
WI	Wisconsin Public Power Inc. (34 of 37 munis offer program): Algoma, Cedarburg, Florence, Kaukauna, Muscodia, Stoughton, Reedsburg, Oconomowoc, Waterloo, Whitehall, Columbus, Hartford, Lake Mills, New Holstein, Richland Center, Boscobel, Cuba City, Hustisford, Sturgeon Bay, Waunakee, Lodi, New London, Plymouth, River Falls, Sun Prairie, Waupun, Eagle River, Jefferson, Menasha, New Richmond, Prairie du Sac, Slinger, Two Rivers, Westby	Renewable Energy Program	small hydro, wind, biogas	2001	2.0¢/kWh
WI	Wisconsin Public Service	Solar Wise for Schools	PV in schools	1996	Contribution
WI	Wisconsin Public Service	NatureWise	wind, landfill gas, biogas	2002	1.86¢/kWh
WY	Cheyenne Light, Fuel and Power Company/Bonneville Environmental Foundation	Renewable Premium Program	99% new wind, 1% new solar	2006	3.5¢/kWh
WY	Lower Valley Energy	Green Power	wind	2003	1.67¢/kWh
WY	PacifiCorp: Pacific Power	Blue Sky	wind	2000	1.95¢/kWh
WY	Tri-State Generation & Transmission: Big Horn Rural Electric Company, Carbon Power & Light, Inc., Garland Light & Power Company, High Plains Power, Inc., High West Energy, Inc., Niobrara Electric Association, Inc., Wheatland Rural Electric Association, Inc., Wyrulec Company	Renewable Resource Power Service	wind, hydro	2001	1.25¢/kWh
WY	Yampa Valley Electric Association	Wind Energy Program	wind	1999	3.0¢/kWh
Source: National Renewable Energy Laboratory, Golden, Colorado.					
Notes: Utility green pricing programs may only be available to customers located in the utility's service territory.					

Appendix F

Table F-1: Utilities That Have Lowered Their Base Green Power Premium

Utility	Year of Change	Initial Premium ¢/kWh	Revised Premium ¢/kWh	Reason Stated
Loveland Water and Power	2006	2.50	1.50	Switched to regional RECs product.
Madison Gas and Electric	2006	3.33	2.68	Higher cost of natural gas generation.
Mason County PUD #3	2006	2.00	1.00	Lower wind energy and transmissions costs.
Minnkota Power Cooperative	2006	1.50	0.50	Higher costs of conventional generation sources.
Otter Tail Power	2006	2.60	1.60	Lower-cost source of wind energy; an increase in the embedded generation cost to which the renewable energy cost is compared; and reduced marketing and promotion costs for the program.
We Energies	2006	2.04	1.37	Higher fossil fuel prices.
Wisconsin Public Service	2006	1.86	1.00	Lower renewable energy purchase costs and administrative costs.
Basin Electric Power Cooperative	2005	2.50	0.50	Greatly expanded wind energy supply lowered costs; switched to "green tag" product.
Lower Valley Energy	2005	1.67	1.17	Eliminated administrative margin.
Wisconsin Public Service	2005	2.65	1.86	Lower renewable energy purchase costs and administrative costs.
Avista Utilities	2004	1.80	0.33	Lower renewable energy purchase costs.
Fort Collins Utilities	2004	2.50	1.00	RECs purchase from new wind energy project.
Portland General Electric	2004	3.50	1.75	Lower cost of wind power.
TECO	2004	10.00	5.00	Greater use of lower-cost renewable resources.
PacifiCorp	2003	2.95	1.95	Lower renewable energy costs and greater customer participation.
Basin Electric Power Cooperative	2002	3.00	2.50	Wind power development costs less than originally estimated.
PacifiCorp	2001	4.95	2.95	Reductions in the forecast cost for new wind energy and increases in the forecast for market alternatives.

Appendix G

Table G-1: Retail Green Power Product Offerings in Competitive Electricity Markets, November 2006

State	Company	Product Name	Residential Price Premium ¹	Resource Mix ²	Certification
CT	CL&P/United Illuminating Sterling Planet (CT Clean Energy Options Program)	Sterling Select 50% or 100% of usage	1.15¢/kWh	33% new wind, 33% small hydro, 34% landfill gas	—
DC	PEPCO Energy Services (3)	Green Electricity 10%, 51% or 100% of usage	3.38¢/kWh (for 100% usage)	landfill gas	—
DC	PEPCO Energy Services (3)	NewWind Energy 51% or 100% of usage	4.08¢/kWh (for 100% usage)	new wind	—
DC	Washington Gas Energy Services / Community Energy (3)	1 year fixed price electricity with 5% wind	2.3¢/kWh	5% new wind	—
ME	Maine Renewable Energy/Maine Interfaith Power & Light (4)	Maine Clean Power	2.62¢/kWh	100% low impact hydro	—
ME	Maine Renewable Energy/Maine Interfaith Power & Light (4)	Maine Clean Power Plus	3.12¢/kWh	80% low impact hydro, 20% wind	—
MD	PEPCO Energy Services (5)	Green Electricity 10%, 51% or 100% of usage	1.3¢/kWh (for 100% RE)	landfill gas	—
MD	PEPCO Energy Services (5)	Wind Electricity 51% or 100% of usage	2.53¢/kWh (for 100% wind)	new wind	—
MD	Washington Gas Energy Services/ Community Energy	1 Year Price Protection with 5% wind	0.12¢/kWh	5% wind	—
MA	Cape Light Compact (6)	Cape Light Compact Green 50% or 100%	2.5¢/kWh (for 100% usage)	75% small hydro, 24% new wind or landfill gas, 1% new solar	—
MA	Massachusetts Electric/Nantucket Electric/ Clear Sky Power	Clear Sky Home	7.2¢/kWh	100% biomass	—
MA	Massachusetts Electric/Nantucket Electric/Community Energy	New Wind Energy and Water 50% or 100% of usage	2.0¢/kWh (for 100% usage)	70% small hydro, 30% new wind	Green-e
MA	Massachusetts Electric/Nantucket Electric/Mass Energy Consumers Alliance	New England GreenStart 50% or 100% of usage	2.4¢/kWh (for 100% usage)	75% small hydro, 25% new biomass, wind, and solar	—
MA	Massachusetts Electric/Nantucket Electric/Sterling Planet	MA Clean Choice	5.0¢/kWh	33% new wind, 33% new landfill gas; 33% small hydro	Environmental Resources Trust

State	Company	Product Name	Residential Price Premium ¹	Resource Mix ²	Certification
MI	Consumers Energy	Green Generation	1.67¢/kWh	68% new wind, 32% landfill gas	Green-e
NJ	PSE&G/JCP&L/Atlantic City Electric/Rockland Electric/Community Energy	NJ Clean Power Choice – Community Energy	1.3¢/kWh	50% wind, 49% low impact hydro, 1% solar	—
NJ	PSE&G/JCP&L/Atlantic City Electric/Rockland Electric/Green Mountain Energy	NJ Clean Power Choice – Green Mountain Energy	1.3¢/kWh	50% wind, 50% small hydro	—
NJ	PSE&G/JCP&L/Atlantic City Electric/Rockland Electric/Jersey-Atlantic Wind	NJ Clean Power Choice – Wind and Water	2.9¢/kWh	50% wind, 50% low impact hydro	—
NJ	PSE&G/JCP&L/Atlantic City Electric/Rockland Electric/Jersey-Atlantic Wind	NJ Clean Power Choice - Wind	5.5¢/kWh	100-kWh blocks of new wind	—
NJ	PSE&G/JCP&L/Atlantic City Electric/Rockland Electric/Sterling Planet	NJ Clean Power Choice – Sterling Select	1.2¢/kWh	33% wind, 33% small hydro, 34% landfill gas	Environmental Resources Trust
NY	ConEdison Solutions (7)	Green Power	1.0¢/kWh	35% new wind, 65% small hydro	Green-e
NY	Con Edison /Sterling Planet	NY Clean Choice	2.5¢/kWh	40% new wind, 30% small hydro, 30% bioenergy	Environmental Resources Trust
NY	ECONergy	Keep It Clean	3¢/kWh	100% wind	—
NY	Energy Cooperative of New York (8)	Renewable Electricity	0.75¢/kWh	25% new wind, 75% landfill gas	—
NY	Long Island Power Authority / Community Energy	New Wind Energy	2.5¢/kWh	new wind	—
NY	Long Island Power Authority / Community Energy	New Wind Energy/Small Hydro	1.3¢/kWh	60% new wind, 40% small hydro	—
NY	Long Island Power Authority / Sterling Planet	New York Clean	1.0¢/kWh	55% small hydro, 35% biomass, 10% new wind	Environmental Resources Trust
NY	Long Island Power Authority / Sterling Planet	Sterling Green	1.5¢/kWh	40% new wind, 30% small hydro, 30% bioenergy	Environmental Resources Trust
NY	NYSEG/Community Energy	Catch the Wind/New Wind Energy	2.5¢/kWh	new wind	—
NY	Niagara Mohawk / Community Energy	60% New Wind Energy and 40% Small Hydro	1.3¢/kWh	60% new wind, 40% hydro	—
NY	Niagara Mohawk / Community Energy	NewWind Energy	2.5¢/kWh	100% new wind	—
NY	Niagara Mohawk / EnviroGen	Think Green!	1.0¢/kWh	75% landfill gas, 25% low impact hydro	—

State	Company	Product Name	Residential Price Premium ¹	Resource Mix ²	Certification
NY	Niagara Mohawk/ Sterling Planet	Sterling Green	1.5¢/kWh	50% wind, 50% small hydro	Environmental Resources Trust
NY	Niagara Mohawk/Green Mountain Energy	Green Mountain Energy Electricity	1.5¢/kWh	50% small hydro, 50% wind	Green-e
NY	Rochester Gas & Electric/Community Energy	Catch the Wind/NewWind Energy	2.5¢/kWh	100-kWh blocks of new wind	—
NY	Suburban Energy Services /Sterling Planet	Sterling Green Renewable Electricity	1.5¢/kWh	40% new wind, 30% small hydro, 30% bioenergy	Environmental Resources Trust
PA	Energy Cooperative of Pennsylvania (9)	EcoChoice 100	10.5¢/kWh	89% landfill gas, 10% hydro, 35% biomass	Green-e
PA	PECO Energy/Community Energy (9)	PECO Wind	2.54¢/kWh	100-kWh of new wind	—
PA	PEPCO Energy Services (9)	Green Electricity 10%, 51% or 100% of usage	5.2¢/kWh (for 100% usage)	landfill gas	—
PA	PEPCO Energy Services (9)	Wind 51% or 100% of usage	5.9¢/kWh (for 100% usage)	new wind	—
RI	Narragansett Electric/ Clear Sky Power	Clear Sky Home	7.2¢/kWh	100% new bioenergy	—
RI	Narragansett Electric / Community Energy, Inc.	40% NewWind /60% Small Hydro	1.5¢/kWh	60% small hydro, 40% new wind	—
RI	Narragansett Electric / Community Energy, Inc.	50% NewWind /50% Small Hydro	2.0¢/kWh	50% small hydro, 50% new wind	—
RI	Narragansett Electric / People's Power & Light	New England GreenStart RI 50% or 100% of usage	1.5¢/kWh	70% small hydro, 17% biomass, 13% wind and solar	—
RI	Narragansett Electric / Sterling Planet	Sterling Supreme 100%	1.98¢/kWh	40% small hydro, 25% biomass, 25% new solar, 10% wind	Environmental Resources Trust
TX	First Choice Power	Simply Better Renewable	-0.7¢/kWh	100% renewables	
TX	Gexa Energy (10)	Gexa Green	-0.2¢/kWh	100% renewable	—
TX	Green Mountain Energy Company (10)	Pollution Free	-0.26¢/kWh	Wind and hydro	—
TX	Green Mountain Energy Company (10)	Pollution Free: Reliable Rate	-0.55¢/kWh	wind and hydro	—
TX	Reliant Energy (10)	Renewable Plan	1.0¢/kWh	100% wind	—
TX	TXU Energy	TXU Energy 100% EarthWise	1.0¢/kWh	100% wind	—

State	Company	Product Name	Residential Price Premium ¹	Resource Mix ²	Certification
TX	TXU Energy	TXU Energy EarthWise 18	-0.02¢/kWh	10% wind	—
VA	PEPCO Energy Services (11)	Green Electricity 10%, 51% or 100% of usage	3.6¢/kWh (for 100% usage)	landfill gas	—
VA	PEPCO Energy Services (11)	NewWind Energy 51% or 100% of usage	4.3¢/kWh (for 100% wind)	new wind	—

¹ Prices updated as of November 2006 and may also apply to small commercial customers. Prices may differ for large commercial/industrial customers and may vary by service territory.

² New is defined as operating or repowered after January 1, 1997 based on the Green-e standard.

³ Offered in PEPCO service territory. Product prices are for new customers based on annual average costs for customers in PEPCO's service territory (8.0¢/kWh), 11/1/06. http://www.dcpsc.org/hottopics/Electric_Rate_Comparisons_2.shtm

⁴ Price premium is for Central Maine Power service territory based on standard offer of 8.38¢/kWh.

http://www.state.me.us/mpuc/industries/electricity/standard_offer/current_sorates_cmp.html

⁵ Product offered in Baltimore Gas and Electric and PEPCO service territories. Price is for PEPCO service territory based on price to compare of 10.08¢/kWh. <http://www.pepco.com/home/choice/md/compare/>

⁶ Price premium is based on a comparison to the NSTAR standard offer of 10.45¢/kWh.

http://www.capelightcompact.org/doc.ccm?10_801_675510_cap675510...Doc.page.html

⁷ Price premium is based on a comparison to ConEdison Solutions' standard electricity product in the ConEdison service territory.

⁸ Offered in Niagara Mohawk and NYSEG service territories.

⁹ Product prices are for PECO service territory (price to compare of 6.7¢/kWh).

<http://www.oca.state.pa.us/Industry/Electric/elecomp/pecor.pdf>

¹⁰ Product prices reflect difference in average price for 1000 kWh based on price to beat of 15.0¢/kWh for TXU service territory (specifically Dallas, Texas). Prices derived from <http://www.powertochoose.org/>.

¹¹ Products are available in Dominion Virginia Power service territory (price to compare of 6.078¢/kWh)

<http://www.yesvachoice.com/howtochoose/pricetocompare.pdf>

Appendix H

Table H-1: Renewable Energy Certificate Retail Products, November 2006

Certificate Marketer	Product Name	Renewable Resources	Location of Renewable Resources	Residential Price Premiums*	Certification
3 Phases Energy Services	Green Certificates	100% new wind	Nationwide	2.0¢/kWh	Green-e
Bonneville Environmental Foundation	Brighter Future Green Tags	90% new wind, 10% new solar	West	2.4¢/kWh	Green-e
Bonneville Environmental Foundation	Cooler Future Green Tags	99% new wind, 1% new solar	Nationwide	2.0¢/kWh	Green-e
Carbonfund.org	MyGreenFuture	99% new wind, 1% new solar	Nationwide	0.5¢/kWh	Green-e
Carbonfund.org	Carbon Offsets	wind, solar, biomass, efficiency, reforestation	Nationwide	\$5.50/ton CO2 (donation)	Environmental Resource Trust**
Clean Energy Partnership/Sterling Planet	National New Clean Energy Mix	24% wind, 25% biomass, 50% landfill gas, 1% solar	Nationwide	0.5¢/kWh-0.75¢/kWh	Environmental Resources Trust
Clean Energy Partnership/Sterling Planet	National New Wind	100% new wind	Nationwide	0.96¢/kWh	—
Clean and Green	Clean and Green Membership	100% new wind	Nationwide	3.0¢/kWh	Green-e
Community Energy	New Wind Energy	100% new wind	Colorado, Illinois, New York, Pennsylvania, West Virginia	2.0¢/kWh - 2.5¢/kWh	Green-e
Conservation Services Group	ClimateSAVE	95% new wind/hydro, 5% new solar	Kansas, New England (wind/hydro), New York (solar)	1.65¢/kWh - 1.75¢/kWh	Green-e
Green Mountain Energy	Green Mountain Energy (Pennsylvania)	100% wind	Nationwide	1.99¢/kWh	—

Certificate Marketer	Product Name	Renewable Resources	Location of Renewable Resources	Residential Price Premiums*	Certification
Maine Interfaith Power & Light/BEF	Green Tags (supplied by BEF)	99% new wind, 1% new solar	Nationwide	2.0¢/kWh	—
Mass Energy Consumers Alliance	New England Wind Fund	100% new wind	New England	~5.0¢/kWh (donation)	—
NativeEnergy	CoolDriver	New wind and biogas	Nationwide	~1.2¢/kWh, \$12 per ton CO2 avoided	***
NativeEnergy	CoolWatts	100% new wind	Nationwide	0.8¢/kWh	Green-e
NativeEnergy	WindBuilders	100% new wind	South Dakota, North Dakota	~1.2¢/kWh, \$12 per ton of CO2 avoided	***
NativeEnergy	Remoovable Energy	100% new biogas	Pennsylvania	0.8¢/kWh-1.0¢/kWh	***
Renewable Choice Energy	American Wind	100% new wind	Nationwide	2.5¢/kWh	Green-e
Renewable Ventures	PVUSA Solar Green Certificates	100% solar	California	3.3¢/kWh	Green-e
SKY energy, Inc.	Wind-e Renewable Energy	100% new wind	Nationwide	2.4¢/kWh	Green-e
Sterling Planet	Sterling Green Energy	100% new wind, hydro, geothermal, methane, or bioenergy	Nationwide	1.5¢/kWh	—
Sterling Planet	Sterling Solar	100% new solar	Nationwide	7.5¢/kWh	—
TerraPass Inc.	TerraPass	Various (including efficiency and CO2 offsets)	Nationwide	~\$10/ton CO2	—
Waverly Light & Power	Iowa Energy Tags	100% wind	Iowa	2.0¢/kWh	—
WindCurrent	Chesapeake Windcurrent	100% new wind	Mid-Atlantic States	2.5¢/kWh	Green-e

Footnote:

* Product prices are updated as of July 2006. Premium may also apply to small commercial customers. Large users are typically able to negotiate price premiums.

** Product is sourced from Green-e and ERT-certified RECs. ERT also certifies the entire product portfolio.

*** The Climate Neutral Network certifies the methodology used to calculate the CO2 emissions offset.

NA = Not applicable.

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