

Green Power Marketing in the United States: A Status Report

Sixth Edition

Lori Bird and Blair Swezey



NREL

National Renewable Energy Laboratory

1617 Cole Boulevard
Golden, Colorado 80401-3393

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Prepared under Task No. AS73.7001



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An Overview of Green Power Marketing in the United States

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. Since then, these products have become more prevalent both from utilities and in states that have introduced competition into their retail electricity markets. Today, nearly 50% of all U.S. consumers have an option to purchase some type of green power product from a retail electricity provider.

Currently, more than 350 investor-owned utilities, rural electric cooperatives, and other publicly owned utilities in 33 states offer green power programs. These programs allow customers to purchase some portion of their power supply – almost always at a higher price – as renewable energy 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 noncompetitive electricity markets.

In some competitive (or restructured) retail electricity markets, electricity customers can purchase electricity generated from renewable sources by switching to an alternative electricity supplier that offers green power. To date, about a dozen states that have opened their markets to competition have experienced some degree of green power marketing activity.

Finally, any consumer can purchase green power through renewable energy certificates (RECs), which represent the unique or “green” attributes of electricity generated from renewable energy-based projects. Consumers can support renewable energy development through REC purchases regardless of whether they already have access to a green power product from their retail power provider and without having to switch to an alternative supplier. At present, nearly 20 companies actively market RECs across the United States for their electricity service.

This report provides an overview of green power marketing activity in the United States. It describes green power product offerings, consumer response, and recent industry trends. The three distinct markets for green power are discussed in turn.

Utility Green Pricing Programs

The number of utilities offering green pricing has grown steadily in recent years – more than 350 utilities in 33 states now have green pricing programs (see **Figure 1** and **Tables A-1, A-2**).¹ While, initially, some part of this growth was attributable to the threat of market competition, recent growth has been spurred by several states that have passed laws requiring utilities to offer green pricing.² In addition, utilities are becoming increasingly comfortable with the operational reliability and improved economics of renewable energy technologies leading to a growing willingness to undertake projects. And a number of utilities have expanded their programs as customer demand has grown.

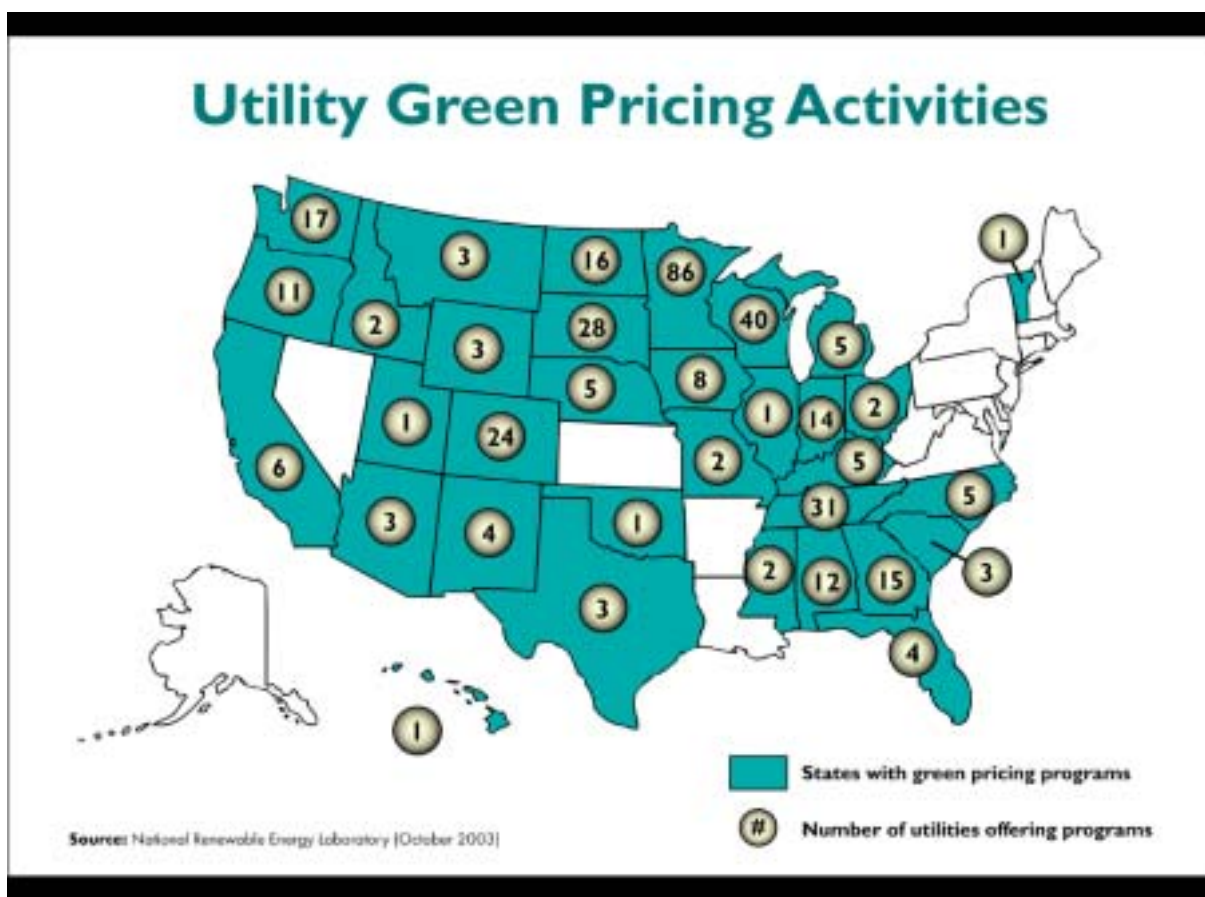


Figure 1: U.S. Map of Green Pricing Activities

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 termed *percent-of-use products*) or

¹ For an up-to-date list of utilities with green pricing programs, see the table of utility green pricing programs on the U.S. Department of Energy's Green Power Network Web site at <http://www.eere.energy.gov/greenpower/summary.shtml>.

² These states include Iowa, Minnesota, New Mexico, Oregon, and Washington.

in discrete amounts or blocks at a fixed price (*block products*), such as \$2 for a 100-kilowatt-hour (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%. Larger purchasers, such as businesses, can often purchase green power for a smaller fraction of their electricity usage.

The price premiums charged in green pricing programs range from 0.7¢/kWh to as much as 17.6¢/kWh, with a median of 2.5¢/kWh and a mean of 2.87¢/kWh.³ Programs that feature solar-only products represent the high end of the range. While the median premium has remained much the same over time, the average price premium has dropped about 10% annually since 2000. Some of this reduction can be attributed to lower-than-expected market costs for renewable energy supplies and the availability of state or federal financial incentives that help offset costs. And recent increases in the price of natural gas have reduced the effective green premiums in utility programs that exempt their green pricing customers from fuel-related price increases.

Customer Participation

At the end of 2002, about 270,000 customers were participating in utility green pricing programs nationwide, including about 3,900 nonresidential customers.⁴ Between 1999 and 2002, the number of participating customers increased four-fold. **Table 1** shows the increase in customers delineated by residential and nonresidential customer segments. During 2002, the number of nonresidential customers participating in green pricing programs increased by 54%, which was twice the rate of growth of residential customers. This reflects the fact that utilities have been increasing their marketing efforts to nonresidential customers.

Table 1: Cumulative Number of Customers Participating in Utility Green Pricing Programs

	1999	2000	2001	2002
Residential	n/a*	164,000	210,000	267,000
Nonresidential	n/a*	1,700	2,500	3,900
Total	67,000	165,000	212,000	271,000
*Information on customer segments is not available for 1999. Source: NREL. Data provided by utility green pricing program managers.				

Customer participation rates in green pricing programs average about 1% across all utilities, although the top programs have achieved participation rates as high as 3% to 6%.⁵ Participation

³ It should be noted that a handful of utilities periodically adjust the green power premium to reflect changes in the cost of conventional generation sources. Thus, when the cost of the utility's generation mix rises, the effective green power premium falls.

⁴ NREL received data for 75% of utility green pricing programs in 2002, including all of the major programs. The remaining programs, which are smaller in size, aren't expected to have a large impact on overall customer numbers.

⁵ Lists of the Top 10 utility green pricing programs are posted on the U.S. Department of Energy's Green Power Network Web site at <http://www.eere.energy.gov/greenpower/topten.shtml>.

rates are often limited by a lack of customer awareness of the green power program,⁶ consumer unwillingness to pay a premium for green power, customer uncertainty regarding the actual benefits of the program, varied levels of interest among utilities in marketing and promoting the program, and, in some cases, limited product availability – some utilities have been slow to expand a program when the initial amount of green power offered is fully subscribed. (Swezey and Bird, 2000; Swezey and Bird, 2001).

Green Power Sales

Collectively, utilities sold 895 million kWh, or 102 average megawatts (aMW),⁷ of green power to customers in 2002 (see **Table 2**).⁸ Green power sales to all customer classes grew by 58% in 2002, compared to 25% in 2001. Purchases by nonresidential customers represented 29% of total purchases in 2001 and 26% of all purchases in 2002.

About 287 MW of new renewables capacity has been installed as a result of utility green pricing programs, with about another 140 MW planned for 2003 (see **Table 3**). 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. Fifty-six utilities have installed or purchase power from new renewable energy capacity for green pricing programs, and 25 utilities have announced firm plans for future capacity additions (Bird and Swezey, 2003).

Table 2: Annual Sales of Green Energy through Utility Green Pricing Programs
(millions of kWh)

	2000	2001	2002
Residential customers	n/a*	332.7	661.3
Nonresidential customers	n/a*	164.4	233.7
All customers	453.7	568.0	895.0
*Information on customer segments is not available for 2000. Source: NREL. Data provided by utility green pricing program managers.			

Table 3: New Renewables Capacity Supplying Green Pricing Programs

	<i>kW in Place</i>	%	<i>kW Planned</i>	%
Wind	225,595	78.5	111,290	80.3
Biomass	43,520	15.1	23,892	17.2
Solar	4,153	1.4	1,359	1.0
Geothermal	5,500	1.9	0	0.0
Small Hydro	8,553	3.0	1,975	1.4
Total	287,321	100.0	138,516	100.0
Source: Bird and Swezey, 2003				

⁶ A number of utilities have reported that only 20% to 30% of their customers are aware that they offer a green power option.

⁷ An average megawatt is defined as a megawatt of capacity that operates continuously, or has a capacity factor of 100%. Because all electric generators tend to have different operating characteristics and, thus, capacity factors, the use of average megawatts allows the contribution from renewables to be represented in a generic fashion. As an example, 1,000 aMW is equivalent to 3,333 megawatts of nameplate wind power capacity operating at a 30% capacity factor or 1,250 megawatts of nameplate geothermal capacity operating at an 80% capacity factor.

⁸ NREL received data for 75% of utility green pricing programs in 2002, including all of the major programs. The remaining programs, which are smaller in size, aren't expected to have a large impact on overall sales.

Competitive Green Power Markets

During the past several years, about one-third of U.S. states have restructured their electricity markets to introduce retail service competition.⁹ Currently, electricity consumers in the following states can purchase competitively marketed green power: Maine, Maryland, Massachusetts, New Jersey, New York, Pennsylvania, Texas, and Virginia, as well as the District of Columbia (see **Figure 2** and **Table A-3**).^{10,11}

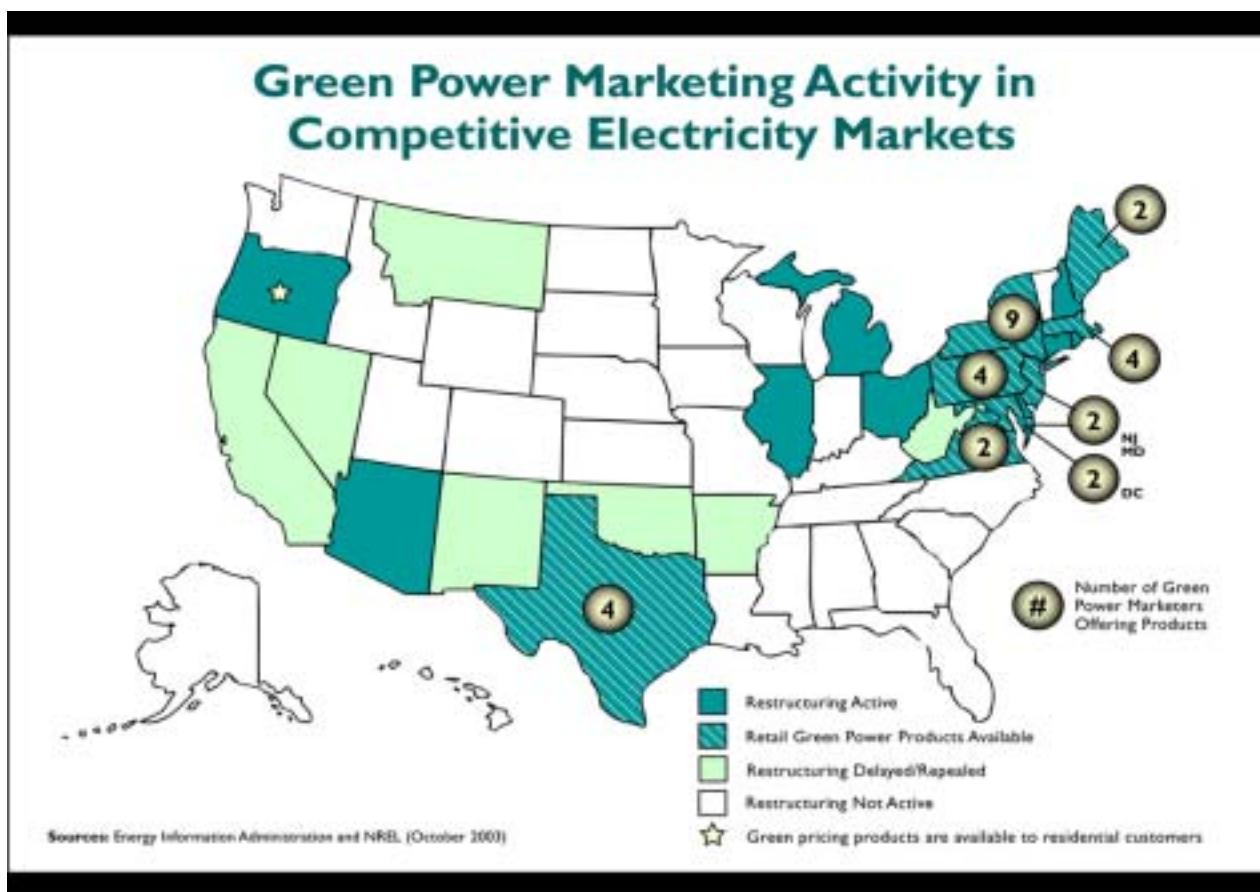


Figure 2: States With Competitive Green Power Offerings

⁹ For summaries of state electric industry restructuring activities, see the U.S. Energy Information Administration Web site at http://www.eia.doe.gov/cneaf/electricity/chg_str/tab5rev.html.

¹⁰ 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/mkt_summ.shtml.

¹¹ 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 are considered green pricing here (see green pricing section). In Ohio, at least one green power marketer supplies customers of municipal aggregation groups with green power; however, there are no green power products available to other customers. In Illinois, green power has been sold only in wholesale markets.

Buying green power in competitive markets generally entails switching service from the incumbent utility to a green power supplier; and the size and strength of the green power market depends greatly on the number of customers switching providers. The level of customer switching, in turn, is heavily influenced by the regulatory rules established to govern these newly opened markets, particularly the pricing of default retail electricity service (Wiser, et. al, 2001).

In most restructured markets, alternative marketers have found it difficult to persuade customers to switch suppliers and, with few exceptions, green power marketing has been slow to emerge. Because of these market problems, green power marketers have started to team with default suppliers to jointly offer green power options. Although these teaming arrangements are relatively new, there are early indications that they may prove to be an effective strategy for marketing green power in restructured states, particularly to residential customers.

Products and Pricing

The products offered in competitive markets tend to differ from those offered by utilities. First, customers must usually receive their entire electricity supply as green power, unlike many utility green pricing programs in which customers can choose to purchase smaller percentages of green power. However, the products often contain less than 100% renewable energy content, therefore, customers still obtain only a portion of their electricity from renewable sources. Second, the products often contain a mix of electricity generated from new and pre-existing renewable energy projects; whereas, utilities generally use only new renewable energy supplies.

Competitively marketed green power products generally carry a price premium of between 0.5¢/kWh and 2.5¢/kWh. The price premium charged depends on several factors such as the price of “standard offer” or default service, whether government incentives are available to green power marketers or suppliers, and the cost of renewable energy generation available in the regional market. Some marketers charge prices very close to the default market price but also charge a monthly service fee; while others offer fixed-price products, which provide customers with insurance against increasing prices for a specified period of time.

Customer Participation

Based on data supplied by marketers, an estimated 150,000 customers were purchasing green power from competitive suppliers at the end of 2002. This includes customers purchasing both certified and uncertified products, although it does not include customers who purchase products that contain only a very small amount of renewables.

Table 4 presents the cumulative number of customers purchasing products that have received *Green-e* certification from the Center for Resource Solutions (CRS).¹² These include customers primarily in California and to a lesser extent in Pennsylvania, New Jersey, and Connecticut. Following rapid growth from 1998 to 1999 when the number of customers nearly tripled, 2000 marked the start of a decline in customers purchasing *Green-e* certified products caused by the

¹² The *Green-e* program for competitively marketed green power products requires that products contain at least 50% renewable energy content. For more information on the *Green-e* program, see <http://www.green-e.org/>.

California power crisis. The state's restructuring debacle forced many green power marketers to exit the market and return their customers to default service. As a result, the number of California customers purchasing *Green-e* certified products fell from about 155,000 in 1999 to 88,000 in 2001.

Table 4: Cumulative Number of Customers Purchasing *Green-e* Certified Green Power

Green Power Customers	1998	1999	2000	2001
Residential	56,600	144,700	154,000	93,600
Nonresidential	5,800	27,700	8,600	13,400
Total	62,400	172,400	162,600	107,000
Source: Center for Resource Solutions, Annual <i>Green-e</i> Verification Reports http://www.green-e.org/what_is/standard/verification.html				

Green Power Sales

Data are not available for total green energy sales in competitive electricity markets. However, the Center for Resource Solutions reports sales of *Green-e* certified electricity, which is a subset of the market (see **Table 5**). Currently, about one-third of competitively marketed green power products are certified by *Green-e*. Nearly one-quarter of the sales of certified green energy are to nonresidential customers, which is consistent with the experience in regulated markets.

The renewable energy sources most commonly used to supply competitive green power offerings are wind, landfill gas, and small or low-impact hydropower. Initially, competitively marketed products were supplied primarily from existing renewable energy sources, although more recent product offerings contain higher fractions of new renewables – the *Green-e* certification criteria require marketers to increase the percentage of new renewable content over time.¹³ Higher priced products often contain a larger fraction of new renewable energy content or highly desirable resources, such as new wind and solar. In 2001, about one-quarter of the *Green-e* certified electricity was supplied from new renewable energy sources.

Table 5: Annual Sales of *Green-e* Certified Green Energy in Competitive Markets
(millions of kWh)

	1998	1999	2000	2001
Residential	303	761	1,125	741
Nonresidential customers	81	466	459	209
All customers	384	1,227	1,584	950
Nonresidential customers (%)	21%	38%	29%	22%
New Renewables	N/A	N/A	N/A	251
Source: Center for Resource Solutions, Annual <i>Green-e</i> Verification Reports http://www.green-e.org/what_is/standard/verification.html				

¹³ The definition of new renewable resources varies by region. See the *Green-e* standard for a more detailed discussion at http://www.green-e.org/ipp/standard_for_marketers.html

Competitive Market Summaries

Overall, the experience in competitive markets has been varied and highly dependent on state-specific market rules, standard offer prices, and the cost of renewable generation sources available in the region. In 1998 and 1999, green power marketers were most successful in California and Pennsylvania, where as many as 1% to 2% of customers purchased green power. More recently, significant marketing activity has been concentrated in Texas and the Northeast states.

Below, we summarize the status of green power marketing in those states in which marketers are now active or in which green power marketing has occurred in the past.

California

The California electricity market opened to competition on March 31, 1998, and the state soon had one of the most active green power markets in the country. At one point, there were more than 20 registered green power suppliers serving a total of more than 175,000 retail customers – or about 1.5% of the state’s electricity customers. Green power sales were bolstered by a state credit for qualifying retail renewable energy purchases, which was initially set at 1.5¢/kWh but later reduced to 1.0¢/kWh. The credit enabled green power marketers to offer renewable energy at prices comparable to and, in some cases below, the default electricity rates.

However, by late 2000, wholesale power prices in the region skyrocketed, creating a host of problems for the state’s power marketers. Most green power marketers exited the retail market because of credit problems resulting from the dramatic spread between rising wholesale prices and fixed retail rates. Then, in February 2001, Governor Gray Davis signed legislation authorizing the Public Utility Commission to suspend retail competition. As a result, marketers were no longer able to accept new customers. A few green power marketers, including Commonwealth Energy and Green Mountain Energy Company, have continued to serve existing customers.

Connecticut

Connecticut opened its electricity market to retail competition on July 1, 2000. During the first six months of competition, two green power marketers – the Connecticut Energy Cooperative and Green Mountain Energy Company – entered the market, offering *Green-e* certified products supplied from a blend of renewable energy sources, such as biomass, small hydro, and wind. By early 2003, both marketers had ceased operations in the state, citing a combination of low standard-offer prices, an overall lack of a competitive electricity market, and regulations imposed by the grid system operator that increased the cost of procuring renewable energy for customers.

Although retail green power products are no longer available directly from competitive marketers, several renewable energy certificate (REC) marketers are now active in the state. In the future, default providers could be required to offer customers green power options under a bill signed into law by Governor John Rowland in June 2003. The legislation grants authority to the Department of Public Utility Control to require electric distribution companies to offer

renewable energy options, which would be developed and implemented by third-party companies selected through a competitive bidding process.

Maine

Maine's retail electricity market was opened to competition on March 1, 2000. At the time, one electricity supplier introduced a 100% green power option but later withdrew from the market because of low enrollment and supply issues. After two years without a green power product, a new marketer introduced two new green power products in early 2003. Maine Interfaith Power & Light offers customers a blend of power from existing small hydropower facilities and wood-fired generators in Maine. The organization plans to set aside a portion of the revenues from its green power sales to support the development of new, clean power sources in the state, such as solar electric systems installed on local churches. Another supplier, Constellation NewEnergy, offers green power supplied from a blend of renewables to some commercial and industrial customers in the state. Customers can also sign up for green power via a web portal called Maine Green Power Connections,¹⁴ which includes information on competitive green power products and REC products available in Maine.

Maryland/Virginia/District of Columbia

The states of Maryland and Virginia and the District of Columbia opened their markets or began phasing-in retail competition between 2000 and 2002. Currently, two green power marketers offer products to residential and business customers in the Washington, DC area. In early 2002, Pepco Energy Services introduced the first green power options supplied primarily from biomass sources and plans to build a new, 2-MW landfill gas generating facility in Virginia in 2003. More recently, Washington Gas Energy Services has teamed with Community Energy, Inc., to offer wind energy from a West Virginia-based wind farm to capital-area residents and businesses.

Massachusetts

Massachusetts opened its electricity market to retail competition in early 1998. Shortly after the market opened, one marketer, AllEnergy, launched a renewable energy upgrade service called *Regen*, which was the first REC product offered in the United States. The product was subsequently purchased by Sun Power Electric and is still available to customers in Massachusetts and other parts of New England. More recently, National Grid launched a renewable energy program through which customers of its electric distribution subsidiaries (Massachusetts Electric and Nantucket Electric) can purchase green power from four participating marketers without switching from their utility service. Under the program, the marketers offer blends of power from new and existing renewable energy resources at prices ranging from 1.2¢/kWh to 2.5¢/kWh above a customer's standard electricity rate.

New Jersey

New Jersey opened its market to competition in November 1999. Within the first six months, two competitive marketers began offering green power options. However, one dropped out of the

¹⁴ See <http://www.maine.greenpower.org>

market in late 2000, leaving only Green Mountain Energy Company, which offers a *Green-e* certified product containing 50% large hydro, 40% existing renewables, and 10% new renewables.

In early 2003, the New Jersey Board of Public Utilities (BPU) rolled out a green power pilot program for about 150,000 residential customers of Jersey Central Power & Light who had not selected an alternative supplier. Under the terms of the program, customers could voluntarily sign up or were randomly assigned to receive a green power product at no extra cost. FirstEnergy Solutions was selected through a competitive bidding process to provide the green energy. At least 9.75% of the electricity comes from renewable energy sources, such as wind, solar, or biomass. About 125,000 customers were assigned to the program and about 25% opted out, in part because the new program did not offer an averaged bill payment option. The BPU plans to evaluate the program, which is slated to run through June 2004.

New York

New York began phasing in retail competition in 1997 with all electricity customers receiving direct access in July 2001. While there was little green power marketing in the state prior to 2002, more than a half dozen marketers now offer green power products. Several marketers are participating in Niagara Mohawk's renewable energy program, which was required as a condition of the utility's merger with National Grid. Under the program, participating customers can purchase green power from any of these marketers without switching their service from the utility. Another utility, New York State Electric & Gas Corporation (NYSEG), has teamed with a green power marketer to offer blocks of wind energy to its residential customers in upstate New York. Finally, residential and small business customers in the New York City area gained access to green power in early 2003 through ConEdison Solutions and Community Energy. Most of the green power supplied to the state's customers comes from in-state resources including small hydro facilities and three new wind farms totaling 50 MW.

Ohio

Ohio opened its electricity market to retail competition in January 2001. However, according to the Ohio Consumer's Counsel (OCC), retail electric competition has "stalled in virtually all parts of the state" (OCC, 2003). There are currently no green power products being marketed directly to retail customers. However, a buying group of nearly 100 Northeast Ohio communities – representing more than 400,000 customers – selected Green Mountain Energy Company to provide a blend of power generated from natural gas (98%) and renewable resources (2%), such as hydro and wind, at a price below the default electricity rates. The state's competitive market rules encourage aggregated purchasing by requiring customers to opt-out of municipal aggregation groups rather than to opt-in.

Pennsylvania

Beginning January 1, 1999, all electricity customers in Pennsylvania became eligible to choose an alternative supplier. Early on, customer switching was spurred by high default electricity rates that existed in some parts of the state. At one time, as many as 20% of residential customers who

switched suppliers were purchasing green power – about 1.7% of all residential electricity customers in the state (Wiser et al., 2000). However, most of these products contained only a small amount of renewable energy. More recently, a significant number of the state’s electricity customers who had switched suppliers have returned to default service because of escalating or volatile electricity prices. However, green power marketers report that few of their customers have returned to default service. Four green power marketers are currently active in Pennsylvania. Most of the products offered contain hydropower, landfill gas, or wind power – or some blend of these sources. One marketer installed a 10-MW wind project in the state to serve its green power customers.

Texas

Following a six-month pilot program, Texas officially opened its retail electricity market to competition on January 1, 2002. Two marketers – Green Mountain Energy Company and Reliant Energy – offer 100% wind energy products to residential customers in most parts of the state. Green Mountain also offers both fixed-rate and variable-rate products supplied from wind and hydropower. Recently, the company began offering its products to commercial and industrial customers as well. In July 2003, Green Mountain, in conjunction with several other companies, announced plans to develop a 160-MW wind project in part to serve its Texas customers. Two other suppliers – Strategic Energy and TXU Energy – are serving large, nonresidential customers with wind energy.

Renewable Energy Certificate Markets

One alternative to both competitive and regulated green power offerings is renewable energy certificates (RECs). Also known as “green tags” or tradable renewable certificates (TRCs), RECs represent the unique or “green” attributes of renewable energy generation and can be sold separately from the commodity electricity. Thus, in competitive electricity markets, consumers can purchase RECs without having to switch to a new retail provider and, likewise, utility customers can purchase RECs separately from utility-supplied power, whether or not their utility offers a green power product. REC-based products may be supplied from a variety of renewable energy sources scattered 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.

RECs are also sold in the wholesale market and are frequently used by utilities and marketers, who rebundle RECs with commodity electricity to sell green power to retail customers. Thus, it can be difficult to distinguish between REC products and other types of green power products. This is particularly true when REC products are supplied from renewable sources located in the same region in which they are marketed.

Products and Pricing

Nearly 20 companies market REC products to retail customers (see **Table A-4**).¹⁵ Retail prices charged for certificate-based green power products typically range from about 1¢/kWh to 2.5¢/kWh. Larger customers may be able to negotiate lower prices. Virtually all REC products are sourced from new renewable energy generation projects. As a result, many REC products qualify for *Green-e* certification offered by the Center for Resource Solutions.¹⁶ Wind energy is the most commonly used renewable energy source, although some REC products blend other renewable energy sources, such as biomass (typically biogas) and solar.

Green Power Sales

According to data provided by marketers, about 6,000 retail customers currently purchase REC products nationwide. Although the number of customers is relatively small, a greater percentage of REC purchasers are businesses and other nonresidential customers whose individual purchases are much greater in size than is typical in the other markets. For example, sales of REC products have helped support the development of about 25 MW of wind energy capacity in Pennsylvania and another 66 MW of wind in West Virginia. And additional wind energy projects are planned in the mid-Atlantic region to supply the growing demand for REC products.

The greater interest in REC products among nonresidential customers can be explained in part by the cost savings that are realized by developing renewable energy projects in more favorable resource locations and the fact that the power need not be delivered directly to the customer, which lowers transaction costs. Business customers are also more amenable to purchasing green power that might be generated in a variety of areas if they operate facilities in multiple locations across the country.

Summary and Observations

Nationally, more than 400,000 electricity customers have elected to purchase a green power product either through their regulated utility company or from green power marketers in a competitive market setting. While the most successful utility programs have achieved customer participation rates of from 3% to 6%, average participation is only about 1% for utility programs. Competitive markets have yielded similar results where markets are conducive to competition and, thus, customer switching is occurring. Renewable energy certificates offer another product alternative and have been particularly popular among nonresidential customers.

Although the green power market is still evolving, it is already clear that it represents a powerful stimulus for renewable energy development. Green power marketing provides a new type of revenue stream for renewable energy developers, while at the same time raising consumer awareness of the benefits of renewable energy. About 1,000 MW of new renewable energy

¹⁵ For an up-to-date list of companies offering certificate-based green power products, see the U.S. Department of Energy's Green Power Network Web site at http://www.eere.energy.gov/greenpower/certif_summ.shtml.

¹⁶ REC products are subject to a different *Green-e* standard than other competitively marketed products. See the full TRC Standard at http://www.green-e.org/pdf/trc_standard.pdf.

capacity is currently supported through consumer demand for green energy, and another 400 MW of capacity is planned in the short term (see **Table 6**).

Table 6: New Renewable Energy Capacity Supplying Green Power Markets
(year-end 2002)

	MW in Place	%	MW Planned	%
Wind	913.3	93.0	302.1	70.0
Biomass	45.1	4.6	76.0	17.6
Solar	4.8	0.5	1.4	0.3
Geothermal	10.5	1.1	49.9	11.6
Small Hydro	8.6	0.9	2.0	0.5
Total	982.3	100.0	431.4	100.0
Source: Bird and Swezey, 2003				

The primary barriers to the expansion of the U.S. green power market relate to market access, product appeal, and consumer awareness. First, fewer than half of U.S. consumers have access to a green power product from their retail electricity provider. Although more than 350 utilities now offer green pricing, this represents only about 10% of all utilities nationwide. And green power marketers have had trouble succeeding in most restructured markets because of competitive market barriers.

Second, the significantly higher prices charged for most green power products remain perhaps the greatest obstacle to significant market expansion. Utilities and marketers may realize greater market penetration levels by lowering the price of green power as well as incorporating other benefits into their products, such as providing green power customers with protection from price increases of other fuels used to generate electricity.

Finally, consumer awareness of green power offerings remains low and could be increased through strengthening utility and other corporate marketing efforts, as well as broader public awareness efforts that could be undertaken by the renewable energy industry, nongovernmental organizations, and government entities.

Future growth in utilities offering green pricing will be driven in part by state laws requiring utilities to offer green power options to their customers. Also, the new business partnerships in which green power marketers team with default suppliers shows some promise for increasing access to green power in restructured markets, while avoiding the fundamental barrier of customer switching. And renewable energy certificates, which are already used extensively in wholesale markets, hold potential for increasing consumer access to green power products at the retail level if the existence of these products is more widely publicized.

Utility Green Pricing Programs

Green pricing is an optional utility service that gives customers an opportunity to support a greater level of utility company investment in renewable energy technologies. Participating customers pay a premium on their electric bill to cover the incremental cost of the additional renewable energy. This section presents information on utilities that offer green pricing programs to their customers (see **Tables A-1** and **A-2** for a list of utilities and a summary of green pricing programs by state, respectively).¹⁷

Alabama Power Company—Alabama Power Company offers its residential customers a *Renewable Energy Rate* under which they can purchase 100-kWh blocks of power generated from renewable energy sources for an additional \$6 a month, or a premium of 6¢/kWh above the standard rate. The initial source of the green power is Alabama-grown switchgrass, co-fired in a utility-owned coal-fired power plant. Participating customers must subscribe for a minimum of one year.

Alliant Energy—Alliant offers a green power option to its residential customers in Iowa, Minnesota, and Wisconsin (nonresidential customers are also eligible in Minnesota). Under the *Second Nature* program, customers can purchase renewable power generated from a mix of new landfill gas and wind energy projects to meet 25%, 50%, or 100% of their electricity needs. The green power premium is 2.0¢/kWh.

Arizona Public Service—In 1996, APS established a voluntary solar tariff to give residents, businesses, and communities the opportunity to purchase solar energy and help develop the technology. Through the utility’s *SolarPartners* program, customers can purchase 15-kilowatt-hour (kWh) blocks of solar energy for \$2.64 a month (or 17.6¢/kWh). Program costs have been partly subsidized by shareholders and the U.S. Department of Energy (DOE) through the Utility PhotoVoltaic Group (UPVG) (now the Solar Electric Power Association).

Customer response far exceeded the utility’s initial targets, and the program has been continually expanded. More than 1 MW of solar projects have been built in various cities, including Flagstaff, Tempe, Scottsdale, Gilbert, Glendale, Prescott and Yuma, with many of the projects built in partnership with the host cities.

City of Alameda—In January 1999, Alameda Power and Telecom began offering its customers the ability to voluntarily contribute to utility investments in clean power programs. Although the California-based municipal utility already obtains more than 80% of its power resources from renewable energy sources, it offers the *Clean Future Fund*, through which customers can affect the way the utility “will make future investments in generation sources.” Participating customers pay an additional 1.0¢/kWh on their bills or about \$3.75 per month for the typical household.

American Municipal Power—Ohio—In May 2003, AMP-Ohio, an Ohio-based nonprofit wholesale power supplier for municipal utilities, selected Green Mountain Energy Company to

¹⁷ In some cases, several distribution cooperatives or other publicly owned utilities might market green power supplied by a single utility entity, such as a generation and transmission (G&T) cooperative. For example, the Tennessee Valley Authority supplies green power to 49 local public power companies that market the power to their customers. Only the supplier utility organization is described here.

offer a new renewable energy option to its 86 member communities, representing more than 380,000 customers in Ohio, Pennsylvania, West Virginia, and Michigan. Under the agreement, communities served by AMP-Ohio can offer residential and small-business customers the opportunity to purchase renewable electricity from Green Mountain. The product, called *Nature's Energy*, costs an additional 1.3¢/kWh, or approximately \$8 to \$10 more per month for the average customer, and will be supplied from landfill gas and/or small hydroelectric generators located in Ohio and neighboring states.

Austin Energy—In January 2000, Austin Energy, the municipally owned utility of the City of Austin, Texas, launched *GreenChoice*, a program through which residential and business customers can choose to receive 100% renewable energy generated primarily from wind and landfill gas resources. In just 10 months, the utility had fully subscribed the initial 40 MW of renewable energy supply planned for the program and has since more than doubled its renewable energy purchases.

A key feature of the program is that subscribers pay a “green rate” that is fixed for 10 years and replaces the utility’s standard fuel charge; *GreenChoice* customers are thus protected from fuel cost adjustments caused by swings in market fossil fuel prices. Because of fuel cost increases announced in 2003, most *GreenChoice* customers will pay a green power premium of only 0.054¢/kWh once the entire fuel charge adjustment takes effect in January 2004.

Avista Utilities—Avista, an investor-owned utility serving 320,000 electricity customers in Washington and Idaho, began offering a wind power option to its customers in early 2002. Residential and business customers can buy 55-kWh blocks of wind energy for an extra \$1 each month (1.8¢/kWh) or designate a fixed share of their monthly electricity use to be supplied with wind power. The power to serve the program is supplied by PacifiCorp Power Marketing from the Stateline wind project on the Oregon/Washington border.

Basin Electric Power Cooperative—Basin Electric supplies wind energy under the *Prairie Winds* brand to its distribution cooperative members – currently, 49 distribution cooperatives in five states offer the program to their member customers. Program participants purchase 100-kWh blocks of wind power for an additional \$2.50 per month, or 2.5¢/kWh. The wind power premium was lowered from an initial rate of 3.0¢/kWh because the wind power development costs were less than originally estimated. The wind power is supplied from two, 1.3-MW wind projects located in North Dakota and South Dakota. The U.S. Air Force base near Minot, N.D., has committed to purchase a significant portion of the North Dakota project output.

Benton County PUD—In December 1999, Benton County PUD, which serves about 37,000 customers in Benton County, Washington, began offering its customers the opportunity to support power purchases from Klickitat PUD’s Roosevelt Regional Landfill Gas Facility. Benton pays about 3.5¢/kWh for the landfill power, which is approximately 1¢/kWh more than it pays for its other power sources. In late 2002, the utility added 3 MW to its green power supply with purchases from the 48-MW Nine Canyon Wind Project in eastern Washington. Customers choose their level of program participation with minimum contributions of \$1 per month required for residential customers and \$10 per month for commercial customers.

Boone Electric Cooperative—BEC, which serves about 25,000 customers in Boone County and portions of five other mid-Missouri counties, announced that it would begin offering its customers a wind energy purchase option beginning in July 2003. The green power will be sold in 100-kWh blocks at a price of about \$3 per month, or a rate premium of 3¢/kWh. The wind energy will be sourced from Aquila's 110-MW Gray County Wind Farm located in southeastern Kansas and be supplied by Associated Electric Cooperative, which provides wholesale power to six regional and 51 local electric cooperative systems in Missouri, Oklahoma, and southeast Iowa.

City of Bowling Green—The City of Bowling Green (Ohio) electric utility offers its customers the opportunity to purchase “green power” from a newly constructed, run-of-the-river hydro facility. Customers can purchase as much as 100% of their electricity needs, in 25% increments, as green power at a price premium of 1.38¢/kWh. The power is supplied from a 42-MW, municipally constructed project of which Bowling Green owns a 6-MW share. Revenues collected from the green power customers are used to construct new solar or wind projects.

Carolina Power & Light—In February 2003, the North Carolina Utilities Commission approved a stakeholder-developed plan to offer two green power products to utility customers statewide. The first product is a "mass-market" product consisting of a resource mix of new solar, wind, and methane from biomass that will be offered primarily to residential customers at a cost of \$4 per 100-kWh block or 4.0¢/kWh. The second product is a "large-volume" product that will include a resource mix of new and existing solar, wind, small hydro, and biomass and be offered to larger-volume customers at a "target price" of \$2.50 per 100-kWh block or 2.5¢/kWh. The green power products will be offered by all of the state's electric utilities, including Carolina Power & Light, Dominion North Carolina Power, Duke Power, Electricities, and North Carolina electric cooperatives. The program is being administered by Advanced Energy, a Raleigh-based nonprofit research organization.

Cedar Falls Utilities—Since February 1999, CFU has offered its customers the option of contributing \$2.50 each month to support the operation and maintenance of three, 750-kW wind turbines that were installed in November 1998 by a consortium of seven Iowa municipal electric utilities. CFU owns two-thirds of the wind project. The project, (near Algona, Iowa) received \$2.8 million of funding from the U.S. DOE and the Electric Power Research Institute (EPRI) through the Utility Wind Turbine Verification Program.

Central Electric Cooperative—CEC markets a share of the output from the 2.5-MW Coffin-Butte landfill gas generation facility operated by Power Resources Cooperative (formerly Pacific Northwest Generating Company), a not-for-profit, private energy services cooperative owned by 15 electric cooperative utilities in the Pacific Northwest. Customers can purchase the product in 100-kWh blocks at a price premium of 1.8¢/kWh.

Chelan County PUD—Chelan County PUD, with more than 38,000 customers in north-central Washington state, has developed the *Sustainable Natural Alternative Power* (SNAP) program, which gives customers an opportunity to purchase alternative energy and support local producers of solar and wind power. Customers donate a fixed amount each month and the funds are distributed annually to local producers with solar and wind systems up to 25 kW in size.

Clallum County PUD—Clallum County PUD, a public utility serving about 25,000 customers in northwestern Washington, offers its customers a fixed-rate green power option. Under the program, customers can opt to purchase green power for 100% of their electricity needs at a fixed rate of 6.9¢/kWh, which represents a premium of 0.7¢/kWh over the utility's standard energy charge of 6.2¢/kWh. To supply the program, Clallam purchases one average megawatt of power from the 8-MW Klickitat landfill-gas facility located in Roosevelt, Washington.

Clark Public Utilities—Clark Public Utilities, a public utility district that provides electric service to more than 155,000 customers throughout Clark County, Washington, offers its customers the ability to purchase 100-kWh blocks of green power for an additional \$1.50 each month, or 1.5¢/kWh. The power for the *Green Lights* program is sourced from the Bonneville Environmental Foundation (BEF) in the form of renewable energy certificates representing the environmental attributes of power generated from new wind and solar projects in the Pacific Northwest region. BEF is also assisting with product marketing.

Colorado Springs Utilities—Colorado Springs Utilities, which serves more than 569,000 customers in the Pikes Peak region of Colorado, offers its residential and commercial customers a wind power option at a cost of \$3 per 100-kWh block, or a premium of 3¢/kWh above the standard rate. The utility purchases 1 MW of power from Xcel Energy's Ponnequin wind project to supply the program.

Consumers Energy—Consumers Energy, an investor-owned utility that provides electricity to about 1.7 million consumers in Michigan, began offering a three-year trial program in October 2001. Residential and business customers can sign up to buy green power at levels equivalent to 10%, 50%, or 100% of their monthly electricity use at a price premium of 3.2¢/kWh. Business customers can also purchase specific blocks of green power. Participants must subscribe for a minimum of one year. To supply the program, the utility has contracted to purchase power from Bay Windpower's 5.25-MW Mackinaw City Wind Power Project.

Cowlitz PUD—Cowlitz PUD, which supplies electricity to customers in southwestern Washington, has established a *Renewable Resource Energy* program, through which its residential and business customers can support the development of new renewable energy sources in the Pacific Northwest. Customers can purchase 100-kWh blocks of green power for an additional \$2 per month, or a premium of 2¢/kWh. To supply the program, Cowlitz has an agreement with the Bonneville Environmental Foundation to purchase green tags generated from the Stateline and Condon wind projects in Washington and Oregon and the Hanford/White Bluffs solar project near Richland, Washington.

Dairyland Power Cooperative—Dairyland Power Cooperative of Wisconsin makes wind power available to its 25 member distribution cooperatives, which can offer the product to their customers at a price of \$3 per 100-kWh block, or 3¢/kWh. The wind energy is supplied from Great River Energy's Chandler Hills wind project in Minnesota.

Dakota Electric Association—Dakota Electric, a Minnesota-based distribution cooperative serving 88,000 customers, offers the *Wellspring Renewable Wind Energy* product to its

customers for a premium of \$1.45 per 100-kWh block, or 1.45¢/kWh. Customers can purchase a minimum of one block of wind energy per month up to their household's average monthly consumption. A 12-month subscription commitment is required. The wind energy is supplied from Great River Energy's Chandler Hills wind project.

Detroit Edison—In 1996, Detroit Edison was one of the first utilities in the United States to offer a green pricing program when it established the *SolarCurrents* program, supporting the development of centrally located PV projects. Customers paid \$6.59 for 100-watt blocks of solar generating capacity. Two facilities, totaling 54.8 kW, were developed through the program and were cost-shared by DOE and UPVG. The program has not been expanded and the utility is not soliciting new subscribers. In 1997, Detroit Edison introduced a *SolarSchools* program, through which commercial businesses could sponsor solar energy service at local elementary schools, to be provided from the two existing projects, as well as a solar energy curriculum for students.

Dominion North Carolina Power—In February 2003, the North Carolina Utilities Commission approved a stakeholder-developed plan to offer two green power products to utility customers statewide. The first product is a "mass-market" product consisting of a resource mix of new solar, wind, and methane from biomass that will be offered primarily to residential customers at a cost of \$4 per 100-kWh block or 4.0¢/kWh. The second product is a "large-volume" product that will include a resource mix of new and existing solar, wind, small hydro, and biomass and be offered to larger-volume customers at a "target price" of \$2.50 per 100-kWh block or 2.5¢/kWh. The green power products will be offered by all of the state's electric utilities, including Carolina Power & Light, Dominion North Carolina Power, Duke Power, Electricities, and North Carolina electric cooperatives. The program is being administered by Advanced Energy, a Raleigh-based nonprofit research organization.

Duke Power—In February 2003, the North Carolina Utilities Commission approved a stakeholder-developed plan to offer two green power products to utility customers statewide. The first product is a "mass-market" product consisting of a resource mix of new solar, wind, and methane from biomass that will be offered primarily to residential customers at a cost of \$4 per 100-kWh block or 4.0¢/kWh. The second product is a "large-volume" product that will include a resource mix of new and existing solar, wind, small hydro, and biomass and be offered to larger-volume customers at a "target price" of \$2.50 per 100-kWh block or 2.5¢/kWh. The green power products will be offered by all of the state's electric utilities, including Carolina Power & Light, Dominion North Carolina Power, Duke Power, Electricities, and North Carolina electric cooperatives. The program is being administered by Advanced Energy, a Raleigh-based nonprofit research organization.

East Kentucky Power Cooperative—EKPC, a generation and transmission (G&T) cooperative serving 16 distribution utilities in Kentucky, offers a green power option, *EnviroWatts*, to its member cooperatives. The green power is offered to residential and business customers in 100-kWh blocks for \$2.75, or 2.75¢/kWh, and will be supplied from three new landfill-gas facilities, totaling 10.4 MW, that are expected to be operational by the end of 2003.

El Paso Electric—El Paso, which serves customers in southern New Mexico and west Texas, offers its customers a wind energy purchase option through the *Renewable Energy Tariff*

Program. Residential and commercial customers can purchase 100-kWh blocks of wind power at costs ranging from \$1.92 to \$3.19 per month, or 1.92¢/kWh to 3.19¢/kWh, depending on the state and customer classification. The wind power is supplied from two, 660-kW turbines located at Hueco Mountain Wind Ranch near Horizon City, Texas. Customers must agree to participate for a minimum of one year.

ElectriCities—In February 2003, the North Carolina Utilities Commission approved a stakeholder-developed plan to offer two green power products to utility customers statewide. The first product is a "mass-market" product consisting of a resource mix of new solar, wind, and methane from biomass that will be offered primarily to residential customers at a cost of \$4 per 100-kWh block or 4.0¢/kWh. The second product is a "large-volume" product that will include a resource mix of new and existing solar, wind, small hydro, and biomass and be offered to larger-volume customers at a "target price" of \$2.50 per 100-kWh block or 2.5¢/kWh. The green power products will be offered by all of the state's electric utilities, including Carolina Power & Light, Dominion North Carolina Power, Duke Power, ElectriCities, and North Carolina electric cooperatives. The program is being administered by Advanced Energy, a Raleigh-based nonprofit research organization.

Emerald People's Utility District—EPUD, a public utility located near Eugene, Oregon, announced in April 2003 that it is negotiating with Green Mountain Energy Company to develop a green pricing option for its customers. Under the terms of the proposed agreement, EPUD's 15,000 residential and 2,000 small business customers will be able to purchase up to 100% of their annual energy use from renewable sources, including geothermal and wind energy.

Estes Park Light & Power—EL&P, an electric utility serving about 8,500 accounts in the City of Estes Park, Colorado, offers its customers a wind power purchase option supplied by Platte River Power Authority from its Medicine Bow, Wyoming, wind site. Under the program, residential customers can purchase 100-kWh blocks of wind energy for an extra \$2.50 each month or 2.5¢/kWh. Business customers can participate by purchasing a minimum of five, 100-kWh blocks for \$12.50 per month.

Eugene Water and Electric Board—In March 1999, EWEB began marketing wind power to customers from its 20% share of the Foote Creek Rim I wind project in southeastern Wyoming. Customers can purchase wind energy to provide from 10% to 100% of their electricity needs for which the utility charges a fixed wind power rate of 5.274¢/kWh. Since the program was established, the effective premium for the *EWEB Windpower* product has fallen from 3.09¢/kWh to 1.29¢/kWh because of cost increases experienced for traditional generation sources.

Fort Collins Utilities—Fort Collins Utilities has offered a wind energy product to its customers since 1996. The Colorado-based municipality offers residential customers the choice of purchasing wind energy in 200-kWh blocks for an additional \$5 per month or to meet 100% of their monthly electricity use at the same 2.5¢/kWh rate premium. Business customers can also participate either by purchasing wind energy to meet their entire monthly electricity requirements or in 1,000-kWh blocks for \$25 per month. All commercial customer subscribers are recognized in the utility's ongoing community outreach. The wind energy is supplied by Platte River Power Authority from its Medicine Bow, Wyoming, wind site.

Georgia Electric Membership Corporation—Sixteen members of the Georgia Electric Membership Corporation (EMC) have formed Green Power EMC, which is offering a green pricing product to more than 850,000 Georgia-based customers. The product, which consists of power generated from three in-state landfill methane projects, is offered in 150-kWh blocks for an additional \$4.50 per month, or a premium of 3.0¢/kWh.

Georgia Power—Georgia Power offers its residential and business customers the option to purchase 100-kWh blocks of green power for an additional \$5.50 per month or a premium of 5.5¢/kWh above the standard electricity rate. The initial supply source for the green power will be landfill gas generation. To participate in the program, small businesses must purchase a minimum of two blocks, while large businesses must purchase at least 400 blocks each month. All participating customers are required to subscribe for a minimum of one year. Georgia Power serves 2 million customers across the state.

Grant County PUD—Grant County PUD, a public utility serving about 35,000 retail customers in central Washington, offers its customers a wind power option. Under its *Alternative Energy Resources* program, customers can purchase 100-kWh blocks of wind power for an extra \$2 per month or 2.0¢/kWh. The power is supplied from the utility's 25% share of the 50-MW Nine Canyon Wind Project located in eastern Washington.

Grays Harbor PUD—Grays Harbor PUD, which supplies electricity to about 32,000 residents of Grays Harbor County in western Washington, has initiated a *Green Power* program through which its customers can purchase 100-kWh blocks of renewable energy for \$3, or a premium of 3¢/kWh. The power is supplied from the utility's 6-MW share of the 50-MW Nine Canyon Wind Project located in eastern Washington.

Great River Energy—Great River, formed in 1998 through the merger of Cooperative Power Association and United Power Association, offers the *Wellspring* renewable energy program to its 29 member distribution cooperatives located in Minnesota and Wisconsin. The wind power is supplied from the 6-MW Chandler Hills wind project. The project was built in three separate 1.98-MW phases to take advantage of state incentive payments available to wind energy facilities of 2 MW or less in size. Great River makes the power available to its members with a suggested retail price premium of 1.5¢/kWh, but each distribution utility sets the wind energy premium for its customers.

Green Mountain Power—GMP, an investor-owned utility that serves one-quarter of the retail customers in Vermont, offers a monthly renewable energy service that enables customers to reduce greenhouse gas emissions by supporting the development of new renewable energy projects. Under the *CoolHome* program, customers can make tax-deductible donations of \$6 per month to Clean Air-Cool Planet (a nonprofit organization dedicated to finding solutions to global climate change), which, in turn, uses the donations to support development of new renewable energy projects through Vermont-based NativeEnergy. Program revenues are being used to support two 30-kW turbines fueled by methane gas from a wastewater facility in Vermont, a 750-kW wind turbine on the Rosebud Sioux reservation in South Dakota, and several farm methane projects in Vermont.

Gulf Power—In 1996, Gulf Power, which serves more than 300,000 customers in northwest Florida, undertook a program to install a variety of solar energy technologies at public schools using customer contributions leveraged with utility funds. The program has resulted in the installation of one, 10-kW solar desiccant cooling/dehumidification system and one, 4-kW PV system at local schools.

Hawaiian Electric—In 1996, HECO initiated a program to be funded in part with customer contributions with a minimum goal of installing 20 kW of PV systems on public school facilities. Customers can make voluntary, monthly fixed-dollar contributions or lump-sum contributions at any time. During its entire period of operation, the *Sun Power for Schools* program has supported the installation of about 22.5 kW of PV at 17 schools.

Holy Cross Energy—Holy Cross, which serves more than 43,000 customers in Colorado's Roaring Fork Valley, offers its customers two different green power options. Under the *Wind Power Pioneers* program, customers can purchase 100-kWh blocks of wind energy at a rate premium of 2.5¢/kWh with the wind energy sourced from Xcel Energy. Under the *Local Renewable Energy Pool* program, customers can purchase green power sourced from local renewable energy projects in blocks of 75 kWh for \$2.50 per month, or a premium of 3.3¢/kWh.

Hoosier Energy—Hoosier Energy, a generation and transmission cooperative serving 16 distribution utilities in Indiana, provides a green power option to its member cooperatives. Participating utilities offer the green option, *EnviroWatts*, to their retail customers at premiums ranging from \$2 to \$4 per 100-kWh block, or 2.0¢/kWh to 4.0¢/kWh. The green power is being supplied from an Indiana-based landfill gas project owned by Wabash Valley Power Association.

Idaho Power Company—Idaho Power Company, which serves 700,000 customers in southern Idaho, eastern Oregon, and northern Nevada, offers a green power program through which residential and business customers in Idaho can contribute a fixed dollar amount each month to support the development of renewable resources through the purchase of renewable energy certificates supplied by the Bonneville Environmental Foundation. Customer contributions are used exclusively to purchase renewable energy, with program overhead and marketing expenses funded from other sources.

Indianapolis Power and Light Company—IPL offers all residential and commercial customers with less than 2,000 kW of monthly demand an option of purchasing 25%, 50%, or 100% of their monthly electricity use from renewable energy sources. The power to supply the program is sourced from other regions of the country with the rate premium capped at 3.0¢/kWh.

Lansing Board of Water and Light—LBWL, the municipally owned utility of Lansing, Michigan, offers its 97,000 residential and business customers an option to purchase 250 kilowatt-hour blocks of green power for an extra \$7.50 per month, or a premium of 3.0¢/kWh. The power for the *GreenWise Electric Power* program comes from existing renewable energy projects: a Lansing-based landfill-gas facility and two small-hydro facilities in Cheboygan County. Customers must subscribe for a minimum of three years.

Lincoln Electric System—LES has constructed two, 660-kW wind turbines on the northeast side of Lincoln, Nebraska, to supply its customers with a green power option. The utility accepts monthly donations of any amount, with a minimum monthly contribution of \$4.30 to purchase the equivalent of about 100 kWh. Initially priced at 6.0¢/kWh, LES was able to reduce the wind costs premium to 4.3¢/kWh because of its eligibility for the Renewable Energy Production Incentive, available through the U.S. Department of Energy.

Longmont Power & Communications—LPC, the municipal utility of the city of Longmont, Colorado, offers its customers a wind power purchase option supplied by Platte River Power Authority from its Medicine Bow, Wyoming, wind site. Under the program, residential customers can sign up to purchase 100-kWh blocks of wind energy for an extra \$2.50 each month or 2.5¢/kWh. Business customers can participate by purchasing a minimum of five, 100-kWh blocks for \$12.50 per month.

Los Angeles Department of Water and Power—LADWP runs the *Green Power for a Green L.A.* program, which gives residents the option to purchase green power for 100% of their electricity needs, with 20% coming from new renewable energy sources, for \$3 per month. The extra cost can be offset by free energy efficiency products and services provided by LADWP. The renewable energy to supply the program is sourced through “green ticket” purchases.

Loveland Water and Power—The City of Loveland (Colorado) Water and Power Department offers its customers a wind power purchase option supplied by Platte River Power Authority from its Medicine Bow, Wyoming, wind site. Under the program, customers can purchase 100-kWh blocks of wind energy for an extra \$2.50 each month or 2.5¢/kWh. The number of blocks purchased is limited to the amount of electricity used by the customer.

Lower Valley Energy—Lower Valley Energy, an electric cooperative serving about 13,500 members in western Wyoming and southeastern Idaho, offers its residential and business customers a wind energy product supplied under an agreement with the Bonneville Power Administration (BPA). Residential customers can purchase 300-kWh blocks of green power for \$5 each month, which represents a rate premium of 1.67¢/kWh, while commercial customers can purchase 3,000-kWh blocks for \$50 each month. Customers are free to sign up for as many blocks as they desire.

Madison Gas and Electric—MGE, which serves 120,000 customers in and around Madison, Wisconsin, constructed an 11.22-MW wind farm in northeastern Wisconsin in 1999 with most of the output being marketed to customers as a green power option – a 3-MW portion of the project is being used to meet a state renewable energy mandate. The utility is selling the power in 150-kWh blocks for \$5 per month – a premium of 3.3¢/kWh over the standard electricity rate. Less than three months after the project came on-line, more than 5,100 residential customers and about 100 businesses had enrolled, fully subscribing the program.

Mason County PUD #3—Mason County PUD No. 3, which serves 28,000 customers in western Washington, offers a wind energy option to its residential and commercial customers. Under the *Mason Evergreen Power* program, customers can purchase 100-kWh blocks of wind power for \$2 per month, or a premium of 2¢/kWh. Each block represents about 10% of an average

residential customer's monthly electricity use. There is no limit on the number of blocks that can be purchased. Customers can enroll, change their participation level, or drop out of the program at any time. The green power is supplied from the utility's 1-MW share of the 50-MW, Nine Canyon Wind project located in Eastern Washington.

Midstate Electric Cooperative—Midstate Electric Cooperative, which serves about 12,000 member customers in central Oregon, offers its customers an *Environmentally Preferred Power* product derived from a mix of low-impact hydroelectric resources and wind energy. The power is purchased from the *Bonneville Power Administration*. Midstate sells the green power to residential and business customers in 100-kWh blocks for \$2.50 per month (2.5¢/kWh) and requires a two-block minimum purchase.

Minnesota Power—Minnesota Power, an investor-owned utility serving approximately 140,000 customers in Minnesota and Wisconsin, offers its Minnesota customers an option to purchase 100-kWh blocks of wind energy for an additional \$2.50 per month or 2.5¢/kWh. To supply the *WindSense* program, the utility is purchasing about 1 MW of wind energy from Great River Energy.

Minnkota Power Cooperative—Minnkota Power Cooperative, a generation and transmission cooperative operating in eastern North Dakota and northwestern Minnesota, offers its member distribution cooperatives and municipals the option to purchase wind-generated power through a program called *Infinity Wind Energy*. Customers can purchase 100-kWh blocks of wind energy for an additional \$2.50 per month or a premium of 2.5¢/kWh. The wind energy is provided from two, 900-kW wind turbines located in North Dakota.

Missouri River Energy Services—MRES, a joint-action agency providing wholesale power to 56 member municipal utilities in Iowa, Minnesota, North Dakota, and South Dakota, provides wind energy to its member utilities through the *RiverWinds* program. The power supply comes from two 900-kW wind turbines located outside of Worthington, Minnesota. The product pricing is determined by the individual municipal utilities. MRES is also making "green tags" available to nonmember municipal utilities interested in developing green pricing programs for their customers. The green tags are priced at \$2.50 per 100 kWh.

Moorhead Public Service—Moorhead Public Service (Minnesota) has constructed two, 750-kW wind turbines to serve customers of its *Capture the Wind* green pricing program. Both turbines were constructed only after the utility had fully subscribed the wind energy output. The utility charges a premium of 0.5¢/kWh for 100% renewable energy – one-third of the energy is provided from the wind projects and the remainder from hydro facilities already in the utility's resource mix. Thus, the effective premium for the wind power is 1.5¢/kWh. Residential customers must make a three-year purchase commitment and can choose to serve 100% of their electricity needs with the renewable energy blend or purchase monthly blocks of 1,000 kWh. Commercial customers pay the same premium and can purchase all of their electricity as renewable energy or buy monthly blocks of 1,500 kWh. Moorhead State University purchases 83,000 kWh each month, representing more than half of the average output of one turbine.

Nebraska Public Power District—NPPD offers a program through which its customers can contribute to a utility-managed fund that will be used for the development of new renewable energy resources. Participation in the *Prairie Power* program requires a minimum monthly contribution of \$6 for residential customers. The annual cost for business membership is \$90.

City of New Smyrna Beach—The City of New Smyrna Beach (Florida) Utilities Commission offers its customers a green power contribution program through which customers can make monthly contributions of \$2, \$5 or \$10 per month to support the installation of solar electric systems at local public facilities. To date, the city has installed two PV systems totaling 9.8 kW.

NorthWestern Energy—NorthWestern Energy, which provides default service to 288,000 electricity customers in Montana, offers the *E+ Green* program under which residential and business customers can purchase an unlimited number of 100-kWh blocks of renewable energy each month for \$2 per block, or a premium of 2¢/kWh. Commercial and industrial customers that meet minimum purchase requirements can become *E+ Green Partners*, which makes them eligible for inclusion in program advertisements and entitles them to use the *E+ Green* program logo. The Bonneville Environmental Foundation (BEF) supplies the program with *Green-e* certified renewable energy certificates generated from wind and solar facilities located in the Pacific Northwest. BEF will also use program revenues to encourage new Montana-based renewable energy projects.

OG&E Electric Services—OG&E, which serves about 700,000 retail electricity customers in Oklahoma and western Arkansas, offers 100-kWh blocks of wind power for an extra \$2 per month or 2.0¢/kWh. However, green power subscribers are exempted from the utility's fuel adjustment charge. (In September 2003, the fuel adjustment charge amounted to about 1.5¢/kWh, making the effective price premium for the wind power about 0.5¢/kWh.) The power comes from OG&E's one-half purchase share of the 102-MW Oklahoma Wind Energy Center project located near Woodward, Oklahoma.

Omaha Public Power District—The Omaha Public Power District (OPPD) offers a green pricing option to its customers consisting of power generated from new wind and landfill gas resources at a price premium of 3¢/kWh. Residential customers can participate at one of four set levels, ranging from \$4.50 to \$30 per month (150 kWh to 1,000 kWh per month), while commercial customers can obtain 25%, 50%, or 100% of their power needs through the program. The green power is supplied from a 660-kW wind turbine and a 3.2-MW landfill gas plant. Customers must agree to participate in the program for a minimum of one year. OPPD serves more than 280,000 customers in southeast Nebraska.

Orcas Power and Light Cooperative—OPALCO, an electric cooperative serving Washington's San Juan Islands, offers its customers a green power mix of low-impact hydropower and wind energy sourced from the Bonneville Power Administration at a price of \$3.50 per 100-kWh block, or a premium of 3.5¢/kWh. The utility uses a portion of the customer contributions to support the development of on-site renewable resources in its service territory. OPALCO "buys down" the cost of customer-owned systems and purchases the system output at above-market prices – 16 local projects have been developed under the program. The utility also sends its green power subscribers an annual report that documents program facts and figures.

Oregon Trail Electric Cooperative—OTEC, which serves 25,000 members in eastern Oregon, offers a green power option under which customers can purchase 200-kWh blocks of wind power for an additional \$3 each month, or 1.5¢/kWh. To supply the program, the co-op has contracted with the Bonneville Power Administration for wind power generated by facilities located in the Pacific Northwest. Participants are required to enroll for a period of one year.

Otter Tail Power Company—Otter Tail Power, an investor-owned electric utility serving nearly 250,000 customers in Minnesota, North Dakota, and South Dakota, offers its customers an option to purchase wind energy in 100-kWh blocks for an extra \$2.60 per month, or a rate premium of 2.6¢/kWh. The green power is supplied from a single, 900-kW wind turbine located along Buffalo Ridge in southwestern Minnesota.

Pacific County PUD #2—Pacific County PUD #2, which serves about 15,000 residents of Pacific County, Washington, offers a green power program through which its residential and business customers can purchase 100-kWh blocks of green power for \$1.05 per month, or 1.05¢/kWh. There is no limit to the amount of green power that customers can purchase. The utility purchases the green power from the Bonneville Power Administration. BPA, in turn, gives a portion of the wholesale green power payment to the Bonneville Environmental Foundation to support the development of new renewable energy facilities in the Pacific Northwest.

PNGC Power—PNGC Power, formerly the Pacific Northwest Generating Cooperative, is a not-for-profit, private energy services cooperative owned by 15 electric cooperatives in the Pacific Northwest. PNGC owns and operates the 2.5-MW Coffin-Butte landfill gas generation facility located in Benton County, Oregon. While the project output is shared proportionally among the member cooperatives, four Oregon-based members market the landfill-derived power to their customers as a premium green power service. The four utilities are Central Electric Cooperative, Consumers Power, Douglas Electric Cooperative, and Umatilla Electric Cooperative. The green power premiums charged range from 1.8¢/kWh to 2.0¢/kWh.

PacifiCorp—PacifiCorp offers a wind energy tariff in four of the six western states in which it sells retail electricity as either Pacific Power or Utah Power. Under the *Blue Sky* program, PacifiCorp customers in Oregon, Utah, Washington, and Wyoming can purchase 100-kWh blocks of electricity from new wind projects for a monthly premium of \$1.95 per block or 1.95¢/kWh. Since the inception of the program, PacifiCorp has twice lowered the premium because of the improved economics of wind energy. The wind energy is supplied by the Bonneville Power Administration from the Foote Creek Rim project in Wyoming. Pacific Power customers in Oregon can also choose from two other green power products offered through the utility by a third-party supplier.

City of Palo Alto Utilities—CPAU offers its residential, commercial, and industrial customers a 100% renewable energy product sourced from newly constructed wind turbines located within the western power system and new California-based solar photovoltaic projects. The green power is provided by 3 Phases Energy Services in the form of renewable energy certificates at an additional cost of 1.5¢/kWh.

Pasadena Water & Power—PWP offers a “green power” option to its approximately 60,000 residential customers. Under the program, customers can purchase newly developed wind energy at a premium of 2.5¢/kWh. The Pasadena City Council approved a long-term contract with PacifiCorp Power Marketing to purchase 6 MW of output from the 150-MW High Winds project located in Solano County, California. PWP will use the wind energy both to supply the green pricing program and to comply with a state law that requires public utilities to develop and implement a renewable portfolio standard.

Peninsula Light Company—PLC, an electric cooperative serving about 26,000 consumers in Gig Harbor, Washington, offers a program through which member customers can purchase green power in 100-kWh monthly blocks for an additional \$2.80, or 2.8¢/kWh. To supply the *GreenChoice* program, PLC has committed to purchase 10 average megawatts (aMW) of *Environmentally Preferred Power* from the Bonneville Power Administration for five years. The power comes from the Foote Creek Rim wind project in Wyoming and the Packwood Lake hydro project in Washington. A portion of the wholesale green power payment goes to the Bonneville Environmental Foundation to support the development of new renewable energy facilities in the Pacific Northwest. In addition, PLC uses 25% of the green power revenue to support environmental education programs and the development of local renewable resources.

Platte River Power Authority—PRPA supplies wind power for the green pricing programs of its four municipal utility members in Estes Park, Fort Collins, Longmont, and Loveland, Colorado, as well as to Tri-State G&T and the city of Aspen. PRPA has expanded its Medicine Bow, Wyoming, wind site several times to meet growing customer demand for green power – the site currently contains 10 turbines totaling nearly 6 MW of capacity.

Portland General Electric—PGE residential and small business customers have access to three different green power products: *PGE Renewable Usage*, which is a 100% renewable power option sourced from and marketed in collaboration with Green Mountain Energy Company, and which includes new wind resources located in the Pacific Northwest; *PGE Salmon Friendly Plan*, which adds a contribution for salmon restoration to the 100% renewables product; and *PGE Clean Wind*, which allows customers to pay a fixed amount for wind power sourced from the Vansycle Ridge wind farm in northeastern Oregon. Half of the revenues collected from the wind product are dedicated for the development of new wind resources. The pricing for the three products is 0.8¢/kWh, 0.99¢/kWh, and 3.5¢/kWh, respectively, above the basic utility rate. PGE is required to offer the portfolio of products under Oregon’s electric industry restructuring law. The utility also offers a 100% wind power option at a premium of 1.7¢/kWh to medium- and large-sized businesses that use more than 30 kilowatts, with a minimum purchase requirement of 1,000 kWh per month.

PSI Energy—PSI Energy, a subsidiary of Cinergy that serves more than 700,000 retail electricity customers in Indiana, offers its customers the ability to make monthly contributions to a fund to support the development of renewable resources. The revenues collected will be used to purchase green power or to assist the utility’s efforts to develop energy generated from environmentally friendly sources. If, after three years, the contributions collected are not sufficient to purchase or develop green power sources, the utility will provide refunds to the participating customers.

Public Service Company of New Mexico—PNM offers its customers a 100% wind energy product sourced from the 204-MW New Mexico Wind Energy Center near House, New Mexico. Residential and small business customers can purchase the wind energy in 100-kWh blocks or to meet 90% of their monthly electricity needs at a premium of 1.8¢/kWh. Large business customers can participate in the program by purchasing wind energy as a percentage of their monthly electricity use at the same 1.8¢/kWh premium.

Puget Sound Energy—PSE, an investor-owned utility serving more than 900,000 customers in western Washington State, offers its residential and business customers the option to purchase 100-kWh blocks of green power for an extra \$4 per month, or a 2.0¢/kWh premium on the regular rate with a minimum monthly purchase requirement of 200 kWh. PSE is teaming with the Bonneville Environmental Foundation to supply the program with power from new wind projects and other renewable resources in the Pacific Northwest.

Roseville Electric—Roseville Electric, a municipal utility in northern California, offers its 40,000 customers options to purchase a 50% renewables content product at a premium of 0.5¢/kWh, or a 100% renewables product for an additional 1.0¢/kWh, for all of their electricity needs. The green power is supplied from geothermal and small hydropower resources. In addition, customers can contribute an additional 1.0¢/kWh to a fund used to build new, renewable energy systems, such as PV systems installed on public facilities, within the city.

Sacramento Municipal Utility District—SMUD offers the *Greenenergy* program, through which its customers can choose to obtain 50% or 100% of their electricity needs from renewable energy sources for an additional \$3 and \$6 per month, respectively. The average residential customer uses 748 kWh per month. In 2002, the power content of the 100% renewables product was 65% biomass and waste, 34% wind energy, and 1% small hydroelectric. The two *Greenenergy* products are also *Green-e* certified.

SMUD has also operated the *PV Pioneers* program since 1993. In the first phase of the program, customers could pay a \$4 flat monthly fee (for 10 years) to have a 2-kW to 4-kW, grid-connected PV system installed on their rooftops. SMUD installed, operated, maintained, and owned the systems, which feed electricity directly into the grid. Under the current program, customers purchase the PV systems, which are sized to meet their household electricity use under a net-metering arrangement. SMUD helps interested customers determine suitable sites and handles the installation.

City of St. Charles—In partnership with ComEd and Community Energy, Inc., the City of St. Charles, Illinois, offers its residents and businesses the ability to donate a fixed monthly amount for green power, which is used to purchase renewable energy certificates from ComEd. The certificates represent the output of local renewable energy projects, including landfill gas and a 51-MW wind project to be constructed just north of Peoria and completed in 2004.

Salt River Project—SRP, an Arizona-based publicly owned utility, offers its 727,000 customers the ability to purchase 100-kWh blocks of renewable energy for an additional \$3 per month or

3.0¢/kWh. The *EarthWise Energy* product is supplied from a local mix of landfill gas, low-impact hydropower, and solar photovoltaics projects.

City Public Service of San Antonio—CPS, the municipal electric utility serving more than 550,000 customers in San Antonio, Texas, offers a wind power option to the city's retail electricity customers. The wind energy is available in 100-kWh blocks for an additional \$3 per month, or a premium of 3.0¢/kWh. Customers are not contractually bound to the program and can enter or leave the program, or change their purchase levels at any time. The power for the *Windtricity* program comes from the 160.5-MW Desert Sky Wind Project located in West Texas, from which CPS purchases the entire output.

Santee Cooper—Santee Cooper, a state-owned electric and water utility in South Carolina, sells green power derived from landfill gas plants to its customers and member utilities for a premium of 3.0¢/kWh, with all program revenues to be reinvested in development of additional renewable resources or facilities. Under the program, residential customers can purchase the green power in 100-kWh blocks, small commercial customers in 200-kWh blocks, and large business customers in blocks of 1,000 kWh. Santee Cooper serves 126,000 direct customers in Horry, Georgetown, and Berkeley counties. The utility also supplies power to 15 of the state's 20 electric cooperatives serving 437,000 customers in 38 counties and directly serves 34 industrial customers in 11 counties.

Savannah Electric—Savannah Electric offers its residential and business customers the option to purchase 100-kWh blocks of green power for an additional \$6 per month or a premium of 6.0¢/kWh above the standard electricity rate. Monthly minimum purchase requirements are one block for residential customers, three blocks for small nonresidential, 100 blocks for medium nonresidential, and 400 blocks for large nonresidential. The initial supply source for the green power will be landfill gas generation. All participating customers are required to subscribe for a minimum of one year. Savannah Electric serves 320,000 people in a five-county area of Georgia.

Seattle City Light—The municipal utility of the City of Seattle offers its residential and business customers a program through which they can contribute funds to a utility-managed fund, which is used to support local renewable energy projects, such as solar, wind, and biomass. Residential customers can contribute \$3, \$7, or \$10 extra each month; and nonresidential customers can participate at different contribution levels. Seattle City Light serves 340,000 customers.

Snohomish County PUD—Snohomish County PUD offers its 260,000 residential and business customers a voluntary program through which they can purchase 150-kWh blocks of electricity generated from renewable energy sources for an additional \$3 per month, or 2.0¢/kWh. Each block represents about 15% of an average residential customer's monthly use. There is no limit on the number of blocks that can be purchased, and customers can enroll or discontinue their participation at any time. The utility has contracted with the Bonneville Environmental Foundation to supply renewable energy certificates representing the output from new wind energy projects in the Pacific Northwest.

Southern Minnesota Municipal Power Agency—SMMPA, the wholesale power supplier for 18 municipal utilities in southern Minnesota, supplies wind energy to its member utilities from two 950-kW wind turbines installed in 2003. Residential and business customers can purchase the wind energy through the member utilities for \$1 per 100-kWh block or a premium of 1.0¢/kWh. SMMPA was able to lower the price from an initial premium of 2.9¢/kWh because the cost of power from the turbines was less than expected. The lower costs resulted from a combination of strong winds, the efficiency of the turbines, and the ability to avoid costly transmission charges and losses by siting the turbines close to the distribution lines of Fairmont Public Utilities, which is a SMMPA member.

City Utilities of Springfield—City Utilities of Springfield, Missouri, offers a wind power option to its residential and business customers. Participants can purchase 100-kWh blocks of wind power for \$5, or 5¢/kWh. The wind power supply is contracted from Westar Energy, which operates a 1.5-MW wind project in Kansas.

Tacoma Power—Tacoma Power, which serves more than 140,000 customers in the state of Washington, offers its customers an option to purchase a blend of low-impact hydro and wind power supplied by the Bonneville Power Administration in partnership with the Bonneville Environmental Foundation. Residential customers can participate by paying an extra \$3, \$6, or \$10 each month. Business customers have additional purchase options. The effective premium charged for the power is 1.5¢/kWh.

City of Tallahassee—The City of Tallahassee municipal utility offers residential and business customers two green power options in partnership with Sterling Planet, a Georgia-based green power marketer. Customers can purchase a blended product, which is supplied from 95% biomass and 5% solar resources, to meet 50%, 75%, or 100% of their electricity needs at a premium of 1.6¢/kWh. A solar-only product, which is supplied from solar systems located in Tallahassee and other areas of Florida, is offered at a premium of 11.6¢/kWh in increments of 10% to 100% of a customer's electricity use.

Tampa Electric Company—TECO, an investor-owned utility serving more than 500,000 customers on Florida's west coast, offers customers an option to purchase 50-kWh blocks of green power for \$5 or a price premium of 10¢/kWh. The power for the program is supplied from a combination of photovoltaic systems and biomass co-fired in an existing coal plant.

Tennessee Valley Authority—TVA offers the *Green Power Switch* program through which customers of TVA-supplied distribution companies can purchase 150-kWh blocks of renewable energy for an extra \$4 per month, or a premium of about 2.67¢/kWh. Power for the program is supplied from a mix of wind energy, landfill gas, and solar energy from PV systems installed at public facilities throughout the TVA region. Sixty-five of TVA's 159 distributors currently offer the program to their customers. The program has also received *Green-e* accreditation from the Center for Resource Solutions.

Traverse City Light & Power—Since 1996, Traverse City (Michigan) has operated a green pricing program for its residential and small commercial customers, selling the output from a

600-kW wind turbine that was constructed on the edge of town. Residential and commercial customers pay a 1.58¢/kWh premium to purchase 100% of their power from wind energy.

Tri-State Generation and Transmission Association—Tri-State, a G&T cooperative serving 44 rural electric systems, provides a green power product to its member distribution systems based in Colorado, Wyoming, and Nebraska. Tri-State offers the green power to its member systems in 100-kWh blocks at a rate premium of 2.5¢/kWh. The program is supplied by wind energy purchases from Platte River Power Authority and other “green tags” purchases.

Tucson Electric Power Company—TEP offers its customers an option to purchase 20-kWh blocks of energy tied to the use of landfill methane at the company's Irvington Generating Station. Customers pay \$2 (10¢/kWh) per month for the first block purchased and \$1.50 (7.5¢/kWh) for all subsequent blocks. The customer funds collected are invested in the construction and operation of solar electric generating facilities.

Vigilante Electric Cooperative—Vigilante Electric Cooperative, which provides electricity service to about 4,500 members in nine southwestern Montana counties, offers its residential and nonresidential customers an option to purchase 100-kWh blocks of green power for an extra \$1.10 each month, or to meet their entire monthly electricity use with green power at the same premium of 1.1¢/kWh. The green power is supplied by the Bonneville Power Administration from wind, hydro, and solar projects in Oregon, Washington, and Wyoming.

Wabash Valley Power Association—Wabash Valley, a G&T cooperative serving 24 member distribution systems in Indiana, Michigan, and Ohio, offers customers of its cooperatives the option to purchase green power generated from landfill gas facilities. The distribution companies participating in the program are offering the green power at price premiums ranging from 0.5¢/kWh to 1.0¢/kWh.

We Energies—We Energies, formerly Wisconsin Electric, offers an optional renewable electricity service under which its customers can choose to receive 25%, 50%, or 100% of their power from renewable energy sources at a premium of 2.04¢/kWh. The renewable energy supply is a mix of wind energy, small hydropower, and landfill-gas generation. The program has received *Green-e* accreditation from the Center for Resource Solutions.

Wisconsin Public Power Inc.—WPPI, which supplies wholesale power to 32 municipal utilities in Wisconsin, offers a green energy option to retail customers of participating distribution utilities. Residential and business customers can purchase 150-kWh blocks of green power for \$3 a month. The power comes from a mix of wind energy, low-impact hydropower, and small, local digester gas facilities.

Wisconsin Public Service Corporation—WPS offers two green power programs to its more than 400,000 customers in northeastern and central Wisconsin. Under the *SolarWise for Schools* program, WPS customers can make tax-deductible donations that are used to purchase and install solar-electric systems on local high schools. The schools receive the solar-electric systems and save money on their electric bills, and also receive a renewable energy curriculum. The utility also offers the *NatureWise* program, under which customers can purchase 100-kWh blocks of

green power for \$2.65, or 2.65¢/kWh. The power is supplied from a combination of Wisconsin-based wind turbines and methane from landfill and farm waste resources. The tariff program has received Green-e accreditation from the Center for Resource Solutions

Xcel Energy—In 1993, Xcel Energy (formerly Public Service Company of Colorado) established a green pricing contribution program for its Colorado-based customers. Through the *Renewable Energy Trust*, customers could either make fixed contributions or use a bill “roundup” option to support utility investments in renewable energy. Through the Trust, Xcel has deployed more than 60 PV projects, including 40 kW of off-grid PV systems and more than 60 kW of school-based systems.

In 1997, Xcel introduced the *Windsorce* program in Colorado, which offers customers an option to purchase 100-kWh blocks of wind energy for \$2.50 per month or a rate premium of 2.5¢/kWh. Customers can also receive their entire monthly electricity consumption from wind energy. Because of growing customer demand, Xcel has expanded its Colorado-based wind energy supply to more than 60 MW, from which it also supplies a number of other utility programs.

Xcel has also installed one, 660-kW turbine near Clovis, New Mexico, to serve its New Mexico-based customers. The wind power is being sold as an optional service at a premium of \$3 per 100-kWh block, or 3¢/kWh. Customers can purchase as few or as many blocks of wind energy as they want, up to their total monthly consumption.

And in early 2003, Xcel launched the *Windsorce* program for its 1.1 million Minnesota-based customers, giving these customers the option to purchase 100-kWh blocks of wind power for \$2 each, or a premium of 2¢/kWh. Xcel supplies the program from 1.8-MW of wind power supplied from a small wind vendor in southwestern Minnesota.

Yampa Valley Electric Association—Yampa Valley, which serves Steamboat Springs and several other cities in northwestern Colorado, offers its customers the opportunity to purchase 100-kWh blocks of wind power for 3¢/kWh. Yampa Valley sources the supply from Xcel Energy’s Ponnequin wind site in northern Colorado.

Competitive Green Power Marketing

Green power marketing refers to the sale of green power in competitive markets, where multiple suppliers and service offerings generally exist. Currently, about 20 marketers offer green power products to retail customers in eight states – Maine, Massachusetts, New Jersey, Maryland, New York, Pennsylvania, Texas, and Virginia (for a summary of retail green power products, see **Table A-3**). And although customers are no longer able to switch suppliers in California, some of the state’s retail customers continue to be served by green marketers. This section presents information on green power marketers and utility/marketer partnerships.

Retail Green Power Marketers

3 Phases Energy Services—A Manhattan Beach, California-based company, 3 Phases is a registered energy service provider in California where it markets power generated from existing and new renewable energy sources to business customers. It also recently entered into an agreement with the City of Palo Alto Utilities to develop a new 100% renewable energy option for the utility’s customers, sourced from newly constructed wind turbines within the western power system and new California-based solar photovoltaic projects. 3 Phases will manage the renewable energy purchases. The company also offers green certificates supplied from new wind resources nationally. (see **Certificates section**).

Agway Energy Products—Agway Energy Products, a Syracuse, New York-based company that provides heating oil, natural gas, and other energy services, offers green power to homeowners and small businesses in the Niagara Mohawk and NYSEG electric service territories in partnership with Sterling Planet. The companies are offering a *Green-e* certified product called *Sterling Green*—a blend of 40% wind, 30% small hydroelectric, and 30% methane gas derived from renewable sources. Customers choosing the green power product will pay 1.5¢/kWh more than Agway's variable rate for electricity.

CET & Conservation Services Group—The Center for Ecological Technology (CET) and Conservation Services Group have teamed to participate in the National Grid *GreenUp* program in Massachusetts (see **Utility/Marketer Partnerships**). The companies are offering a product called *GreenerWatts New England*, which is supplied from a blend of small hydro, biomass, wind, and solar resources at a premium of 1.9¢/kWh.

Community Energy, Inc.—CEI has teamed with a variety of utilities and marketers to offer its *New Wind Energy* products to retail customers in the Northeast. The company participates in the National Grid *GreenUp* renewable energy program in New York and Massachusetts through which it offers 100% wind energy products and wind energy blends. In upstate New York, CEI has teamed with utility NYSEG to offer 100-kWh blocks of wind energy supplied from the 30-MW Fenner wind project near Syracuse. In addition, Community Energy markets wind energy to customers in New York City and the Washington, D.C., area through cooperative marketing agreements with ConEdison Solutions and Washington Gas Energy Services. The company also acts as a renewable energy certificate marketer and a wholesale supplier (see **Certificates section**).

ConEdison Solutions—An unregulated subsidiary of Consolidated Edison that provides electricity service to residential and small business customers, ConEdison Solutions is teaming with Community Energy, Inc., to offer green power to residential customers in the New York City region. Its *GREEN Power* product is a *Green-e* certified blend of New York-based wind (25%) and hydropower (75%) offered at a premium of 0.5¢/kWh compared to the company's standard electricity rate. The power is supplied from the recently developed 30-MW wind farm in Fenner, New York, and small, run-of-the-river hydropower facilities. The offering is available to all residential customers in the ConEdison and Orange and Rockland service territories.

Constellation NewEnergy—Working in conjunction with Maine PowerOptions (MPO), a not-for-profit consortium that serves as an aggregator for the state's governmental and nonprofit organizations, Constellation NewEnergy has contracted to supply renewable energy to a hospital in Maine. Constellation NewEnergy plans to continue to offer renewable energy options to medium and large commercial and industrial customers, subject to interest and resource availability.

ElectricAmerica (formerly Commonwealth Energy)—ElectricAmerica provides electricity service supplied wholly or in part from renewable sources in Pennsylvania and California. The company offers a small hydropower product to customers in PECO's service territory at a 0.44¢/kWh premium over standard-offer rates. In California, the company continues to serve a number of customers with 100% geothermal energy. Commonwealth has a fixed-price contract for renewable energy with *Calpine Corporation*, which enabled it to remain in business in the once-volatile California market.

Energy Cooperative of New York—A Buffalo-based nonprofit organization, ECNY offers a green power option to residential electric customers in the Niagara Mohawk service territory. The renewable energy for the product is sourced from wind (20%) and landfill gas (80%) generation facilities within New York State. As of January 2003, ECNY customers paid a premium of 1.1¢/kWh for the green power but save about 0.5¢/kWh by switching to ECNY service. The green power charge appears on the customer's regular Niagara Mohawk bill. In 2002, ECNY received a grant from the New York State Energy Research and Development Authority (NYSERDA) to market green power in New York.

Energy Cooperative Association of Pennsylvania—ECAP, a 20-year-old, Philadelphia-based fuel oil cooperative, is offering *Greene-e* certified green power product to its members. The *EcoChoice 100* renewable energy product consists of nearly 90% biomass power, 10% new wind energy, and a small fraction of solar. ECAP purchases the solar energy from its members who own photovoltaic systems. ECAP's green power product is available only in the PECO service territory and, as of May 2003, is sold at 7.55¢/kWh, a price premium of about 1.7¢/kWh over the price-to-compare. In the fall of 2002, ECAP began offering a wind power option to all of its residential and commercial customers in collaboration with Community Energy. The product, called *New Wind Energy*, is sold in 100-kWh blocks at an extra cost of \$2.50 per block each month.

EnviroGen—EnviroGen participates in the National Grid *GreenUp* program in New York (see **Utility/Marketer Partnerships**). The company offers a product supplied from a blend of 75% biomass and 25% hydro resources at a premium of 1.0¢/kWh.

FirstEnergy Solutions Corporation—FirstEnergy Solutions was selected to supply a retail green energy pilot program available to residential customers in the Jersey Central Power & Light (JCP&L) service territory who have not selected an alternative supplier. About 10% of the energy provided comes from renewable sources (such as wind, solar, or biomass), which is three times the level that retail companies must currently meet under the state's renewable portfolio standard (RPS). Under the pilot program, First Energy Solutions will serve 150,000 residential customers who elected the green power option or were randomly assigned. There is no difference in the price paid by those who choose to take part in the Green Pilot Program and other residential customers with Basic Generation Service.

Green Mountain Energy Company—Based in Austin, Texas, Green Mountain Energy Company serves about 600,000 customers in California, New Jersey, New York, Ohio, Oregon, Pennsylvania, and Texas with its brand of products, which it claims feature renewable and other generation sources “that are dramatically cleaner than typical regional system power.” Green Mountain offers a 100% wind energy product in Texas; but, in most other states, the company markets renewable energy blends from sources such as landfill gas, small hydro, wind, and solar. In Ohio, Green Mountain serves a number of municipal aggregation groups with electricity generated primarily from natural gas facilities, with a small percentage from renewable sources (2%). The company also administers and markets green power products offered through utilities in Oregon, Ohio, and New York.

Green Mountain Energy’s market activities have resulted in the development of about 13 MW of new renewable energy projects, including wind projects in California and Pennsylvania, and commercial-scale photovoltaic systems in most of the states in which it operates. The company has also announced plans to build a 160-MW wind project in west Texas in partnership with several other companies. Green Mountain Energy is financially backed by Nuon (which is one of the largest electric utilities in the Netherlands and a green power provider) and BP Amoco.

Maine Interfaith Power & Light—In January 2003, MIP&L began offering a green power option to residential and commercial customers in Maine. The product is a blend of power from existing small hydropower facilities (50% or more) and wood-fired generators in the state. It is supplied by Maine Renewable Energy at a premium of about 1.5¢/kWh above the standard-offer rate charged in most parts of the state. Customers who choose this option must switch from their current electricity supplier and enter into a service contract until February 2005. The organization sets aside a minimum of 20% of its revenues from the sale of green power to support the development of new, clean power sources in Maine, such as solar electric systems installed on local churches. MIP&L also offers a renewable energy certificates product. (see certificates section)

Mass Energy Consumers Alliance—Mass Energy participates in the National Grid *GreenUp* program in Massachusetts (see **Utility/Marketer Partnerships**). Under the program, the company offers two products that meet either 50% or 100% of a customer’s electricity needs

with renewable energy sources, at premiums of 1.2¢/kWh and 2.4¢/kWh, respectively. Both products are supplied from a blend of small hydro, biomass, wind, and solar resources.

Pepco Energy Services—Pepco Energy Services, an unregulated subsidiary of Potomac Electric Power Company (PEPCO), offers green power to customers in some areas of Maryland, Pennsylvania, Virginia, and Washington, D.C. Customers can choose from among the company's 10%, 51%, or 100% green electricity options. PES currently obtains its green power supplies primarily from biomass sources, such as landfill gas. In early 2003, the company announced plans to build and operate a new 2-MW landfill gas generating facility at the Warrenton, Virginia, landfill to supply its customers in Virginia and surrounding areas. Pepco Energy Services serves a number of large accounts including the state of Maryland and the U.S. Department of Energy.

Reliant Energy—Reliant Energy offers a 100% wind energy option to residential customers in Texas. In the TXU service territory, the product is offered to residential customers at a 0.3¢/kWh discount from the standard-offer service price. The product is supplied from new, in-state wind projects.

Select Energy—As the competitive energy marketing and services arm of Northeast Utilities, Select Energy has expanded its retail energy product portfolio to include environmentally friendly power choices for business and institutional customers in the Northeast. The company signed a three-year contract with the U.S. General Services Administration (GSA) to supply wind energy at a premium of 1.75¢/kWh to meet the electricity needs of two GSA buildings in New York. Select Energy is procuring the wind energy from the Fenner wind farm in New York under a wholesale supply agreement with Community Energy.

Sterling Planet—Sterling Planet participates in the National Grid *GreenUp* program (see **Utility/Marketer Partnerships**) in Massachusetts and New York. In Massachusetts, Sterling Planet offers two products supplied from a blend of biomass, wind, and small hydro priced at 1.2¢/kWh and 2.2¢/kWh. In New York, the company offers a product that is supplied from 40% wind, 30% hydro, and 30% biomass, and priced at 1.5¢/kWh. Customers can purchase it to meet 50%, 75%, or 100% of their electricity needs.

Sterling Planet also partners with Agway Energy Products to offer green power to homeowners and small businesses in the Niagara Mohawk and NYSEG electric service territories in New York. The companies are offering a *Green-e* certified product called *Sterling Green*, which is a blend of 40% wind, 30% small hydroelectric, and 30% methane gas derived from renewable sources. Customers choosing the green power product will pay 1.5¢/kWh more than Agway's variable rate for electricity.

Strategic Energy—A Pittsburgh-based competitive electricity supplier, Strategic Energy LLC entered into a multiyear agreement with Kinko's to provide approximately 1.6 million kWh of wind energy annually to meet a portion of the electricity needs of 57 retail stores in Texas. Strategic Energy was able to offer cost savings on the nonrenewable portion of the contract to offset the additional cost of the wind power.

TXU Energy—A utility serving 2.7 million electric customers in Texas, TXU Energy contracted with Dyess Air Force Base in Abilene to supply wind power to meet the entire electricity requirements of the base. Under the two-year agreement, Dyess will purchase approximately 78 million kilowatt-hours of wind power each year from TXU.

Washington Gas Energy Services—An affiliate of Washington Gas, WGES is partnering with Community Energy to offer wind energy to capital-area businesses and residents at a 2.5¢/kWh premium. The power is supplied from the 66-MW Mountaineer Wind Energy Center in West Virginia, which began operating in December 2002. Exelon Power Team has entered into a 20-year power purchase agreement for the output of the project. As of February 2003, WGES reported that it was serving about 5,000 residential and small commercial customers in the Washington, D.C.-area, with about 3.3 MW of wind energy generation.

Utility/Marketer Partnerships

National Grid—In 2002, Niagara Mohawk, a National Grid subsidiary that serves 1.5 million electricity customers in upstate New York, introduced a program through which its residential and commercial customers could purchase electricity generated from renewable energy sources offered by third-party providers. The *Green-up* renewable energy program was developed as a result of the settlement agreement reached in the Niagara Mohawk-National Grid merger. Under the program, participating customers do not switch from their regular utility service, but see a line item for a green power surcharge on their utility bills. Customers can choose to purchase green power products offered by three providers – Community Energy, Inc., Green Mountain Energy Company, and Sterling Planet. The products are blends of power from new and existing renewable energy resources and range in price from 1¢/kWh to 2.5¢/kWh above a customer's standard electricity rate.

In the fall of 2003, National Grid expanded its *Green-up* program and began offering green power options to customers of its electric distribution subsidiaries in Massachusetts. Currently, customers of Massachusetts Electric Company and Nantucket Electric Company can purchase products offered by four different green power suppliers – CET & Conservation Services Group, Community Energy, Mass Energy, and Sterling Planet. The products are blends of power from new and existing renewable energy resources and range in price from 1.2¢/kWh to 2.5¢/kWh above a customer's standard electricity rate. Six of the seven products are Green-e certified.

New York State Electric and Gas—NYSEG, an electric utility serving about 830,000 electricity customers in upstate New York, has teamed with Community Energy to offer wind energy to its residential customers. The *New Wind Energy* product is offered in 100-kWh blocks at a cost of \$2.50 per block each month. Customers must purchase a minimum of two blocks. The power is supplied from the 30-MW Fenner Wind project located about 40 miles southeast of Syracuse.

Renewable Energy Certificate Programs

Renewable energy certificates (RECs) – also known as green tags or tradable renewable certificates (TRCs) – represent the environmental attributes of power generated from renewable electric generators, which are often sold separately from the commodity electricity. The following marketers, utilities, and power producers are actively selling or facilitating the sale of green certificates to retail and wholesale customers (for a summary of retail REC products, see **Table A-4**).

Retail Marketers

3 Phases Energy Services—Based in Manhattan Beach, California, 3 Phases offers green certificates supplied from new wind resources for approximately 2¢/kWh. The certificates can be purchased on a monthly or annual basis. The company's Web site includes an “environmental footprint calculator,” which helps potential customers calculate the number of certificates that would be required to offset the carbon emissions associated with an individual's annual household energy use and transportation requirements. 3 Phases also operates as a registered energy service provider in California where it markets power generated from existing and new renewable energy sources to business customers under its *Green Direct* program.

Aquila—Aquila offers *Green-e* certified “tradable renewable energy credits” to commercial and industrial customers and retail marketers. The certificates are supplied from the company's 110-MW Gray County (Kansas) Wind Farm, which was completed at the end of 2001.

Big Green Energy—A division of Georgia-based Biomass Gas & Electric, Big Green Energy offers *GeoVerde Energy* to commercial customers. The *Green-e* certified product is supplied exclusively from biomass resources.

Bonneville Environmental Foundation—BEF, an independent nonprofit foundation established in 1998 by regional environmental groups and the *Bonneville Power Administration* (BPA), markets green tags sourced from renewable energy projects in the Pacific Northwest. The revenues generated from the certificate sales are used to fund projects that restore damaged watersheds and support new renewable energy projects utilizing solar, wind, and biomass resources. In 2002, BEF sold more than \$700,000 worth of green tags, representing the annual energy output of approximately 35 large utility-scale wind turbines. Along with new wind energy resources, BEF funds have supported the development of 100 kW of solar energy projects in the region.

Community Energy, Inc.—CEI is a Pennsylvania-based, for-profit corporation that markets wind energy certificates in New York and several Mid-Atlantic States at a premium of 2.5¢/kWh. Under long-term arrangements with wind developers and electricity suppliers, CEI builds customer demand to support identified wind energy projects in the customer's region. These marketing arrangements have supported the development of 140 MW of new wind generation in the region. CEI has also developed marketing partnerships with several utilities in the Northeast.

Constellation NewEnergy—Constellation NewEnergy is partnering with the Environmental Resources Trust (ERT) – a certifier and broker of green power – to offer *EcoPower Certificates* to nonresidential customers in Illinois. The certificates are supplied from existing (60%) and new (40%) landfill methane facilities. The green power price premium depends on the volume purchased. The company supplies certificates to the state of Illinois, which has committed to purchase green power to meet at least 5% of the state government's electricity needs.

EAD Environmental—EAD Environmental is a New York City-based marketer of renewable energy certificates and greenhouse gas credits; the RECs are *Green-e* certified and marketed via the Internet in 500-kWh blocks for \$7.50 or 1.5¢/kWh. The company is a subsidiary of *Natsource*, a broker of emissions credits and renewable energy certificates serving wholesale markets.

Green Mountain Energy Company—Green Mountain Energy offers Green-e certified REC products to commercial customers nationally. The products are supplied from wind and landfill gas resources or blends of other renewable resources, depending on customers' needs.

Maine Interfaith Power & Light—MIP&L markets two green power products for electricity customers in Maine. The first product is a blend of power from existing small hydropower facilities (50% or more) and wood-fired generators in the state supplied by *Maine Renewable Energy*. Customers that choose this option must switch from their current electricity supplier. Under the second option, customers can purchase "green tags" from the *Bonneville Environmental Foundation* in increments of 1,000 kWh. The green tags represent the environmental attributes of power generated from new solar and wind facilities in the Pacific Northwest. Under this second option, customers are not required to switch electricity providers or enter into long-term service contracts.

Mainstay Energy—Chicago-based Mainstay Energy is offering three Green-e certified products under its brand name Fossil Free to commercial and residential customers nationally. It offers a 100% renewable energy option for 2.0¢/kWh, a 100% wind option for 2.5¢/kWh, and 100% solar option for 20.0¢/kWh. The products are supplied from small-scale renewable resources.

Massachusetts Energy Consumers Alliance—Mass Energy and *People's Power and Light* offer *New England Wind*, a *Green-e* certified renewable energy certificate product, to consumers in New England. The product is supplied exclusively from New England-based wind farms and offered in 150-kWh blocks for \$5.25, or a premium of 3.5¢/kWh. Initially, the wind energy will be supplied from a 660-kW wind turbine located in Hull, Massachusetts.

NativeEnergy—*NativeEnergy* offers a program that enables individuals and businesses to support new wind farm construction through the advance purchase of long-term streams of renewable energy credits, including the associated carbon dioxide (CO₂) offsets. The *NativeEnergy* program has directly supported the development of a 750-kW wind turbine on the Rosebud Sioux Indian Reservation in South Dakota and is assisting the development of farm-based wind and methane projects.

PG&E National Energy Group—PG&E NEG sells wind energy certificates representing the environmental attributes of the output from two wind energy projects: an 11.5-MW project in

Madison County, New York, and a 44-MW project in California. In April 2003, *Green Mountain Energy Company* announced that it purchased nearly all of the environmental attributes associated with the Madison project output through 2004.

Peoples Energy Services—Peoples Energy Services is partnering with the Environmental Resources Trust (ERT), a certifier and broker of green power, to offer *EcoPower Certificates* to nonresidential customers in Illinois. Customers can buy 1 MWh blocks of green energy supplied from existing (60%) and new (40%) landfill methane facilities. The green power price premium depends on the volume purchased.

People's Power and Light—See **Massachusetts Energy Consumers Alliance**, above.

Renewable Choice Energy—RCE, based in Boulder, Colorado, offers two RECs-based products for sale to consumers nationwide: *American Wind*, a 100% new wind energy option supplied primarily from Texas-based wind resources; and *EcoChoice*, a blend of 10% new wind resources and 90% existing renewables. The company uses grassroots marketing, including direct sales and community events, to promote its products.

Sterling Planet, Inc.—Sterling Planet, an Internet-based green power marketer based in Roswell, Georgia, offers a 100% renewable energy certificate product to residential and business customers nationwide. The company sells RECs directly to consumers and has developed green power marketing partnerships with several utility companies, including JEA, the *City of Tallahassee*, and *Niagara Mohawk*. The green power is obtained from a number of different sources across the United States, encompassing the use of solar, wind, low-impact hydropower, biomass, and geothermal resources. The average cost of the RECs is 1.6¢/kWh.

Sun Power Electric—Sun Power Electric, a division of the nonprofit *Conservation Services Group*, sells a *Green-e* certified TRC product to consumers in the northeastern United States. The *Regen* product (which is derived from a mix of 1% solar and 99% landfill methane) is sold in annual blocks of 2,000 kWh, which are roughly equivalent to 20% of the annual energy use of the average New England home. The company has teamed with Shaw's Supermarkets, a grocery chain with stores throughout New England, to sell *Regen* in three Shaw's stores. The company also provides TRCs at wholesale to Green Mountain Energy Company.

Waverly Light and Power—WL&P, a municipal electric utility serving 4,300 customers in Waverly, Iowa, sells wind energy certificates representing the environmental attributes of the output of three utility-owned and operated wind turbines: an 80-kW turbine north of Waverly and two 750-kW turbines near Alta, Iowa. The certificates are sold in 2,500-kWh blocks for \$50, or 2.0¢/kWh. According to the utility, revenues from the certificate sales will be used to develop additional wind energy projects.

WindCurrent—Based in Baltimore, Maryland, WindCurrent offers a *Green-e* certified product called Chesapeake WindCurrent to customers in the Washington, D.C., area. Customers can purchase the green power to meet 25, 50, 75, or 100 percent of their electricity needs at a premium of 2.5¢/kWh, or purchase 150-kWh blocks for 3¢/kWh. The product is currently

supplied from the Mountaineer Wind Energy Center in West Virginia. In the future, wind power projects planned for Maryland and Virginia may be added to the resource mix.

Wholesale Marketers

Basin Electric Power Cooperative—Basin Electric, a regional power cooperative that generates and transmits electricity to 124 member rural electric systems in nine Midwestern states, plans to market RECs derived from two new 40-MW wind energy projects in North Dakota and South Dakota. The projects are scheduled to be operational by the end of 2003. Basin also supplies green power – marketed under the *Prairie Winds* product name – to 49 distribution cooperatives.

Bonneville Environmental Foundation—See listing under **Retail Marketers**, above.

Environmental Resources Trust—ERT, an independent, nonprofit organization founded with the help of the Environmental Defense Fund, acts as an electric power broker for clean electricity products. Under its *EcoPower* program, ERT substantiates the “environmental attributes” of clean electricity products and brokers sales from generators to large consumers.

Missouri River Energy Services—MRES, a joint-action agency providing wholesale power to 56 member municipal utilities in Iowa, Minnesota, North Dakota, and South Dakota, provides wind energy to its member utilities from two 900-kW wind turbines located outside of Worthington, Minnesota. MRES also makes “green tags” available to nonmember municipal utilities interested in developing green pricing programs for their customers. The green tags are priced at \$2.50 per 100 kWh.

Certificate Brokers

Cantor Environmental Brokerage—Cantor Fitzgerald is a financial services firm with operating units that are involved in a variety of market-based business initiatives, including energy and environmental brokerage, such as RECs and CO₂ emissions trading.

Evolution Markets—Evolution Markets is an emissions and coal brokerage firm based in White Plains, New York, which has been approved as a broker of *Green-e* certified TRCs. The company also manages an Internet-based bulletin board for TRCs, which provides a venue for wholesale buyers and sellers to post bids and offers for renewable energy attributes and green power.

GT Energy—GT Energy is an international environmental brokerage that is active in both U.S. and European renewable energy markets.

Natsource LLC—Natsource, based in New York City, is an international broker of emissions credits and renewable energy certificates.

Selected Green Power Customers

Early green power marketing efforts focused primarily on residential customers because polls and surveys show that individual consumers place a high value on environmental protection and the use of cleaner energy sources. More recently, green power providers have focused marketing efforts on nonresidential customers. Once thought to be too price sensitive to be willing to pay more for green power, businesses recognize that green power purchasing can help meet corporate goals related to environmental improvement and sustainable business practices. Larger customers are also more economical for marketers to serve than many small customers.

This section provides information on green power purchasing by selected nonresidential customers. In addition to business customers, municipalities, government agencies, and other organizations are purchasing green power. In the federal sector, green power purchases are being encouraged by a 1999 Presidential Executive Order, which calls for federal agencies to expand the use of renewable energy within facilities.

Businesses

Advanced Micro Devices—Advanced Micro Devices (AMD), a leading supplier of personal computer processors and memory, doubled its purchase of renewable energy from Austin Energy's *GreenChoice* program in May 2002, making it the largest green power subscriber in the program and among the largest in the nation. AMD purchases 24 million kWh of renewable energy annually or enough to power 2,000 average Austin homes year-round.

American Psychological Association—The American Psychological Association (APA) is purchasing green power equal to 75% of the annual electricity consumption of its two Capitol Hill office buildings. Green Mountain Energy Company is supplying the green power as renewable energy certificates derived from wind energy and other renewable resources. The green power purchase amounts to more than 20 million kWh during a 19-month period.

Ben & Jerry's—In August 2002, Ben & Jerry's announced that it would offset a year's worth of carbon dioxide (CO₂) emissions from its Vermont ice cream production facilities by supporting the construction of a new 750-kW wind turbine on Native American lands in South Dakota. Through its participation in *NativeEnergy's WindBuilders* Business Partner program, Ben & Jerry's purchases renewable energy credits equivalent to 4.5 million kWh of wind energy generated during the life of the Rosebud Sioux Tribe wind turbine currently under development. The purchase offsets approximately 5,000 tons of CO₂.

Clif Bar—Clif Bar, a Berkeley, California-based maker of nutrition bars and foods for endurance activities, offsets the carbon dioxide emissions associated with the energy used to power its offices, manufacturing operations, and business travel during 2002 by purchasing renewable energy credits generated from a new Native American-owned wind turbine. Through its participation in *NativeEnergy's WindBuilders* program, Clif Bar will purchase RECs equivalent to 2.2 million kWh of wind energy generated during the life of the 750-kW Rosebud Sioux Tribe wind turbine in South Dakota. The purchase offsets about 2,000 tons of CO₂.

Green Power Market Development Group—Formed in 2000, the GPMDG is a commercial and industrial partnership of 12 companies dedicated to building corporate markets for green power. In September 2003, the GPMDG announced that member companies have signed deals to obtain 97 MW of power from renewable and other clean energy generation options. Among the various commitments are purchases totaling 15 MW of wind energy and 36 MW of renewable energy certificates. The group's goal is to develop 1,000 MW of new, cost-competitive green power by 2010. The diverse group of businesses, which represent an estimated 8% of total U.S. corporate energy use, includes DuPont, General Motors, IBM, Interface, Johnson & Johnson, Kinko's, and Pitney Bowes. In 2003, Dow Chemical Company and Staples, Inc., joined the group.

Interface Fabrics Group—Interface Fabrics Group, a supplier of fabrics for commercial interiors based in Guilford, Maine, purchases wind energy certificates equivalent to 10% of the electricity used at its Maine and Massachusetts facilities. Under the agreement with BEF, the company is purchasing 12.5 million kWh of "green tags" over five years. Interface Fabrics Group, which is a division of Interface, Inc., derives almost 90% of its thermal needs from biomass or waste wood chips.

Kinko's—In early 2003, Kinko's, Inc., announced a series of agreements that increases its projected annual use of green power by 37% to approximately 11.2 million kWh. Sixty-six Kinko's locations in California, Oregon, Pennsylvania, and Washington have joined the company's ongoing efforts to support the development and use of renewable energy. Kinko's made its first two renewable energy purchases in Pennsylvania and California in 1999 and now uses green power at more than 150 branches in 13 states.

Lowe's Home Improvement Warehouse—Lowe's, the nation's 13th largest retailer, purchases about 3% of its monthly electrical use for its 32 stores from the *Green Power Switch* program offered by the Tennessee Valley Authority (TVA) and 46 distributors of TVA power across the Tennessee Valley. The company originally agreed to purchase about 4.5 million kWh of green power annually for its stores but expects to increase its purchases as other TVA power distributors with Lowe's stores join the green power program.

Lundberg Family Farms—Lundberg Family Farms, a Sacramento-based farm and packager of natural and organic rice products, is purchasing green power for 100% of the electricity used to run its milling, processing, and packaging operations. Under an agreement with 3 Phases Energy Services, the farm is purchasing 4.4 million kWh per year of wind energy certificates supplied from the Stateline and Klondike wind energy facilities in Oregon

Luzenac America, Inc.—Luzenac America, Inc., has purchased renewable energy certificates from the Bonneville Environmental Foundation to offset 100% of the greenhouse gas emissions associated with its electrical energy use at the Yellowstone Talc Mine in Montana. The certificates, or "green tags," represent more than 1.7 million kWh of renewable energy generated from wind energy sources in the region.

New Belgium Brewing Company, Inc.—The New Belgium Brewing Company, Inc., of Fort Collins, Colorado, purchases 100% wind energy to power the brewery's operations. A brewer of

specialty beers, New Belgium entered into an agreement in March 1999 with Fort Collins Utilities to purchase the wind energy at a premium price for 10 years. The entire 70-person staff of New Belgium voted to purchase the wind power even though the additional cost will diminish the size of their annual bonuses. To supply the New Belgium contract, a new 660-kW wind turbine was added at the Platte River Power Authority wind site near Medicine Bow, Wyoming.

Port of Portland—PacifiCorp and Portland General Electric (PGE) announced that the Port of Portland (Oregon) – which owns and maintains five marine terminals, four airports, and seven business parks – will obtain about 1% of its electricity needs from renewable resources through the two utilities' green pricing programs. The Port will purchase 6.3 million kWh of renewable energy annually through PacifiCorp's *BlueSky* program and PGE's *Clean Wind* and *Salmon-Friendly Power* programs. The bulk of the purchase will support the development of new wind resources.

Tower Companies—A family-owned commercial and residential building developer, the Tower Companies announced an agreement in March 2003 to purchase green power to supply company-owned buildings in the Washington, D.C., metropolitan area. Under the terms of the 18-month deal, Pepco Energy Services (PES) will supply 24 million kWh of green power to meet 50% of the energy needs of Tower's commercial buildings and 25% of the energy of Tower-owned apartment communities. Sterling Planet is providing the green power to PES using renewable energy certificates.

White Wave—A leading manufacturer of soy milk and other soy-based foods, White Wave contracted to purchase wind energy certificates equivalent to 100% of the electricity used in its manufacturing operations. The company plans to purchase a total of 20 million kWh of "green tags" in 2003 from two renewable energy suppliers – Renewable Choice Energy and Bonneville Environmental Foundation. The wind energy will be supplied from wind farms in several different states, including Iowa, Oregon, Texas, Washington, and Wyoming.

Universities

American University—Under a contract with Washington Gas Energy Services and Community Energy, American University is purchasing wind power to meet 5% of its electricity needs for the next five years. The power is supplied from the 66-MW Mountaineer Wind Energy Center located in West Virginia, which began operating in December 2002.

Carnegie Mellon University—A Pittsburgh-based research university of about 7,500 students, Carnegie Mellon University purchases wind power to meet 5% of its annual electricity needs. In 2002, the university began purchasing approximately 4.8 million kWh of wind energy annually under an agreement with green power marketer Community Energy. The power is supplied from the 15-megawatt Mill Run wind project now under construction 40 miles southeast of Pittsburgh.

Catholic University—In the summer of 2002, the Catholic University of America, based in Washington, D.C., entered into an agreement with Washington Gas Energy Services to purchase wind energy, meeting 12% of its electricity needs for five years. The power is supplied from the 66-MW Mountaineer Wind Energy Center in West Virginia under a wholesale supply agreement

with Community Energy. The purchase is equivalent to the entire annual output of one, 1.5-MW wind turbine.

Concordia University—In the summer of 2003, Concordia University became the first college or university in the nation to subscribe to 100% green power for all of its power needs. The 77 year-old Lutheran school located in Austin, Texas, has enrolled in Austin Energy's *GreenChoice* program to supply all of the 5.5 million kWh of electricity that it uses annually. Concordia will use energy efficiency improvements to offset the additional cost of the green power.

Connecticut College—Connecticut College is purchasing wind energy for 22% of its electricity needs. Under a contract with EAD Environmental, the university will purchase wind energy certificates equivalent to 3.2 million kWh annually. In 2001, the Board of Trustees of Connecticut College unanimously approved a student measure calling for the college to purchase as much as 20% of its power needs from renewable energy sources. The move was spearheaded by the student body, which petitioned to raise student activity fees by \$25 to pay the additional cost of purchasing the green power.

Drexel University—Under an agreement reached with Community Energy in 2002, Pennsylvania-based Drexel University purchases wind energy to meet nearly 10% of its electricity needs. The wind purchase amounts to about 4 million kWh per year or the output equivalent of a single 1.3-MW wind turbine. The wind energy is to be supplied from the new 60-MW Pocono Wind Farm, under construction near Scranton, Pennsylvania.

Duke University—In April 2003, Duke University teamed with certificate-marketer Renewable Choice Energy to issue a green power challenge to its students. The university has agreed to match student purchases of wind power up to 1.25 million kWh annually. Funding for the program comes from savings generated by a cooperative energy conservation effort between the university and Environmental Alliance, a student organization committed to promoting the implementation of sustainable practices at the university. The student group is conducting events to promote the challenge.

Oregon State University—In September 2003, OSU committed to purchase 5 million kWh of green power from the Bonneville Environmental Foundation. Under the four-year agreement, the university will purchase "green tags" representing the energy output of wind and solar facilities in the Pacific Northwest. The purchase was made possible through a state policy that allows large customers, like OSU, to self-direct a portion of their state-mandated public purpose charge payments to support specific renewable energy and energy efficiency programs. The university and BEF also plan to site a small renewable energy project, such as a solar photovoltaic array, on the campus.

Pennsylvania State University—Under a five-year contract with Community Energy in 2001, Penn State University is purchasing 13.2 million kWh of wind energy annually. The power is supplied from Mill Run and Somerset wind energy projects in Pennsylvania, which have a combined capacity of 24 megawatts (MW).

State University of New York—The University at Buffalo, the largest campus in the State University of New York (SUNY) system, is purchasing wind energy from the new Fenner wind project in upstate New York. Under a contract with Community Energy signed in 2002, the university purchased the entire output of one, 1.5-MW wind turbine, which represents about 2% of the university's electricity needs. The university plans to increase its wind power purchase in the future.

University of Colorado—By a margin of nearly 5 to 1, students at the University of Colorado voted in April 2000 to increase student fees by \$1 per semester so that several campus buildings can be powered with wind energy. The wind purchase measure was placed on the ballot following a petition drive that garnered 1,300 student signatures. The affirmative vote for wind energy represented the largest margin of victory of any measure on the ballot. According to college officials, the record turnout was directly attributable to student campaigning in support of the wind energy measure. The amount of wind energy purchased is roughly equivalent to the entire annual output of one large, 750-kW wind turbine. The university purchases the wind energy from Xcel Energy, which operates the *WindSource* green pricing program.

University of Pennsylvania—In April 2003, the University of Pennsylvania entered into a 10-year agreement to purchase 40 million kWh of wind energy annually from Community Energy. The new agreement doubles the amount of wind energy that the university previously purchased to the equivalent of 10% of its annual electricity needs. The purchase made it possible for Community Energy and other partners to construct a new 20-MW wind project in Pennsylvania with the university purchasing 40% of the output.

University of Wisconsin—In the spring of 2003, the University of Wisconsin (UW) Oshkosh became the first Wisconsin university to make a green power purchase commitment. At least 3% of the university's electricity needs, totaling nearly 1 million kWh annually, will be provided through Wisconsin Public Service (WPS) Company's *NatureWise* product, which is sourced from a combination of wind and biomass resources located in Wisconsin.

Municipalities

City of Chicago—The City of Chicago and 48 local government agencies selected [ComEd](#) to supply 10% of their aggregated electricity needs with renewable power. Under the agreement, ComEd will increase the percentage of green power supply to 20% after five years, representing 80 MW of annual renewable power capacity from sources such as wind, solar, small hydro, and landfill gas. ComEd's profits from the sale of green power to the city will go into a Reinvestment Fund, which will be used to help attract and develop new renewable generation within the area. ComEd will administer the fund through the [Environmental Resources Trust](#), a Washington, D.C., based auditing group that also will substantiate and track ComEd's green purchases.

City of Los Angeles/ Los Angeles World Airports—In October 1999, LAWA – the municipal organization that governs the city's four airports, including Los Angeles International (LAX) – announced its participation in the Los Angeles Department of Water and Power's (LADWP) *Green Power for a Green LA* program. Under a 10-year agreement, LAWA will gradually

increase the percentage of green power it purchases from LADWP from an initial 10% of total electricity use to 50% in 2010. LAWA hopes to purchase 100% green power by 2015. Although, initially, LAWA will use discounted rate savings to pay the higher cost of the green energy, the organization is prepared to spend an additional \$250,000 annually to meet the longer-term commitment. LAWA currently purchases about 1 million kWh annually to power the LAX and Van Nuys airports.

On March 2, 2001, the Los Angeles City Council expanded the city government's purchases when it approved a plan to meet about 10% of the city's electricity needs with power generated from new renewable resources. The city will purchase approximately 50 million kWh per year of renewable power from LADWP. With the previous commitments from the city's airports and water system, the total city government green power purchase will be more than 70 million kWh.

City of Myrtle Beach—In April 2002, Myrtle Beach became the first city in South Carolina to purchase green power for its municipal facilities by subscribing to Santee Cooper's *GreenPower* program. Under the one-year agreement, Myrtle Beach will purchase 372,000 kWh of green power, which represents between 2% and 5% of the city's total annual energy use, at an extra cost of \$10,800, or 2.9¢/kWh.

Radnor Township—In February 2003, the Board of Commissioners of Radnor Township (a suburb of Philadelphia with about 30,000 residents) unanimously approved a resolution to purchase wind energy to meet 62% of the township's electricity needs. Under a three-year contract with Community Energy and the Energy Cooperative of Pennsylvania, Radnor is purchasing 1.4 million kWh of wind energy annually from the new 66-MW Mountaineer Wind Energy Center in West Virginia. The township is offsetting the added cost of the green power with energy savings from the installation of energy-efficient LED traffic lights and competitive market savings from switching its entire electric load to ECAP.

Salt Lake City—In the fall of 2002, Salt Lake City Mayor Rocky Anderson approved a contract to purchase wind energy to supply Salt Lake's historic City and County Building. Under the agreement, the city purchases a total of 350 blocks of wind energy each month (or 420,000 kWh annually) from Utah Power. The extra cost of the wind energy is covered with savings realized from energy efficiency improvements. The Mayor's Office also worked with the Utah Wind Power Campaign and Utah Power to develop a direct-mail piece for residents to tout the benefits of wind power.

City of Seattle— In the fall of 2001, the Seattle City Council unanimously approved a plan for its municipal utility to obtain about 5% of its power supply from wind resources. Initially, Seattle City Light purchased 50 megawatts (MW) of wind energy generation from the Stateline project, under a contract with PacifiCorp Power Marketing, Inc. The city's wind energy purchase will continue to increase over time to as much as 175 MW by August 2004. According to Mayor Paul Schell, the wind energy agreement moved the city more than halfway to its goal of obtaining 100 average megawatts from new renewable resources by 2011.

State Governments

Illinois—Illinois Governor George Ryan issued an executive order in April 2002 committing the state to purchase green power for at least 5% of the electricity used by buildings owned or operated by agencies under the governor's control. The amount of renewable energy purchased will increase to at least 15% by 2020. The executive order defines "green power" as electricity generated from renewable sources such as wind, solar, organic wastes, and hydropower. It excludes the burning of municipal solid waste, wood waste, or tires.

Maryland—In the fall of 2002, the Maryland Department of General Services (DGS) issued a solicitation for electricity service in the Conectiv service territory, which includes an "aggressive" green power procurement goal of 20%. At least 10% of the energy must come from wind or solar energy sources. The DGS already purchases green power to serve 6% of the load of 18 state agencies and departments in the Annapolis and Baltimore areas, under two-year contract with Pepco Energy Services, which began in July 2002. The state's green power purchases are in response to an executive order issued by Maryland Governor Parris Glendening in March 2001 calling for at least 6% of the electricity consumed by state-owned facilities to be generated from green energy sources.

New Jersey—In July 2003, the State of New Jersey reaffirmed its commitment to purchase green power by entering into a 33-month contract with Pepco Energy Services and Community Energy for 54.9 million kWh or 20.6 MW of wind energy generated from wind farms in the mid-Atlantic region. More than 90% of the wind power could come from the 20-MW Bear Creek wind farm to be constructed near Wilkes-Barre, Pennsylvania, less than 60 miles from northern New Jersey. The agencies entered into the agreement in part to meet the 10% environmentally friendly green power purchase goal established by New Jersey Governor James McGreevey.

New York—In June 2001, New York Governor George Pataki issued an executive order calling for state agencies to obtain 10% of their electricity needs from renewable sources (such as wind, solar, biomass, geothermal, and fuel cells) by 2005, with the percentage increasing to 20% by 2010. The order applies to state buildings and those of quasi-independent organizations such as the State University of New York and the Metropolitan Transportation Authority.

In June 2003, the New York Power Authority (NYPA) – a state-owned power supplier for state agencies, municipal utilities, and rural electric cooperatives – announced that it was in the final stages of negotiations with two wind project developers to purchase up to 50 MW of wind energy beginning in 2005. The authority plans to include the wind energy in a portfolio of renewable power to be supplied to state government customers, which will meet the goals of the executive order.

Pennsylvania—The Commonwealth of Pennsylvania purchases renewable energy to supply 5% of the state government's power needs. Under a two-year contract with Community Energy that began in 2002, the government agencies are purchasing about 50 million kWh of green power annually supplied from a mix of wind power, landfill gas, hydroelectric, and solar energy. In May 2003, the Commonwealth announced plans to increase the amount of renewable energy it purchases to 10% of total state government electricity use. The announcement came with the

unveiling of a \$5 million initiative called Pennsylvania Energy Harvest, designed to encourage greater development and use of renewable energy technologies throughout the state.

Tennessee—In May 2002, Tennessee Governor Don Sundquist announced that all state buildings in Nashville, including the governor's mansion, are obtaining a portion of their power from renewable sources, making Tennessee the first state government in the Southeast to purchase green power. The power is supplied by Nashville Electric Service through the utility's participation in the Tennessee Valley Authority's *Green Power Switch* program, which utilizes wind, landfill-methane, and solar resources. The state purchases about 720,000 kWh annually at an extra cost of \$19,000 per year.

Federal Government

In 2003, federal green power purchases increased from 125 million kWh to more than 300 million kWh. The Department of Defense has at least 19 agreements to purchase renewable energy or renewable energy credits, totaling approximately 200 million kWh annually. Green power purchases represent nearly one-half of the renewable energy resources acquired by the federal government since 1990 to meet the intent of Executive Order 13123, which is to encourage greater use of renewable energy by the federal government. A number of these federal green power purchases are described below.

Dyess Air Force Base—In early 2003, Dyess Air Force Base in Abilene, Texas, contracted with TXU Energy to purchase wind power to meet the entire electricity requirements of the base. Under the two-year agreement, Dyess will purchase approximately 78 million kWh of wind power each year. Dyess is offsetting the extra cost of the wind power with savings realized in the state's competitive retail electricity market.

General Services Administration—GSA purchases 100% renewable electricity service to the Liberty Bell Pavilion at Independence National Historical Park and other federal government-operated facilities in Philadelphia. Under the three-year contract with Green Mountain Energy initiated in the fall of 2002, the federal government purchases a total of 3.7 million kWh of green power annually. The facilities are purchasing Green Mountain Energy's *Nature's Choice*, a *Green-e* certified product generated from renewable resources such as wind, water, biomass, and solar generation.

GSA also purchases green power to meet the entire electricity needs of two of its buildings in New York – the Binghamton Federal Building and the Pirnie Federal Building in Utica. In 2002, GSA entered into a three-year contract with Select Energy to purchase 1.1 million kWh of wind energy annually at a premium of 1.75¢/kWh. The wind energy is supplied from the Fenner wind farm in New York.

National Renewable Energy Laboratory—In 2001, the National Renewable Energy Laboratory (NREL) entered into an agreement with Xcel Energy to use wind power to meet about 10% of the laboratory's annual electricity needs. Under the three-year contract, NREL purchases nearly 2 million kWh of wind energy each year through the utility's *Windsource* program at a cost of about \$50,000 annually.

Oak Ridge National Laboratory—In 2000, the U.S. Department of Energy's Oak Ridge National Laboratory (ORNL) began purchasing green power from the Tennessee Valley Authority (TVA) to meet a portion of its electricity needs. Under the agreement, the laboratory became one of the first industrial participants in TVA's *Green Power Switch* program. ORNL purchases 375 blocks, or 675,000 kWh annually, at an extra cost of \$18,000 per year.

Pacific Northwest National Laboratory—In October 2002, the U.S. Department of Energy's Pacific Northwest National Laboratory (PNNL) announced plans to purchase wind power to supply more than 10% of the electricity needed to operate its research and office facilities in eastern Washington. Under an agreement with the City of Richland, PNNL purchases 8.8 million kWh of power from the Stateline Wind Energy Center, located on the Washington-Oregon border.

U.S. Army—In 2002, the U.S. Army entered into a contract with Washington Gas Energy Services to purchase wind energy for a portion of the electricity needs of the Walter Reed Army Medical Center, Fort McNair, and Adelphi Labs. The Army purchase is equivalent to the entire power output of one of the 1.5-MW wind turbines that comprise the 66-MW Mountaineer Wind Energy Center in Tucker County, West Virginia.

U.S. Department of Energy—In 2002, the U.S. Department of Energy (DOE) began purchasing green power to supply 17% of the electricity needs of its headquarters facilities in Washington, D.C., and Germantown, Maryland. Under the arrangement, the agency purchases 6 million kWh of green power annually, comprised of a blend of 25% wind power, supplied by Community Energy; and 75% landfill methane, supplied by Pepco Energy Services. DOE offsets the extra cost of the green power with savings realized from the competitive power market.

U.S. Environmental Protection Agency—In September 2003, the U.S. EPA contracted with 3 Phases Energy Services to supply its Region 6 Houston Laboratory with wind energy certificates procured from the 204-MW New Mexico Wind Energy Center. The certificate purchase amounts to 10 million kWh during a three-year period.

Earlier in 2003, EPA agreed to purchase wind energy to meet all of the electricity needs of its Region 2 office in Lower Manhattan. Under an agreement with Community Energy, EPA is purchasing 6.2 million kWh of wind energy during a one-year period. The power is supplied from the Fenner Wind Power Project in Madison County, New York.

EPA also purchases renewable energy to meet 100% of the energy needs of a 10-story laboratory and office building and two other facilities in Cincinnati, Ohio. Under three-year agreements with Community Energy and Com Ed initiated in 2001, EPA purchases more than 15 million kWh of renewable energy annually. Community Energy supplies 5% of the power from the 15-MW Mill Run wind farm in Pennsylvania, and ComEd supplies the remainder from landfill gas facilities in Illinois.

In June 1999, the EPA became the first federal agency to purchase green power in California's competitive electricity market, when it announced that the agency's Richmond research

laboratory would be powered with 100% renewable electricity. Under a three-year agreement reached between the General Services Administration and the Sacramento Municipal Utility District (SMUD), SMUD provided the facility with *Green-e* certified power from its *Greenergy* product. The EPA facility uses about 1.8 million kWh of electricity annually, which is the equivalent of 200 average Sacramento homes.

With its green power purchases in California, Colorado, Massachusetts, Ohio, New York, and Washington, EPA receives more than 9% of its nationwide electricity use from renewable sources.

References

Bird, L. and B. Swezey, 2003. "Estimates of Renewable Energy Capacity Serving Green Power Markets in the United States." National Renewable Energy Laboratory, February 2003.

http://www.eere.energy.gov/greenpower/new_gp_cap.shtml

Center for Resource Solutions, 2002. *Green-e Verification Report, 2001*

http://www.green-e.org/what_is/standard/verification.html

Ohio Consumers' Counsel, 2003. News Release: "End-Of-Year Update On Ohio's Electric Market," January 8, 2003. <http://www.pickocc.org/news/182003.shtml>

Swezey, B. and L. Bird, 2000. *Green Power Marketing in the United States: A Status Report (Fifth Edition)*, NREL/TP-620-28738. Golden: CO: National Renewable Energy Laboratory, August 2000. http://www.nrel.gov/analysis/emma/brief_5.html

Swezey, B. and L. Bird, 2001. *Utility Green Pricing Programs: What Defines Success?* NREL/TP-620-29831. Golden: CO: National Renewable Energy Laboratory, August 2001.

<http://www.eere.energy.gov/greenpower/29831.pdf>

Wiser, R., M. Bolinger, and E. Holt, 2000. *Customer Choice and Green Power Marketing: A Critical Review and Analysis of Experience to Date*. Prepared for the ACEEE Summer Study on Energy Efficiency in Buildings, August 2000. <http://eetd.lbl.gov/ea/EMS/reports/46072.pdf>

Wiser, R., M. Bolinger, E. Holt, and B. Swezey, 2001. *Forecasting the Growth of Green Power Markets in the United States*. NREL/TP-620-30101. Golden: CO: National Renewable Energy Laboratory, August 2001. <http://www.eere.energy.gov/greenpower/30101.pdf>

Appendix A

Table A-1: Utilities Offering Green Pricing Programs

<p>Investor-Owned Utilities Alabama Power Company Alliant Energy Arizona Public Service Avista Utilities Carolina Power & Light Consumers Energy Detroit Edison Dominion North Carolina Power Duke Power El Paso Electric Georgia Power Green Mountain Power Gulf Power Hawaiian Electric Idaho Power Company Indianapolis Power & Light Company Madison Gas & Electric Minnesota Power NorthWestern Energy OG&E Electric Services Otter Tail Power Company PacifiCorp* Portland General Electric PSI Energy Public Service Company of New Mexico Puget Sound Energy Savannah Electric Tampa Electric Company Tucson Electric Power Company We Energies Wisconsin Public Service Corporation Xcel Energy</p> <p>Electric Cooperatives Basin Electric Power Cooperative* Boone Electric Cooperative Central Electric Cooperative Dairyland Power Cooperative* Dakota Electric Association East Kentucky Power Cooperative* Georgia Electric Membership Corporation* 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* Peninsula Light Company Tri-State Generation and Transmission Assoc.* Vigilante Electric Cooperative Wabash Valley Power Association* Yampa Valley Electric Association</p>	<p>Federal Tennessee Valley Authority*</p> <p>Municipals/Other Public Utilities City of Alameda American Municipal Power – Ohio Austin Energy Benton County PUD City of Bowling Green Cedar Falls Utilities Chelan County PUD Clallum County PUD Clark Public Utilities Colorado Springs Utilities Cowlitz PUD ElectriCities Emerald People’s Utility District Estes Park Light & Power Eugene Water & Electric Board Fort Collins Utilities Grant County PUD Grays Harbor PUD Lansing Board of Water and Light Lincoln Electric System Longmont Power & Communications Los Angeles Department of Water and Power Loveland Water and Power Mason County PUD #3 Missouri River Energy Services* Moorhead Public Service Nebraska Public Power District* City of New Smyrna Beach Omaha Public Power District Pacific County PUD #2 City of Palo Alto Utilities Pasadena Water & Power Platte River Power Authority* Roseville Electric Sacramento Municipal Utility District City of St. Charles Salt River Project City Public Service of San Antonio Santee Cooper* Seattle City Light Snohomish County PUD Southern Minnesota Municipal Power Agency* City Utilities of Springfield Tacoma Power City of Tallahassee Traverse City Light & Power Wisconsin Public Power Inc.*</p> <p>* denotes program offered through multiple utilities or distribution cooperatives</p>
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Table A-2: Utility Green Pricing Programs by State (as of October 2003)

	Utility Name	Program Name	Resource Type	Size	Start Date	Premium
AL	Alabama Power	Renewable Energy Rate	biomass co-firing	TBD	2003	6.0¢/ kWh
AL	Tennessee Valley Authority (TVA) ¹⁸	Green Power Switch	wind, landfill gas, solar	joint 8.7 MW	2000	2.67¢/ kWh
AZ	Arizona Public Service	Solar Partners Program	central PV	616 kW	1997	\$2.64/15kWh
AZ	Salt River Project	EarthWise Energy	central PV, landfill gas, small hydro	4.4 MW	1998/2001	3.0¢/kWh
AZ	Tucson Electric	GreenWatts	landfill gas, PV, wind	400 kW	2000	7.5-10¢/ kWh
CA	City of Alameda	Clean Future Fund	various, electric vehicles	--	1999	1.0¢/kWh
CA	Los Angeles Dept. of Water and Power	Green Power for a Green LA	wind, landfill gas	27 MW	1999	3.0¢/kWh
CA	Palo Alto Utilities/3 Phases Energy Services	Palo Alto Green	wind, solar	TBD	2003	1.5¢/kWh
CA	Pasadena Water & Power	Green Power	wind	purchase from PPM	2003	2.5¢/kWh
CA	Roseville Electric	RE Green Energy Program	geothermal, hydro, PV	26.8 kW	2000	1.0¢/kWh
CA	Sacramento Municipal Utility District	Greenergy	wind, landfill gas, hydro	70.3 MW	1997	1.0¢/kWh
CA	Sacramento Municipal Utility District	PV Pioneers I/II	PV	1.9 MW	1993/1998	\$4/month
CO	Colorado Springs Utilities	Green Power	wind	1 MW from Xcel	1997	3.0¢/kWh
CO	Holy Cross Energy	Wind Power Pioneer	wind	5 MW from Xcel	1998	2.5¢/kWh
CO	Holy Cross Energy	Local Renewable Energy Pool	small hydro, PV	50 kW	2002	2.5¢/kWh
CO	Platte River Power Authority ¹⁹	Wind Power Program	wind	5.8 MW	1996	2.5¢/kWh
CO	Tri-State Generation & Transmission ²⁰	Renewable Resource Power Service	wind, landfill gas	660 kW from PRPA	1999	2.5¢/kWh
CO	Xcel Energy	WindSource	wind	52.7 MW	1997	2.5¢/kWh
CO	Xcel Energy	Renewable Energy Trust	PV	100 kW	1993	Contribution
CO	Yampa Valley Electric Association	Green Power	wind	450 kW from Xcel	1999	3.0¢/kWh
FL	City of Tallahassee/Sterling Planet	Green for You	biomass, solar	TBD	2002	1.6¢/kWh

¹⁸ City of Athens Electric Department, Cullman Electric Coop, Cullman Power Board, Florence Utilities, Hartselle Utilities, Huntsville Utilities, Joe Wheeler EMC, Muscle Shoals Electric Board, Scottsboro Electric Power Board, Sheffield Utilities, Tusculumbia Electric Department.

¹⁹ Estes Park, Fort Collins Utilities, Longmont Power & Communications, Loveland Water & Light.

²⁰ 16 of 44 coops offer program: Gunnison County Electric, K.C. Electric, La Plata Electric, Morgan Co. Rural Electric Association, Mountain Parks Electric, Mountain View Electric, Poudre Valley Rural Electric Association, San Isabel Electric, San Luis Valley Rural Electric Coop, San Miguel Power, United Power, Y-W Electric.

FL	City of Tallahassee/Sterling Planet	Green for You	solar only	TBD	2002	11.6¢/kWh
FL	Southern Company: Gulf Power Company	EarthCents Solar	PV in schools; central PV	14 kW; joint 1 MW	1996/1999	Contribution; \$6.00/ 100 watts
FL	Tampa Electric Company (TECO)	Smart Source	PV, biomass (co-firing)	1.5 MW	2000	10.0¢/kWh
FL	Utilities Commission City of New Smyrna Beach	Green Fund	local PV projects	9.8 kW	1999	Contribution
GA	Electric Membership Corporation ²¹	Green Power EMC	landfill gas	13 MW	2001	TBD
GA	Georgia Power	Green Energy	landfill gas, wind, solar	TBD	2003	5.5¢/kWh
GA	Savannah Power	Green Energy	landfill gas, wind, solar	TBD	2003	6.0¢/kWh
HI	Hawaiian Electric	Sun Power for Schools	PV in schools	22 kW	1996	Contribution
IA	Alliant Energy	Second Nature	landfill gas, wind	4.6 MW	2001	2.0¢/kWh
IA	Basin Electric Power Cooperative ²²	Prairie Winds	wind	2.6 MW	2000	3.0¢/kWh
IA	Cedar Falls Utilities	Wind Energy Electric Project	wind	1.5 MW	1999	Contribution
IA	Waverly Light & Power	Iowa Energy Tags	wind	planned 900 kW	2001	2.0¢/kWh
ID	Avista Utilities	Buck-A-Block	wind	1 aMW	2002	1.8¢/kWh
ID	Idaho Power	Green Power Program	various	TBD	2001	Contribution
IN	Hoosier Energy ²³	EnviroWatts	landfill gas	--	2001	2.0¢/kWh - 4.0¢/kWh
IN	Indianapolis Power & Light	Elect PlanSM Green Power Program	geothermal	0.5 aMW	1998	0.9¢/kWh
IN	PSI Energy/Cinergy	Green Power Rider	wind, solar, landfill gas, digester gas	TBD	2001	Contribution
IN	Wabash Valley Power Association ²⁴	Enviro Watts	landfill gas	7.5 MW	2000	0.5-1.0¢/kWh
IL	City of St. Charles/ComEd and Community Energy, Inc.	Green Power	landfill gas, wind	TBD	2003	Contribution
KY	East Kentucky Power Cooperative: Blue Grass Energy, Inter-county Energy, Owen Electric	EnviroWatts	landfill gas	3.2 MW	2002	2.75¢/kWh
KY	TVA: Bowling Green Municipal Utilities, Franklin Electric Plant Board	Green Power Switch	wind, landfill gas, solar	joint 8.7 MW	2000	2.67¢/kWh
MI	Consumers Energy	Experimental Green Power Program	wind, various	1.8 MW	2001	3.2¢/kWh
MI	Detroit Edison	Solar Currents	central PV	55 kW	1996	\$6.59/100 watts
MI	Lansing Board of Water and Light	GreenWise Electric Power	landfill gas, small hydro	1 aMW	2001	3.0¢/kWh
MI	Traverse City Light and Power	Green Rate	wind	600 kW	1996	1.58¢/kWh

²¹ 13 of 42 coops offer program: Carroll EMC, Coweta-Fayette EMC, Flint Energies, GreyStone Power, Habersham EMC, Irwin EMC, Jackson EMC, Lamar EMC, Ocmulgee EMC, Sawnee EMC, Snapping Shoals EMC, Tri-County EMC, Walton EMC of Monroe

²² Lyon Rural, Harrison County, Nishnabotna Valley Cooperative, Northwest Rural Electric Cooperative, Western Iowa

²³ 5 of 16 coops offer program: Southeastern Indiana REMC, South Central Indiana REMC, Utilities District of Western Indiana REMC, Decatur County REMC, Daviess-Martin County REMC

²⁴ 7 of 24 coops offer program: Boone REMC, Hendricks Power Cooperative, Kankakee Valley REMC, Miami-Cass REMC, Tipmont REMC, White County REMC, Northeastern REMC

MI	We Energies	Energy for Tomorrow	wind, landfill gas, hydro	8.2 MW	2000	2.04¢/kWh
MN	Alliant Energy	Second Nature	landfill gas, wind	4.6 MW	2002	2.0¢/kWh
MN	Basin Electric Power Cooperative ²⁵	Prairie Winds	wind	2.6 MW	2000	3.0¢/kWh
MN	Great River Energy ²⁶	Wellspring	wind	6 MW	1997	1.28-2.0¢/kWh
MN	Minnesota Power	WindSense	wind	0.2 aMW	2002	2.5¢/kWh
MN	Minnkota Power Cooperative ²⁷	Infinity Wind Energy	wind	900 kW	1999	3.0¢/kWh
MN	Missouri River Energy Services ²⁸	RiverWinds	wind	1.8 MW	2002	2.0-2.5¢/kWh
MN	Moorhead Public Service	Capture the Wind	wind	1.5 MW	1998	1.5¢/kWh
MN	Otter Tail Power	TailWinds	wind	900 kW	2002	2.6¢/kWh
MN	Southern Minnesota Municipal Power Agency ²⁹	SMMPA Wind Power	wind	1.9 MW	2000	1.0¢/kWh
MN	Xcel Energy	WindSource	wind	1.8 MW	TBD	2.0¢/kWh
MO	Boone Electric Cooperative	TBD	wind	purchase from Aquila	2003	3.0¢/kWh
MO	City Utilities of Springfield	WindCurrent	wind	purchase from Western	2000	5.0¢/kWh
MS	TVA ³⁰	Green Power Switch	wind, landfill gas, solar	joint 8.7 MW	2000	2.67¢/kWh
MT	Basin Electric Power Cooperative: Lower Yellowstone	Prairie Winds	wind	2.6 MW	2000	3.0¢/kWh
MT	Northwestern Energy	E+ Green	wind, solar	purchase from BEF	2003	2.0¢/kWh
MT	Vigilante Electric Cooperative	Alternative Renewable Energy	wind, hydro, solar	purchase from BPA	2003	1.1¢/kWh
NC	Dominion North Carolina Power	NC GreenPower	biomass, wind, solar	TBD	TBD	4.0¢/kWh
NC	Duke Power	NC GreenPower	biomass, wind, solar	TBD	TBD	4.0¢/kWh
NC	Electricities	NC GreenPower	biomass, wind, solar	TBD	TBD	4.0¢/kWh
NC	NC Electric Cooperatives	NC GreenPower	biomass, wind, solar	TBD	TBD	4.0¢/kWh

²⁵ Minnesota Valley Electric Coop, Sioux Valley Southwestern

²⁶ All 29 coops offer program: Agralite Electric Cooperative, Arrowhead Electric Cooperative, 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, Head of the Lakes, 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 Electric Cooperative, Nobles Cooperative Electric, North Itasca, Redwood Electric Cooperative, Runestone Electric, South Central Electric Association, Stearns Electric, Steele-Waseca, Todd-Wadena, Wright-Hennepin Electric

²⁷ Beltrami, Clearwater Polk, North Star, PKM, Red Lake, Red River, Roseau, Wild Rice, Thief River Falls.

²⁸ 23 of 55 offer program: Adrian, Alexandria, Barnesville, Breckenridge, Detroit Lakes, Elbow Lake, Henning, Jackson, Lakefield, Lake Park, Luverne, Madison, Moorhead, Ortonville, St. James, Sauk Centre, Staples, Wadena, Westbrook, Worthington

²⁹ 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

³⁰ City of Oxford, North East Mississippi Electric Power Association.

NC	Progress Energy/CP&L	NC GreenPower	biomass, wind, solar	TBD	TBD	4.0¢/kWh
ND	Basin Electric Power Cooperative ³¹	PrairieWinds	wind	5.2 MW	2000	2.5¢/kWh
ND	Minnkota Power Cooperative ³²	Infinity Wind Energy	wind	1.8 MW	1999	3.0¢/kWh
NE	Lincoln Electric System	LES Renewable Energy Program	wind	1.32 MW	1998	4.3¢/kWh
NE	Nebraska Public Power District	Prairie Power Program	TBD	TBD	1999	Contribution
NE	Omaha Public Power District	Green Power Program	landfill gas, wind	3.9 MW	2002	3.0¢/kWh
NE	Tri-State ³³	Renewable Resource Power Service	wind, landfill gas	planned 2.66 MW	2001	2.5¢/kWh
NM	El Paso Electric	TBD	wind	TBD	TBD	3.19¢/kWh
NM	Public Service of New Mexico	TBD	wind	TBD	TBD	1.8¢/kWh
NM	Tri-State: Kit Carson Electric Cooperative	Renewable Resource Power Service	wind, landfill gas	planned 2.66 MW	2001	2.5¢/kWh
NM	Xcel Energy	WindSource	wind	660 kW	1999	3.0¢/kWh
OH	City of Bowling Green	Bowling Green Power	small hydro, PV	2 kW	1999	1.35¢/kWh
OH	American Municipal Power-Ohio	Nature's Energy	landfill gas, small hydro	TBD	2003	1.3¢/kWh
OK	Oklahoma Gas & Electric	TBD	wind	TBD	TBD	TBD
OR	Emerald People's Utility District/Green Mountain Energy	TBD	TBD	TBD	TBD	TBD
OR	Eugene Water & Electric Board	EWEB Wind Power	wind	6.5 MW	1999	1.3¢/kWh
OR	Midstate Electric Cooperative	Environmentally Preferred Power	wind, small hydro	0.1 aMW	1999	2.5¢/kWh
OR	Oregon Trail Electric Cooperative	Green Power	wind	0.2 aMW	2002	1.5¢/kWh
OR	Pacific Northwest Generating Cooperative ³⁴	Green Power	landfill gas	1.1 MW	1998	1.8-2.0¢/kWh
OR	PacifiCorp/Green Mountain Energy (Renewable Usage)	Green Mountain Energy Electricity	existing geothermal, wind	3 aMW	2002	0.78¢/kWh
OR	PacifiCorp/Green Mountain Energy (Salmon Friendly)	Green Mountain Energy Salmon-Friendly Plan	existing geothermal, wind	0.9 aMW	2002	0.78¢/kWh + \$2.50 donation
OR	PacifiCorp: Pacific Power	Blue Sky	wind	purchase from BPA	2000	1.95¢/kWh
OR	Portland General Electric Company	Clean Wind Power	wind	purchase from BPA	2000	3.5¢/kWh

³¹ 49 coops offer program in 5 states: 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, Slope Electric Coop.

³² Cass County, Cavalier, Nodak.

³³ Chimney Rock Public Power District, Northwest Rural Public Power District.

³⁴ 5 of 16 coops offer program: Central Electric Cooperative, Clearwater Power, Consumers Power, Douglas Electric Cooperative, Umatilla Electric Cooperative.

OR	Portland General Electric/Green Mountain Energy	Green Mountain Energy Electricity	existing geothermal, wind	4.2aMW	2002	0.8¢/kWh
OR	Portland General Electric/Green Mountain Energy	Green Mountain Energy Salmon-Friendly Plan	existing geothermal, wind	2aMW	2002	0.99¢/kWh
SC	Santee Cooper, Horry Electric Cooperative, and Santee Electric Cooperative	Green Power Program	landfill gas	2.2 MW	2001	3.0¢/kWh
SD	Basin Electric Power Cooperative ³⁵	Prairie Winds	wind	2.6 MW	2000	3.0¢/kWh
TN	TVA ³⁶	Green Power Switch	landfill gas, solar, wind	joint 8.7 MW	2000	2.67¢/kWh
TX	Austin Energy	GreenChoice	wind, landfill gas, solar	97 MW	2000/1997	0.85¢/kWh
TX	City Public Service of San Antonio	Windtricity	wind	1 MW	2000	3.0¢/kWh
TX	El Paso Electric	Renewable Energy Tariff	wind	1.32 MW	2001	1.92¢/kWh
UT	PacifiCorp: Utah Power	Blue Sky	wind	3 MW	2000	1.95¢/kWh
VT	Green Mountain Power	CoolHome, CoolBusiness	wind, biogas	purchase from Native Energy	2002	Contribution
WA	Avista Utilities	Buck-A-Block	wind	1 a MW	2002	1.8¢/kWh
WA	Benton County Public Utility District	Green Power Program	landfill gas, wind	1 MW	1999	Contribution
WA	Chelan County PUD	Sustainable Natural Alternative Power (SNAP)	PV, wind, micro hydro	31 kW	2001	Contribution
WA	Clallam County PUD	Green Power Rate	landfill gas	1 aMW	2001	0.7¢/kWh
WA	Clark Public Utilities	Green Lights	PV, wind	0.2 aMW	2002	1.5¢/kWh
WA	Cowlitz PUD	Renewable Resource Energy	wind, PV	purchase from BEF	2002	2.0¢/kWh
WA	Grant County PUD	Alternative Energy Resources Program	wind	12 MW	2002	2.0¢/kWh
WA	Grays Harbor PUD	Green Power Program	wind	6 MW	2002	3.0¢/kWh
WA	Mason County PUD No. 3	Mason Evergreen Power	wind	1 MW	2003	2.0¢/kWh
WA	Orcas Power & Light	Green Power	small hydro, wind, PV	0.5 aMW	1999	3.5¢/kWh

³⁵ 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, 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

³⁶ Appalachian Electric Coop, Bristol Tennessee, Caney Fork Electric Coop, Clarksville, Clinton, Cookeville, Cumberland EMC, Duck River EMC, Elizabethton, EPB (Chattanooga), Erwin, Gibson Electric, Greeneville, Johnson City Power Board, Jackson, Knoxville, Lawrenceburg, Lenoir, McMinnville, Middle Tennessee EMC, Morristown, Mountain Electric Coop, Murfreesboro, Nashville, Newport, Oak Ridge, Paris BPU, Powell Valley Electric Coop, Pulaski, Sevier County, Tullahoma

WA	Pacific County PUD	Green Power	wind, hydro	0.3 aMW	2002	1.05¢/kWh
WA	PacifiCorp: Pacific Power	Blue Sky	wind	3 MW	2000	1.95¢/kWh
WA	Peninsula Light	Green Choice	wind, hydro	purchase from BPA	2002	2.8¢/kWh
WA	Puget Sound Energy	Green Power	wind, solar	purchase from BEF	2002	2.0¢/kWh
WA	Seattle City Light	Seattle Green Power Program	solar	1.1 kW	2002	Contribution
WA	Snohomish County PUD	Planet Power	wind	0.5aMW	2002	2.0¢/kWh
WA	Tacoma Power	EverGreen Options	small hydro, wind	1 aMW	2000	Contribution
WI	Alliant Energy	Second Nature	wind, landfill gas	2 MW	2000	2.0¢/kWh
WI	Dairyland Power Cooperative	Evergreen Renewable Energy Program	wind	660 kW	1997	3.0¢/kWh
WI	Great River Energy: Head of the Lakes	Wellspring	wind	6 MW	1997	1.28-2.0¢/kWh
WI	Madison Gas & Electric	Wind Power Program	wind	8.22 MW	1999	3.3¢/kWh
WI	We Energies	Energy for Tomorrow	landfill gas, hydro, wind	8.2 MW	1996	2.0¢/kWh
WI	Wisconsin Public Power Inc ³⁷	Renewable Energy Program	small hydro, wind, digester gas	2.0 MW	2001	2.0¢/kWh
WI	Wisconsin Public Service	SolarWise for Schools	PV installations on schools	72 kW	1997	Contribution
WI	Wisconsin Public Service	NatureWise	Wind, landfill gas, animal waste	0.12 aMW	2002	2.65¢/kWh
WY	Lower Valley Energy	Green Power	wind	purchase from BPA	2003	1.67¢/kWh
WY	PacifiCorp: Pacific Power	Blue Sky	wind	3 MW	2000	1.95¢/kWh
WY	Tri-State: Carbon Power & Light	Renewable Resource Power Service	wind, landfill gas	planned 2.66 MW	2001	2.5¢/kWh

³⁷ 34 of 37 munis offer program: Algoma, Cedarburg, Florence, Kaukauna, Muscoda, 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

Table A-3: Retail Green Power Product Offerings in Competitive Electricity Markets (as of October 2003)

Company	Product Name	Residential Price Premium ¹	Fee	Resource Mix ²	Certification
District of Columbia					
Washington Gas Energy Services/Community Energy	New Wind Energy	2.5¢/kWh	—	Wind	—
PEPCO Energy Services ³	100% Green Electricity	1.16¢/kWh	—	100% biomass	—
	51% Green Electricity	0.89¢/kWh	—	51% biomass and less than 1% hydro	—
	10% Green Electricity	0.56¢/kWh	—	10% biomass	—
	Nonresidential product	N/A	—	50% to 100% eligible renewables	Green-e
Maine⁴					
Maine Renewable Energy/Maine Interfaith Power & Light	Green Supply	1.5¢/kwh	—	50% small hydro, 50% wood-fired biomass	—
Constellation New Energy	Nonresidential product	N/A	—	Various	—
Maryland³					
Washington Gas Energy Services/Community Energy	New Wind Energy	2.5¢/kWh	—	Wind	—
PEPCO Energy Services	100% Green Electricity	0.99¢/kWh	—	100% biomass	—
	51% Green Electricity	0.69¢/kWh	—	51% biomass and less than 1% hydro	—
	10% Green Electricity	0.39¢/kWh	—	10% biomass	—
	Nonresidential product	N/A	—	50% to 100% eligible renewables	Green-e
Massachusetts					
CET & Conservation Services Group	GreenerWatts New England	1.9¢/kWh	—	75% small hydro, 14% biomass, 10% wind, 1% solar	Green-e
Community Energy	New Wind Energy 100%	2.4¢/kWh	—	50% small hydro, 50% wind	Green-e
	New Wind Energy 50%	1.2¢/kWh	—	25% small hydro, 25% wind	Green-e
Mass Energy Consumers Alliance	New England GreenStart 100%	2.5¢/kWh	—	70% small hydro, 19% biomass, 10.5% wind, 0.5% solar	Green-e
	New England GreenStart 50%	1.25¢/kWh	—	37% small hydro, 10% biomass, 5% wind, 0.25% solar	—
Sterling Planet	Sterling Premium	1.2¢/kWh	—	65% small hydro, 25% biomass, 10% wind	—
	Sterling Premium Plus	2.2¢/kWh	—	75% small hydro, 15% biomass, 10% wind	Green-e

New Jersey					
Green Mountain Energy Company ⁵	Enviro Blend	0.8¢/kWh	\$3.95/mo.	95% hydro, 5% wind	Green-e
Jersey Central Power & Light/ First Energy Solutions	Green pilot program	No premium	—	9.75% renewable	—
New York					
Agway Energy Products/Sterling Planet	Sterling Green Renewable Electricity	1.5¢/kWh	—	40% wind, 30% small hydro, 30% biogas	Green-e
Community Energy/Niagara Mohawk	60% New Wind Energy and 40% Small Hydro	1.0¢/kWh	—	60% wind/40% hydro	Green-e
	New Wind Energy	2.0¢/kWh	—	100 kWh blocks of 100% wind	Green-e
Community Energy/NYSEG	New Wind Energy	2.5¢/kWh	—	100-kWh blocks of 100% wind	Green-e
ConEdison Solutions ⁶	GREEN Power	0.5¢/kWh	—	25% wind, 75% small hydro	Green-e
Energy Cooperative of New York ⁷	Renewable Electric Program	0.5¢/kWh to 0.75¢/kWh	—	20% new wind, 80% existing landfill gas	—
EnviroGen	75% BioEnergy and 25% Hydro	1.0¢/kWh	—	75% biomass/25% hydro	—
Green Mountain Energy/Niagara Mohawk	Green Mountain Energy Electricity	1.3¢/kWh	—	50% wind/50% hydro	Green-e
Select Energy	Nonresidential product	N/A	—	Wind	—
Sterling Planet/Niagara Mohawk	Sterling Green	1.5¢/kWh	—	40% wind, 30% small hydro, 30% bioenergy	Green-e
Pennsylvania⁸					
ElectricAmerica	50% Hydro	0.44¢/kWh	—	50% large hydro	—
Energy Cooperative of Pennsylvania	Eco Choice 100	1.69¢/kWh	\$5/year	90% landfill gas, 10% wind, 0.1% solar	Green-e
	New Wind Energy	2.5¢/kWh	—	Wind	—
Green Mountain Energy Company	Enviro Blend	0.83¢/kWh	\$3.95/mo.	50% renewable: 20% biomass, 30% small hydro, 6% wind, <1% solar	Green-e
	Nature's Choice	1.5¢/kWh	\$3.95/mo.	60% biomass, 30% small hydro, 10% wind, < 1% solar	Green-e
PEPCO Energy Services	100% Renewable	1.84¢/kWh	—	100% renewable	—
Texas⁹					
Green Mountain Energy Company	100% Wind Power	1.0¢/kWh	\$4.95/mo.	100% wind	Green-e
	Reliable Rate Plan	0.8¢/kWh	\$4.95/mo.	Wind and hydro	—
	Month-to-Month Plan	0.6¢/kWh	\$4.95/mo.	Wind and hydro	—
Reliant Energy	Renewable Plan	-0.3¢/kWh	\$4.81/mo.	100% wind	—
Strategic Energy	Nonresidential product	N/A	—	Wind	—

TXU Energy	Nonresidential product	N/A	—	Wind	—
Virginia¹⁰					
Washington Gas Energy Services/Community Energy	New Wind Energy	2.5¢/kWh	—	Wind	—
PEPCO Energy Services	100% Green Electricity	3.02¢/kWh	—	100% biomass	—
	51% Green Electricity	2.41¢/kWh	—	51% biomass and less than 1% hydro	—
	10% Green Electricity	1.97¢/kWh	—	10% biomass	—

Source: National Renewable Energy Laboratory.

Notes:

N/A= Not applicable.

¹ Prices may vary by service territory. Prices may also differ for commercial/industrial customers.

² New is defined as operating or repowered after January 1, 1999 based on the Green-e TRC certification standards.

³ Offered in PEPCO and Baltimore Gas & Electric service territories. Product prices are for PEPCO service territory.

⁴ Price premium is for Central Maine Power service territory.

⁵ Green Mountain Energy offers products in Conectiv, GPU, and PSE&G service territories. Product prices are for Conectiv service territory.

⁶ Price premium is based on a comparison to ConEdison Solutions' standard electricity product.

⁷ Price premium is for Niagara Mohawk service territory. Premium varies depending on energy taxes.

⁸ Product prices are for PECO service territory.

⁹ Offered in CPL, TXU, TNMP, and Reliant service territories. Product prices are based on kWh rate for the TXU service territory.

¹⁰ Products are only available in Dominion service territory.

References:

Green power marketer and utility web sites.

District of Columbia Public Service Commission http://www.dcpsc.org/ci/cch/elec/calculators/static_calc_table.html#ft10

Maryland Attorney General Electricity Supplier Rate and Service Information <http://www.oag.state.md.us/energy/>

Pennsylvania Office of Consumer Advocate Residential Price Comparison Charts

<http://www.oca.state.pa.us/elecomp/pricecharts.html>

Virginia's State Corporation Commission <http://www.yesvachoice.com/howtochoose/howtocompare.asp>

Table A-4: Retail Green Energy Certificate Product Offerings (as of October 2003)

Certificate Marketer	Product Name	Renewable Resources	Location of Renewable Resources	Residential Price Premium ¹	Certification
3 Phases Energy Services	Green Certificates	100% new wind	Nationwide	2.0¢/kWh	Green-e
Aquila, Inc.	Aquila Green Credits (nonresidential only)	100% new wind	Kansas	N/A	Green-e
Big Green Energy	GeoVerde Energy	100% biomass	Georgia	N/A	Green-e
Bonneville Environmental Foundation	Green Tags	99% new wind, up to 1% new solar	Washington, Oregon, Wyoming	2.0¢/kWh	Green-e
Community Energy	New Wind Energy	100% new wind	Pennsylvania, West Virginia	2.5¢/kWh	Green-e
Constellation NewEnergy/ERT	EcoPower Certificates	100% landfill gas, 40% new	Illinois	N/A	ERT
EAD Environmental	100% Wind Renewable Energy Certificates	100% new wind	Nationwide	1.5¢/kWh	(Green-e for nonresidential only)
Green Mountain Energy	TRCs (nonresidential only)	100% renewable	Nationwide	N/A	Green-e
Maine Interfaith Power & Light	Green Tags (supplied by Bonneville Environmental Foundation)	99% new wind, up to 1% new solar	Washington, Oregon, Wyoming	2.0¢/kWh	—
Mass Energy/People's Power and Light	New England Wind	100% new wind	Massachusetts	3.5¢/kWh	Green-e
Mainstay Energy	Fossil Free 100% Renewable	100% renewable	Nationwide	2.0¢/kWh	Green-e
	Fossil Free 100% Wind	100% wind	Nationwide	2.5¢/kWh	Green-e
	Fossil Free 100% Solar	100% solar	Nationwide	20¢/kWh	Green-e
NativeEnergy	WindBuilders	100% new wind	South Dakota	1.0¢/kWh \$10 per ton of CO2 avoided	Climate Neutral Network
	Vermont CoolHome (residential only)	New biogas and new wind	Vermont (biomass), South Dakota (wind)	1.0¢/kWh \$10 per ton of CO2 avoided	—
	WindBuilders Gift Certificate	100% new wind	South Dakota	\$10 to 15 per ton of CO2 avoided	Climate Neutral Network

	WindBuilders Business Partners (nonresidential only)	100% new wind	South Dakota Minnesota	<1.0¢/kWh <\$10 per ton of CO2 avoided	Climate Neutral Network
PG&E National Energy Group	PureWind Certificates	100% new wind	New York	4.0¢/kWh	—
Peoples Energy Services/ERT	EcoPower Certificates	100% landfill gas, 40% new	Illinois	N/A	ERT
Renewable Choice Energy	American Wind	100% new wind	Nationwide	4.0¢/kWh	Green-e
Sterling Planet	Green America	40% wind 35% biomass 15% geothermal 5% low-impact hydro 5% solar (all new)	Nationwide	~1.6¢/kWh	Green-e
Sun Power Electric	ReGen (available in New England only)	99% new landfill gas, 1% new solar	New York, Massachusetts, Rhode Island	3.6¢/kWh	Green-e
Waverly Light & Power	Iowa Energy Tags	100% wind	Iowa	2.0¢/kWh	—
WindCurrent	Chesapeake Windcurrent	100% new wind	West Virginia	2.5¢/kWh - 3.0¢/kWh	Green-e

¹ Large users may be able to negotiate price premiums.

N/A = Not applicable.

Source: National Renewable Energy Laboratory.

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