



The Center for Resource Solutions

2006 Green-e Energy Verification Report

Green-e Energy is the nation's leading independent certification and verification program for renewable energy. This voluntary consumer-protection program verifies superior, certified renewable energy options offered by utilities and marketers in the retail market.



Energy

2006 Green-e Energy Verification Report Highlights

Total sales of Green-e Certified renewable energy **reached nearly 10 million MWh**, almost 90 percent greater than the certified sales in 2005.

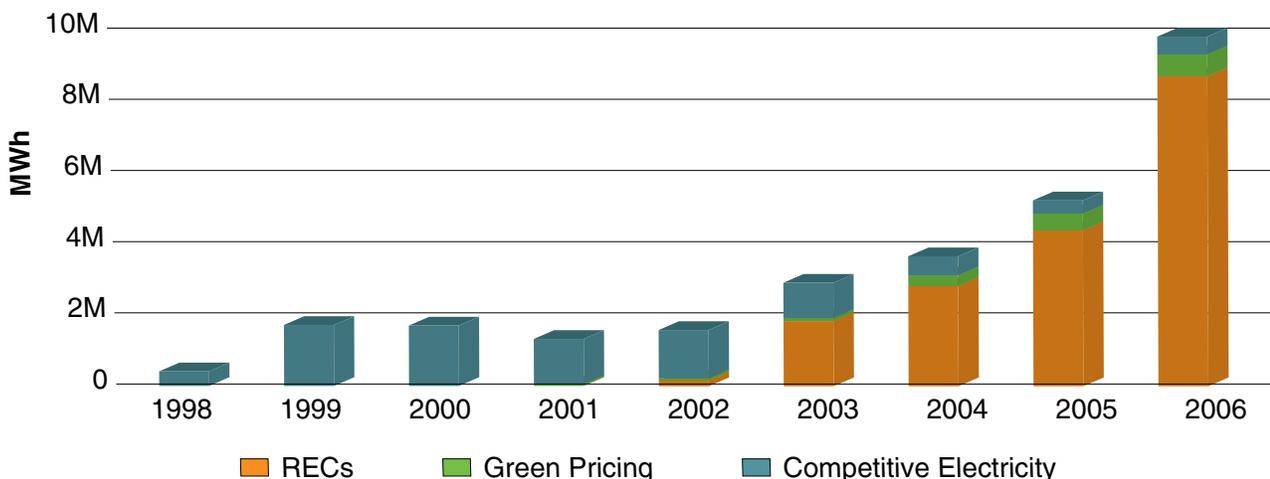
Sales of Green-e Certified renewable energy certificates (RECs) **reached almost 8.8 million MWh in 2006**, double the certified REC sales in 2005.

208,000 residential customers and almost 7,000 commercial customers across the U.S. and Canada purchased Green-e Certified renewable energy.

38 business customers participated in the Green-e Consumer Labeling Program, with **over 114,000 MWh** of Certified renewable energy purchased or self-generated.

The total purchases of Green-e Certified renewable energy in 2006 **displaced over 4.8 million tons of carbon dioxide** that would have been emitted by an equivalent amount of system power.

Figure 1 Sales of Green-e Certified Renewable Energy by Product Type, 1998–2006



Green-e Energy was established in 1997 in order to provide consumer protection in the emerging and unregulated voluntary renewable energy market through clear guidelines, disclosure, and standards.

This report details the number of marketers, utilities, and electric service providers that participated in Green-e Energy in 2006, their aggregate sales of Green-e Certified renewable energy, and the number of customers who bought certified renewable energy. The numbers show that the market for Green-e Certified renewable energy is expanding at a rapid pace and that more individuals and companies are buying Green-e Certified renewable energy than ever before. This is part of a larger trend of an increasing market for renewable energy that is driving the development of new renewable energy facilities.¹

1. Bird, Lori. *Green Power Marketing in the United States: A Status Report* (Tenth Edition). National Renewable Energy Laboratory, 2007.

Introduction

Summary

Green-e Certified renewable energy is sold in three forms in the voluntary renewable energy market.²

Renewable Energy Certificates (RECs): The renewable and environmental attributes of renewable electricity generation that are sold separately from electricity.

Green Pricing Programs: Renewable electricity sold by a monopoly utility to customers that sign up to receive renewable electricity beyond what is included in standard electricity service.

Competitive Renewable Electricity: Similar to a green pricing program, but sold by an electric service provider (ESP) in a deregulated electricity market.

2. The voluntary market comprises renewable energy purchasers whose purchases go beyond renewable energy requirements from law, regulation, or other legal mandates (such as state-level renewable portfolio standards). The market for renewables purchased due to regulations and laws is called the "compliance market."

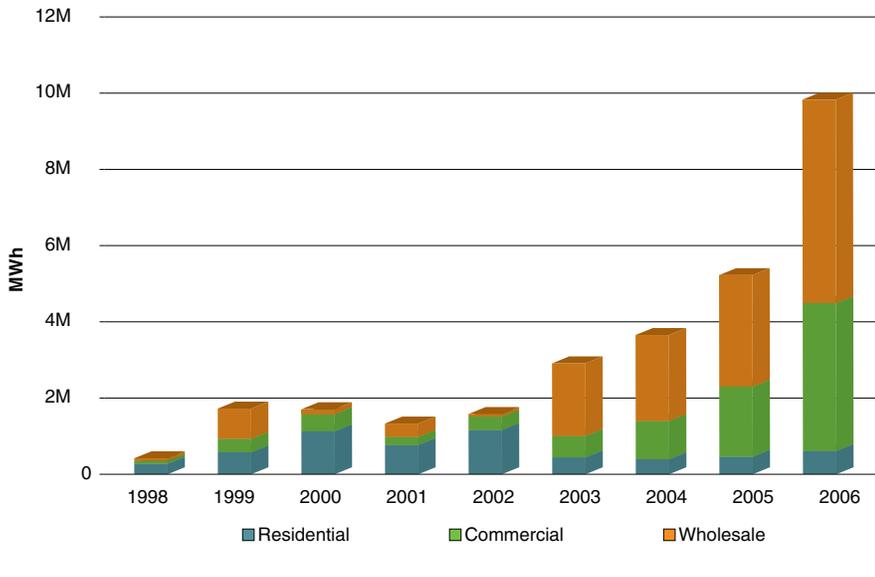
Sales of Green-e Certified renewable energy³ in 2006 far surpassed the 2005 figures in all categories, climbing to a grand total of nearly 10 million MWh of certified renewable energy sold to residential, commercial, and wholesale customers.⁴ This is an increase of nearly 90 percent compared to 2005. The largest increases came from a doubling in REC sales from 4.4 million MWh to 8.8 million MWh. The volume of renewable energy sold through Green-e Energy Certified

3. All of the sales figures reported are for renewable energy only. Suppliers of certified electricity may offer certified products that meet less than 100 percent of a customer's demand with renewable energy, while the rest is comprised of non-renewable resources. These non-renewable resources must be as clean or cleaner than local power, but are not counted toward certified renewable energy sales in this report.

4. Figures for total certified sales include all transactions between counterparties. Figures do not reflect the total volume of renewable energy retired by end-users in the voluntary market.

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Figure 2 Sales of Green-e Certified Renewable Energy by Customer Type, 1998–2006



green pricing programs increased by 29 percent, while certified sales by ESPs grew by 36 percent.

The increases in Green-e Energy Certified sales were consistent across all the three customer types: residen-

tial, commercial, and wholesale. In 2006, approximately 45 percent of the Green-e Energy Certified sales were to retail customers⁵ with the rest being

⁵ "Retail customers" refers to both residential and non-residential/commercial/industrial end-use customers.

wholesale transactions (wholesale sales are typically to entities selling a product not certified by Green-e). Of the retail sales, more than 86 percent were to commercial and industrial customers, with the remaining volume being purchased by residential customers. Sales of certified renewable energy since the inception of Green-e Energy are broken out in Figure 2. Sales of certified renewable energy in 2006 is detailed more specifically in Table 1 (p. 4).

The overall number of purchasers of Green-e Certified renewable energy rose dramatically in 2006, by 88 percent over 2005, to more than 215,000 customers spread throughout Canada and all 50 U.S. States. The breakdown of customers buying each renewable energy product type is shown in Figure 3.

With environmental issues gaining traction in the media and in people's minds, it is not surprising that 2006 saw impressive growth in the number of residential purchasers of certified renewable energy. The number of residential customers buying certi-

Figure 3 Customers Purchasing Green-e Certified Renewable Energy by Product Type, 1998–2006

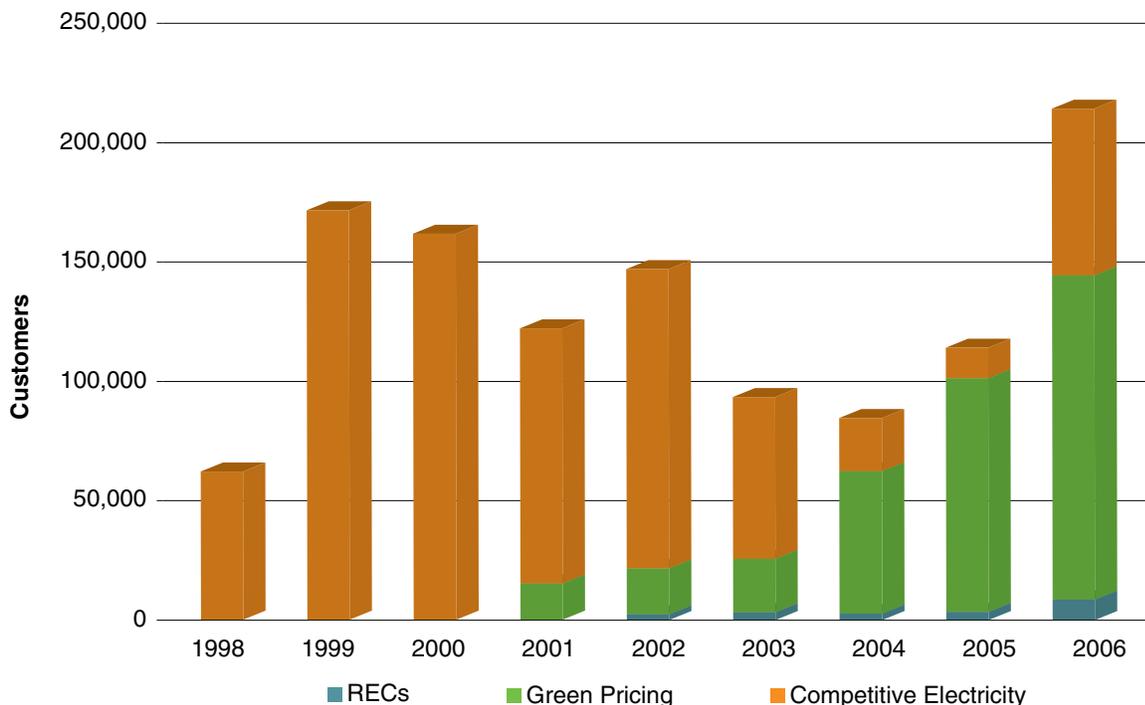


Figure 4 States in which Green-e Energy Certified Renewable Electricity is Available, 2006



RECs are available in all U.S. States and territories, and internationally.

In 2006, Green-e Certified renewable energy prevented the emission of over **4.8 million tons of CO₂**. An equivalent amount of non-renewable energy would produce almost **13,400 tons of SO₂**, nearly **7,500 tons of NO_x**, and over **80 tons of mercury**.

fied RECs surged by 184 percent over 2005, and each customer bought 35 percent more RECs on average than they did in 2005. The number of residential purchasers from Certified green pricing programs rose by 40 percent over the same period. And after a dip in 2005, the number of residential customers buying certified renewable energy from participating ESPs rebounded to 70,000 in 2006, more than five times as many customers as the previous year.

Participation in Green-e by renewable energy sellers continues to grow. At the time of publication, Green-e Energy Certified products were offered by 175 marketers, utilities, distributors, and ESPs. Most of the new participants were REC marketers.

In 2006, certified renewable energy products were offered by 25 REC marketers, one REC broker, 11 utilities, 106 distributors and 12 ESPs. RECs are available nationally, and Figure 4 maps the 19 states in which certified green pricing and competitive electricity products were offered.

Tables 2 and 3 (p. 4) provide insight into the states with facilities supplying the renewable energy in Green-e Energy Certified products, as well as where the majority of retail customers buying certified renewable energy are located. The difference in states with generators and purchasers of renewables demonstrates how the national market for RECs is allowing customers without access to local renewable

Figure 5 Percent of Green-e Certified Renewable Energy Sourced from New Facilities, 2001–2006

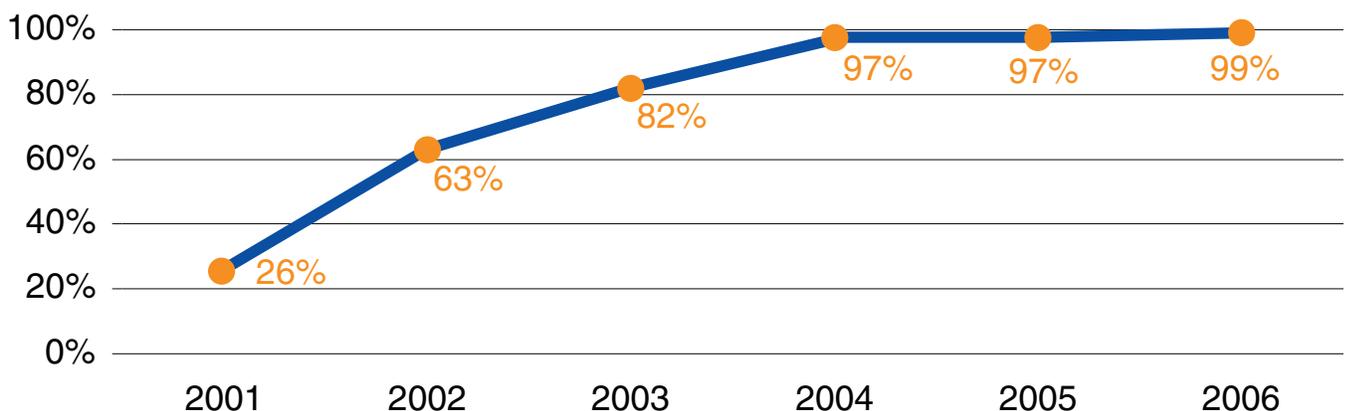


Table 1 Total Sales of Green-e Certified Renewable Energy by Product Type and Customer Type, 2006 (MWh)

	Retail		Wholesale	Total
	Residential	Commercial		
RECs	39,000	3,495,000	5,223,000	8,757,000
Green Pricing	484,000	125,000	0	609,000
Competitive Electricity	84,000	273,000	148,000	505,000
Total Sales	607,000	3,893,000	5,371,000	9,871,000
Total Renewable Sales	4,500,000	5,371,000	9,871,000	

In 2006, sales of Green-e Energy Certified RECs shot up to nearly **8.8 million MWh**, double 2005 sales.

energy facilities to support changes in the energy landscape.

2006 was the last year in which certain certified competitive electricity products were allowed to include some amount of generation from renewable facilities that do not meet the Green-e definition of “new” in their certified

renewable energy total.⁶ Overall, 99 percent of the renewable energy used in Green-e Energy Certified products in 2006 came from “new” facilities

6 The Green-e Energy National Standard for Renewable Energy replaced the previous regional standards for RECs, green pricing, and competitive electricity for Green-e Energy Certified sales made as of January 1, 2007. As part of this change, Green-e required 100 percent of all resources to be sourced from facilities built or significantly repowered on or after January 1, 1997. For details see: www.green-e.org/getcert_re_stan.shtm.

that began operating on or after January 1, 1997. Figure 5 shows the rise in new renewables in Green-e Energy Certified products since 2001; in 2007 this figure will reach and remain at 100 percent.

The mix of resource types used to supply Green-e Energy Certified products is provided in Figure 6 (p. 5). Geothermal increased remarkably over 2005, and hydro and biomass increased by two percent each. Wind’s contribution decreased accordingly.

In 2006, Green-e Energy certified 63 percent of the renewable energy sold to end-use customers in the voluntary renewable energy market (based on preliminary figures on the total size of the U.S. voluntary market in 2006 from the National Renewable Energy Laboratory, [NREL]). This is up from 53 percent market share in 2005.

The renewable energy generated to supply Green-e Certified products sold in 2006 prevented the emission of over 4.8 million tons of CO₂, a gas that contributes to global warming. An equivalent amount of non-renewable energy would produce almost 13,400 tons of SO₂, which can lead to acid rain, nearly 7,500 tons of NO_x, which causes smog and ground-level pollution, and over 80 tons of mercury, a

Table 2 Top Ten States Supplying Eligible Renewable Energy to Green-e Energy Certified Products by Percent of Total Supply, 2006

CA	20%
OR	10%
KY	10%
KS	9%
WY	7%
WA	7%
OK	6%
WV	3%
OH	3%
GA	3%

The percentage shows the total eligible supply reported by sellers of Green-e Energy Certified products in 2006.

Table 3 Top Ten States Purchasing Retail Green-e Certified Renewable Energy by Percent of Total Retail Sales, 2006

CO	28%
CA	18%
NY	9%
NJ	4%
DE	4%
OR	3%
MA	3%
MN	3%
WI	3%
MI	3%

The percentage shows the percent of total retail Green-e Certified renewable energy purchased in-state.

toxic substance linked to neurological problems.

Green-e Marketplace

In 2003, the Center for Resource Solutions launched Green-e Marketplace (formerly known as the Consumer Labeling Program), which allows businesses using certified renewable energy to contract with CRS to display the Green-e logo as a part of their environmental commitment.

Green-e Marketplace has participants in a range of industry sectors

including manufacturing, banking and finance, organic foods, retail, and business services. Participants can display the Green-e logo on product packaging, annual reports, displays, marketing collateral, and corporate websites to promote their renewable energy use.

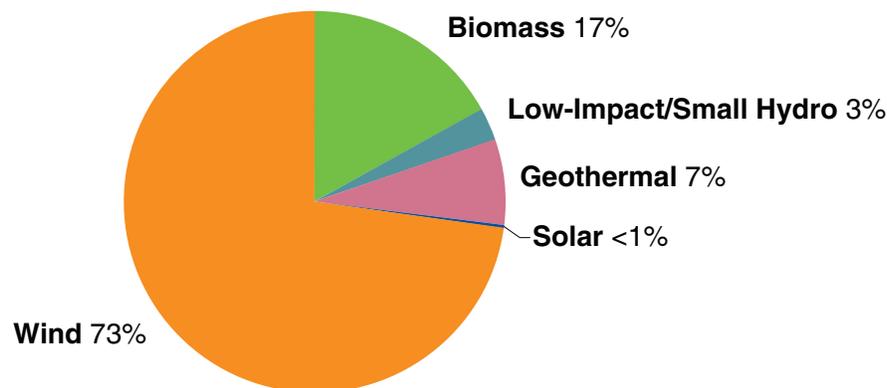
Thirty-eight companies participated in Green-e Marketplace in 2006, purchasing or generating close to 114,000 MWh of certified renewable energy. The majority of participants, 67 percent, bought RECs to meet their

Table 4

Green-e Marketplace Participants Meeting 100% of Their Electricity Usage From Their Offices, Manufacturing, or Entire Operations With Green-e Certified Renewable Energy

- Acterra Palo Alto Facilities
- Adrift Mobiles
- Sandy Alexander
- All Things Organic
- Batdorf and Bronson Coffee Roasters
- Baxter Healthcare
- Choice Organic Tea/Granium Inc.
- CTI Paper Group, Inc.
- Debra Lynn Dad Communications
- Designarchy
- Earthsite
- Forrest Ethics
- Garden of Life
- Globe Lithographing
- H2Gro/Innovative Energy Systems
- iCMS
- Jon's Pit Stop
- Lawrence *Journal-World*
- Lundberg Family Farms
- Mohawk Fine Papers
- MolletPhoto
- New Leaf Paper
- Only Natural Pet Store
- Pepper Papers, LLC
- prAna
- ReCellular, Inc.
- Santa Cruz Organics
- Smucker Quality Beverages
- Kelley Stoltz

Figure 6 Contribution of Renewable Resource Types to Total Green-e Energy Certified Sales



The percentage of new fuel used in these renewables in 2006 is as follows: Biomass, 97%; Low-Impact/Small Hydro, 81%; and Geothermal, Solar, and Wind all had 100% new fuels.

Figure 7 Contributions of Renewable Resource Types to Green-e Energy Certified RECs, 2006

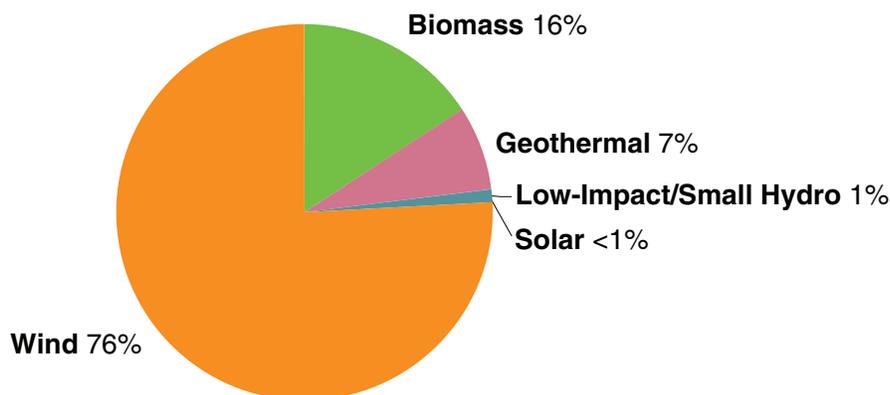
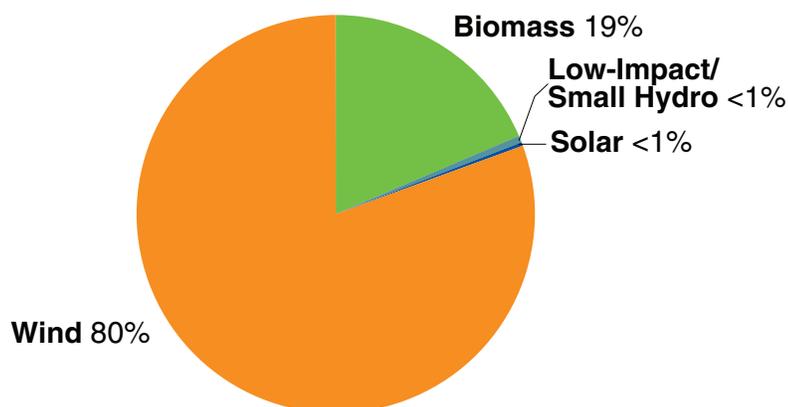


Table 5 Marketers Offering Green-e Energy Certified RECs, 2002–2006

Year	Suppliers of Green-e Energy Certified REC Products	Number of Green-e Energy Certified REC Products
2002	7	11
2003	18	23
2004	21	29
2005	21	28
2006	27	37

Figure 8 Contributions of Renewable Resource Types to Green-e Energy Certified Green Pricing Programs, 2006



Green-e Marketplace requirements, 18 percent bought certified electricity through their utility or ESP, and the remaining 15 percent generated their own Green-e eligible renewable energy on-site.

Green-e Marketplace participants can attribute their renewable energy purchases to the electricity used by their offices, by the manufacturing of one or more of their products or by their entire operations. Of the 38

participating companies, 28 purchased or generated enough certified renewable energy to cover 100 percent of the electricity consumed by their chosen use category, allowing them to make specific claims about an aspect of their business (see Table 4).

At print time, Green-e Marketplace was expanding rapidly. Participants in the program bought a total of over 1.7 million MWh of certified renewable energy by October 2007.

Renewable Energy Certificates

In 2006, 26 marketers and one broker sold Green-e Certified RECs to customers in the United States and Canada.

Participating Marketers and Broker:

3Degrees Group
 Aquila
 Bonneville Environmental Foundation
 CarbonFund
 Clean and Green
 Community Energy
 Conservation Services Group
 Constellation NewEnergy
 Consumers Energy
 Element Markets
 Empire District
 Evolution Markets (Broker)
 Green Mountain
 GT Environmental Finance
 Midwest RECs LLC
 NativeEnergy
 PowerLight
 PPM Energy
 Renewable Choice
 Renewable Ventures
 Sky Energy
 Sterling Planet
 Viking Wind
 TransAlta
 Weyerhaeuser
 WindCurrent
 Xcel Energy

One REC marketer left Green-e Energy and six joined during 2006, resulting in ten new Certified REC products being offered, with one product leaving the program. 2006 showed the largest addition of certified REC products since the jump in participation between the first and second years

Table 6 Sales of Green-e Energy Certified RECs by Customer Type, 2006

	Renewables Sales (MWh)	Increase from 2005 Sales	Percent of Total REC Sales	Customers	Average Renewables Purchase Size (MWh)
Residential	39,000	284%	<1%	6,800	5.7
Commercial	3,495,000	133%	40%	1,500	2,330.0
Wholesale	5,223,000	81%	60%	150	34,820.0
Total	8,757,000	99%	100%	8,450	1,036.3

Table 7 Utilities Offering Green-e Energy Certified Green Pricing Programs, 2001–2006

Year	Utilities with Green-e Energy Certified Green Pricing Programs	Number of States with Green-e Energy Certified Green Pricing Programs
2001	2	7
2002	4	8
2003	5	9
2004	7	11
2005	8	12
2006	11	13

of the program, when RECs were introduced, as shown in Table 5.

In 2006, sales of Green-e Energy Certified RECs shot up to nearly 8.8 million MWh, double 2005 sales. As can be seen in Table 6, this is largely due to an 81 percent increase in the certified MWh sold in the wholesale market, and to purchases by commercial customers of 3.5 million MWh in 2006, up 133 percent over 2005. The volume of Green-e Energy Certified RECs bought by residential customers came close to quadrupling since 2005, and on average customers bought 35 percent more renewable energy than they did in 2005 (See Table 6).

As REC trading becomes more active, a single REC may change hands several times before it is retired by a retail customer, meaning that an increase in the number and volume of wholesale transactions is to be expected, and the role of Green-e becomes more important in averting double-counting.

Green-e tracks individual RECs that are certified both at the wholesale and retail levels, counting only once the individual RECs that were certified first in a wholesale transaction and then again in a retail transaction. Green-e Energy certified approximately 6.7 million MWh of unique RECs in 2006, 78 percent above the amount in 2005.

The types of eligible renewable resources supplying Green-e Energy Certified RECs sold in 2006 are provided in Figure 7 (p. 5). Hydroelectric, biomass, and solar contributed slightly larger percentages in 2006 than they did in 2005, and geothermal resources burst into the mix, making up seven percent where they only represented one percent in 2005. Wind was the only resource that decreased percentage-wise, falling to 76 percent, in line with the increased contributions of other resources.

Green Pricing Programs

Eleven utilities and 106 distributors offered 15 Green-e Certified renewable energy products through their green pricing programs in 2006.

Participating Utilities:

Alliant (Iowa & Minnesota)
 Buckeye Power (Ohio)
 City of Palo Alto (California)
 City of Roseville (California)
 Platte River Power Authority (Colorado)
 Santee Cooper (South Carolina)
 Sacramento Municipal Utility District (California)
 Tennessee Valley Authority (Tennessee and others)⁷
 We Energies (Wisconsin)
 Xcel Energy (Colorado)
 Xcel Energy (Minnesota)

Utility participation in Green-e continues to grow steadily, as shown in Table 7. Three utility programs joined in 2006, and no programs left.

Together, the participating utilities and their distributors sold over 609,000 MWh of Green-e Certified renewable energy, an increase of 29 percent over 2005 sales, and nearly double 2004 sales. Residential purchase volume grew by 31 percent over 2005, and non-residential volume was up 22 percent over 2005.

The number of customers participating in Green-e Energy Certified green pricing programs climbed as well. The majority of this growth

⁷ Tennessee Valley Authority's Green Power Switch product is offered in Alabama, Georgia, Kentucky, Mississippi, North Carolina, and Tennessee, and by 96 distributors.

Table 8 Sales of Green-e Energy Certified Green Pricing Programs by Customer Type, 2006

	Renewables Sales (MWh)	Increase from 2005	Percent of Total Green Pricing Sales	Customers	Average Renewables Purchase Size (MWh)
Residential	484,000	31%	80%	131,000	3.7
Commercial	125,000	22%	20%	5,200	24.0
Total	609,000	29%	100%	136,200	4.5

Table 9 ESPs Offering Green-e Energy Certified Electricity Products, 1998–2006

Year	Suppliers of Green-e Energy Certified Competitive Electricity Products	Number of Green-e Energy Certified Competitive Electricity Products
1998	11	15
1999	11	18
2000	17	27
2001	16	26
2002	9	19
2003	14	37
2004	13	27
2005	11	16
2006	12	17

occurred in residential participation, which increased to over 131,000 customers, 41 percent above the 2005 figures. The number of non-residential customers increased over the same period by about 2 percent, for a total of almost 5,200 business, commercial, and industrial customers buying certified green energy from green pricing programs in 2006. Table 8 summarizes sales by and participation in certified green pricing programs.

Rates of customer participation in Green-e Energy Certified green pricing programs varied among participating utilities, with the highest level being 16.9 percent participation. This rate was achieved by the City of Palo Alto’s “Palo Alto Green” program, and was the highest among all U.S. green pricing programs, as recognized by NREL in their annual Top Ten lists

for successful green pricing programs. Four of the certified programs appear on the NREL Top Ten lists for total MWh sold, total subscribers, and participation rates.⁸

Certified green pricing programs sourced, on average, over 80 percent of their renewable energy from wind facilities, shown in Figure 8, compared to wind providing a 69 percent share in 2005. The proportion of biomass decreased commensurate with this increase in wind.

Competitive Electricity Products

In 2006, 12 participating Electricity Service Providers (ESPs) offered 17 Green-e Certified renewable energy

products to their customers in nine states.

Participating ESPs:

- Accent Energy (New York)
- AMP-Ohio (Ohio)
- APS Energy (California)
- ConEdison Solutions (New York)
- Constellation NewEnergy (Massachusetts, New York and Rhode Island)
- Consumers Energy (Michigan)
- Energy Cooperative of Pennsylvania (Pennsylvania)
- Green Mountain Energy Company (New York)
- Hess Corporation (Maryland, New England, New Jersey, New York and Pennsylvania)
- PEPCO Energy Services (Maryland, New Jersey and Pennsylvania)
- PPL Energy Plus (Pennsylvania)
- Select Energy (Maryland, New Jersey, and Pennsylvania)

The number of participating ESPs, products, and states in which Green-e Energy Certified competitive electricity products are offered have all grown from 2005, as shown in Table 9.

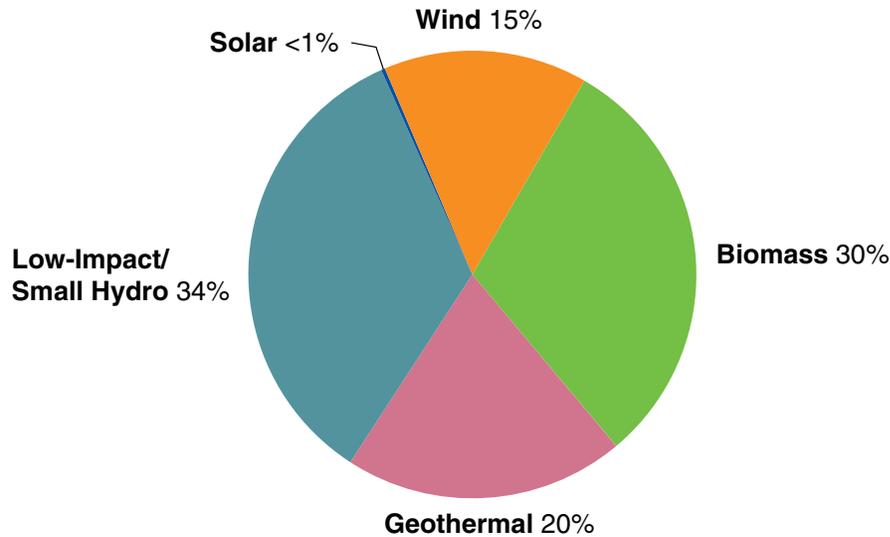
Total 2006 sales of renewables in competitive electricity products grew by 36 percent over 2005 numbers, shown in Table 10, beginning to reverse the contraction in certified competitive electricity products between 2004 and 2005. The greatest percentage growth from 2005 to 2006 was in wholesale sales, but commercial sales dominated in total volume. The numbers of both commercial and residential competitive electricity customers jumped, with commercial

⁸ Results are available from the Green Power Network at www.eere.energy.gov/greenpower/.

Table 10 Sales of Green-e Energy Certified Electricity by ESPs by Customer Type, 2006

	Renewables Sales (MWh)	Increase from 2005	Percent Total Competitive Electricity Sales	Customers	Average Renewables Purchase Size (MWh)
Residential	84,000	21%	17%	70,000	1.2
Commercial	273,000	10%	54%	300	910.0
Wholesale	148,000	179%	29%	4	37,000.0
Total	505,000	36%	100%	70,304	7.2

Figure 9 Renewable Resource Types Sold in Competitive Electricity Products



customers doubling and residential customers more than quintupling their 2005 figures.

As with REC wholesale sales, some amount of wholesale certified electricity was sold to other Green-e participants; most of the certified wholesale competitive electricity sales were transacted in this way in 2006. When these sales are removed, certified competitive electricity sales represented over 360,000 unique MWh in 2006. (see Table 10)

2006 is the last year in which certified competitive electricity products

may contain any renewables from facilities that became operational prior to 1997; starting in 2007, Green-e Energy Certified products may only contain new renewable resources. Of the renewables sold in certified competitive electricity products in 2006, 81 percent of renewables came from new facilities, up from 65 percent in 2005, and half of participating ESPs sold products comprised exclusively of new renewables.

The renewable resource types sold in competitive electricity products is represented in Figure 9, which shows a

dramatic shift since 2005. Geothermal resources supplied 20 percent of the renewables used, after being entirely absent from the certified competitive electricity mix in 2005. The proportion of biomass stayed consistent with 2005 levels, while hydro provided a substantially larger portion of supply than it did in 2005. Wind supply fell from over 50 percent of supply in the previous year to only 15 percent in 2006. ●

About CRS

The Center for Resource Solutions is a national nonprofit with global impact. CRS brings forth expert responses to climate change issues with the speed and effectiveness necessary to provide real-time solutions. Our leadership through collaboration and environmental innovation builds policies and consumer-protection mechanisms in renewable energy, greenhouse gas reductions, and energy efficiency that foster healthy and sustained growth in national and international markets.



Center for Resource Solutions

P.O. Box 29512
Presidio, Building 97
San Francisco, CA 94129
415-561-2100
www.resource-solutions.org



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