

# Center for Resource Solutions

## CERTIFIED RENEWABLE ENERGY PRODUCTS



### VERIFICATION RESULTS YEAR 2003

A report of the Green-e renewable energy product sales for Electricity Service Providers, Tradable Renewable Certificate Marketers, and Utilities.

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Center for



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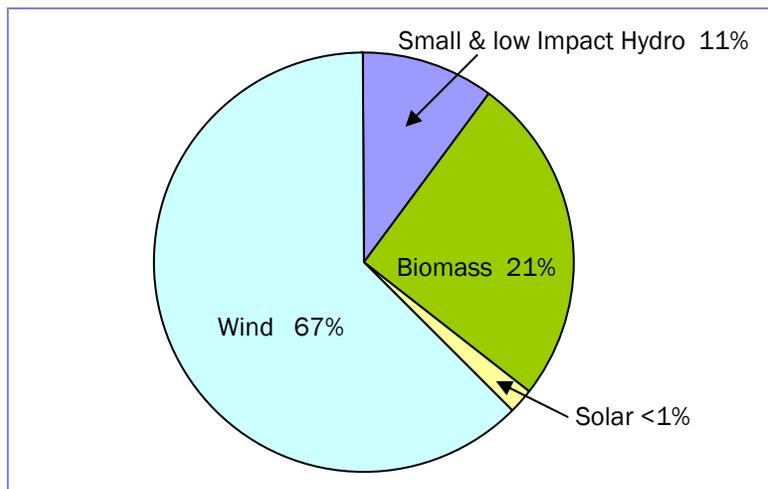
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## Special points of interest:

- > In 2003, 102 companies offered 65 Green-e products offering renewable electricity or TRCs.
- > Green-e renewable sales increased 76 percent in 2003 over 2002, for a total of over 2.9 million MWh.
- > In 2003, the proportion of large non-residential purchases increased to more than half of retail sales volume, compared to less than a quarter in 2002 .
- > Green-e certified TRC sales experienced a twelve-fold expansion in 2003 compared to 2002.
- > Forty-one percent of non-utility green power retail sales in the U.S. were certified by Green-e in 2003.

### Green-e Certified Resource Mix:

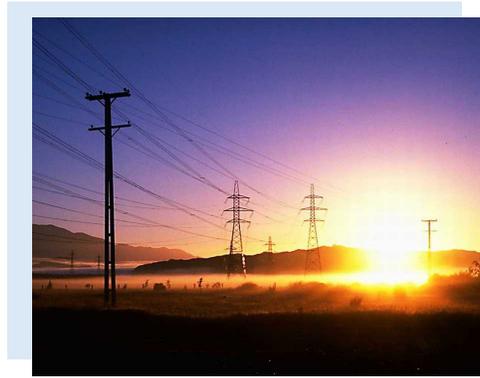


Green-e is administered by the non-profit Center for Resource Solutions (CRS). Renewable energy products that are certified by the Green-e Program must meet environmental and consumer protection standards that are established through the Green-e and Green Pricing stakeholder advisory process and CRS. The Program requires that providers undergo an annual independent audit and verification process and disclose information about their product to customers in a standardized format. The Green-e Program is expanding the retail market and building consumer confidence in retail renewable energy products. This document presents the results of the Green-e verification process for calendar year 2003 sales.



## Green-e Providers and Products

In 2003, sixty-five separate Green-e certified products were offered across the country. Green-e certified electricity products were sold in California, the Mid-Atlantic<sup>2</sup>, New England<sup>3</sup>, New York, Ohio, South Carolina, the Tennessee Valley Authority (TVA) Service Territory, Texas, and Wisconsin. Nationwide in 2003, fourteen electricity retailers, five utilities<sup>4</sup>, and eighteen TRC marketers participated in the Green-e Program.



## Green-e Sales and Customers

Green-e Competitive, TRC, and Green Pricing program sales totaled over 3.1 million MWh in 2003<sup>5</sup> compared to 1.7 million MWh in 2002. This 76 percent increase in Green-e certified sales in 2003 over 2002 was driven by a more than twelve-fold expansion in the volume of Green-e certified TRCs, and a 14 percent increase in the volume of Green-e electricity sold in monopoly markets through green pricing programs.

In 2003, nearly 94,000 customers<sup>6</sup> purchased Green-e certified renewable electricity products. Table 1 summarizes the customers and sales volume for each Green-e product type. Table 2, presents a comparison of Green-e certified sales in 2003 and 2002.

TABLE 1: Green-e Customers Served & Sales by Certified Product Type <sup>7</sup>

Type of Green-e Product	# Residential Customers	Residential Sales (MWh)	# Non-Residential Customers	Non-Residential Sales (MWh)	Wholesale Sales (MWh)
Competitive Electricity	67,500	462,000	500	255,200	420,500
TRC	2,700	8,000	400	332,000	1,494,500
Utility Green Pricing	20,900	122,300	1,500	28,100	-
<b>Subtotals</b>	<b>91,100</b>	<b>592,200</b>	<b>2,400</b>	<b>615,400</b>	<b>1,915,000</b>

TABLE 2: Green-e Electricity Sales for 2003 and 2002<sup>8</sup>

	NUMBER OF CUSTOMERS		SALES IN MWh	
	2003	2002	2003	2002
Competitive Electricity	68,000	126,000	1,137,700	1,436,000
TRCs	3,200	2,200	1,834,500	149,600
Utility Green Pricing	22,400	19,400	150,400	132,000
<b>Total</b>	<b>93,600</b>	<b>147,600</b>	<b>3,122,600</b>	<b>1,717,600</b>

<sup>2</sup> For the purposes of Green-e Criteria, the Mid-Atlantic region includes the following states; Delaware, Maryland, Pennsylvania, New Jersey, Virginia and Washington, DC.

<sup>3</sup> For the purposes of Green-e criteria, New England includes the following states; Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island and Vermont.

<sup>4</sup> One of the utilities, Tennessee Valley Authority, sells its Green-e product through 65 affiliated distribution utilities.

<sup>5</sup> Of the sales, 1,915,000 MWh were wholesale transactions of which, 58% were sold to non-Green-e certified retailers and utilities.

<sup>6</sup> The data in this report represent the number of customers at the end of 2003. In this report the term customers is interchangeable with electricity accounts.

<sup>7,8</sup> Figures are approximate due to rounding.

## Green-e Resource Mix

There were 2.9 million MWh of Green-e certified renewable resources sold in 2003. This represents a 76 percent increase in verified renewable sales over 2002. Eighty-two percent of total verified sales or 2.6 million MWh were from qualifying “new” renewable resources. Table 3, below, summarizes the total renewable energy sales and *new* renewable sales, by resource type, for Green-e certified electricity products in 2003 and 2002.

TABLE 3: Total Renewable Resource Mix for Green-e Sales in 2003<sup>9</sup>

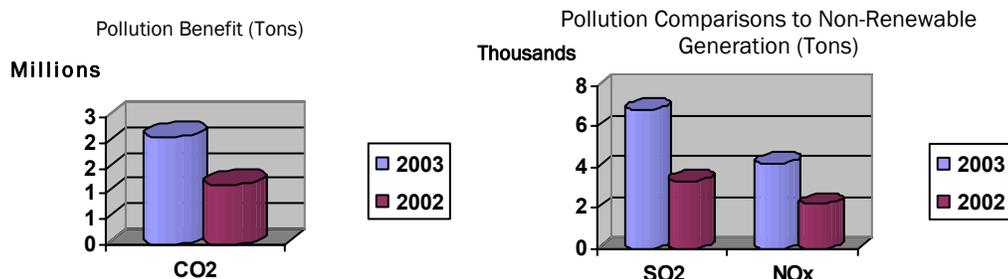
Resource	2003		2002	
	Total Renewables MWh	New Renewables MWh	Total Renewables MWh	New Renewables MWh
Wind	1,966,800 (67%)	1,966,700 (81%)	922,000 (48%)	922,000 (76%)
Biomass	627,000(21%)	598,200 (19%)	316,000 (16%)	285,000 (24%)
Small & Low Impact Hydro	323,000 (11%)	2,100 (<1%)	50,000 (3%)	-
Solar	1,300 (<1%)	1,300 (<1%)	1,100 (<1%)	1,000 (<1%)
Geothermal	-	-	637,000 (33%)	-
<b>Total</b>	<b>2,918,300 (100%)</b>	<b>2,568,300 (100%)</b>	<b>1,926,000 (100%)</b>	<b>1,208,000 (100%)</b>



## Green-e Environmental Benefits<sup>10</sup>

Nationwide, Green-e certified products sold in 2003 resulted in a pollution benefit of 2,127,900 tons of avoided carbon dioxide (CO<sub>2</sub>), a major contributor to global warming. The equivalent amount of non-renewable electricity generated in 2003 released 6,800 tons of sulfur dioxide (SO<sub>2</sub>), a precursor of acid rain, and 4,200 tons of nitrogen oxides (NO<sub>x</sub>), which causes smog. The total CO<sub>2</sub> benefits are 80 percent higher than in 2002, SO<sub>2</sub> equivalents are more than double 2002, and NO<sub>x</sub> figures are 88 percent higher than 2002.

TABLE 4: National Environmental Benefits and Comparisons of Green-e Product Sales 2003<sup>11</sup>



Please note that renewable energy generators and/or purchasers cannot claim reduction of regulated “cap and trade” pollutants such as SO<sub>x</sub> (and in some cases NO<sub>x</sub>). This is because renewable energy facilities are not assigned emission reduction credits; therefore renewable energy generation has no effect on the number of credits available. The Green-e program is the only certification program that actively monitors the claims of marketers to ensure that no false claims related to capped and traded pollutants are made. The SO<sub>x</sub> and NO<sub>x</sub> emissions comparisons are included in this report for data collection purposes only and are not intended to imply that emissions reductions of capped and traded pollutants occur due to renewable energy generation.

<sup>9, 11</sup> Figures are approximate due to rounding.

<sup>10</sup> All emissions data are from the United States Environmental Protection Agency’s Emissions and Generation Resource Integrated Database (EPA eGRID) 2003, Version 2.01 (For more information; <http://www.epa.gov/cleanenergy/egrid/index.htm>) and based on North American Electricity Reliability Council (NERC) regions (For more information; <http://www.nerc.com>). For a map of NERC regions, please see Appendix A.



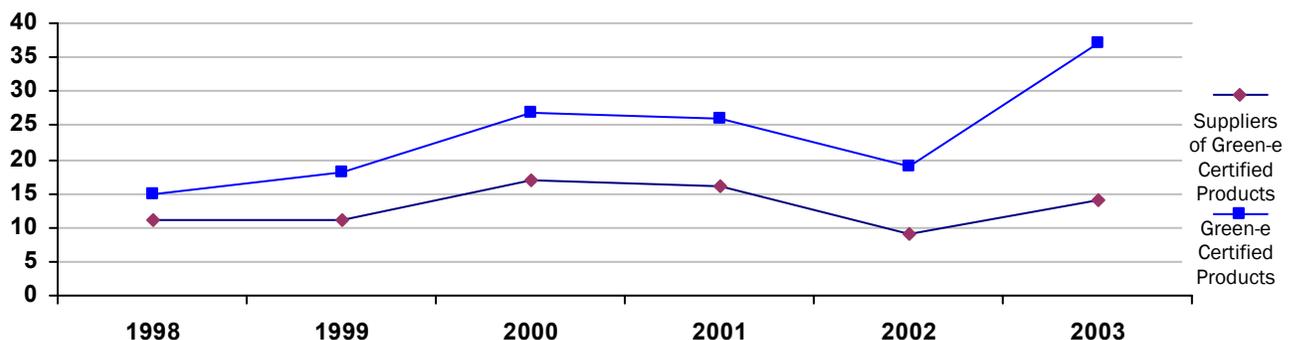
## Competitive Electricity Providers and Products

The following 14 ESPs offered 37 products for sale during calendar year 2003. Products were available in California, the Mid-Atlantic<sup>12</sup>, New England<sup>13</sup>, New York, Ohio, and Texas.

- AMP-Ohio
- Community Energy, Inc.
- Con Edison Solutions
- Conservation Services Group
- Constellation New Energy
- Energy Cooperative of PA
- Enron Energy Services
- EnviroGen
- Green Mountain Energy Co.
- Mass Energy
- Pepco Energy Services
- PPL Energy Plus
- Sacramento Municipal Utility District
- Sterling Planet

Table 5, below presents the evolution of the Green-e certified electricity program in terms of number of suppliers and products from 1998 through 2003.

TABLE 5: Green-e Competitive Market Activity 1998 – 2003



## Green-e Competitive Electricity Sales and Customers

Overall, customers purchasing Green-e certified electricity products in states with competitive electricity markets represented 45 percent of the green power customers. Green-e sales represented approximately 60 percent of total green power sales from competitive marketers<sup>14</sup>.

The total sales for Green-e certified competitive electricity products in 2003 were 1,137,700 MWh. In 2003 there was a shift from residential sales as a percent of sales volume to commercial sales compared to 2002. The average non-residential purchase increased from 3,150 kWh per month in 2002 to 44,680 kWh per month in 2003. This large increase in non-residential average monthly purchases is due to an increase in the number of large commercial buyers.

<sup>12</sup> For the purposes of Green-e Criteria, the Mid-Atlantic region includes the following states: Delaware, Maryland, Pennsylvania, New Jersey, Virginia and Washington, DC.

<sup>13</sup> For the purposes of Green-e criteria, New England includes the following states: Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island and Vermont.

<sup>14</sup> Sales and customer data based on Green-e verification data and Bird, Lori and Blair Sweazey. Green Power Marketing in the United States: A Status Report, 7th Edition. National Renewable Energy Laboratory, Golden, CO: 2004

TABLE 6: Green-e Competitive Electricity Customers and Sales<sup>15</sup>

In 2003 there was a 50 percent decrease in Green-e certified retail sales volume compared to 2002. One reason for this decrease may be that in 2003 non-residential customers replaced large competitive electricity purchases with TRC purchases. Wholesale sales were 420,500 MWh in 2003, of this total, 118,300 MWh were later re-sold in Green-e retail products. There were no Green-e certified wholesale sales in the competitive electricity market in 2002. Table 6, compares Green-e competitive electricity sales and customers in 2003 and 2002.

Customer Type	2003		2002	
	Customers	Sales (MWh)	Customers	Sales (MWh)
Residential	67,500	462,000	118,000	1,135,000
Non-Residential	500	255,200	8,000	301,000
Wholesale	10	420,500	-	-
<b>Total</b>	<b>68,000</b>	<b>1,137,700</b>	<b>126,000</b>	<b>1,436,000</b>

## Competitive Electricity Resource Mix



Green-e certified electricity products in 2003 amounted to nearly 995,000 MWh of renewable power. Table 7, below shows the resource sales mix and the amount of new renewables sold in 2003.<sup>17</sup>

TABLE 7: Sales Mix for Green-e Competitive Electricity Products in 2003<sup>16</sup>

Resource	% of Total Electricity Sold	Total Sales Volume (MWh)	New Renewable Sales Volume (MWh)
<b>Renewable Resources</b>	<b>87%</b>	<b>994,700</b>	<b>666,200</b>
Wind	29%	327,100	327,000
Biomass	30%	346,200	339,000
Small & Low Impact Hydro	28%	321,200	0
Solar	<1%	200	200
<b>Non-Renewable Resources</b>	<b>13%</b>	<b>143,000</b>	<b>-</b>
Large Hydro	2%	20,700	-
Natural Gas	2%	22,800	-
Municipal Solid Waste	2%	25,400	-
System Power	7%	74,100	-

The Green-e new renewables standard requires that certified products contain a specified percentage of new renewable resources. The proportion of new renewables in total Green-e certified product sales increased from 54 percent in 2002 to 59 percent in 2003. The increasing role of new renewables in Green-e products is strong evidence of the program achieving one of its primary missions: to increase demand for new renewables.

## Competitive Electricity Products Environmental Benefit<sup>18</sup>

Electricity generated to supply Green-e certified competitive electricity retail products in 2003 resulted in a pollution benefit of 523,700 tons of avoided carbon dioxide. In addition, the equivalent amount of non-renewable electricity generated in 2003 released 2,200 tons of sulfur dioxide, and 1,100 tons of nitrogen oxides.<sup>19</sup>

<sup>15</sup> Figures are approximate due to rounding.

<sup>16</sup> Figures are approximate due to rounding.

<sup>17</sup> Note that some Green-e electricity products are sold in blends with non-renewable electricity. For more information on Green-e new renewable standards, refer to the Green-e Competitive Electricity Standard at [www.green-e.org](http://www.green-e.org).

<sup>18</sup> All emissions data is from EPA eGRID 2003, Version 2.01 (For more information; <http://www.epa.gov/cleanenergy/egrid/index.htm>). Emissions are calculated based on NERC region (For more information; <http://www.nerc.com>) and supply.

<sup>19</sup> Please see Green-e Environmental Benefits Section (bottom of Page 4) for discussion of emissions claims for SO<sub>2</sub> and NO<sub>x</sub>.

## TRC Providers and Products

Eighteen TRC marketers provided certified products during calendar year 2003.

- 3 Phases Energy
- Aquila
- Bonneville Environmental Foundation
- Big Green Energy
- Community Energy Inc.
- Conservation Services Group
- EAD Environmental
- Evolution Markets
- Green Mountain Energy Co.
- Mainstay Energy
- Pacific Renewables
- PowerLight
- People's Power and Light
- PPM Energy
- Renewable Choice Energy
- Sterling Planet
- VisionQuest
- WindCurrent



All TRC retailers accepted customers from any location in the U.S. Green-e certified TRCs can be generated anywhere in North America and sold to any customer location.

Table 8, below presents the growth in the number of TRC marketer and products participating in Green-e from 2002 to 2003.

TABLE 8: Green-e TRC Market Activity 2002 - 2003<sup>20</sup>

Year	Suppliers of Green-e Certified Products	Green-e Certified Products
2002	7	11
2003	18	23

<sup>20</sup> Green-e did not certify TRC products prior to 2002.

# TRC Sales and Customers

Total retail and wholesale sales were over 1.8 million MWh of certificates, representing a twelve-fold increase over 2002. Retail customers purchasing a Green-e certified TRC product represented 62 percent of all customers purchasing retail TRC products in the U.S. In addition, Green-e retail sales represented approximately 52 percent of all TRC retail sales in the U.S. Eighty-six percent of customers were retail residential, however over 99 percent of the demand was from non-residential and wholesale buyers. The majority of wholesale sales (82%) were resold by monopoly utilities and competitive ESPs in non-Green-e certified products through retail green power programs.



The average non-residential customer purchased over 70,000 kWh of new renewable certificates per month in 2003. This is more than double the number of certificates sold to non-residential customers per month in 2002. As Table 9 indicates, nationwide, nearly 3,200 retail customers purchased Green-e certified TRCs in 2003; this represents a 45 percent increase over 2002.

TABLE 9: Sales of Green-e TRC Products in 2003<sup>21</sup>

Type of Customer	# of Customers (2003)	# of Customers (2002)	MWh of Sales (2003)	MWh of Sales (2002)	% of Sales (2003)	% of Sales (2002)
Residential	2,730	2,030	8,000	8,600	<1%	6%
Non-Residential	390	190	332,000	68,000	18%	45%
Wholesale	50	20	1,494,500	73,000	81%	49%
<b>Total</b>	<b>3,170</b>	<b>2,240</b>	<b>1,834,500</b>	<b>149,600</b>	<b>100%</b>	<b>100%</b>

Figures 2 and 3, show Green-e residential and non-residential TRC sales by NERC region.<sup>22</sup>

FIGURE 2: Regional Residential TRC

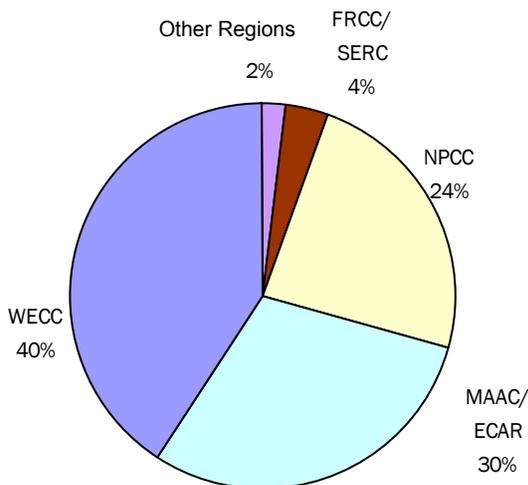
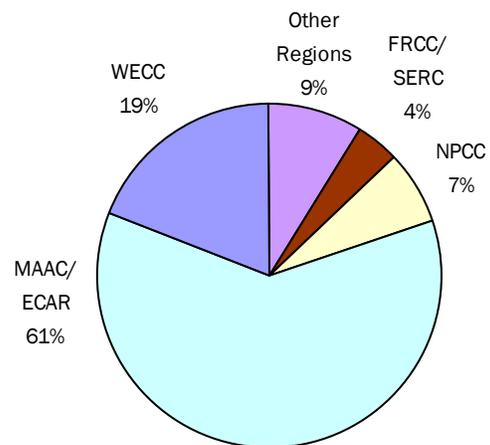


FIGURE 3: Regional Non Residential



<sup>21</sup> Figures are approximate due to rounding.

<sup>22</sup> For a map of NERC regions, please see **Appendix A**. The NPCC and WECC regions only refer to the U.S. and do not include Canadian provinces.

## TRC Resource Mix

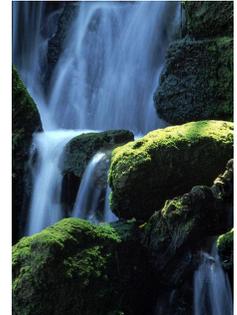
Table 10, below shows the resource mix for Green-e certified TRC sales in 2003. Wind power was the dominant source of renewable electricity generation used for TRC sales at 88 percent of the total supply.

TABLE 10: 2003 Resource Mix for Green-e TRC Products<sup>23</sup>

New Renewable Resource	TRC Sales (MWh)
Wind	1,622,300
Biomass	211,800
Solar	500
<b>Total</b>	<b>1,834,600</b>

TRC % of Sales
<p>A pie chart titled 'TRC % of Sales' showing the distribution of renewable energy sources. The largest slice is blue, representing Wind at 88%. A smaller green slice represents Biomass at 12%. A very thin white slice represents Solar at less than 1%.</p>

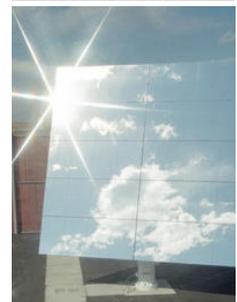


## Location of TRC Supply<sup>24</sup>

The WECC region provided the majority of the supply for TRC products. Details of Green-e certified TRC supply by region in which the generator was located are listed below.

TABLE 11: Geographic Source of 2003 Green-e TRC Supply<sup>25</sup>

Region	TRCs supplied (MWh)	% of Supply	% of Sales
<b>WECC</b>	1,453,600	63%	20%
<b>SPP</b>	434,400	19%	<1%
<b>MAAC/ECAR</b>	382,400	17%	60%
<b>Other Regions</b>	42,500	1%	20%
<b>Totals</b>	<b>2,313,000</b>	<b>100%</b>	<b>100%</b>



## TRC Products Environmental Benefit<sup>26</sup>

Renewable electricity generation used to supply Green-e TRC products in 2003 resulted in a pollution benefit of 1,400,000 tons of avoided carbon dioxide. The equivalent amount of non-renewable electricity generated in 2003 released 3,700 tons of sulfur dioxide and 2,700 tons of nitrogen oxides.<sup>27</sup>

<sup>23</sup> Figures are approximate due to rounding

<sup>24</sup> For a map of NERC regions, please see Appendix A.

<sup>25</sup> Green-e providers purchased more TRCs than required to satisfy their sales; therefore the sales total is lower than the total verified supply. The percentages in this table are provided for comparison. Wholesale sales to Green-e providers are not included in the supply numbers to avoid double counting. Figures are approximate due to rounding.

<sup>26</sup> All emissions data is from EPA eGRID 2003, Version 2.01 (For more information; <http://www.epa.gov/cleanenergy/egrid/index.htm>). Emissions are calculated based on NERC region (For more information; <http://www.nerc.com>) and supply.

<sup>27</sup> Please see Green-e Environmental Benefits Section (bottom of Page 5) for discussion of emissions claims for SO<sub>2</sub> and NO<sub>x</sub>.



## Green Pricing Providers and Products

Five utilities completed the verification audit for sales during calendar year 2003.

- City of Palo Alto Utilities
- Santee Cooper
- Tennessee Valley Authority (TVA)<sup>28</sup>
- We Energies
- Wisconsin Public Service

## Green Pricing Sales and Customers

In 2003, there were over 22,000 customers purchasing Green Pricing Accredited products, a 15 percent increase from year 2002. Total sales to Green Pricing customers in 2003 were over 150,000 MWh, a 14 percent increase over 2002.

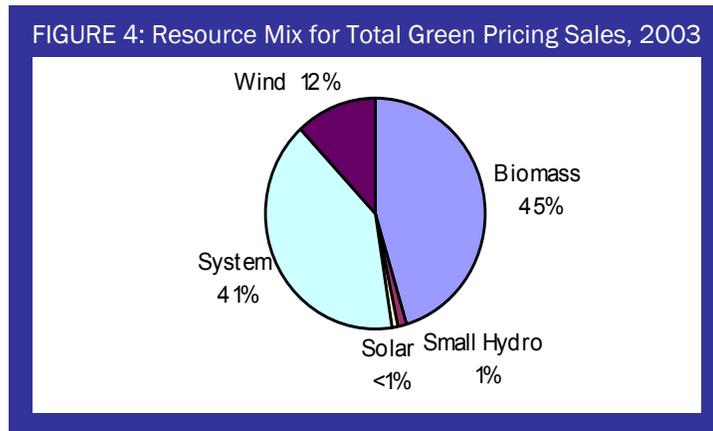
TABLE 12 Green-e Accredited Green Pricing 2003 Customers and Sales by Customer Class<sup>29</sup>

<b>Customer Class</b>	<b>Total Customers</b>	<b>Total MWh</b>
Residential	21,000 (93%)	122,500 (81%)
Non-Residential	1,500 (7%)	28,000 (19%)
<b>Total</b>	<b>22,500</b>	<b>150,500</b>

The five utilities averaged about a one percent participation rate in their green pricing programs measured as a percentage of the number of meters served by the utility. This falls within the national average for utility green pricing programs. In addition, four of the five Green-e certified utility products are on the NREL Top Ten<sup>30</sup> lists for successful Green Pricing Programs.

## Green Pricing Resource Mix

Fifty-nine percent of total verified sales or 89,000 MWh were from renewable generation, of which over 68,000 MWh were from new renewable generation. Figure 4, below shows the resource mix for Green-e Green Pricing Sales.



28 TVA sells its Green-e product through 65 affiliated distribution utilities.

29 Figures are approximate due to rounding.

30 NREL Green Power Network Green Pricing Top Ten Utility Green Pricing Programs; <http://www.eere.energy.gov/greenpower/markets/pricing.shtml?page=3> for full list.

## Green Pricing Products and Environmental Benefit<sup>31</sup>

Green Pricing retail products sold in 2003 resulted in a pollution benefit of 204,200 tons of avoided carbon dioxide. The equivalent amount of non-renewable electricity generated in 2003 released 900 tons of sulfur dioxide and 500 tons of nitrogen oxides.<sup>32</sup>



### For further information

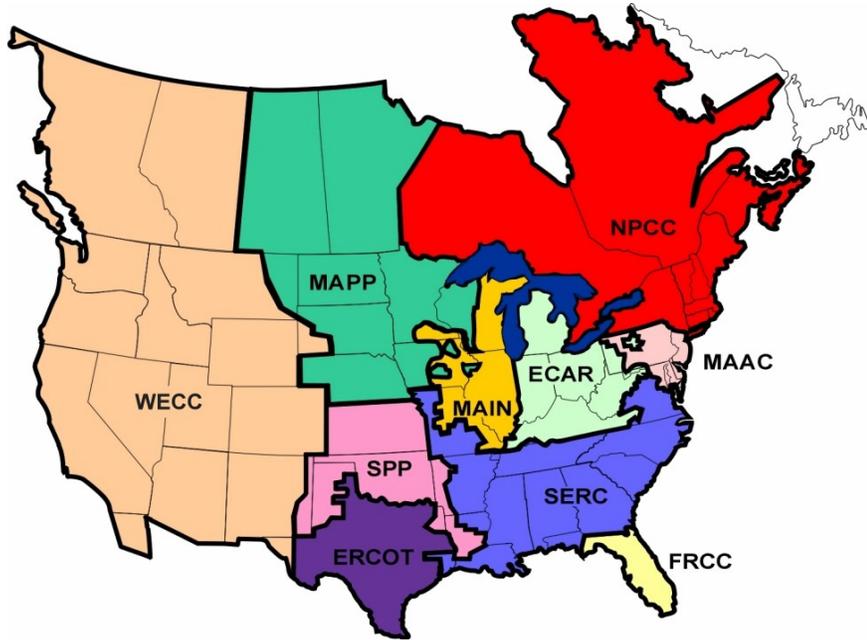
*The Green-e Program is the only national certification program for renewable electricity and TRC products. For more information about competitive electricity and TRC markets and products, and for a copy of this report, please visit the Green-e website at [www.green-e.org](http://www.green-e.org). More information on the Green Pricing Accreditation program can be found on the CRS website, [www.resource-solutions.org](http://www.resource-solutions.org). For other Green-e questions or comments, please call our toll free number at 1 (888) 63-GREEN or contact the Center for Resource Solutions at (415) 561-2100.*

<sup>31</sup>All emissions data is from EPA eGRID 2003, Version 2.01 (For more information; <http://www.epa.gov/cleanenergy/egrid/index.htm>). Emissions are calculated based on NERC region (For more information; <http://www.nerc.com>) and supply.

<sup>32</sup>Please see Section 1.6 for discussion of emissions claims for SO<sub>2</sub> and NO<sub>x</sub>.

# NERC Regions

The following map and table detail the breakdown of the North American Electricity Reliability (NERC) regions.



NERC Region	States
ASCC	Alaska
ECAR	Indiana, Kentucky, Michigan, Ohio, Pennsylvania*, West Virginia
ERCOT	Texas*
FRCC	Florida*
HICC	Hawaii
MAAC	Delaware, District of Columbia, Maryland, New Jersey, Pennsylvania*
MAIN	Illinois, Iowa*, Missouri*, Wisconsin*
MAPP	Iowa*, Minnesota*, Montana*, Nebraska, North Dakota, South Dakota*, Wisconsin*
NPCC (Only US)	Connecticut, Maine, Massachusetts, New Hampshire, New York, Rhode Island, Vermont
SERC	Alabama, Arkansas*, Florida*, Georgia, Louisiana*, Mississippi, Missouri*, North Carolina, South Carolina, Tennessee, Virginia
SPP	Arkansas*, Kansas, Louisiana*, New Mexico*, Texas*, Oklahoma*,
WECC (Only US)	Arizona, California, Colorado, Idaho, Montana, Nevada, New Mexico*, Oregon, South Dakota*, Texas, Utah, Washington, Wyoming

\* Note that these states reside in more than one NERC region.