



CRS

center for
resource
solutions

2011 Green-e Verification Report

Green-e® is the nation's leading independent certification and verification program for renewable energy and greenhouse gas emission reductions in the voluntary market. There are three Green-e programs: Green-e Climate is a global certification program that sets consumer-protection and environmental-integrity standards for carbon offsets sold in the voluntary market. Green-e Energy is North America's leading independent certification and verification program for renewable energy. Green-e Marketplace provides forward-thinking organizations a simple, nationally recognized logo they can use to communicate their renewable energy and climate commitment to their customers and shareholders. To learn more about Green-e, visit www.green-e.org.



Green-e

About Center for Resource Solutions

Center for Resource Solutions (CRS) creates policy and market solutions to advance sustainable energy. It is a national nonprofit with global impact, bringing forth expert responses to climate change issues with the speed and effectiveness necessary to provide real-time solutions. Its leadership through collaboration and environmental innovation builds policies and consumer-protection mechanisms in renewable energy and greenhouse gas reductions that foster healthy and sustained growth in North American and international markets.

About Green-e

For over fifteen years CRS has developed and implemented consumer-protection standards for the voluntary renewable energy market through the Green-e program. These standards mandate a rigorous accountability for retail products sold to consumers, bringing a level of transparency that can bolster consumer confidence in the industry. Green-e has three programs:

Green-e Energy is North America's leading voluntary certification program for renewable energy. Since 1997, Green-e Energy has been certifying renewable energy that meets environmental and consumer protection standards developed in conjunction with leading environmental, energy, and policy organizations. Green-e Energy requires that sellers of certified renewable energy disclose clear and useful information to potential customers, allowing consumers to make informed choices. For more information, see www.green-e.org/energy.

Green-e Climate is the first certification program for carbon offsets sold to consumers on the retail market. This consumer-protection program strengthens the voluntary market by providing credible oversight and transparency to retail greenhouse gas (GHG) emission reduction products (offsets), from beginning to end. Consumers purchasing Green-e Climate certified offsets have clear information about the projects their GHG reductions are sourced from, and are guaranteed that no one else can claim their offset. The program verifies that a seller's supply of offsets equals their sales, that GHG reductions are independently certified, and that consumer disclosures are accurate. For more information, see www.green-e.org/climate.

Green-e Marketplace certifies companies across a range of industries, from food to paper manufacturers to web services, and offers them a range of services to help them better find, use, and promote clean energy and greenhouse gas emissions reductions in their operations and facilities. For more information, see www.green-e.org/marketplace.

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Green-e Energy

Green-e Energy is the leading certification program for voluntary renewable energy products in North America.

On behalf of consumers buying renewable energy products certified by Green-e Energy, the program requires that such products undergo an independent annual audit to demonstrate compliance with Green-e Energy's rigorous consumer-protection and environmental standards. Green-e Energy requires that sellers of certified renewable energy products provide full and accurate information to their customers, deliver the renewable energy they promise, and source from renewable energy generators that meet Green-e Energy's resource eligibility requirements, developed by stakeholders over the past 15 years.

Green-e Energy certified renewable energy products are sold in three different types:

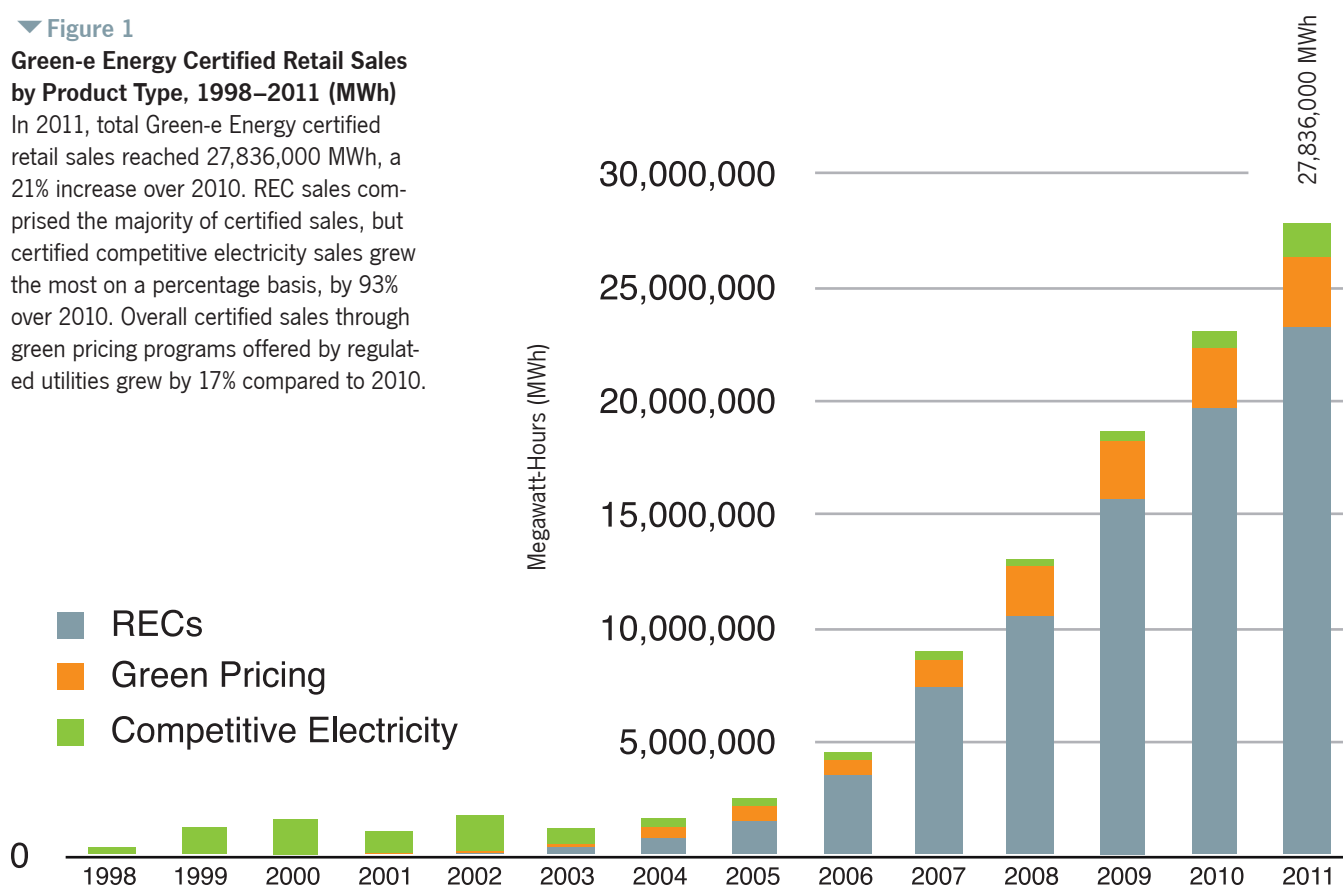
- **Green Pricing Programs.** Renewable electricity sold by electric utilities in regulated electricity markets, provided beyond the renewable electricity included in standard electricity service.
- **Competitive Renewable Electricity.** Similar to a green pricing program, but sold by an electric service provider in a deregulated electricity market.
- **Renewable Energy Certificates (RECs).** A REC is the way that renewable electricity generation and use is tracked and accounted for. A REC represents the non-electricity attributes of one MWh of renewable electricity generation, including all the environmental attributes, and is a tradable commodity that can be sold separately from the underlying electricity, allowing for a larger and more efficient national market for renewable energy.

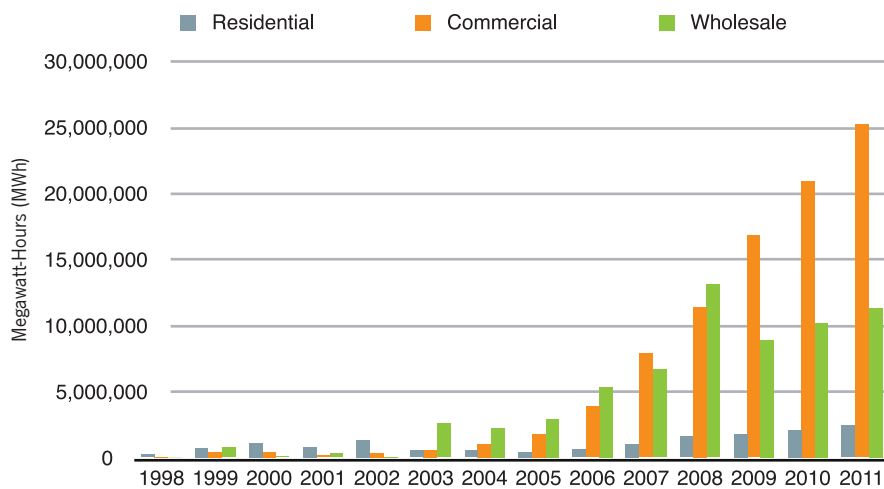
As the public's awareness of the impacts of pollution arising from electricity generation, energy security issues, and sustainable economic development rises, the demand for renewable energy has increased greatly, as the following pages will show. In fact, voluntary certified renewable energy sales in the U.S. have increased an average of 33% each year since 2007. When Green-e Energy began in 1997, it was the first certification program of its kind, and it has remained the most respected renewable energy certification program in North America.

▼ Figure 1

Green-e Energy Certified Retail Sales by Product Type, 1998–2011 (MWh)

In 2011, total Green-e Energy certified retail sales reached 27,836,000 MWh, a 21% increase over 2010. REC sales comprised the majority of certified sales, but certified competitive electricity sales grew the most on a percentage basis, by 93% over 2010. Overall certified sales through green pricing programs offered by regulated utilities grew by 17% compared to 2010.

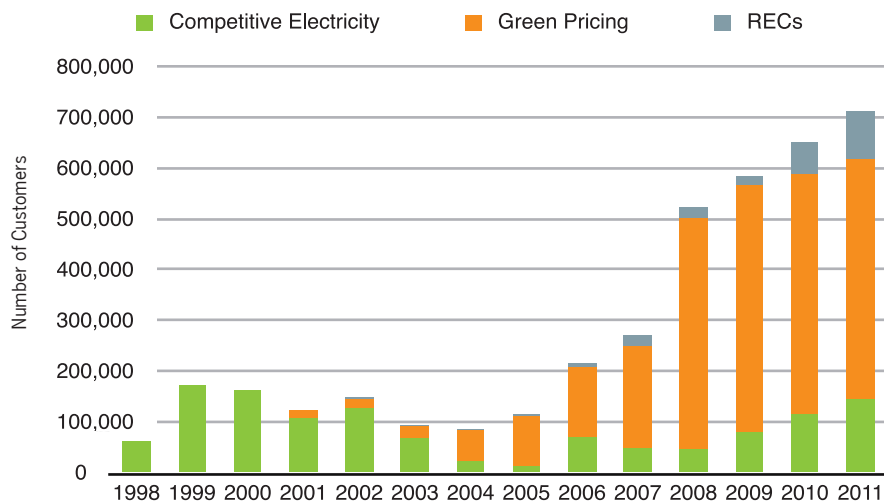




◀ **Figure 2**

Green-e Energy Certified Sales by Customer Type, 1998–2011 (MWh)

Non-residential entities once again accounted for the vast majority of certified MWh purchased, at over 25.4 million MWh, up by 21% over 2010. 2011 also saw a 17% increase in certified residential sales volume, reaching nearly 2.5 million MWh, or more than the annual residential load of Maine and Vermont combined. Although there are significantly more residential customers that purchase Green-e Energy certified renewable energy, they tend to purchase smaller amounts than non-residential customers.



◀ **Figure 3**

Number of Retail Customers Purchasing Green-e Energy by Product Type, 1998–2011

In 2011, over 470,000 mostly residential customers participated in a certified green pricing program. Competitive electricity programs continued their annual growth rates of over 25% since 2008, with participation roughly split between residential and non-residential customers. Residential customers made up the majority of REC purchasers as well, despite more volume going to non-residential customers. Overall, the number of REC purchasers increased by 52% in 2011, and the total number of REC purchasers quadrupled since 2007.



◀ **Figure 4**

States With Green-e Energy Certified Renewable Electricity Options, 2011

Many customers throughout the U.S. have the option to purchase Green-e Energy certified renewable energy through their local utility or electric service provider. In 2011, the number of states with certified, bundled renewable electricity options available increased to 36.

RECs unbundled from electricity are available to buyers regardless of location. Businesses purchasing large MWh volumes tend to purchase unbundled RECs, while residential customers and businesses purchasing smaller volumes tend to purchase a bundled electricity product available through their utility or electric service provider.

Table 1 Total Green-e Energy Certified Sales of Renewable Energy by Product Type and Customer Type, 2011 (MWh, rounded)

	Retail Residential	Retail Commercial	Wholesale
RECs	508,000	22,723,000	11,274,000
Green Pricing	1,653,000	1,471,000	0
Competitive Electricity	317,000	1,164,000	66,000
Total Sales	2,478,000	25,358,000	11,340,000
Total Retail: 27,836,000 MWh Total Unique Certified: 33,853,000 MWh Total Certified Transactions: 39,176,000 MWh			

▲ **The total volume of all Green-e Energy certified transactions in 2011 reached over 39.1 million MWh, an 18% increase from the 2010 total.**

This total represents transactions of all types, including both certified retail sales to electricity end users looking to make a green power use claim, and wholesale

sales to resellers of renewable MWh that did not claim the RECs themselves.

Green-e Energy certified wholesale transactions exceeded 11.3 million MWh in 2011. Of these certified wholesale transactions, over 5.3 million MWh were resold in Green-e Energy certified retail transactions. The remaining 6 million MWh were sold in non-Green-e Energy certified

transactions to utilities, electric service providers, power marketers, and other buyers in the voluntary market. Removing the instances of renewable MWh certified by Green-e Energy at both the wholesale and retail levels, Green-e Energy certified sales of nearly 33.9 million unique MWh in 2011, an increase of almost 24% from 2010.

TOP 10 STATES BY RETAIL SALES VOLUME (MWh)

TEXAS 15% NEW YORK 9% CALIFORNIA 7%
 WASHINGTON, D.C. 7% MINNESOTA 6%
 WASHINGTON 6% NEW JERSEY 5%
 PENNSYLVANIA 5% ILLINOIS 5% MARYLAND 4%

▲ **Table 2**

Top Ten States Purchasing Retail Green-e Energy Certified Renewable Energy by Percent of Total Certified Retail Sales (MWh), 2011

Green-e Energy collects data on the number of retail customers and the certified MWh delivered to them. Texas claimed the top spot for number of certified renewable MWh delivered to retail customers. 69% of Green-e Energy certified renewable MWh are delivered to customers located or headquartered in these top 10 states.

► **Retail customers buying Green-e Energy certified renewable energy are spread out throughout the U.S. and Canada.** However, 78% of retail customers are located in these top 10 states. For the fourth year in a row, Tennessee maintained the number-one slot with its large number of retail customers.

There is significant overlap between these two “Top Ten” lists, but the main difference relates to the purchasing habits of retail customers. For instance, although Tennessee has the largest number of customers, these customers are buying fewer MWh on average.

Table 3 Top Ten States by Highest Number of Retail Customers Purchasing Green-e Energy Certified Renewable Electricity, 2011

Tennessee	17%
Texas	12%
California	9%
Washington	7%
Oregon	7%
New York	6%
Colorado	5%
Michigan	5%
Wisconsin	5%
Minnesota	5%

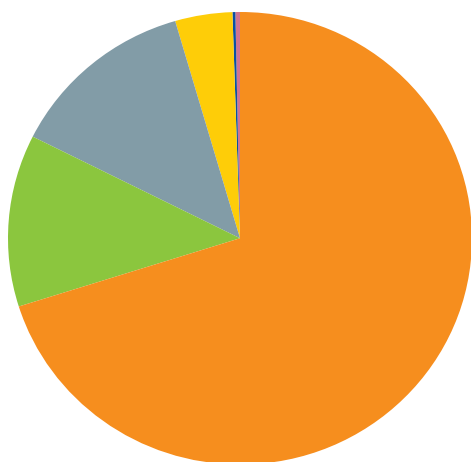


Figure 5
Contributions of Renewable Resource Types to Total Green-e Energy Certified Retail Sales, 2011

- Wind (70%)
- Non-Gaseous Biomass (12%) ¹
- Low-Impact Hydro (13%)
- Gaseous Biomass (4%)
- Solar (0.2%)
- Geothermal (0.3%)

▲ **The U.S. is abundant with the potential for many different types of renewable resources.** In 2011, wind continued to dominate the voluntary market for renewable energy. Over half of installed wind facilities in the U.S. participate in Green-e Energy certified transactions, based on total capacity. ²

2011 also saw large growth in low-impact hydropower facilities and slighter proportional increases among the gaseous biomass and non-gaseous biomass resources, while solar facilities and geothermal facilities maintained their overall percentage share.

► **Over two-thirds of the renewable energy certified by Green-e Energy was sourced from these top 10 states.**

This is primarily related to the high wind content in many certified products, and the high rate of potential for (and installation of) wind facilities in the middle of the country. The difference between states with generators and purchasers of renewable energy demonstrates how the national market for renewable energy certificates is allowing customers with limited access to local renewable energy products to support changes in the national generation portfolio.

Table 4 Top Ten States Supplying Renewable Energy to Green-e Energy Certified Retail Sales by Percent of Total Certified MWh, 2011

Texas	15%
Iowa	12%
Oklahoma	9%
Kansas	8%
North Dakota	6%
Nebraska	5%
Montana	4%
Florida	3%
South Dakota	3%
Tennessee	3%

▼ **Based on the most recently available National Renewable Energy Laboratory (NREL) data, Green-e Energy certified sales are estimated to make up over 99% of all retail REC sales in the U.S.**³ Non-residential customers purchasing large volumes of

renewable energy certificates (RECs) make up the majority of the overall voluntary renewable energy market on a MWh basis, and this portion of the market has continued to grow. This rate of growth for MWh of certified REC purchases by non-residential customers has started to slow

over the past two years, but the number of non-residential customers has more than tripled in that time. And although the number of residential customers purchasing RECs makes up a small portion of the market, this number is growing quickly.

Table 5 Green-e Energy Certified Sales of Renewable Energy Certificates by Customer Type, 2011

	2011 Sales (MWh, rounded)	Percent Change From 2010	Percent of Total Retail REC Sales	Customers	Average Purchase Size (MWh)
Residential	508,000	49%	2.2%	82,000	6
Non-Residential	22,893,000	18%	97.8%	14,500	1,570
Total Retail	23,401,000	19%	100.0%	96,500	
Wholesale	11,274,000	11%		97	116,910

1. Gaseous Biomass includes landfill gas, wastewater methane, digester gas, biogas, and other biogenic gases. Non-gaseous Biomass includes wood waste, sawmill waste, black liquor, agricultural waste, ethanol, fuel crops, and other resources as described in the *Green-e Energy National Standard*, available at www.green-e.org/getcert_re_stan.shtml.

2. Based on total U.S. wind power capacity installed in 2011. Available at www.awea.org/learnabout/industry_stats/.

3. *Status and Trends in U.S. Compliance and Voluntary Renewable Energy Certificate Markets (2010 Data)*. Available at apps3.eere.energy.gov/greenpower/pdfs/52925.pdf.

Table 6 Green-e Energy Certified Sales in Green Pricing Programs by Customer Type, 2011

	2011 Sales (MWh, rounded)	Percent Change From 2010	Percent of Total Green Pricing Sales	Customers	Average Purchase Size (MWh)
Residential	1,653,000	10%	53%	455,000	4
Commercial	1,471,000	28%	47%	18,000	82
Total	3,124,000	17%	100%	473,000	

▲ **In states where the electricity market is regulated, many customers can purchase a bundled renewable electricity product, known as a utility green pricing program, from their local utility.** Utility programs in Green-e Energy consistently rank high in the National Renewable Energy Laboratory's Top Ten rankings in terms of customer participation rate, total number of subscribers, and total MWh sold. In 2011, these programs recovered from a slight dip in the number of MWh purchased by residential customers from 2010, and there are now more Green-e Energy certified MWh sold through green pricing programs than ever before. Although the number of MWh sold to retail customers increased 17% in 2011, the overall number of utility green pricing customers stayed flat between 2010 and 2011.

Table 7 Green-e Energy Certified Sales of Electricity by ESPs by Customer Type, 2011

	2011 Renewable Sales (MWh, rounded)	Percent Change From 2010	Percent of Total Competitive Electricity Retail Sales	Customers	Average Purchase Size (MWh)
Residential	317,000	15%	21.4%	85,000	4
Commercial	1,164,000	137%	78.6%	60,000	19
Total Retail	1,481,000	93%	100%	145,000	
Wholesale	66,000	-31%		<10	66,000

▲ **In states where the electricity market has been deregulated, customers have the option to choose their electric service provider (ESP).** The market for certified competitive electricity products has increased dramatically for non-residential customers. Since 2009, the number of businesses purchasing Green-e Energy certified competitive electricity products has quadrupled, and the number of MWh they are purchasing increased over 500%.



Over **300** companies participated in Green-e Energy in 2011, including **66** REC sellers offering **72** Green-e Energy certified REC products, **221** utility green pricing program participants* offering **29** certified green pricing programs, and **14** competitive electricity suppliers offering **19** certified renewable electricity programs.

3 Phases Renewables
3Degrees
AEP Retail Energy LLP
Alliant Energy
Ambit Energy, LP
Ameren Missouri
Arizona Public Service
Austin Energy
BlueStar Energy Services
Bonneville Environmental Foundation
Carbon Solutions Group
Cascade Renewable Energy
Cincinnati Bell Energy
Cirro Group, Inc.
City of Palo Alto Utilities
Clean Currents
ClearView Electric Inc.
Community Energy, Inc.
Community Green Energy, LLC
ConEdison Solutions
Constellation Electric dba BGE Home
Constellation NewEnergy
Consumers Energy Company
Direct Energy
Dominion Virginia Power
DTE Energy
Duke Energy
EcoElectrons Renewable Energy
EDF Trading
Element Markets, LLC
Empire District Electric
Energy Plus Holdings LLC
Eugene Water and Electric Board
Evergreen Wind Power, LLC
Evolution Markets
Exelon Energy Company

FirstEnergy Solutions Corp.
Georgia Power
Glacial Energy V.I.
Good Energy
Green Mountain Energy Company
Green Power EMC
Greenlight Energy
Hampton Lumber Mills—Washington, Inc.
Hess Corporation
Hudson Energy Services
Iberdrola Renewables, LLC
ICAP United, Inc.
Indianapolis Power & Light Company
Integrus Energy Services, Inc.
J.P. Morgan Ventures Energy Corporation
Kansas City Power and Light
Greater Missouri Operations
LG&E and KU Energy
Luminant Energy Company, LLC
McKinney LFG, LLC
NativeEnergy
New York Power Authority
Nexant Clean Energy Markets
NextEra Energy Resources, LLC
Noble Americas Energy Solutions LLC
North American Power and Gas, LLC
NSTAR Electric Company
OneEnergy Renewables
PacifiCorp
Pepco Energy Services
Platte River Power Authority
Powerex Corp
Public Service Company of Oklahoma
Puget Sound Energy
Reliant Energy
Renewable Choice Energy
Sacramento Municipal Utility District

Salt River Project
Santee Cooper
Seattle City Light
Silicon Valley Power—City of Santa Clara
Soltage
Sterling Planet, Inc.
Suez Energy Resource NA, Inc.
SunPower Corporation
Tennessee Valley Authority (TVA)
The CarbonNeutral Company
The Offset Project
TransAlta
TXU Energy
Viking Wind Partners, LLC
Viridian Energy, Inc.
Wabash Valley Power Association
Washington Gas Energy Services (WGES)
We Energies
WindStreet Energy
WPPI Energy
Xcel Energy

Green-e Program Governance

Green-e Energy and Green-e Climate are governed by an independent board called "The Green-e Governance Board". CRS serves as the program administrator. The Board ensures that the program's standards and policies are appropriate and necessary to meet its stated goals and objectives, and that certification and verification are handled in a credible and effective manner. The board regularly reviews the program's standards in consultation with stakeholders and amends them as necessary so that they remain consistent with changing circumstances and evolve with market conditions.

* Retail distributors not listed

Green-e Climate

As the only independent, third-party certification program for retail carbon offsets in the voluntary carbon market, Green-e Climate provides critical consumer-level protections and assurances to retail purchasers, sellers, and greenhouse gas (GHG) project certification programs in the market. The program is intended to strengthen credibility in the voluntary carbon market and thereby promote use of carbon offsets by individuals and companies to reduce their GHG footprints.

2011 marked another year of growth in the volume of sales of Green-e Climate certified carbon offsets and the number of certified offset products offered by participating sellers. Certified sales grew by nearly 9% from 2010 to 220,236 metric tons carbon-dioxide-equivalent (tCO₂e). This represents over 60% cumulative growth since the program's inception just three years prior.

Green-e Climate is an international program. Offset projects supplying emissions reductions in 2011 to certified products can be registered with any of the five endorsed project verification standards—the Clean Development Mechanism (CDM), the Climate Action Reserve, the Gold Standard, CRS's Protocol for Renewable Energy (PRE), or the Verified Carbon Standard (VCS)—and may be located around the world. In 2011, reductions supplying Green-e Climate certified offsets

were sourced from renewable energy and methane capture project types, mostly wind electricity generation and methane capture and reutilization from coal mines. Other project types included solar, biomass, sustainable hydro, and geothermal power generation, and methane capture from landfills. Emissions reductions were overwhelmingly sourced from U.S. projects, though Chinese, Turkish, and Brazilian projects also supplied reductions to certified products. The project verification standards utilized included the PRE and VCS, where VCS repre-

sented 42% of Green-e Climate certified sales in 2011, up from 27% in 2010.

Buyers of Green-e Climate certified offsets in 2011 were overwhelmingly US businesses buying through individually negotiated contracts, though certified offsets were also sold to individuals and through third-party distributors. Buyers were located in 41 of 50 states, plus Washington, D.C., Canada, and the UK. New York, Massachusetts, and Ohio had the most buyers, and New York and Florida buyers bought the most certified offsets.

Figure 6
Project Types Used in Green-e Climate Certified Offsets, 2011

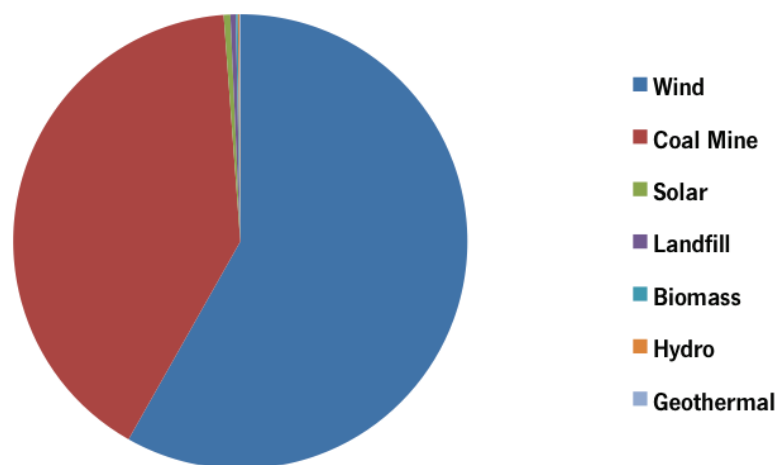


Figure 7
Top 10 Buyer Locations by 2011 Certified Sales

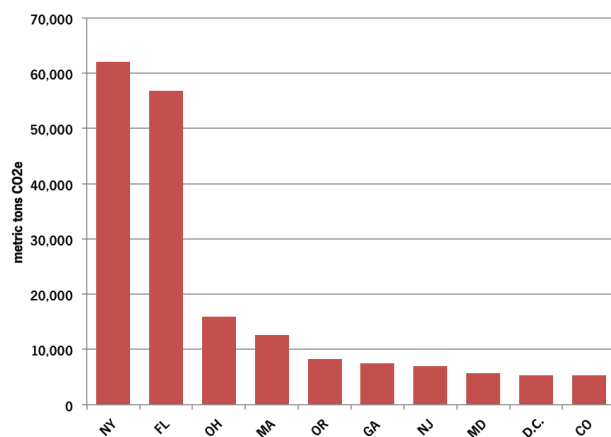
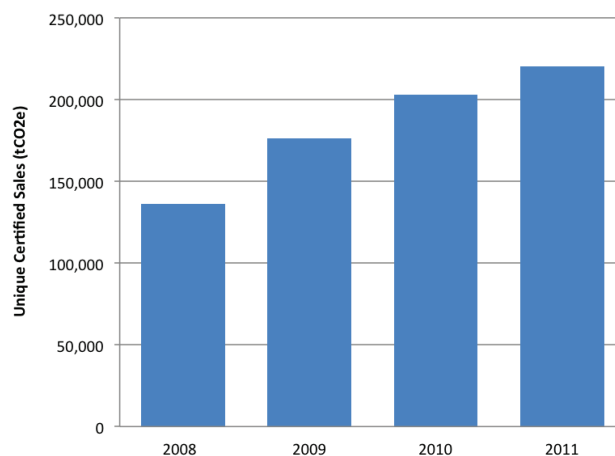


Figure 8
Green-e Climate Program Growth



ee engagement in renewable energy as well as energy-management perspectives from Silicon Valley companies. Green-e Marketplace staff undertook significant outreach, attending a variety of conferences speaking on the benefits of renewable energy and communicating commitments through Green-e Marketplace certification. In addition to case studies, Green-e Marketplace began a video series highlighting the renewable energy commitments of its participants. Green-e Marketplace also continued to build on and rely on its outside advisory council and membership subgroups to help increase program feedback and participant involvement in future program development. ●

11



Center for Resource Solutions creates policy and market solutions to advance sustainable energy.