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LOCAL GOVERNMENT CLIMATE AND ENERGY STRATEGY SERIES

Green Power Procurement

A Guide to Developing and Implementing Greenhouse Gas Reduction Programs

U.S. ENVIRONMENTAL PROTECTION AGENCY
2014

EPA's Local Government Climate and Energy Strategy Series

The Local Government Climate and Energy Strategy Series provides a comprehensive, straightforward overview of greenhouse gas (GHG) emissions reduction strategies for local governments. Topics include energy efficiency, transportation, community planning and design, solid waste and materials management, and renewable energy. City, county, territorial, tribal, and regional government staff, and elected officials can use these guides to plan, implement, and evaluate their climate change mitigation and energy projects.

Each guide provides an overview of project benefits, policy mechanisms, investments, key stakeholders, and other implementation considerations. Examples and case studies highlighting achievable results from programs implemented in communities across the United States are incorporated throughout the guides.

While each guide stands on its own, the entire series contains many interrelated strategies that can be combined to create comprehensive, cost-effective programs that generate multiple benefits. For example, efforts to improve energy efficiency can be combined with transportation and community planning programs to reduce GHG emissions, decrease energy and transportation costs, improve air quality and public health, and enhance quality of life.

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All documents are available at: *www.epa.gov/statelocalclimate/resources/strategy-guides.html*.

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- Energy-Efficient Product Procurement
- Combined Heat and Power
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- Resource Conservation and Recovery

RENEWABLE ENERGY

- Green Power Procurement
- On-Site Renewable Energy Generation
- Landfill Gas Energy

Please note: All Web addresses in this document were working as of the time of publication, but links may break over time as sites are reorganized and content is moved.

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Green Power Procurement

EXECUTIVE SUMMARY

Developing and Implementing Renewable Energy Programs

A growing number of local governments are turning to renewable energy as a strategy to reduce GHGs, improve air quality and energy security, boost the local economy, and pave the way to a sustainable energy future. Renewable energy resources—such as solar, wind, biomass, hydropower, and landfill gas—reduce GHG emissions by replacing fossil fuels. Renewables also reduce emissions of conventional air pollutants, such as sulfur dioxide, that result from fossil fuel combustion. In addition, renewable energy can create jobs and open new markets for the local economy, and can be used as a hedge against price fluctuations of fossil fuels. Local governments using renewable energy can demonstrate leadership, helping to spur additional renewable energy investments in their region.

Local governments can promote renewable energy by using it to help meet their own energy needs in municipal operations, and by encouraging its use by local residents and businesses. The renewable energy guides in this series present three strategies that local governments can use to gain the benefits of renewables: purchasing green power, generating energy from renewable sources on-site, and generating renewable energy from landfill gas.

Green Power Procurement

This guide describes a variety of approaches that local governments can use to advance climate and energy goals by meeting some or all of their electricity needs through green power. The sections in this guide discuss how local governments can work with utilities, local businesses, nonprofit groups, residents, state agencies, and green power marketers and brokers to purchase green power directly or through Renewable Energy Certificates. It is designed to be used by municipal energy coordinators, local energy and environment agency staff, environmental and energy advisors to elected officials, utility staff, and community groups.

Readers of the guide should come away with an understanding of the different types of green power products, the steps involved in designing and implementing procurement programs, and strategies for funding

RELATED GUIDES IN THIS SERIES

- **Energy Efficiency:** ***Energy Efficiency in Local Government Operations***

  Local governments can implement energy-saving measures in existing local government facilities, new and green buildings, and day-to-day operations. Green power purchasing can be used in combination with energy efficiency in government operations to reduce a local government's total use of fossil-fuel power and help it meet GHG reduction targets.

- **Energy Efficiency:** ***Combined Heat and Power***

  Combined heat and power (CHP), also known as cogeneration, refers to the simultaneous production of electricity and thermal energy from a single fuel source. Local governments can implement CHP systems at suitable facilities and purchase green power for any remaining energy needs to help reduce their overall GHG emissions.

- **Renewable Energy:** ***On-Site Renewable Energy Generation***

  Local governments can implement on-site renewable energy generation by installing wind turbines, solar panels, and other renewable energy generating technologies. A local government can combine on-site renewable energy generation with green power purchasing to generate Renewable Energy Credits while reducing GHG emissions.

- **Renewable Energy:** ***Landfill Gas Energy***

  Landfill gas energy technologies capture methane from landfills to prevent it from being emitted to the atmosphere, reducing landfill methane emissions by 60–90%. Local governments can complement their landfill gas energy programs with green power procurement to maximize the amount of their energy needs that are met by renewable sources.

green power purchases. The guide highlights examples of successful procurement programs from across the United States to demonstrate how green power can meet the diverse energy needs of communities of different sizes, governance structures, and locations.

The guide describes the benefits of green power procurement (section 2); measures for purchasing green power (section 3); key participants and their roles (section 4); the policy mechanisms that local governments have used to support green power purchases (section 5); implementation strategies for effective programs (section 6); costs and funding opportunities (section 7); federal, state, and other programs that may be able to help local governments with information or financial and technical assistance (section 8); and two case studies of local governments that have comprehensive programs in place for purchasing green power (section 9). Other examples of successful implementation are provided throughout the guide.

Relationships to Other Guides in the Series

Local governments can use other guides in this series to develop comprehensive climate and energy programs that incorporate complementary strategies. For example, local governments could combine green power procurement with initiatives in **energy efficiency in local government operations, combined heat and power, on-site renewable energy generation,** and **landfill gas to energy** to help achieve additional environmental, economic, and social benefits.

See the box on page v for more information about these complementary strategies. Additional connections to related strategies are highlighted in the guide.

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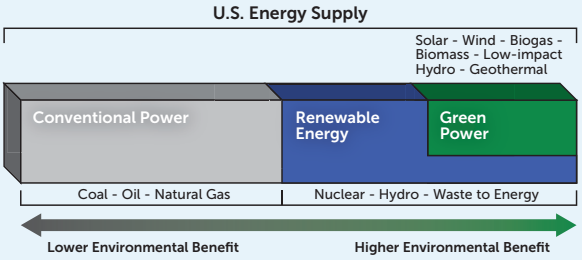
1. OVERVIEW

Many local governments are using green power in their facilities and providing assistance to local businesses and residents to do the same. Green power is a subset of renewable energy that is produced with no GHG emissions, typically from solar, wind, geothermal, biogas, biomass, or low-impact hydroelectric sources. It includes three types of products: utility products (i.e., green power purchased from the utility through the electricity grid), renewable energy certificates (RECs), and on-site generation. (One REC is equal to one MWh of qualified renewable energy; see the text box on page 4 for more information on RECs.) Opportunities to purchase RECs are increasing significantly through the voluntary market. For example, the National Renewable Energy Laboratory (NREL) estimates that the voluntary REC market was 35.6 million MWh in 2010, growing to 48.6 million MWh of RECs in 2012 (NREL, 2013).

RENEWABLE ENERGY AND GREEN POWER

Green power is a subset of renewable energy, and represents those renewable energy resources and technologies that provide the highest environmental benefit. Green power is produced from solar, wind, geothermal, biogas, eligible biomass, and low-impact hydro.



Green power sources produce electricity with an environmental profile superior to that of conventional power technologies, and produce no anthropogenic greenhouse gas emissions. EPA requires that green power sources must also have been built within the last 15 years in order to support "new" renewable energy development (U.S. EPA, 2007).*

** January 1, 1997 is considered a definitive point in time when green power facilities could be adequately identified as having been developed to serve the green power marketplace. Green power facilities placed into service after January 1, 1997 are said to produce "new" renewable energy. The "new" criterion addresses the additionality requirement for the voluntary market (U.S. EPA, 2007a).*

By substituting green power for conventional electricity, which is produced primarily by combusting fossil fuels and is responsible for nearly 33 percent of total U.S. energy-related GHG emissions, local governments and their communities can achieve significant energy, environmental, and economic benefits (U. S. EPA, 2013).

This guide deals primarily with opportunities to purchase, or procure, green power directly from utilities and through RECs. It provides information on how local governments have planned and implemented green power purchases for their facilities and throughout their communities, and highlights sources of funding and case studies. Links to more examples and resources are provided in Section 10, *Additional Examples and Information Resources*. For more information on generating green power on-site, see EPA's *On-site Renewable Energy Generation* guide in the *Local Government Climate and Energy Strategy Series*.

2. BENEFITS OF GREEN POWER PROCUREMENT

Green power procurement can produce significant energy, environmental, economic, and other benefits by helping local governments:

- **Reduce greenhouse gas (GHG) emissions and other environmental impacts.** Purchasing green power reduces GHG emissions and emissions of pollutants associated with conventional electricity generation. As noted above, fossil fuel combustion for electricity generation accounts for 33 percent of the nation's GHG emissions (U.S. EPA, 2013a). Many local governments have committed to purchasing green power as a primary strategy for meeting their GHG emission reduction goals (U.S. EPA, 2004).

The Philadelphia Local Action Plan for Climate Change includes a commitment to obtain 100 percent of the city government's electricity from wind as a way to help reduce its GHG emissions to 1990 levels by 2010. The city government has already reduced municipal GHG emissions by 11 percent, bringing its emissions below the baseline level in 1990 (Philadelphia, 2012).

GREEN POWER IMPLICATIONS FOR AIR QUALITY

Some local governments cite air quality concerns as a primary driver for committing to green power. In 2006–2007, 23 local governments in Pennsylvania signed on to the Pennsylvania Clean Energy Communities Campaign, which helped local governments commit to purchasing 20% green power by 2010 and to encourage 7% of their businesses and residents to commit to purchasing green power. One of the goals of this campaign was to improve regional air quality. Ten of the 23 municipalities met their commitments under the program by the end of 2007, three years ahead of schedule.

In Swarthmore Borough, a campaign participant and EPA Green Power Community, 26% of all households committed to purchasing green power. As of 2013, the community was meeting approximately 33% of its consumption with green power.

Sources: Smart Power, 2007, 2013a; U.S. EPA, 2007f; U.S. EPA, 2013b; Swarthmore, 2007.

In addition to reducing emissions of GHGs, purchasing green power (which produces little or no toxic emissions) can reduce the air quality impacts of electricity consumption (U.S. EPA, 2007e). Fossil fuel combustion for electricity generation accounts for 67 percent of the nation's sulfur oxides (SOx) emissions and 23 percent of the nation's emissions of nitrogen oxides (NOx), both of which can lead to smog and acid rain (U.S. EPA, 2008). The combustion of fossil fuels also results in emissions of trace amounts of airborne particulate matter that can cause respiratory problems for many people (U.S. EPA, 2008).

- **Support economic growth through job creation and market development.** Purchasing green power can lead to increased regional employment. When renewable energy generation facilities are sited close to the end user, local jobs are created to install and operate renewable energy generation facilities (U.S. EPA, 2004; IREC, Undated; Apollo, 2007). As of 2010, the clean energy industry is estimated to have created more than 138,000 direct jobs in the United States, at an approximate 3 percent growth since 2003 (EESI 2013; Brookings Institution 2011).[1] Many local governments are using their purchasing power to support regional and state manufacturing sectors by specifying green power developed in-state or within a particular region.

The municipal electric utility in Austin, Texas contracts for its green power specifically from in-state resources, including six wind farms in West Texas (Austin Energy, 2013). The total wind capacity of the six projects is 634 MW, enough to supply power for 80,000 Austin homes annually. In Texas, these projects provided approximately 600 jobs during construction and 60–80 permanent jobs for the administration, operation, and maintenance of the wind farms (TX State Energy Conservation Office, 2013).

- **Demonstrate leadership.** Public awareness of the benefits of green power is generally high, which means green power procurement can be an effective way for local governments to demonstrate community leadership and spur private investments. Many local governments are leading community efforts to purchase green power.

Since being designated an EPA Green Power Community in 2011, Washington, DC has worked hard to remain the number one Green Power Community in the country. The district has exceeded its goal for renewable energy, using more than one billion kWh of renewable energy and meeting more than 11 percent of its residential, business, and municipal electricity needs with green power (U.S. EPA, 2013c).

PURCHASING GREEN POWER FOR HIGHLY VISIBLE LOCAL GOVERNMENT FACILITIES

Many local governments have found that purchasing green power for facilities that are frequented by the public can raise community awareness of local government leadership and clean energy benefits. Lacey, Washington, for example, is using green power in its city hall, public library, local museum, public works operations center, and its parks and recreation centers. In issuing a challenge to local businesses and residents to increase their purchases of green power, the city referred them to its own local government successes.

Source: Lacey, 2007.

- **Hedge against financial risks.** Green power can reduce a local government's susceptibility to fossil fuel price volatility, since it is less sensitive than fossil

[1] *This estimate includes only direct employment in the renewable energy sector. The number of both direct and indirect jobs created is estimated at 903,536 to 1,055,536 (EESI, 2013).*

fuel-based electricity to market fluctuations and supply limitations. Green power is often available for purchase at a more stable or fixed price over the long term (U.S. EPA, 2004; NYSERDA, 2003).

The city council of Austin, Texas, issued a resolution directing its municipal electric utility, Austin Energy, to adopt a risk management strategy and to invest in long-term renewable energy and energy conservation programs (Austin Energy, 2003). To hedge against rising fuel prices and to provide better rates for its customers, Austin Energy has signed long-term contracts with its green power providers for as long as 10 and 12 years (Austin Energy, 2007). This strategy led the City of Austin to become the first large city in the country to use 100 percent renewable energy in all of its municipal buildings (Austin Energy, 2013b; U.S. DOE, 2012).

- **Increase energy security through energy portfolio diversification.** In addition to the local and regional benefits of purchasing green power, local governments can help achieve national-scale energy benefits by increasing the amount of green power in the country's energy portfolio. This reduces dependence on imported fossil fuels and diversifies the nation's fuel resources, which can improve the overall robustness of the country's energy systems by reducing dependence on a vulnerable, centralized energy delivery infrastructure (U.S. EPA, 2004).

3. GREEN POWER PRODUCTS

Three types of green power products are available to local governments and the businesses and residents in their communities. See the *Steps for Purchasing Green Power* text box at right for more information on how municipalities, businesses, and residents can take advantage of these green power products:

- **Utility products.** Many local governments purchase green power directly from their electricity provider. These purchases are often supplied as a fixed percentage of monthly use. Some local governments purchase green power in fixed-quantity blocks (e.g., a 100 kWh block of green power).

STEPS FOR PURCHASING GREEN POWER

1. **Identify key decision makers**. Local governments can increase the effectiveness of a green power procurement policy by combining the needs of a range of stakeholders to ensure broad support for a project.
2. **Gather energy data**. By conducting an inventory of energy use, local governments can identify where green power purchases produce the greatest benefits and determine how much green power to purchase.
3. **Choose green power options**. Local governments can assess their options and eliminate green power products based on feasibility considerations, such as quality and supply of wind or solar resources.
4. **Collect product information**. Before purchasing green power products, local governments can obtain information and technical assistance from green power marketers, REC vendors, federal and state governments, other local governments, and various other resources.
5. **Create a procurement plan**. Local governments can enhance the effectiveness of a green power procurement policy by developing a clear plan that identifies the project's scope, expected benefits, procurement and financing methods, and implementation guidelines.
6. **Capture the benefits**. Local governments can ensure the effectiveness of green power procurement policies by tracking, evaluating, and reporting the benefits of green power.

Source: U.S. EPA, 2004.

In September 2012, the City of Falls Church, Virginia, partnered with Dominion Virginia Power in a year-long campaign to become an EPA Green Power Community. As part of this effort, the city set a goal to meet 3 percent of municipal electricity needs through green power by September 2013 (Dominion Green Power, 2013). The city met that goal, and in October 2013 EPA recognized Falls Church as the first Green Power Community in Virginia. The city encouraged residents and business to purchase RECs from a green power provider and/or install on-site renewable energy projects for solar, geothermal, or wind power. The city is now purchasing more than 4 million kWh of green power annually, avoiding CO2 emissions equivalent to those from 700 vehicles per year (City of Falls Church, 2013; Falls Church Post, 2013).

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- **Renewable energy certificates (RECs).** RECs (also known as green tags, green energy certificates, or tradable renewable certificates) represent the technological and environmental attributes of electricity generated from renewable sources. When renewable energy is generated, the RECs may be separated from the physical electricity and sold as a distinct product. Separating RECs from physical electricity makes the physical electricity effectively "null" (i.e., environmentally equivalent to conventional power). RECs can be purchased directly from the renewable electricity generator or through several types of REC providers, including retail and wholesale REC marketers (e.g., utilities, nonprofits, or other environmental foundations) and REC brokers (U.S. EPA, 2004; WRI, 2003).

  Selling RECs as a separate product has the benefit of creating green power opportunities for electricity customers in areas that lack access to utility products, and can create additional supply and cost options for customers with access to utility products. Purchasing RECs allows customers to maintain their existing procurement relationships with electricity providers, and makes the option of purchasing green power available to customers in leased spaces (where landlords control electricity purchases). Local governments can also specify the renewable energy source type and location from which the RECs come.

  In June 2013, Houston, Texas, was the largest municipal purchaser of green power in the country, purchasing more than 140 MW of wind and solar power through RECs from Reliant Energy, a local energy provider. Under its contract with Reliant Energy, Houston will meet 50 percent of its municipal energy needs with green power and use almost 623,000 MWh of renewable energy per year, equivalent to the power consumed annually by 55,000 homes (City of Houston, 2013; U.S. EPA 2013d).

- **On-site generation.** Many local governments generate green power at their own facilities. Generating green power on-site can be especially beneficial for local governments with facilities that are sensitive to the risks of fuel supply disruptions and electricity blackouts (e.g., hospitals) (U.S. EPA, 2004). In certain states, net metering rules allow excess green power generated on-site to be sold to a local utility for distribution to grid-connected customers. For more information on on-site generation, see EPA's *On-site Renewable Energy Generation guide in the Local Government Climate and Energy Strategy Series.*

WHAT IS A RENEWABLE ENERGY CERTIFICATE (REC)?

At the point of generation, green power can be sold directly to the customer or separated into its two components: physical electricity and the technological and environmental attributes. When separated, the technological and environmental attributes associated with renewable energy are sold as renewable energy certificates (RECs). The physical electricity, no longer "bundled" with the technological and environmental attributes, is sold through the grid and is indistinguishable from electricity generated from conventional sources.

Source: U.S. EPA, 2012b.

Yolo County, California, developed a 7 MW capacity on-site solar energy project to help it meet its sustainability and environmental stewardship goals and to provide an educational resource for K-12 schoolchildren on renewable energy. The project generates almost 14 million kWh of solar energy, enough power to meet 152 percent of the county's electricity needs. This project has avoided CO2 emissions equivalent to those from 2,000 passenger vehicles per year and has put Yolo County at #14 on the EPA's Top 20 On-Site Generation green power users (Yolo County, 2013; U.S. EPA, 2013e).

BENEFITS OF PURCHASING RECS

- RECs create green power opportunities for electricity customers in areas that lack access to utility products and can create additional supply and cost options for customers with access to utility products.
- RECs enable customers to maintain existing procurement relationships with electricity providers.
- RECs provide green power opportunities for customers in leased spaces where landlords control electricity purchases.
- REC purchasers can specify the green power source type and location from which the RECs are derived.
- RECs may have a lower cost premium than green power purchased directly from the utility.

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4. KEY PARTICIPANTS

A number of stakeholders are key in planning and implementing local green power procurement activities, including:

- **Mayor or county executives.** The mayor or county executive can provide increased visibility for green power procurement activities. In many local governments, the mayor or county executive has been the driving force behind an initiative to increase use of green power throughout the community.

- **City or county councils.** Local city and county councils, or comparable legislative bodies, often initiate or authorize green power procurement activities.

Suffolk County, New York, enacted two bills requiring the local government to purchase green power. Suffolk County currently gets 90 percent of its electricity from renewable energy sources, and in 2011 was included in EPA's list of the nation's top 50 green power purchasers (U.S. EPA, 2013f; U.S. EPA, 2011).

- **Energy coordinators.** Local governments can employ an energy coordinator to monitor energy use. An energy coordinator can gather energy data, select green power systems and products, aggregate agency purchasing accounts, install on-site renewable energy systems, and quantify and communicate the benefits of green power procurement.

- **Planning staff.** Local planners can provide insight into how green power fits into existing local government and community-wide development plans. Many local government planning departments are responsible for local energy-related activities, including developing energy plans. A number of local governments have included green power procurement as a feature of their energy and climate action plans.

The Worcester, Massachusetts, Climate Action Plan included a proposed measure that would require the local government to purchase $25,000 in RECs to help meet its goal of purchasing 20 percent green power by 2010 (Worcester, 2006).

COMMUNITY-WIDE REC PROGRAMS

In addition to purchasing RECs to offset their own energy demands, local governments can establish programs that encourage residents and local businesses to purchase RECs. The municipal electric utility in Ashland, Oregon, for example, purchases RECs from a REC marketer to be sold to municipal utility customers. The REC marketer has agreed to direct a portion of its revenue from the REC sales to be invested in local renewable energy projects, such as solar PV installations and educational programs for Ashland students.

Source: Ashland, 2007.

- **State energy offices.** State energy offices can provide local governments with information on incentives for purchasing green power, offer expertise to arrange green power purchases tailored to community needs and interests, and assist local governments in working with utilities to obtain optimal green power rates.

The Oregon Energy Office provides local governments with technical assistance for renewable energy and energy efficiency projects and offers low-interest loans for clean energy investments, including on-site renewable energy generation system installation (Oregon, 2007).

- **Local businesses and residents.** Many local governments have enhanced the energy, environmental, and economic benefits of green power procurement by engaging local businesses and residents. As of July 2013, 48 communities had joined the EPA Green Power Communities program, an initiative that recognizes communities where local governments and their businesses and residents collectively purchase quantities of green power that meet EPA-determined requirements (U.S. EPA, 2013g). (For more information on EPA's Green Power Communities, see Section 8, *Federal, State, and Other Program Resources.*) Many local governments have expanded their green power procurement activities to provide incentives and encouragement for businesses and residents to purchase green power.

- **Utilities.** Local governments often work closely with utilities to purchase green power. Utilities can assist local governments in consolidating multiple local government electricity accounts into master agreements. In some instances, local governments can negotiate long-term contracts with utilities to obtain reduced green power rates. Local governments can also work with utilities to engage the public and encourage green power procurement by local businesses and residents.

In Fort Collins, Colorado, for example, the city government coordinates with the local utility to provide information to customers on green power procurement opportunities through various media, including utility bills, the Internet, newsletters, mailings, and advertisements (City of Fort Collins, 2013; ICLEI, 2005).

- **Green power marketers.** Green power marketing refers to selling green power in the competitive market. More than a dozen states have deregulated their electricity markets, allowing retail and wholesale green power marketers to compete to provide green power to customers. In states that allow competitive electricity markets, local governments can choose to switch from standard electricity service to an alternative electricity service offered by a green power marketer (U.S. DOE, 2007c).

Edmond, Oklahoma, partnered with utility companies to provide enough wind and geothermal energy to power 73 percent of the city's facilities. Edmond's wind program, called Pure and Simple Wind Power, is open to all utility customers, who can sign up for block increments (in 100 kWh each) or 100 percent wind power (U.S. EPA, 2013h; City of Edmond, 2013).

- **Renewable electricity generators, REC marketers, and REC brokers.** Local governments have several options for purchasing RECs. RECs can be purchased directly from the renewable electricity generator or indirectly through REC providers, which include REC marketers and REC brokers. Many local governments have purchased RECs through retail and wholesale REC marketers, such as utilities, non-profit organizations, and environmental foundations.

REC brokers can help facilitate transactions between local governments and renewable electricity generators by matching a local government's specific REC needs with an appropriate seller. In addition, REC brokers can often structure the agreement to avoid some of the transaction charges that local governments would have to pay if the RECs were purchased from a retail marketer (U.S. EPA, 2004; WRI, 2003).

- **Non-profit organizations and community groups.** Local governments sometimes work with non-profit organizations to tailor green power procurement activities to meet community needs.

Smart Power, a non-profit organization dedicated to promoting clean energy, has established community clean energy campaigns in Connecticut and Pennsylvania. These campaigns initially encouraged local governments to commit to purchasing 20 percent green power by 2010 and to work with local businesses and residents to meet targets for green power procurement at the community scale. In 2013, more than 100 local governments throughout Connecticut met the 20 percent green power goal and received the Connecticut Clean Energy Community status (Smart Power, 2013b).

5. FOUNDATIONS FOR PROGRAM DEVELOPMENT

Local governments can use several mechanisms to establish green power procurement policies and to create incentives for local businesses and residents, including:

- **Mayor or executive initiatives.** Mayors and county executives can use executive orders to direct resources toward purchasing green power products. Mayors and county executives have also established green power initiatives by challenging the community to meet green power goals.

In 2006, the mayor of Moab City, Utah, issued a challenge for 5 percent of the city's electric customers to purchase wind power through a local utility's wind program. The city achieved its goal in little over one month, and then

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expanded its efforts to promote more green power. As of 2013, 13 percent of the community is buying wind power through the program, accounting for 3.4 percent of Moab City's electricity purchases (U.S. EPA, 2013i; City of Moab, 2013).

In 2007, the Austin (Texas) City Council adopted the mayor's Climate Protection Program and approved a resolution setting Austin's renewable energy portfolio goal at 30 percent by 2020. The resolution included a 100 MW set-aside for solar energy and a goal for all municipal buildings to use 100 percent renewable energy by 2012. By 2011, the city achieved its goal for municipal buildings. By 2013, the city added a total of 851 MW of wind power to its renewable energy portfolio, achieving 27 percent renewable energy (Austin Energy, 2013c; City of Austin, 2013). EPA recognized Austin's renewable energy efforts with a Climate Leadership Award in 2013.

In 2012, the City Council of Creve Coeur, Missouri, launched its Green Power Community Challenge to become the second EPA Green Power Community in Missouri. The city set a goal to reduce its energy consumption by 3 percent and use 1,523 MWh of renewable energy through solar installations and the purchase of RECs for its residents and businesses (City of Creve Coeur, 2013; Missouri Green Power Communities, 2013). To help achieve this goal, the city provided outreach and education to its citizens about sustainability while a city solar installer offered a zero upfront cost option for residents and businesses installing solar systems. In 2013, the city achieved its goal of becoming an EPA Green Power Community (Creve Coeur Patch, 2013).

- **Local government resolutions.** Many local government city and county councils have passed resolutions establishing green power procurement requirements for government facilities. These requirements often take the form of specified percentages of green power that the local government must use on an annual basis.
- **Local renewable portfolio standards.** Many states have established renewable portfolio standards for investor-owned utilities. These rules require utilities to meet a certain percentage of their energy supply with energy from qualified renewable sources. Some local governments have adopted comparable requirements for municipally owned utilities.

In Columbia, Missouri, residents approved an ordinance that requires the municipal water and electric utility to purchase increasing levels of renewable energy, beginning with 2 percent by 2008, 5 percent by 2012, 10 percent by 2017, and 15 percent by 2022 (DSIRE, 2013b). In 2012, renewable energy accounted nearly 8 percent of Columbia's power purchases, exceeding the city's goal (Columbia Water and Light, 2013).

6. STRATEGIES FOR EFFECTIVE PROGRAM IMPLEMENTATION

Local governments can use a number of approaches to enhance the effectiveness of local green power procurement activities, including:

- **Aggregation of demand for green power with other jurisdictions.** Some local governments have contracted for green power at reduced electricity rates and transaction costs by aggregating electricity purchases. Local governments can also use aggregated purchasing power to encourage utilities to provide green power, especially in deregulated markets (U.S. EPA, 2010). Aggregation can take several forms, including:
  - ***Aggregation with other local governments and community organizations.*** Local governments can aggregate purchases with other local governments and community organizations by working within existing associations or forming new ones.

In 2007, Allegheny County, the City of Pittsburgh, Pittsburgh Water & Sewer, the Sports and Exhibition Authority, and the Pittsburgh Zoo & PPG Aquarium established the Western Pennsylvania Energy Consortium (WPEC) to form a single purchasing authority focused on green power initiatives and other environmental programs. In 2008, WPEC purchased more than

11 million kWh of RECs, which supplied 10 percent of WPEC's annual electricity needs. As a result, the consortium became an EPA Green Power Partner and received an EPA Green Power Leadership award in 2012. As of 2013, WPEC's power portfolio had grown to 25 percent renewable energy, at a discounted price for all the organizations within the consortium (U.S. EPA, 2013j; Allegheny County, 2013).

- ***Community Choice Aggregation.*** Communities in California, Ohio, and Massachusetts have adopted resolutions authorizing Community Choice Aggregation (CCA), which allows local governments to aggregate the purchases of businesses, residents, and municipal facilities that opt in to the program. This arrangement enables local governments to make decisions about electric services on a community scale, which can lead to reduced rates. To learn more about CCA and communities that have adopted CCA, see the U.S. Local Energy Aggregation Network website: *http://www.leanenergyus.org/cca-by-state/*.

BOULDER, COLORADO COMMUNITY CHALLENGE

In 2005, the Boulder, Colorado, Office of Environmental Affairs announced the Wind Power 500 Challenge, a program to encourage residential and commercial municipal electric utility customers to enroll in the utility's wind power program. The goal for the Challenge was for 500 new customers to enroll in the program over a two-month period. After two months, the program had more than doubled its enrollment goal, gaining 1,150 new customers.

Source: Boulder, 2005; Boulder, 2005b.

In 2012, the Village of Oak Park became the first local government in Illinois to adopt an aggregation program with a local energy provider to supply 100 percent renewable energy at a 25 percent discounted rate compared with other state utility rates. As of 2012, approximately 95 percent of the city's residents and small businesses were participating in the program (Oak Park, 2012; U.S. DOE, 2013).

The Cape Light Compact, a regional energy services organization that serves 21 towns in eastern Massachusetts, has established a CCA program that allows customers to purchase either 50 percent or 100 percent of their electricity from green power sources, with 25 percent of the proceeds being directed to development of new renewable energy generation sources (CLC, 2013).

- **Engaging the community.** In addition to purchasing green power for their own facilities, local governments can use a variety of approaches to encourage local businesses and residents to purchase green power, including:

  - ***Challenging local businesses and residents.*** A number of local governments have challenged commercial and residential electricity customers to meet green power purchase targets.

In 2012, the community of Mercer Island, Washington, challenged its residents and businesses to increase their involvement in a local utility's green power program, with a goal of enrolling 750 participants. The community met this goal, increasing its renewable energy use by 55 percent and purchasing 5.81 million kWh of renewable energy in 2012. Through the challenge, Mercer Island avoided more than 3,900 metric tons of CO2 emissions, equivalent to the emissions from the energy used by 195 homes in one year. Following this achievement, the local utility gave Mercer Island a $30,000 grant to fund a community solar system at the Mercer Island Community Center. The utility continues to collaborate with the community by providing affordable program costs to encourage residents and businesses to switch to clean energy (City of Mercer Island, 2013; Puget Sound Energy, 2013).

  - ***Creating competitions with other local governments.*** Some local governments have found that competitions can help increase community awareness of the benefits and availability of green power.

Each year since 2010, EPA's Green Power Partnership has sponsored a Green Power Community Challenge, in which

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communities around the country compete to achieve the highest green power percentage of total electricity use and to use the most green power. Communities compete against one another by challenging their residents and businesses to purchase more renewable energy from local energy providers than their competitors. Washington, DC, won the competitions in 2010–11, 2011–12, and 2012–13 for using the most green power. Brookville, Maryland, won in 2010–11 for the highest green power percentage of total electricity use, and Oak Park, Illinois, won in 2011–12 and 2012–13 in the same category (U.S. EPA, 2012).

- **Negotiating terms of green power purchases.** When selecting green power products and making green power purchases, local governments often establish product and purchase criteria that reflect local government- or community-specific preferences (e.g., a preference for green power to be generated locally). Local governments can ensure that the terms of green power procurement contracts meet these criteria through several approaches (e.g., including the criteria in a request for proposals). Specifically, local governments can take the following actions:

  - ***Seeking fixed-price, long-term contracts.*** Because green power generation requires no fuel input and is not subject to fuel price volatility, it comes at a consistent cost to the generator, meaning customer prices remain relatively stable over time. Many local governments have entered into long-term purchase agreements with utilities or REC providers. While short-term contracts may offer greater future flexibility, long-term contracts can reduce a supplier's risk, which often translates into reduced rates (U.S. EPA, 2004; WRI, Undated).

The mayor of Ann Arbor, Michigan drafted a resolution that called for the city to seek long-term, fixed-price contracts for the procurement of wind power. In May 2006, the mayor's proposed resolution was unanimously adopted by the city council (Ann Arbor, 2006).

  - ***Requesting proposals.*** Local governments can use competitive sourcing policies to require electricity service providers to meet their commitment to green power (IREC, Undated). Several local governments have structured requests for proposals so that respondents must include green power as a component of proposed electricity delivery.

DRAFTING A REQUEST FOR PROPOSALS

To gather information from multiple green power product providers and to obtain the best price possible, local governments can issue a request for proposals (RFP) that includes green power specifics, such as:

- The volume to be purchased.
- Duration of the purchase agreement.
- Types of renewable resources desired.
- Preferred location of renewable resources.
- Certification by a third party.
- Year of vintage (for RECs).
- Delivery start date.

Sources: WRI, 2006; U.S. EPA, 2004.

In 2013, Washington, DC's Department of General Services issued an RFP soliciting green power providers to develop a wind or solar energy project for 150,000 MWh of energy per year (Renew Grid, 2013).

- **Requiring certification for green power products.** Local governments can require third-party certification to ensure that green power providers' products meet consumer protection and environmental standards. Certification provides assurance that green power products reduce a local government's environmental impact, which can help secure buy-in throughout the community. Certification can also verify that green power product claims are valid (e.g., with respect to the mix of renewable energy resources) and that the products have not been repackaged (U.S. EPA, 2006; AWEA, 2004).[2] A number of organizations provide certification services, including the Center for Resource Solutions Green-e Renewable Energy Certification Program.

[2] *"Repackaging" refers to the concern that green power can be "repackaged" and sold as a mix of renewable energy that is already injected into the grid to satisfy legal mandates (e.g., through renewable portfolio standards) rather than to meet consumer demand. Repackaged renewable energy does not result in environmental improvement, since it merely sustains the status quo (AWEA, 2004). Renewables that are counted toward satisfying mandates cannot be used to support purchasers' environmental claims.*

When Westport, Connecticut, committed to purchasing 100 percent green power in 2002, it became one of the first municipalities in the Northeast to require that its green power purchases be Green-e certified to demonstrate to the community and other local governments its commitment to using only energy from the cleanest power sources available (U.S. DOE, 2004).

7. COSTS AND FUNDING OPPORTUNITIES

This section provides information on the costs of purchasing green power and describes funding opportunities for addressing these costs.

Costs

While green power purchases require no upfront investment, they typically include a small cost premium related to the still-developing nature of renewable energy technologies. Premiums depend on a number of factors, including the availability of subsidies, the terms of the contract with the provider, the size of the green power market, the proximity of the local government to the source, and the type and quality of the product.

Green power premiums vary. In 2012, the national average residential green power premium was 1.58¢ per kWh. On average, residential consumers spent about $6.97 per month above standard electricity rates for green power through utility programs, an increase from $5.40 per month in 2009 (NREL, 2013).

In Fort Collins, Colorado, the premium added to customers' rates for the Platte River Power Authority's wind program was 2.4¢ per kWh, as of 2013 (City of Fort Collins, 2013b).

In Palo Alto, California, where the Palo Alto Green program has encouraged more than 16 percent of the community to purchase green power, the premium added to customers' electricity rates was 1.5¢ per kWh, as of 2013 (Palo Alto, 2013).

CITY-OWNED UTILITY PURCHASES RENEWABLE ENERGY

Murray City Power, a municipal electric utility in Utah, is purchasing electricity produced from a 3 MW capacity landfill gas project at the Salt Lake Valley Solid Waste Management Facility in Salt Lake City. The initiative, which provides a use for landfill methane, a potent greenhouse gas that would otherwise be released into the atmosphere, raised residents' electricity costs by less than $0.50 per year.

For more information on how local governments have planned and implemented landfill gas energy projects, see EPA's *Landfill Gas Energy* guide in the *Local Government Climate and Energy Strategy Guides* series.

Source: WAPA, 2005.

Since there are no barriers that would impede competitive pricing of green power utility products, purchasing RECs to complement conventional electricity can be less expensive than purchasing green power directly from a utility. In some instances, REC prices can be as much as 90 percent less than the premium for green power utility products in regulated electricity markets, and 80 percent less than the premium in deregulated electricity markets (WRI, 2003).

Funding Opportunities

Funding for local green power procurement activities can come from a variety of sources, including:

- **Savings from energy efficiency investments.** Local governments can use cost savings from energy efficiency investments to offset the cost premium associated with purchasing green power. Improving energy efficiency also reduces a facility's energy load, allowing local governments to meet their green power goals at lower costs. For information on how local governments can improve energy efficiency in municipal operations and lower costs, see EPA's *Energy Efficiency in Local Government Operations* guide in the *Local Government Climate and Energy Strategy Series*.

In 2005, Grand Rapids, Michigan, partnered with a utility to receive 20 percent green power from in-state renewable energy sources. The utility assisted the city in offsetting the cost of participating in its green power program by

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performing energy audits in the city's facilities to identify opportunities to reduce energy use (Grand Rapids, 2007). After the city met its 20 percent target, the mayor extended the goal to purchasing 100 percent renewable energy by 2020. As of 2013, the city was on target to meet its interim goal of 30 percent (Michigan Radio, 2013; DSIRE, 2013c).

- **State clean energy funds.** A number of states administer clean energy funds that can provide financial assistance to local governments for green power procurement. Other state programs offer incentives for businesses and residents who invest in renewable energy and energy efficiency. Local governments can access information on state funding opportunities and incentives for energy efficiency and renewable energy projects by using the Database of State Incentives for Renewable Energy at www.dsireusa.org.

The Energy Trust of Oregon offers financial incentives for renewable energy and energy efficiency programs for a variety of eligible sectors, including local government, commercial, residential, and agricultural sectors. The trust is funded through a 3 percent public-purchase charge on electric customer utility bills through 2026 (DSIRE, 2013d).

- **Federal grant programs.** Local governments may be able to obtain financial assistance for purchasing green power through several federal government programs. Local governments can locate grants for clean energy projects from federal government agencies by searching the database of federal grants at www.grants.gov. In addition, the EPA Grants Office and DOE Office of Energy Efficiency and Renewable Energy provide information on additional funding opportunities, including grants, cooperative agreements, continuation awards, and renewal awards.

Websites:

http://www.grants.gov/
(All federal grant-issuing agencies)

http://www.epa.gov/epahome/finance.htm
(EPA Funding Opportunities)

http://www1.eere.energy.gov/financing/
(DOE Energy Efficiency and Renewable Energy)

8. FEDERAL, STATE, AND OTHER PROGRAM RESOURCES

A variety of federal, state, regional, and other agencies and organizations provide resources that local governments can use when planning and implementing green power procurement activities.

Federal Programs

Local governments can obtain information and assistance for green power procurement activities from several federal government programs, including:

- **National Renewable Energy Laboratory (NREL).** NREL is the primary national laboratory for renewable energy and energy efficiency research and development. NREL provides local governments with information on existing and emerging technologies, including how to plan, site, and finance projects using renewable energy sources. NREL also provides information on developing rules and regulations for net metering and renewable portfolio standards for municipal utilities.

Website: *http://www.nrel.gov/learning/re_basics.html*

- **U.S. DOE Green Power Network.** Local governments can obtain news and information on green power markets from the DOE Green Power Network. The network's website provides information on green power providers; green power products; and federal, state, and local policies pertaining to green power markets, and contains an extensive library of papers, articles, and reports on green power.

Website: *http://www.eere.energy.gov/greenpower/*

- **U.S. EPA Green Power Communities.** The Green Power Communities program is an initiative of EPA's Green Power Partnership that recognizes communities where local governments and their businesses and residents collectively purchase quantities of green power that meet EPA-determined requirements. As of June 2013, the percentages of green power purchased by the 48 Green Power Communities range from 3 percent to nearly 92 percent of total electricity consumption (U.S. EPA, 2013g).

Website: *http://www.epa.gov/greenpower/communities/index.htm*

- **U.S. EPA Green Power Partnership.** The EPA Green Power Partnership is a voluntary program to support the market for green power products. Local governments that meet partnership requirements earn publicity and recognition, and are ensured of the credibility of their green power purchases. In addition, partners can receive EPA expert advice on identifying green power products and purchasing strategies, along with tools and resources to calculate the environmental benefits of green power purchases. The annual percentage requirements to qualify as a partner are as follows: 3 percent green power for entities using over 100 million kWh, 5 percent for between 10 million kWh and 100 million kWh, 10 percent for between 1 million kWh and 10 million kWh, and 20 percent for less than 1 million kWh.

  Website: *http://www.epa.gov/greenpower/*

- **U.S. EPA RE-Powering America's Land.** EPA is encouraging renewable energy development on current and formerly contaminated lands, landfills, and mine sites when such development is aligned with a community's vision for the site. The initiative identifies the renewable energy potential of tracked sites and provides other useful resources for local governments to achieve the environmental, social, and economic benefits of such development.

  Website: *http://www.epa.gov/renewableenergyland*

- **U.S. EPA State and Local Climate and Energy Program.** This program helps state, local, and tribal governments achieve their climate change and clean energy goals by providing technical assistance, analytical tools, and outreach support. It includes two programs:

  - The *Local Climate and Energy Program* helps local and tribal governments meet multiple sustainability goals with cost–effective climate change mitigation and clean energy strategies. EPA provides local and tribal governments with peer exchange training opportunities along with planning, policy, technical, and analytical information that support reduction of GHG emissions.

  - The *State Climate and Energy Program* helps states develop policies and programs that can reduce GHG, lower energy costs, improve air quality and public health, and help achieve economic development goals. EPA provides states with and advises them on proven, cost–effective best practices, peer exchange opportunities, and analytical tools.

  Website: *http://www.epa.gov/statelocalclimate/*

State Programs

Local governments have obtained technical assistance and information resources from many state-administered programs. State energy offices and public utilities commissions (PUCs), in particular, can be helpful resources for local governments planning to purchase green power or developing community green power programs. Some states engage local governments in statewide challenges or initiatives to promote green power.

The Connecticut Clean Energy Communities Program, which is sponsored by the Connecticut Clean Energy Fund, partners with communities throughout the state, offering technical assistance and incentives for renewable energy investments. For example, the program offers local governments a free 1 kW photovoltaic solar electric system for every 100 residential customers who sign up for the program's clean energy option (Smart Power, 2007).

In 2008, Georgia's governor committed all state facilities to reducing their energy consumption by 15 percent by 2020 through the Georgia Energy Challenge. The state later expanded the challenge to include all state residents and businesses. More than 5,000 residents, businesses, and local authorities had registered for the energy program as of late 2012 (Georgia Energy Challenge, 2013; Georgia Environmental Finance Authority, 2012).

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Other Programs

Other sources of information and assistance include:

- **Database of State Incentives for Renewables & Efficiency (DSIRE).** A project of the North Carolina Solar Center and the Interstate Renewable Energy Council, DSIRE provides information on federal, state, and local incentives for renewable energy and energy efficiency projects, including tax credits, loans, and grants. The database also provides information on state and local regulations pertaining to renewable energy purchases and on-site renewable energy generation, including overviews of state and local net metering rules, renewable portfolio standards, and requirements for renewable energy use at public facilities.

  Website: *http://www.dsireusa.org/*

- **Green-e Renewable Energy Certification Program.** Developed by the Center for Resource Solutions, Green-e is a voluntary certification and verification program for wholesale, retail, and commercial electricity products, RECs, and utility green pricing programs. Green-e certifies about 100 retail and wholesale green power marketers across the country. In addition, Green-e sets consumer protection and environmental standards for energy-related products. Local governments can seek certification from Green-e as purchasers of certified renewable energy, for which Green-e provides a label that can be displayed in government facilities.

  Website: *http://www.green-e.org/*

- **Interstate Renewable Energy Council (IREC).** IREC promotes deployment of renewable energy in state and local government activities by providing information and assistance to state and local governments for a number of renewable energy activities, including public education, procurement coordination, and adoption of uniform standards.

  Website: *http://www.irecusa.org/*

- **Renewable Energy Policy Project.** The Renewable Energy Policy Project, created by the Center for Renewable Energy and Sustainable Technology, aims to accelerate the deployment of renewable energy technologies and serves as a clearinghouse for information on renewable energy technologies and policies.

  Website: *http://www.repp.org/index.html*

9. CASE STUDIES

The following two case studies describe comprehensive programs for purchasing green power products for local government facilities and operations, and for supporting green power purchases throughout the community. Each case study describes how the program was initiated, key program activities and features, and program benefits.

Bellingham, Washington – Green Power Purchasing

Bellingham, Washington, has become one of the nation's leading communities in green power procurement. In 2006, the city government committed to meeting 100 percent of its electricity demand with green power. The city has worked with local businesses and residents to increase green power purchases to 14.5 percent of community-wide electricity demand (U.S. EPA, 2013l). These efforts have earned Bellingham recognition as an EPA Green Power Community and a Green Power Leader.

PROFILE: BELLINGHAM, WASHINGTON

Area: 28 square miles

Population: 82,234 (2012 data)

Structure: The city is governed by a mayor and a six-member city council. Activities under the city's climate action plan are implemented by the Environmental Resources division in the Department of Public Works.

Program Scope: Bellingham is purchasing green power for 100% of its government operations' electricity demand. The community, including local businesses and residents, is purchasing 14.5% green power.

Program Creation: A city council resolution in 2006 committed the city to purchasing 100% green power in 2007, endorsed the Bellingham Green Power Community Challenge, and authorized participation in EPA's Green Power Partnership.

Program Savings: The Bellingham community purchases a total of 76 million kWh of green power annually. The city government's purchase of 100% green power (accounting for 25 million kWh) has reduced city government CO_2 emissions by 12,000 metric tons annually (approximately 65 percent below emissions in the year 2000).

PROGRAM INITIATION

In 2002, the Bellingham city council passed a resolution endorsing the Earth Charter, an international statement that endorses the use of renewable energy sources. The council followed this endorsement with a resolution in 2005 that committed the city to participate in the ICLEI – Local Governments for Sustainability *Cities for Climate Protection* program. As a requirement for participation, the city developed an action plan for implementing measures that would reduce its GHG emissions. Also in 2005, the mayor signed the U.S. Conference of Mayors Climate Protection Agreement, which establishes goals for local governments to increase use of "clean, alternative energy" sources and encourage development of renewable energy resources. In 2006, the city council passed Resolution 2006-28, which committed the city government to purchasing RECs equal to 100 percent of its electricity consumption in 2007 (Bellingham, 2002; 2005; 2006; 2007).

PROGRAM FEATURES

Bellingham's green power procurement program includes the following features:

- **Participation in ICLEI's Cities for Climate Protection program.** In a 2005 city council resolution, Bellingham committed to participating in the ICLEI Cities for Climate Protection program. As required for program members, the city developed an inventory of its GHG emissions and drafted a climate action plan. The inventory revealed that government operations account for more than 2 percent of the community's total GHG emissions. Purchasing green power is a key element of the city's action plan (Bellingham, 2005; 2007).

- **City council resolution.** City Council Resolution 2006-28 was the primary mechanism for implementing the city's green power procurement program. Under this resolution, the Bellingham city government endorsed the Bellingham Green Power Community Challenge, authorized the mayor to enter the city as a participant in the EPA Green Power Partnership, and committed the city government to purchasing RECs equal to 100 percent of its electricity consumption (about 25 million kWh annually). The cost premium of purchasing this quantity of green power was $120,000 in 2009 (Bellingham, 2008; Bellingham Herald, 2010).

- **GHG emissions reduction goals.** The Bellingham City Council passed a resolution in 2007 committing to reduce GHG emissions resulting from government operations by 64 percent below 2000 levels by 2012 and 70 percent by 2020. These targets were based on the fact that electricity consumption accounts for approximately 60 percent of all GHG emissions from city government operations, and that by purchasing 100 percent green power the city reduced 2007 government GHG emissions by approximately 60 percent. The city has also established a community-wide goal to reduce emissions resulting from all community activities by 7 percent below 2000 levels by 2012 and by 28 percent by 2020 (Bellingham 2006; 2007; 2007c).

- **Green Power Community Challenge.** Bellingham partnered with a non-profit organization to encourage local businesses to participate in the Bellingham Green Power Community Challenge, with a goal of increasing the total amount of green power purchased in Bellingham to 2 percent. The non-profit, whose members include more than 600 businesses and community leaders in northwest Washington, used its membership to reach out to a large number of potential green power purchasers. Participation by the Bellingham community reached a total of nearly 2,000 households and more than 100 businesses, and the city successfully met and exceeded its 2 percent target. The city awarded $1,000 for neighborhood improvement projects to the neighborhood that achieved the highest percentage of households participating in the challenge (Bellingham, 2006; Sustainable Connection, 2007b).

- **EPA Green Power Community.** In 2007, EPA's Green Power Partnership recognized Bellingham as a Green Power Community, meeting green power purchase requirements for its own facilities and a target for total green power purchased by the community, including the city government, businesses, residents, and non-profit organizations.

- **Utility partnership.** Bellingham has benefited from a close relationship with its electric utility. As a reward for the city's successful facilitation of the Green Power Community Challenge, the utility provided two solar electric demonstration projects to Bellingham, installed on a rooftop and parking shed in the city. The utility has benefited from the challenge as well, with the community's significant green power purchases enabling it to purchase green power in bulk at reduced rates. These rate reductions have lowered the price

premium that local businesses and residents pay for their green power by about 40 percent (Bellingham, 2008; Sustainable Connections, 2007b).

PROGRAM RESULTS

Bellingham's goal for the Green Power Community Challenge was for the entire community to collectively commit to purchasing at least 2 percent green power. The city exceeded this goal: as of 2013, the community was purchasing 96 million kWh of green power annually (25 million kWh by the local government), or greater than 14 percent of total community electricity use. The city believes its renewable energy purchases will reduce annual GHG emissions equivalent to the amount produced by 10,000 cars in one year. Bellingham has become the EPA Green Power Community with the highest percentage participation, and earned a 2007 EPA Green Power Community of the Year award (Bellingham, 2007b; Bellingham, 2008; Sustainable Connections, 2007b; U.S. EPA, 2013l).

Website: *http://www.cob.org/services/environment/green-resolutions.aspx*

Montgomery County, Maryland Clean Energy Buyers Group – Green Power Purchasing

By combining aggregated purchase agreements with green power purchasing, the Montgomery County Clean Energy Buyers Group, led by Montgomery County, Maryland, has achieved substantial energy and environmental benefits. The group's 2012 aggregated purchase includes enough wind power to supply approximately 26 percent of the 11 participating entities' annual electricity use (U.S. EPA, 2013m).

PROGRAM INITIATION

In 2000, Montgomery County partnered with multiple jurisdictions to aggregate standard electricity purchases in order to obtain reduced rates. In 2003, the county executive and county council approved a resolution to amend the county's energy policy to require all county departments to obtain 5 percent of their electricity from green power and for the county to pursue cost-saving opportunities to aggregate purchases. In 2004, the county partnered with multiple local jurisdictions to finalize a two-year contract that would provide nearly 40 million kWh of wind power per year, thus enabling the county to meet 5 percent of its departmental electricity needs with renewable energy. In 2006, the buying group renewed this contract and increased the total amount of wind power to nearly 56 million kWh annually, allowing the county to raise its green power target from 5 percent to 10 percent (DSIRE, 2013e; Montgomery County, 2008). In fiscal year 2008, the buying group purchased 65 million kWh of wind power, and the county set a goal of doubling its green power purchase percentage to 20 percent by 2011 (U.S. EPA, 2013m). As of 2012, the buying group was purchasing more than 138 million kWh of wind power annually, equivalent to 26 percent of the group's overall electricity use (U.S. EPA, 2013m).

PROFILE: MONTGOMERY COUNTY, MARYLAND

Area: 500 square miles

Population: 1.005 million (2012 estimate)

Structure: The county is governed by a county council and a county executive. The Department of Public Works and Transportation coordinates the county's green power purchases; the Department of Environmental Protection administered the Clean Energy Rewards program.

Program Scope: Montgomery County aggregates green power purchases with 17 other public jurisdictions/entities. In addition to purchasing green power for its own facilities and operations, the county administered a Clean Energy Rewards program through June 15, 2010 that promoted green power in the residential and commercial sectors.

Program Creation: In 2003, the county passed a resolution requiring all departments to obtain at least 5 percent of their electricity from renewable energy.

Program Savings: A three-year extension of the county's aggregated green power purchase is expected to save the county and its aggregation partners a combined $25 million compared with the cost of purchasing separately.

PROGRAM FEATURES

Montgomery County's green power purchasing program includes the following features:

- **Aggregated demand.** Aggregating the demand of multiple electricity customers can help leverage purchasing power, enabling local governments to obtain reduced electricity rates as opposed to

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purchasing on individual contracts. When Montgomery County made its original aggregated purchase in 2000, it partnered with Montgomery County Public Schools, the county Housing Opportunities Commission, Montgomery College, the Washington Suburban Sanitary Commission, and the Maryland-National Capital Park and Planning Commission. In 2005, six Montgomery County agencies formed a new buying group with 11 municipalities and neighboring Prince George's County to aggregate demand for green power (DSIRE, 2007e). As of 2012, buying group participants included the Montgomery County Government, Montgomery County Public Schools, Montgomery College, the Maryland National Capital Park and Planning Commission, Chevy Chase Village, Chevy Chase Village Section 5, the City of Gaithersburg, the City of Rockville, the City of Takoma Park, the Town of Kensington, and the Town of Somerset (U.S. EPA, 2013m).

- **Green-e certification.** In accordance with the county energy policy, any wind power purchased must meet Green-e certification for environmental claims (Montgomery County, 2003).

- **Multi-year contract.** The purchasing group agreed to a two-year fixed-rate contract in 2004 to purchase 38 million kWh annually (Montgomery County, 2004). In 2006, the group renewed this contract for an additional three years (Montgomery County, 2006).

- **"Energy-Wise Offices."** The 2003 Montgomery County Energy Policy created the "Energy-Wise Offices" program, which encourages county employees to implement energy conservation practices that complement the county's green power purchases (Montgomery County, 2003).

- **Financial incentives for businesses and residents.** Through its Clean Energy Rewards program, Montgomery County offered rebates to businesses and residents that purchased green power and RECs, or that installed photovoltaic solar power generation systems at their homes and buildings. Residential consumers received 1¢ per kWh of green power purchased, while non-residential consumers received 1.5¢ per kWh. The county Department of Environmental Protection estimates that its community incentives reduced the cost premium of purchasing green power by approximately 40 percent (Montgomery County, 2007). While the program was considered beneficial, economic conditions in recent years affected the viability of many county programs, and the county closed the Clean Energy Rewards program on June 15, 2010 (Montgomery County, 2010).

- **Public awareness.** The Montgomery County Department of Environmental Protection website provides businesses and residents with information resources about purchasing green power. Information includes comparisons among the green power provider options available to the county's electricity customers (Montgomery County, 2007).

PROGRAM RESULTS

In May 2005, Montgomery County signed a contract to supply five percent of the buying group's power with wind energy resources, resulting in a purchase of 38.4 million kWh per year for two years from wind facilities in West Virginia. The contract applied to six county agencies, 11 municipalities, and Prince George's County. In early 2006, the county and its partners doubled their commitment to 10 percent renewable energy (Resolution 15-1529) for FY 2007 with a further goal of 20 percent by FY 2011. The county further updated the green power purchasing policy in October 2008, enacting a resolution setting a goal of 15 percent renewable energy in FY 2009 while maintaining the FY 2011 goal of 20 percent. The 2008 resolution also updated the county's renewable energy qualification criteria to include only wind, solar, anaerobic digestion, landfill gas, biomass, geothermal, and tidal energy, as defined under the Tier I resource definitions of the state renewable portfolio standard.

As of June 2012, the group's purchase was 134.6 million kWh, or 26 percent of the group's electricity use. The county's FY 2013 budget documents assumed a continuation of these purchases, with most county agencies achieving a minimum purchase of 20 percent renewable energy through the extension of current contracts (DSIRE, 2013e).

Website: *http://www.montgomerycountymd.gov/deptmpl.asp?url=/content/dep/Energy/home.asp*

10. ADDITIONAL EXAMPLES AND INFORMATION RESOURCES

Title/Description	Website
Examples of Green Power Procurement by Local Governments	
Ann Arbor, Michigan. Ann Arbor established a goal of obtaining 30 percent of its energy needs from renewable sources by 2015.	*http://www.a2gov.org/government/publicservices/systems_planning/energy/energychallenge/Pages/WhatIsTheEnergyChallenge.aspx*
Aspen, Colorado. The city established a goal to purchase 100 percent of its electricity from renewable sources by the year 2020.	*http://www.dsireusa.org/incentives/incentive.cfm?Incentive_Code=CO19R&re=0&ee=0*
Austin, Texas. The city council adopted a renewable portfolio standard for Austin Energy, requiring the utility to supply 35 percent of its energy portfolio with energy from renewable sources by 2020.	*http://www.dsireusa.org/library/includes/incentive2.cfm?Incentive_Code = TX11R&state = TX&CurrentPageID = 1&RE = 1&EE = 1*
Bellingham, Washington. The city of Bellingham committed to purchasing 100 percent of its 2007 energy demands from green power sources.	*http://www.dsireusa.org/incentives/incentive.cfm?Incentive_Code=WA18R*
Caroline, New York. Caroline purchased enough green power to offset 100 percent of its electricity demand in 2005.	*http://www.townofcaroline.org/energyindependent/*
Columbia, Missouri. Columbia passed an initiative in 2004 that established a renewable portfolio standard for the city's municipal water and electricity utility.	*http://www.dsireusa.org/incentives/incentive.cfm?Incentive_Code=MO04R&ee=0*
Dallas, Texas. Dallas, an EPA Green Power Partner, is purchasing 40 percent of its electricity from green power sources.	*http://www.greendallas.net/energy_air.html*
Durango, Colorado. In 2007, Durango became one of the first governmental entities in Colorado to commit to purchasing 100 percent green power for its municipal facilities and operations.	*http://www.durangotelegraph.com/index.cfm/archives/2007/april-19-2007/quick-n-dirty/*
Evanston, Illinois. Evanston committed to purchasing RECs to offset 20 percent of its energy consumption in municipal facilities.	*http://ir.constellation.com/common/mobile/iphone/releasedetail.cfm?releaseid=318078&CompanyID=CEG&mobileid=*
Fairfax County, Virginia. Fairfax County entered into a three-year contract to purchase wind energy. The quantity of the purchase will constitute 10 percent of the county's energy demand.	*http://www.eere.energy.gov/greenpower/news/news_template.shtml?id = 1261*
Houston, Texas. As of July 2013, Houston purchases enough green power to meet nearly half of its annual electricity demand.	*http://www.epa.gov/greenpower/partners/partners/cityofhoustontx.htm*
Lacey, Washington. Lacey is one of a handful of cities across the nation that is purchasing green power to supply 100 percent of its municipal electricity needs. The city uses green power in its office buildings, parks and recreation areas, utilities, and streetlights and traffic signals.	*http://www.ci.lacey.wa.us/city-government/city-departments/public-affairs/sustainability/green-power-challenge*
Moab, Utah. Moab purchases green power to supply the city's entire annual electricity use. In 2006, the mayor challenged residents to commit to purchasing 5 percent green power.	*http://www.epa.gov/greenpower/partners/partners/cityofmoabut.htm*
Olympia, Washington. Olympia committed to using green power to supply 100 percent of the energy demand for its drinking water, wastewater, and storm and surface water utilities in 2007.	*http://apps3.eere.energy.gov/greenpower/markets/carbon.shtml?page=2&companyid=211*

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Title/Description	Website
Park City, Utah. EPA designated Park City as a Green Power Community for purchasing 8.2 percent of its electricity use community-wide from green power sources.	*http://www.epa.gov/greenpower/communities/communities/parkcityutcommunity.htm*
Portland, Oregon. Portland saves $300,000 annually by aggregating purchases, taking advantage of wholesale rates on its power (5 percent from renewable resources). The city uses 10 percent green power for its municipal operations.	*http://www.epa.gov/greenpower/partners/partners/cityofportlandor.htm*
Radnor Township, Pennsylvania. In 2003, the commissioners committed to purchasing 62 percent green power, motivated by their concern over poor air quality caused by electricity generation from fossil fuels in the Philadelphia region.	*http://erendev.nrel.gov/greenpower/buying/pr/0303_radnor_pr.html*
Rochester, New York. In 2005, Rochester purchased 15 percent Green-e certified green power for its municipal facilities. As of August 2013, the city was using 25 percent renewable energy to power its facilities.	*http://www.epa.gov/greenpower/partners/partners/cityofrochesterny.htm*
Salem, Massachusetts. The city of Salem convened a renewable energy task force to assess the city's potential for purchasing green power and installing renewable energy generation systems at municipal facilities.	*http://www.salem.com/Pages/SalemMA_BComm/energy*
San Antonio, Texas. The San Antonio municipal utility established a goal of supplying 20 percent of its power with renewable energy by 2020.	*http://www.dsireusa.org/incentives/incentive.cfm?Incentive_Code=TX15R&re=0&ee=0*
Santa Monica, California. Santa Monica became the first city in the United States to convert to 100 percent renewable energy in municipal buildings. In July 2013, the city purchased 28 million kWh in RECs.	*http://www.epa.gov/greenpower/toplists/partner100.htm*
Suffolk County, New York. Suffolk County, one of EPA's Top 50 green power purchasers, acquires 90 percent of its electricity from renewable energy sources.	*http://www.epa.gov/greenpower/partners/partners/suffolkcountyny.htm*
Westport, Connecticut. Westport became one of the first municipalities in the Northeast to commit to purchasing 100 percent green power. The city's purchases are certified by Green-e.	*http://www.eere.energy.gov/greenpower/buying/pr/0102_ctecoop_pr.html*
Examples of Local Government Green Power Procurement Programs for Businesses and Residents	
Austin, Texas. The Austin Green Choice Program offers businesses and residents the opportunity to purchase renewable energy from the municipal utility.	*http://www.austinenergy.com/energy%20efficiency/Programs/Green%20Choice/*
Beaverton, Oregon. Beaverton established a Green Power Challenge to encourage businesses and residents to enroll in one of the local utility's renewable energy programs. The city government is leading by example by purchasing 7.6 million kWh of renewable energy for its own facilities in 2007.	*http://www.portlandgeneral.com/community_environment/initiatives/renewable_energy/beaverton_challenge.aspx*
Berkeley, California. The Community Choice Aggregation, which includes the cities of Berkeley, Oakland, and Emeryville, provides residential and business electricity customers with alternatives to conventional energy. The initiative's goal is to increase the use of renewable energy in the region.	*http://www.ci.berkeley.ca.us/communitychoice/*
Cape Cod and Martha's Vineyard, Massachusetts. The Cape Light Compact committed to purchasing RECs and became the first entity in Massachusetts to adopt the "Community Choice" aggregation model. Each participating town passed a resolution accepting the purchase agreement. Participation is voluntary for all residents.	*http://apps3.eere.energy.gov/greenpower/markets/certificates.shtml?page=2&companyid=400*
Houston, Texas. The City of Houston maintains the Houston Consumer Choice website to inform electricity customers of opportunities to purchase green power.	*http://www.shoptexaselectricity.com/houston-consumer-choice.aspx*

Title/Description	Website
Los Angeles, California. The Green Power for a Green LA program encourages local businesses and residents to sign up for green power purchases at a cost of 3¢ per kWh.	*https://www.ladwp.com/ladwp/faces/ladwp/residential/r-gogreen/r-gg-signupforgreenpower?_adf.ctrl-state=16dxjjopnq_21&_afrLoop=76215054654000*
Ogden City, Utah. Ogden City established a community energy challenge that aims to increase residential and commercial procurement of green power. One component of the program is a quantity savings option that allows businesses to purchase green power in blocks at wholesale rates.	*http://www.ogdencity.com/displayarticle92.html*
Palo Alto, California. EPA recognized Palo Alto as a Green Power Community for achieving an enrollment rate of 20 percent in its PaloAltoGreen community green power purchasing program.	*http://www.epa.gov/greenpower/communities/communities/paloaltocacommunity.htm*
Information Resources on Green Power Procurement	
Assessing the Economic Development Impacts of Wind Power. This report provides examples that document the economic development implications of investing in wind power.	*http://www.nationalwind.org/assets/past_workgroups/Assessing_the_Econ_Development_Impacts_of_Wind_-_March_2003.pdf*
Best Practices for Siting Solar Photovoltaics on Municipal Solid Waste Landfills. This document provides assistance in addressing common technical challenges for siting photovoltaics on municipal solid waste landfills and is geared towards the functional integration of the solar photovoltaic installation and the engineered systems typically found at these landfills.	*http://www.epa.gov/renewableenergyland/docs/best_practices_siting_solar_photovoltaic_final.pdf*
Community Choice Aggregation. The Local Government Commission developed this fact sheet to advise local governments on how to aggregate community energy purchases to produce significant energy and environmental benefits.	*http://www.lgc.org/cca/docs/cca_energy_factsheet.pdf*
Community Choice Aggregation: A Description and Analysis with Considerations for Colorado. This paper addresses the benefits of aggregating community electricity purchases.	*http://www.capelightcompact.org/library/2010/08/02.01.07-Community-Choice-Aggregation-Report.pdf*
Corvallis, Oregon – An EPA Green Power Community. This presentation identifies the green power suppliers used by the City of Corvallis, the cost-benefit of purchasing green power, and success factors.	*http://www.epa.gov/greenpower/documents/events/18jan12_webinar_lovett.pdf*
Customer Aggregation: An Opportunity for Green Power? This National Renewable Energy Laboratory (NREL) report identifies current aggregation practices and assesses the community and environmental benefits of aggregated green power purchases.	*http://www.eere.energy.gov/greenpower/resources/pdfs/lb29408.pdf*
DSIRE. The Database of State Incentives for Renewable Energy provides information on state and local government renewable energy and energy efficiency incentives.	*http://www.dsireusa.org/*
Emerging Markets for Renewable Energy Certificates: Opportunities and Challenges. This Lawrence Berkeley National Laboratory report describes the current market for RECs. It provides an overview of how RECs are marketed and identifies key challenges to broader expansion of REC markets.	*http://www.eere.energy.gov/greenpower/resources/pdfs/37388.pdf*
Environmental Resources Trust. The Environmental Resources Trust certifies RECs through its EcoPower certification program.	*http://www.ert.net/*
Federal Grants. The Federal grants.gov program provides information on financial incentives available from 26 government agencies for a range of investments, including renewable energy generation.	*http://www.grants.gov/*

Title/Description	Website
FEMP Renewable Energy. The DOE FEMP program provides information on federal government initiatives for using renewable energy, including on-site generation.	*https://www1.eere.energy.gov/femp/technologies/renewable_energy.html*
Green Power Marketing in the United States, A Status Report. This NREL report provides an overview of current trends in green power prices and the state of renewable energy technologies.	*http://www.nrel.gov/docs/fy14osti/60210.pdf*
Green Power Purchasing and Sustainability Planning in Washington, D.C. This report provides an overview of green power purchasing efforts in Washington, DC, along with a summary of lessons learned.	*http://www.epa.gov/greenpower/documents/events/18jan12_webinar_yambrach.pdf*
Green-e. Green-e is a voluntary certification and verification program for wholesale, retail, and commercial electricity products, RECs, and utility green pricing programs.	*http://www.green-e.org/*
Greening the City of Moab. This EPA presentation provides a list of the criteria for EPA's Green Power Communities certification, as well as steps for community action campaigns.	*http://www.eere.energy.gov/greenpower/conference/10gpmc05/wright_clouse.pdf*
Guide to Purchasing Green Power. This EPA Green Power Partnership guide provides information on planning and implementing green power purchases.	*http://www.epa.gov/greenpower/pdf/purchasing_guide_for_web.pdf*
Handbook on Siting Renewable Energy Projects While Addressing Environmental Issues. This Handbook provides information to help interested parties determine the overall feasibility of siting renewable energy production on contaminated sites and some key considerations for integrating the development of such systems during all phases of typical cleanup processes.	*http://www.epa.gov/renewableenergyland/docs/handbook_siting_repowering_projects.pdf*
Jobs from Renewable Energy and Energy Efficiency. This fact sheet provides information on existing and projected energy efficiency- and renewable energy-related jobs in the United States by sector.	*http://www.eesi.org/briefings/2007/Energy%20&%20Climate/11-8-07_green_jobs/EEREJobsFactSheet_11-8-07.pdf*
Municipal Guide to Purchasing Renewable Energy. This report provides guidance on designing and financing RFPs for renewable energy purchases.	*http://www.mass.gov/Eoca/docs/doer/esmart-purchasing-renewable-energy.pdf*
Putting Renewables to Work: How Many Jobs Can the Clean Energy Industry Generate. This University of California-Berkeley report shows the economic benefits of investing in renewable energy in terms of jobs created.	*http://rael.berkeley.edu/files/2004/Kammen-Renewable-Jobs-2004.pdf*
Regulator's Handbook on Renewable Energy Programs & Tariffs. This report by the Center for Resource Solutions provides an overview of state renewable energy programs, along with case studies on different states' methods of implementing those programs.	*http://www.resource-solutions.org/pub_pdfs/Handbook_on_Renewable_Energy_Programs_&_Tariffs.pdf*
Renewable Energy Certificates: An Attractive Means for Corporate Customers to Purchase Renewable Energy. This World Resources Institute report provides an overview of RECs, including funding opportunities for procuring RECs and steps for selecting appropriate options.	*http://pdf.wri.org/gpmdg_corporate_5.pdf*
Renewable Energy Certificates and Generation Attributes. This Regulatory Assistance Project report provides an overview of the concept behind marketing renewable energy attributes.	*http://www.raponline.org/docs/RAP_Holt_IssuesLetter-RenewableEnergyCertificatesAndAttributes_2003_05.pdf*
Renewable Energy and Energy Efficiency: Economic Drivers for the 21st Century. This report was developed by the American Solar Energy Society to describe the existing and projected breakdown of renewable energy and energy efficiency-related employment in the United States.	*http://www.greenenergyohio.org/page.cfm?pageID=2257*
Switching to Green. This World Resources Institute report provides guidance to offices and retail companies on procuring green power. The report gives an overview of steps to consider when deciding to switch to green power.	*http://pdf.wri.org/switching_to_green.pdf*

Title/Description	Website
Tackling Climate Change in the U.S.: Potential Carbon Emissions Reductions from Energy Efficiency and Renewable Energy. This report by the American Solar Energy Society addresses the potential contributions of different energy-efficient and renewable technologies toward GHG emissions reductions. It provides an overview of the status and potential of each renewable energy resource type.	*http://kansas.sierraclub.org/Wind/Climate_Change.pdf*
Tradable Renewable Certificates Handbook. This handbook provides information on basics and benefits of RECs and provides an overview of the regulator's role in facilitating REC transactions.	*http://www.resource-solutions.org/pub_pdfs/Regulators%20Handbook%20on%20TRCs.pdf*
Treatment of Renewable Energy Certificates, Emissions Allowances, and Green Power Programs in State Renewable Portfolio Standards. This Lawrence Berkeley National Laboratory report provides an overview of the treatment of renewable energy attributes in states that enforce renewable portfolio standards. The report identified implementation issues that arise when RECs are used for RPS compliance.	*http://eetd.lbl.gov/ea/ems/reports/62574.pdf*
Trends in Utility Green Pricing. This NREL report presents data on trends in green pricing for renewable energy products and provides an overview of utility green pricing program implementation since 1999.	*http://www.nrel.gov/docs/fy07osti/40777.pdf*
Using Wind Power to Hedge Volatile Electricity Prices for Commercial and Industrial Customers in New York. This report, prepared for the New York State Energy Research and Development Authority, provides a financial analysis of the comparative benefits of relying on wind power as compared to conventional fossil fuels.	*http://www.powernaturally.org/About/documents/WindHedgeExSumm.pdf*
Green Power Procurement Tools	
CACP Software. The Clean Air and Climate Protection (CACP) is a Windows-based software tool designed to help state and local governments develop harmonized strategies to reduce both GHG and air pollution emissions. It allows users to create a cross-sector emissions inventory at the entire community level or at the government operations level. This tool was developed as a joint project involving the former State and Territorial Air Pollution Program Administrators and Association of Local Air Pollution Control Officers (STAPPA/ALAPCO), now the National Association of Clean Air Agencies, and ICLEI – Local Governments for Sustainability.	*http://www.icleiusa.org/tools/cacp-2009*
eGRID. EPA's eGRID is a comprehensive source of data on the environmental characteristics of domestic electric power generation. It compiles data from 24 federal sources on emissions and resource mixes for virtually every power plant and company that generates electricity in the United States. It also provides user search options, including aspects of individual power plants, generating companies, states, and regions of the power grid.	*http://www.epa.gov/cleanenergy/egrid/index.htm*
EPA Green Power Locator. This tool enables users to locate green power options available in each state.	*http://www.epa.gov/greenpower/locator/index.htm*
EPA Power Profiler Tool. This EPA tool provides emission factors for a given region to help calculate the pollution benefits of energy savings. Users enter a ZIP code and specify their electric utility. This tool uses information from EPA's eGRID database of emissions and electricity generation data.	*http://www.epa.gov/cleanenergy/powerprofiler.html*
GHG Equivalencies Calculator. Local governments can use this calculator to translate GHG emissions reductions into more tangible quantities (e.g., vehicle miles reduced or trees planted).	*http://www.usctcgateway.net/tool/*
Power Scorecard. The Power Scorecard is a Web-based information tool created by a coalition of environmental groups. It enables consumers to compare the environmental impacts of green power and conventional power products.	*http://www.powerscorecard.org/*
RE-Powering Mapper. The mapper tool makes it possible to view EPA's information about renewable energy potential on contaminated lands, landfills, and mine sites, alongside other information contained in Google Earth.	*http://www.epa.gov/renewableenergyland/rd_mapping_tool.htm#i_map*

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