

# Renewable Energy: A key step on the road to sustainability

## Executive Summary

*In today's hypercompetitive global economy, organizations are looking for any way to optimize supply chain management and reduce costs through operating efficiencies. Yet at the same time, they are being held to higher standards for corporate social responsibility, a key element of which is the environmental impact of their business practices. One of the ways companies can demonstrate environmental responsibility is to purchase renewable energy. Unlike traditional fossil fuels, which are in finite supply and emit harmful greenhouse gases when consumed, renewable energy sources such as solar, wind, hydro and geothermal cannot be depleted and minimize negative environmental impacts. Renewable energy certificates (RECs) allow companies to purchase the positive attributes of renewable energy and support the continued development of renewable energy generation facilities. This white paper explains the basics of renewable energy and outlines the choices companies have for purchasing RECs and "greening up" their power usage.*

## The Reason and the Result: Building a Sustainable Business

The concept of "sustainability" has been gaining steady ground as a business driver over the past few years. In environmental discussions, it refers to sustaining the planet. In business, however, the meaning is much broader.

The idea is this: For a business to maintain a competitive advantage and achieve long-term success in today's economy, it must excel in three areas:

- **People** — Treat all stakeholders (customers, employees, larger community) fairly.
- **Planet** — Operate in an environmentally responsible manner.
- **Profits** — Achieve an acceptable return on investment and a healthy bottom line.

Purchasing renewable energy minimizes a firm's impact on the environment and thus is a key variable in the sustainability equation. Generating electricity from renewable resources such as wind, sunlight and water is an environmentally preferred alternative to traditional electric generation using fossil fuels. Achieving sustainability can be both a motivation for using renewable energy and one of the rewards for firms striving to impact their "triple bottom line" of people, planet and profits.

## What is Renewable Energy?

Renewable energy refers to electricity from energy sources that can regenerate indefinitely without being depleted. Examples of renewable energy sources include:

- **Wind** — The most rapidly growing source of renewable energy. Naturally occurring wind currents are used to spin wind turbines to generate power.
- **Solar** — Energy collected from sunlight is used to generate electricity via photovoltaic arrays. Though currently one of the most expensive forms of renewable energy, solar has great potential as the technology continues to advance.
- **Hydro** — Flowing water is used to spin turbines connected to generators. There are several types of hydroelectric systems, such as dams and river current, as well as emerging technologies such as wave and tidal power. Only energy generated from low-impact hydro sources is considered renewable by U.S. Environmental Protection Agency (EPA) standards.
- **Geothermal** — Power generated by geysers fueled by heat located deep within the earth's core.
- **Biomass** — Energy created by burning wood, wood waste, animal or other organic waste and methane gas generated from landfills.

Renewable energy is an alternative to energy created by burning fossil fuels, such as coal, oil or natural gas, or by nuclear generation. Because traditional fossil fuels require millions of years to develop, they are not considered renewable energy sources.

When fossil fuels burn, they emit greenhouse gases, such as carbon dioxide (CO<sub>2</sub>), the primary source of greenhouse gas in the United States. Other greenhouse gases include methane, nitrous oxide and hydrofluorocarbons. Greenhouse gases are believed to trap heat within the earth's atmosphere, causing a rise in the earth's temperature. Rising temperatures may, in turn, produce climate change, with effects on weather patterns, sea levels and land use.

## Demand for Renewable Energy

As of 2004, the U.S. produced about 22 percent of the world's CO<sub>2</sub> emissions,<sup>1</sup> a significant portion of which (39 percent in 2006) comes from the conversion of fossil fuels to electricity.<sup>2</sup> Coal is used to generate approximately 48 percent of the electricity in the U.S. Gas and oil make up another 23 percent, nuclear adds 19 percent, and large hydro another 6.6 percent. Other energy sources, including renewable resources (which include only low-impact hydro), account for 3 percent of the electricity generated.<sup>3</sup>

Recognizing the positive attributes of renewable energy (more environmentally sound, less reliance on finite fossil fuels), U.S. state and federal governments have taken steps to promote increased use. As of 2007, 24 states and the District of Columbia have enacted renewable portfolio standards (RPS) that require electricity providers to obtain a certain percentage of their electricity from renewable providers by a certain date. At the national level, the Federal Energy Policy Act provides development incentives for renewable energy, such as tax credits and accelerated depreciation to enhance the economic attractiveness of renewable projects. In addition, federal executive orders require certain state agencies (such as NASA) to meet aggressive renewable timetables.

### **CO<sub>2</sub> Emissions Shifting, but Rising**

*As of 2004, China produced about 17 percent of the world's CO<sub>2</sub> emissions compared to the U.S.'s 22 percent. However, projections for 2010 predict a shift, indicating that the U.S. will emit 17 percent of the world's total CO<sub>2</sub> and China will emit 21 percent, making China the world's largest CO<sub>2</sub> emitter. Overall, the world's total CO<sub>2</sub> emissions during this period (2004 to 2010) are projected to increase by 15 percent, a substantial amount.<sup>4</sup>*

At the same time, voluntary demand for renewable energy is growing. The Commission for Environmental Cooperation reports “exponential growth” in the U.S. voluntary market since the mid-1990s, brought on by new product development, lower prices and increased awareness. Voluntary purchases represented more than 2,000 MWs of installed capacity in 2004 and are estimated to grow to more than 7,000 MWs of capacity by 2010.<sup>5</sup>

## How to Access Renewable Energy

Electricity consumers can pursue renewable energy sources in two ways. Some may choose to generate renewable energy on-site; for example, by installing a photovoltaic (solar panel) array or other distributed energy system. A more cost-effective and more easily implemented option is to purchase renewable energy certificates (RECs) from an electricity supplier or broker.

*RECs promote the positive attributes of renewable energy and encourage further development*

### About RECs

RECs represent the positive attributes of renewable energy and encourage further development of renewable energy generation facilities. When fossil fuels are burned to generate electricity, there is a positive outcome (electricity) and a negative outcome (harmful greenhouse gas emissions). When renewable energy sources generate electricity, both the electricity generated and the environmental impact of that generation are positive. These positive attributes are often decoupled and sold separately: The electricity is sold into the market, with electrons flowing into the “grid” along with conventional fossil fuel-generated electricity, and the positive environmental attributes are sold as RECs. One REC equals one MWh of renewable energy produced, and each REC can be counted only once before being retired.

### Why Buy RECs

Why are companies voluntarily seeking out renewable energy and purchasing RECs? Pursuit of a sustainable corporate business model is one reason, as renewable energy supports both environmental and social responsibility. Demonstrating this responsibility is also an important contributor to positive investor, employee and general public relations. Other reasons to support renewable energy include competitive differentiation — setting a company apart from others — and being a leader in addressing environmental change issues. Firms looking to participate in the Leadership in Energy and Environmental Design (LEED) Green Building Rating System™ also look to use REC purchases to satisfy requirements for certification for high-performance green buildings. From a “big picture” perspective, buying RECs helps build the market for renewable energy, thus supporting increased research and development of renewable energy technology and strengthening the independence and diversity of the U.S. energy supply through increased capacity in renewable generation. This increase in renewable generation will also serve to reduce U.S. greenhouse gas emissions.

#### **Companies purchase RECs to:**

- *Demonstrate social and environmental responsibility*
- *Differentiate themselves*
- *Keep pace with competitors*
- *Meet global standards*
- *Support renewable energy R&D*
- *Generate positive publicity*
- *Offset the environmental impact of normal business operations*

### REC Pricing

RECs have their own market value. The cost of the REC depends on several factors, including the type of generation technology (solar costs more than wind, for example), the geographic origin of the electricity (e.g., New York, California, New England, national), the specific generation facility and the “vintage” or year the energy was produced. Each REC purchased describes these specifics, enabling a buyer to trace where, when and how the renewable energy was produced.

Generally, the less specific the REC, the lower the cost. A REC described as “national blend” refers to renewable energy produced from various, unspecified generators within the U.S. and is the least expensive. RECs that are more specific, such as wind-generated from a particular wind farm, typically cost more.

The REC vintage is typically matched to the year of use. For example, if a company wishes to offset its electricity usage for 2007, it would procure RECs generated in 2007, the same vintage year. Due to market liquidity factors, RECs are typically not sold more than one or two years in advance. It is also possible to purchase RECs for a specific purpose, such as to offset the electricity used at a particular facility or during a conference or other event.

In late 2007, the national average cost for electricity was 9 cents per kWh. A national blend REC would typically add about one-half cent to 1.5 cents per kWh to that cost. Of course, a company's ratio of renewable energy to total energy purchased would determine the bottom-line impact of paying that premium: Companies that purchase only a small percentage of renewable energy see a correspondingly small increase in total energy costs. Purchasing higher percentages of renewable energy results in proportionally higher total energy costs. However, as the significant rise in recent REC purchases attests, companies believe these increases are worth it, given the many environmental, competitive, social and marketing benefits associated with procuring RECs.

### **How to Buy RECs**

RECs can be purchased from retail electricity providers, utilities or REC brokers. Companies who purchase RECs from their regular retail electricity provider may also receive guidance from their provider on how to integrate RECs into their overall energy strategy. For example, a company's energy plan may include various components aimed at environmentally responsible energy use and reducing the company's "carbon footprint" — the measure of how much CO<sub>2</sub> it contributes directly or indirectly to the environment. The energy plan might include:

- Reducing consumption directly through energy efficiency measures.
- Purchasing renewable energy to help offset greenhouse gas emissions from the energy it does consume.
- Offsetting non-environmentally friendly practices. For example, companies may consider offsetting their employees' business travel by car or plane or implement recycling programs for the products or materials consumed or produced in the course of doing business.

Retail electricity providers can also provide assistance on how to leverage REC purchases to best advantage, such as purchasing Green-e® certified renewable energy products or obtaining recognition from the U.S. EPA's Green Power Partnership (GPP) program.

### **About Green-e**

Green-e is an independent renewable energy certification and verification program administered by the Center for Resource Solutions (CRS), a non-profit organization. Renewable energy bearing the Green-e logo has been certified by a rigorous CRS-administered audit process designed to meet strict consumer protection and environmental standards. Green-e specifically supports the development of new renewable energy facilities; only new renewables, those from facilities beginning operation or repowered after January 1, 1997, are eligible to meet Green-e standards. Green-e certification provides an "audit trail" allowing the renewable energy certificates to be traced from generator to final purchaser. Organizations that meet the Green-e program standards and pay a licensing fee are eligible to display the Green-e logo as a sign of their commitment to certified renewable energy.<sup>6</sup>

### About the EPA's Green Power Partnership

The EPA's Green Power Partnership assists companies in purchasing renewable power (including RECs, utility products or onsite generation systems) and actively recognizes and promotes companies that participate. Companies can become Green Power Partners or Green Power Leaders, designations based on the percentage of green energy purchased. Similar to Green-e certification, participation in the Green Power Partnership signifies that an organization's green power purchase meets nationally accepted standards in terms of size, content and resource base.<sup>7</sup>

Businesses and organizations wishing to become an EPA GPP must:

- Meet the Minimum Purchase Requirements outlined below.
- Fill out the EPA Green Power Partners Application.
- Follow the EPA's basic Marketing Guidelines.

### Green Power Purchase Requirements

Your Organization's Baseload	Green Power Partner Requirements	Green Power Leadership Club Requirements
<i>If your annual electricity use in kilowatt-hours is...</i>	<i>You must, at a minimum, purchase this much green power within one year of joining the Partnership</i>	<i>You must, at a minimum, purchase this much green power</i>
≥ 100,000,001 kWh	2% of your use	20% of your use
10,000,001 – 100,000,000 kWh	3% of your use	30% of your use
1,000,001 – 10,000,000 kWh	6% of your use	60% of your use
≤ 1,000,000 kWh	10% of your use	Not Applicable

*In addition, the minimum Partner and Leadership Club purchase requirements must be entirely met with power from "new" renewable facilities (i.e., installed after 1/1/1997).*

For example, if you are enrolling facilities that have a combined total electricity use of 8 million kWh, then the minimum green power purchase requirement to join the Partnership would be 6 percent or 480,000 kWh.

### How Much Renewable?

How much renewable energy to purchase, whether 1 percent or 100 percent of total electricity consumed, is at each company's discretion. Some companies have established corporate social responsibility goals and plan their renewable energy purchases accordingly to support those goals. EPA Green Power Partners PepsiCo and Whole Foods Market, for example, have committed to purchasing 100 percent renewable energy, Starbucks has committed to 20 percent, and many others choose to simply purchase the minimum percentage to meet program requirements.

## Deciding to Purchase — What to Consider

In deciding if your company wants to purchase RECs and if so, in what quantity, here are some considerations.

- Do you have an energy procurement, environmental or overall sustainability strategy?  
If so, how do REC purchases fit in?
- What do you hope to gain from purchasing RECs?
  - Meet corporate social responsibility goals?
  - Support renewable energy generation and continued development?
  - Market your company as environmentally conscious in the hopes of gaining sales?
  - Differentiate yourself from competitors?
  - Keep up with competitors?
  - Participate in Green-e or Green Power Partnership programs?
  - Offset electricity use for a particular location or event?
  - Offset a specific amount of CO<sub>2</sub> emissions?
- How will you purchase the RECs — from a retail energy supplier or other channel? Working with a retail energy supplier is often beneficial in being able to plan and implement an overall integrated energy strategy.
- Are you purchasing RECs that specifically support new development and provide an audit trail tracking the origin of the energy generated and the payment stream for it?
- Do you wish to support a particular type of renewable energy with your REC purchase?
- Do you wish to support a particular renewable energy facility by buying RECs for energy that it specifically generated? Can your REC supplier accommodate this request?

## Conclusion

RECs give companies a practical and tangible way to demonstrate their environmental responsibility and support the continued development of renewable energy. By carefully considering REC purchases in light of their overall energy strategy, companies can both meet their sustainability goals and positively contribute to the nation's energy independence and the planet's environmental future while improving their triple bottom line.

### Presented by Direct Energy Business

Transparent pricing, experienced guidance and unequalled service. Direct Energy Business is dedicated to serving our customers with innovative energy management solutions. As your energy partner, we can help you gain greater control of your energy costs and streamline your procurement process. With more than 20 years of industry experience, we are dedicated to helping companies make cost-effective choices for their electricity and natural gas requirements. Contact us to talk about your energy demands, and we'll help you navigate the procurement options available in your service area. To learn more about our company and other energy strategies for commercial and industrial enterprises, visit [www.directenergybusiness.com](http://www.directenergybusiness.com) or call 800.830.5923.

<sup>1</sup> *Emissions of Greenhouse Gases in the United States 2006*, Energy Information Administration, November 2007, page 7, Table 3.

<sup>2</sup> *Ibid.*, page 4 diagram.

<sup>3</sup> *Electric Power Monthly*, November 2007 edition, Energy Information Administration, ([http://www.eia.doe.gov/cneaf/electricity/epm/epm\\_sum.html](http://www.eia.doe.gov/cneaf/electricity/epm/epm_sum.html)), Figure 1. Net Generation Shares by Energy Source: Total (All Sectors), Year-to-Date through August, 2007

<sup>4</sup> *Emissions of Greenhouse Gases in the United States 2006*, Page 7, Table 3.

<sup>5</sup> *Fostering Renewable Energy Markets in North America Executive Summary*, Commission for Environmental Cooperation, Montreal, April 2007.

<sup>6</sup> Visit [www.green-e.org](http://www.green-e.org) for more information about the Green-e program.

<sup>7</sup> Visit [www.epa.gov/greenpower](http://www.epa.gov/greenpower) for more information about the Green Power Partnership.