EPRI

Fifth National Green Power Marketing Conference

Powering the New Millennium, August 7-8, 2000, Denver, Colorado

Technical Report

Fifth National Green Power Marketing Conference

Powering the New Millennium

August 7-8, 2000, Denver Colorado

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REPORT SUMMARY

Radical changes in the electricity industry have dramatically opened the marketplace to renewable energy development. In fact, by the end of 2000, more than one-thid of all U.S. electricity consumers had option to purchase green power. The Fifth National Conference on Green Power Marketing—attended by some 160 green power professionals—examine various strategies for growing the green power market, successful utility approaches to green power pricing programs, and the cost of renewable energy systems. The conference also provided an overview of international green power activities and the government as a green power purchaser. Finally, the conference featured a business customer roundtable exploring why customers are purchasing green power as well as panel discussions on the nature of green power and information technology as it relates to green power.

Background

The term green power is used to define power generated from renewable energy resources, such as wind and sun (solar), the earth's hear (geothermal), falling water (hydropower), and power and waste materials (biomass). Green power is typically marketed through either a regulated utility green-pricing program or as a competitive offering in a deregulated market. Even as the tide of deregulation sweeps the country, new green-pricing programs continually emerge. The focus for many, however, is on marketing innovations in the competitive retail sector, where green power is believed to hold significant customer appeal.

Objective

To examine the state of green power marketing and explore opportunities for enhancing the success of green power sales in both regulated and deregulated markets.

Approach

Organizers of the Fifth National Conference on Green Power Marketing—held August 7-8, 2000, in Denver, Colorado—included the U.S. Department of Energy, EPRI, the U.S. Environmental Protection Agency, and the Edison Electric Institute, Conference organizers arranged for presentations to cover governmental and commercial approaches to renewable energy development as well as customer perspectives on green power.

Results

Key messages that emerged from the conference include the following:

- Although energy providers may disagree over which sources qualify as green power, there appears to be a consensus that conformation disclosure is crucial to educating consumers about electricity product options and their relative environmental impacts. Consumers making power purchase decisions in the marketplace may be the ultimate arbiters of this debate.

- Businesses, governments, and other commercial customers account for a growing share of green power demand. Nonresidential customers are interested in green power as a reflection of organizational values. Businesses increasingly recognize that green power purchasing can help meet corporate goals related to environmental improvement and sustainable business practices. Finally, government entities at all levels are purchasing green power, both as a matter of civic duty and to "lead by example." Given these realities, suppliers need to assist customers in identifying tangible private benefits.
- Conference attendees heard from several utility representatives whose companies have been particularly successful in marketing their respective green power products. In almost all cases, these utilities were responding to the interest expressed by customers in green power choices. Utility representatives pointed to internal management support, collaborative marketing, activities involving community groups, and participation by nonresidential customers as key success factors.
- Utilities are employing a number of strategies to grow the green market beyond the yield of simple marketing efforts. Among the strategies discussed were customer aggregation, grassroots marketing, the linking of green power purchases to environmental compliance, and the creation of renewable energy certificates that reduce green power transaction costs.

EPRI Perspective

With electricity price spikes occurring in California and other areas of the country, additional green power development is viewed as a necessary and attractive means for addressing electricity shortages and stabilizing market prices. EPRI fosters and participates in conferences such as this one to facilitate the advancement of green power technologies in both regulated and deregulated marketplaces. These National Green Power Marketing Conferences have provided a key forum for shaping effective, innovative strategies that accelerate the development of a green power customer base and the associated technology infrastructure. Previous DOE-EPRI National Green Power Conferences are documented in reports TR-109179, TR-112315, and TR-114878.

Keywords

Renewable energy
Green power

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1
OVERVIEW

In the half-dozen years since the first utility offered its ratepayers the option of contributing to a fund for renewable energy development, the electricity marketplace has changed radically. As we entered the new millennium, many states were formally in some stage of opening their electric markets to competition, talk of federal electricity restructuring laws was intensifying, and more than a dozen companies were competitively marketing "green power" options to retail customers. In still-regulated markets, more than 80 utilities were offering or planning to offer "green pricing" to their customers. By the end of 2000, one-third of all U.S. electricity consumers would have the option to purchase green power.

The term *green power* is used to define power generated from renewable energy resources, such as the wind and the sun (solar), the earth's heat (geothermal), falling water (hydropower), and plant and waste materials (biomass). Green power is typically marketed through either a regulated-utility green-pricing program or as a competitive offering in a deregulated market. Even as the tide of deregulation sweeps the country, new green-pricing programs continually emerge, but the focus for many is upon marketing innovations in the competitive retail marketplace where green power is believed to hold significant customer appeal.

The Fifth National Conference on Green Power Marketing was organized to examine the state of green power marketing and to explore opportunities to improve on the success of green power sales in both regulated and deregulated markets. Conference organizers included the U.S. Department of Energy (DOE), the Electric Power Research Institute (EPRI), the U.S. Environmental Protection Agency (EPA), and the Edison Electric Institute. Additionally, the following companies and organizations provided conference sponsorship: the Center for Resource Solutions, Green Mountain Energy Company, PacifiCorp, PG&E Corporation, Public Service Company of Colorado, and the Western Area Power Administration.

Some key messages that emerged from the conference are the following:

- With electricity price spikes beginning to occur in California and other areas of the country, additional green power development is viewed as a necessary and attractive means for addressing electricity shortages and providing market price stability.
- Although people may disagree over which particular energy sources qualify as green, there appeared to be a consensus that information disclosure is an important vehicle for educating consumers about electricity product options and their relative environmental impacts. Consumers making power purchasing decisions in the marketplace may be the ultimate arbiters of this debate.

- Businesses, governments, and other commercial customers account for a growing share of green power demand. Nonresidential customers are interested in green power as a reflection of organizational values. Businesses are increasingly recognizing that green power purchasing can help meet corporate goals related to environmental improvement and sustainable business practices, while government entities at all levels are purchasing green power both as a matter of civic duty and to "lead by example." At the same time, suppliers need to assist these customers in identifying tangible private benefits.
- Conference attendees heard from several utility representatives whose companies have been particularly successful in marketing their respective green power products. In almost all cases, these utilities were responding to the interest expressed by customers in green power choices. Utility representatives pointed to internal management support, collaborative marketing and other activities involving community groups, and participation by nonresidential customers as key success factors.
- Finally, a number of strategies are being employed to grow the green market beyond what simple marketing efforts normally yield. Among the strategies discussed were customer aggregation, grassroots marketing, the linking of green power purchases to environmental compliance, and the creation of renewable energy certificates, which can reduce green power transaction costs.

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FIRST DAY OPENING SESSION

Paul Thomas, chief operating officer of **Green Mountain Energy Company**, started the conference with an overview of the company's green power marketing efforts. The central premise of the company's business is to "use the power of customer choice to change the way power is made." Green Mountain is actively marketing in three states: California, Pennsylvania, and New Jersey. To meet customer demand, the company has supported the development of five new solar and wind projects totaling more than 12 megawatts (MW). Mr. Thomas noted that market data indicate that a large fraction of consumers are potential green power purchasers. For example, two-thirds of U.S. consumers are likely to switch to brands associated with a good cause and more than one-half of Americans have purchased environmentally safe products.

Although most marketing to date has focused on the residential sector, Mr. Thomas suggested that the business sector is also a promising market for green power. A number of large businesses such as Coca-Cola, Ford Motor Company, and the Bank of America have adopted the CERES* principles, agreeing that "green business is good business."

Given its new partnership with BP Amoco, Green Mountain plans to tap into Amoco's sales force to attract new residential and business customers and to lower customer acquisition costs. The company also plans to position itself more favorably in increasingly volatile electricity markets by offering fixed-price products, which protect customers from unexpected price increases. According to Mr. Thomas, the California experience provides an opportunity to determine what makes a competitive market work, noting that ideal market conditions require a fair "price to compare," minimal barriers to choice, and uniform business rules. Mr. Thomas noted that green power development is part of the solution to price spikes and supply shortages.

[*Editor's note*: Following the conference, Green Mountain entered retail energy markets in Connecticut, Ohio, and Texas.]

U.S. Representative Mark Udall, co-chair of the Congressional Renewable Energy Caucus, described the environmental imperative to support initiatives that lead us toward a more sustainable energy system. He stated that renewable energy and energy efficiency need to play a more important role in addressing the growing impacts of energy use on our environment. As the nation's demand for energy grows over the next decade and longer, it is important to use clean

* The Coalition for Environmentally Responsible Economies (CERES) is a nonprofit coalition of investors, public pension funds, foundations, labor unions, and environmental, religious, and public interest groups, working in partnership with companies toward the common goal of corporate environmental responsibility worldwide.

energy sources to meet these increasing needs. He also noted that development of our domestic base of renewable energy resources can help reduce the economic and national security impacts associated with imported fuel.

Representative Udall noted a number of ways in which the U.S. Congress can support increased renewable energy development, such as increasing tax incentives, supporting research and development of clean energy technologies, and including specific provisions for renewable energy in federal electricity restructuring legislation. Because of the recent electricity price spikes in California and other power markets, there is growing concern that federal legislation may be necessary to make restructured markets work properly. Restructuring legislation is also important so that all customers can choose their power suppliers. Currently, one-third of U.S electricity customers can select their electricity provider, and the rest of U.S. consumers should also have that choice, according to Representative Udall.

Dan Reicher, assistant secretary for energy efficiency and renewable energy at the **U.S. Department of Energy**, provided an overview of how far we have come in the deployment of renewable energy technologies in the United States. In particular, he noted that wind energy surpassed nuclear energy in worldwide capacity additions in 1999. According to Mr. Reicher, aggressive research and development and smart policies should lower the cost of renewable technologies even more in the next few years. He described several DOE initiatives focused on stimulating the market for renewable energy systems, such as the Million Solar Roofs, Wind Powering America, and Geopowering the West programs. Mr. Reicher also noted that there are significant opportunities for growing the biomass market by tapping methane gas from landfills and pursuing biomass gasification. DOE is also partnering with utilities, federal agencies, cities, and businesses to support the market for green power. In the future, DOE plans to continue its support of the green power market through research and development, policy support, outreach, and federal purchases with the goal of transforming green energy into mainstream energy.

Kathleen Hogan, director of the Climate Protection Division at the **U.S. Environmental Protection Agency**, concluded the opening session with a discussion of how green power can help address global environmental problems. She noted that although Congress has not ratified the Kyoto Protocol, the threat of climate change is real and needs to be addressed. According to Ms. Hogan, if we neglect to take action, climate change could have a considerable impact on weather patterns, vegetation, coastal areas, habitats, and storm events, and it could increase the incidence of disease. Accelerating the demand and supply for clean energy is a key component of addressing these environmental impacts. To this end, EPA's Climate Protection Division is reorganizing to form a new group that will focus on clean energy technology deployment. The Clean Energy Group will help stimulate demand for green power and promote the development of new renewable resources for the green power market. Initially, the new group will work to increase EPA's purchases of green power, clarify air quality regulations to stimulate the market for combined heat and power projects, support the development of new landfill gas recovery projects, and help consumers understand the impacts of their energy use.

3
BUSINESS CUSTOMER ROUNDTABLE— WHY WE'RE PURCHASING GREEN POWER

Although early marketing efforts targeted residential customers as the ones most likely to purchase green power, businesses account for an increasing share of such demand. This session featured representatives from three companies at the forefront of green power purchasing in the business sector.

Ed Holt, president of **Ed Holt & Associates**, began the session by presenting interim results of a research project, funded by the American Wind Energy Association and the National Wind Coordinating Committee, to understand nonresidential demand for green power. About 1,800 commercial and industrial green power customers were surveyed to obtain information on their power purchasing decisions, selection criteria for suppliers and products, purchasing motivations and barriers, and policy preferences. The survey yielded a 27% response rate; the primary respondents were small and mid-sized businesses in California, Pennsylvania, Oregon, Colorado, and Wisconsin.

Most respondents indicated that they purchased off-the-shelf green power products rather than issuing requests for proposals (RFPs) or negotiating directly with green power providers. In regulated markets, the utility or a third party was most likely to initiate contact with a prospective customer, whereas in competitive markets, customers were more likely to approach a green power supplier. Most responded that they were paying more for green power, although about one-quarter reported that there was essentially no change in their power rate. In companies of all sizes, the CEO was most frequently the decision champion, but in large companies, the champion was often the facilities manager.

Respondents ranked the following factors as among the most important for motivating a green power purchase: organizational values, civic responsibility, public image, and employee morale. Mr. Holt concluded that early adopters are more altruistic than expected in purchasing green power and that large firms appear more likely to seek private benefits. Mr. Holt advised marketers and utilities to find creative ways to provide benefits for less altruistic customers.

[*Editor's note*: The full report, *Understanding Non-Residential Demand for Green Power*, is available from the National Wind Coordinating Committee at http://www.nationalwind.org/pubs/default.htm]

Jim Cooke of **Toyota Motor Sales USA** described the company's motivations to purchase 12 MW of green power for its southern California-based facilities. Toyota entered into a contract to purchase green power in April 1998, when the California market first opened to retail

competition. The company selected Edison Source as its supplier because the two companies had a previous working relationship to develop electric vehicles. Toyota also negotiated a green power discount for its employees, and 20% of them have used it. By the time the initial two-year supply contract expired, Edison Source had pulled out of the retail market and Toyota switched to another green power supplier, Green Mountain Energy Company.

According to Mr. Cooke, Toyota's motivation in purchasing green power was to be an environmental leader and to make a corporate statement in support of clean energy technologies. Toyota has a long-standing corporate commitment to the environment—one of the company's guiding principles is "to exist in harmony with nature."

A number of factors enabled the facilities team to complete the green power deal, including good timing, support from upper management, and corporate interest in environmental issues. The major hurdles the team faced were in educating management about green power and in covering the additional, unbudgeted cost of the purchase. One of the key lessons learned was that managers may not be excited about green power, which makes it even more important to "feed the fire" and report back periodically on the status of the project. Toyota is now considering purchasing green power for facilities in other areas of the country.

Mr. Cooke suggested that in seeking out business customers, green power marketers should look for the "low-hanging fruit," i.e., those companies that display a high degree of social responsibility. Marketers also need to keep their message simple and help each customer define how a green power purchase will benefit the company.

Jeff Lebesch, president of **New Belgium Brewing Company**, a nine-year old, privately held microbrewery with about 100 employees, described how the company came to be "the world's first 100% wind-powered brewery." Green power purchasing is just one facet of a sustainable business practices culture at New Belgium. The impetus for the purchase was a desire to be a zero-emissions business. After exploring a number of carbon dioxide (CO_2) emissions control options, New Belgium determined that it would be less expensive and more practical to offset the brewery's CO_2 emissions by purchasing wind power. Fort Collins Utilities, the local utility, agreed to install an additional wind turbine for its green pricing program to match the brewery's annual power consumption. The wind turbine offsets approximately 4 million pounds of CO_2 each year.

According to Mr. Lebesch, the primary reasons for the wind energy purchase were to develop rapport with staff, to achieve the brewery's waste-reduction goals more easily and quickly, and to create a positive public image. One unexpected benefit of the purchase was the unanimous support of the staff—employees voted to pay more for the wind power with part of their annual bonus. The wind purchase has strengthened the company's corporate fabric and has helped create a more positive work environment.

Larry Rogero of **Kinko's** announced a new wind energy deal that will supply up to 50% of the energy used by the company's New York-based retail operations. Kinko's intends to purchase Pure Wind certificates representing about 4.5 million kilowatt-hours (kWh) of annual wind energy generation from an 11.5-MW wind project under construction in Madison, New York.

The company is already purchasing green power for about 90 stores in California, Colorado, and Pennsylvania. With an annual electricity demand of about 260 million kWh, Kinko's will soon be getting about 9% of its power from renewable sources and has established a corporate goal of increasing green power purchases by about 5% to 10% each year.

The driving force behind these purchases is Kinko's environmental vision statement, which specifically calls for the use of energy efficiency and renewable energy sources in the company's operations. According to Mr. Rogero, a primary benefit is developing goodwill among both customers and employees. One factor that confounded the process was that green power purchasing did not fall within the domain of any particular corporate department. The company also lacked account and metering data for its stores.

Kinko's goal is to buy renewable energy at no additional cost, which requires creativity to ease the "pain of the price." Strategies that have worked for Kinko's include developing internal referral programs, using savings in other operations to pay for the higher cost of green power, co-branding with suppliers, and seeking out suppliers that can provide tangible benefits. In general, the company has found the public relations benefits of its green power purchases to be minimal, which led Mr. Rogero to stress that suppliers need to assist companies in identifying tangible benefits.

4
PANEL DISCUSSION—WHAT IS GREEN POWER?

There are legitimate differences of opinion about which energy sources should be included in definitions of green power, even within the renewable energy community. This session brought together representatives of several groups to describe their respective approaches to defining, certifying, or rating green power products.

Sam Swanson of the **Pace Energy Project** provided an overview of the Power Scorecard, a Web-based rating mechanism that assesses the environmental impacts of retail electricity products. The designers of the scorecard, which is being developed as a consumer education tool, are the Pace University School of Law, Environmental Defense, the Izaak Walton League, the Natural Resources Defense Council, the Northwest Energy Coalition, and the Union of Concerned Scientists. The tool scores power products on eight environmental impacts, including global climate change, acid rain, ozone, air toxics, water consumption, water quality, on-site land impacts, and off-site land impacts. Electricity products are also rated on their new renewable resource content. The Power Scorecard will initially rate products being marketed in Pennsylvania and California.

[*Editor's note*: The Power Scorecard is now online at http://www.powerscorecard.org/.]

John Polak of **Terra Choice Environmental Services Inc**. provided an overview of Canadian Environmental Choice, a product certification program that has been expanded to include electricity products. The Environmental Choice program was created by the Canadian government in 1988 to "encourage demand for and supply of products and services that are less stressful on the environment." Although still owned by the government, the program is now run by Terra Choice, a private firm. To date, more than 2,500 products in 100 product categories have been certified.

The formal process for developing criteria for electricity products began in late 1998. Final criteria for renewable low-impact electricity are expected to be complete by early 2001. The program will certify both generating facilities and products. Draft criteria have been developed for wind, solar, hydro, biomass, and biogas resources, as well as for marketing, transferring ownership, and bundling products. The group is also developing verification protocols that include site visits, marketing and energy audits, and spot checks. In conclusion, Mr. Polak noted that credible certification involves developing science-based criteria that reflect social values and third-party verification, both elements that the Environmental Choice program is trying to achieve. Once the criteria are established, certification will be available both in Canada and the United States.

Kirk Brown, assistant director of the **Center for Resource Solutions** (CRS), described his organization's green power certification activities. CRS has established a variety of programs to help build consumer confidence in green power options, such as the Green-e certification program, green pricing accreditation, low-impact hydro standards, and Green-e Plus. CRS has focused on establishing minimum product standards as the best strategy to use as green power markets evolve. However, these standards may change over time as the market grows. In fact, Green-e has already added requirements for new renewable resource content in its product certification process.

To date, CRS has developed renewable energy definitions and product standards for a number of regions, including California, New England, and the Mid-Atlantic, through the combined efforts of a governing board and advisory committees made up of local stakeholders. As CRS has facilitated stakeholder discussions around the country, the most controversial issues have involved the treatment of biomass, hydropower, and energy efficiency. Regional groups have developed different standards, which CRS hopes to harmonize over time. CRS also helped form the Low Impact Hydro Institute, which has developed minimal environmental impacts criteria for hydropower projects.

Mr. Brown noted that while there may be different perspectives on what is green, information disclosure will help to educate consumers about electricity product options and their relative environmental impacts and that, over the longer term, standard definitions will emerge.

5
UTILITY GREEN PRICING PROGRAMS— WHAT'S WORKING WELL?

Enough time has now elapsed to clearly indicate that some utilities' green pricing programs have been more successful than others in attracting customers for their products. In this session, representatives from some of the more successful utilities were invited to share key success factors as well as pitfalls to avoid.

Terry Peterson of **EPRI**, the session moderator, began the session by providing a quick overview of green pricing trends, noting that the number of utilities undertaking green pricing programs continues to climb. Wind and solar resources figure prominently in most utility programs, and wind provides the bulk of the energy supply across all programs.

Andy Sulkko of **Public Service Company of Colorado** (PSCo) provided an overview of the company's three green power offerings. In 1993, PSCo became one of the first utilities to offer a green pricing program when it launched the Renewable Energy Trust. Around 12,000 customers contribute a total of about $120,000 annually to the Trust, either through fixed contributions or by rounding up their bills. The utility has used these funds to install about 40 kW of off-grid photovoltaic (PV) systems and twenty-eight, 2-kW PV systems on schools. PSCo also offers a solar referral program, Solarsource, through which customers can purchase PV systems from an authorized vendor. PSCo allows net metering of these systems.

In 1997, PSCo introduced the Windsource program, which offers customers an option to purchase 100-kWh blocks of wind energy for $2.50 per month or 2.5¢/kWh. The wind energy is supplied from 29 wind turbines located in northeastern Colorado. The program is fully subscribed, with about 15,000 residential and 450 business customers. PSCo also supplies power to four wholesale customers. In 2000, the Colorado Public Utilities Commission approved an expansion of the program, and PSCo plans to install another 35 MW of wind energy capacity by the end of 2001. According to Mr. Sulkko, some of the keys to the success of the Windsource program have been consistent management support, a customer base with a strong environmental ethic, participation by nonresidential customers, collaborative marketing with outside groups, and a good program plan.

Lori Clements-Grote of **Fort Collins Utilities** described the utility's green pricing program, noting that the program was initiated because consumer surveys indicated a strong interest in clean power, lower costs for wind because of technological advancements, and access to a good wind site with existing infrastructure. In addition, with electricity markets across the country opening to competition, the utility was interested in experimenting with customer choice.

Fort Collins decided to offer the wind energy on a pilot basis to determine if the technology worked well, whether customers were truly interested, and whether the price was right. Residential subscribers were required to purchase all of their power from wind at a premium of 2.0¢/kWh for three years. Commercial customers could purchase wind power in 1,000-kWh blocks. Approximately 450 residential and small-business customers subscribed, selling out the power available from two 600-kW wind turbines installed by Platte River Power Authority in Medicine Bow, Wyoming.

Continued customer interest drove Fort Collins to expand the program with an additional two and one-half wind turbines; one of the turbines serves the entire annual load of New Belgium Brewing Company, Inc. The City of Fort Collins also purchases wind energy for a portion of its facilities. At the same time, the utility raised the wind power premium from 2.0¢/kWh to 2.5¢/kWh because the lower premium established for the pilot did not fully cover program costs. Residential customers were given the additional option of purchasing wind power in 400-kWh blocks for an extra $10.00 per month. To date, the program has about 750 subscribers (1.4% of customers), and the utility purchases more than half the power output from the 10 turbines now operating at the Medicine Bow site.

Fort Collins has relied primarily on utility bill stuffers and local media to promote the program. Through the marketing process, the utility has learned that potential business customers have diverse needs. A key challenge is maintaining the municipal commitment to the program. Also, as a college town, the city experiences high account turnover, which presents a challenge for retaining green power customers; however, retention has been high among long-term residents. Finally, the higher availability of the wind energy in the fall and winter months does not match well with the utility's summer-based peak demand requirements.

Cassius McChesney of **Arizona Public Service** (APS) provided an overview of the company's solar power offerings. APS elected to integrate solar into its service offerings because customers, who will soon be able to choose an electricity supplier under the state's electricity restructuring law, expect a clean environment and perceive solar as a viable option. Thus, in 1996, APS launched its Solar Partners program, which provides residential customers with an option to purchase 15-kWh blocks of solar energy for $2.64 a month (or 17.6¢/kWh). The premium covers only about one-third of the solar project costs; the remainder is paid by shareholders and with a grant from the Utility PhotoVoltaic Group.

About 1,500 customers who are participating in the program pay an average monthly premium of $5 or more. With extensive promotion, the program achieved a 1.5% participation rate in its initial market test (Flagstaff), which had a higher proportion of likely green customers, but the rate dropped to 0.2% after the program was extended to all APS residential customers. APS believes that the potential green customer market is 5% to 8% of the total market. The utility will have more than 500 kW of solar projects installed in various cities by the end of 2000 and 1 MW by the end of 2001, which would produce fifteen thousand 15-kWh blocks—enough to serve 7,500 customers, or 1% of the total customer base.

One of the most important issues facing the utility is the establishment of a statewide Environmental Portfolio Standard and whether or not customers will still be willing to participate

in the voluntary program. In the short term, Mr. McChesney noted that APS must continue to increase awareness of the solar product.

John Giese of the **Los Angeles Department of Water and Power** (LADWP) provided an overview of the Green Power for a Green LA program. For an extra $3.00 per month, residential and small business customers can purchase green power to supply 20% of their electricity needs. Commercial and industrial customers can also participate at a nominal level. To help green power customers offset the extra cost, LADWP gives out two free compact fluorescent light bulbs. About 55,000 customers are participating in the program, and about half of them are low-income customers who receive power from existing renewable sources at no additional cost. Together, participating customers are purchasing about 2 million kWh of green power each month. Within three years, the utility hopes to have 100 MW of new renewable resource capacity installed and 100,000 program participants.

Community events are a central component of LADWP's grassroots marketing strategy and have been supported with direct mailings and bill checkoffs. LADWP has also used extensive contacts with environmental groups and external stakeholders. Internally, the program received intensive review among corporate departments to make sure that the product could be delivered effectively.

Laura Williams of **Madison Gas and Electric Company** (MGE) described the utility's success in offering a wind power option to its customers. In October 1997, MGE, which serves 120,000 customers in and around Madison, Wisconsin, announced plans to construct, own, and operate an 11.22-MW wind farm in the northeastern part of the state. The utility decided to move forward with the wind project because of consumer interest in renewable energy, the lower cost of new wind technology, and wind energy's environmental benefits. MGE was also allowed to earn a return on the wind plant investment.

MGE is selling the power in 150-kWh blocks for $5.00 per month—a premium of 3.3¢/kWh over the standard electricity rate. Businesses must spend a minimum of $15 per month or purchase 5% of their electricity as wind energy to be recognized as business leaders in the program. Within the first six months, more than 5,100 residential customers and about 100 businesses had signed up, fully subscribing the program at an overall subscription rate of 4.7% of all customers. MGE has established a waiting list for other customers.

MGE's marketing strategy involved targeted mailing and bill inserts supported with mass marketing. Ms. Williams noted that customer education is essential but expensive. MGE also learned that it is important to involve the local community and that collaborative marketing with external groups is important to gain product credibility. Future plans include evaluating the technical performance of the project, determining customer acceptance and preferences, and considering other renewable technologies.

6
SECOND DAY OPENING SESSION

Ashley Houston, energy analyst with **XENERGY, Inc.,** provided an overview of customer switching trends in competitive power markets. To date, 24 states have passed legislation or adopted regulatory orders to give customers a choice of electricity providers. Of the 92 million customers served by investor-owned utilities, fewer than 20 million can choose an electricity supplier, but by the end of 2002, 57 million customers are scheduled to have a choice. In markets currently open to competition, only about 1 million customers have switched to an alternate energy supplier, and the market is most active for industrial customers. Pennsylvania has been the most active market for residential customers, with nearly 10% of households switching providers.

Retail green power products are available in 6 of the 17 states with markets fully or partially open to competition—California, Connecticut, Maine, Massachusetts, New Jersey, and Pennsylvania. Green power is also available at wholesale in California, Illinois, and New York. California and Pennsylvania have been leaders in green power switching activity—85% of residential switches in California and 18% in Pennsylvania have been to green power. Green switching has been much less prevalent in New Jersey, where only 3% of residential customers have chosen a green power provider.

Regarding green consumer demographics, a survey conducted by Xenergy found that green power customers in Pennsylvania are likely use large amounts of energy, be college educated, have larger households, buy organic foods, use the Internet, be aware of energy conservation issues, and have greater wealth. Customers also reported that the decision to purchase green power was influenced by the lowest price and environmental concerns, such as air pollution.

In conclusion, Ms. Houston noted that green power has become one of the more successful means of product differentiation, and it should continue to play a key role in states in which restructuring policies support retail market competition. Although price spikes in wholesale power have caused some green power providers to return customers to default service, marketing activity is likely to pick up in the fall as supply shortages subside.

Ed Tirello of **Deutsche Bank Alex. Brown** provided a Wall Street view of green power. He noted that "it all comes down to price and guilt." Green power allows customers to offset the negative environmental impacts of their lifestyles, such as driving a sport utility vehicle. He suggested that this market may be as high as 15% of residential customers.

Mr. Tirello described trends in transmission and generation that could impact green power sales. First, he declared that third-party control over transmission is good for competition because it will help maintain the operation of the grid and keep generators from manipulating the system.

The downside is that no money is flowing into transmission because there is no financial incentive for companies to invest in a system they do not or will not own. There is also a shortage of generation, which is causing power price spikes in California and other parts of the country. He contended that the sale of utility generation assets has wreaked havoc because of greater price uncertainty and reduced coordination of power plant maintenance schedules. As a result, competitive market prices are going up, not down. He noted that price problems will likely intensify in the coming years as the shortage of turbine generators intensifies under increasing global power demand.

According to Mr. Tirello, these two problems—lack of transmission investment and generation shortages—represent an opportunity for green power marketers. Marketers may be able to capitalize on the situation by offering fixed-price products and power reliability to customers facing shortage-induced rate increases. This could cause more customers to switch. Mr. Tirello also suggested that marketers work with utilities rather than viewing them as competitors. He argued that utilities are likely to be open to affiliate deals involving green power.

Mr. Tirello maintained that there are attractive market opportunities in distribution systems and ancillary services, particularly with rural electric cooperatives, which face high transmission and distribution costs. Bundled residential services are also likely to become more prominent.

7
PANEL DISCUSSION—INFORMATION TECHNOLOGY AND GREEN POWER

Information technology is revolutionizing industries across the economy, and the electric power industry is no exception. The speakers in this session were asked to describe how consumers perceive information technology and how the increased use of information technology will benefit the green power marketing industry.

James Porco of **RKS Research and Consulting** provided an overview of an RKS telephone survey designed to determine customer preferences for Internet services. The goal of the survey was to gain insight into the ways that on-line shoppers think. Most consumers reported owning a personal computer, and about 55% had access to the Internet. Respondents said they were using Internet access for e-mail (89%), contacting companies (56%), banking (19%), investing (18%), and paying bills (12%). The survey found that on-line shoppers were looking for value, trust, convenience, and simplicity. They also wanted rewards for loyalty and had high expectations of service.

When asked about their interest in protecting the environment, 7 out of 10 responded that it was important to improve air quality and that the cost of doing so should be shared. Mr. Porco suggested that green power must be offered in a narrow price range to be of interest to more than a small segment of customers.

Forty percent of respondents expressed interest in purchasing electricity through membership buying clubs. They reported interest in purchasing bundled services, such as Internet access, natural gas, and telephone service, and they expressed strong interest in obtaining simplified billing. He noted that trust and credibility are very important to customers and so marketers should look for branding opportunities.

John Savage of **Green Mountain Energy Company** discussed the role of the Internet as a tool for protecting the environment and advancing green power sales. Some of the benefits of using the Internet are that it is a natural aggregation tool, it is energy efficient, and it provides almost infinite product selection. For example, purchasing goods over the Internet reduces the energy expended in driving to and from stores; if this is widely adopted, it could significantly reduce the energy intensity of our lifestyles. However, most of today's users rely on the Internet primarily for communications and research, and not for shopping. Mr. Savage contended that consumers' use of the Internet is based more on value and convenience than on price.

Mr. Savage noted that consumers weigh price, convenience, visibility, impact, and reward in making a decision to purchase environmentally friendly products. Of these criteria, green power

is convenient and it yields a personal reward. The downsides are price, visibility, and the inconvenience of getting two bills. However, the Internet can help make green power more visible. For example, Green Mountain recently built awareness of its new Pennsylvania wind farm by conducting a live Web broadcast and posting pictures of the turbines on its Website. He also asserted that the Internet facilitates aggregation and information dissemination.

Looking to the future, Mr. Savage predicted that attempts at commercial aggregation will continue to struggle, the proliferation of information on the Internet will accelerate the adoption of sustainable business practices, and there will be no green or Internet brands, only brands.

Dan Lieberman of **Utility.com** provided an overview of his company's pure play strategy as a Web-based provider of utility services, including electricity, Internet access, and telephone service. Mr. Lieberman noted that the company, which bills itself as the world's first Internet utility company, is selling electricity in California, Pennsylvania, and Massachusetts; is licensed to sell electricity in six other states; and plans to expand its operations to the rest of the country in the near future. Utility.com primarily has targeted residential customers, but about 5% of its customers are small businesses.

In California, the company is selling 100% renewable energy generated from a mix of biomass, hydropower, and geothermal power sources, which is purchased through the Automated Power Exchange. The green power product is offered at a discount to default rates as a result of California's customer credit for renewable energy purchases. The company is also able to keep the green premium low by using electricity trading desks, using information technology to reduce transaction costs, and balancing the green power margins with other service product offerings. According to Mr. Lieberman, Utility.com intends to continue to offer a renewable energy option in California, even if the customer credits are allowed to expire. As the company expands to other states, it plans to offer green power options, although it will position itself primarily as a low-cost provider.

The company plans to offer a "market basket of products" including natural gas, long distance service, appliance service plans, and high-speed Internet access (DSL) in all of its markets. Utility.com conducts all of its billing via the Internet and, whenever possible, offers consolidated billing. Paperless billing systems are low-cost, fast, and convenient, and they allow customers to review their historical electricity use, which could be important for implementing real-time pricing in the future.

In conclusion, Mr. Lieberman noted that a Web-based approach to providing utility services offers paperless billing, ease of handling new customers, the ability to add new products quickly, and the ability to market nationally and to remote customers.

[*Editor's note*: In January 2001, Utility.com returned its electricity customers to their default suppliers and exited the retail electricity marketing business because of rising prices in wholesale electricity markets.]

8
INTERNATIONAL GREEN POWER ACTIVITIES

Green power marketing is taking off abroad as well as in the United States. Several international speakers were invited to describe the status of green power marketing abroad.

Rick Sellers of the **International Energy Agency** (IEA) and session chair, introduced the panel by describing the IEA's Renewable Energy Unit. The unit is working with IEA member countries on strategies to accelerate the deployment of renewable energy technologies through coordination of policies, particularly electricity restructuring or liberalization. The unit is also looking at cooperation on green power tariffs and the linking of green certificate trading systems.

Rolf Wüstenhagen of the Institute for Economy and the Environment at **St. Gallen University** and the Centre for Energy Policy and Economics at the **Swiss Federal Institutes of Technology**, provided an overview of green power marketing activities in Europe. He began with a short discussion of electric utility restructuring in Germany, one of the more active competitive electricity markets. He noted that energy suppliers in Germany have dramatically increased their marketing expenditures. Similar to findings in the United States, market research indicates that majorities of German customers are interested in purchasing green power. According to one study, about 89% of German consumers "welcome the opportunity to buy electricity from clean, environmentally friendly sources" and 22% would be prepared to pay a 15% premium for it.

Studies conducted in other European countries have had similar results: majorities of consumers indicate that they would be willing to pay a premium to receive green power. And like those in the United States, European consumers tend to favor solar and wind resources.

Green power marketers are active in the Netherlands, Germany, Switzerland, and the United Kingdom. In most European countries, green power marketers have achieved a market share of 1% or less, with the exception of the Netherlands, which has seen much higher penetration rates. In Switzerland, where the market has yet to be liberalized, more than 80 utilities now offer a green power option and the top programs have achieved participation rates of about 4.5%. According to Dr. Wüstenhagen, efforts have been under way to help facilitate the market for green power, such as the development of labeling and certification schemes; however, there is a growing need to harmonize these efforts. In addition, a number of countries have adopted policies that promote the development of renewable resources but not necessarily the development of retail markets.

In conclusion, Dr. Wüstenhagen noted that there are many similarities between U.S. and European markets with respect to customer survey data findings and green power purchasing behavior. He also noted that companies interested in marketing green power throughout the European Union (EU) face several challenges, including differences in government support for renewables, the pace of deregulation, consumer preferences, and competitive pressures from conventional power providers.

Jos Benner of the **CEA/RECS Secretariat** provided an overview of green power certificate trading in Europe. The driving force behind the effort to develop tradable certificates is the design of renewable energy policies to help meet the goals of the Kyoto Protocol. In May 2000, a policy directive was proposed calling for countries in the EU to create renewable energy trading structures and to harmonize their renewable energy price-support mechanisms. Tradable credit systems have been a policy focus because, being market-based mechanisms, they will stimulate efficient market operation and technology improvement.

Five European countries (Belgium, Denmark, Italy, the Netherlands, and the United Kingdom) are developing certificate programs. A Renewable Energy Certificate System (RECS) has been established to develop a harmonized approach using a standard certificate format and a uniform trading process. Currently, 10 countries are participating in the RECS process: the 5 countries already developing certificate programs and Austria, France, Germany, Norway, and Sweden. However, many discrepancies exist among the different systems and, until the process is completed, states are willing to accept trades only from equivalent systems.

Key issues to be addressed in the development of a uniform trading system are certificate content and life span, description of technologies, state-aid impact, and related CO_2 benefits. Mr. Benner noted that other considerations include whether or not the RECS trading system should be linked to CO_2 trading schemes and whether or not a global trading mechanism should be developed.

Michael Rucker of the **Automated Power Exchange** (APX) described the APX green ticket program and the potential for credit trading to help link international green power markets. In the APX green tickets program, the environmental attribute of green power generation is separated from the commodity energy, which trades in real time. The environmental attribute, which commands a price premium, is traded in an annual market through APX Green Power Markets, which exist in California and Illinois. In California, green tickets are traded with respect to particular renewable technologies, plant vintage (old or new), and eligibility for the state's green power purchasing rebate. In Illinois, both EcoPower tickets, sold by ComEd, and generic renewable energy tickets are traded in the APX Green Power Market.

According to Mr. Rucker, one of the benefits of the APX green ticket market is that it provides a way of tracking and verifying renewable power production and purchases. In general, credit trading is advantageous for renewables because it removes time-specific requirements for intermittent generators, simplifies verification, provides a more liquid green exchange, and allows price premiums to go directly to generators. For these reasons, Mr. Rucker asserted that trading has appeal in most regions of the United States.

Credit trading may also be an important mechanism for linking international markets, though there are still significant hurdles to overcome before cross-country trading becomes a reality. For instance, international trading requires common product definitions, certification/verification procedures, and regulations that encourage the development of robust power markets. In closing, Mr. Rucker asserted that green ticket trading mechanisms should be developed with carbon trading in mind to ensure that renewable power generators can benefit from carbon trading when it is established.

9
RENEWALS ENERGY SYSTEMS—HOW MUCH DO THEY REALLY COST?

This session examined the economics of several renewable energy technologies currently supplying the green power market. The speakers were asked to describe the primary cost factors and the role that policies, incentives, and industry partnerships can play in buying down the ultimate price to consumers.

Jan Pepper, president of **Clean Power Markets, Inc**. discussed the cost of green power in competitive markets. There are two components of green power: commodity energy, which is delivered in real time into the grid, and green certificates, which represent the environmentally preferred attributes of the renewable power. Since the California market opened in late March 1998, green power can be traded bilaterally or through the APX Green Power Market. Existing renewable generators selling into these markets receive state subsidies administered by the California Energy Commission (CEC) of 1.0¢/kWh. Based on data from the APX Green Power Market in California, the monthly average prices for green tickets have ranged from less than 0.1¢/kWh to about 0.5¢/kWh. On a technology basis, the average prices for geothermal, biomass, small hydro, and generic renewable tickets have been 0.4¢/kWh to 0.5¢/kWh, while the price of new wind tickets has been 2.6¢/kWh.

Overall, the data suggest that (1) premiums are affected by the CEC customer credits, (2) new renewable resources command a higher price, and (3) resources in shorter supply command a higher premium. According to Ms. Pepper, growth of the green power market across the United States will depend on the acceptance of unbundling the green attribute from the power, a verification process that can work across states, and the development of transparent and liquid green certificate markets in states beyond California.

Brian Parsons, project manager at the **National Renewable Energy Laboratory** (NREL), addressed the real cost of wind power. He showed that the cost of wind has dropped from a range of 8¢ to 11¢/kWh (depending on the wind resource) in the early 1990s to a range of 4¢/ to 6¢/kWh currently. These cost improvements result from the installation of larger turbines on taller towers as well as from volume production and production learning. Wind energy costs are expected to fall further to between 2¢/ and 3¢/kWh by 2010.

According to Mr. Parsons, wind energy costs depend on a number of factors, including location, financing and incentives, the number and size of turbines installed, and other costs, such as those for resource assessments, transmission, and ancillary services. Location is a significant factor because the wind speed at a given site has a pronounced effect on the cost of the power. For example, the 1 mile-per-hour average wind speed difference between a Class IV and a Class V

wind site translates into a cost differential of about 0.5¢/kWh. Permitting can also be a cost issue; typically it is very difficult to site projects on public lands because of requirements contained in the National Environmental Policy Act (NEPA). Expansion of an existing site can lower costs.

Financial incentives, such as the federal production tax credit (PTC) and state tax credits, help reduce project development costs. The PTC, which is set to expire at the end of 2001, provides 1.7¢/kWh for 10 years, adjusted for inflation. This provides for a reduction in contract prices of about 1.1¢/kWh. State and local tax incentives can reduce costs by another 0.5¢/kWh. A federal Renewable Energy Production Incentive (REPI) is also available to publicly owned utilities, but because the REPI is subject to annual appropriations, it has less of an impact on production costs. Finally, larger projects benefit from volume discounts from manufacturers and economies of scale in performing operation and maintenance.

In conclusion, Mr. Parsons noted that while the wind industry is contracting to deliver power at 3¢/kWh, this price is not realistic for many projects, particularly small projects in new locations. However, achieving the lowest price may not be the most important factor in the marketplace. Customers are seeking value and may be just as interested in a high-visibility project or one located in nearby.

Tom Kerr of the **U.S. Environmental Protection Agency** provided an overview of the current status of the landfill methane recovery industry and the cost of developing landfill methane projects. The number of facilities converting landfill gas (LFG) to energy facilities has grown significantly in the last five years, and this growth is expected to continue because more than 500 viable development sites remain. The trend is toward the development of smaller projects and direct use of the methane and away from electricity generation. This trend is expected to continue.

The primary costs associated with an LFG plant are the capital outlays for the gas collection system, the backup flare, and grid interconnection. There are also costs associated with financing and permitting a facility. Capital costs range from $900 to $1,300/kW of installed capacity, and facilities generally require a minimum buyback rate of about 4¢/kWh. Operation and maintenance costs average an additional 1.5¢ to 1.8¢/kWh over the life of a project. Incentives available to help reduce generation costs include federal tax credits worth about 1¢/kWh, the DOE REPI payments for publicly owned utilities, and, in some cases, state grants or loan programs. In the future, greenhouse gas trading systems could provide an additional economic impetus.

EPA maintains a landfill methane project database, which is designed to serve as a resource for LFG-to-energy project development. The EPA Landfill Methane Outreach Program focuses on creating alliances among states, energy users, the LFG industry, and communities to remove barriers and promote the development of cost-effective projects.

John Hoffner, of **Conservation Services Group** and representing Sun Power Electric provided an overview of PV costs. Sun Power Electric has pursued a business model based on using retail commercial rooftops. To date, the company has installed three PV systems totaling 107 kW on the roofs of BJ's wholesale warehouse clubs in the Northeast. Under the arrangement, BJ's

consumes the power and Sun Power Electric offers the green attribute for resale to the retail market. Sun Power Electric is selling the green attribute to AllEnergy and Green Mountain Energy Company and has agreed to maintain the systems for 10 years.

Mr. Hoffner offered two scenarios for the costs of PV installations. His first scenario assumed a system cost of $7/W in a location that would yield 1.8 kWh/W annually. Assuming that operation and maintenance adds 20% to the system cost, he estimated that the total cost of power would be 46¢/kWh, and of that, about 10¢/kWh would be recovered from selling the power to the host. An optimistic scenario assumed that a system could be installed for $3/W under the same conditions. In this case, the total power cost would be 20¢/kWh, and of that, 10¢/kWh would be recovered from the host, yielding a solar price premium of 10¢/kWh.

Mr. Hoffner noted that the company's strategy has been to focus on reducing the costs of installing PV systems through standardization of design and installation, developing long-term financing sources, and reducing barriers to system interconnection.

10
GROWING THE GREEN POWER MARKET

A number of strategies are being employed to grow the green market beyond what simple marketing efforts normally yield. This session featured speakers describing experiences with aggregation, grassroots marketing, the linking of green power purchases to environmental reparations, and the creation and marketing of renewable energy certificates.

Bob Maddox of the **Connecticut Energy Cooperative**, a Hartford-based energy cooperative created to offer energy options to member customers in Connecticut's newly competitive electricity market, described the organization's green power offering. At the time of the conference, the co-op was the only entity offering a purchase option for the state's retail customers and thus had garnered a good deal of publicity for its operations. The co-op offers both a 100% renewable energy product, EcoWatt, consisting of power generated from landfill gas, small hydro, and wind resources, and a standard electricity product, which is priced below the utility standard offer. The green power premium, at about 1¢/kWh, is relatively low because, as a nonprofit, the cooperative needs only to break even on its costs. The co-op has also received state funding assistance. The two power products are available to about 80% of the customers in the state.

Rudd Mayer of the **Land and Water Fund of the Rockies** (LAW Fund), a non-profit environmental organization based in Boulder, Colorado, provided an overview of the organization's green power marketing efforts. She noted that the extensive amount of education required for customers to switch to green power translates into high customer acquisition costs for utilities and marketers but that environmental groups can help educate customers through grassroots organizing techniques.

A grassroots education campaign, organized and managed by an environmental group relying on existing relationships and outreach mechanisms, can reach a broader set of potential customers at lower cost and at the same time build credibility for the green power product. In Colorado, the LAW Fund began its grassroots campaign to market PSCo's Windsource program by "plucking the low-hanging fruit," including city governments, the governor, and environmentally conscious businesses. The program now counts more than 450 businesses among its participants. The grassroots campaign uses marketing techniques such as "street teams" of canvassers, free television coverage, local events, and Web sites that list green power offerings.

In the few years that the LAW Fund has been actively marketing green power, the grassroots education movement has gained momentum among students, businesses, and religious organizations. In conclusion, Ms. Mayer noted that in Colorado, with more than 18,000 residential and 450 business customers, green power is becoming mainstream as a noticeable shift in values is occurring in the marketplace.

Eric Blank of **Community Energy** described the creation of a for-profit green power marketing company designed to increase public awareness of green power and increase the supply of new renewable resources. Mr. Blank explained his vision of this undertaking as an economically self-sustaining education effort in support of green power. The company's goal is to offer a 100% new clean power product in a competitive market. Mr. Blank argued that competitive markets offer the greatest promise for green power sales because of incentives, where available, and the ability of customers to switch suppliers.

According to Mr. Blank, Community Energy's appeal is in delivering an ethical message, rather than simply a marketing message. Initially, the company tried to negotiate with an existing supplier to bring a pure product to market but was unable to negotiate a deal. Therefore, the company had two small wind turbines constructed and sold the entire output to small commercial customers. Community Energy is now trying to add wind capacity and expand its customer base. According to Mr. Blank, the key to success is having an exciting product to sell in an attractive market with government policy support.

[*Editor's note*: In March 2001, Community Energy announced a partnership with PECO Energy Company to jointly market up to 74 MW of new wind energy to residential and business customers in Pennsylvania.]

Jill Cooper of the **Colorado Department of Public Health and Environment** described the settlement of a state air pollution violation that involved a green power purchase. In August 2000, the Colorado Air Pollution Control Division finalized a settlement with the largest electricity user in the state. Under that settlement, the company agreed to purchase approximately $300,000 worth of wind power for up to five years to offset an air quality violation. The state typically allows violators to offset up to 80% of a civil penalty by performing a Supplemental Environmental Project (SEP). In this case, the two parties agreed to a SEP in which the company will place funds into an escrow account to be managed by Public Service Company of Colorado. The utility will use the funds to pay for power from its Windsource program. The average annual purchase called for in the SEP is roughly equivalent to the annual output of one 750-kW wind turbine.

Muir Davis of **PG&E National Energy Group** discussed the importance of renewable energy certificates in capturing green value. According to Mr. Davis, certificate transactions ease the burden of physically tying green power to a customer, thus reducing transaction costs, simplifying verification, and alleviating "scheduling nightmares." Certificate transactions also allow for a separate focus on the emissions benefits of the clean power, encourage wholesale trading, and permit monetization of emissions-free electricity. With a credit system in place, power suppliers can build projects in locations with optimal renewable resources and infrastructure.

Mr. Davis announced that PG&E Corporation will sell Pure Wind certificates from an 11.5-MW wind project currently under construction in Madison, New York. The power from the project will be sold directly into the New York power grid, while the credits will be sold separately. He also announced that the company will supply Kinko's with wind certificates for its retail stores in New York state.

[*Editor's note*: The Madison wind energy project became operational in November 2000. PG&E Corp. also announced that it will acquire a new, 44-MW wind project in California from which the company will sell Pure Wind certificates in 2001.]

11
GOVERNMENT AS A GREEN POWER PURCHASER

Government entities at all levels—federal, state and local—increasingly view green power purchasing as a way to lead by example in implementing sustainable energy strategies. A number of government representatives were asked to describe their green power purchasing efforts.

Beth Shearer, director of the **U.S. Department of Energy's** Federal Energy Management Program (FEMP), provided an overview of renewable power purchases by the federal sector. The federal government is the largest power purchaser in the United States, consuming 2% of the nation's electricity. To reduce this demand, President Clinton in 1999 signed Executive Order 13123, calling for a 35% reduction in energy consumption in buildings and a 30% reduction in greenhouse gas emissions by 2010. The order also calls for federal agencies to increase their use of renewable energy.

Subsequent to the executive order, several initiatives have been established to increase federal purchases of renewable energy. Energy Secretary Bill Richardson issued a directive calling for DOE to procure 3% of its electricity from nonhydro renewable resources by 2005 and 7.5% by 2010. And the DOE Wind Powering America program has set a goal for federal agencies to purchase 5% of their electricity from wind by 2010. In response to these initiatives, several federal agencies, including DOE, EPA, the General Services Administration (GSA), and the National Park Service, are purchasing green power. Agencies are also beginning to consider green certificate purchases and aggregated green power purchases. In Colorado, 31 agencies announced plans to collectively purchase about 10 MW of green power. To encourage additional purchases, FEMP plans to offer assistance with regional initiatives in both regulated and competitive markets and to continue educational efforts targeted at the federal sector.

Sue Damore of the **General Services Administration** described what she called "the largest single wind power purchase" to date in the United States. Earlier in the summer, 31 federal agencies located along the Colorado Front Range collectively agreed to purchase more than 10 MW of wind power. The aggregated purchase resulted from efforts by a team composed of staff from GSA, DOE, EPA, and NREL. The team used a top-down approach—appealing to agency leaders—to garner the purchase commitments. The group was also able to leverage existing relationships among members of the Denver Federal Agency Board.

The primary sales pitch was that purchasing wind power is a way to address the air quality issues along the Front Range. One key factor was that Colorado already had a successful wind program in place: the PSCo Windsource program, under which the utility has already built and fully subscribed 20 MW of wind energy. Ms. Damore also noted that people want to be a part of something positive, and the wind energy purchase provided a specific action to tie to the annual Earth Day celebration.

Ray Levinson of the **U.S. Postal Service** (USPS) described the agency's experience with purchasing green power for its California facilities. He noted that the USPS has a history of implementing energy efficiency improvements but that this was the first attempt to purchase renewable energy. He also noted that DOE does not count renewable energy purchases for the purposes of measuring agencywide energy efficiency improvements, which creates a disincentive to undertake such projects. Nevertheless, the USPS, in an effort to be an environmental leader, decided to purchase green power for its California facilities.

In California, the USPS has approximately 1,500 accounts with a total annual demand of about 40 MW and two primary facility demand patterns: (1) 24-hour operations, which account for about 90% of the agency's statewide load, and (2) 12- to 14-hour operations. The USPS assembled a multifunction energy team composed of individuals from the environmental compliance, purchasing, finance, and maintenance departments to secure a contract for the highest percentage of green power at or below the utility default rates. No bids were accepted from an initial RFP. In a second attempt, the RFP was revised to focus specifically on green power rather than on energy services generally, allow offers on a facility-by-facility basis, and remove requirements to serve the entire service territory. As a result of the second solicitation, the USPS awarded a 38-month contract to Preferred Energy Services (also known as Go-Green.com) for the purchase of 3.8 MW of 100% green power to supply approximately 1,100 sites representing about 10% of the agency's total state load.

According to Mr. Levinson, some lessons learned from the USPS experience are that it is important to become an educated buyer and to involve a variety of stakeholders within the organization. He also noted that commodity energy savings may be small in the early years of a restructured market, so it is important not to overlook internal cost savings. He also warned that in California, state subsidies for renewable power purchases inject substantial uncertainty into the market.

[*Editor's note*: In late-2000, Go-Green.com ceased its California operations "due to the unstable regulatory and economic energy situation." The USPS accounts were turned back to default utility service.]

Jay Goth, senior vice president with **Commonwealth Energy Corporation**, provided a marketer's perspective on municipal decisions to purchase green power. Commonwealth supplies green power to the City of Santa Monica and other California cities. According to Mr. Goth, the primary motivation for cities is to lead the way for their citizens. Most cities are also looking for marketers to provide consumer outreach and education in addition to the power supply. Commonwealth has been successful in serving municipal customers because of its willingness to help with community outreach. The company has also teamed with local environmental groups interested in clean power issues, such as Global Green and CEERT, to undertake the education and outreach efforts. Mr. Goth suggested that cities employ whatever resources they have at hand, such as those provided by local environmental groups.

In conclusion, Mr. Goth noted that selling to municipals is no different from selling to businesses—both entities want to do the right thing and marketers must be prepared to show how green power serves this purpose. He highlighted a number of other factors that impact municipal purchasing decisions, such as risk aversion, metering issues, price, where the generation comes from, and public relations.

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B
WORKSHOP PRESENTATIONS

Opening Session
"A Bright Future for Green Power" *Paul Thomas, COO and President, GreenMountain.com*
"DOE's Green Power Initiatives" *Dan Reicher, U.S. Department of Energy*

"Why We're Purchasing Green Power: Business Customer Roundtable" **Session Moderator: Katherine O'Dea, Business for Social Responsibility**
"Understanding Business Customer Demand for Green Power" *Ed Holt, Ed Holt and Associates*
Business Customer Representatives: *Jim Cooke, Toyota Motor Sales, USA* *Jeff Lebesch, New Belgium Brewing Company* *Larry Rogero, Kinko's*

Panel Discussion – "What is Green Power?" **Session Moderator: Kurt Johnson, U.S. Environmental Protection Agency**
"U.S. Green Power Certification Activities" *Kirk Brown, Center for Resource Solutions*
"The Power Scorecard" *Sam Swanson, PACE University*
"Canada's Environmental Choice Program" *John Polak, Environment Canada*

"Utility Green Pricing Programs: What's Working Well?" **Session Moderator: Terry Peterson, EPRI**
Lori Clements-Grote, Fort Collins Utilities
Cassius McChesney, Arizona Public Service
John Giese, Los Angeles Department of Water and Power
Laura Williams, Madison Gas and Electric

Opening Session
"What's Happening in Competitive Markets?" *Ashley Houston, XENERGY*

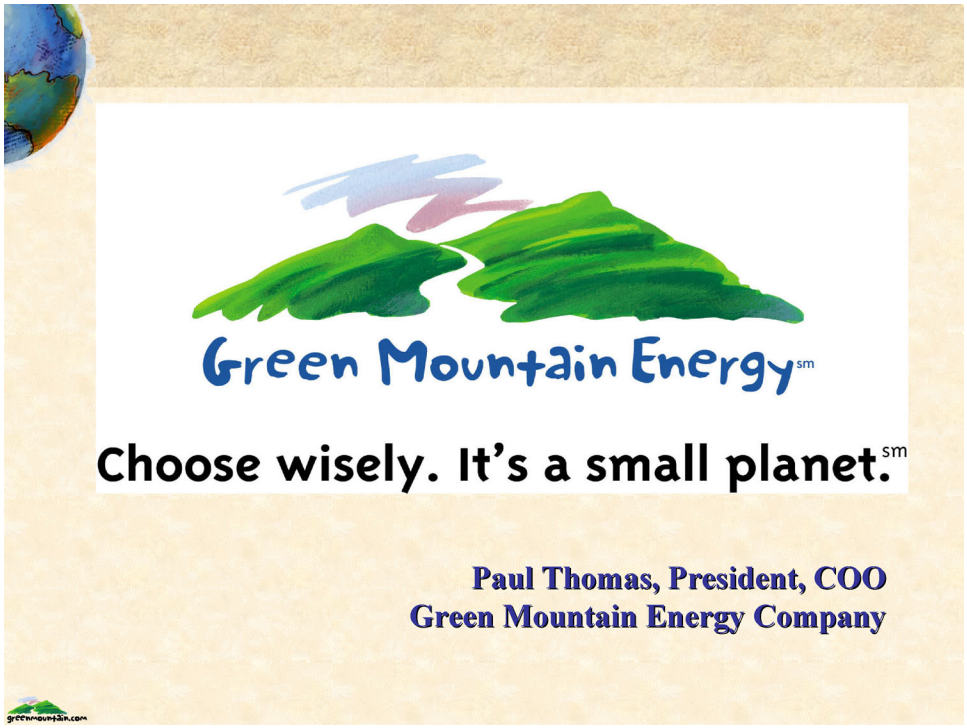
"Information Technology and Green Power" **Moderator: Howard Mueller, EPRI**
"The Pure Play Approach to Utility Services" *Dan Lieberman, Utility.com*
"The Internet as a Force for Environmental Improvement" *John Savage, GreenMountain.com*

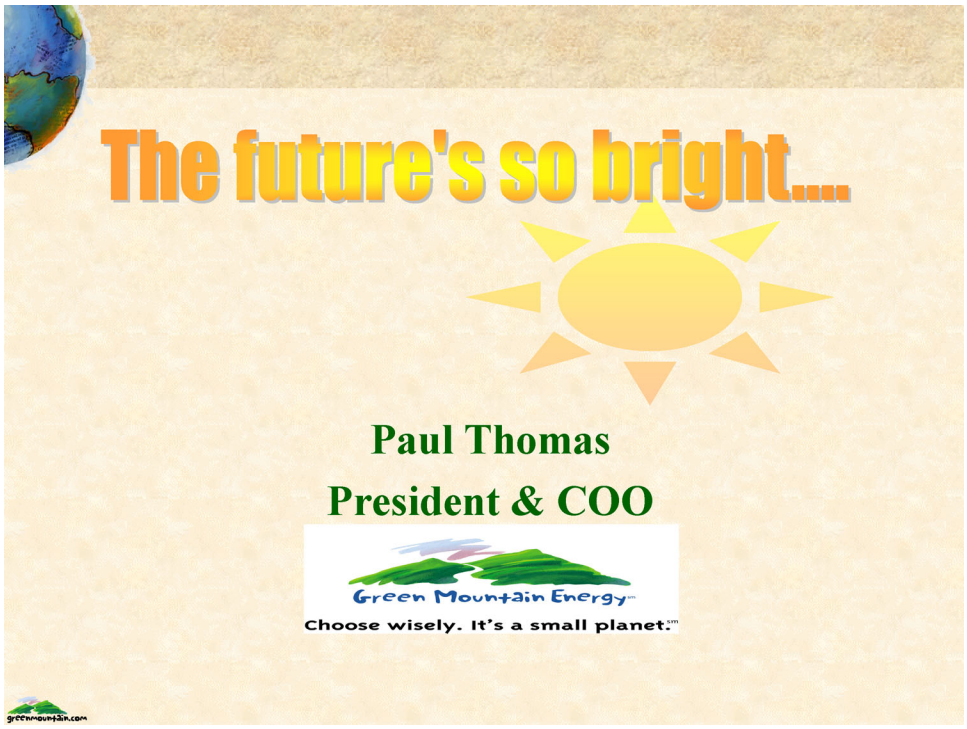
"International Green Power Activities" **Session Moderator: Rick Sellers, International Energy Agency**
"Development of an International green Certificate Trading System" *Jos Benner, CEA/RECS Secretariat, The Netherlands* "Green Power Marketing in Europe" *Rolf Wustenhagen, IWOe-HSG and CEPE, Switzerland*
"Linking International Green Power Markets" *Michael Rucker, Automated Power Exchange, USA*

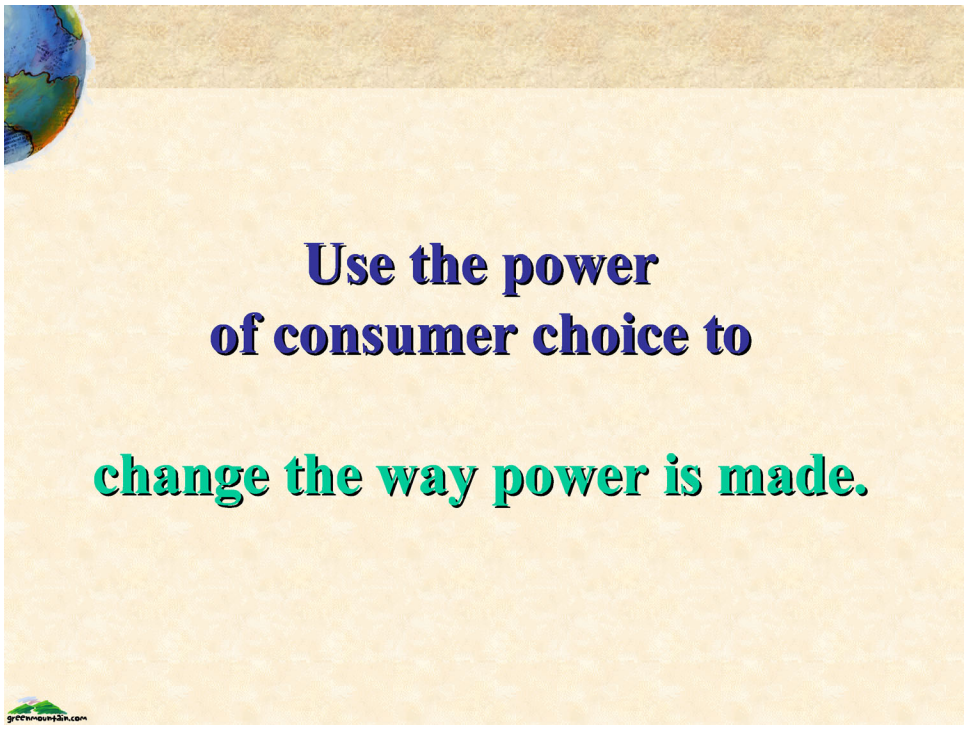
"Renewables: How Much Do They Really Cost?" ***Session Moderator: Blair Swezey, National Renewable Energy Laboratory***
The Cost of Green Power in Competitive Power Markets *Jan Pepper, Enertron Consultants*
Wind Power *Brian Parsons, National Renewable Energy Laboratory*
Landfill Methane *Tom Kerr, U.S. Environmental Protection Agency*
Photovoltaics *John Hoffner, Conservation Services Group*)

"Growing the Green Power Market" **Session Moderator: Tina Kaarsberg, U.S. Department of Energy**
"Community-Based Marketing" *Rudd Mayer, Land and Water Fund of the Rockies*
"Renewable Certificates: An Important Dimension in Capturing the Green Value" *Muir Davis, PG&E National Energy Group*

"Government as a Green Power Purchaser" ***Session Moderator: Jerry Kotas, U.S. Department of Energy***
"Overview of Federal Green Power Purchasing Efforts" *Beth Shearer, U.S. Department of Energy*
"U.S. Postal Service Green Power Purchase" *Ray Levinson, U.S. Postal Service*

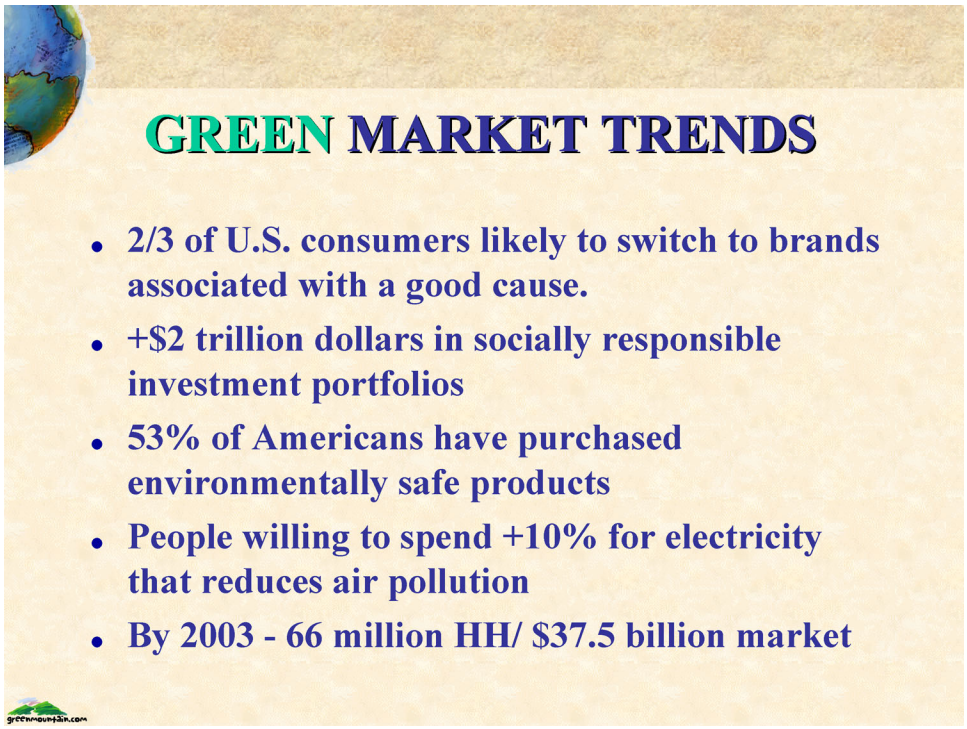

Green Mountain Energy℠
Choose wisely. It's a small planet.℠
Paul Thomas, President, COO
Green Mountain Energy Company


The future's so bright....
Paul Thomas
President & COO
Green Mountain Energy™
Choose wisely. It's a small planet.℠


Use the power
of consumer choice to
change the way power is made.


WHERE WE'VE BEEN...
Open for Business
CALIFORNIA
PENNSYLVANIA
NEW JERSEY
Five New Renewable Wind and Solar
Wind - San Gorgonio Pass
Solar - Conshocken, PA
Solar - Hopland, CA
Wind - Garret, PA
Solar - Berkeley, CA


WHERE WE ARE
TODAY….
➤ BP investment brings opportunity
➤ Business validation of "green" energy market
➤ Poised for aggressive growth to capitalize on consumer trends for environmentally motivated purchases.


GREEN MARKET TRENDS
• 2/3 of U.S. consumers likely to switch to brands associated with a good cause.
• +$2 trillion dollars in socially responsible investment portfolios
• 53% of Americans have purchased environmentally safe products
• People willing to spend +10% for electricity that reduces air pollution
• By 2003 - 66 million HH/ $37.5 billion market

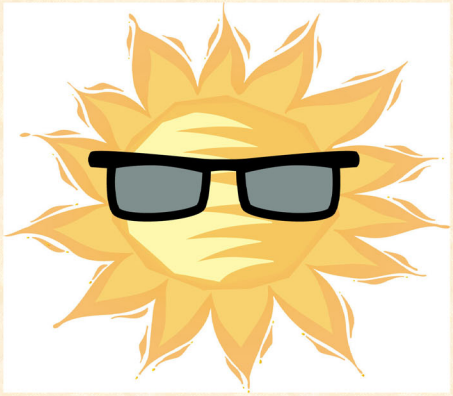

PROBLEM/SOLUTION
MESSAGE STRATEGY
Problem - Air Pollution
Solution - Choose "Green" Electricity


GREEN BUSINESS is GOOD BUSINESS
Coca-Cola
Ford Motor Company
Bank of America
…….. adopting CERES principals of environmental responsibility

IDEAL GREEN MARKET CONDITIONS

- Fair "price to compare"
- Low barriers to consumer choice
- Uniform Business Rules

.....we gotta wear shades.



Clean ENERGY for the 21st Century

Office of Energy Efficiency and Renewable Energy
U.S. Department of Energy

Green Power Initiatives at the U.S. Department of Energy —
Remarks for the 5th Annual Green Power Conference

August 7, 2000

Dan W. Reicher
Assistant Secretary

GP5 8/7/00

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U.S. Department of Energy

5 Years Ago…

- First Green Pricing Workshop
- Only a Handful of Utilities Had Green Pricing
- No State Electricity Competition or Choice
- No Substantial Green Power Purchases

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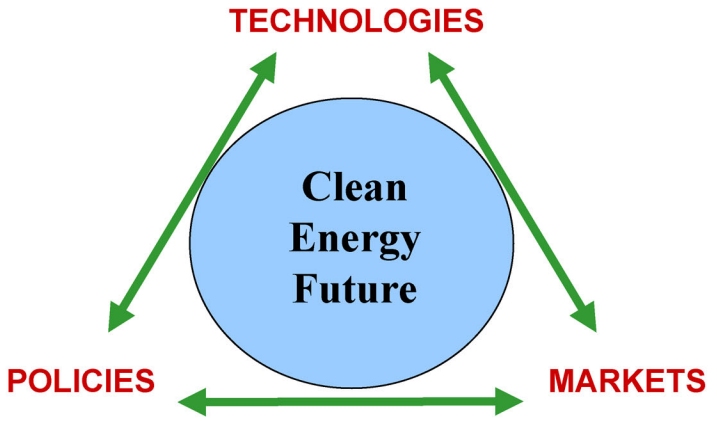
U.S. Department of Energy

THE ELEMENTS OF SUCCESS



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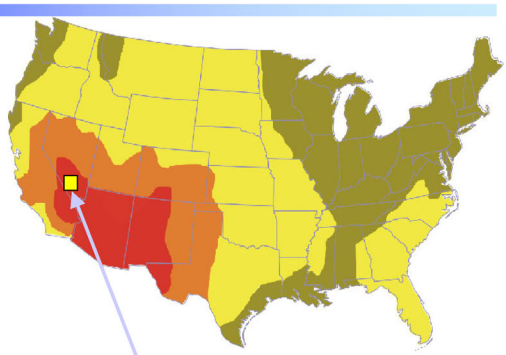
Photovoltaics

1980:
$1.00/kWh

2000:
~20¢/kWh

2005:
~10¢/kWh



Solar can supply all electricity for the U.S. using this area (100x100 mi.) in the SW*

Using a distributed approach with systems installed on buildings, vacant land, and parking lots the same result could be achieved with PV in every state.

*SOURCE: A Realizable Renewable Energy Future, Science Magazine, July 30, 1999

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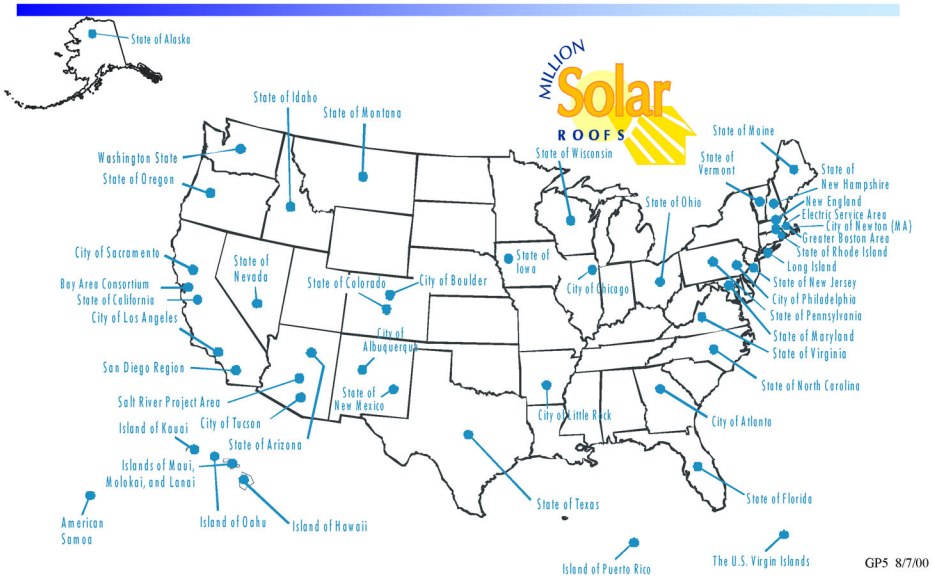

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1979: 40 cents/kWh

2000: 4-6 cents/kWh

- Increased Turbine Size
- R&D Advances
- Manufacturing Improvements

NSP 107 MW Lake Benton wind farm
4 cents/kWh (unsubsidized)

2007 Goal: 2-4 cents/kWh

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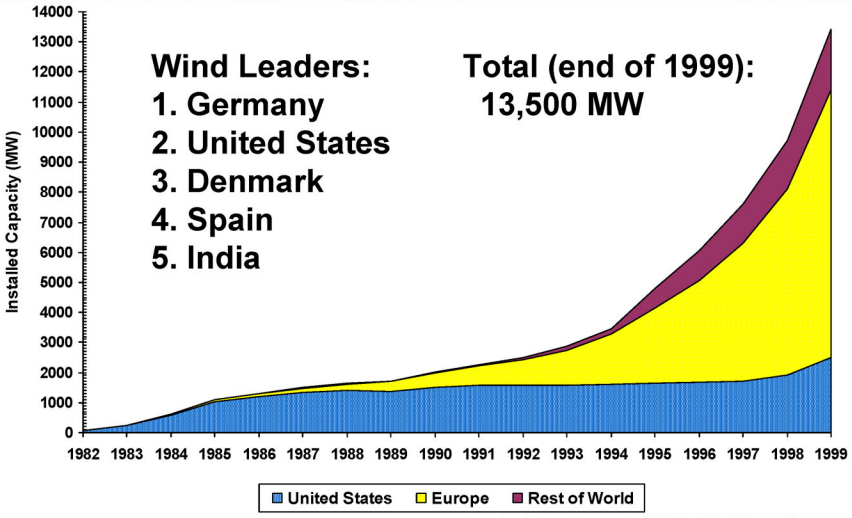

Based on information supplied by International Energy Agency.

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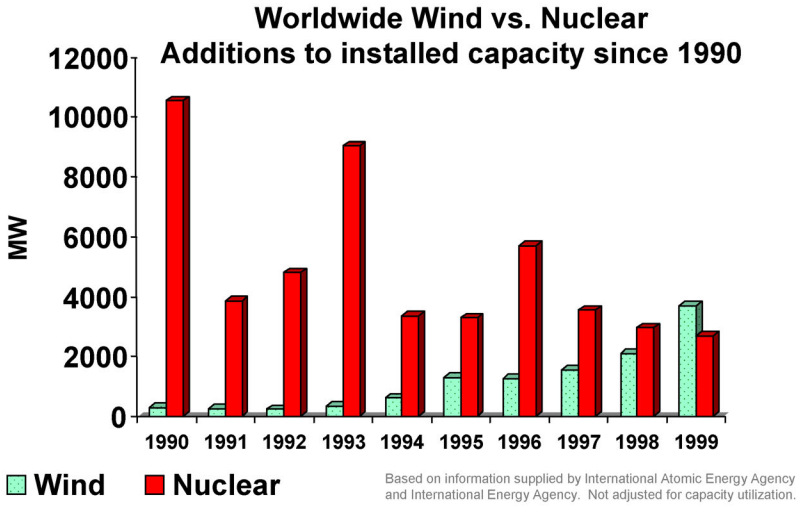

Based on information supplied by International Atomic Energy Agency and International Energy Agency. Not adjusted for capacity utilization.

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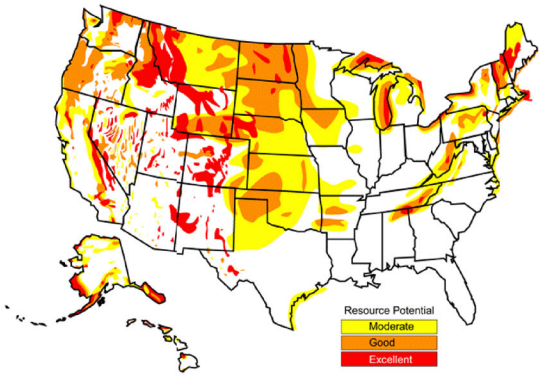
Rank	State
1	North Dakota
2	Texas
3	Kansas
4	South Dakota
5	Montana
6	Nebraska
7	Wyoming
8	Oklahoma
9	Minnesota
10	Iowa
11	Colorado
12	New Mexico
13	Idaho
14	Michigan
15	New York
16	Illinois
17	California

Source: AWEA

Wind: An All American Resource



World Class Wind Potential

Germany's Potential: 100 GW
North Dakota's Potential: 250 GW

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WIND POWERING AMERICA

GOALS

- **5% of nation's electricity by 2020**
- **Double the states with >20 MW installed to 16 by 2005, and then to 24 by 2010**
- **5% of Federal electricity use by 2010 (1,000 MW)**

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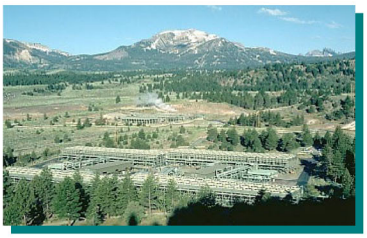
Geothermal Energy

1985: 15-16 cents/kWh

- More industry experience
- Improved drilling technology
- Economies of scale
- Reduced cost of finance

2000:
5-8 cents/kWh

2003:
4-6 cents/kWh



Mammoth Pacific
Geothermal Facility

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U.S. Department of Energy

GeoPowering the West
Bringing clean sources of electricity and heat to the American West

"Geothermal power is a clean, reliable and renewable energy source available in all western states…. We are confident that this initiative will help to increase the power produced by this existing resource and make it a major contributor to our clean energy mix."

Bill Richardson, Secretary of Energy

- **Announced January 2000 with Senator Reid**
- **Double the states with geothermal facilities to eight by 2006**
- **Seven million homes using geothermal energy by 2010**
- **10% of the electricity use of 19 Western states by 2020**

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Biobased Products and Bioenergy Initiative

Biomass Feedstock

– Trees
– Grasses
– Agricultural Crops
– Agricultural Residues
– Animal Wastes
– Municipal Solid Waste

Conversion Processes

- Enzymatic Fermentation
- Gas/liquid Fermentation
- Acid Hydrolysis/Fermentation
- Gasification
- Combustion
- Co-firing

USES

Fuels:
Ethanol
Renewable Diesel

Electricity

Heat

Chemicals
– Plastics
– Solvents
– Pharmaceuticals
– Chemical Intermediates
– Phenolics
– Adhesives
– Furfural
– Fatty acids
– Acetic Acid
– Carbon black
– Paints
– Dyes, Pigments, and Ink
– Detergents
– Etc.

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U.S. Department of Energy

Goal

To triple U.S. use of biobased products and bioenergy by 2010

President Clinton
Executive Memorandum
August 12, 1999

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U.S. Department of Energy

- **Landfill gas is not only renewable, but also avoids emission of methane**
- **50% of landfill gas is methane - a powerful greenhouse gas**

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Gasification Cost of Electricity

1995: 8¢/kWh

2000: 7¢/kWh

2010: 6¢/kWh

- ❖ Combined gas-turbine with steam cycle
- ❖ Hot-gas clean-up
- ❖ Increased types of biomass fuels

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- Million Solar Roofs
- Wind Powering America
- Bioenergy Initiative
- GeoPowering the West

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U.S. Department of Energy

Today … !

- Fifth Green Power Conference
- More than 80 Utilities with Green Pricing
- 24 States with Competition/Choice
- 22 Green Power Products
- Major Green Power Purchases by Industry and Government

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U.S. Department of Energy

EERE Mission

Lead the Nation in research, development & deployment of advanced energy efficiency and clean power technologies and practices, providing Americans with a stronger economy, healthier environment and more secure future.

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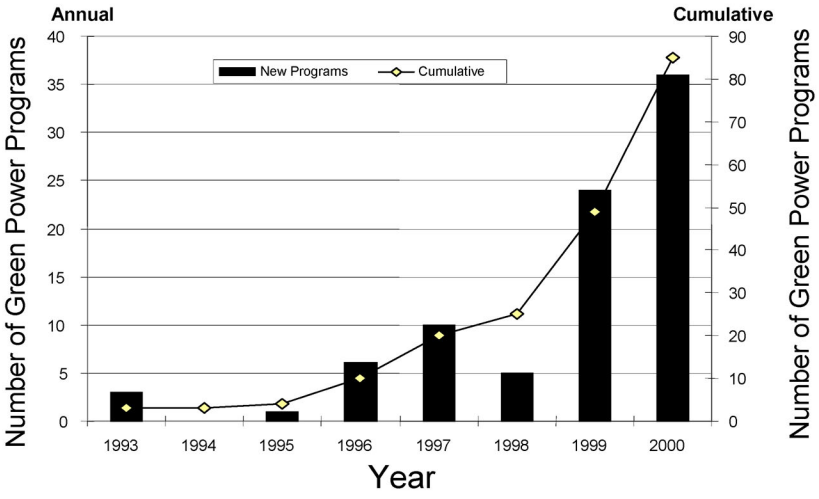

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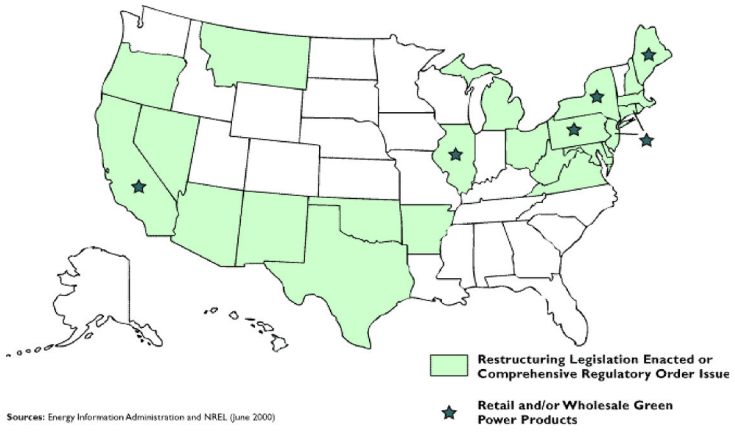
States with Competitive Green Power Offerings



Sources: Energy Information Administration and NREL (June 2000)

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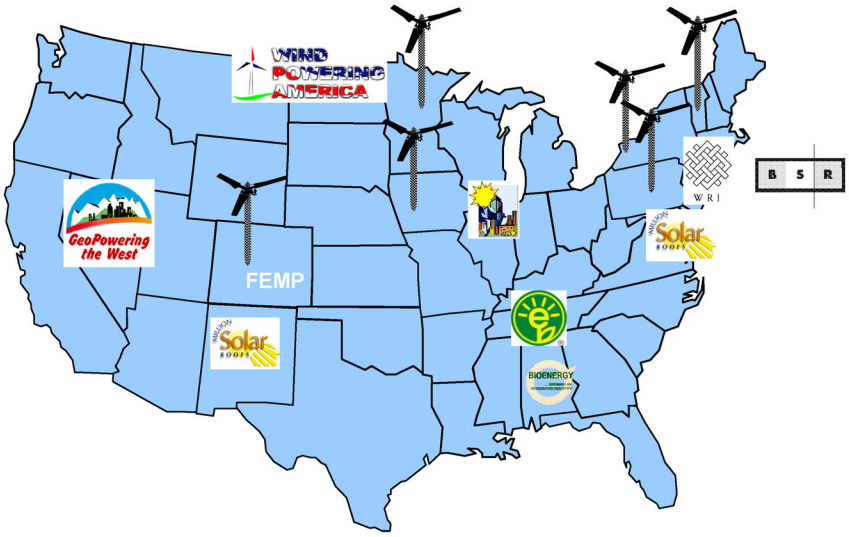

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CHICAGO GOES GREEN!

- **400 MW Competitive Procurement**
- **20% Renewable by 2005**
- **Must also reduce CO_2, NOx, SO_2 in other ways**

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Brightfields

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U.S. Department of Energy

Green Power for a Green LA

Our goal is to replace electricity generated from polluting power plants with green power

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U.S. Department of Energy

Greening the Government
Executive Order : Major Goals

- 35% improvement in buildings energy efficiency by 2010
  - Build on 30% goal for 2005
- 25% improvement in industrial/laboratory facilities by 2010
  - Builds on 20% goal for 2005
- 30% reduction in greenhouse gas emissions by 2010
- Expand use of renewable energy
  - Greater number of renewable systems at Federal facilities
  - Enhanced purchase of green power
  - Meet million solar roofs goals at Federal facilities
- Enhance water conservation

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DENVER GREEN POWER PURCHASE

Participating Federal Agencies

Bureau of Land Management ❖ Defense Contract Management Agency ❖ Department of Air Force ❖ Department of Agriculture ❖ Department of Army ❖ Department of Education ❖ Department of Energy ❖ Department of Health and Human Services ❖ Department of Housing and Urban Development ❖ Department of Interior ❖ Department of Justice ❖ Department of Labor ❖ Department of Veterans Affairs ❖ Environmental Protection Agency ❖ Federal Emergency Management Agency ❖ General Services Administration ❖ Government Printing Office ❖ National Institute of Standards and Technology ❖ National Oceanic and Atmospheric Administration ❖ National Park Service ❖ National Renewable Energy Laboratory ❖ Office of Personnel Management ❖ Social Security Administration ❖ U.S. Geological Survey ❖ U.S. Marshal Service ❖ U.S. Mint ❖ Western Area Power Administration

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Office of Energy Efficiency and Renewable Energy
U.S. Department of Energy

DOE Commits to More Green Power

- First Federal agency Department-wide commitment to Green Power
- 3% of electricity needs from non-hydro renewables by 2005
- Rising to 7.5% of electricity needs by 2010
- In deregulated states, DOE will competitively select suppliers
- No increase in utility bill expected

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U.S. Department of Energy

Green Power Market Development Group

BSR

WRI

Alcoa
Cargill-Dow
Delphi
DuPont
Kinkos
GM
Oracle
Interface
IBM
Pitney Bowes
Johnson & Johnson

Account for 7% of industrial energy use

1,000 MW of Green Power by 2010

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U.S. Department of Energy

5 Years From Now…?

- Green Power Is Mainstream Power
- Thousands of Green Power Products Offered
- Name Your Price for Green Power from Priceline.com
- Federal Electricity Restructuring Legislation
- Convergence of Renewables and Natural Gas

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U.S. Department of Energy

Green Power Issues

- Electric Industry Restructuring
- Environmental Regulation
- Climate Change
- Information Technology and Telecommunications
- Cost and Value of Green Power

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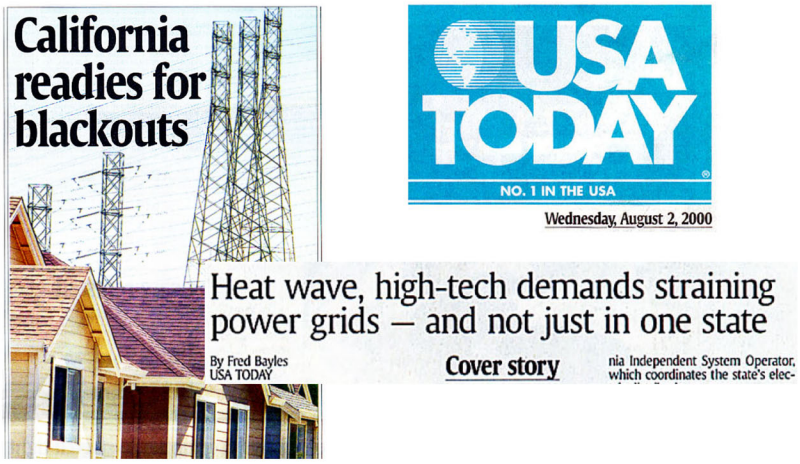

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Comprehensive Electricity Competition Act

- Renewable Portfolio Standard (RPS) @ 7.5%
- Public Benefits Fund ($3 billion per year)
- Increased Information Disclosure
- Net Metering
- National Interconnection Standards

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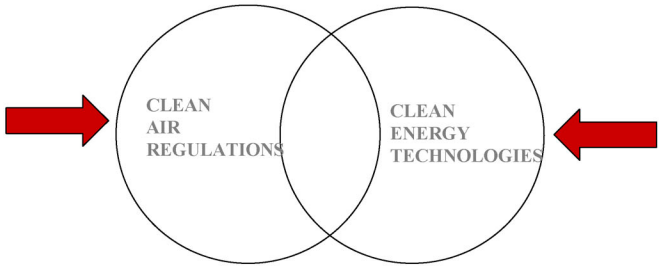
U.S. Department of Energy

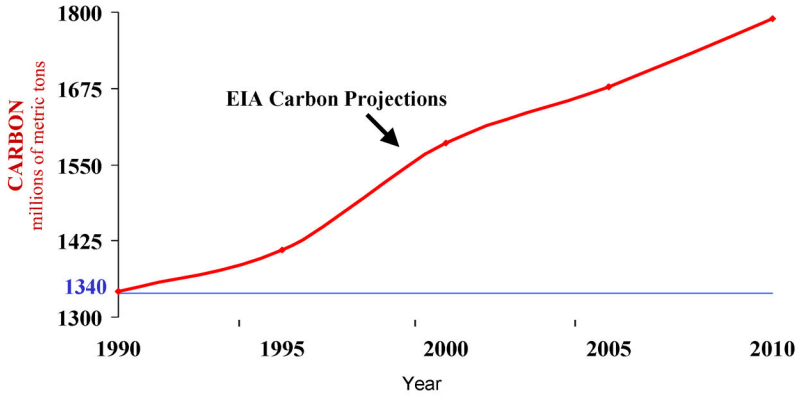
OUR CHALLENGE:



GP5 8/7/00

Office of Energy Efficiency and Renewable Energy
U.S. Department of Energy

Key Driver: Climate Change

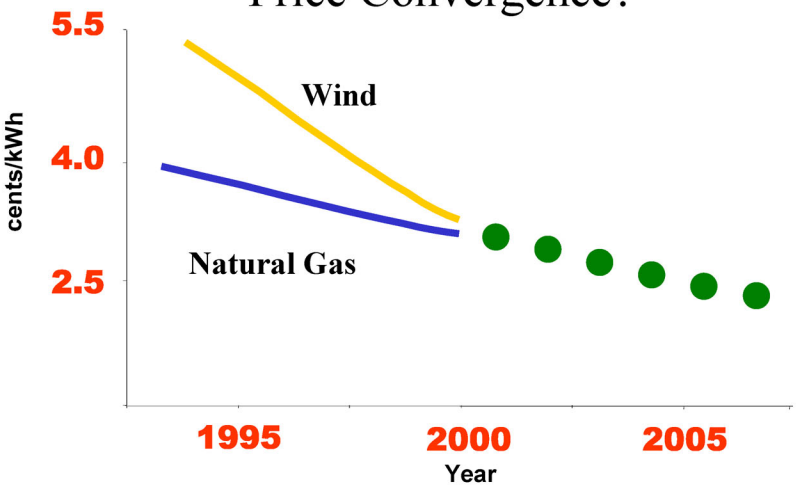


Sources: Energy Information Administration 1999 Annual Energy Outlook

GP5 8/7/00

Office of Energy Efficiency and Renewable Energy
U.S. Department of Energy

Price Convergence?



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Office of Energy Efficiency and Renewable Energy
U.S. Department of Energy

Natural Gas and Renewable Energy Alliance

American Bioenergy Association	Coalition for Gas-Based Environmental Solutions	Future Energy Resources Corporation	National BioEnergy Industries Association
American Gas Association	Columbia Energy Group	Gas Technology Institute	Plug Power
American Wind Energy Association	DCH Technology	Geothermal Energy Association	Sempra Energy
BP Amoco	Enron Corporation	Interstate Natural Gas Association of America	Solar Turbines
Battelle Commercial Operations	Distributed Power Coalition of America	Keyspan Energy	Solar Energy Industries Association
Business Council for Sustainable Energy			Spire Corporation

GP5 8/7/00

Clean ENERGY for the 21st Century

Office of Energy Efficiency and Renewable Energy
U.S. Department of Energy

Distributed Energy Resources

- 20-40% new generating capacity
- Critical for reliability and power quality
- Environmental and economic benefits
- Systems approach
  - electricity, heating, cooling, and mechanical drive

World's First Residential Fuel Cell - New York

GP5 8/7/00

Clean ENERGY for the 21st Century

Office of Energy Efficiency and Renewable Energy
U.S. Department of Energy

Carborne Home
Rochester, New York

The Civano Community
Tucson, Arizona

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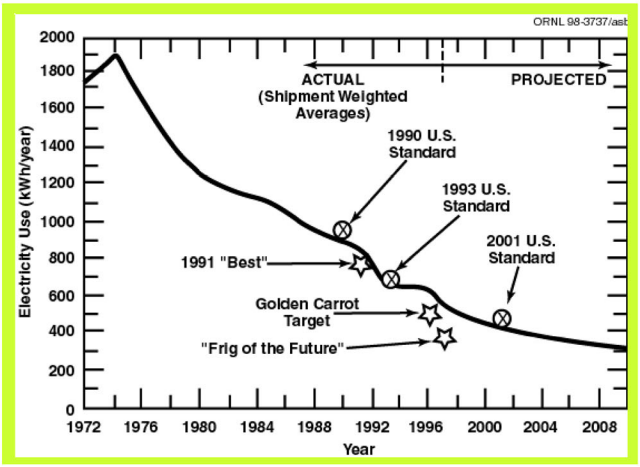
U.S. Department of Energy

Technology, Policy and Energy Impacts: Refrigerator Appliance Standards



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U.S. Department of Energy

Bringing It Home

GP5 8/7/00

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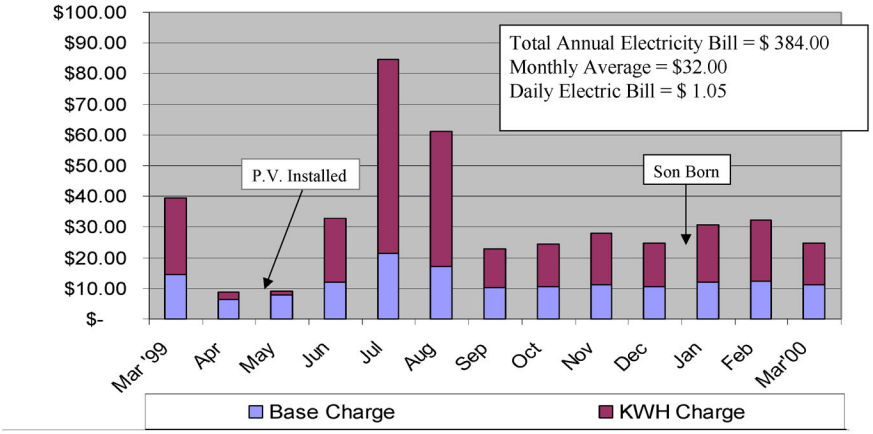
U.S. Department of Energy

Dan Reicher's Electric Bill



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Office of Energy Efficiency and Renewable Energy
U.S. Department of Energy

DOE Supports Green Power in Many Ways

- RD&D
- Policy
- Outreach
- Procurement

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Clean ENERGY for the 21st Century

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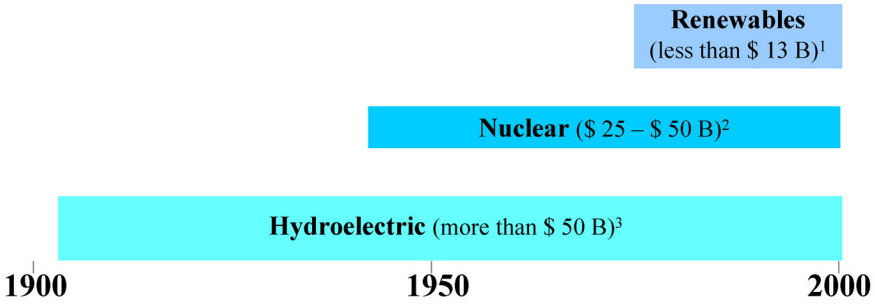
U.S. Department of Energy

Maturing an Energy Source = Time + Money



1 Cumulative Federal renewable energy federal appropriations (1999$)

2 Range of cumulative appropriations based on 1998 Nuclear Energy Institute Federal Spending Analysis (1997$)

3 Federal appropriations since 1903 (1999$)

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Clean ENERGY for the 21st Century

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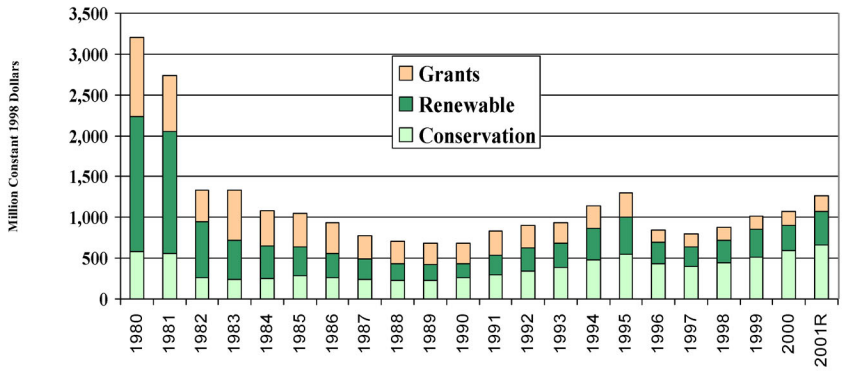
U.S. Department of Energy



EERE Budget History 1980-2001

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U.S. Department of Energy

GREEN POWER Network

by NREL/LBNL Green Power Team

http://www.eren.doe.gov/greenpower

GP5 8/7/00

Office of Energy Efficiency and Renewable Energy
U.S. Department of Energy

The End (extras after this)

GP5 8/7/00

5th National Green Power Marketing Conference
Denver, Colorado
7 August 2000

Understanding Non-Residential Demand for Green Power

ED HOLT
& Associates
Energy Smart Consulting

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Harpswell, ME 04079
Tel. 207.798.4588
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Acknowledgements

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  - American Wind Energy Association
  - National Wind Coordinating Committee
- Funder
  - U.S. Department of Energy
- Investigators
  - Ed Holt & Associates, Inc., Lawrence Berkeley National Lab, Land and Water Fund of the Rockies
- Cooperators
  - Commonwealth Energy, Eugene Water & Electric Board, GreenMountain.com, LAW Fund, Los Angeles DWP, Madison Gas & Electric, Wisconsin Electric

The Overview

- Project scope
  - green power customer mailed survey
  - green power customer interviews
  - mailed survey of potential customers
- Existing customer survey objectives:
  - purchasing and decision process
  - selection criteria for suppliers and products
  - company motivations and barriers
  - policy preferences

Ed Holt & Associates, Inc.

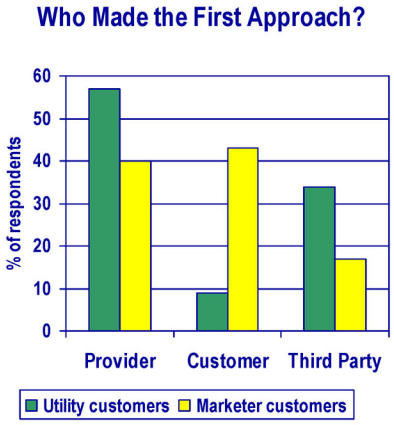
The Sample

- Mailed to 1800 customers, response rate 27%
  - 222 competitive marketer customers
  - 242 regulated utility customers
- Organization Type
  - 82% business, 14% non-profit, 4% public sector
  - Businesses: 82% retail/service, 18% mfg/wholesale
- Size
  - 57.5% small (<$500,000 revenue/year)
  - 31.6% medium ($.5 - $10 million/year)
  - 10.9% large (>$10 million/year)
- Geography: CA, PA, OR, CO, WI

Ed Holt & Associates, Inc.

The Decision

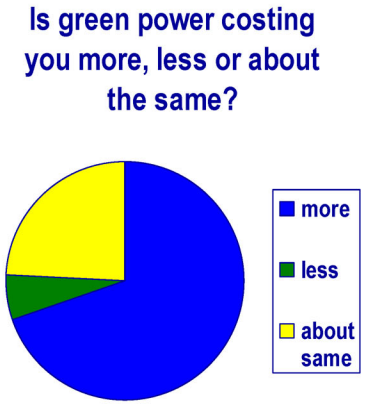
- Procurement
  - 82% purchased off the shelf products
  - 9% issued an RFP
  - 9% negotiated with the green power provider
- Time
  - generally a quick decision
  - larger firms take longer
  - RFP takes longer



Ed Holt & Associates, Inc.

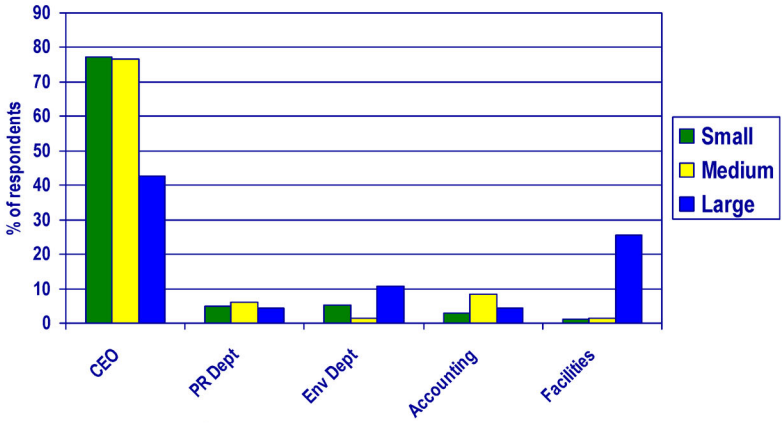
The Cost

- Small customers:
  - 9% premium ($140/year)
- Medium customers:
  - 8.4% premium ($990/year)
- Large customers:
  - 6.4% premium ($9,030/year)
- average includes those who said they are paying about the same, or less



Ed Holt & Associates, Inc.

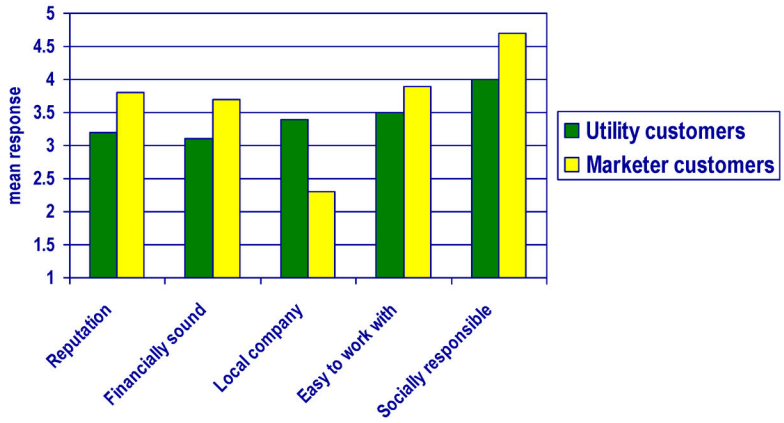
The Champions



Parent company = 0; some "other"

Ed Holt & Associates, Inc.

Supplier Selection Criteria



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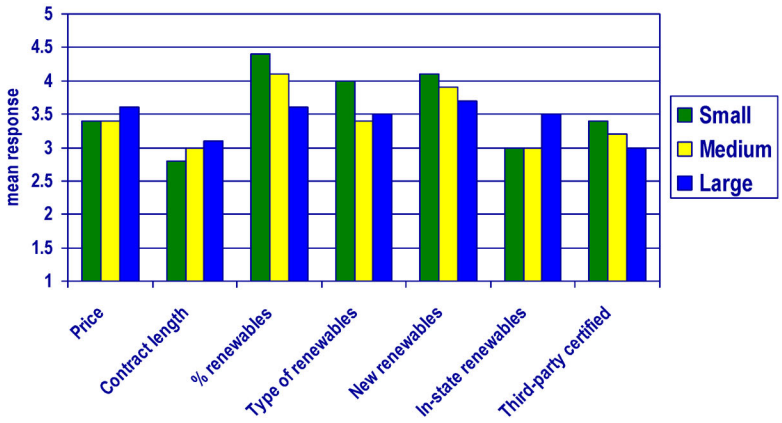
Product Selection Criteria



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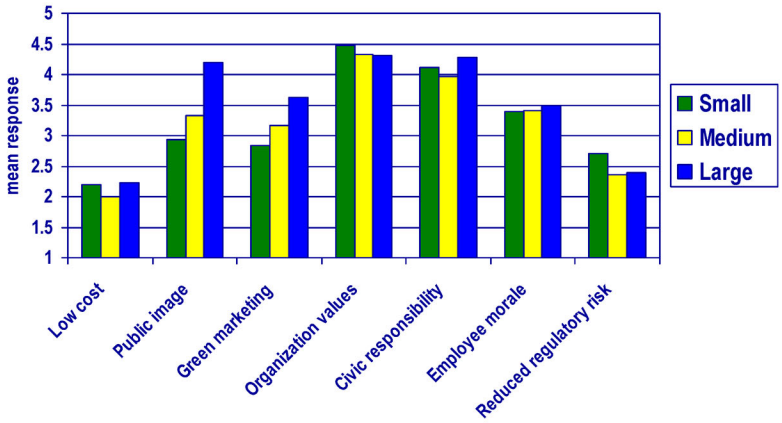
Motivations



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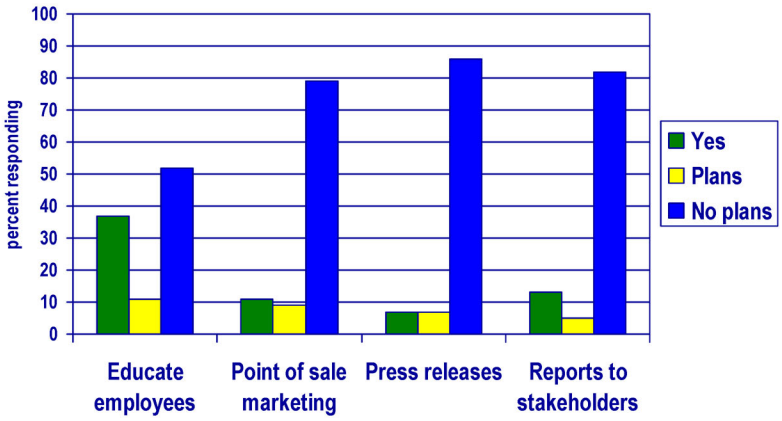
Getting the Word Out



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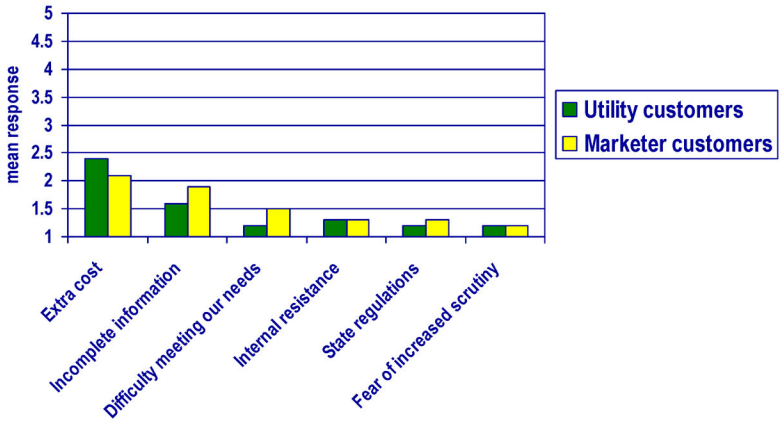
Barriers



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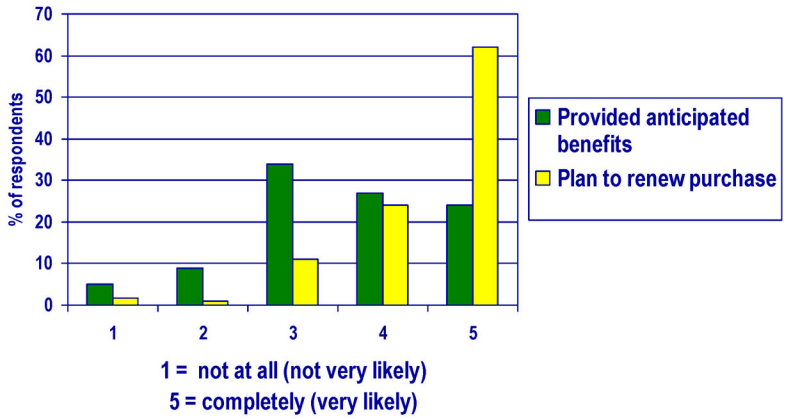
Satisfaction



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Preliminary Conclusions

- Early adopters are more altruistic than anticipated
  - organization values, civic responsibility, employee morale
- The largest firms are more likely to seek private benefits
- Marketers and utilities need to find ways to create more private benefits to reach those organizations that are less altruistic

Ed Holt & Associates, Inc.

Toyota's Green Power Commitment

Why We're Purchasing Green Power

Fifth National Green Power Marketing Conference
Business Customer Roundtable
August 7, 2000

Toyota's Green Power Commitment

- What we did
- Why we did it
- How we did it
- Life since the switch - what's next

What we did

Earth Day 1998

100% Renewable Electricity

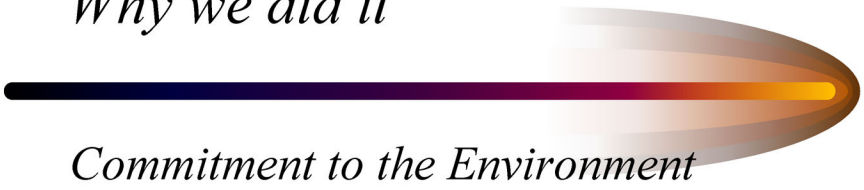
EdisonSource's EarthSource 100

12 megawatts of load

Southern California Facilities

Two-year term

Why we did it



Commitment to the Environment

- *One of Toyota's "Guiding Principles": "to exist in harmony with the earth"*
- *Earth Charter*
  - *Comprehensive Approach*
  - *Proactive measures*
  - *Social contribution*

Why we did it

- *Environmental Leadership*
  - *Advanced automotive technologies*
  - *Reforestation*
  - *Hybrid trees - process additional CO_2*

Why we did it

- *Corporate Leadership*
  - *Commitment to corporate leadership*
  - *Use of green power is a statement and challenge to our business partners, our competitors and the rest of corporate America that it is important for all of us to take responsibility for our environment.*

Why we did it

Reality of Doing Business Now and In the Future

- *Environmental responsibility is the "price of admission" for doing business*
- *Our customers are not willing to accept environmentally advanced automotive products and then look the other way at how we conduct the rest of our business.*

Why we did it

Social Responsibility and Our Employees

- *We are a citizens of the world*
- *We recognize that the actions we take can have a lasting impact on everyone - we all breathe the same air.*
- *Green power discount for employees*
  - *reinforces corporate commitment*
  - *encourages individual personal action*

How we did it

- *The Idea*
  - *Generated in the Real Estate & Facilities and Environmental Affairs department*
  - *Looking electric utility deregulation*
  - *Opportunity to build on our Green Lights and Energy Star programs*
  - *We knew that it would not be easy – we needed help*

How we did it

- *Opportunity Knocks*
  - *October 1997 about 90% the annual Toyota Global Symposium dedicated to the environment and environmental issues.*
  - *December 1997 the Kyoto Conference*
  - *In Japan, our parent company tuned into the environment – it should be an easy sell here in the United States*

How we did it

- *Selling the Idea - Answering the Questions*
  - *Things are never as easy as they seem*
  - *Even with a strong environmental focus in Japan, our senior management was still focused on our core business of profitably selling motor vehicles.*
  - *The program needed the approval of the Finance and the Executive Committee.*

How we did it - the Questions

- *Cost*
  - *There was a lot of discussion about the cost premium for green power*
  - *This was not a budgeted cost*
  - *Even with the vast financial resources of a company like Toyota, it spends it's money one yen at a time*

How we did it - the Questions

- *What is "Green Power"?*
  - *Education and understanding is the key.*
  - *Do your homework - keep it simple*
  - *Explain "what's green power" and "what's not green power - "LGE"*
  - *Green power is providing financial support for generating electricity from renewable sources - encouraging more production*

Green Power - Toyota Style

How we did it - the Questions

- *Is it Reliable?*
  - *"green power" is just as reliable as electricity from any other power producer.*
  - *The lights wouldn't go out or the computers shut down if the wind stops blowing or the sun stops shinning.*
  - *How can we be sure we are "getting" what we're paying for? "Green-e"*

Green-e Brand

50% Renewable Electricity

The Green-e Brand

How we did it - the Questions

- *Is there enough of it to meet our current and future needs?*
  - *Capacity of available "green" power versus our demand*
  - *Future needs*

How we did it

- The Surprise
  - We had senior management approval
  - Negotiations with Edison were done
  - The attorneys were done
  - Earth Day was selected to sign the agreement make the announcement.
  - We had done it!……or so we thought.
  - The day before of Earth Day…….

Life since we switched - What's next

- Preferences for certain renewables
- Successful EdisonSource"pilot" program
- Earth Day at Toyota
- Switch of provider to GreenMountain
- Green power purchases for other facilities
- Distributed generation "cleaner and greener"
- New constituencies
- New decision makers

Toyota's Green Power Commitment

Choosing Renewable Energy for a Small Business

Jeff Lebesch
New Belgium Brewing Company, Inc.
Fort Collins, Colorado, USA

A sustainable small business

Facets of sustainable business practices at New Belgium

- Waste stream reduction
- Energy and resource conservation
- Cultivating employees' desire to be active/engaged members of the company
- Community philanthropy

Some company statistics:

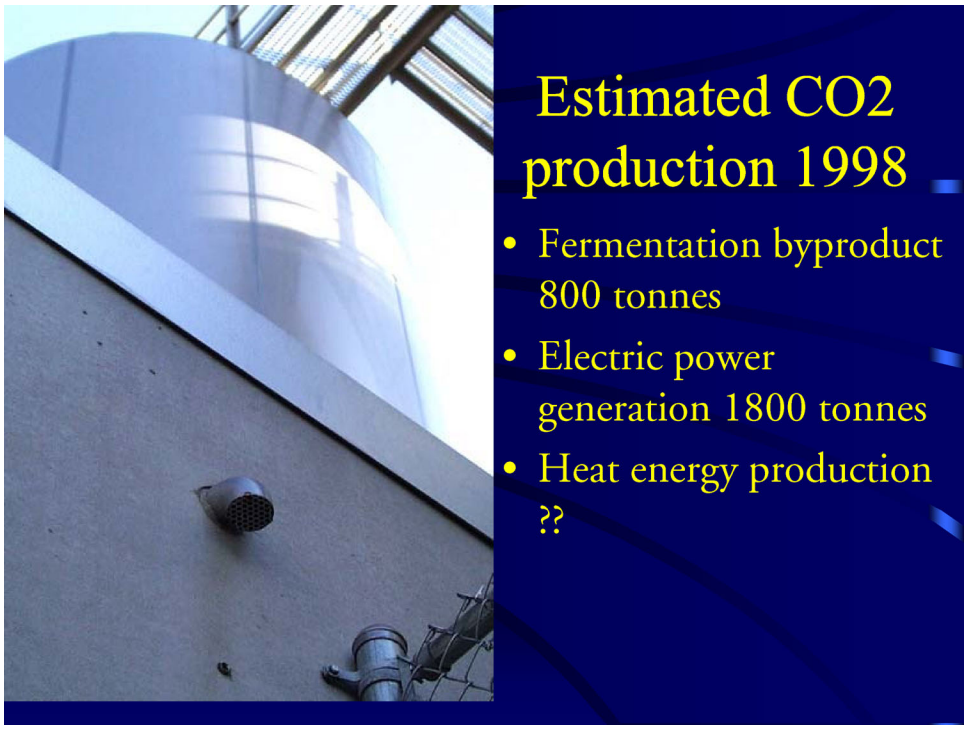
- Privately held, 9 years old
- 100 employees
- 1999 shipments 147,000 barrels
- 2000 philanthropy budget $147,000

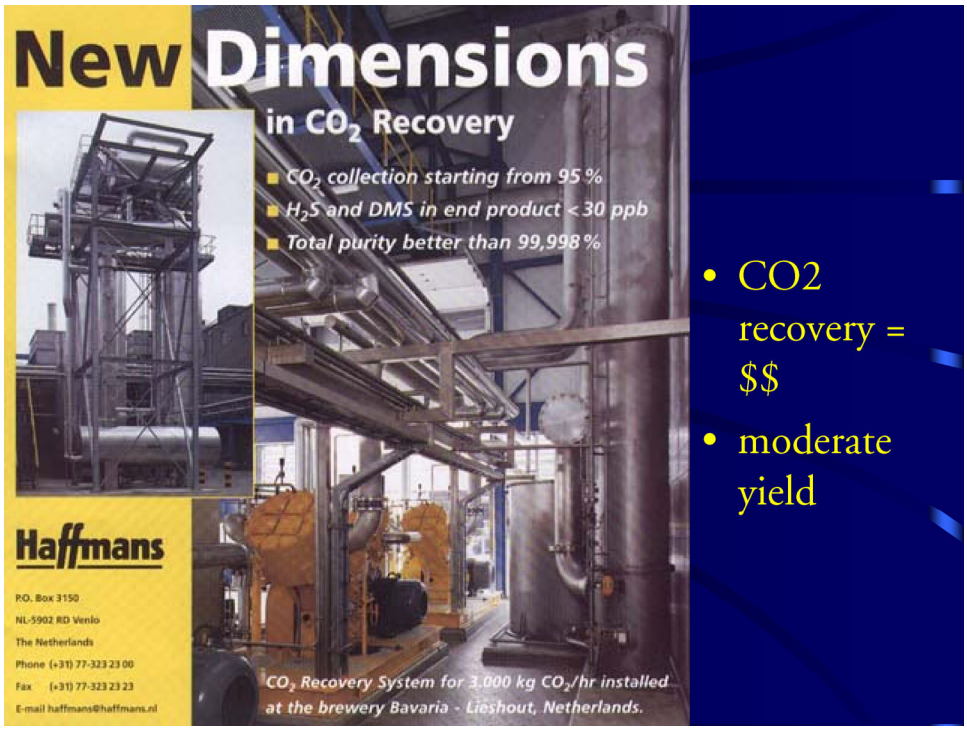
How we got involved with renewable energy

- Focusing on waste reduction/zero waste
- Searching for a viable action
- Most options were capital or engineering intensive

Major waste streams at New Belgium:

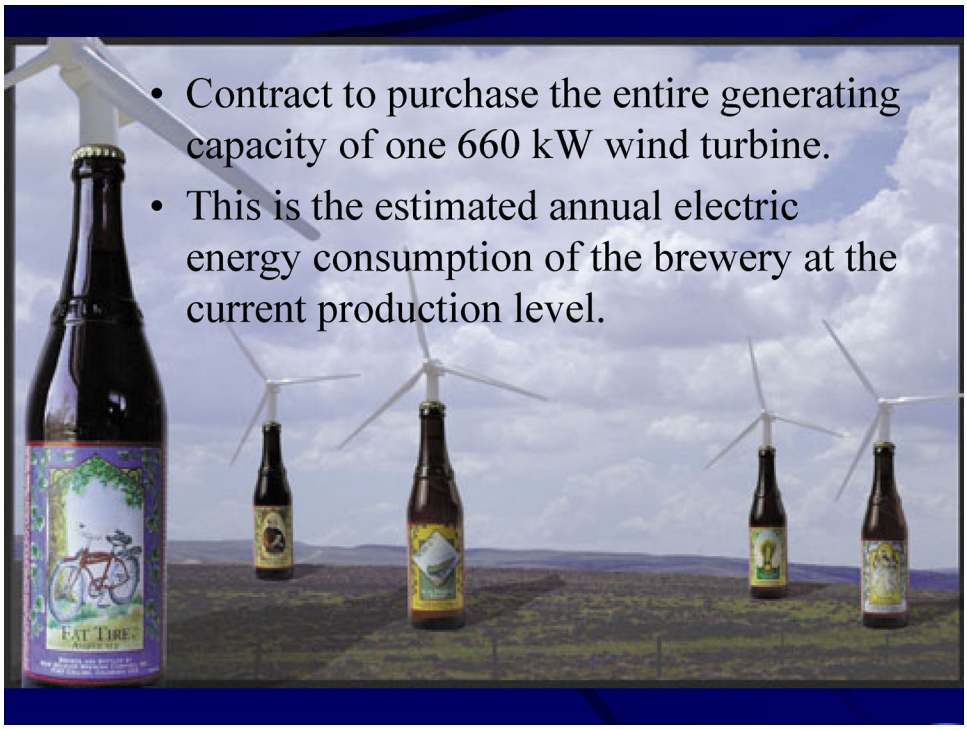
- Carbon dioxide from fermentation, and electric and steam power generation
- Spent grain 2500 T
- Glass 4300 T
- Waste water and suspended organics 10M gal

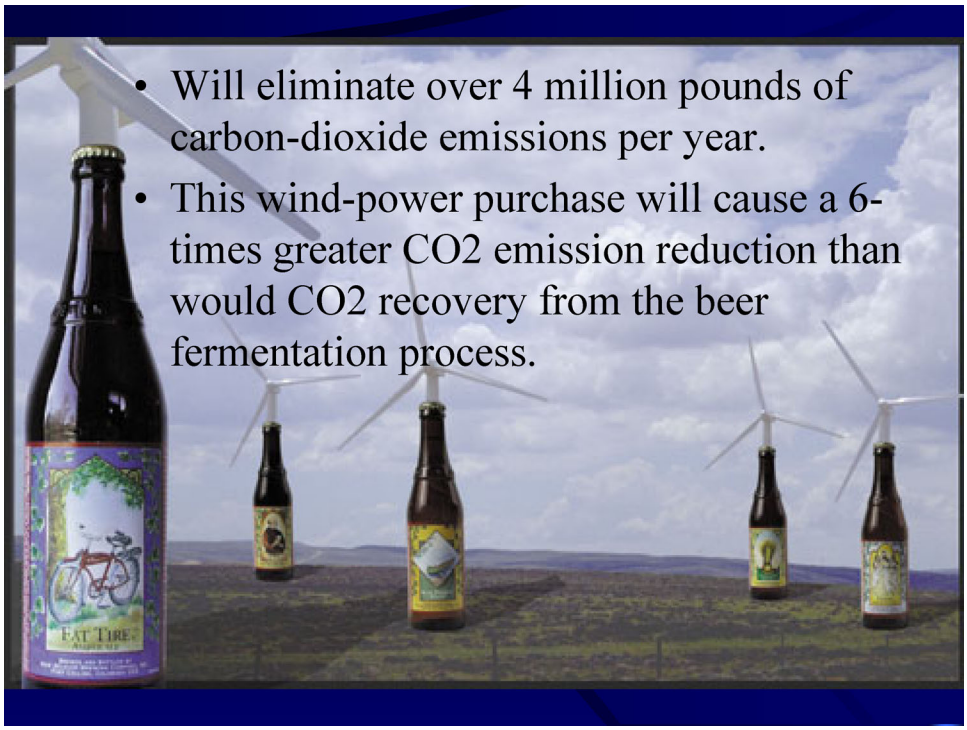

Estimated CO2 production 1998
• Fermentation byproduct 800 tonnes
• Electric power generation 1800 tonnes
• Heat energy production ??

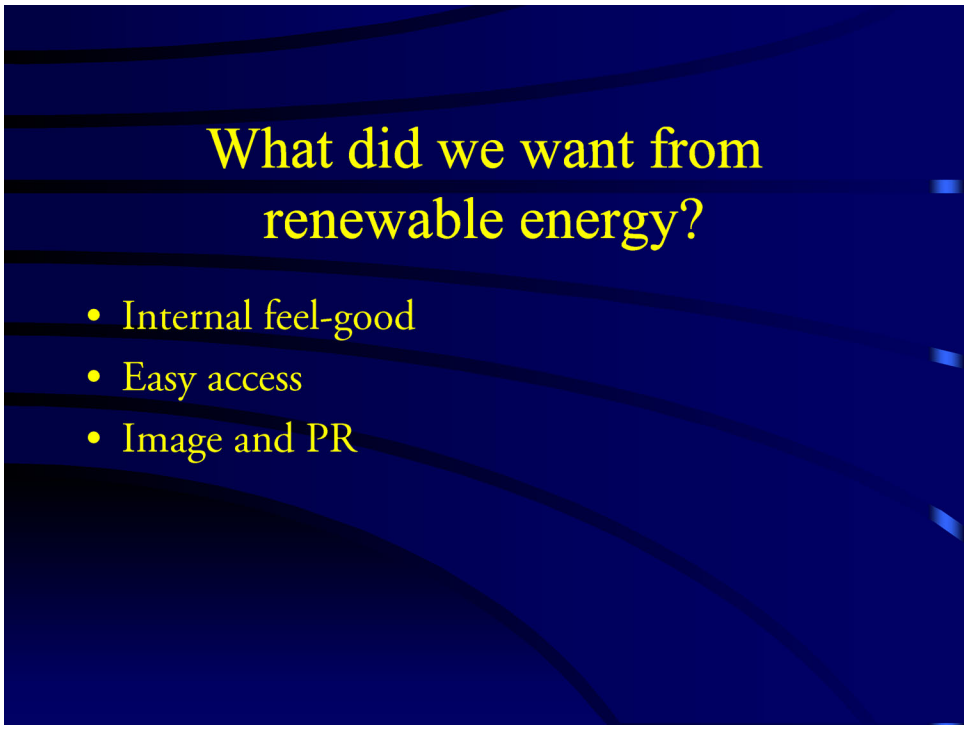

New Dimensions
in CO_2 Recovery
CO_2 collection starting from 95 %
H_2S and DMS in end product < 30 ppb
Total purity better than 99,998 %
Haffmans
P.O. Box 3150
NL-5902 RD Venlo
The Netherlands
Phone (+31) 77-323 23 00
Fax (+31) 77-323 23 23
E-mail haffmans@haffmans.nl
CO_2 Recovery System for 3.000 kg CO_2/hr installed at the brewery Bavaria - Lieshout, Netherlands.
• CO2 recovery = $$
• moderate yield

What about wind power?

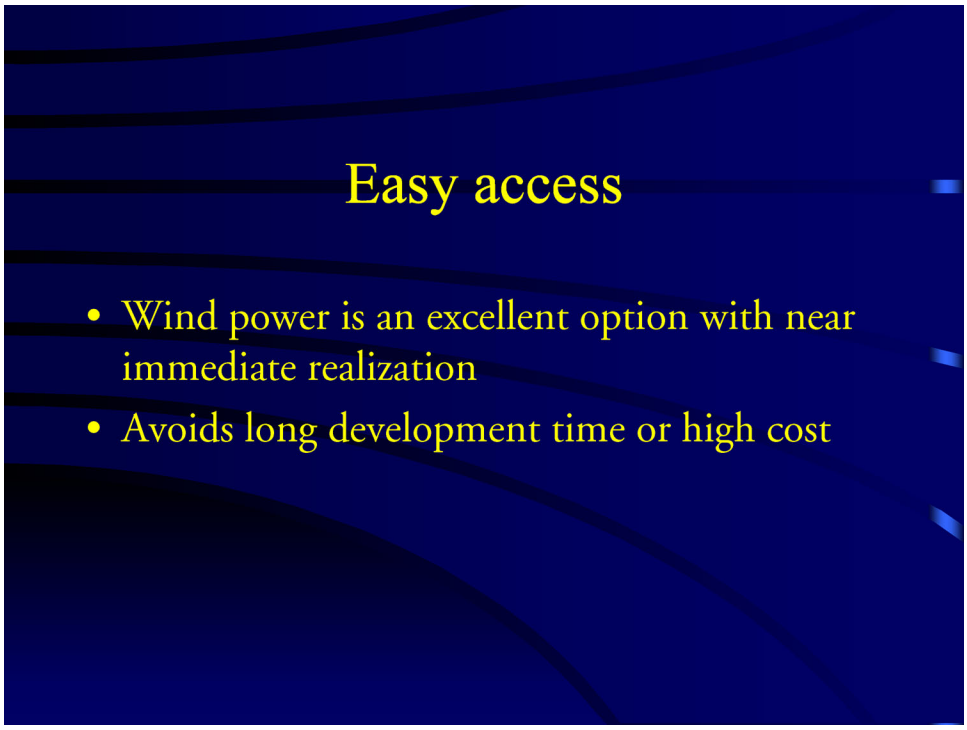
- Approached by the City of Fort Collins, Electric Utility Department, suggesting purchase of wind-generated electric power
- Possibility to make a real waste stream reduction without time or capital investment


• Contract to purchase the entire generating capacity of one 660 kW wind turbine.
• This is the estimated annual electric energy consumption of the brewery at the current production level.
EAT TIRE


• Will eliminate over 4 million pounds of carbon-dioxide emissions per year.
• This wind-power purchase will cause a 6-times greater CO2 emission reduction than would CO2 recovery from the beer fermentation process.
EAT TIRE


What did we want from renewable energy?
• Internal feel-good
• Easy access
• Image and PR


Internal feel-good
• Environmental responsibility is important to the owners and employees
• Need to act, and not just talk
• Be a community and industrial leader


Easy access
• Wind power is an excellent option with near immediate realization
• Avoids long development time or high cost

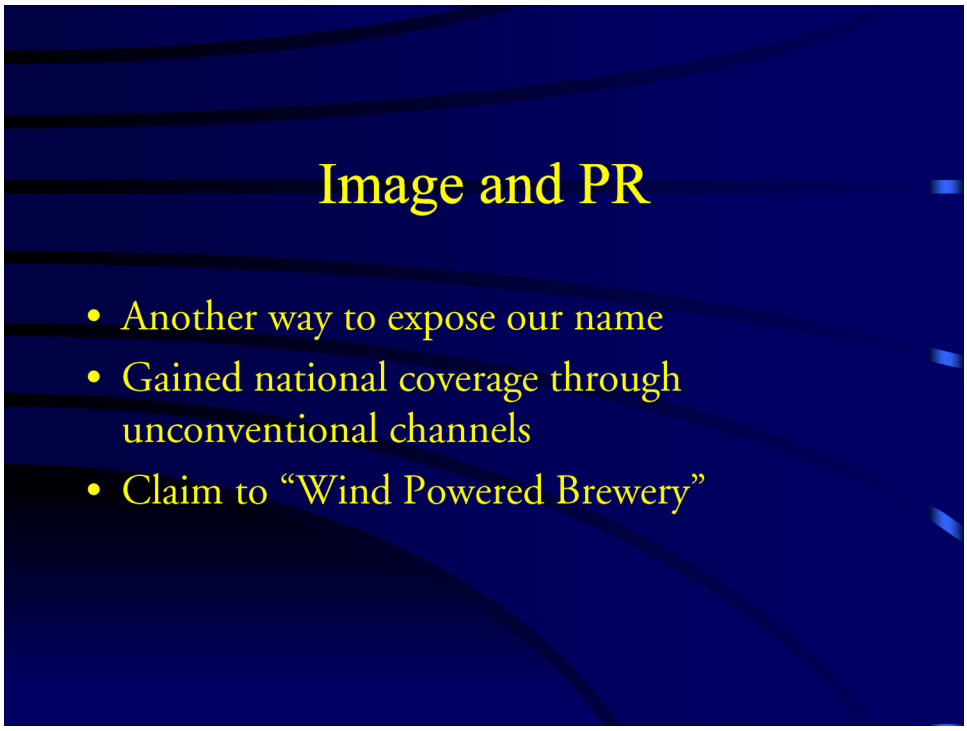


Image and PR
• Another way to expose our name
• Gained national coverage through unconventional channels
• Claim to "Wind Powered Brewery"

Unexpected benefits

- Unanimous staff support, despite reduction of profit sharing bonus
- Strengthening of corporate fabric

kinko's *Purchasing Renewable Power*

Overview

- **Introduction**
- **The Process of Purchasing Power**
  - Deregulated
    - California and Pennsylvania
    - New York
  - Regulated
    - Colorado
    - Sacramento Municipal Utility District
- **Lessons Learned**

kinko's *Purchasing Renewable Power*

Introductions

- **My Story**
- **Kinko's Story**
  - Company History
  - Company Philosophy
  - Environmental Vision Statement
  - The Numbers
  - IPO

kinko's — Purchasing Renewable Power

- **Background**
  - Over 95% of our stores open 24 hrs/day 7 days/wk
  - Demand >260 million kWh of electricity/yr. (>$20M/yr)
    - 30% lights
    - 30% Heating/AC
    - 40% Equipment
  - Currently ~9% renewable. Goal to increase by 5 to 10% per year
  - Energy efficient lighting systems
  - Company/Philosophy/Environmental Vision Statement
    - "…care for our environment…"
    - "Use energy-efficient technologies and renewable energy sources"

kinko's — Purchasing Renewable Power

Power Purchase in Deregulated Market - CA

- **Engage the Purchasing Department**
  - No one owned this
  - Lack of knowledge or desire to address this
- **The Goal**
  - Buy renewable energy with NO price premium
  - Develop customer and co-worker goodwill

kinko's *Purchasing Renewable Power*

The Process of Purchasing Power

- **The Problems**
  - Very unstable market/offerings
  - We had never done this before
  - Had little or no information
    - Account Numbers
    - Demand Class
    - Number of meters

kinko's *Purchasing Renewable Power*

The Process of Purchase Power

- **The Solution**
  - Get Educated
    - Interview energy providers
    - Free services
  - Leverage Kinko's brand with Energy Providers
  - Leverage internal customer base
    - Referral Program for co-workers, friends and family members

kinko's *Purchasing Renewable Power*

The Process of Purchase Power

- **The Process (16 months)**
  - Issued RFP
    - Renewable energy
    - Meter upgrades
    - Consolidated billing
  - Generally responses were poor
  - Short listed, interviewed and selected
  - Signed LOI
  - Contract never signed

kinko's *Purchasing Renewable Power*

The Process of Purchase Power

- **The Process (16 months)**
  - Received unsolicited offer
    - Again many points of negotiation
    - Removed metering and consolidated billing
  - Agreement signed September 1999

kinko's *Purchasing Renewable Power*

The Results

- **What did we Purchase**
  - 100% renewable where demand is < 50kW
    - Approximately 75 branch in CA (35-40% of demand)
    - No more than 22,000 MWh/yr.
    - Green-e Certified
  - Eleven (11) branches in PA converted to non-fossil - 50%
  - Co-worker Referral Program
    - Co-workers can participate
    - Co-branding opportunities
  - Public Relation benefits were minimal

kinko's *Purchasing Renewable Power*

Power Purchase in Deregulated Market - NY

- **Most Creative Arrangement to date**
  - Established relationship directly with Generator
  - Power from 11.5 MW wind farm in Madison, NY
  - Purchase *Pure Wind*^{TM} certificate representing environmental attributes of 1MWh
  - Offset costs by sacrificing realized rate roll backs
- To Purchase up to 50% of New York demand
- Letter of Intent signed in June 2000
- Public Relations Benefits - TBD

kinko's *Purchasing Renewable Power*

Regulated Market

- **Wind in Colorado**
  - Proposition: 20% Wind
  - 23 branches representing 540,000 kWh/month
  - GO/NO GO given to local management ~ $146/Mo. hit
  - Five (5) branches said GO
  - Public relations very positive
- **SMUD**
  - Proposition: 50% renewable
  - Seven (7) branches representing 168,000 kWh/month
  - GO/NO GO given to local management ~ $109/Mo hit
  - All NO GO's. Try to budget in 2001

kinko's *Purchasing Renewable Power*

Lessons Learned

- **Be a "Change Agent"**
- **Proceed with Caution, but do proceed**
  - Prepare a specification, but keep it simple
- **Consolidate your data and your demand**
- **Get creative to offset the Pain of the Price**
  - Referral programs
  - Finding savings to pay for premiums
  - Co-branding opportunities
  - Suppliers need to provide tangible benefits.

Center for
RESOURCE SOLUTIONS
P.O. Box 29512 San Francisco, CA 94129
415/ 561.2100

U.S. Green Power Certification Programs:

Resource definitions and how we got there

Presented by:
Kirk Brown
Assistant Director
Center for Resources Solutions

Who is CRS?

- Non-Profit Organization -- 501(c)3
- Mission -- Promote Renewable Energy and Energy Efficiency
- Support Comes from:
  - Foundations (45%)
  - State & Federal Government (45%),
  - International Energy Agency (6%),
  - Other (4%)

Why Voluntary Certification Programs?

- Build understanding of renewables
- Ensure people get what they pay for if they buy certified "green" electricity
- Shape the renewable energy market
- Use minimum thresholds as basis for getting good information to consumers

Why Focus On Minimums?

- Markets Evolving
  - Consumers grow more sophisticated over time
- Interim Steps Are Acceptable
  - Build customer awareness
  - Ensure resource availability

CRS Certification Initiatives

- Green-e
  - Consumer confidence in restructured markets
- Green Pricing Accreditation
  - Best practice criteria for utility programs
- Low Impact Hydropower Institute
  - What is “renewable” hydropower?
- Green-e *PLUS*
  - Integrating renewables and efficiency

Typical Organization for Programs

- Governing Board
- Participant Advisory Committee
- Stakeholder Advisory Committee
- Ad-hoc Governmental Advisory Committee

Typical Thresholds for "Eligible Products"

- Use of renewables
  - biomass, geothermal, wind, small hydro (less than 30MW), solar, ocean
  - 50-100% of total energy for Green-e
  - Emphasis on use of new renewables
- Non-renewables, if used, are as clean or cleaner than system power per kWh for SO_x, NO_x, and CO_2
- No differentiated nuclear power purchases

Renewables Definition: Evolving Areas of Discussion

- Biomass Definitions
  - From broad to more specific
- Co-Firing
  - Could very specific definition become more broad?
- Hydropower
  - Size-based standard evolves to Low Impact Hydropower?
- Efficiency
  - Negawatts in place as pilot
  - Green-e *PLUS*?

Green-e Biomass Definitions

- California
  - Wood-based, agricultural crops or wastes, animal or other organic wastes, landfill gas, MSW
- Mid-Atlantic
  - Landfill gas, clean urban wood waste (no painted, treated, or pressurized wood or wood contaminated with plastics or metals), animal or non-herbaceous agricultural waste, mill residues, bioenergy crops
- New England
  - Waste wood (including construction debris that does not contain any painted, treated, or pressurized wood), agricultural crops or waste, animal or other organic waste, and landfill gas

Green-e Biomass NOx Emissions Limits

- Biomass emissions limits in New England and Mid-Atlantic
  - Standard Starts at 2.9 lbs./MWh in 2000
  - Ratchets to 2.25 lbs./MWh during 2006-2008
  - Based on average weighted Nox emissions from all biomass sources, except for landfill gas or digester gas
- New England -- NOx emissions on landfill gas facilities
  - Standard set at 3.5 lbs./MWh
  - Based on weighted average of the resource supply mix contributing to the product

Green-e Definition on Co-firing

- Co-firing of landfill methane with natural gas permitted
  - can be piped directly to gas facility or co-mingled in pipeline
  - landfill gas must be metered
  - contracts must be in place to allow verification
  - New England -- must meet emissions limits for landfill gas facilities
- Co-firing limited to landfill methane with natural gas
  - Only amount of electricity produced by the landfill methane counts towards Green-e's "eligible renewables" requirements

Low-Impact Hydropower

- Eight Criteria Areas:
  - Flows
  - Water Quality
  - Fish Passage & Protection
  - Watershed Protection
  - Threatened and Endangered Species Protection
  - Cultural Resource Protection
  - Facility Removal
- Information at www.lowimpacthydro.org

Pennsylvania Green-e: Energy Efficiency Option

- In PA, Marketers Can Use Energy Efficiency
  - Recognizes Potential Lack of Renewables in Early Years
- Energy Efficiency Option
  - Year 1: Up to Half "Renewable" Resource May be Derived from Energy Efficiency
  - Decreasing Amounts to Year 5

What is Green? Some Parameters

- Perspective View
  - Electricity system is dirty and dangerous
    - 52% of electricity is coal; 18% nuclear
- Existential View
  - All resources have impacts
- "Right Answer" View
  - Regulatory -- race to bottom?
  - Environmental -- race to top?

Part of the Answer: Disclosure

- Education is the key
  - Green power choice forces us to talk to consumers -- for the first time?
- Disclosure forces customer education
- Certification reinforces disclosure
- Standard definitions long-term goal
  - Policy discussion has time to evolve increasing degrees of sophistication as customers learn more

Green Power In Prime Time

Power Scorecard™

July 26, 2000

By
Sam Swanson, Project Director, Tom Bourgeois, Mollie Lampi, John Williams, and Fred Zalcman
Pace Energy Project
Pace University School of Law Center For Environmental Legal Studies

With
Environmental Defense
Izaak Walton League
Natural Resources Defense Council
Northwest Energy Coalition
Union of Concerned Scientists

Power Scorecard™

Executive Summary

Flip that switch. We do it every day to power our lights, TV, stereo and in ever-increasing numbers, computers. Unlike the air we breathe or the water we drink, electricity that serves our basic human needs must be generated from a variety of fuels. And because most of this enormous system is not visible to us from the vantage point of our homes, it is easy to overlook the fact that generating electricity is the largest industrial source of pollution in the world, and that our own lifestyle choices and consumption patterns have an impact on the environment. Radioactive waste, global climate change, acid rain, declines in native fish populations, the scarring of once pristine landscapes to access fuel supplies – all of these environmental issues are linked to generating electricity.

Up until now, we had little choice about how much, or what kinds, of pollution our own electricity consumption generated. Decisions about which power plants to run or build were made for us by our local utility. We simply paid the bill. Today, growing numbers of consumers have a choice.

The electricity business is following in the footsteps of telecommunications, where consumers have had product and service choices for quite some time. Ultimately, all of us will have choice when it comes to power supplies. Even in electricity markets that remain regulated, incumbent utilities are often now offering premium electricity eco-products to their customers.

Many consumers and investors, if given the chance, will support the development of cleaner and greener power supplies. At least that is what public opinion polls have reported consistently over the years. However, the electric power industry is unique in its complexity, in its invisible omnipresence. We never actually see electricity, only the services it provides, and the gadgets this power source supports in our lives. The processes involved to generate electricity are engineering marvels whose details would baffle most consumers. Since monopolies have sold electricity throughout most of our lifetimes, we are not used to shopping for power. Consumers don't know who to trust in an era of competition among electricity offers.

In order to allow a real market to develop, consumers and investors need tools to cut through the noise, to understand the environmental implications of their power choices, in order for them to act on their preferences.

The Power Scorecard is that tool. *Power* Scorecard provides consumers with the means to directly compare the environmental characteristics of various power products through a one-of-a-kind rating methodology. It allows consumers to evaluate the environmental quality of specific products in direct head-to-head comparisons. Now we can get answers to basic questions that previously never seemed to get a straight answer: *Just how "clean" is the electricity I am buying*? *How good is that claim by one of those new power marketers that their electricity service is greener than what I am getting now? How bad can my current supply be?*

Here is how it works. The Power Scorecard grades, the relative environmental impacts of the fuel resources and technology employed to produce an electricity product. A lower score means that the

product produces less pollution and therefore impact on the environment and human health is minimal. A high score means the opposite: the product creates more – not less – environmental impacts such as increasing smog or acid rain or degrades land and water supplies. The Power Scorecard offers an easy to understand "score" customers can then use to compare the environmental quality of electricity products before they choose to either switch to a new supplier or stay with their existing electric utility company.

The Power Scorecard evaluates the environmental impacts of the specific generating facilities used to produce a specific retail power supply product. It measures the performance of the product on eight environmental criteria: global climate change, smog, acid rain, air toxics, water consumption, water pollution, land impacts and fuel cycle/solid waste.

An overall environmental impact score for each electricity product is calculated as the weighted average of eight measured indices, where the index of global climate change impacts is counted twice, reflecting the greater importance *Power* Scorecard assigns to this global environmental impact issue relative to the other seven. In light of the environmental risks associated with the long-term storage of radioactive wastes, nuclear power plants will typically have a score exceeding ten in the category of land use impacts.

The Power Scorecard provides detailed information on each of the eight environmental criteria that underlie the final score so users can see clearly how the impacts of power supplies on air, water and land contribute to a final score. This allows a consumer to align products with their own values. For example, if your top concern is global climate change, Power Scorecard allows you to find the product that best responds to this particular environmental threat. Any electricity product, whether marketed as an environmentally superior product or not, can be ranked. Products will be labeled, Excellent, Very Good, Good, Fair, Poor, and Unacceptable.

Along with judging products according to the fuel and specific electricity generation technology employed, Power Scorecard also reveals what portion of the power product comes from new renewable supplies, the most important building blocks for a more sustainable energy future. Not only do new, clean sources of electricity provide significant environmental improvement over most current generating resources, but purchases from **new** low impact sources create the consumer demand necessary for even more new renewable resources to be constructed. Buying electricity from new renewable generation yields immediate and long-term environmental gains. The Power Scorecard can finally end confusion over exactly how much of your own electricity bill supports the new state-of-the-art clean power technologies of tomorrow. The Power Scorecard also identifies those electricity products that offer other environmental enhancements such as commitments to energy efficiency or purchases of pollution credits to offset the negative air emission impacts from specific power plants whose output is included in a power product.

Some power marketers are selling products that are actually dirtier than the generic mix your current incumbent provides. Power Scorecard can also be used to compare dirty power products, too. Whether focused on the clean or the dirty, the Power Scorecard simplifies the switching process by underscoring the difference in environmental impacts between renewable and non-renewable electric supply.

California and Pennsylvania are among the first states to open up electricity markets to competition. New York and many New England states are phasing in full-scale retail choice. User-friendly tools like

the Power Scorecard empower consumers to consider the environmental impacts when exercising their opportunity of choice in electricity supply in these and other electricity markets in the near future. The Power Scorecard allows conscientious consumers to align their electricity supply with their own personal environmental values.

The Power Scorecard evaluation tool was created by the Pace Law School Energy Project with Environmental Defense (ED), the Izaak Walton League (IWL), the Natural Resources Defense Council (NRDC), the Northwest Energy Coalition (NWEC), and the Union of Concerned Scientists (UCS). The authors gratefully acknowledge the substantial dedication of time and energy in providing input and oversight to the project by Sheryl Carter, Natural Resources Defense Council; Bill Grant, Izaak Walton League; Nancy Hirsh, Northwest Energy Coalition; Paul Jefferiss, formerly of the Union of Concerned Scientists and now with the Royal Society for the Protection of Birds, UK; James Marston, Environmental Defense; Alan Nogee, Union of Concerned Scientists; Karl Rabago, formerly of Environmental Defense and now of the Rocky Mountain Institute; Ed Smeloff, Pace Law School Energy Project; and Steve Smiley, Bay Energy Services, for UCS.

The authors also appreciate input and feedback provided by Margaret Bowman, American Rivers; Anna Aurelio, U.S. Public Interest Research Group, the Appalachian Mountain Club. These generous contributors are not responsible, however, for any errors or for the conclusions of this document.

Financial support has been provided by the Energy Foundation, by the Surdna Foundation**,** by the Education Foundation of America and by a grant from the Office of Solar Energy Technologies of the US Department of Energy.

NOTICE

TO OBTAIN ADDITIONAL INFORMATION CONTACT THE AUTHORS DIRECTLY

OR CALL THE PACE ENERGY PROJECT AT: 800/ 424-0031

Green Power Conference
Denver August 7 & 8, 2000

The Canadian Environmental Choice Program

Green Power Criteria

John Polak
Leslie Welsh

TerraChoice Environmental Services Inc.
Environment Canada

TerraChoice Environmental Services Inc.
- Who Are We Anyway? -

- Private Canadian Company
- Founded in 1995 to Manage Environment Canada's Environmental Choice Program
- 1995 - 2000 - Diversification

"Helping Turn Environmental Investment into Market Advantage"

TerraChoice Environmental Services Inc.

A Market Full of Claims & Labels

Policy Instruments and Options

- Regulatory
- Economic
- Social

- Market-Based

Purpose & History of ECP

- 1988 Environment Canada

"encourage demand for and supply of products and services which are less stressful on the environment"

- Canadian Environmental Protection Act
- Life Cycle Based
- Third Party Verification
- TerraChoice in 1995

TerraChoice
Environmental Services Inc.

Current Status of ECP

- Criteria for Over 100 Product Categories
- Over 230 Customers in Canada & the USA
- Over 2500 Products Certified
- In Electricity Sector Since late 1996

TerraChoice
Environmental Services Inc.

Renewable Low Impact Electricity

History

- 1996 - Interim criteria
- Market Penetration
  - 39 sites certified
  - BC, Alta, Ont, Que, Nfld
- 2000 - Interim criteria updated
- Renewable: replenished via natural processes or sustainable management practices

TerraChoice
Environmental Services Inc.

Renewable Low Impact Electricity - cont'd

Current Status

- Late 1998 - Formal Criteria Development Process Started
- Background Paper Prepared
- Multi-stakeholder Review Committee Struck
- Research, Consultations, Meetings
- Late 2000 - National & International Notification for Public Review & Comment
- Expect Final Criteria by Early 2001

Certification & Compliance

- Certify Facilities - Type I & II
- Certify Electricity Product Bundled with Env'l Benefits
- Compliance with Safety & Performance Standards & Req'ts of Applicable Gov't Acts, Bylaws and Regulations

TerraChoice
Environmental Services Inc.

Environmental Criteria

- General Requirements
- Wind
- Solar
- Hydro
- Biomass
- Biogas

TerraChoice
Environmental Services Inc.

Environmental Criteria
- General Requirements -

- Evidence of Consultation
- Issues of Concern Addressed
- Facility is Non-Temporary
- Protection of Endangered or Threatened Species
- Limits to Use of Non-Renewable Fuels
- Alternative Use

TerraChoice
Environmental Services Inc.

Environmental Criteria
- General Requirements -

Continued

- Marketing Requirement 50% of Type II (After Jan 1, 1991)
- Transfer of Ownership of Environmental Benefits
- ECP Certified Product Contains Only Certified Electricity - However It Can be Bundled and Sold as “X”% Certified

TerraChoice
Environmental Services Inc.

Environmental Criteria - Wind -

- Facility Structures not Harmful to Birds
- Not Located in Areas with Concentrations of Endangered Bird Species

TerraChoice Environmental Services Inc.

Environmental Criteria - Solar -

- All Solid Waste that Contains Measurable Levels of Cadmium, Including in Disposal of Equipment, is Properly Disposed of or Recycled

TerraChoice Environmental Services Inc.

Environmental Criteria - Hydro -

- Regulatory Licenses - Fish & Water
- Policies on Habitat Management
- Waterway Coordination
- Water Out = Water In over 48 Hrs
- Reduced Water Flows Not Detrimental
- Flows to Support Downstream Species
- Water Quality Water Temperatures
- Fish Passage in Case of Structures
- Measures to Minimize Fish Mortality

TerraChoice
Environmental Services Inc.

Environmental Criteria - Biomass -

- Load Point Limits for CO, PM, NOx, SOx
- TOMA
- Management System and Sustainable Harvesting in Woodlands or Agricultural Operations
- Wood Waste Must be Untreated

TerraChoice
Environmental Services Inc.

Environmental Criteria - Biogas -

- Load Point Limits for CO, PM, SOx, Smog Forming Agents
- TOMA
- For Landfill Sites - Leachate Management Program

TerraChoice Environmental Services Inc.

Verification

- Verification Protocols & Checklists
- Site Visit and Audit
- Marketing Audit (Sales Cannot Exceed Purchases)
- Costs for Audit at Hourly Rate
- Spot Checks at Expense of TerraChoice

TerraChoice Environmental Services Inc.

Licensing

Available to:
- Generators
- Marketers
- Users

Annual Fees:
- Function of Sales from Facility
  - Minimum $600 per Year
  - Maximum $10,000 per Year

TerraChoice
Environmental Services Inc.

Summary

- Many Definitions of Green
- Credible Certification Requires:
  - Science Based Criteria which Also Reflect Social Values
  - 3rd Party Verification
- ECP Certification Available in Canada and the USA

What's Working Well in Utility Green-Pricing Programs?

5th National Green Power Marketing Conference
Marriott City Center, Denver CO
August 7–8, 2000

Terry M. Peterson
Manager, Solar Power and Green Power Marketing, EPRI

EPRI

Green-Pricing Utilities, 1999

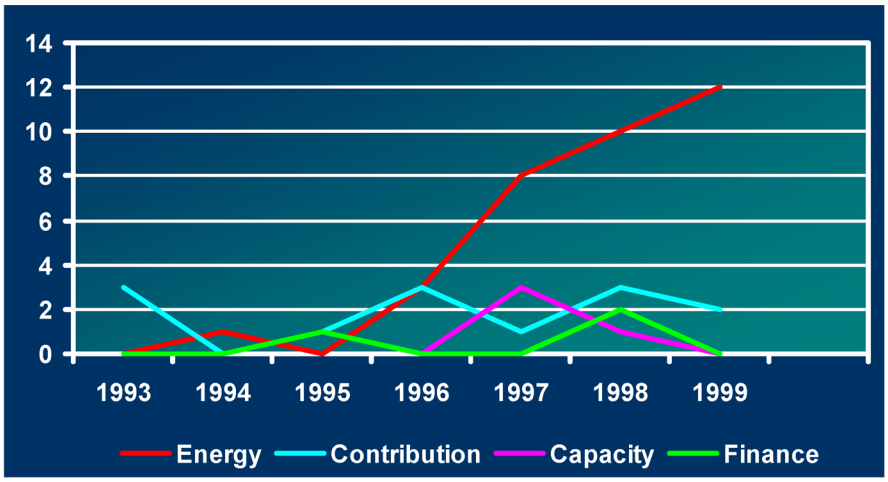
Arizona Public Service
Austin Electric Utility
Bonneville Power Administration
Bowling Green
Cedar Falls Utilities
Clark PUD
Colorado Springs Utilities
Dairyland Power Cooperative (27)
Detroit Edison
Eugene Water and Electric Board
Flathead Electric Cooperative
Florida Power & Light
Fort Collins Utilities
Gainesville Regional Utilities
Great River Energy (29)
Hawaiian Electric (3)
Holy Cross Electric Cooperative
Indianapolis Power & Light
Lincoln Electric System
Longmont Power & Communications
Los Angeles Dept. of Water & Power
Madison Gas & Electric
Moorhead Public Service
Nebraska Public Power District
Nevada Power
New Smyrna Beach Utilities Commission
Northern States Power
Orcas Power & Light
Pacific Northwest Generating Co (4)
PacifiCorp
Portland General Electric
Public Service Company of Colorado
Public Service Company of New Mexico
Sacramento Municipal Utility District
Salt River Project
Southwestern Public Service-New Mexico
Tallahassee Electric Department
Traverse City Light & Power
Tri-State G&T (32)
TU Electric/Lone Star Gas
Turlock Irrigation District
Utilicorp United
Washington Water Power (Avista)
West Texas Utilities
Western Resources (2)
Wisconsin Electric Power
Wisconsin Public Service

Source: Ed Holt, EPRI report TR-114211, *Green Pricing Update, 1999*

11/13/01.2

EPRI

Green-Pricing Programs by Type and Launch Year



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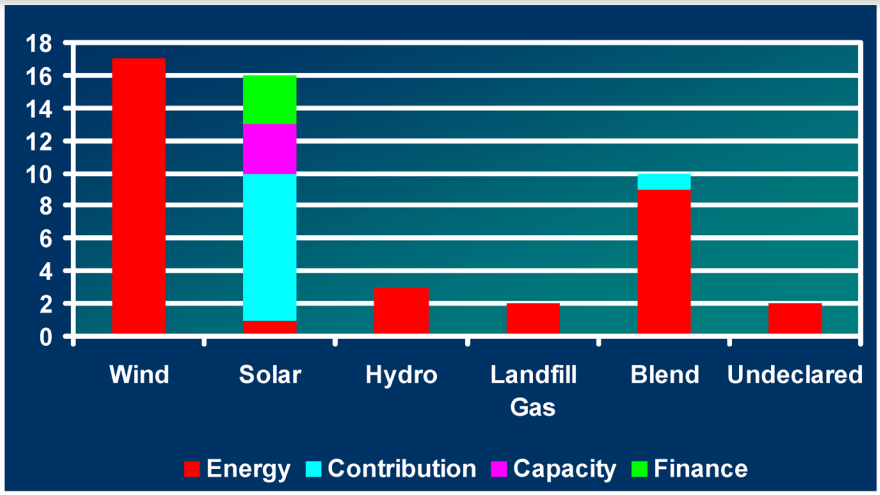
EPRI

Number of Programs by Resource and Type



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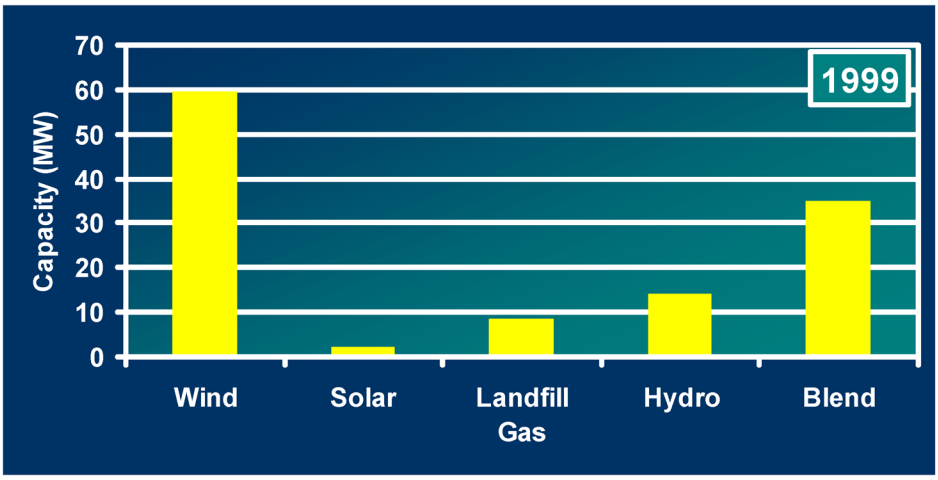
EPRI

Renewable Capacity Serving Green-Pricing Programs



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EPRI

Recent EPRI Green Power Literature

- TR-109192-V1 *Green Power Guidelines: Volume 1, Assessing Residential Market Segments*
- TR-109192-V2 *Green Power Guidelines: Volume 2, Assessing Small- and Medium-Sized Business Market Segments*
- TR-109204 *Green Pricing: Experience and Technology Options Assessment*
- TR-111893 *Renewable Power Industry Status Overview*
- TR-112315 *Proceedings: Third National Green Power Marketing Conference*
- TR-114202 *Identifying and Capturing the Green Power Market*
- TR-114203 *Building Community Support for Local Renewable and Green-Pricing Projects*
- TR-114210 *Green Power in Competitive Markets, 1999*
- TR-114211 *Green Pricing Update, 1999*
- TR-114878 *Fourth National Green Power Marketing Conference*

11/13/01.6

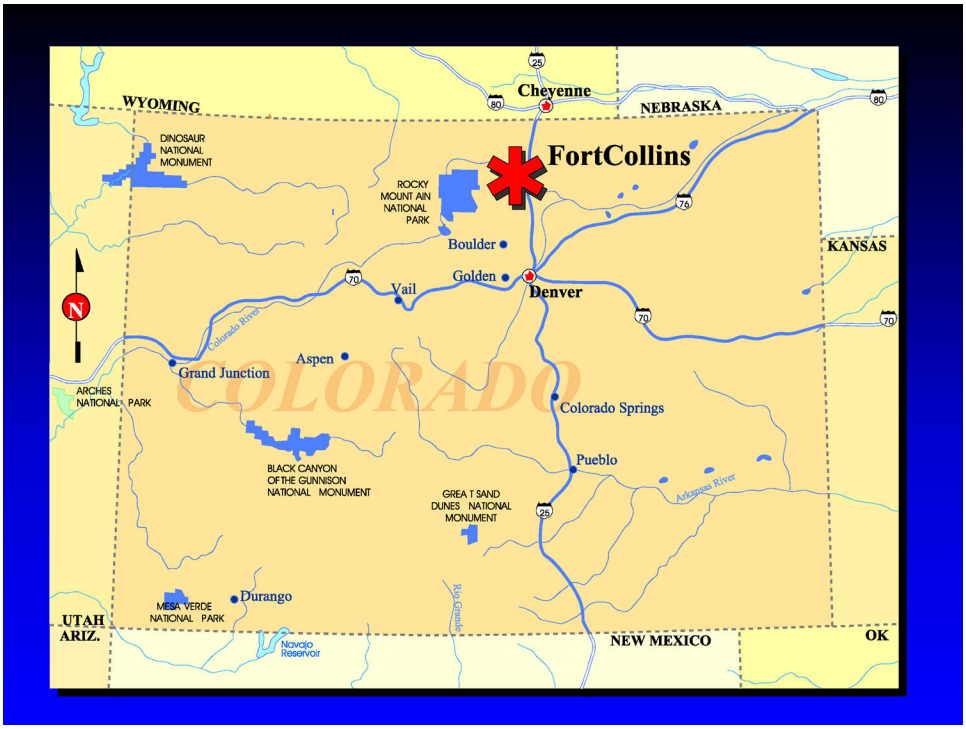
EPRI

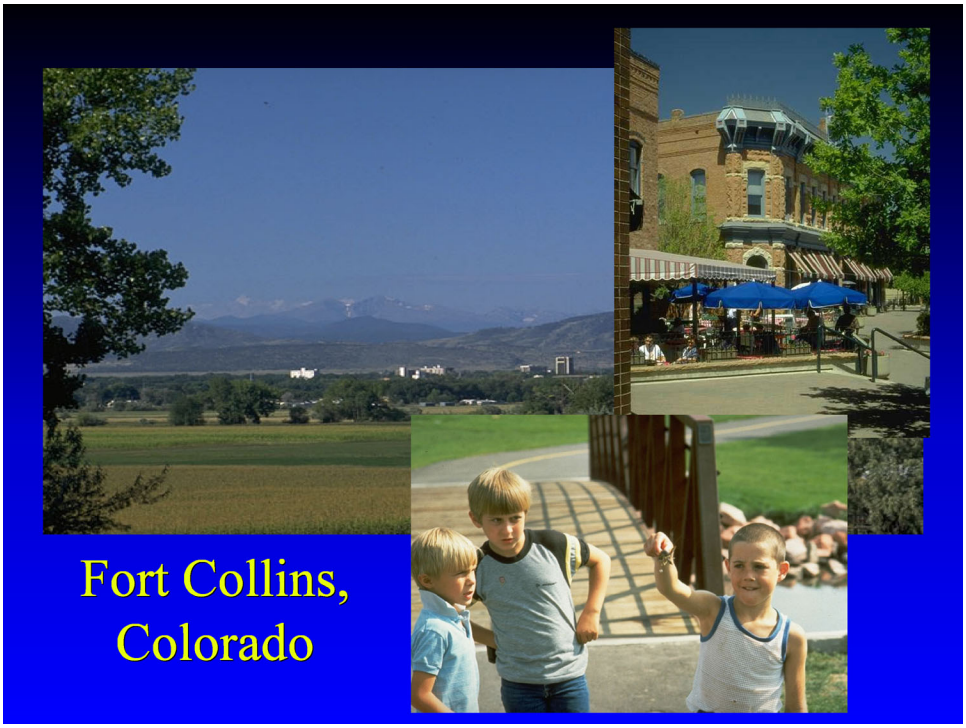
SELLING WIND ENERGY

Lessons from Fort Collins

Fifth National Green Power Marketing Conference
Powering the New Millennium
August 7, 2000
Lori Clements-Grote

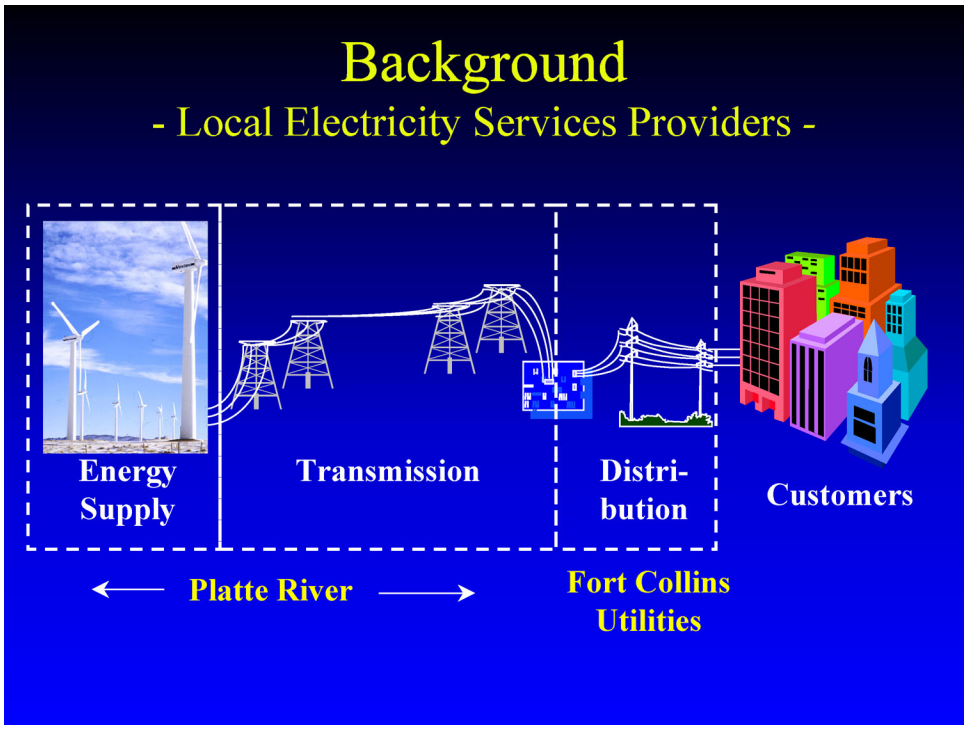
City of Fort Collins
Utilities





Why Wind Energy?

- **Resource planning / customer surveys:**
  - **Local environmental awareness & interest**
  - **More cost effective than solar program**
  - **Willingness to pay higher costs (level unknown)**
  - **New resource preferences**
- **Technology advancements**
- **"Local" wind resource**
- **Opening markets & customer choice**



Getting the *Green* Light

- Commit to wind only when minimum pre-subscription levels reached
- Limit the number of turbines during the pilot phase to three
- When threshold reached, Platte River issued RFP and sought suppliers

Why a Pilot Program?

- To explore the feasibility of wind energy:
  - Does the technology work?
  - Did we price it accurately?
  - Is there sustainable interest in the community?
  - Information from Pilot to determine future direction

Original Offer

- Residential customers agree to pay 2 cents per kWh for total usage
- Commercial customers sign up for total usage or in 1,000-kWh blocks for $20 per block
- Three-year commitment

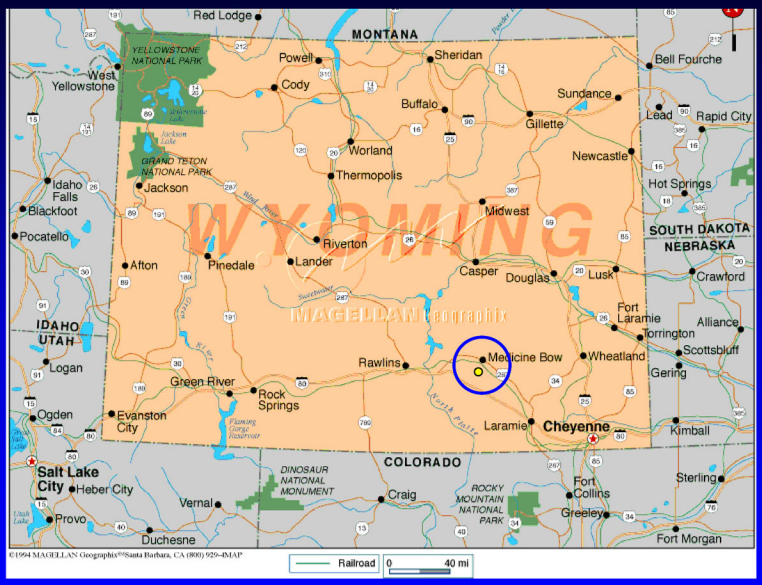
The Launch

- Media Relations
- Community Support
- Advertising & Direct Mail
- Other Outreach & Promotion

Pilot Results

- Enough customers to support two 600-kW turbines
- Waiting list
- April 12, 1998 -- First in Colorado!

Site Location



Turbine Site

- Good wind
- Substation & line
- Roads & access
- Control building
- MET equipment
- Permits / easements
- Transmission rights
- Wind assets owned
- 40-year land lease
- Good performance

Then What?

- Demand remained strong
- New Belgium Brewing Company wanted to commit
- Research indicated additional interest
- Platte River made sales to other cities and other utilities
- Decision to expand summer 1999

The New Offer

- 2.5 cents per kWh
- Equivalent of household electricity use
- Any number of 400-kWh blocks
- Blocks are $10 per block per month

Commercial Customers

- Equivalent or portion of electricity use
- Any number of 1,000-kWh blocks
- Blocks are $25 per block per month
- Recognition in Fort Collins Utilities' ongoing community outreach

Marketing Phase II

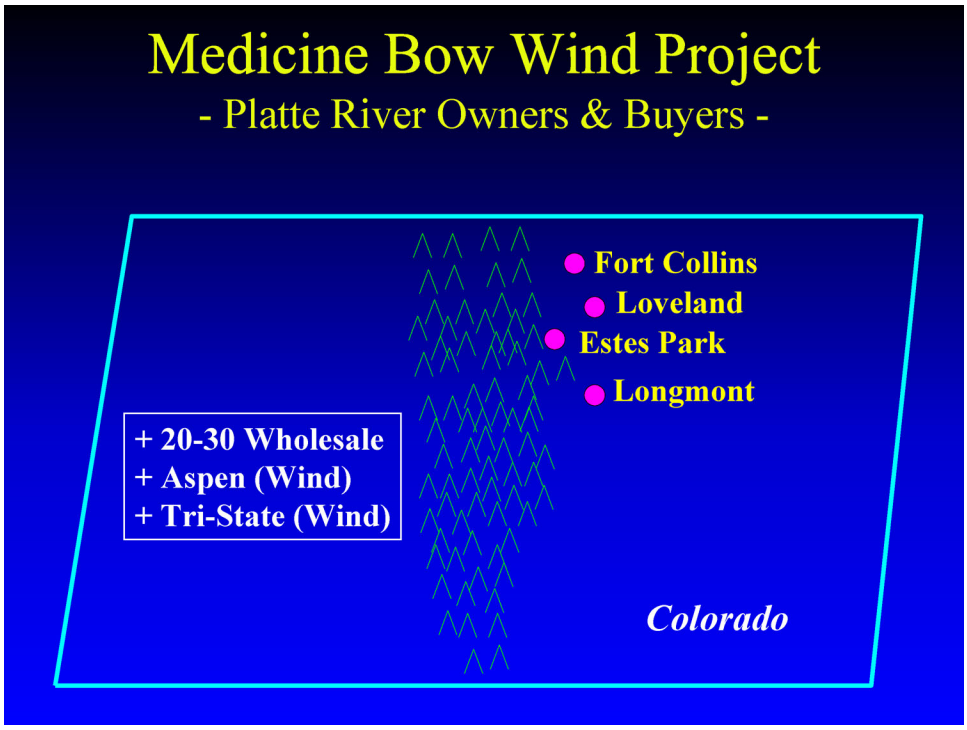
- Utility bills
- Articles
- Letters to waiting list and others
- Media
- Newsletters
- Displays
- Tours

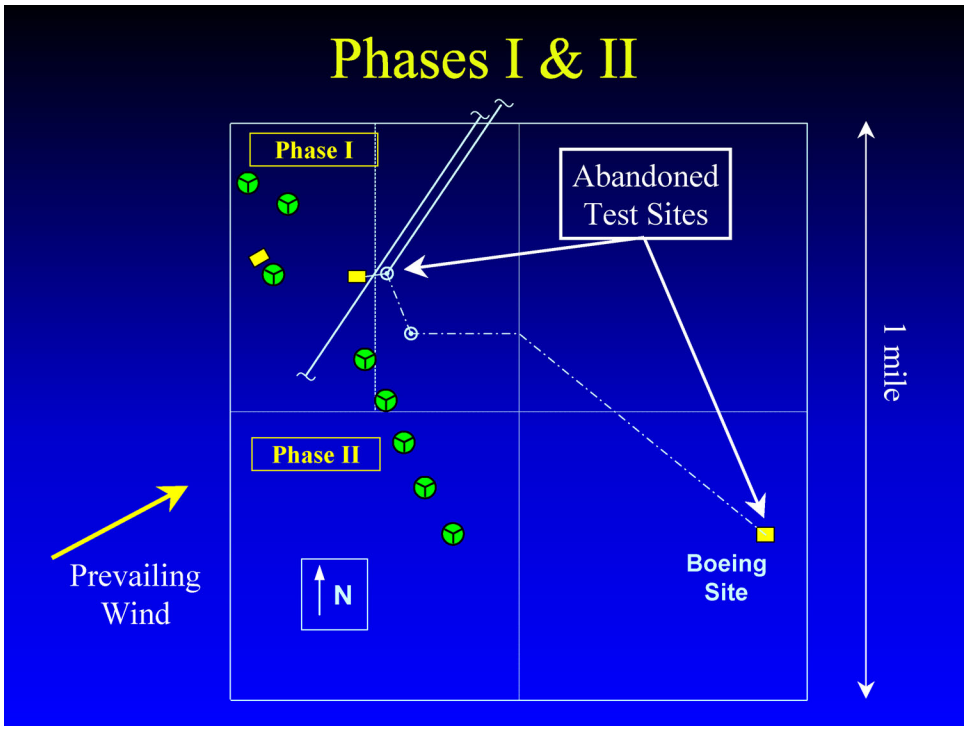
Where are we now?

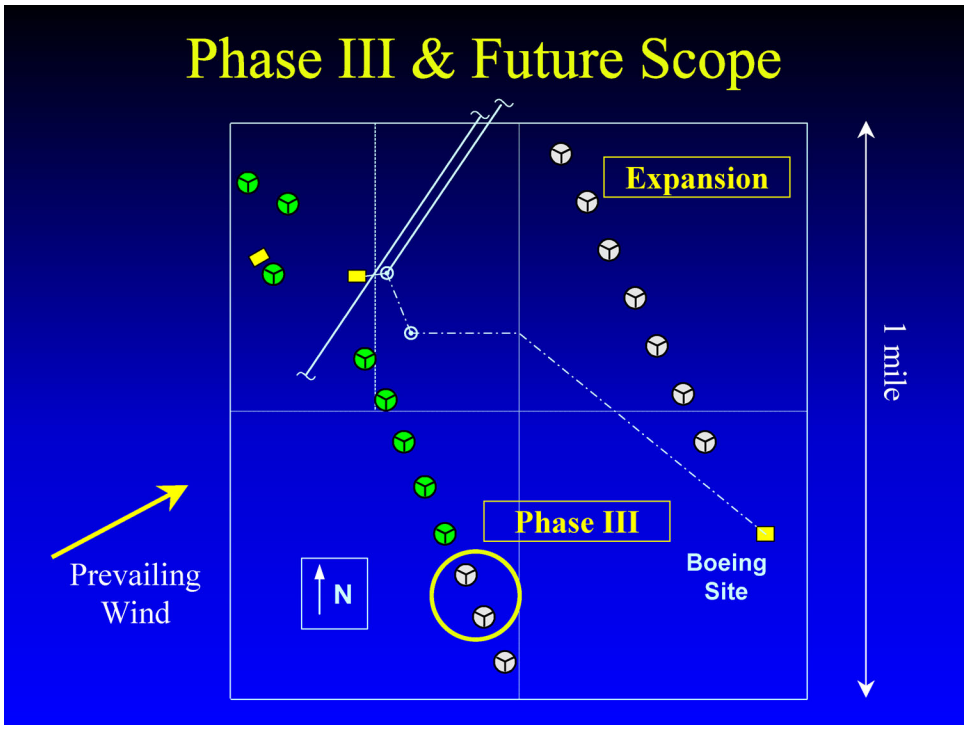
- More than 700 residential subscribers
- 21 commercial subscribers
- City of Fort Collins becomes a subscriber
- Phase III turbines built
- Total of 10 turbines with a capacity of 6 megawatts
- Fort Collins purchases output of 5.5 of those turbines

Business Subscribers

- Air Resource Specialists
- Alan Apt - Commercial Bldg.
- Alpenglow Medical
- Chiropractic Wellness Center
- City of Fort Collins
- EDAW, Inc.
- The Food Co-op
- Friendship Hospital for Animals
- Glaser Assoc. Architects
- Hewlett-Packard Company
- Kinko's
- Kramer & Houston Towing
- Mountain Centre for Healing
- New Belgium Brewing Company
- Old Town Import Repair
- Outpost Sunsport
- The Parts Place
- REI
- Roberto's Salsa
- Skibo's Front Range Tattoo Studio
- Walrus Ice Cream


Medicine Bow Wind Project
- Platte River Owners & Buyers -
Fort Collins
Loveland
Estes Park
Longmont
+ 20-30 Wholesale
+ Aspen (Wind)
+ Tri-State (Wind)
Colorado


Phases I & II
Phase I
Abandoned
Test Sites
1 mile
Phase II
Prevailing
Wind
N
Boeing
Site



Challenges

- Sustainability
- Municipal issues
- Characteristics of wind
- Deregulation

Opportunities

- Customer demand
- Demographics
- Increased awareness
- Growth
- Federal agencies
- Legislation: Deregulation & global climate change

More Information

- Visit these web sites:
  - www.light-power.org/windpowr.htm
  - www.ci.fort-collins.co.us/UTILITIES
  - www.prpa.org
- Questions?

EPRI
Green Pricing

APS Solar Partners

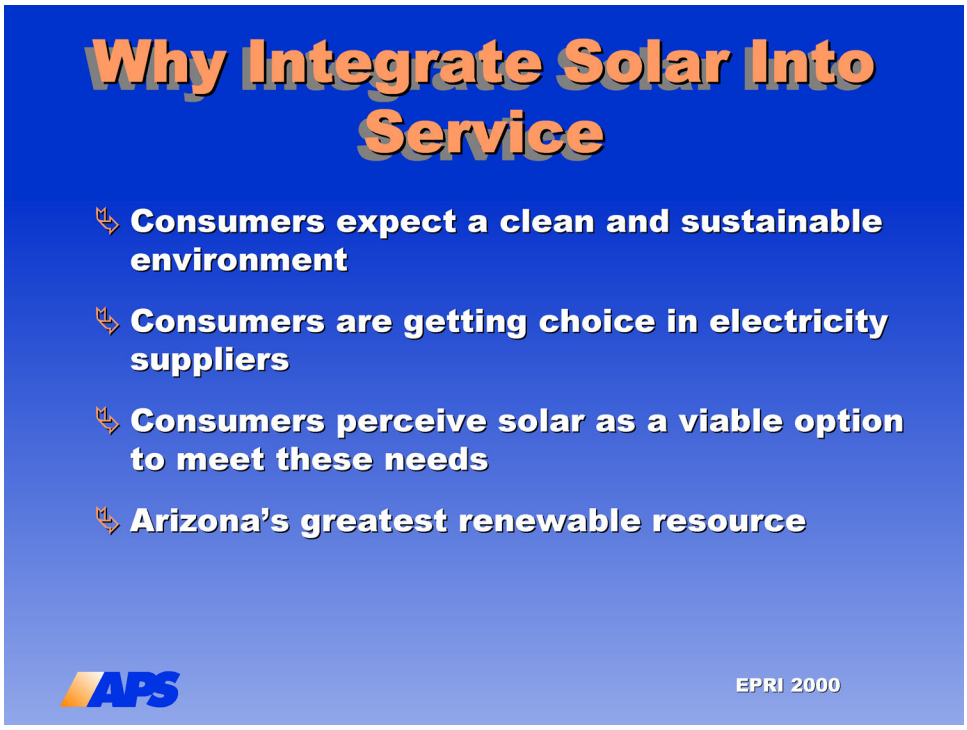
Cassius McChesney
Solar Programs Manager
Pinnacle West Capital Corporation

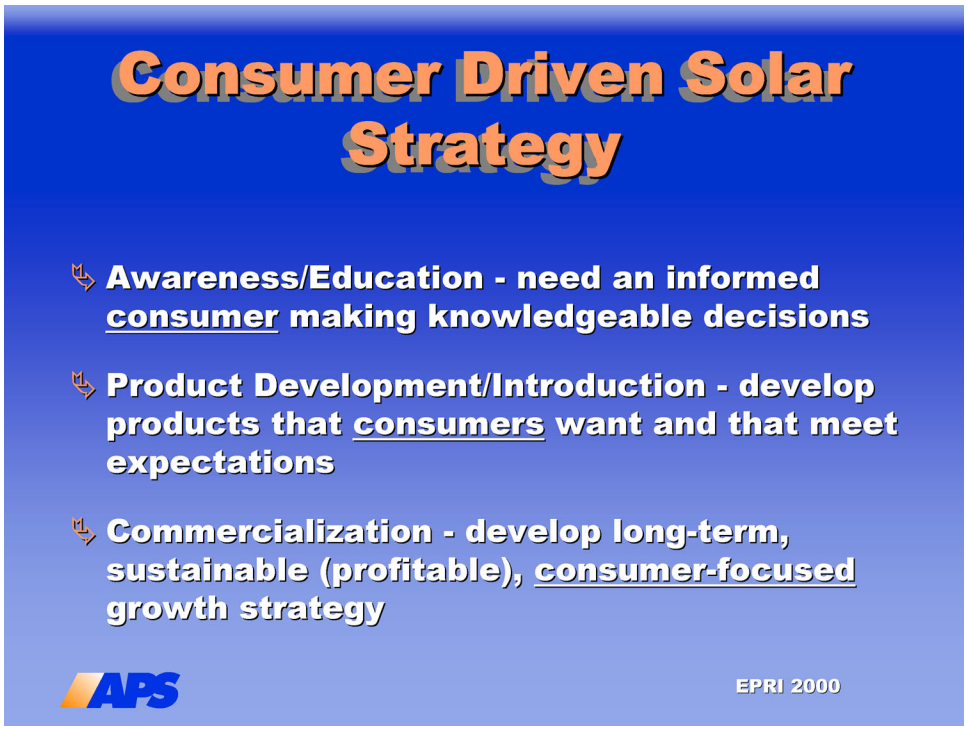
EPRI 2000

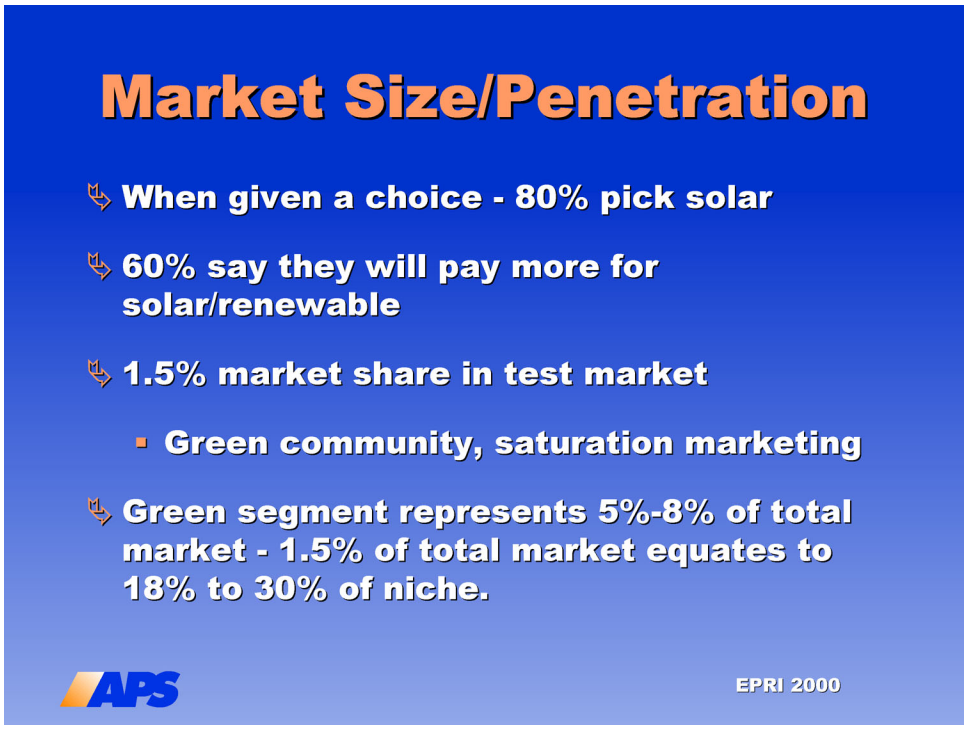
APS Solar Programs

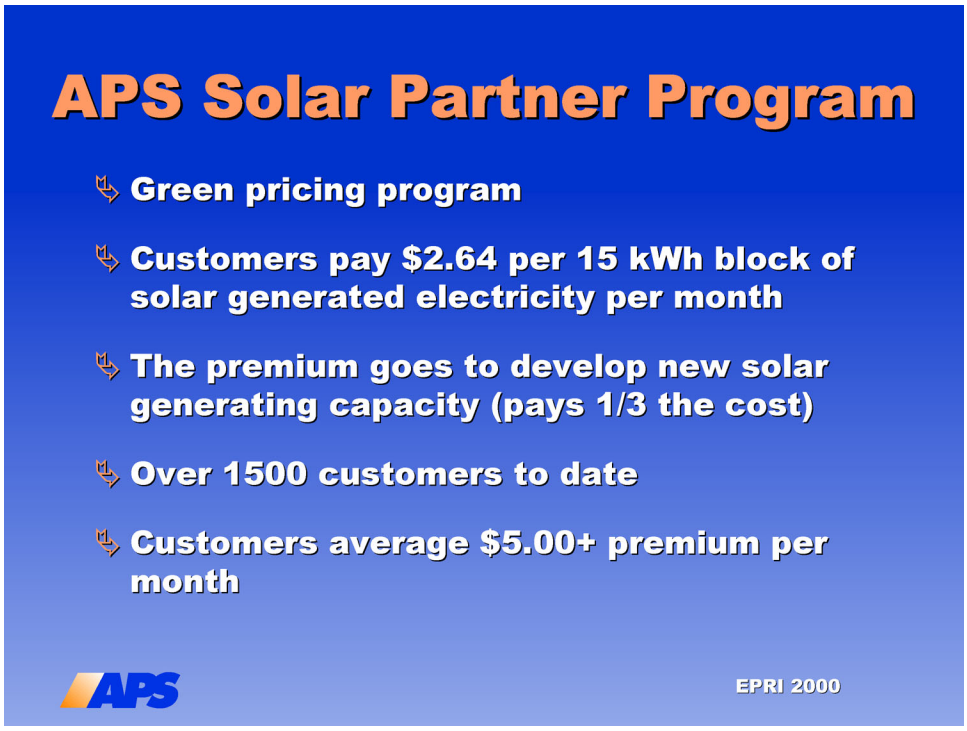
- **APS Solar Test and Research Center - Constant search new cost-effective solar products/technologies to meet customers needs**
- **Project SOL - Educationally based PV systems with Web interaction - museums, libraries, observatory - for customer education**
- **APS Remote Solar Electric Service - Choice for APS customers in remote areas to a line extension or generator**
- **APS Solar Partner Program - Choice for grid-tied customers who will pay a premium to have a portion of the electricity needs generated from the sun**

EPRI 2000


Why Integrate Solar Into Service
Consumers expect a clean and sustainable environment
Consumers are getting choice in electricity suppliers
Consumers perceive solar as a viable option to meet these needs
Arizona's greatest renewable resource
APS
EPRI 2000


Consumer Driven Solar Strategy
Awareness/Education - need an informed consumer making knowledgeable decisions
Product Development/Introduction - develop products that consumers want and that meet expectations
Commercialization - develop long-term, sustainable (profitable), consumer-focused growth strategy
APS
EPRI 2000


Market Size/Penetration
When given a choice - 80% pick solar
60% say they will pay more for solar/renewable
1.5% market share in test market
Green community, saturation marketing
Green segment represents 5%-8% of total market - 1.5% of total market equates to 18% to 30% of niche.
APS
EPRI 2000


APS Solar Partner Program
Green pricing program
Customers pay $2.64 per 15 kWh block of solar generated electricity per month
The premium goes to develop new solar generating capacity (pays 1/3 the cost)
Over 1500 customers to date
Customers average $5.00+ premium per month
APS
EPRI 2000

Solar Partner Program Success

- Test market - 2% participation
  - Very green market/highly educated
  - Extensive promotion
  - Sold all existing and planned capacity
- Overall market - .2% participation
  - Minimal promotion - minimal capacity - bill stuffers (expected response)
  - Residential customers only

APS

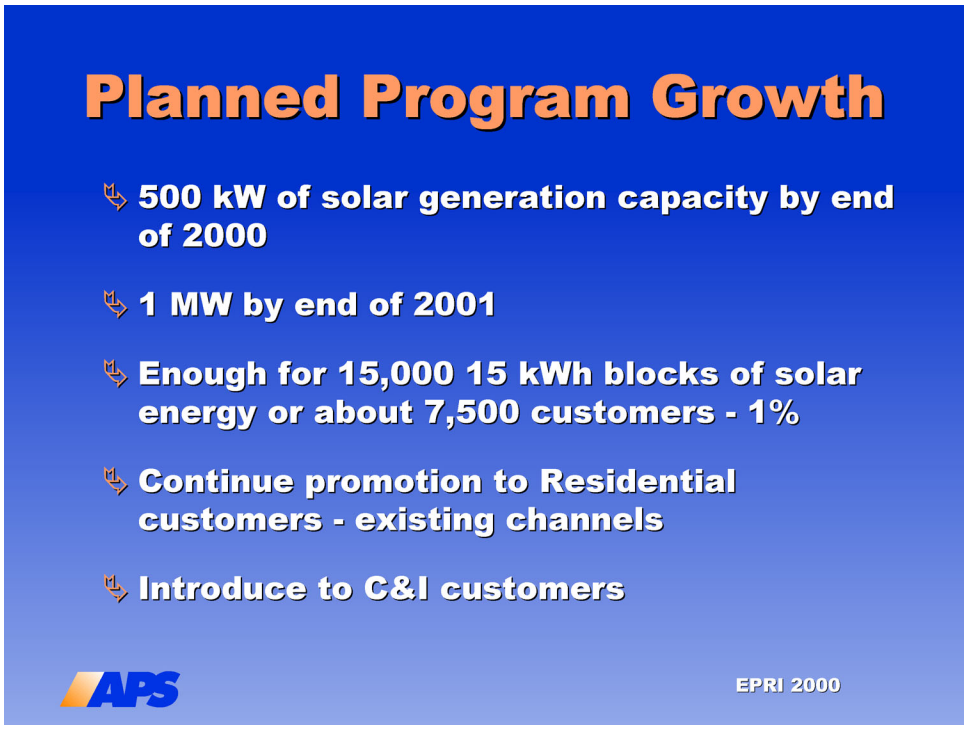
EPRI 2000

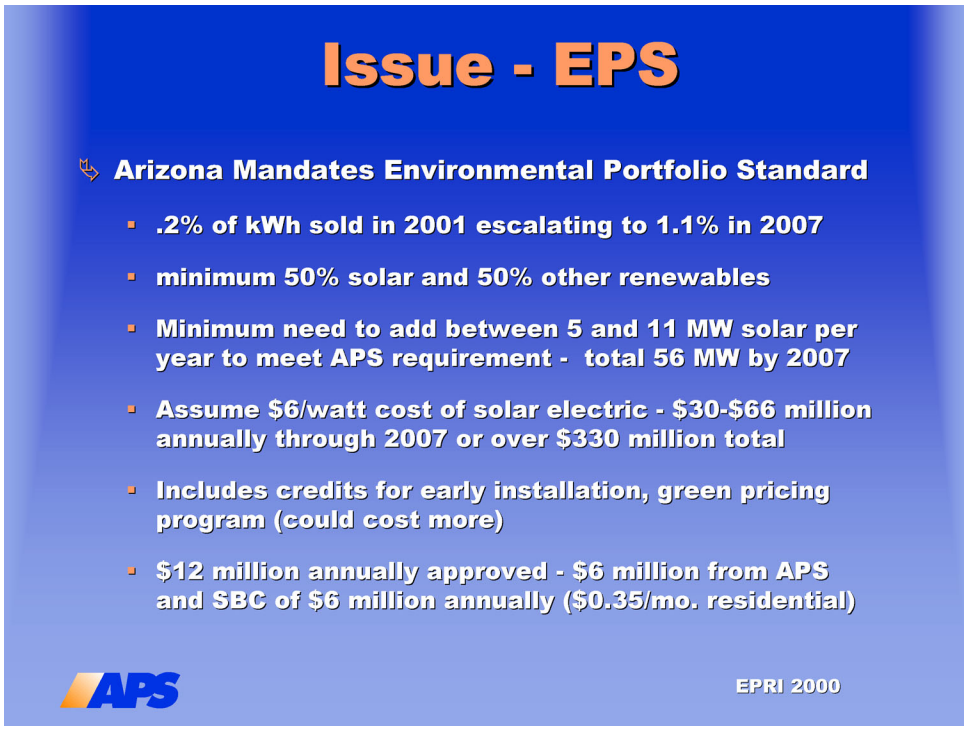
Customer Demographics

- College or graduate degree
- Smaller family size - 2.3- empty nesters
- 44-55
- 60% internet access
- Considers themselves an Environmentalist
- Segment represent 5-8% of total market

APS

EPRI 2000


Planned Program Growth
500 kW of solar generation capacity by end of 2000
1 MW by end of 2001
Enough for 15,000 15 kWh blocks of solar energy or about 7,500 customers - 1%
Continue promotion to Residential customers - existing channels
Introduce to C&I customers
APS
EPRI 2000


Issue - EPS
Arizona Mandates Environmental Portfolio Standard
.2% of kWh sold in 2001 escalating to 1.1% in 2007
minimum 50% solar and 50% other renewables
Minimum need to add between 5 and 11 MW solar per year to meet APS requirement - total 56 MW by 2007
Assume $6/watt cost of solar electric - $30-$66 million annually through 2007 or over $330 million total
Includes credits for early installation, green pricing program (could cost more)
$12 million annually approved - $6 million from APS and SBC of $6 million annually ($0.35/mo. residential)
APS
EPRI 2000

Growth Issues

- RPS Impact on green pricing programs
  - Mandates may cause customers to reject voluntary program
  - Technology risk - newer low cost technologies emerge - HCPV @ $3-$4/watt, Dish Stirling @ $2-$3/watt
  - Rush to implement may impact quality
- Unknown growth potential
- Cost and time of market establishment and development

APS

EPRI 2000

Summary

- Still in awareness building level of product

Los Angeles Department of Water and Power
Green Power for a Green LA Program

John Giese
Green Power Program Manager

1-800-Green LA **www.GreenLA.com**

Presentation Outline

- **Overview of Program**
- **What We Did Right - what we did wrong would take too long**
- **Suggestions For Your Success**
- **Questions**

1-800-Green LA **www.GreenLA.com**

Program Overview

- **Flagship DWP Environmental Offering**
  - **Facilitates the Development of New Renewable Energy**
  - **Encourages Energy Efficiency**
  - **Includes Energy Sales and Services (Future)**
- **Aligns With Other Public Benefits Programs (AB 1890)**
  - **Photovoltaic Installations**
  - **Electric Transportation - 100% No Emission Vehicles**
  - **Cool Schools Tree Planting Program**
  - **Energy Efficiency Programs**
  - **Electric Leafblowers**
  - **Recycling - non pb program**

1-800-Green LA **www.GreenLA.com**

Program Description

- **Green Rate Choice for Customers**
  - **Customers Can Choose to Have of a Portion of Their Electricity Provided by New Renewable Energy Resources:**
  - **20% for Residential and Small Business**
  - **500 to 1,000 kWh/month for Larger Customers**
  - **Custom Contracts for Others**
- **Provide Energy Efficiency Products and Services for Participants**

***Existing Green Power will be provided to low income customers**

1-800-Green LA **www.GreenLA.com**

Energy Efficiency Component

- **Products and Services Provided to Participating Customers**
  - **Compact Fluorescent Lights and Fixtures**
  - **Retail Alliances for Discounts on Energy Efficient Appliances**
  - **Audit and Energy Use Reduction Services**

1-800-Green LA **www.GreenLA.com**

Pricing

- **Extra 3 Cents Per kWh for New Resource**
  - **6% Rate Increase for Residential and Small Business Customers ($3 Increase on a $50 Bill)**
  - **$15 to $30/month for Large Business Customers, More if They Choose a Higher Percentage**

1-800-Green LA **www.GreenLA.com**

Rationale / Benefits

- **Environmental Responsibility**
- **Resource Diversity**
- **Improved System Reliability**
- **Cleaner Air**
- **Economic Development**
- **A Better World for Future Generations**

1-800-Green LA **www.GreenLA.com**

Program Goals

- **Initial 2,000,000 kWh Per Month or 20,000 Customers**
  - **Both Attained in January, 2000**
- **100,000 Customers in Three Years**
- **100 MW of Installed New Capacity in Three Years**
- **Cost Competitive Green Power by 2005**

1-800-Green LA **www.GreenLA.com**

Development of the Program

Things We Did Right - Marketing

- **Extensive Contact With Environmental Groups and Other External Community Stakeholders**
- **Community Groups Were Contacted Trained, and Reimbursed for the Cost of Their Involvement, If They Were Convinced It Was a Good Program**
  - **Generated Good Press and Jobs, as Well as Third Party Validation of Our Program**

Things We Did Right - Marketing

- **Good Public Relations and Media Relations**
  - **Lots of Free Press Through Relationship With a Good PR Company and Inviting Celebrities and Politicos to Relevant Events**
- **Lots of Community Events, Backed up by Inexpensive Direct Mailings and Bill Check Offs**
- **Use of Third Party Mailing Lists and Endorsements**
- **Did Not Say Anything Bad About Other Marketers**

1-800-Green LA **www.GreenLA.com**

Things We Did Right - Marketing

- **Tied the Program in Well (Almost Too Well) With Our Other Public Benefits and Non-public Benefits Programs.**
- **Tried to Develop a Brand That Would Help DWP If Successful, and Be Forgotten If Not Successful**
- **Did Not Over Promise**

1-800-Green LA **www.GreenLA.com**

Things We Did Right - Logistics

- **Simple Energy Efficiency to Start**
  - **Logistics Did Not Get Over Strained**
- **Simple Website With Lots of Information and Minimal Required Functionality to Start, but Built With E-commerce in Mind**

1-800-Green LA **www.GreenLA.com**

Things We Did Right - Logistics

- **Lots of Internal Stakeholder Review and Input**
  - **Energy Control Center**
  - **Legal / Purchasing**
  - **Customer Relations**
    - » **ARUM Customer Tracking**
    - » **Call Center Training**
    - » **Branch Offices Training**
    - » **Account Reps for Larger Customers**
    - » **Lots of Service Delivery Flow Charts and Testing Before Launch.**
- **Kept the Whole Organization in Mind and Did Not Reinvent the Wheel or Create Non Duplicable Processes**

1-800-Green LA **www.GreenLA.com**

Things We Did Right - Information Technology

- **Straight Percentage of Use, Easy on the Computers**
- **Talked to These Folks Well Before Designing the Program**

Things We Did Right - F&A

- **Keep Info on Quickbooks**
- **F&A Support and Auditing for Financial Documents**
- **Rate Group Support on Ordinance That Funds Us Exclusively**

Suggestions

- **Do Your Research**
  - **Marketing Lead Time, Branding, Positioning, Customer Demographics, Test Messages**
    - **Art and Creative Should Not Be Ignored**
  - **Market Competitors – Do Not Assume You Are Not in Competition**
- **Convince Your Management to Have a Long-term View, It Will Get You Better Prices on Your Resources.**
- **Don't Try to Be Everything to Everyone at First, Unless You Are Really Good**
- **Pick a Deadline to Launch and Stick With It, Nothing Will Go Right Anyway**

1-800-Green LA **www.GreenLA.com**

Green Power for a Green LA

Questions

John Giese
Green Power Program Manager

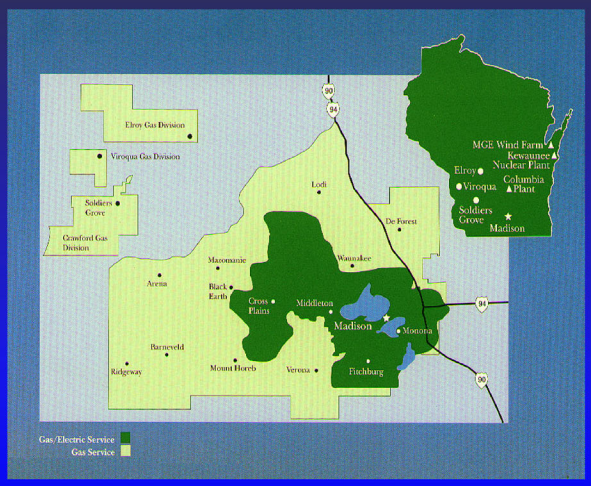
1-800-Green LA **www.GreenLA.com**

MGE WIND POWER

Presented by
Laura Williams
Madison Gas and Electric Company

Fifth National
Green Power Marketing Conference
August 7-8, 2000

Who Are We?



Who Are We?

- 107,000 residential customers
- 12,000 business customers
- 3,224,000 MWh
- $186,000,000 electric revenues
- Combined electric and gas utility

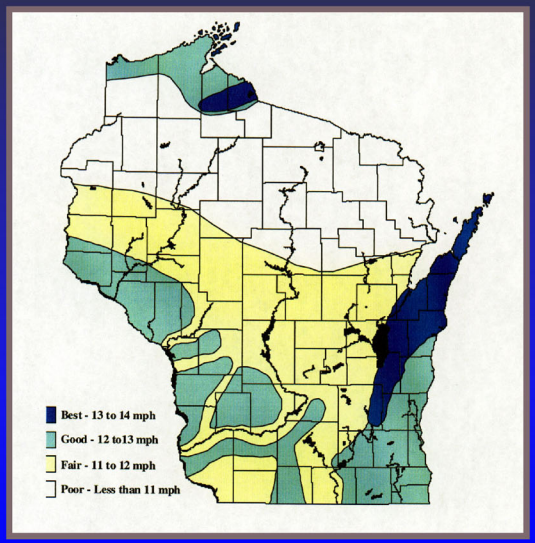
Why Has MGE Built Wind Power?

- Customer preference
- Technology progress/cost
- Sustainable
- Environmentally friendly
- Earn return on the investment

MGE Project Summary

- 17 660 kW Vestas turbines
- 24,000,000 kWh/year
- On line July 1, 1999
- $14.5 million investment
- Leases with Kewaunee County farmers

Why Kewaunee County?



Project Decision Making

- Acceptable economics
- Customer market exists
- Community acceptance
- Siting approvals

Project Economics

- Construction costs: $14,500,000
- Other Costs:
  - O&M, transmission access, marketing
- Amortized over 38 years
- Wind energy cost: $0.09 per kWh
- Green priced: $0.0333 per kWh

Wind Farm Energy Production

- First year: 22,604 MWh
- Capacity factor: 23%

Wind Power - the product

- Customer choice
- "Green Pricing"
  - Residential customers
    - $5 per 150 kWh block or,
    - 100% @ $0.0333/kWh
  - Businesses
    - Leaders - significant purchase
    - Supporters - Greater of 5% or $15/month

Marketing Strategy

- Targeted mailings and bill inserts supported with mass marketing
- Be everywhere with information
- Promotional support for businesses
- Gain credibility through third parties
- It's the right thing to do

Marketing Effectiveness

- Sold all available energy in six months
- Subscription rate - 4.7%
- Targeted direct mail -

Shareholders:	9.2%
Targeted list:	6.9%
Random list:	5.6%
Bill insert or other:	2.9%

Lessons Learned

- Take time to get buy-in from local community
- Customer education - essential and expensive
- Collaborative marketing works
- Learn from others

Next Steps

- Evaluate:
  - technical performance
  - project economic assumptions
  - customer acceptance and preferences
  - Other renewable technologies
- Optimize future investments

Fifth National Green Power Marketing Conference: Powering the New Millennium

August 8, 2000

Denver, CO

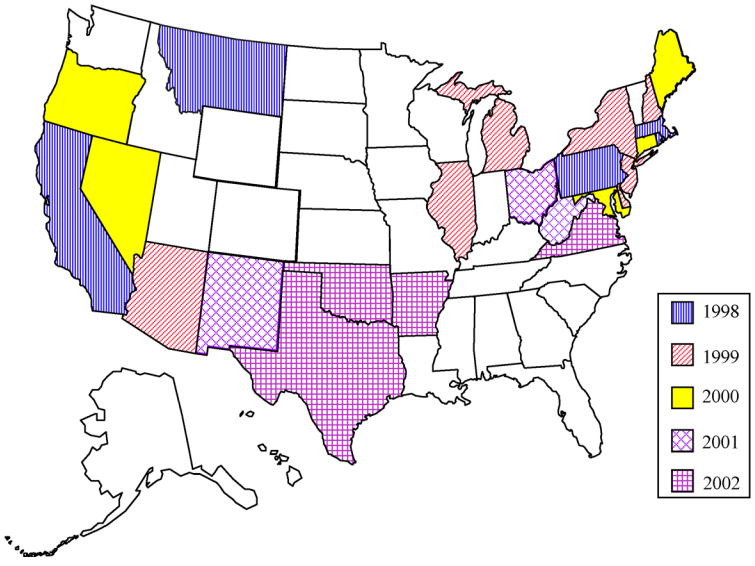
What's Happening in Competitive Markets?

Ashley H. Houston

XENERGY Inc.
Three Burlington Woods
Burlington, MA 01803
781.273.5700
www.xenergy.com

XENERGY

Market Opening Status



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Market Background

- 24 states have adopted customer choice to date
- Total IOU Customers = ~ 92 million
- Less than 20 million have access to choice currently
- By the end of 2002 ~ 57 million customers will have access to choice
- To date, a little over 1 million customers have selected an alternative supplier

2

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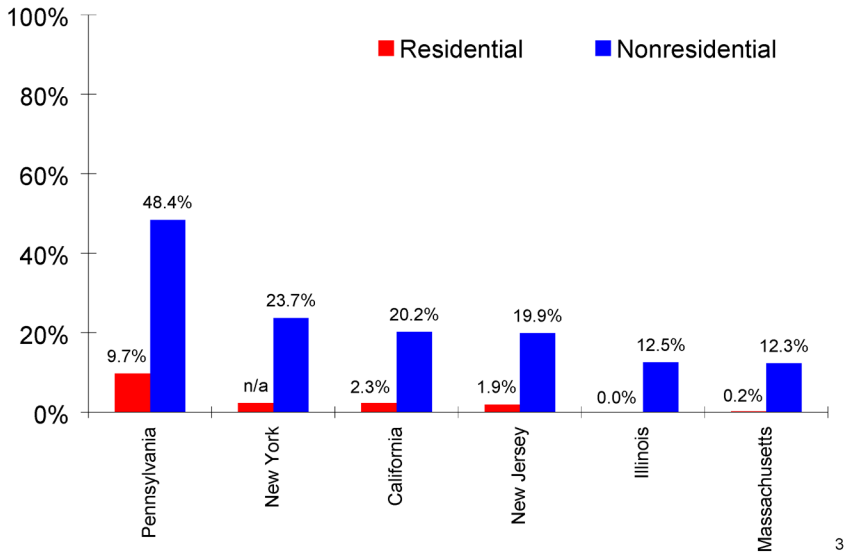
Load Migration by State – Spring 2000



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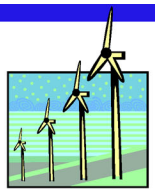
Role of Green Power in Competitive Markets



- As of July 2000, 17 states fully or partially open to competition with retail green offerings in 6 (CA, PA, MA, NJ, ME, CT) and wholesale green through APX markets in other states
- 53 MW of new installed capacity - majority wind and geothermal
- Another 40 MW planned – nearly all wind

4

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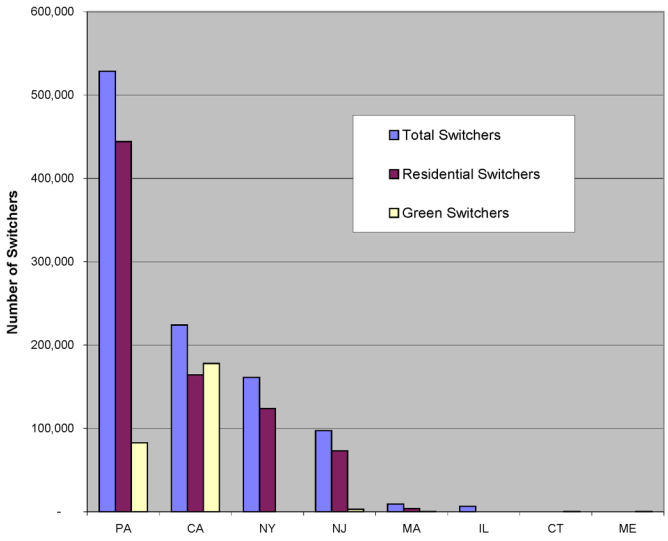
Residential Switching Activity



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PA Residential Customer Demographics

- Green customers are more likely to have:
  - High energy use (84% over $50/month)
  - College education
  - Larger households, more children
  - High organic product consumption
  - Energy conservation awareness
  - High Internet use
  - Wealth (28% over $75,000/year)

6

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PA Decision Factors

- Green switchers
  - Best for environment
  - Lowest price
  - Company has environmental philosophy
  - Reduce air pollution
  - Lowest cost green power
- Non-green switchers
  - Lowest price

7

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Role of C, I, & I Customers

- Commercial/Industrial
  - MCI WorldCom
  - Toyota Motor Sales (40 million kWh)
  - Kinko's
  - Patagonia
  - Birkenstock
  - Los Angeles World Airports (50% by 2010)
  - Fetzer Vineyards (5 million kWh)
  - Time Warner Communications (1,700 accounts)
- Institutional
  - City of Chicago (80 MW)
  - Assoc. of CA Water Agencies
  - Cities of Santa Barbara, Santa Monica (5 MW), Oakland (9 MW)
  - U.S Postal Service (1000 sites for 30 million kWh)
  - PA Dept. of General Services (37.5 million kWh)
  - Episcopal Diocese of CA
  - ABAG

8

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Retail Suppliers

- Active
  - Green Mountain (CA, PA, NJ)
  - Commonwealth Energy (a.k.a Electric America) (CA, PA, NJ?)
  - Go-Green.com (CA)
  - Conectiv (NJ)
  - CT Energy Cooperative (CT)
  - ECAP (PA)
  - Mack Services (PA)
  - Atlantic Energy (ME)
  - Essential.com (MA)
  - AllEnergy (MA)
  - Community Energy (PA)
  - Utility.com
- Dropped Out
  - Enron Energy Services (CA)
  - EdisonSource (CA)
  - PG&E Energy Services (CA)
  - Conectiv (PA)
  - Keystone Energy Services (CA)
  - Friendly Power Corp. (CA)

9

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Market Drivers

- Basic Market Rules
  - Default service
  - Market size
  - Wholesale costs
  - Wholesale market structure
  - Business rules
  - Stranded Costs
  - Competitive Metering, Billing and Customer Service
- Renewable Energy Policies
  - RPS
  - SBC funding
  - Disclosure and labeling requirements
  - Definitions of "green"
  - Existing and new resources
  - Certification
  - Transmission pricing

10

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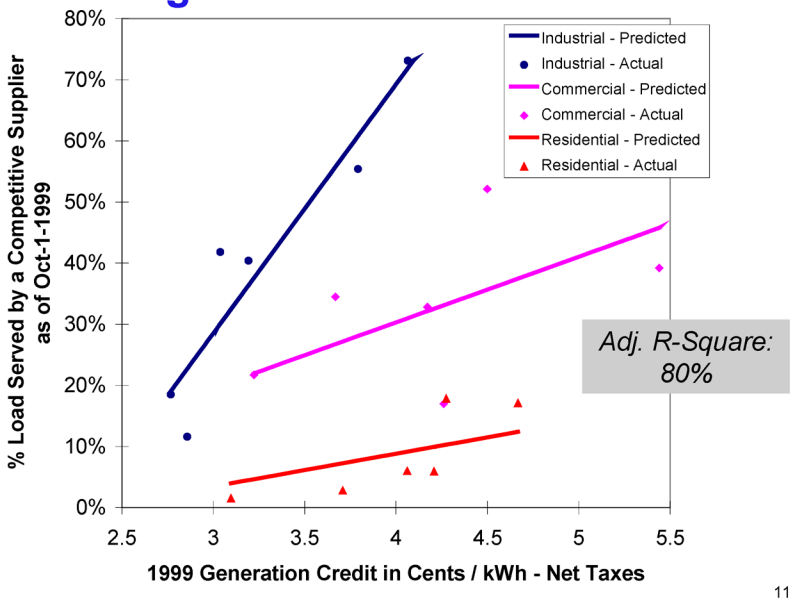
Modeling Oct-1999 PA Switch Rates



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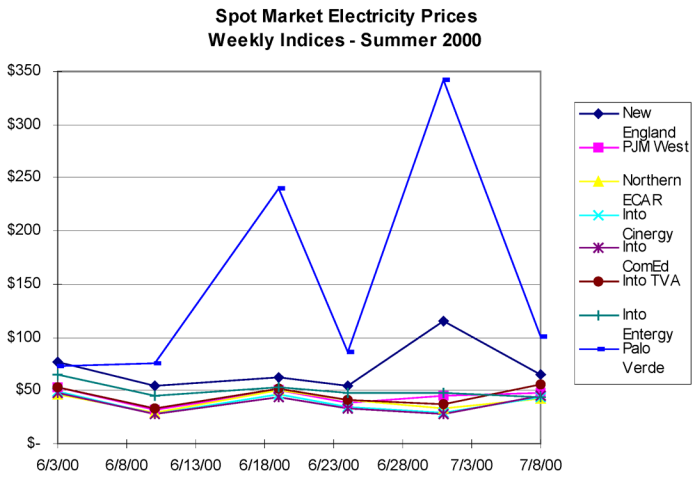
Wholesale Price Spikes in 2000



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Customer Dumping

- Recent rash of green customers being dumped in CA and PA due to high wholesale prices and other related issues
  - In PA, Conectiv drops all 70,000 residential customers, including 20,000 green customers
  - In CA, Commonwealth Energy loses contract with SANDAG and turns back undisclosed # of customers

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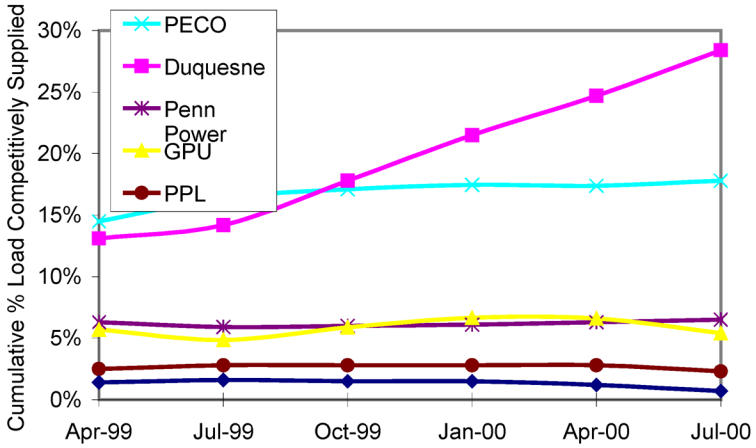
PA Residential Switching Trend



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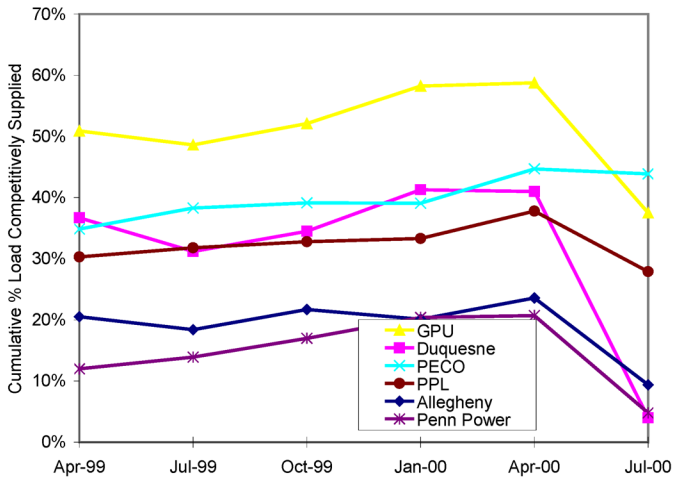
PA Commercial Switching Trend



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Market Status

- NJ – Recent decline in competitive load; Internet switching now allowed, still no telephone switching; green switch rates expected to rise as marketing ramps up
- CA – Prior to summer price spikes, slow and steady growth in competitive load; recently markets declared dysfunctional; SDG&E customers fully exposed to market volatility; no surge in activity expected any time soon; hearings to tweak AB 1890
- PA – Residential switch rates have not declined significantly even with dumping; expect increased activity in the fall; free parking still an issue
- MA – Recent decrease in competitive share of load; DTE established market-based default rates

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New Markets Outlook

- CT - 4 marketers approved, 6 others awaiting approval, 3 withdrew, CT Energy Cooperative only green marketer to date reporting 200 switchers; lengthy approval process, $250,000 bond, only DISCO billing, default service not subject to RPS
- OH - 20% switching requirement by 2003; shopping incentives for early shoppers, but suppliers are expected to find little headroom
- TX - Preliminary estimates of price to beat (5 cents/kWh) should provide good amount of headroom but stranded costs still need to be worked out; strong RPS and other renewable-friendly policies make green market look promising

17

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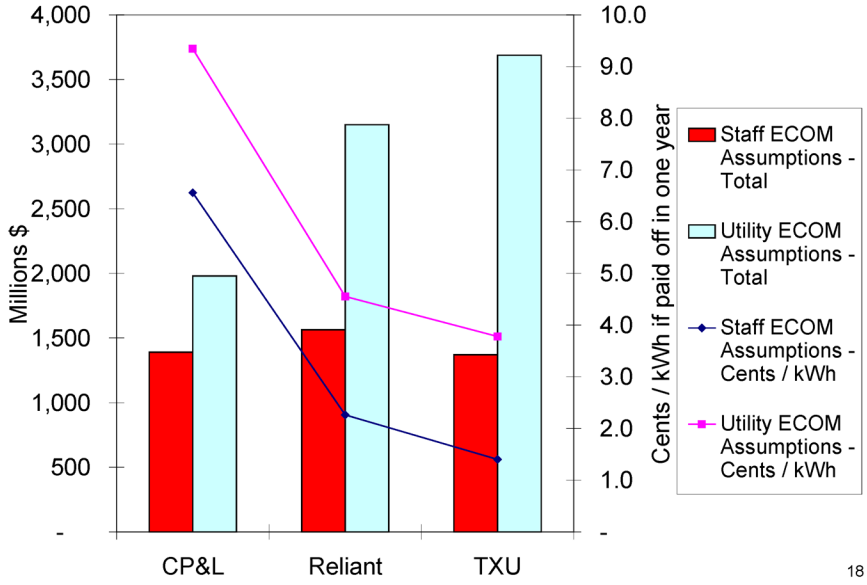
TX: Estimated Stranded Costs by Utility



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Conclusions

- Green power has become one of the most successful means of product differentiation, but it cannot transform the market itself
- Supplier margins drive switching activity
- In states where market rules are conducive to competition, expect green power to continue to play key role
- Activity is expected to pick up in the fall
- Enough incentive for new generation out there that wholesale price spikes are not expected to be as dramatic next summer

19

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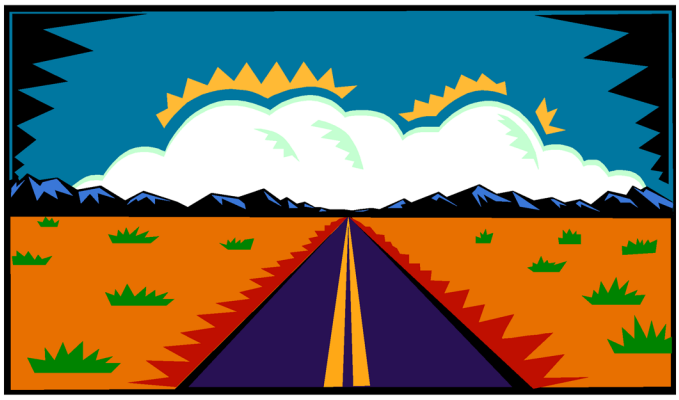
Its Darkest Before the Dawn



20

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Questions

- For more information, contact:
  - Ashley H. Houston -- ahouston@xenergy.com
    (781) 273-5700 x 414

21

The Internet Pure Play Approach to Utility Services

Dan Lieberman
Utility.com
August 8, 2000

8/8/00 1

utility.com

Topics to Discuss

- Who is Utility.com
- Utility.com's green message
- Offering multiple products to create margin
- Using IT to reduce costs
- Potential to reduce green premiums through pure play

8/8/00 2

Who is Utility.com

- The world's first internet utility company
- Utility.com provides residential and small business consumers with electricity, internet service, and telephony service…all on the web
- We sell electricity in CA, PA, MA; licensed in 6 others
- Through cutting edge technology we provide 100% online billing
- Andersen Consulting named Utility.com the Best-Performing Utility Web Site in the World

8/8/00 3

Utility.com's GreenPlanet Product

- 100% renewable resources from APX
- Certified Green by Green-e and the California Energy Commission
- 5% new renewable resources in year 2000
- Forest Friendly℠ paperless billing
- 20% discount every month

8/8/00 4

Green Corporate Policy

- We'll always offer GreenPlanet in California
- We'll offer Green options in other states
- We support new renewables through Green-e standards (5% in 2000)
- We support renewable portfolio standards
- Provide environmental information for customers on our website
- Our paperless online Forest Friendly Billing[SM] reduces the usage of paper and saves trees

8/8/00 5

Market Basket of Products

- Now:
  - Electricity
  - ISP/DSL
  - Appliance Service Plans
  - Long Distance Telephone
- Soon:
  - Natural Gas
  - Cyberstat
- Benefits of Basket Approach
  - Customer convenience and savings
  - Shopping cart signup approach
  - Balancing margins

8/8/00 6

Using IT to Reduce Costs

- Utility.com is a technology company
- State of the art programming
- Online enrollment
- Supplier consolidated online billing
- Extremely fast processing
- Web-based account management for customers
- Well positioned for advanced metering and real-time pricing

8/8/00 7

Utility.com's E-Utilities Program

- Benefit to Local Utility
  - Utility.com provides E-commerce solution
  - Utility lowers billing & data management costs
  - Opportunity for Utility's Product Expansion
- Benefit to Customer
  - Cost savings & convenience
- Benefit to Utility.com
  - b-2-b channel
  - Channel into regulated markets

8/8/00 8

Benefits of Paperless systems

- Automated = low cost for us
- Forrest Friendly℠ paperless billing
- Saves on postage $ and energy
- Reduces paper use by us and customer
- Online marketing is lower cost
- Fast
- Convenient
- Adaptable/Scalable

8/8/00 9

Reducing Green Premiums

- Partnership with Southern
- Use IT to reduce transaction costs
- Balance margins with other products

8/8/00 10

utility.com

Advantages of Pure Play

- Utilities are slow to adopt new approaches
- Electronic enrollment & billing systems = fast, cheap, adaptable, scalable
- Ability to offer green add-ons to our billing system
- Synergy of green power and paper-reduction
- No paper = cheap, convenient, green
- Increasing online market base
- Able to market nationally and to remote customers

8/8/00 11

Dan Lieberman
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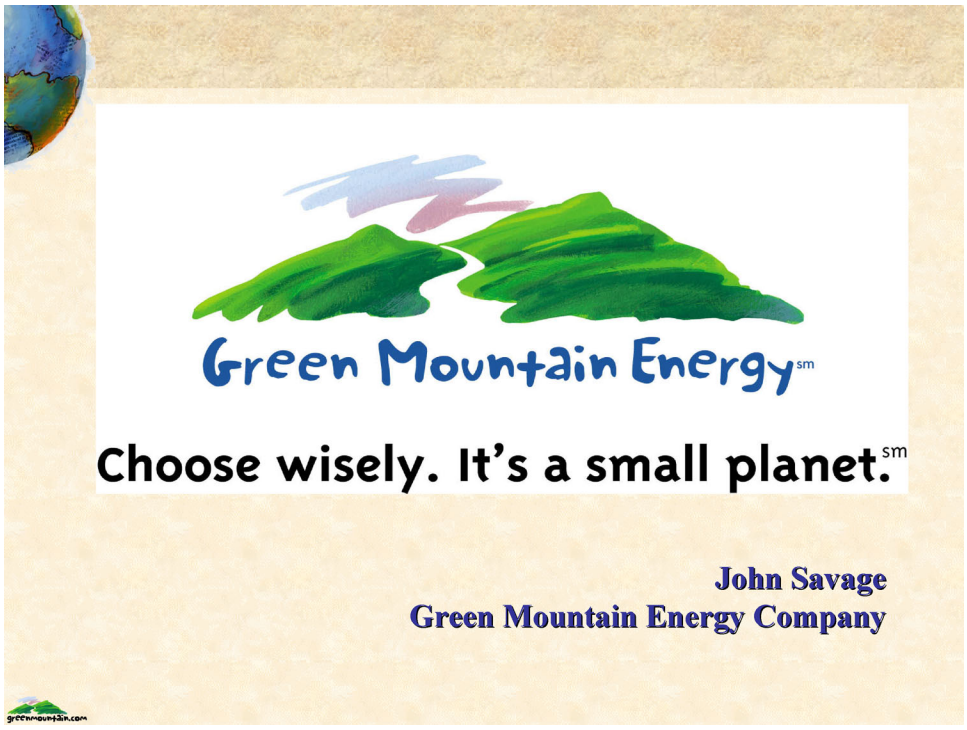
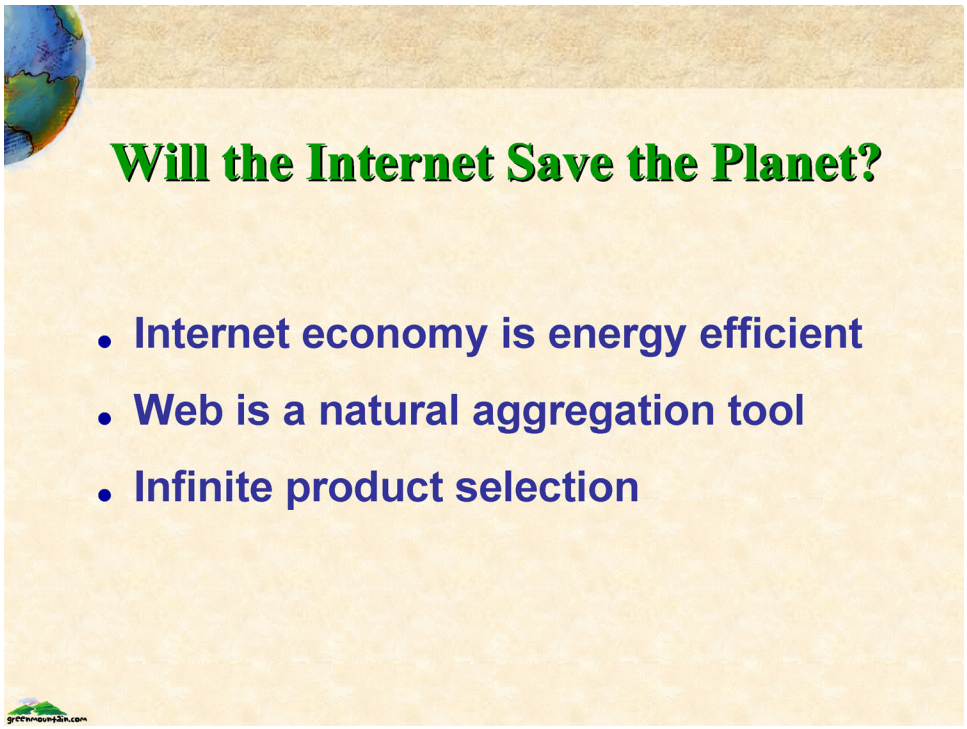
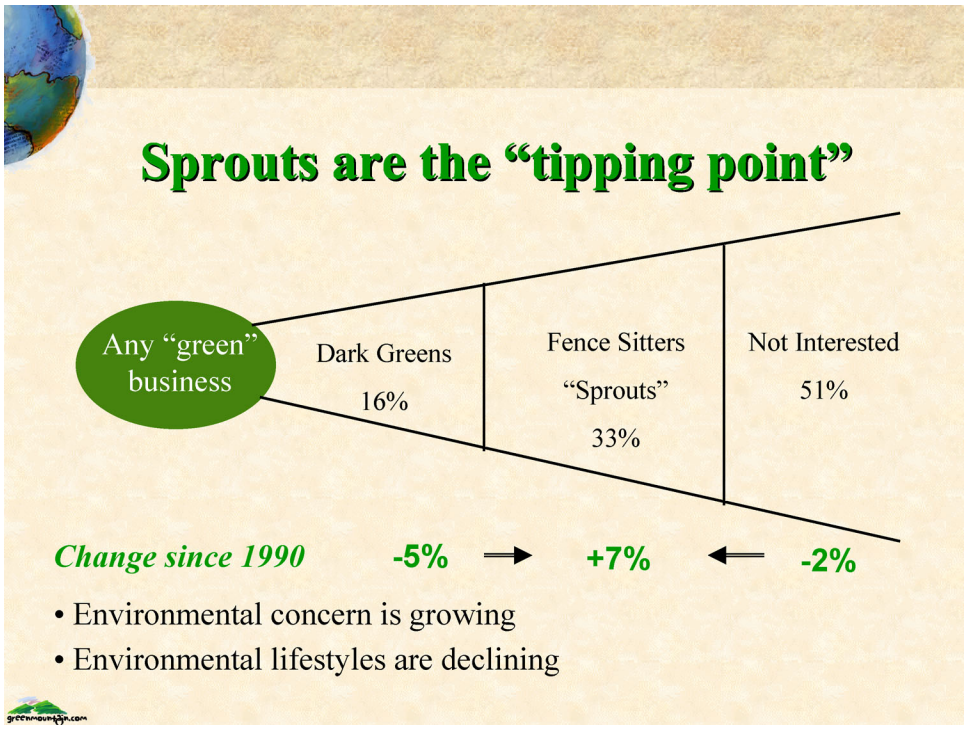
8/8/00 12


Green Mountain Energy℠
Choose wisely. It's a small planet.℠
John Savage
Green Mountain Energy Company


Will the Internet Save the Planet?
• Internet economy is energy efficient
• Web is a natural aggregation tool
• Infinite product selection


Sprouts are the "tipping point"
Any "green" business
Dark Greens
16%
Fence Sitters
"Sprouts"
33%
Not Interested
51%
Change since 1990
-5%
+7%
-2%
• Environmental concern is growing
• Environmental lifestyles are declining

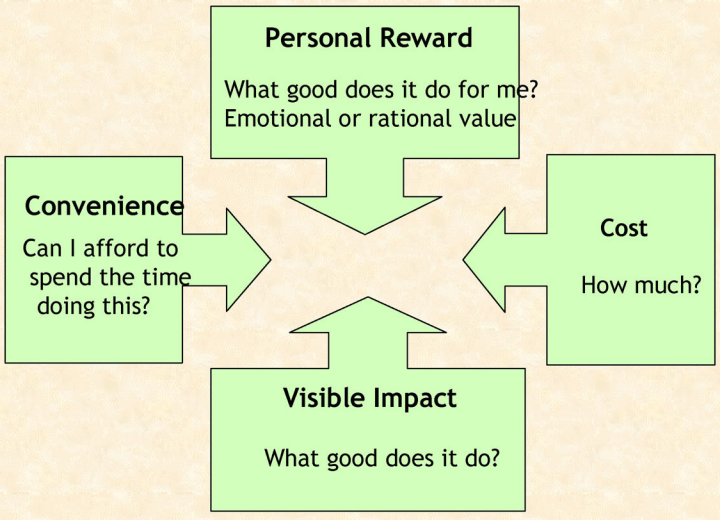

What Do "Fencesitters" Think
about using the Internet
• Leading use is for communications and research, not shopping
➢ instant messaging and e-mail
• Value convenience more than price
➢ time is money
• 4 million Web sites are a lot to surf
➢ brands enable consumers to find their way

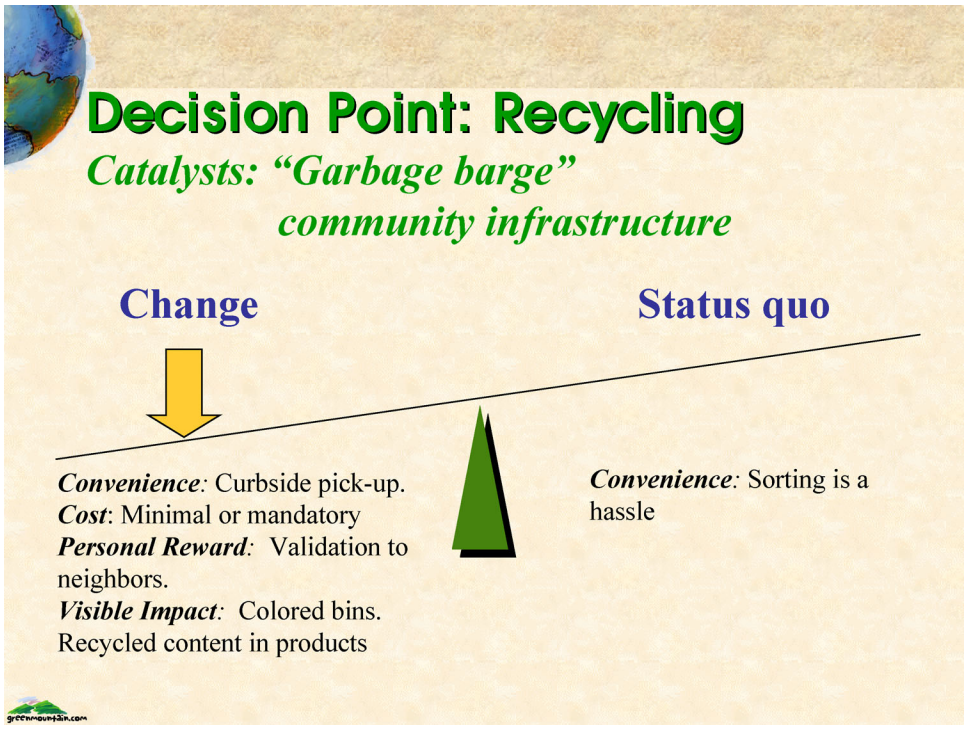
What Do "Fencesitters" Think

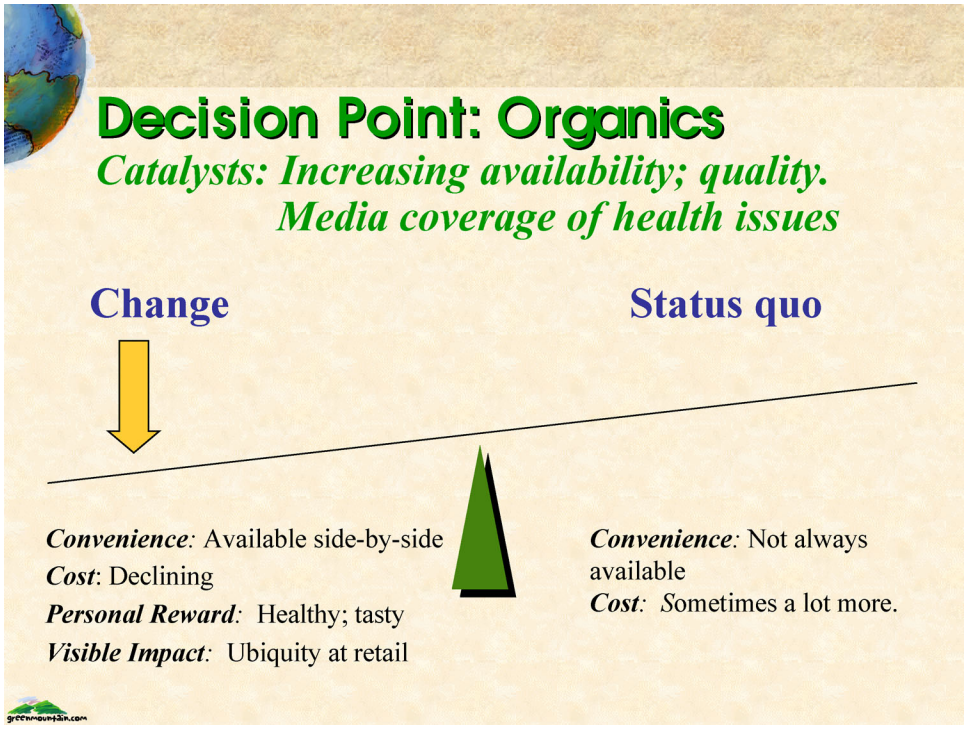
about environment problems

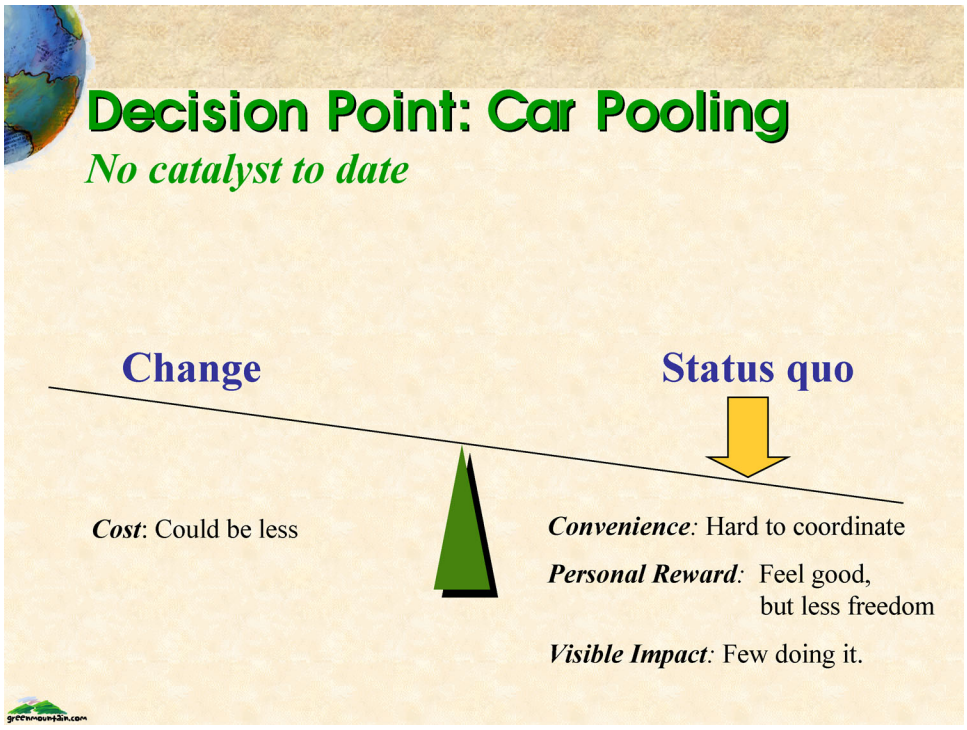
- Environmental problems not ones they are proactively seeking to *solve* in their lives, like finances or health.
- Catalysts to a more environmental lifestyle are interpersonal rather than market driven.
- While they aspire to do the right thing, "fencesitters" apply a cost-benefit analysis in deciding what actions to take for the environment.

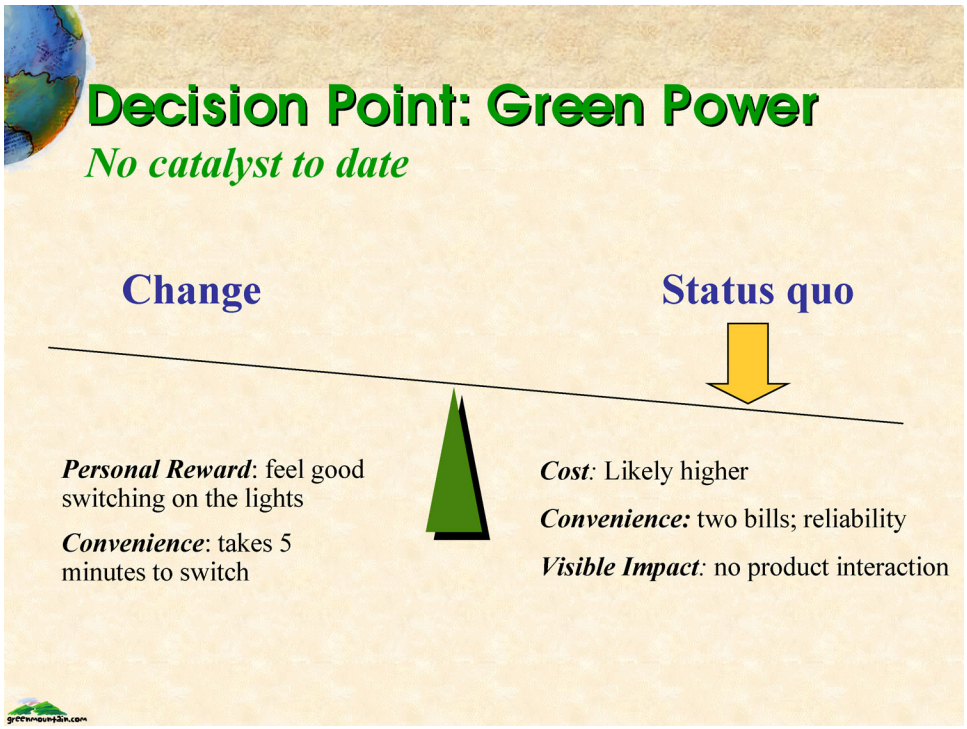
The Decision Point

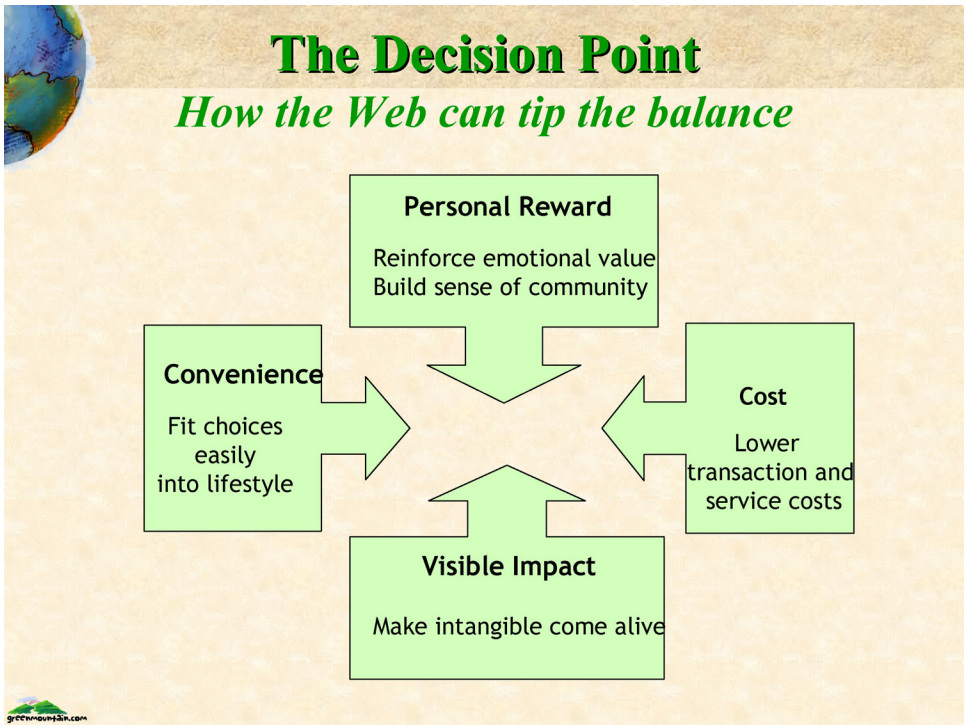



Decision Point: Recycling
Catalysts: "Garbage barge"
community infrastructure
Change
Status quo
Convenience: Curbside pick-up.
Cost: Minimal or mandatory
Personal Reward: Validation to neighbors.
Visible Impact: Colored bins. Recycled content in products
Convenience: Sorting is a hassle

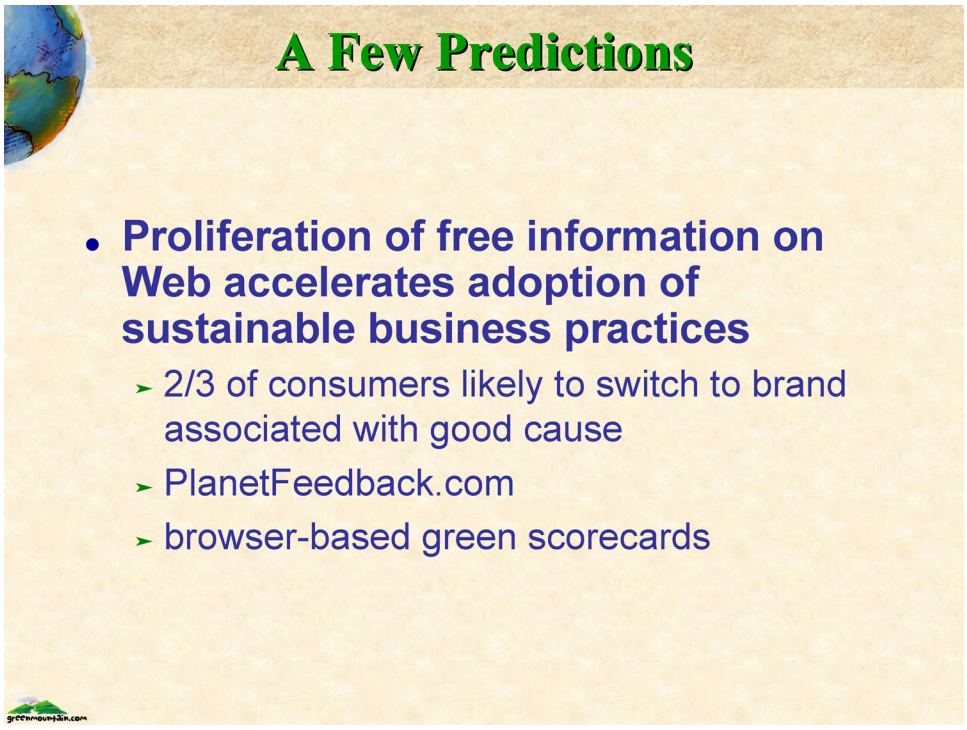

Decision Point: Organics
Catalysts: Increasing availability; quality.
Media coverage of health issues
Change
Status quo
Convenience: Available side-by-side
Cost: Declining
Personal Reward: Healthy; tasty
Visible Impact: Ubiquity at retail
Convenience: Not always available
Cost: Sometimes a lot more.


Decision Point: Car Pooling
No catalyst to date
Change
Status quo
Cost: Could be less
Convenience: Hard to coordinate
Personal Reward: Feel good, but less freedom
Visible Impact: Few doing it.


Decision Point: Green Power
No catalyst to date
Change
Status quo
Personal Reward: feel good switching on the lights
Convenience: takes 5 minutes to switch
Cost: Likely higher
Convenience: two bills; reliability
Visible Impact: no product interaction

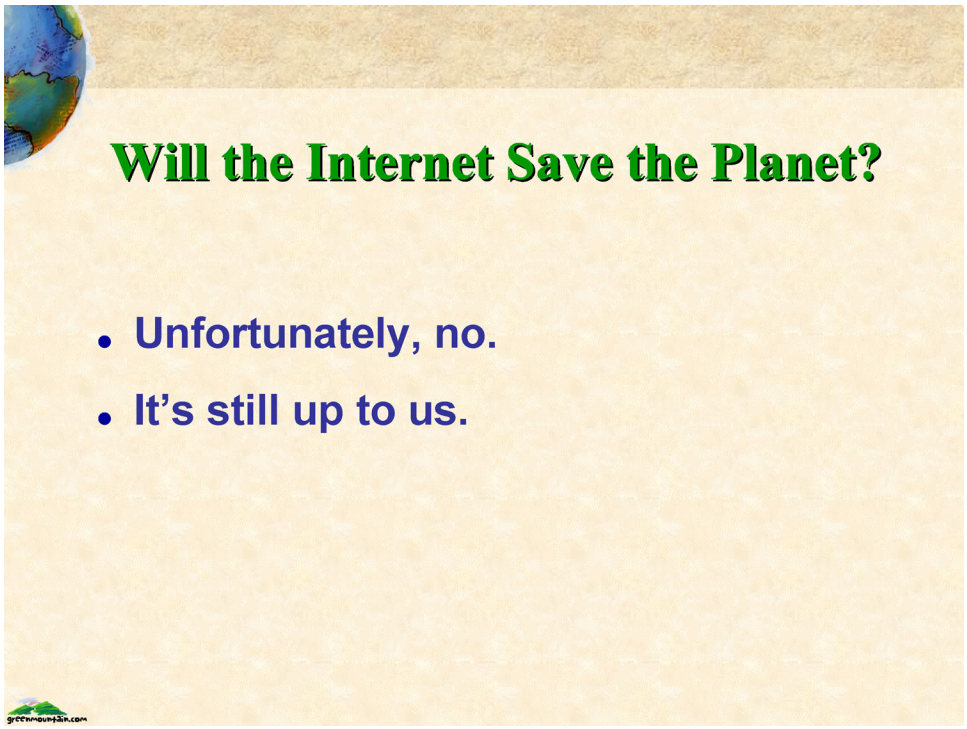

The Decision Point
How the Web can tip the balance
Personal Reward
Reinforce emotional value
Build sense of community
Convenience
Fit choices easily into lifestyle
Cost
Lower transaction and service costs
Visible Impact
Make intangible come alive


A Few Predictions
Web simplifies environmental "activism" and participation rates rise dramatically
aggregation through self-organizing communities
EnviroLink, care2.com
charitable giving online
greatergood.com, hungersite.com
Commercial aggregation attempts will continue to struggle
verde.com and wholepeople.com


A Few Predictions
• Proliferation of free information on Web accelerates adoption of sustainable business practices
➢ 2/3 of consumers likely to switch to brand associated with good cause
➢ PlanetFeedback.com
➢ browser-based green scorecards


A Few Predictions
• There will be no internet brands, only brands
➢ eBay and Yahoo have magazines
➢ AOL bought Time-Warner
➢ many online categories already dominated by “offline” brands (Southwest, Dell, Bank of America)


A Few Predictions
There will be no "green" brands, only brands
Ben & Jerry's makes delicious ice cream
Patagonia designs high-performance outdoor gear
Body Shop develops high-quality beauty products


Will the Internet Save the Planet?
Unfortunately, no.
It's still up to us.

Green Power Conference
Denver, Colorado
August, 2000

IEA Renewable Energy Unit

Rick Sellers (email: rick.sellers@iea.org)

INTERNATIONAL ENERGY AGENCY | AGENCE INTERNATIONALE DE L'ENERGIE

IEA Renewable Energy Unit

- Developing renewable energy market acceleration strategies for the IEA/REWP
- Addressing international aspects, including co-ordination of policies, integration of N-S markets, global data and projections
- Assessing the impacts of restructuring and liberalisation

Rick Sellers (email: rick.sellers@iea.org)

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Roper Green Gauge Survey (1996)

Category	% of US adults	% premium willing to pay	Cumulative weighted average
True Blue Greens	10%	7%	7%
Greenback Greens	5%	20%	12%
Sprouts	33%	4%	6%
Total	48%		

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DATAMONITOR

Market Analysis Experts

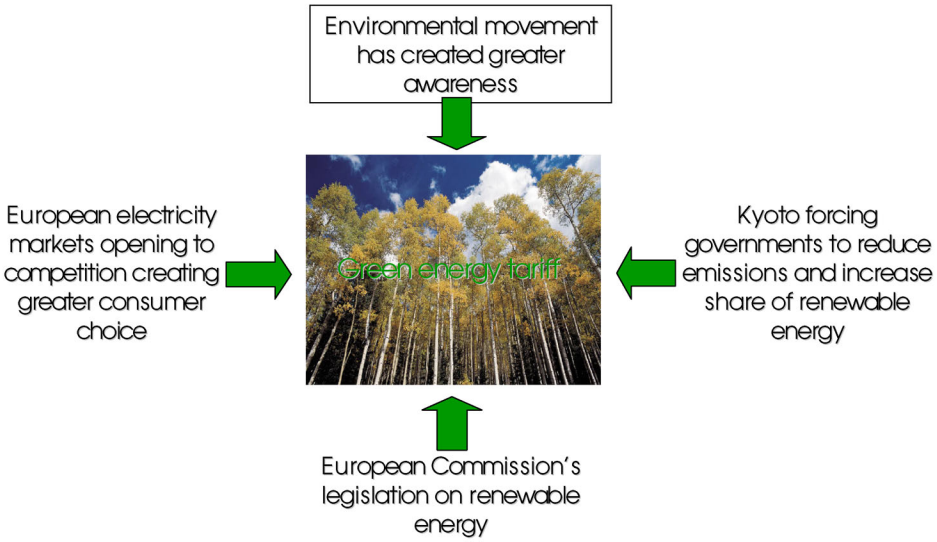
Providing the information and the answers...

DATAMONITOR

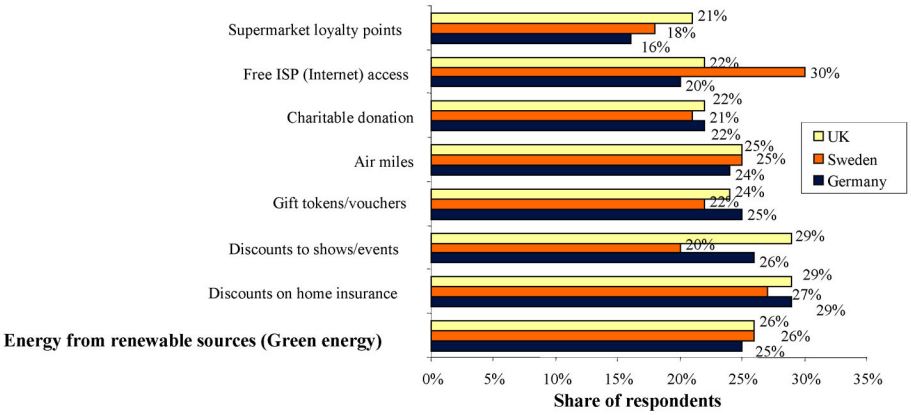
Market Analysis Experts

Providing the information and the answers...

Drivers for a green tariff in Europe

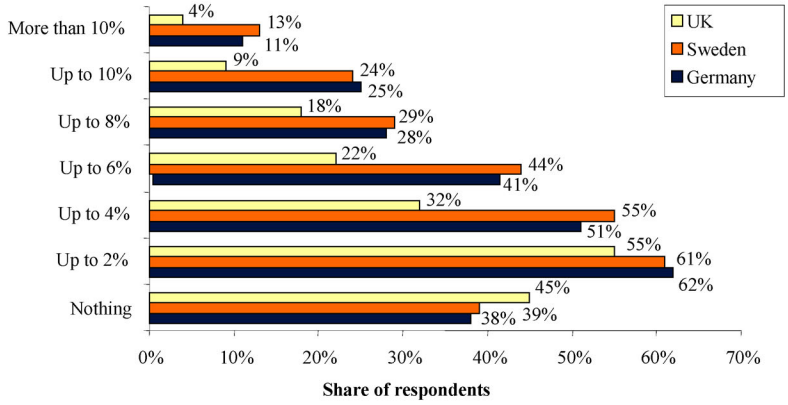


All things being equal, which of the following offers would make you more likely to switch supplier?



Green energy is one of the top three offers that would encourage those surveyed to choose one supplier over another

How much more would you be willing to pay for green energy?



Over 60% of respondents in Germany and Sweden, and over half in the UK are willing to pay a premium for green energy


International Aspects
Similar customer attitudes
Similar stakeholder processes and goals
Similar market responses
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Potential International Co-operation
Share experience
- accelerate learning
- broaden perspective
Standardise definitions
- simplify public awareness issue
- lower business overheads
Link trading systems
- increase market potential
- strengthen position vis-a-vis future carbon trading
Assess market impact on new renewables
- political support
- investment
INTERNATIONAL ENERGY AGENCY
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KEY CONTACTS
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• Rolf Wüstenhagen <rolf.wuestenhagen@unisg.ch>
• Michael Rucker <mrucker@apx.com>
• Lisa Petrovic <lpetrovic@datamonitor.com>
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C E A

Development of an International Green Certificate Trading System

CEA, consultants on energy and the environment/
RECS Secretariat

Jos Benner

Denver Green Power Conference

C E A

Content of the presentation

- European RE policy context
- Motives for trading and certification
- RECS developments
- Perspectives

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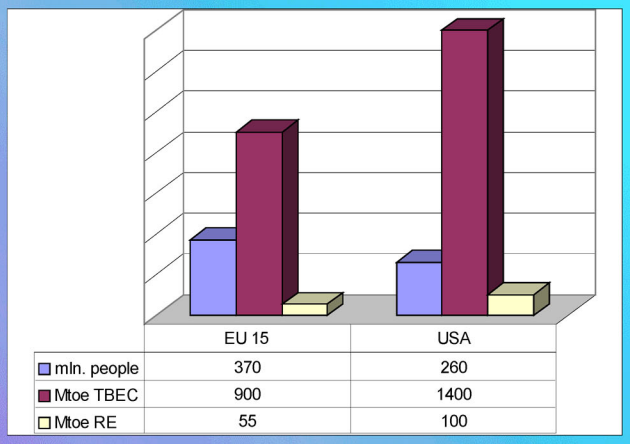
Rough comparison EU 15 / USA



	EU 15	USA
mln. people	370	260
Mtoe TBEC	900	1400
Mtoe RE	55	100

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RECS

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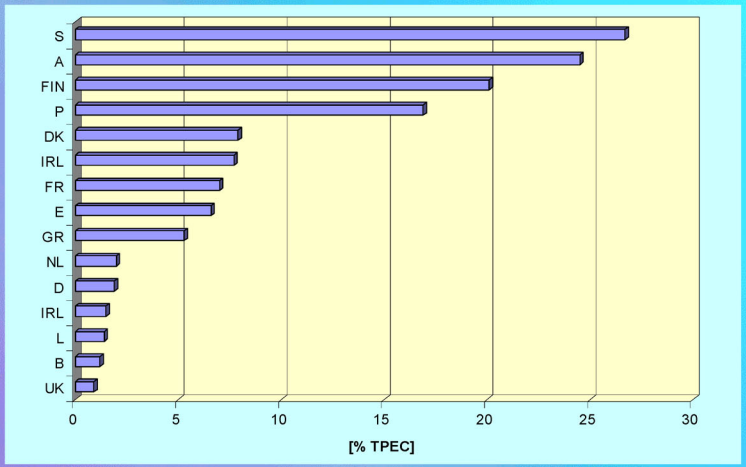
Realisation 1997 EU 15 (per country)



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RE policy European Community

- Commission's *White Paper for a Community Strategy and Action Plan* (1997, final)
  - In 1997 ca. 6% renewable energy
  - In 2010 double volume (12%; RE_{el}: ca. 22 %)
  - Kyoto-commitment (after White Paper) 8% reduction of green house gasses in 2010 compared to 1990
- Set of financial and juridical instruments

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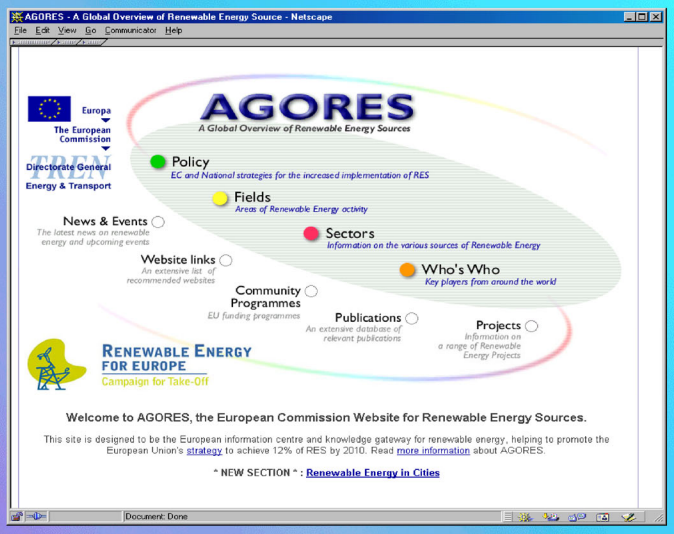
www.agores.org



RECS

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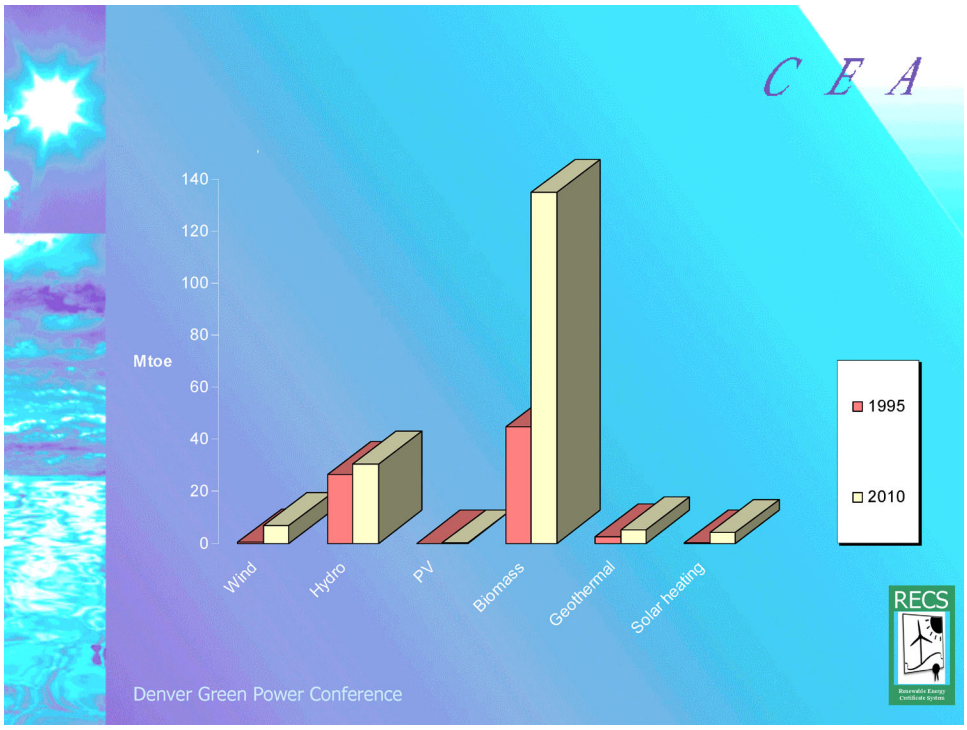
C E A
140
120
100
80
Mtoe
60
40
20
0
Wind
Hydro
PV
Biomass
Geothermal
Solar heating
1995
2010
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C E A
Directive RE-el
(proposed policy,May 2000)
• Targets member states < 1 year ("set and *meet*")
• Creation of trade structures (certification)
– < 2 year
– Certification of origin (type, place, moment)
• Harmonisation of (price) support mechanisms
– Support is necessary and welcome
– All mechanisms are allowed (for the moment)
– A level playing field is crucial (also for non RE sources)
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C E A

Why green certificates rather than other support mechanisms ?

- Support is necessary
- In the end all support comes from end users
- Promotional schemes (like fixed premium or feed in tariffs) lack an 'efficiency drive'
- Green certificates are market based, which stimulates efficient operation and technology improvement

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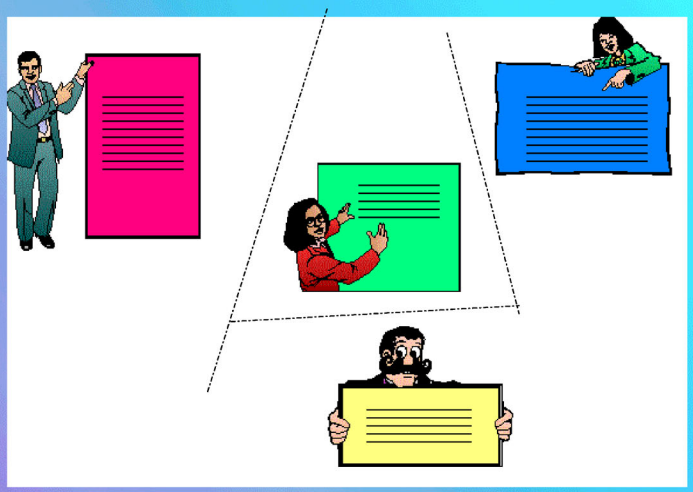

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C E A
Green certificate initiatives in Europe
• Italy : certificates with quota on producers and importers from 2002 onwards
• Belgium (Flanders): certificates with quota on suppliers from 2001 onwards
• Netherlands : certificates linked with eco-tax exemption from 2001 onwards
• Denmark : certificates with quota on end users from 2002 onwards
• UK : certificates linked with climate levy exemption and quota on suppliers (?)
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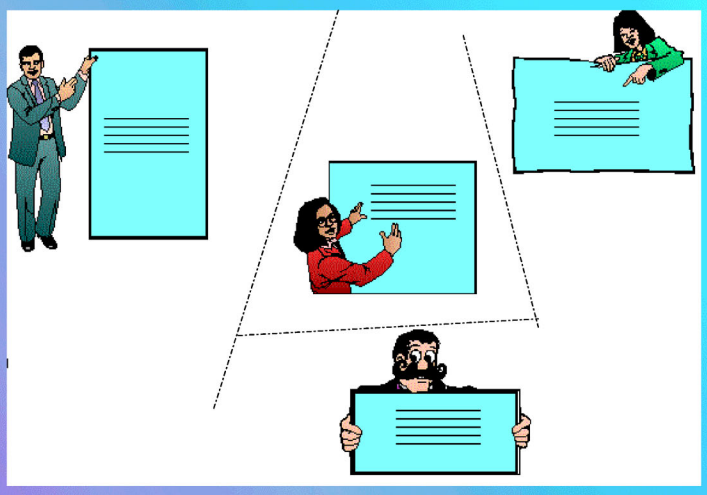
RECS


C E A
The international development for harmonisation of green certificates is:
www.RECS.org
RECS
Renewable Energy Certificate System
Denver Green Power Conference
RECS

C E A



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Participating countries

- Netherlands
  (EnergieNed, NUON, Essent, Ministry, Rabobank, APX)
- Belgium
  (Electrabel, Flanders ministry)
- Germany
  (HEW, RWE, Ministry)
- Denmark
  (Eltra, Elkraft, Ministry)
- Austria
  (Verbund)
- Italy
  (ENEL, CESI, GRTN,Edison)
- Norway
  (Nordpool, Norsk Hydro, Statnett)
- Sweden
  (Vattenfall, Arnesson)
- United Kingdom
  (Shell, Powergen)
- France
  (Total-Fina, ObservER)

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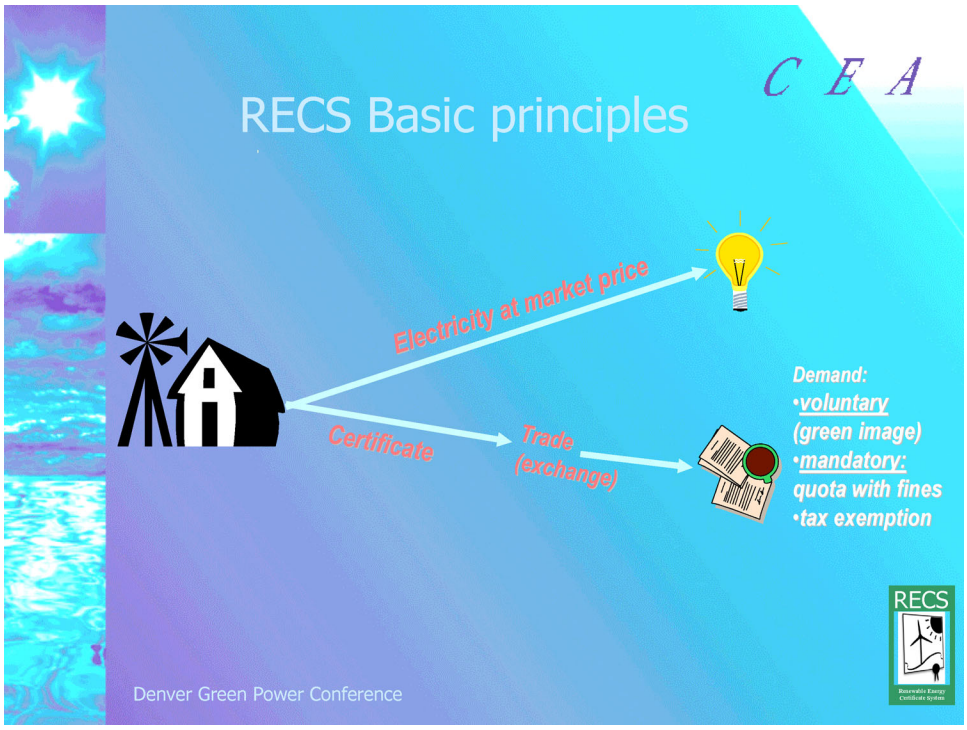
RECS


C E A
RECS Basic principles
Electricity at market price
Certificate
Trade (exchange)
Demand:
•voluntary (green image)
•mandatory: quota with fines
•tax exemption
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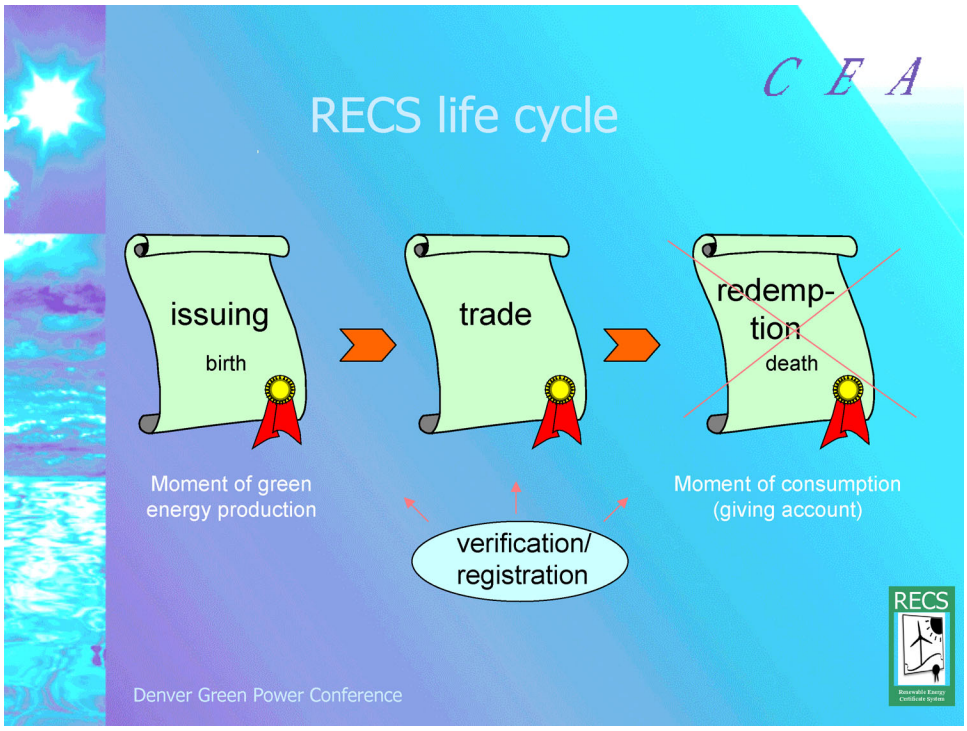
C E A
RECS life cycle
issuing
birth
trade
redemp-tion
death
Moment of green energy production
verification/ registration
Moment of consumption (giving account)
RECS
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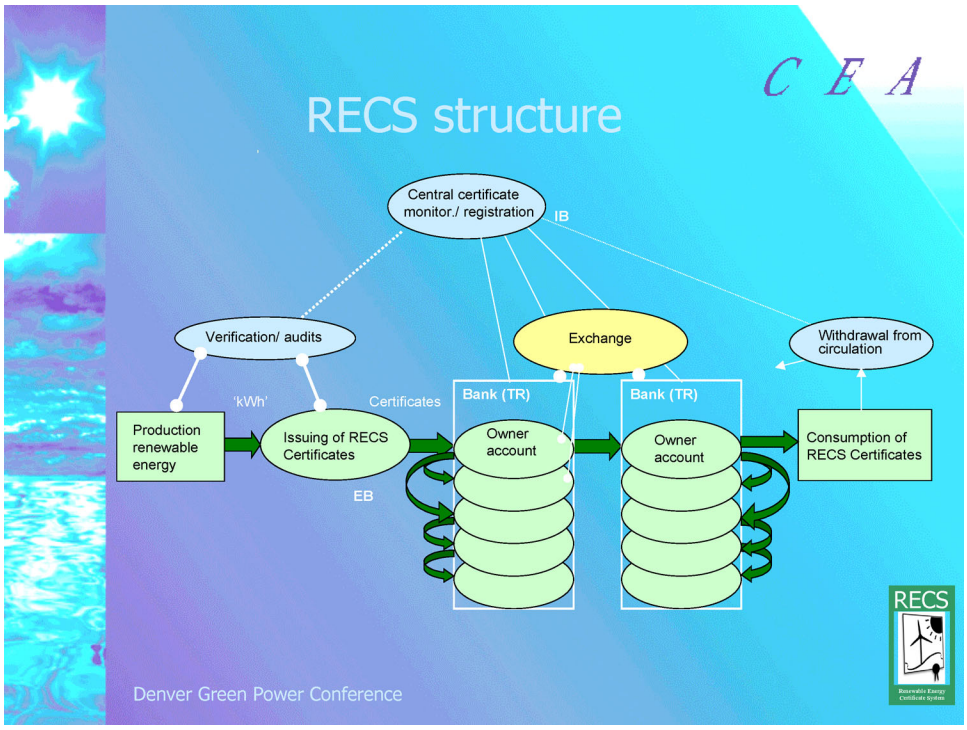
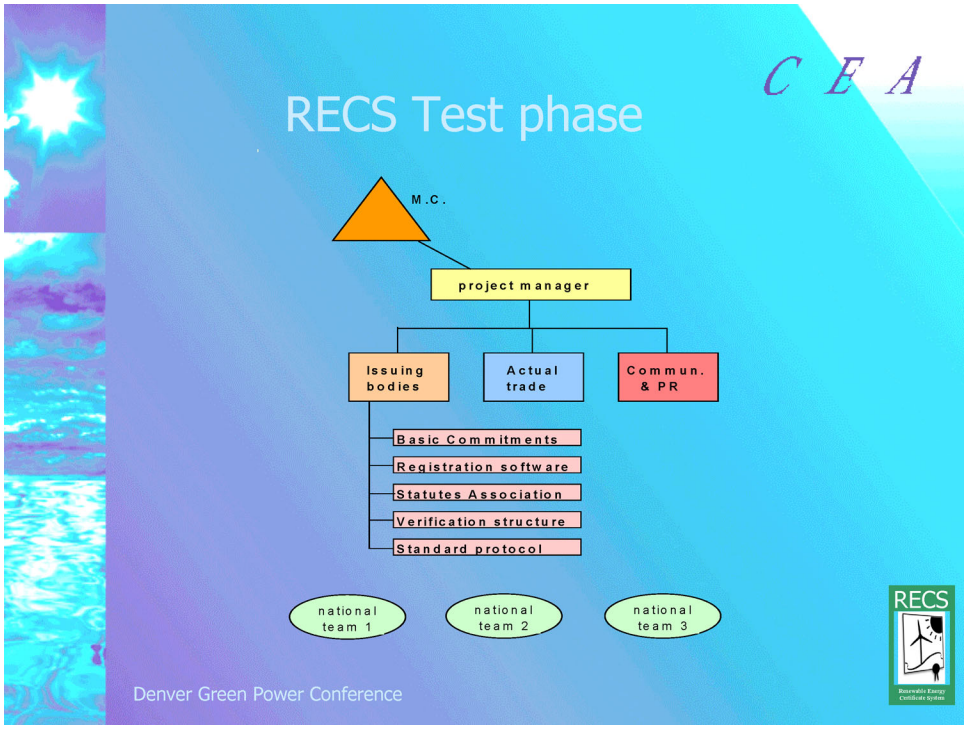

C E A
RECS structure
Central certificate monitor./ registration
IB
Verification/ audits
Exchange
Withdrawal from circulation
'kWh'
Certificates
Bank (TR)
Bank (TR)
Production renewable energy
Issuing of RECS Certificates
Owner account
Owner account
Consumption of RECS Certificates
EB
RECS
Denver Green Power Conference


C E A
RECS Test phase
M.C.
project manager
Issuing bodies
Actual trade
Commun. & PR
Basic Commitments
Registration software
Statutes Association
Verification structure
Standard protocol
national team 1
national team 2
national team 3
RECS
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C E A
Related European projects
• 5th Framework programme EU
RECerT, IntraCert, Elgreen
(dissemination, other options and CO_2-link)
• ALTENER programme EU
International Benchmark Renewable Energy
(potentials, costs, instruments)
• EURELECTRIC's GETS project
Very professional green electricity trade simulation
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C E A
Complexities
• EU-wide harmonisation politically impossible at this stage.
• States are only willing to accept certificates from equivalent systems or reduce the benefit of inter-national trade by increasing their national target.
• Comparison of systems shows discrepancies and lack of equivalence: e.g. certificate contents: technology description, state aid impact, life-span, related CO_2-benefits, etc.
But: We are going to DO IT !!
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C E A

Perspectives

- Link to CO_2-credits
- Certification of all energy options
- Global system

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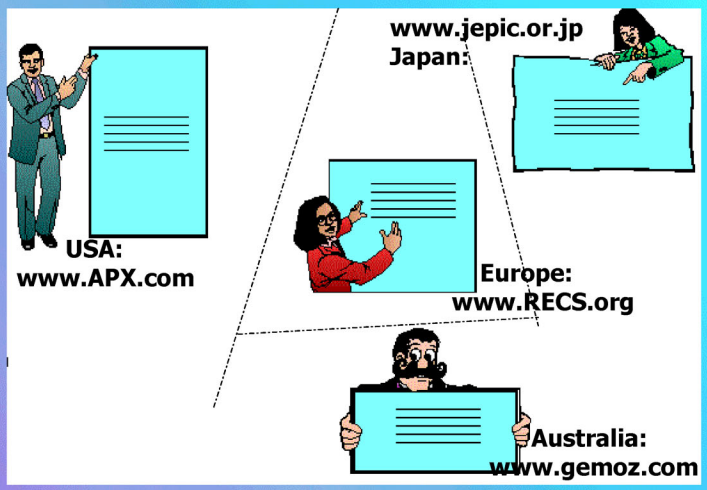
C E A



RECS

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RECS; THE RENEWABLE ENERGY CERTIFICATE SYSTEM

The development of an European green certificate system

Open any international magazine on energy and you will stumble upon green certificates. Even though the phenomenon is relatively young, it is clear that it has a future. The only question is when international certificate trade will commence.

Several European countries are working on the development of national certification systems. International bodies like the European Commission, the IEA and Eurelectric support the general principle of market based stimulation of renewable energy demand. The RECS Group provides effective international exchange of information and promotes harmonisation of trade. Jos Benner of CEA[1] charts recent progress on behalf of the RECS Group.

Tradability of environmental benefits

Renewable energy has specific environmental benefits. However, as renewable energy is usually more expensive than conventional energy new renewable energy projects will only be realised if someone is willing to pay the extra cost. Willingness to invest will increase if investors receive satisfactory proof that the projects that they sponsor actually benefit the environment, particularly if this benefit has market value.

Green certificate systems allow environmental benefits (represented by certificates) to be traded independently from the physical energy, as an individual commodity. They allow renewable generation to take place at the most economically viable sites. The related environmental benefit can be 'consumed' elsewhere, and at another time.

Green certificates disclose the source of renewable energy and make trade reliable and transparent. This benefits generators, traders and consumers, provided there is adequate demand. Overall renewable energy production benefits the most through best use of available investment funds.

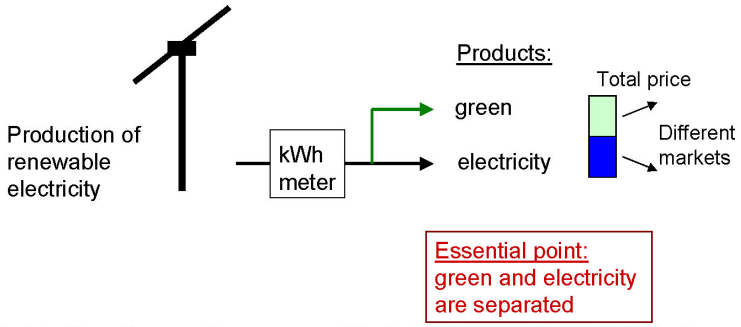


Figure 1: Principle One of renewable energy certificate trade; separate markets for the certificates and for the related physical energy.

International interest and activities

Governments in most West European countries are currently developing (or at least considering) national green certificate systems. Front runners are Italy, Flanders, Denmark, the United Kingdom and The Netherlands. These countries intend to introduce national certificate systems in 2001.

[1] *: *Jos Benner is a senior consultant for CEA (Consultants on Energy and the Environment), situated in Rotterdam. He manages the RECS secretariat.*

RECS promotes the use of renewable energy by making its environmental benefits tradable separately from the physical energy flow and under internationally harmonised rules.

RECS / CEA
pa: P.O. Box 21421
3001 AK Rotterdam
The Netherlands

Tel: (31) 10 280 56 13
Fax: (31) 10 280 56 54
Email: advies@cea.nl

RECS; THE RENEWABLE ENERGY CERTIFICATE SYSTEM

They are now working on the necessary legal basis, the issuing and trade procedures, etc. Some of these systems will encompass all renewable energy forms, others the electricity options only.

Existing experience gained from the Dutch green label trade system (which has been functioning since 1997 within the Dutch energy distribution sector), operational power exchanges and similar development processes in the USA, Canada and Australia can be drawn upon in the design of the systems.

The European Commission supports the development of green certificate structures through a number of 5th Framework and ALTENER projects, including RECerT, IntraCert, ELGREEN and REALM. Green certification also has a prominent position in the Commissions' recent new Directive on renewable energy.

The role of RECS

Early 1999, a small group of innovative representatives of energy industry took the initiative to promote international trade in renewable energy certificates. The pioneers believe that international harmonisation of the certificate trade is achievable, and will deliver far greater benefits than a series of disconnected national initiatives. The 'Renewable Energy Certificate System' (RECS) was born.

The RECS initiative started in The Netherlands, Denmark and the United Kingdom. Meanwhile over 50 participants from Belgium, Germany, Italy, France, Austria, Norway and Sweden and several international organisations joined the process. Other countries are showing interest, even from outside Europe. RECS Group members include major electricity sector companies, government departments, industry bodies and related specialists. Membership of the RECS Group is, in fact, open to all interested organisations and individuals. Activities are co-ordinated by an Executive, drawn from the energy industries of RECS Group members, currently EnergieNed (NL), DEF (DK), ENEL (I), Electrabel (B), HEW (D) and Enfo (N).

Similarity in topics to tackle

A large number of similar questions arise in all countries that are developing certificate systems. These questions concern the definition of renewable energy; the information that has to be included in a certificate; the life span of a certificate; the best way to monitor generation of renewable energy and trade; the relation with CO_2-credits and so on. Just because these issues are so international, the co-operation and harmonisation process led by RECS is crucial. RECS is now concentrating on the transition between phase 1 and phase 2 in the following diagram, obviously with an eye on the relevant longer term aspects.

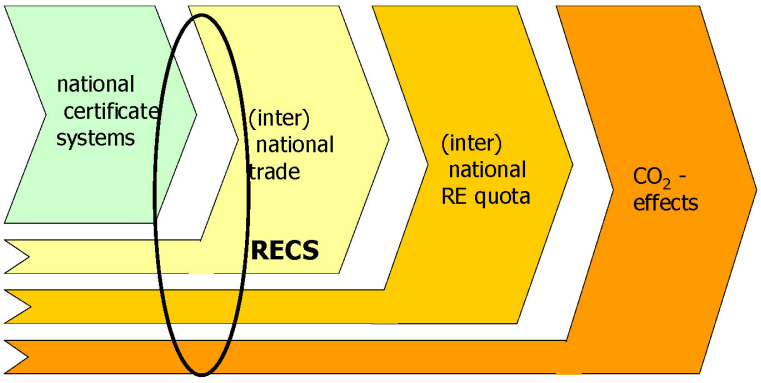


Figure 2: The main perspective of RECS in the wider policy context

RECS promotes the use of renewable energy by making its environmental benefits tradable separately from the physical energy flow and under internationally harmonised rules.

RECS / CEA
pa: P.O. Box 21421
3001 AK Rotterdam
The Netherlands

Tel: (31) 10 280 56 13
Fax: (31) 10 280 56 54
Email: advies@cea.nl

RECS; THE RENEWABLE ENERGY CERTIFICATE SYSTEM

RECS activities

RECS provides a platform for information exchange and collective action, leading to international harmonisation of green certificate trade. RECS meetings generally have a highly informative part, and a working part.

The principles of RECS are contained in the 'Basic Commitment', which has been drawn up and broadly agreed by the members of the RECS Group, although many details still have to be developed. Different sub-groups concentrate on the various roles proposed by the system, in particular certificate issuing and trade. The aim is to produce a transparent, efficient and flexible market, facilitated and regulated by credible, robust and trustworthy institutions and systems. Future stakeholders will demand this credibility, and RECS participants are committed to its achievement. Regular general RECS Group meetings ensure all groups remain well informed of each other's progress.

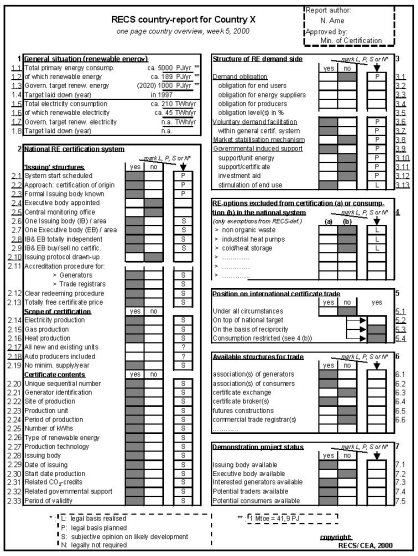
The quarterly general meetings have become too large to deal with specific topics on a plenary basis. These topics are now addressed by sub-groups, which meet more frequently.

Issuing Bodies

The Issuing Bodies within the RECS-group have joined forces to mutually improve their systems and stimulate international harmonisation. They are focusing on a series of topics, including: the link with CO2; the reciprocity principle; market transparency; the character of certificates and market stabilisation mechanisms. These are all tough topics, particularly at the international level, so they will need time to agree. Nevertheless, the Issuing Bodies are optimistic, and determined to bring their task to a successful conclusion. They will keep the other RECS members well informed of their progress, and involve them where necessary.

Country reports

A working group addressing the development of country reports has agreed a report structure which is used to create overviews of the national situation within the RECS countries. The participants in each country completed these reports, which are published on the restricted area of the RECS website: www.recs.org.


RECS country-report for Country X

one page country overview, week 5, 2000

Report author: N. Ame

Approved by: Mn. of Certification

1 General situation (renewable energy)

1.1 Total primary energy consump. ca. 5000 PJ/yr **

1.2 of which renewable energy ca. 150 PJ/yr **

1.3 Govern. target renew. energy (2020) 1000 PJ/yr **

1.4 Target laid down (year) in 1997

1.5 Total electricity consumption ca. 210 TWh/yr

1.6 of which renewable electricity ca. 15 TWh/yr

1.7 Govern. target renew. electricity n.a. TWh/yr

1.8 Target laid down (year) n.a

2 National RE certification system

'Issuing' structures — exp/n.L.R.S or N* — yes / no

2.1 System start scheduled P

2.2 Approach: certification of origin P

2.3 Formal issuing body known P

2.4 Executive body appointed P

2.5 Central monitoring office P

2.6 One issuing body (IB) / area P

2.7 One Executive body (EB) / area P

2.8 IB& EB totally independent P

2.9 IB& EB loan/sell no certific. P

2.10 Issuing protocol drawn-up P

2.11 Accreditation procedure for: P

- Generators P
- Trade registrars P

2.12 Clear redeeming procedure P

2.13 Totally free certificate price P

Scope of certification — yes / no

2.14 Electricity production

2.15 Gas production

2.16 Heat production

2.17 All new and existing units

2.18 Auto producers included

2.19 No minim. supply/year

Certificate contents — yes / no

2.20 Unique sequential number

2.21 Generator identification

2.22 Site of production

2.23 Production unit

2.24 Period of production

2.25 Number of MWh

2.26 Type of renewable energy

2.27 Production technology

2.28 Issuing body

2.29 Date of issuing

2.30 Start date production

2.31 Related CO_2-credits

2.32 Related governmental support

2.33 Period of validity

Structure of RE demand side — exp/n.L.R.S or N* — yes / no

Demand obligation P

obligation for end users

obligation for energy- suppliers

obligation for producers

obligation level(s) in %

Voluntary demand facilitation P

within general certif. system P

Mark-of stabilisation mechanism P

Governmental induced support P

support/unit energy P

support/certific ate P

investment aid P

stimulation of end use L

RE-options excluded from certification (a) or consumption (b) in the national system (only exemptions from RECS-set.) — (a) (b)

- non organic waste
- industrial heat pumps L
- coldheat storage L
-
-
-

Position on international certificate trade — yes / no

Under all circumstances

On top of national target

On the basis of reciprocity

Consumption restricted (see 4 (b))

Available structures for trade — exp/n.L.R.S or N* — yes / no

association(s) of generators

association(s) of consumers

certificate exchange

certificate broker(s)

futures constructions

commercial trade registrar(s)

Demonstration project status — exp/n.L.R.S or N* — yes / no

Issuing body available

Executive body available

Interested generators available

Potential traders available

Potential consumers available

E: legal basis realised

P: legal basis planned

S: subjective opinion on likely development

N: legally not required

copyright RECS/CEA, 2000

Figure 3: the format of the one page overview, as part of the RECS country-report

Test phase

The most substantial working group addresses the RECS test phase. The major aim of the test phase will be to prove that the mechanism for reliable, robust and transparent international certificate trade, as proposed by RECS, really works. The test phase will have to show that the mechanism is credible, fraud-resistant and self-correcting and that it really promotes the use of renewable energy in the future energy market.

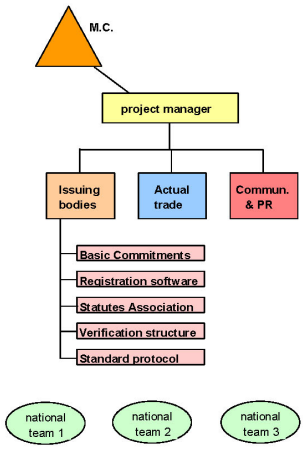
The aim of the test phase will not yet be to demonstrate the effects of the market mechanism of demand and supply or to prove the profitability of the system. Trading volumes in the test phase are expected to be too small for that purpose and it is not realistic to expect a perfect system right from the beginning.

RECS; THE RENEWABLE ENERGY CERTIFICATE SYSTEM

The test phase has four stages: orientation, design, implementation and operation. The operational stage is scheduled to start January 1st, 2001.

The project manager for the test phase preparation directly reports to the RECS Management Committee. Three working groups (issuing, trade and commu-nication) are doing the actual work. They are assisted by five task forces and by national teams from a series of RECS countries.

The Test phase will include real trade transactions and real money. The Issuing Bodies have expressed their willingness to support the 'real' test phase



RECS Seminar and more information

Whilst interest in the system is high, these remain early days on the road to a fully functioning market. The RECS Group is fully aware of the scale of the challenge, and the need to convince all actors of the potential advantages of the system. The RECS Group intends to have a public seminar on tradable green certificates in co-operation with the EU-sponsored projects RECerT, InTraCert and ELGREEN. The seminar will be held in Brussels on Thursday 12 October 2000.

Until then, more information on RECS can be obtained from the RECS website at http://www.recs.org, and from the RECS secretariat (see below for contact details).

RECS promotes the use of renewable energy by making its environmental benefits tradable separately from the physical energy flow and under internationally harmonised rules.

RECS / CEA
pa: P.O. Box 21421
3001 AK Rotterdam
The Netherlands

Tel: (31) 10 280 56 13
Fax: (31) 10 280 56 54
Email: advies@cea.nl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Green Power Marketing in Europe
Presentation at the 5th National Green Power Marketing Conference
Denver, August 7/8, 2000
Dr. Rolf Wüstenhagen
Institute for Economy and the Environment (IWOe-HSG) @
St. Gallen University,
and Centre for Energy Policy and Economics (CEPE) @
Swiss Federal Institutes of Technology, Zurich
http://www.iwoe.unisg.ch/institut/rwu.htm
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Outline
• Intro: Competitive European Retail Markets for Electricity: Germany as an Example
• Customer Attitudes towards Green Electricity in Europe
• Marketing Strategies to Enhance Customer Demand
• Policy Support for Renewables and Green Power
• Conclusions
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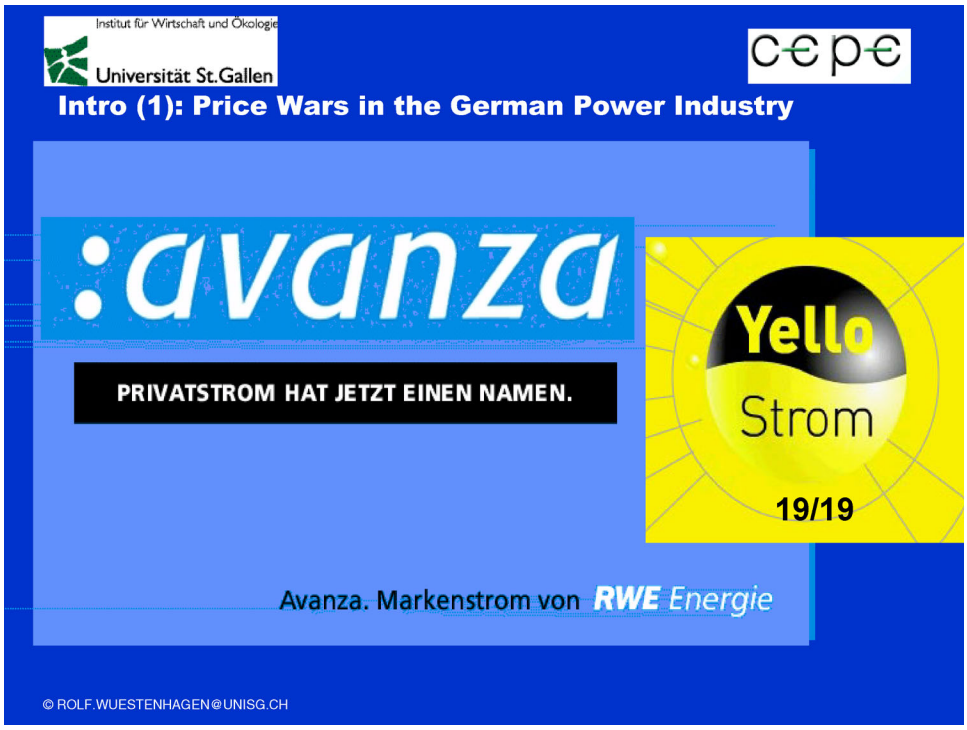
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Intro (1): Price Wars in the German Power Industry
:avanza
PRIVATSTROM HAT JETZT EINEN NAMEN.
Yello
Strom
19/19
Avanza. Markenstrom von RWE Energie
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Intro (2): New Competitors
Das elektrisiert Deutschland.
ProMarkt
Wir sind die Guten.
Neuigkeiten
Wir über uns
Services
Angebote
FunMarkt
Standorte
Kontakt + Hilfe
Home
ares
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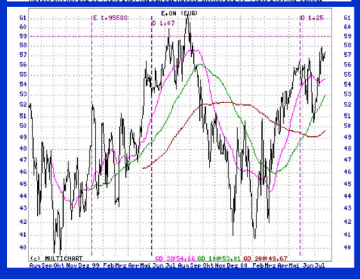
Intro (3): Profit Margins & Stock Prices declining

RWE

EnBW

e.on



Bewag

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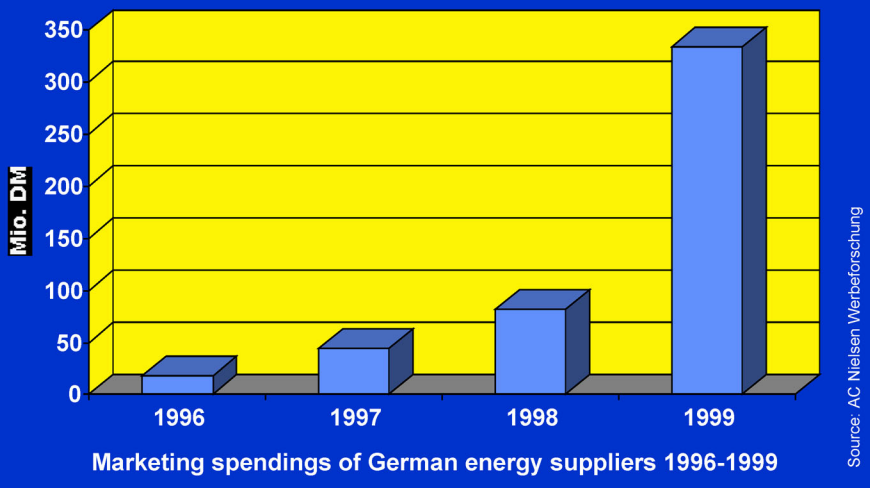
Intro (4): Massive increase in marketing spendings



Marketing spendings of German energy suppliers 1996-1999

Source: AC Nielsen Werbeforschung

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No Future for the European Power Industry?

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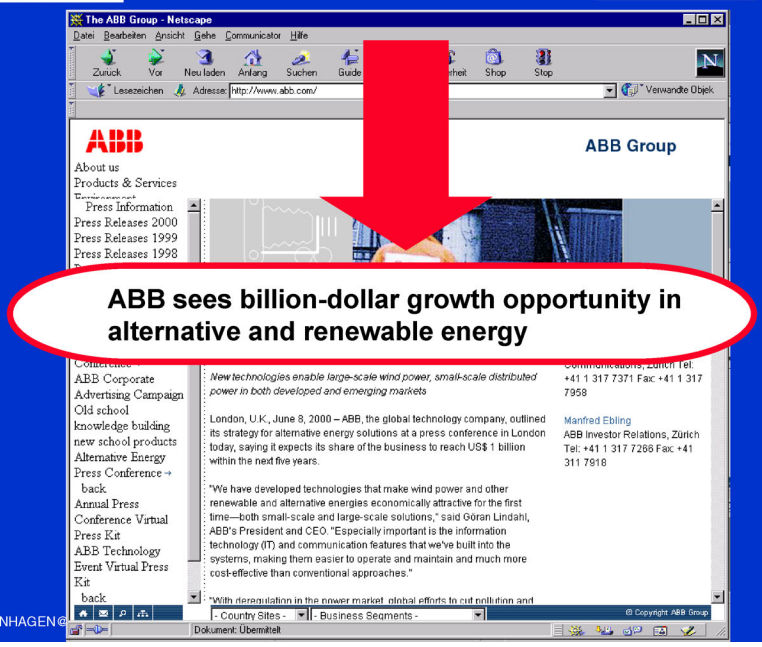


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Netscape: GreenMountain.com - Live Webcast
greenmountain.com
BP Amoco
GreenMountain.com
Webcast
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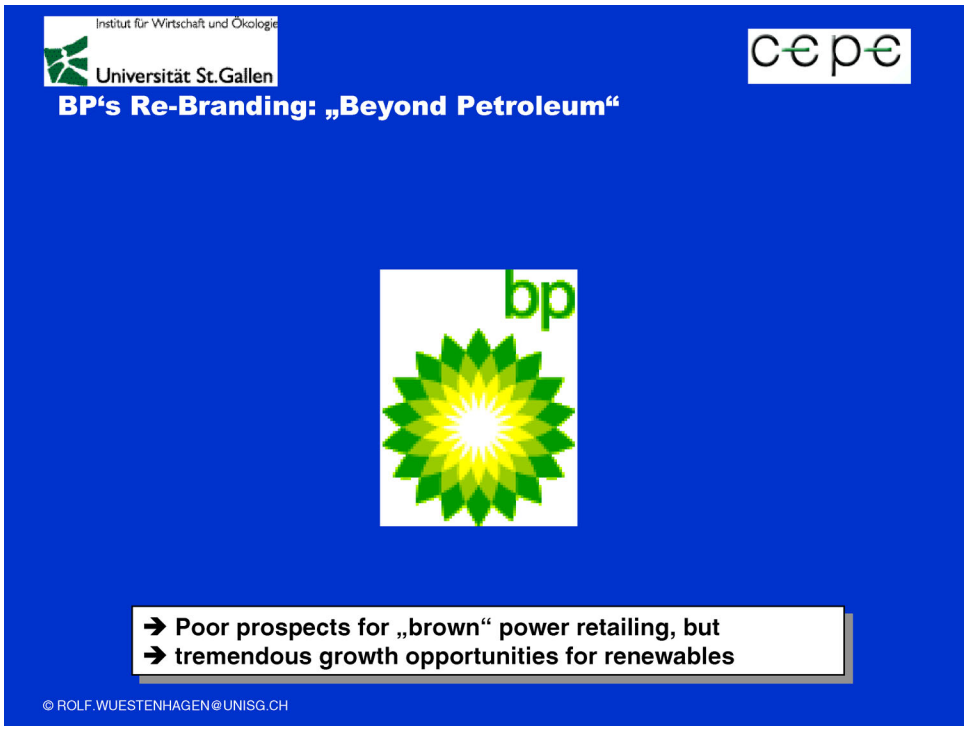
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BP's Re-Branding: „Beyond Petroleum"
bp
➔ Poor prospects for „brown" power retailing, but
➔ tremendous growth opportunities for renewables
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Customer Attitudes in the European Green Power Market

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Customer attitudes towards renewables in Germany:

- „80 % of the Germans would switch to renewables rather today than tomorrow“ (Welt am Sonntag, 10.10.99)
- 23 % of German electricity customers would probably buy green power in the near future (Forsa-Umfrage, i.A. der Zeitschrift GELDidee 19/99)
- 89 % (75 %) of German consumers welcome the opportunity to buy electricity from clean, environmental friendly sources. 22 % (35%) would be prepared to pay a 15 % premium (Infas 1999, Emnid 1999)
- 43 % of the Germans prefer their current utility as green power supplier, 33 % would prefer a new entrant
  (EMNID-Energiemarktforschung 7/98)

➔ Widespread preferences for renewables
➔ This, however, is far from actual purchasing decisions

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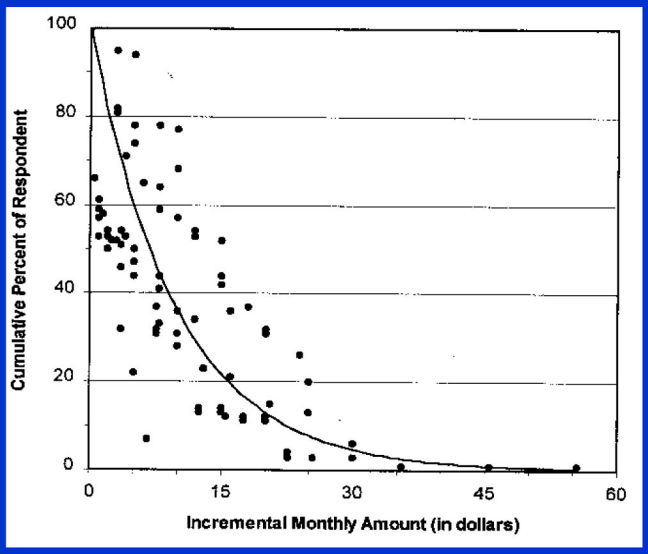
US Customers are willing to pay more for renewables...



Source: Farhar 1999

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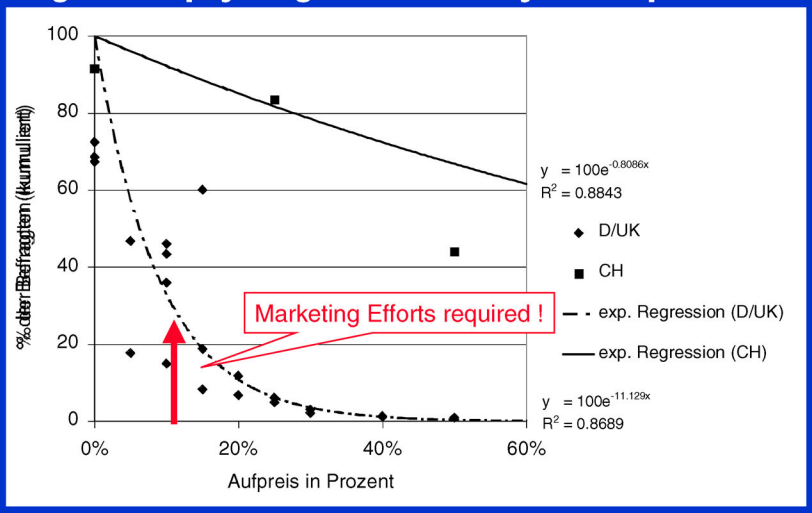
...and so do their European Counterparts: Willingness to pay for green electricity in Europe



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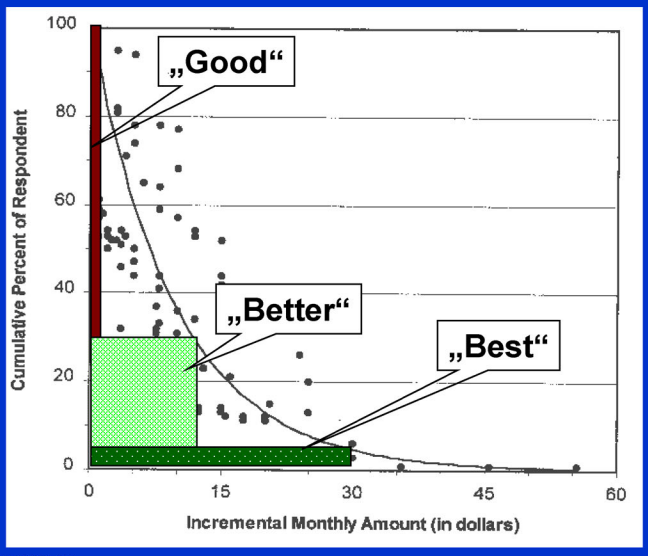
...different products reflect different willingness to pay:



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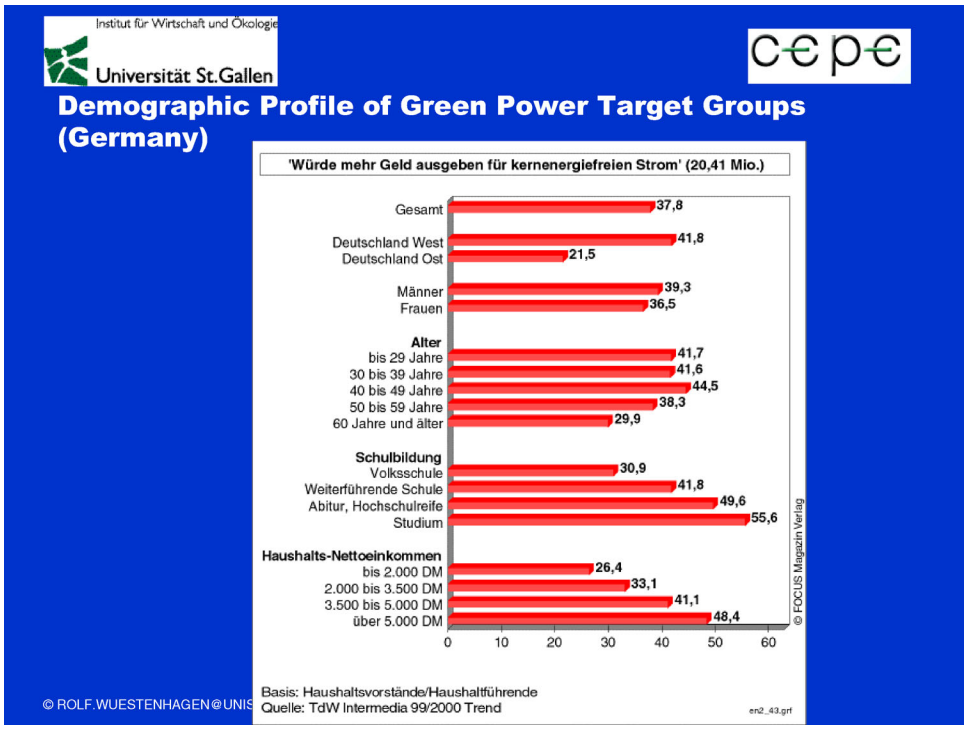
Who are the green power customers?
1998 Green Gauge Report
by Roper Starch Worldwide

- True-Blue Greens 11 %
- Greenback Greens 5 %
- Sprouts 33 %
- Grousers 15 %
- Basic Browns 34 %

Source: Roper Starch Worldwide 1998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Demographic Profile of Green Power Target Groups (Germany)
'Würde mehr Geld ausgeben für kernenergiefreien Strom' (20,41 Mio.)
Gesamt 37,8
Deutschland West 41,8
Deutschland Ost 21,5
Männer 39,3
Frauen 36,5
Alter
bis 29 Jahre 41,7
30 bis 39 Jahre 41,6
40 bis 49 Jahre 44,5
50 bis 59 Jahre 38,3
60 Jahre und älter 29,9
Schulbildung
Volksschule 30,9
Weiterführende Schule 41,8
Abitur, Hochschulreife 49,6
Studium 55,6
Haushalts-Nettoeinkommen
bis 2.000 DM 26,4
2.000 bis 3.500 DM 33,1
3.500 bis 5.000 DM 41,1
über 5.000 DM 48,4
0 10 20 30 40 50 60
© FOCUS Magazin Verlag
Basis: Haushaltsvorstände/Haushaltführende
Quelle: TdW Intermedia 99/2000 Trend
en2_43.grf
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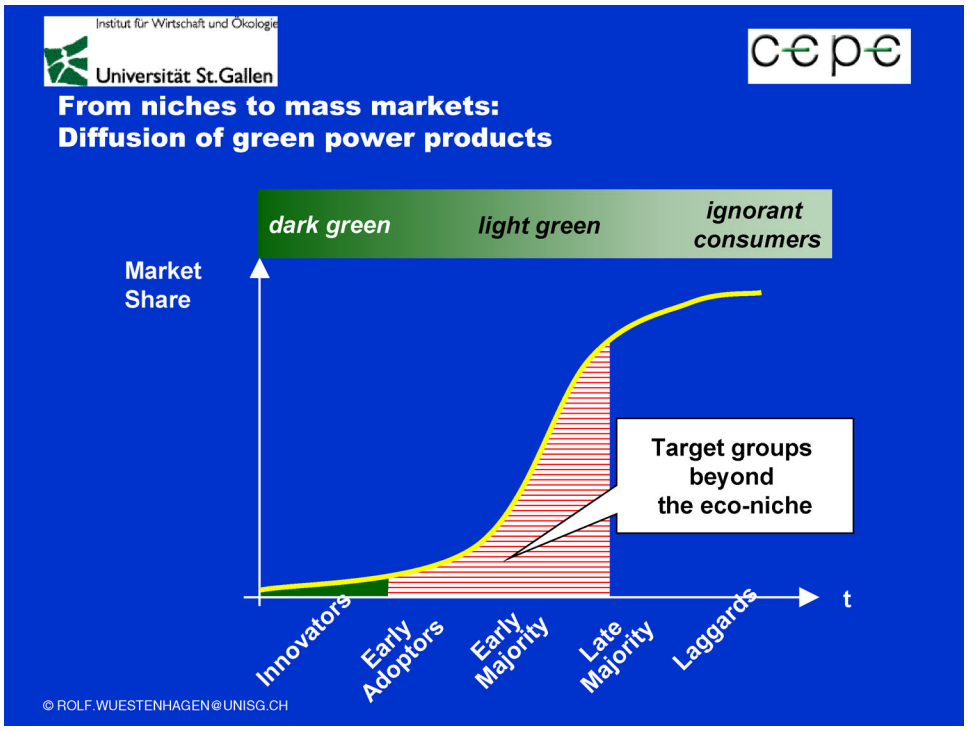
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From niches to mass markets:
Diffusion of green power products
dark green
light green
ignorant consumers
Market Share
Target groups beyond the eco-niche
t
Innovators
Early Adoptors
Early Majority
Late Majority
Laggards
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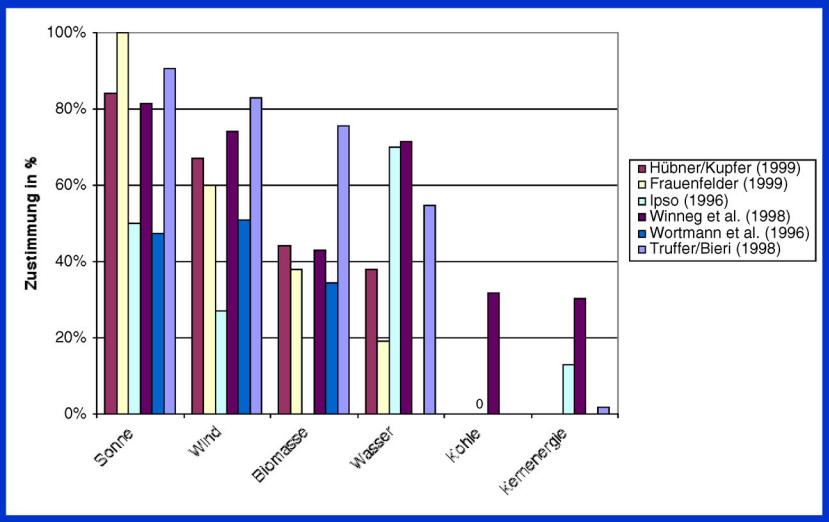
Customers prefer solar and wind, hydro preferences are somewhat country specific



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Business customers play an important role in growing the green power market, e.g.

- Thames Water

- Lörrach Church District Kindergartens
- Green Party in several German Länder
- several small Eco Businesses in Germany

- Credit Suisse
- Swisscom

- ...and many others...

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Conclusions: Customer Attitudes

- A large majority of Europeans thinks positively about renewables
- A majority in most countries says they would be prepared to buy renewables, even at a premium
- However, the actual market share of green power products is typically below 1 %, with minor exceptions (e.g. the Netherlands)

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Green Power Marketing Strategies in Europe

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Several Green Power Marketing Start-Ups have entered the German Market

NaturEnergie

naturstrom

GREENPEACE energy

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Existing Utilities have converted their Green Pricing Schemes to competitive Green Power Products

RWE Energie

DER ÖKOSTROM MIT TÜV-PLAKETTE

:avanza

MVV Wissen schafft Lösungen

TERRA DER GRÜNE STROM

energreen

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80+ Swiss utilities offer some sort of green power scheme

- 25'000 residential customers
- 4 Mio. kWh solar electricity sold
- participation rates up to 4.5 %
- actual market share < 1 %
- typical price premium (per kWh) 600-800 %

ewz Die Energie

➔ amazingly successful (given the price level), but strictly niche-oriented

➔ move towards differentiated product range can be seen, e.g. EBM

Solar-Strom | Rainbow-Mix | WKK-Strom

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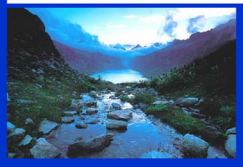
Branding electricity + tourist destinations in Switzerland

PURE GRAUBÜNDEN POWER

PURE St. Moritz® POWER

KWO GRIMSELSTROM



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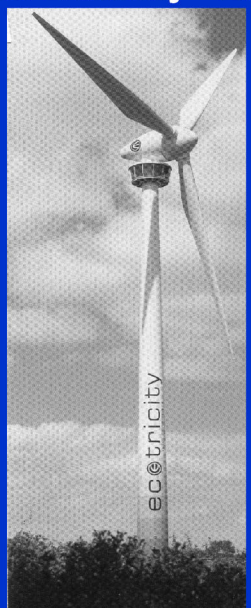
Branding a wind turbine: Ecotricity - The Renewable Energy Company UK



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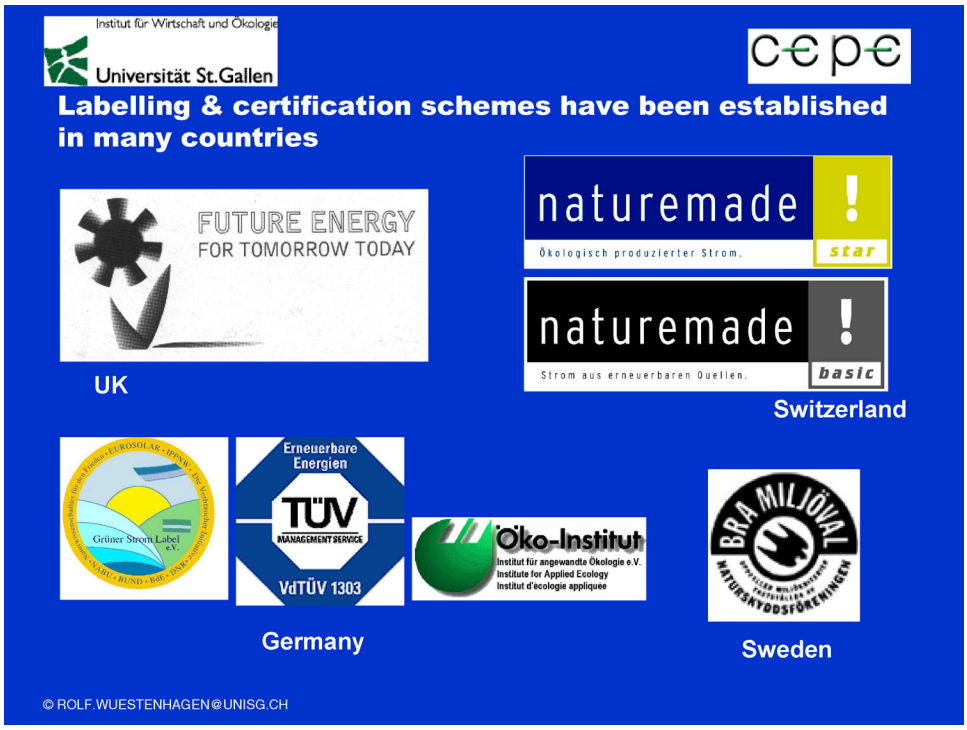
Market Facilitation Efforts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Labelling & certification schemes have been established in many countries
FUTURE ENERGY
FOR TOMORROW TODAY
UK
naturemade star
Ökologisch produzierter Strom.
naturemade basic
Strom aus erneuerbaren Quellen.
Switzerland
Grüner Strom Label e.V.
Erneuerbare Energien
TÜV
MANAGEMENT SERVICE
VdTÜV 1303
Öko-Institut
Institut für angewandte Ökologie e.V.
Institute for Applied Ecology
Institut d'écologie appliquée
Germany
BRA MILJÖVAL
NATURSKYDDSFÖRENINGEN
Sweden
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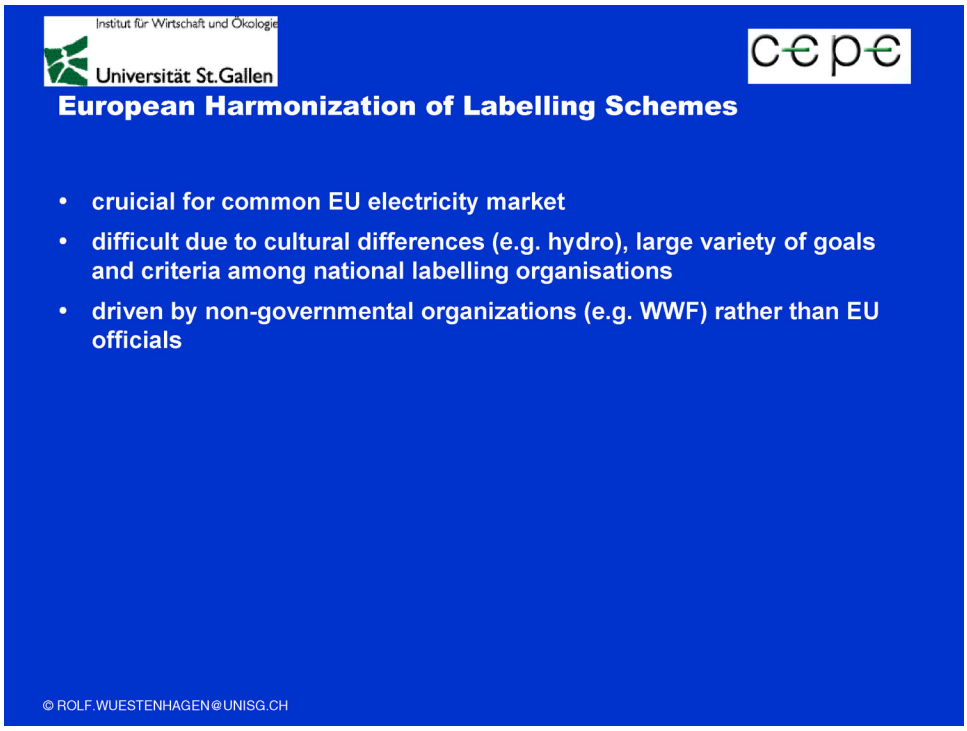
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European Harmonization of Labelling Schemes
• cruicial for common EU electricity market
• difficult due to cultural differences (e.g. hydro), large variety of goals and criteria among national labelling organisations
• driven by non-governmental organizations (e.g. WWF) rather than EU officials
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Public Policy Support for Renewables

- Ambitious targets by EU commission (doubling RES by 2010)
- further enhanced by Kyoto protocol and...
- ...national policies (NFFO, EEG), but:

➔ strong focus on generation

➔ few informed policies to enhance the retail market

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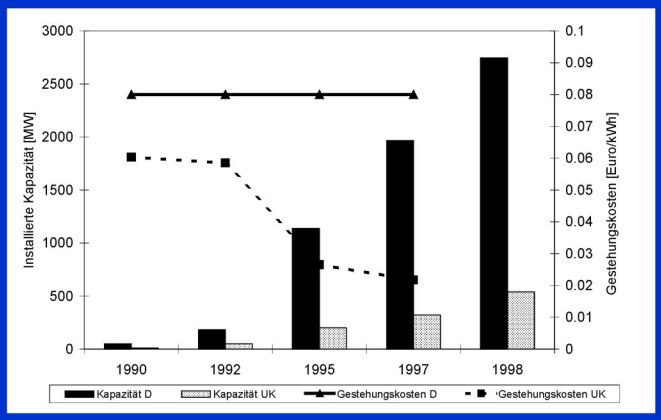
Market-based vs. Public-policy-based approaches to renewables promotion in Europe: Germany vs. UK



- Fixed feed-in tariffs in Germany were highly effective, but not very efficient
- Competitive bidding scheme in UK drives cost down, but does not bring much capacity online

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Market - Policy Interface

- UK tax exemption for renewables expected to create strong impetus for business customers to switch to green power
- Strong German government support seems to have negative impact on creating a viable retail market for green power
- Green Power Marketing stronger where public policy support for renewables is weaker?

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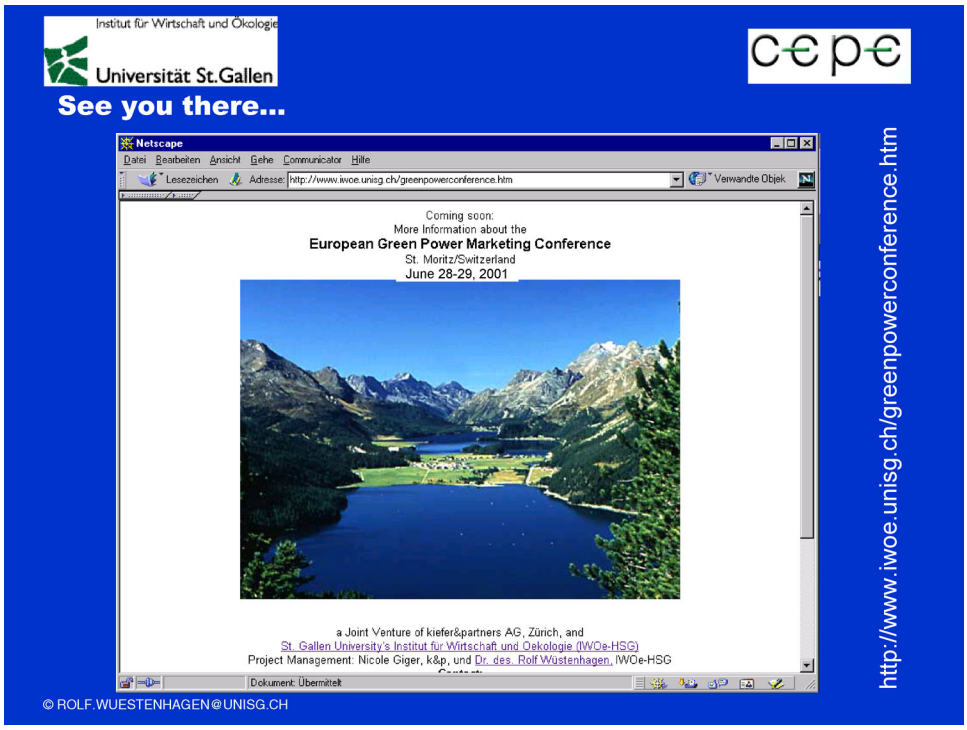
Conclusions

- Many parallels between the US and main European markets
- Some significant differences among European countries...
  - extent of government support for renewables
  - pace of market liberalisation
  - customer willingness to pay
  - preferences for certain renewable technologies
  - # and degree of professionalization of green power marketers
  - competitive pressure from „brown“ providers
- ...make pan-European approaches to both marketing & policy a challenge
- stronger policy support is probably good for renewables, but includes difficulties for green power marketers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See you there...
Netscape
Datei Bearbeiten Ansicht Gehe Communicator Hilfe
Lesezeichen
Adresse: http://www.iwoe.unisg.ch/greenpowerconference.htm
Verwandte Objekt
Coming soon:
More Information about the
European Green Power Marketing Conference
St. Moritz/Switzerland
June 28-29, 2001
a Joint Venture of kiefer&partners AG, Zürich, and
St. Gallen University's Institut für Wirtschaft und Oekologie (IWOe-HSG)
Project Management: Nicole Giger, k&p, und Dr. des. Rolf Wüstenhagen, IWOe-HSG
Dokument: Übermittelt
http://www.iwoe.unisg.ch/greenpowerconference.htm
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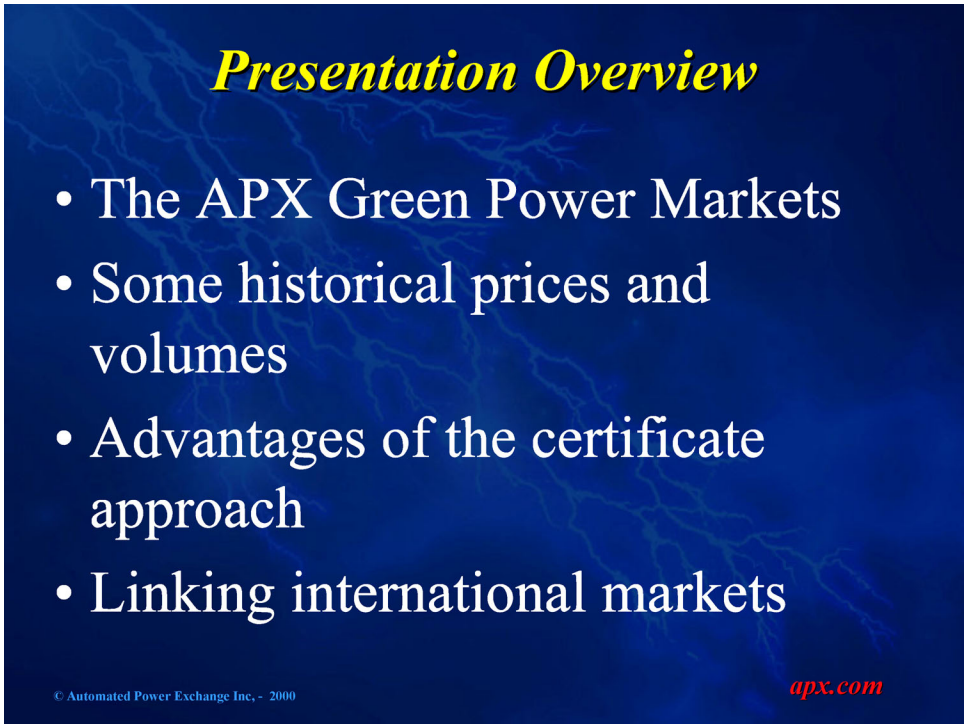
Linking International
Green Power Markets:
Lessons from the APX Green Tickets
Fifth National Green Power Marketing Conference
Denver, Colorado
August 7-8, 2000
Automated
Power Exchange
Michael Rucker
Director, Green Power Markets
Automated Power Exchange
mrucker@apx.com


Presentation Overview
• The APX Green Power Markets
• Some historical prices and volumes
• Advantages of the certificate approach
• Linking international markets
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apx.com

APX Green Power Market

- Two components of green power:
  - Commodity Energy, delivered in real-time and traded up to a week-ahead
  - Green Ticket, created by green generation, issued after meter is read, and traded in a yearly market
- Green Power Price = Hourly Electricity Price + Green Ticket Premium
- APX Green Power Market provides method for generators to sell firm green power and buyers to purchase firm green power

apx.com

Types of APX Green Tickets (In California)

- Technologies:
  - Geothermal
  - Biomass
  - Wind
  - Small Hydro
  - Solar
  - Landfill Gas
  - Generic Green
- Plant Vintage:
  - Existing
  - New
- CEC Eligibility:
  - Eligible
  - Non-eligible

apx.com

Types of APX Green Tickets (In Illinois)

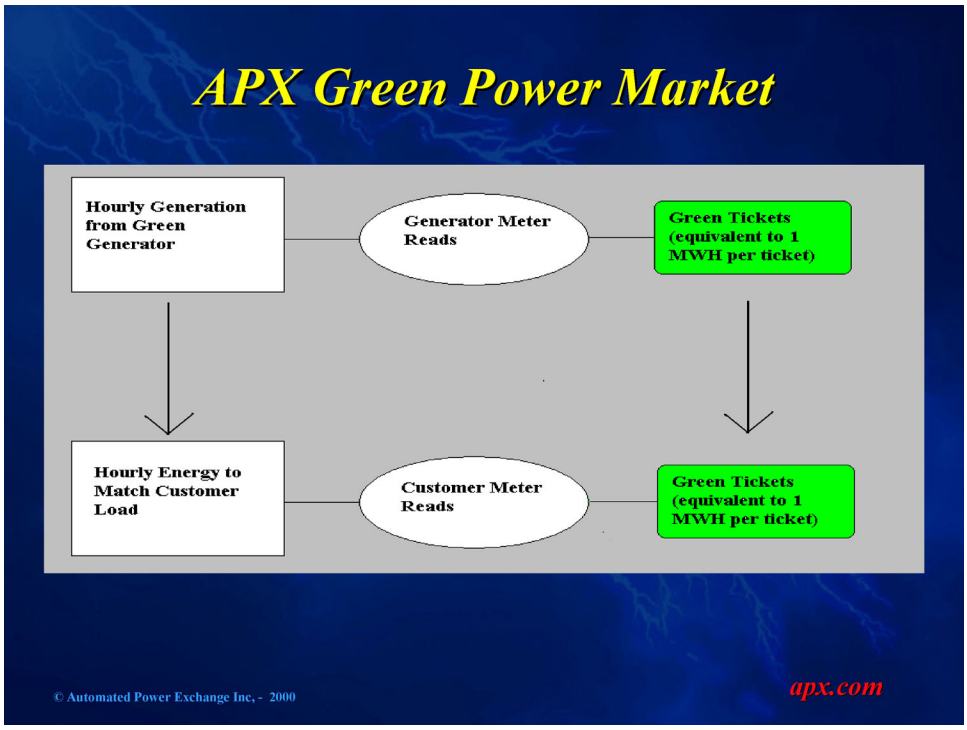
- *EcoPower by ComEd* - extra premium from this ticket is re-invested into new renewable energy projects, and certified by Environmental Resources Trust (ERT)
- *Generic Renewable* - any renewable plant can sell into this category

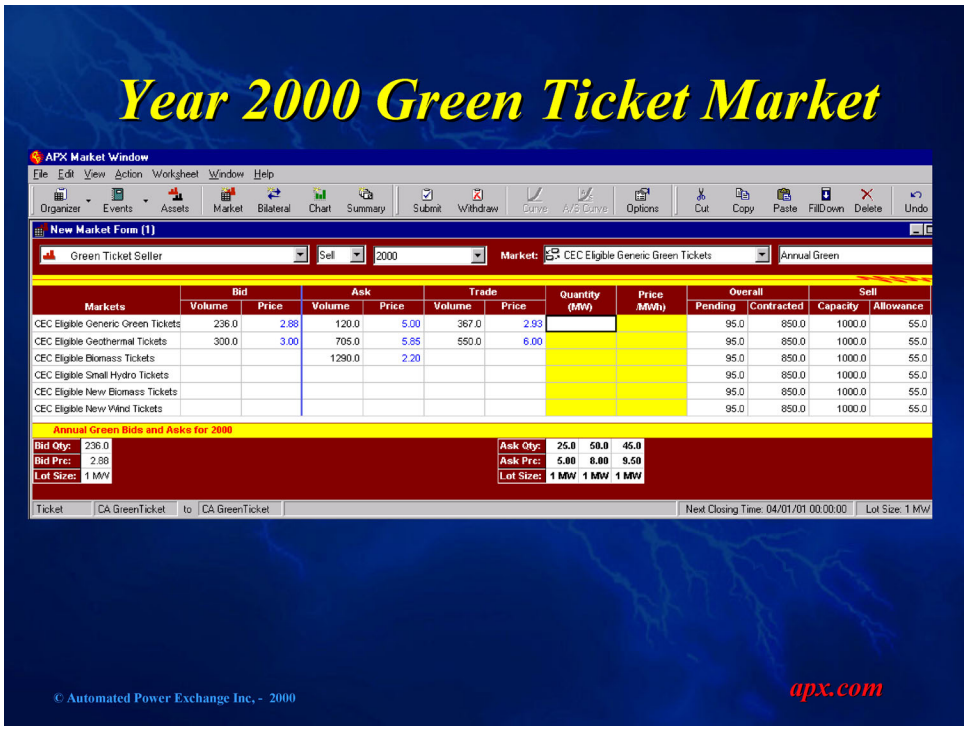
apx.com

Buying and Selling Green Tickets

- Generators can only sell into their own technology/vintage/CEC or ERT eligibility and the "generic green" category
- Buyers can purchase from any technology/vintage/CEC/ERT eligibility

apx.com


APX Green Power Market
Hourly Generation from Green Generator
Generator Meter Reads
Green Tickets (equivalent to 1 MWH per ticket)
Hourly Energy to Match Customer Load
Customer Meter Reads
Green Tickets (equivalent to 1 MWH per ticket)
© Automated Power Exchange Inc, - 2000
apx.com


Year 2000 Green Ticket Market
APX Market Window
File Edit View Action Worksheet Window Help
Organizer Events Assets Market Bilateral Chart Summary Submit Withdraw Curve Adj Curve Options Cut Copy Paste FillDown Delete Undo
New Market Form (1)
Green Ticket Seller
Sell
2000
Market:
CEC Eligible Generic Green Tickets
Annual Green
Markets
Bid Volume Bid Price
Ask Volume Ask Price
Trade Volume Trade Price
Quantity (MW)
Price /MWh
Overall Pending Overall Contracted
Sell Capacity Sell Allowance
CEC Eligible Generic Green Tickets 236.0 2.88 120.0 5.00 367.0 2.93 95.0 850.0 1000.0 55.0
CEC Eligible Geothermal Tickets 300.0 3.00 705.0 5.85 550.0 6.00 95.0 850.0 1000.0 55.0
CEC Eligible Biomass Tickets 1290.0 2.20 95.0 850.0 1000.0 55.0
CEC Eligible Small Hydro Tickets 95.0 850.0 1000.0 55.0
CEC Eligible New Biomass Tickets 95.0 850.0 1000.0 55.0
CEC Eligible New Wind Tickets 95.0 850.0 1000.0 55.0
Annual Green Bids and Asks for 2000
Bid Qty: 236.0
Bid Prc: 2.88
Lot Size: 1 MW
Ask Qty: 25.0 50.0 45.0
Ask Prc: 5.00 8.00 9.50
Lot Size: 1 MW 1 MW 1 MW
Ticket CA GreenTicket to CA GreenTicket
Next Closing Time: 04/01/01 00:00:00
Lot Size: 1 MW
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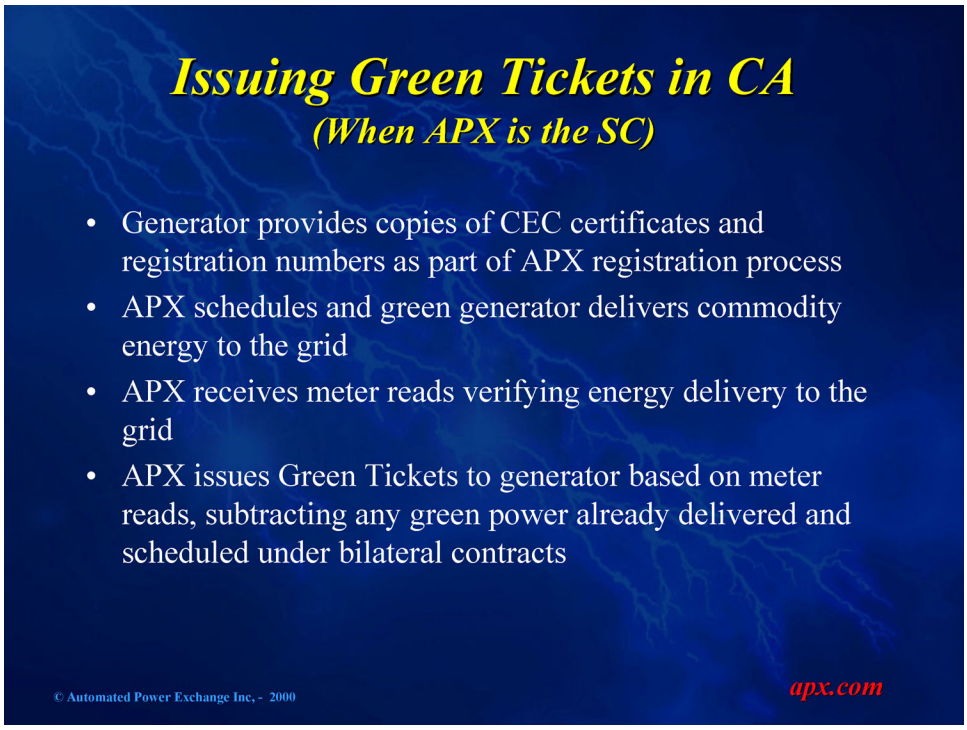
apx.com


Issuing Green Tickets in CA
(When APX is the SC)
• Generator provides copies of CEC certificates and registration numbers as part of APX registration process
• APX schedules and green generator delivers commodity energy to the grid
• APX receives meter reads verifying energy delivery to the grid
• APX issues Green Tickets to generator based on meter reads, subtracting any green power already delivered and scheduled under bilateral contracts
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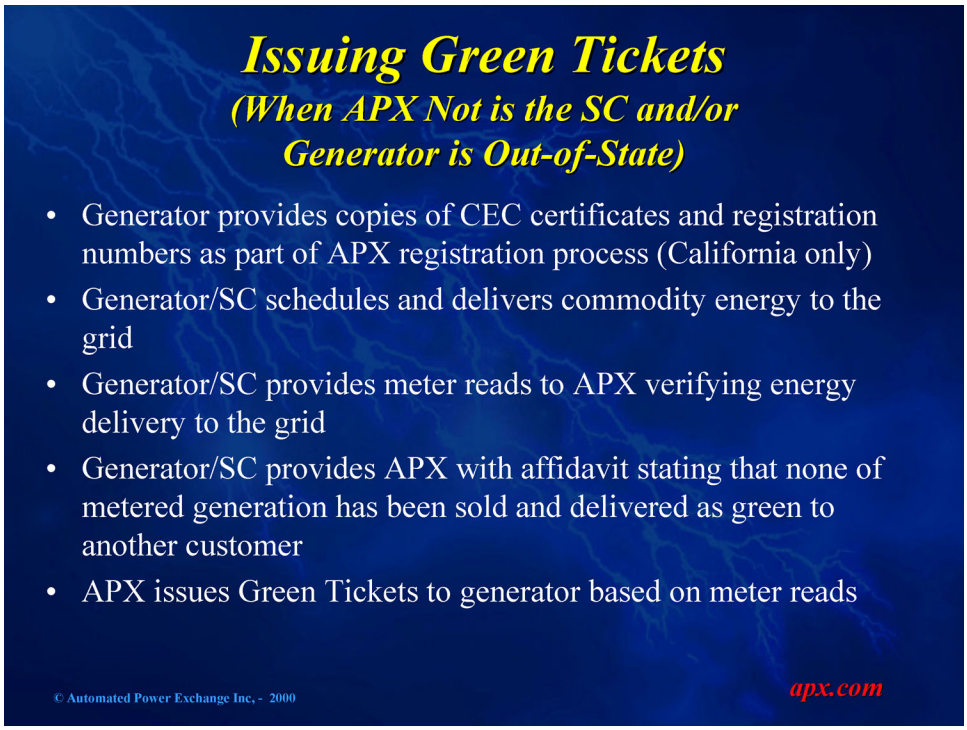
Issuing Green Tickets
(When APX Not is the SC and/or
Generator is Out-of-State)
• Generator provides copies of CEC certificates and registration numbers as part of APX registration process (California only)
• Generator/SC schedules and delivers commodity energy to the grid
• Generator/SC provides meter reads to APX verifying energy delivery to the grid
• Generator/SC provides APX with affidavit stating that none of metered generation has been sold and delivered as green to another customer
• APX issues Green Tickets to generator based on meter reads
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APX Green Ticket Market

- Current system provides means for
  - tracing and verifying renewable power production and purchases
  - verifying renewable supplier's claims
  - trading Green Tickets
- APX system tracks both APX Green Ticket trades and bilateral trades
- APX system is expanding as out-of-state green generators are added to the APX Green Power Market
- Provides simple, inexpensive and accurate method to track power production and delivery

apx.com

Summary of Average Prices by Technology for APX Year 1999 Green Tickets traded from May 1999 through July 31, 2000

Commodity	Volume Traded (MWH)	Average Price ($/MWH)
CEC Eligible Generic Green Tickets	226,540	1.42
CEC Eligible Geothermal Tickets	392,211	3.08
CEC Eligible Biomass Tickets	23,448	3.53
CEC Eligible Small Hydro Tickets	3,591	5.99
CEC Eligible New Biomass Tickets	4,002	4.22
CEC Eligible New Wind Tickets	1,397	21.01
	651,189	2.58

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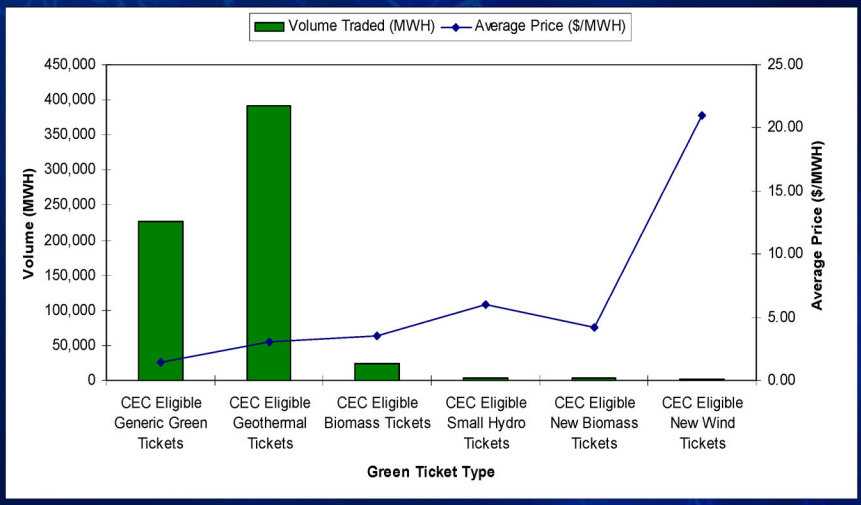
Volume and Prices for Year 1999 Tickets



apx.com

Summary of Average Prices by Technology for APX Year 2000 Green Tickets traded from Jan 1 - July 31, 2000

Commodity	Volume Traded (MWH)	Average Price ($/MWH)
CEC Eligible Generic Green Tickets	98,038	3.76
CEC Eligible Geothermal Tickets	56,977	4.01
CEC Eligible Biomass Tickets	23,448	3.53
CEC Eligible Small Hydro Tickets	21,780	4.14
CEC Eligible New Biomass Tickets	2,800	3.95
CEC Eligible New Wind Tickets	6	10.21
	203,049	3.85

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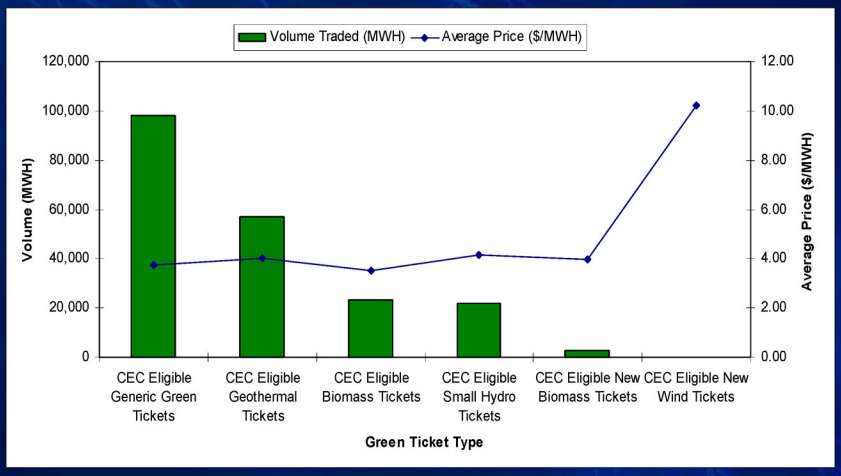
Volume and Prices for Year 2000 Tickets



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Advantages of Certificate Trading Approaches

- Removes time-specific requirement (easier on intermittent generators)
- Makes verification easier. Less administrative burden for regulatory authorities.
- Premiums go directly to owners of assets
- A market based mechanism. Provides for a more liquid green exchange.
- Certificates applicable to other generation attributes: SO_2, NO_x, CO_2

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Linking International Markets

- For these reasons, certificate trading has strong appeal and good prospects in most US regions
- Outside of the USA, prototype certificate systems underway in 5 countries, being considered in 10 RECs countries, Japan, Australia, Poland and the list is growing
- APX is opening an exchange in UK, Japan and Sweden and is considering green products in these markets

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Linking International Markets

- Some challenges:
  - pace of deregulation: progress of EC market-opening directive slow in some countries
    - Denmark, Sweden, developing certificates and ambitious RPS, market phase-in 2002
    - UK -- NETA regulations (penalties for intermittent generators, climate levy)
  - a common market requires a common product
    - green power definitions differ by country/state jurisdictions
    - eligible generation for Renewable Portfolio Standards can differ substantially by state
    - definition of technologies, applicability of incentive programs are not harmonized

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Linking International Markets

- Other challenges
  - certification and verification
    - several institutions are offering different certification standards
    - cross-border verification potentially difficult
  - Regulation should encourage efficient markets, not hinder them
    - Example, capping certificate price (considered in UK, Australia). Obligations "crowding-out" market.
      - some say will remove incentive to comply (penalty price becomes price)
      - price ceilings can deter some technologies (ex., new wind power in CA
    - Alternatives, options markets: hedge against high prices, technology bands

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Linking International Markets

- From the perspective of the private sector:
  - start trading early, gain experience
  - allow certificates to trade separately from energy (increases liquidity, etc.)
  - allow for multiple technology attributes. Countries have different definitions/standards.
  - Harmonized definitions lower costs, allow for asset comparability, facilitates cross-border and international trades

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Linking International Markets
• Think ahead … how will carbon trading markets affect nascent certificate markets ...
• … and how can we make sure that they add to the incentives.
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The Cost of Green Power in Competitive Power Markets

August 8, 2000

Presented at the Fifth National Green Power Marketing Conference by
Jan Pepper
President
Clean Power Markets, Inc.

pepper@cleanpowermarkets.com

Clean Power Markets, Inc.

Defining Green Power

- Two components of green power:
  - Commodity Energy
    - delivered real-time into the grid by ALL power plants
    - can be sold forward or in spot markets close to delivery
    - price reflects different value placed on peak and off-peak power
    - typically "pre-scheduled" into a utility or ISO control area
  - Green Certificates
    - represent the environmentally preferable attributes of a renewable power plant
    - purely financial transaction with value determined by market
    - does not need to be scheduled into the grid, or even originate from the same grid
    - quantity produced based on a generator's meter read

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California's Competitive Green Market

- California's energy markets opened on March 31, 1998
- Green power is traded bilaterally and through APX Green Power Market
- California Energy Commission administers subsidies of $540 million over 4-year "transition period" for:
  - generators through the existing renewables, new renewables and emerging renewables accounts
  - end-use customers through the customer credit

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Price Paid to Generators in CA Competitive Market

- CEC Subsidy Based on Existing or New Technologies Account

  PLUS
- Bilaterally-Agreed Price
  - **OR**
- Hourly Commodity Price and
- Green Premium

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Subsidies for "Existing" Generators

- Biomass and Solar Thermal:
  - 1 ¢/kWh in 2000 and 2001, with target price of 4¢/kWh in 2001 and 3.5 ¢/kWh in 2001
- Wind:
  - 1 ¢/kWh, with target price of 3.5¢/kWh
- Geothermal, Small Hydro, Landfill Gas:
  - 1 ¢/kWh, with target price of 3¢/kWh

(Target price based on SRAC of utilities)

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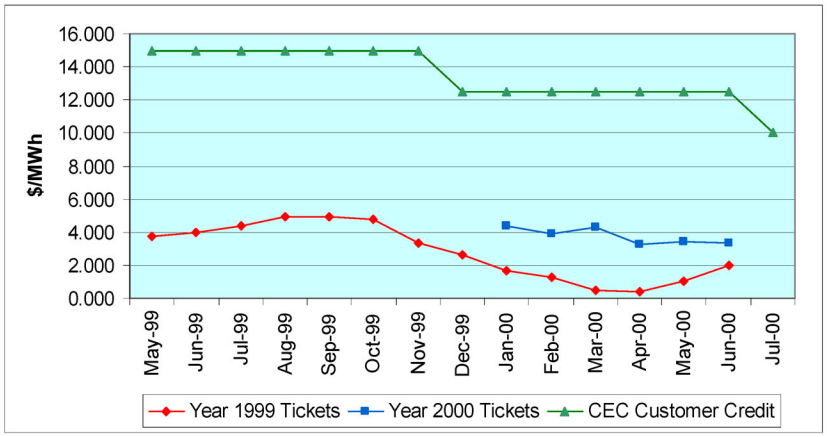
Monthly Average Green Ticket Price



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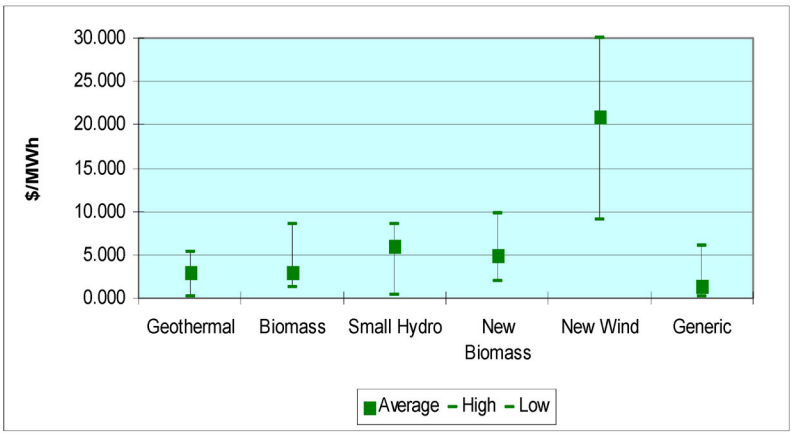
Average, High and Low Prices for Year 1999 Tickets



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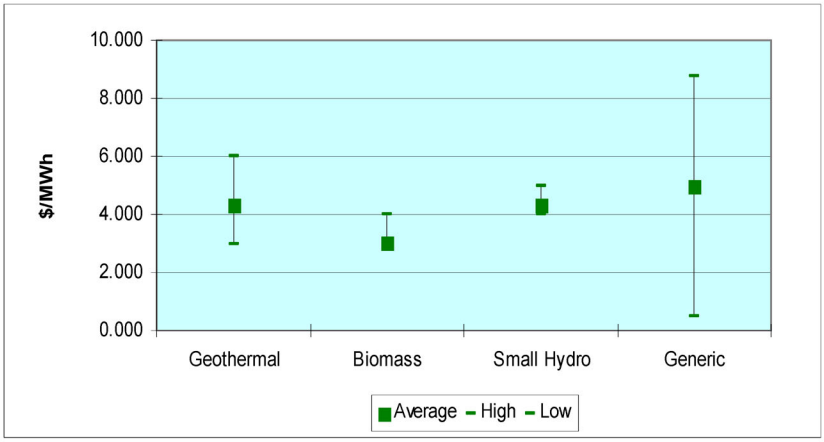
Average, High and Low Prices for Year 2000 Tickets



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What do these prices mean?

- Premiums are affected by Customer Credit
- Customer Credit is important in maintaining the green market in CA
- New resources command a higher premium
- Resources in shorter supply command a higher premium

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What else does the green market need?

- Acceptance of unbundling of green attribute from energy in all states
- Verification process from generator to end-user that crosses state boundaries
- Transparent and liquid green certificate markets in more places than CA

Clean Power Markets, Inc.

Clean Power Markets, Inc.

- Jan Pepper
- phone: 650-949-5719
- pepper@cleanpowermarkets.com
- www.cleanpowermarkets.com

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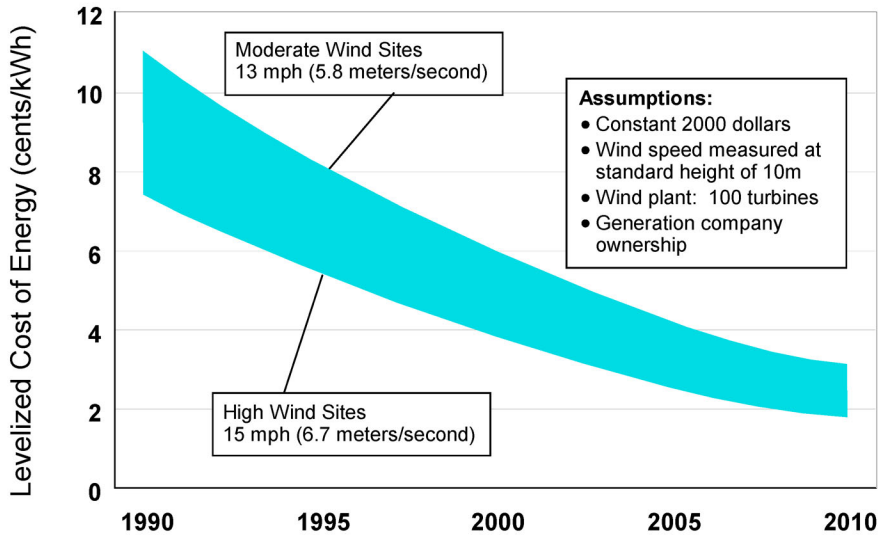
What Does Wind Energy Really Cost?

EPRI Green Power Workshop
August 7-8, 2000
Denver, Colorado

Brian Parsons
Project Manager, Wind Applications
National Renewable Energy Laboratory

email: *brian_parsons@nrel.gov*
(303) 384-6958



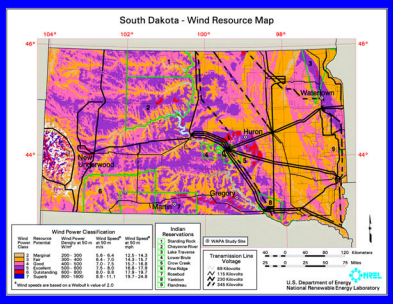
But… *It really depends*

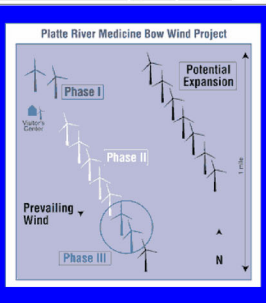
- Location
- Finances and Incentives
- Number and size of turbines
- What does cost include?

Costs not completely open and public

Location, Location, Location

- Resource
  - 1 mph in average speed is ~ 0.5 cents/kWh
  - Raising tower from 50 to 100m increases kWh ~15% or more in class 4-5
  - Coincidence of wind with load increases value
- Permitting
  - private vs. public land
  - state and local regulations
- Existing site expansion
  - low cost option





Finances and Incentives

- Production Tax Credit
  - 1.7 cents/kWh (escalating) for 10 years equates to around 1.1 cents/kWh reduction in contract price
  - deadline pressure *increases* costs
- State and Local tax, etc. can be significant
  - +/- 0.5 cents/kWh impact
- Public Power (100% debt at tax free rates) can be 60% of GenCo or IPP cents/kWh
- Renewable Energy Production Incentive
  - annual appropriations problem leads to little impact

Plant and Turbine Size

- Spread "nearly fixed" costs: permitting, crane, legal and other soft costs
- Volume discount from manufacturer
- Economies of scale can bring O&M to under 0.2 cents/kWh
- Next generation of 1.2-2.0 MW machines are 10-15% cheaper/kW

What does the price include?

Additional Factors

- Point of delivery: *bus bar or include transmission?*
- Resource Assessment, Land and permitting: *sometimes provided*
- Ancillary services ??

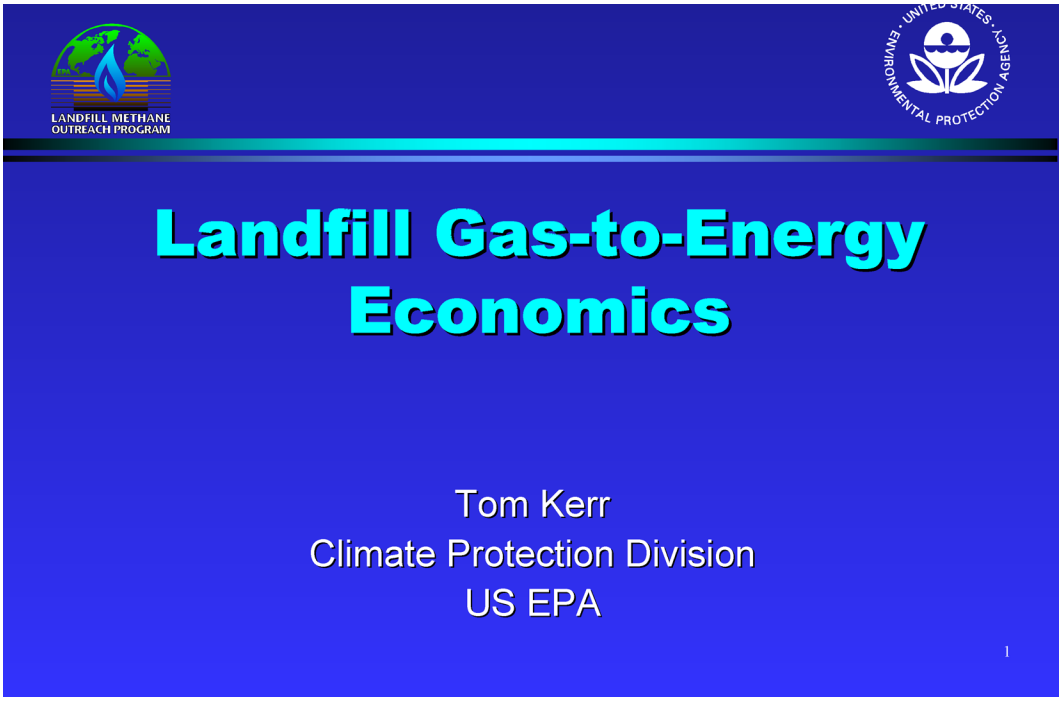
Cost Semantics

- Inflation (constant or current dollars)
- Hardware only, overnight construction, or turn-key cost
- Levelized or initial cost

can be significant additions for marketing, etc. on retail side

Conclusions

- The wind industry is delivering ~ 3 cent/kWh contracts, including PTC
- This price is not realistic for many situations, particularly small projects in new locations
- For green markets, lowest price does not seem to be the only driver


LANDFILL METHANE
OUTREACH PROGRAM
UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
Landfill Gas-to-Energy Economics
Tom Kerr
Climate Protection Division
US EPA
1


LANDFILL METHANE
OUTREACH PROGRAM
Presentation Overview
2000 LMOP Database Findings
Industry Trends
Project Economics
2

LMOP Database

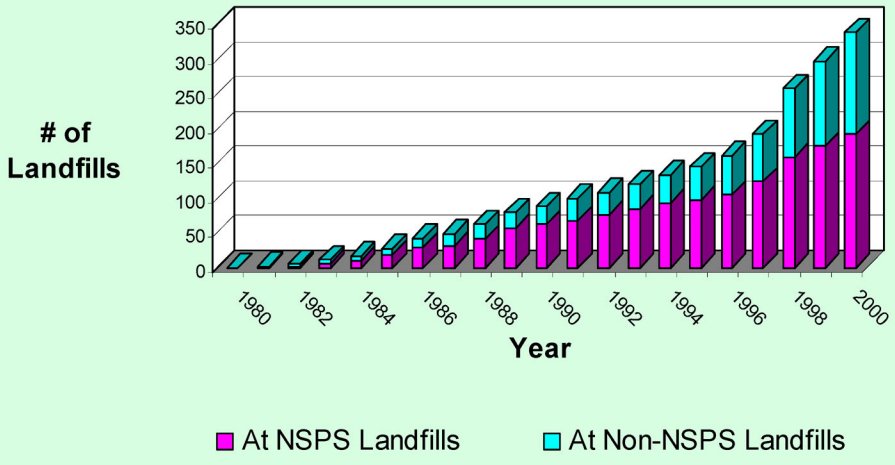
LMOP projects database
- landfill characteristics, including NSPS/EG status
- LFG project type and project developer
- LFG generation rates

Tracks existing, under construction, shut down, and planned projects

Calculates environmental benefits of LFG utilization

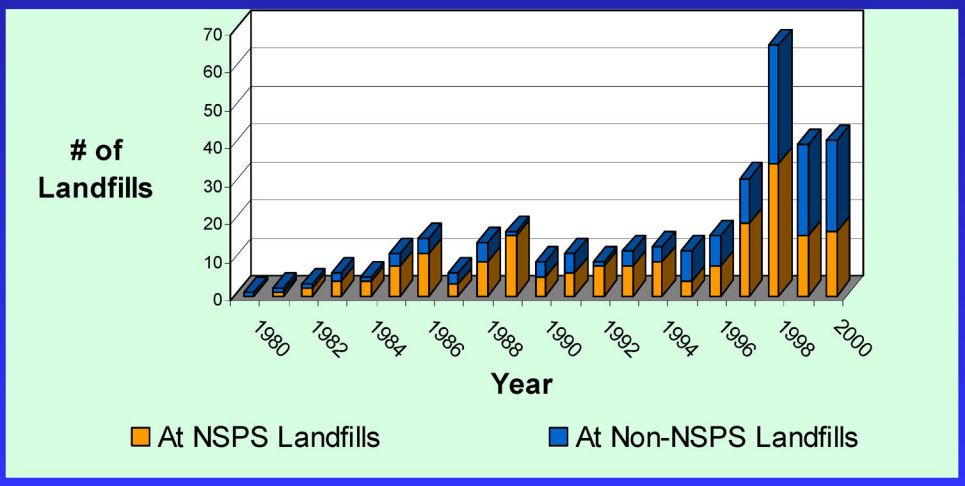
3

Operational LFGTE Projects



LANDFILL METHANE OUTREACH PROGRAM

Incremental LFG Projects

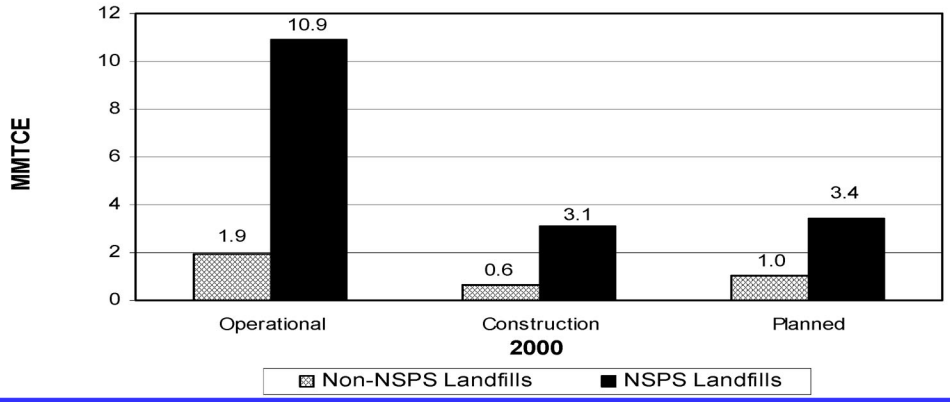


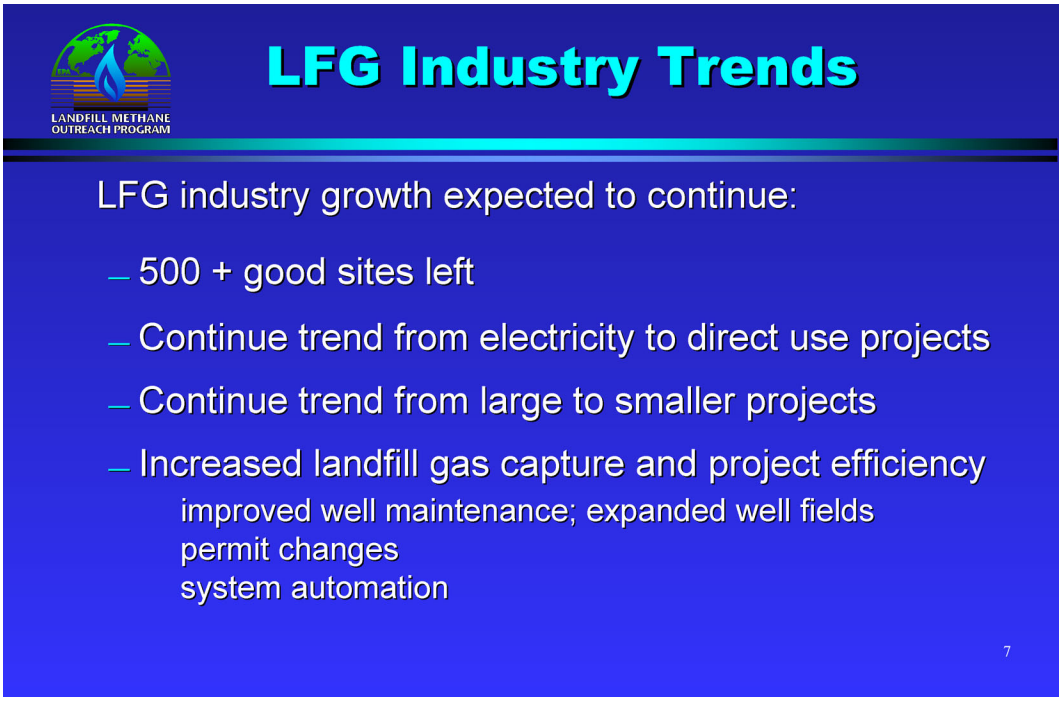
5

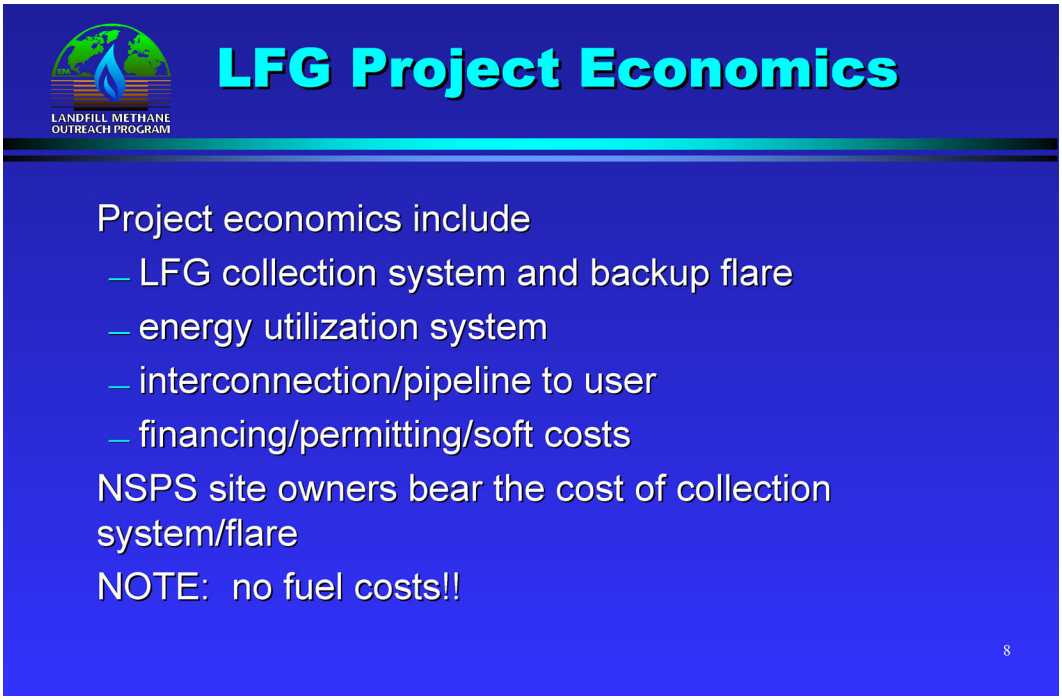
LANDFILL METHANE OUTREACH PROGRAM

GHG Emission Benefits From LFG Projects

Figure 3: Estimated Annual Carbon Equivalent Emission Benefits From Operational LFGTE Projects At NSPS And Non-NSPS Landfills




LANDFILL METHANE OUTREACH PROGRAM
LFG Industry Trends
LFG industry growth expected to continue:
– 500 + good sites left
– Continue trend from electricity to direct use projects
– Continue trend from large to smaller projects
– Increased landfill gas capture and project efficiency
improved well maintenance; expanded well fields
permit changes
system automation
7


LANDFILL METHANE OUTREACH PROGRAM
LFG Project Economics
Project economics include
– LFG collection system and backup flare
– energy utilization system
– interconnection/pipeline to user
– financing/permitting/soft costs
NSPS site owners bear the cost of collection system/flare
NOTE: no fuel costs!!
8

Typical LFG Project Costs

Capital costs

- Electricity Generation: $900-1300/kW installed (at least 4 cents/kWh buyback rate)
- Direct Use: $6-13/mmBtu/year ($/mmBtu)

O & M costs over project lifetime

- Electricity Generation: 1.5-1.8 cents/kWh
- Direct Use: 13 - 74 cents/mmBtu/year

9

LFG Economic Drivers

Federal tax credits (worth ~ 1 cent/kWh)

DOE's REPI payments

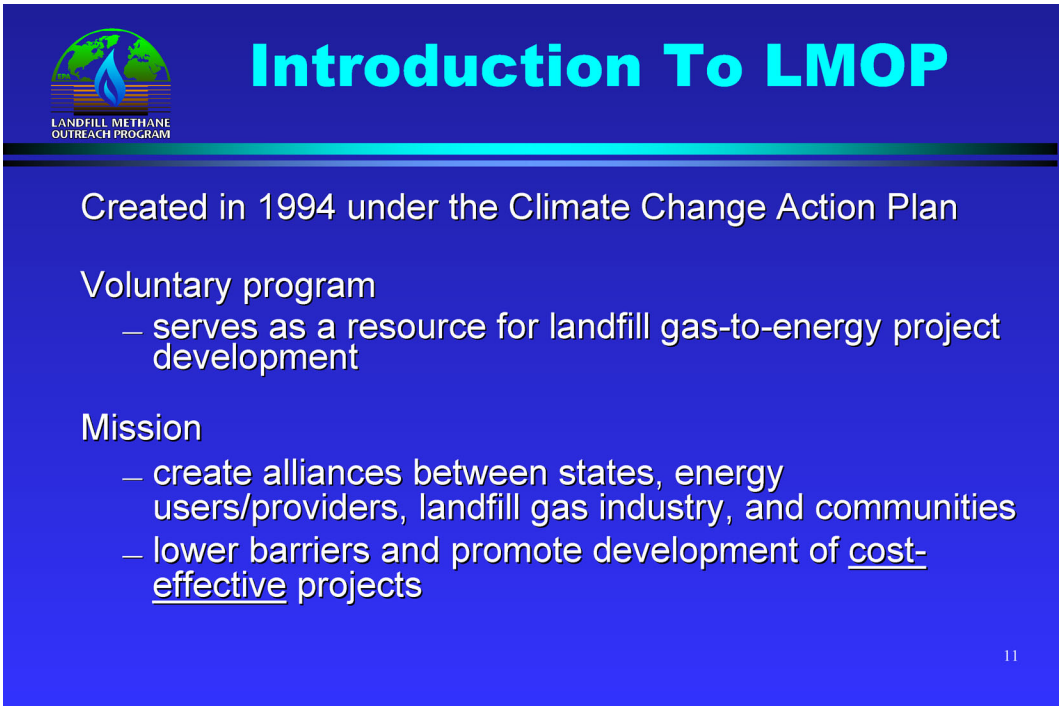
State grant/loan programs

Green pricing/marketing programs

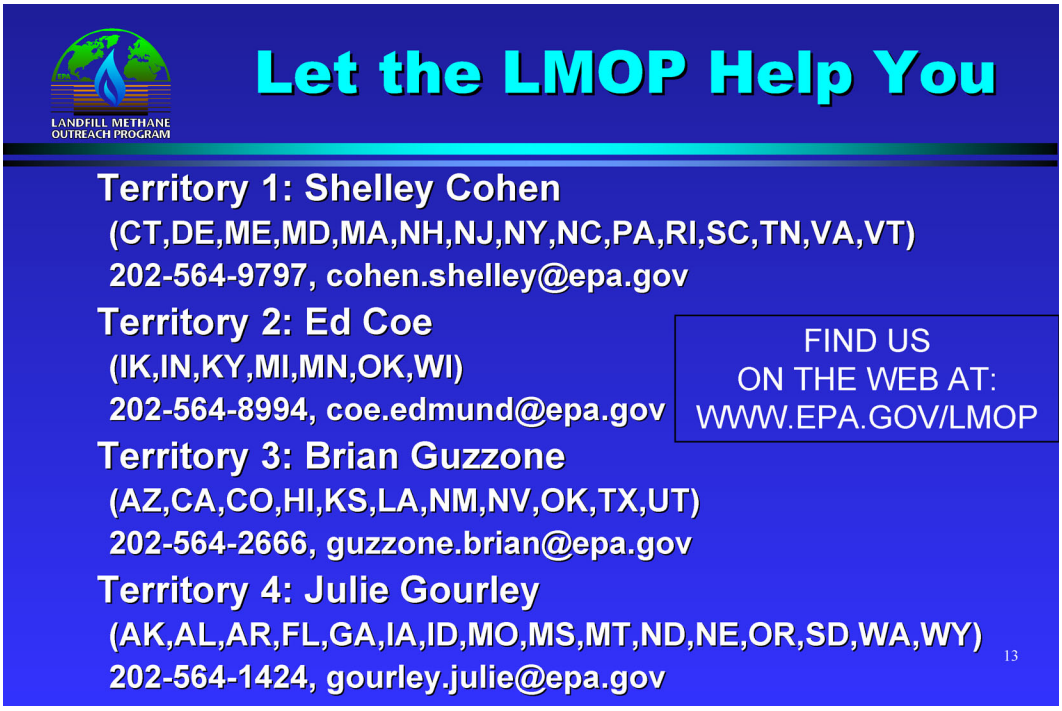
Local tax incentives/economic development

GHG credit trading

10


LANDFILL METHANE OUTREACH PROGRAM
Introduction To LMOP
Created in 1994 under the Climate Change Action Plan
Voluntary program
– serves as a resource for landfill gas-to-energy project development
Mission
– create alliances between states, energy users/providers, landfill gas industry, and communities
– lower barriers and promote development of cost-effective projects
11


LANDFILL METHANE OUTREACH PROGRAM
Use LMOP Resources
Program Managers
Project Development Handbook
Profiles of Candidate Landfills - 31 states
E-PLUS Project Evaluation Software
Landfill NSPS/EG Guidance Booklet
Guidance Document for State/Local Permitting Authorities
Technical Issues Papers
State Primers
More….
LMOP Hotline
1-888-782-7937
12


LANDFILL METHANE OUTREACH PROGRAM
Let the LMOP Help You
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FIND US
ON THE WEB AT:
WWW.EPA.GOV/LMOP
Territory 3: Brian Guzzone
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Territory 4: Julie Gourley
(AK,AL,AR,FL,GA,IA,ID,MO,MS,MT,ND,NE,OR,SD,WA,WY)
202-564-1424, gourley.julie@epa.gov
13

Solar Electricity - Premium Power for Consumers

John Hoffner
Manager, Advanced Energy Division, CSG
Sun Power Electric™

Green Power Marketing Conference
August 8, 2000

Presentation

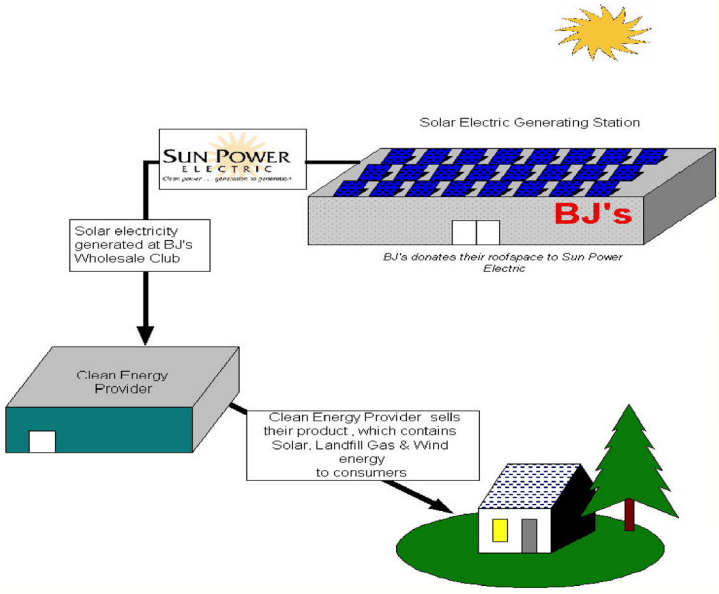
- 1. Background on Sun Power Electric
- 2. Green Products
- 3. Cost of Green Solar Electric Energy

History of Sun Power

- Established in 1998 by Conservation Services Group (CSG) to provide consumer choice in the deregulated electric utility industry
- The first solar electric utility to provide consumers with PV power
- 107.7 kw has been installed since the program has been established
- Merged with Planergy to form affiliate: - CSGServices Inc. an additional 75 kW on schools.

SUN POWER ELECTRIC
Clean power . . . generation to generation

BJ's Wholesale Club & Sun Power Electric's Business Relationship



Critical Success Factors

- Lower Cost through design and installation strategies
- Help the Market for Green Power Grow
- Secure the Full Economic Benefits of Solar Grid Connected PV
- Develop long term financing sources
- Reduce Barriers to Utility Interconnection

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Clean power . . . generation to generation

Develop Replicable Design Strategies

- Design for common roof types
- Standardized and flexible inverter; interconnect and metering packages
- Mobile installation team
- Plan for expansion at low cost

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Clean power . . . generation to generation

Key to the Future: Green Power Market

- Will solar be a part of the mix?
- Will Customers pay a premium for Green?
- Will Customers pay a higher premium for Solar content?

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Green Power Products and Sun Power Electric

- Green Mountain.Com: 137,000 kwh per year order
- AllEnergy/Regen: 60,000 kwh per year order
- Long Term contracts

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Clean power . . . generation to generation

Using Solar to Market Green Energy

- Sun Power Electric is Reselling Regen on the Retail Level
- Sun Power Electric is helping Green Mountain.com sign up commercial customers packaged with solar installations
- Green Marketers Publicizing Sun Power Electric Involvement

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How much do they really cost?

- Based on the following for a 100 kW site:
  - $7/watt installed cost PV, no subsidies
  - Low interest loan
  - 20 % cost for O & M
  - Good site at 1.8 kWh/kW production
- Cost to breakeven:
  - **10 c/kWh from host plus,**
  - **36 c/kWh for green attributes = 46 c/kWh total**

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Clean power . . . generation to generation

Cost? Scenario 2

- Based on the following for a 100 kW site:
  - $3/watt installed PV - (subsidies and innovative $)
  - 0 interest loan - 10 year
  - 15 % cost for O & M
  - Good site at 1.8 kWh/kW production
- Cost to breakeven:
  - **10 c/kWh from host plus,**
  - **10 c/kWh for green attributes = 20 c/kWh total**

SUN POWER ELECTRIC
Clean power . . . generation to generation

Concluding Remarks

1. Sun Power Electric successful in offering solar GREEN products
2. Customers desire solar electric power in their mix
3. Need to continue finding innovative financing and cost reductions with photovoltaics

SUN POWER ELECTRIC
Clean power . . . generation to generation

COMMUNITY-BASED MARKETING OF GREEN POWER

Rudd Mayer
Green Marketing Program Director
Land and Water Fund of the Rockies
Boulder, Colorado
rudd@lawfund.org

Why Community-Based Marketing?

- Extensive **education** of market needed - the "M" word
- Makes customer acquisition **costs high for utilities/suppliers**
- Enviro group uses grassroots organizing techniques to reach and educate a **broader set of potential customers cost-effectively**
- Lends **credibility** to the product and marketing message
- Generates significant **free media -** utility/enviro adversarial relationship

How it Works

- A **grassroots campaign** organized and managed by an environmental group
- Focus on **community-wide support** - use of pre-existing relationships and networks (municipal bills, local business organizations)
- State/local gov't, businesses, non-profits, communities of faith, schools, tribal communities
- Goal: purchases AND use of bully pulpits, newsletters, outreach mechanisms to **mainstream the use of clean energy**
- Goal: community ethic like recycling

Will They Come?: First Steps

- Boulder Bookstore - **low hanging fruit**, enviro ethic, community involvement, knew owner - 1st business buyer in CO
- **Governor** (Democrat and now Republican)
- Denver and Boulder press events
- Now **13 cities** - Crested Butte 4th parade float
- Corporate "champions" (Coors, US West, IBM, Rocky Mountain Steel Mills (CEO champion)
- Now over **450 businesses** statewide
- Sierra Club newsletter (14,000) Eco-Cycle (35,000) and sign up brochures at recycling center

The Fun Begins

- **"Street teams"** - a business canvass in high density commercial areas, poster designed and printed courtesy of One World Arts and D&K Printing (both 100% wind buyers)
- **Free TV -** Channel 9 News Weather Center/the solar-powered "wind cam" - product of non-profit/utility marketing cooperation
- **National 10K race theme**: Run with the Wind - postcard in 40,000 runners packets designed and printed free, banner at finish line
- **www.cogreenpower.org** - statewide sign up, interactive enviro benefits, promotion of businesses

Gaining Momentum

- **CU** students week long campaign, 30% turnout high - $50,000 (a turbine's worth)
- **Employee campaigns**/incentives (8,000 Lockheed Martin employees, BCH)
- **Leadership -** BCH statewide outreach to health care community
- 10-day national Episcopal **convention** - PSCo, PUC, LAW Fund/**100% wind**
- Denver Congregational church sells members' garden produce to pay for wind

The Bandwagon Effect

- **Major polluter** hesitant due to possible greenwash accusation buys wind - leverages with other programs (P3)
- low profile **biotech firm** - no interest in PR - would buy wind to increase employee pride and satisfaction
- Coming to us: Kinko's web site connection - 5 stores, 3 utilities - **New Belgium** initiates wind
- Sign ups across entire political spectrum
- **Marketing coordination** on sales to national brand companies: brings national significance to purchase, media appeal

The Value Shift

- **1997 - 2000** - 18,000 residential customers, 450 businesses, **80 MW committed**
- Community-based campaigns ongoing or beginning in CA,WI, PA, NW, TN, NY
- **1/3 in U.S. can choose**, Chicago 48 city 80 MW aggregation (lower cost and clean), wind turbines in Texaco ad, Democratic Convention
- coal burning power plant in London transformed into Tate Gallery of Contemporary Art

Renewable Certificates: an Important Dimension in Capturing Green Value

Fifth National Green Power Marketing Conference

August 8, 2000

G. Muir Davis, Director Market & Product Development

Capturing Green Value

Supporting

100% Emission-Free Electricity

from

PG&E National Energy Group

Certificate Transactions

- Compliment existing markets
- Make verification simple
- Create "credit markets"
- Capture renewable value
- Break historic boundaries

Certificate Transactions

Compliment existing markets

- Alleviate tying burden and associated expenses
- Enable and encourage wholesale trading
- Alleviate scheduling nightmare

Certificate Transactions

Make Verification Easy

- Annual tallies of supply and consumption
- Appropriate burden of proof
- May foster accountability for all attributes

Certificate Transactions

Create "credit markets"

- Allow separate focus on the emission benefits of power, e.g. "credits"
- Encourage trading opportunities for credits
- Monetize emission-free electricity

Certificate Transactions

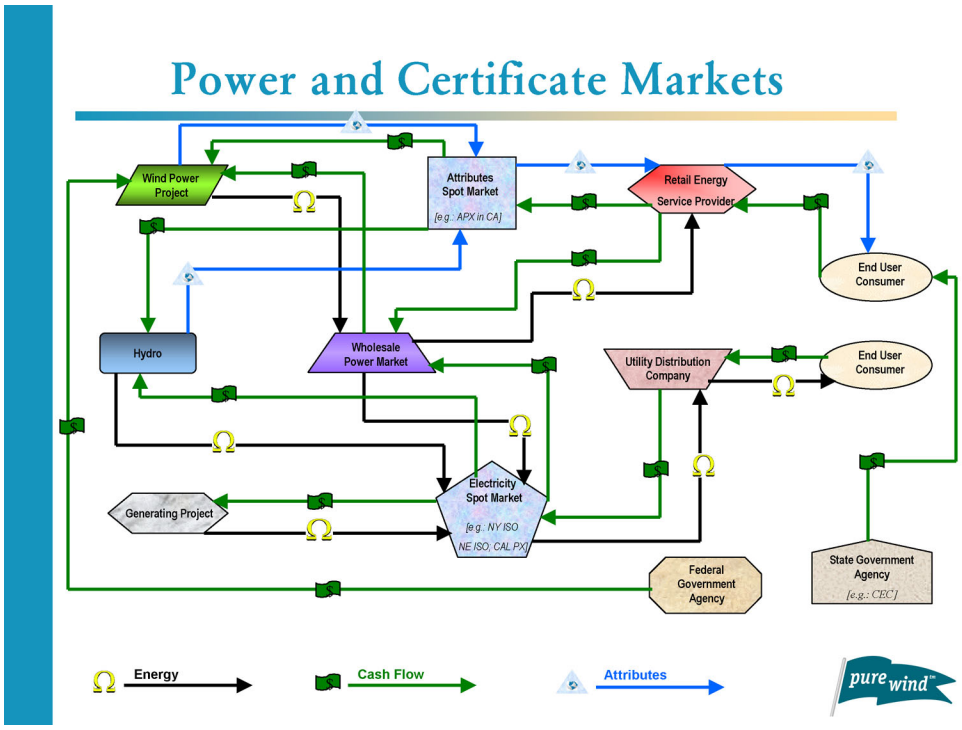
Capture renewable value

- Independent factor of power
- Additional paths for transactions

Certificate Transactions

Break historic boundaries

- Foster ***environmental*** renewable sales
- Re-focus siting on
  - Optimal resource potential
  - Minimal natural resource impacts


Power and Certificate Markets
Wind Power Project
Attributes Spot Market
[e.g.: APX in CA]
Retail Energy Service Provider
End User Consumer
Hydro
Wholesale Power Market
Utility Distribution Company
End User Consumer
Electricity Spot Market
[e.g.: NY ISO NE ISO, CAL PX]
Generating Project
Federal Government Agency
State Government Agency
[e.g.: CEC]
Energy
Cash Flow
Attributes
pure wind

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U.S. Department of Energy

Renewable Power Purchasing by the Federal Sector

Beth Shearer, FEMP Director
"Fifth National Green Power Marketing Conference"
August 8, 2000

Office of Energy Efficiency and Renewable Energy
U.S. Department of Energy

Presentation Outline

- Federal Energy Management Program (FEMP) Overview
- Executive Order 13123
- Federal Renewable Power Purchasing
- Resources

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U.S. Department of Energy

Federal Government as Consumer

- $200 billion annually on products and services
- $8 billion on Federal energy bill
- 500,000 buildings
- Consumes 2% of nation's electricity

FEMP FEDERAL ENERGY MANAGEMENT PROGRAM

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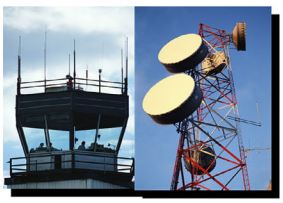
U.S. Department of Energy

Federal End-Use Sectors

- Buildings & Facilities
- Vehicles & Equipment
- Energy Intensive Operations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U.S. Department of Energy

Executive Order 13123 Goals

- Reduce energy consumption
  - Standard buildings - 35% by 2010
  - Energy intensive buildings - 25% by 2010
  - Reduce greenhouse gases - 30% by 2010
- Increase use of renewable energy
- Reduce water usage

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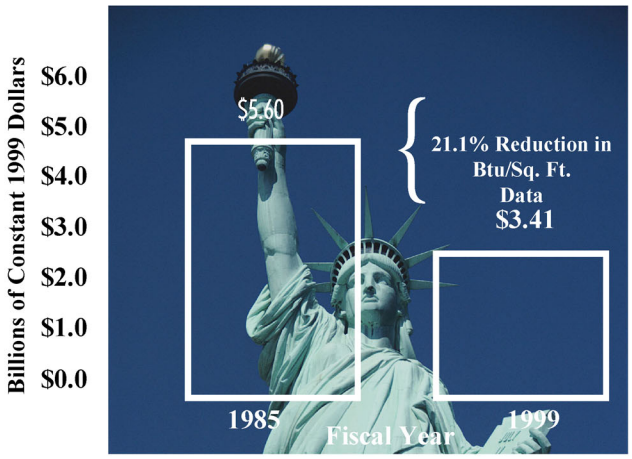
Progress

- FY 1999 data indicates that the Federal government achieved the FY 2000 goal one year early.
- In real dollars, FY 1999 energy costs for Federal buildings were almost $2.2 billion less than in 1985.
- As of FY 1998, the Federal government reduced petroleum use in Federal facilities by 64% relative to 1985.



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Federal Renewable Usage Goals

- Wind Powering America Program Goal
  - Entice federal agencies to purchase 5% of electricity from wind by 2010
- DOE Secretarial Directive
  - 3% of DOE electricity from non-hydro renewable energy by 2005 and 7.5% by 2010

FEMP
FEDERAL ENERGY MANAGEMENT PROGRAM

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U.S. Department of Energy

What are agencies doing?

- In competitive environments, agencies are buying renewable power.
- In regulated environments, agencies are signing up for renewable offerings
- Agencies are beginning to look at "Green Tag" possibilities

FEMP
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Federal Sector Renewable Power Purchase Contracts

Federal Agency (ies)	Location	kWh	Resource
US Postal Service	California	30 million	Geothermal/Biomass/Small Hydro
GSA	MA & RI	4.8 million	TBD
GSA/EPA/NPS	Pennsylvania	2.7 million	Landfill Gas
EPA	Richmond, CA	1.8 million	Landfill Gas/Geothermal
EPA	Golden, CO	0.384 million	Wind
BPA	Portland, OR	0.552 million	Wind

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U.S. Department of Energy

Federal Sector Renewable Power Purchase Agreements

Federal Agency (ies)	Location	kwh	Resource
31 agencies*	Colorado	25 million	Wind
EPA	Manchester, WA	2.1 million	Wind
Oak Ridge National Lab.	Oak Ridge, TN	0.675 million	Landfill Gas/Wind/Solar

*Denver Wind Purchase Initiative

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Short Term Activities

- Assistance with regional initiatives in both regulated and competitive markets
- Education
- Encourage agencies to explore renewables opportunities

FEMP FEDERAL ENERGY MANAGEMENT PROGRAM

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U.S. Department of Energy

Resources

- Purchasing Renewable Energy: A Guidebook for Federal Agencies
- EO 13123 and other FEMP Guidance
- Contacts:

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Web Sites

- **FEMP Web Site -** www.eren.doe.gov/femp/
- **EO 13123 -** www.eren.doe.gov/femp/aboutfemp/exec13123.html
- **GSA Green Power** -www.gsa.gov/pbs/centers/energy/green.htm
- **Wind Powering America -**
  www.eren.doe.gov/windpoweringamerica/
- **GeoPowering the West -** www.eren.doe.gov/geopoweringthewest/
- **GSA Request for Proposals** - www.gsa.gov/pbs/xu/co1.htm
- **DOD Request for Proposals -**
  www.desc.dla.mil/main/a/electric/index.htm
- **Green Power Network** -www.eren.doe.gov/greenpower/home.shtml
  1) Green Pricing Programs -
  www.eren.doe.gov/greenpower/pricing.shtml
  2) Competitive Green Power Products
  www.eren.doe.gov/greenpower/marketing.shtm

Purchasing Electricity at the U.S. Postal Service

Ray Levinson
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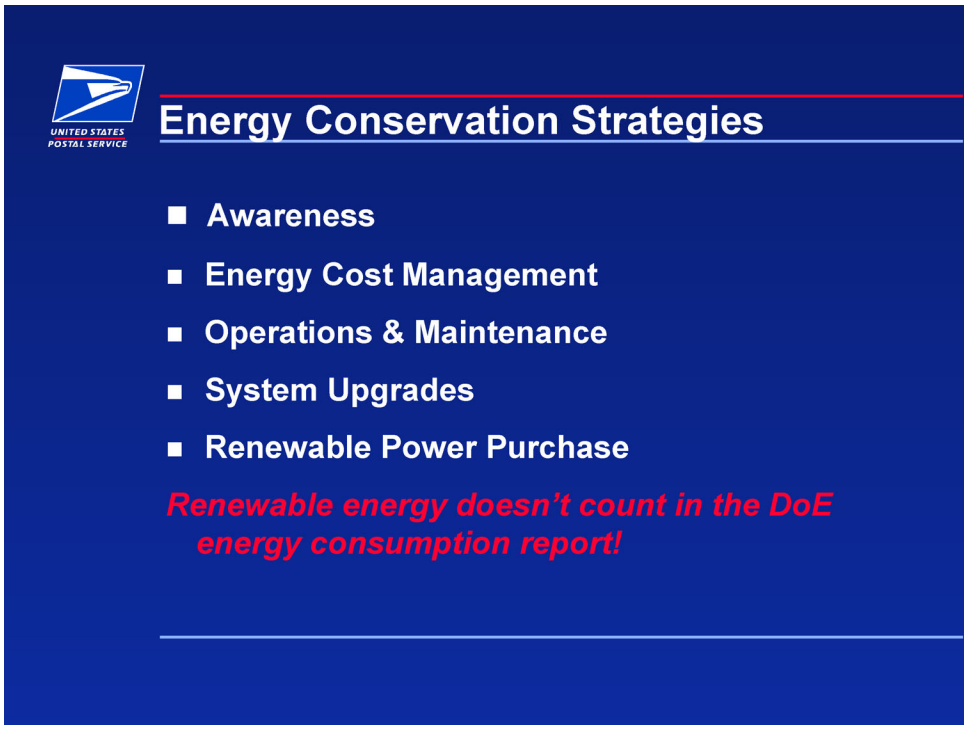
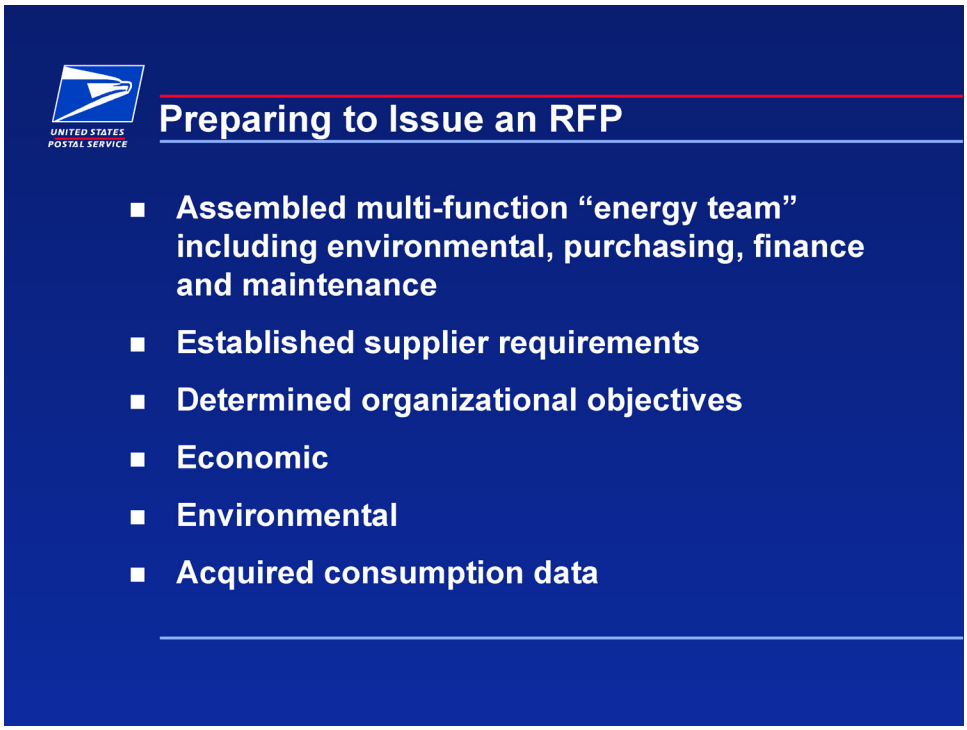
USPS Impacts on Environment


UNITED STATES POSTAL SERVICE
Energy Conservation Strategies
Awareness
Energy Cost Management
Operations & Maintenance
System Upgrades
Renewable Power Purchase
Renewable energy doesn't count in the DoE energy consumption report!


UNITED STATES POSTAL SERVICE
Preparing to Issue an RFP
Assembled multi-function "energy team" including environmental, purchasing, finance and maintenance
Established supplier requirements
Determined organizational objectives
Economic
Environmental
Acquired consumption data

California Characteristics

- More than 1500 eligible accounts in three IOU territories
- Approximately 40 MW annual demand
- Approximately $35M annual expenditures on electric service
- 2 primary facility demand patterns
  - 24 hour operations
  - 12-14 hour operations
- More than 1000 facilities under 20kW

Offer Evaluation

- "Best Value" approach
- First criterion - highest percentage of green power at or below current utility tariff rates
- Other criteria
  - Percent discount from utility tariffs
  - Reasonable meter acquisition costs
  - Meter installation timetable
- *No offers accepted*

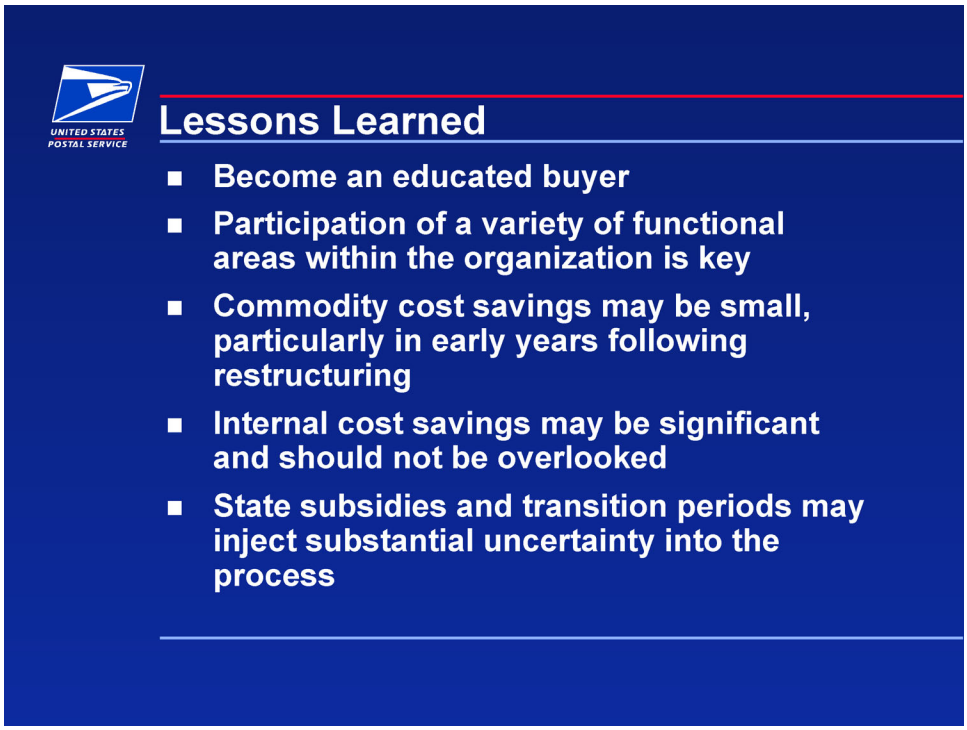
New Solicitation Offered

- Focus on green power rather than electric service more generally
- Still included billing, metering, EDI, etc.
- Offers made on facility-by-facility basis
- No requirement to serve whole service territories

Contract Awarded

- Supplier: Preferred Energy Services, Inc dba go-green.com
- ~1,100 sites in CA, mostly under 20kW
- 100% “green power”
- ~33,000,000 kWh/year; 3.8 mW
- 38 month contract term


UNITED STATES POSTAL SERVICE
Unexpected Surprises
One potential supplier refused to comply with the requirements of the solicitation
Another potential supplier dropped out of negotiations as a result of a merger
Current supplier has hinted at early termination of contract as a result of possible regulatory changes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Lessons Learned
Become an educated buyer
Participation of a variety of functional areas within the organization is key
Commodity cost savings may be small, particularly in early years following restructuring
Internal cost savings may be significant and should not be overlooked
State subsidies and transition periods may inject substantial uncertainty into the process

Target:
Understanding Green Power Markets

About EPRI

EPRI creates science and technology solutions for the global energy and energy services industry. U.S. electric utilities established the Electric Power Research Institute in 1973 as a nonprofit research consortium for the benefit of utility members, their customers, and society. Now known simply as EPRI, the company provides a wide range of innovative products and services to more than 1000 energy-related organizations in 40 countries. EPRI's multidisciplinary team of scientists and engineers draws on a worldwide network of technical and business expertise to help solve today's toughest energy and environmental problems.

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