

Customer Choice and Green Power Marketing: A Critical Review and Analysis of Experience to Date

*Ryan Wiser, Lawrence Berkeley National Laboratory
Mark Bolinger, Lawrence Berkeley National Laboratory
Edward Holt, Ed Holt & Associates, Inc.*

ABSTRACT

This article explores whether and to what extent individuals are willing to voluntarily pay a premium for products that provide public environmental benefits. In particular, we critically review and analyze the status and impacts of U.S. green power marketing to date. Green power marketing—the business of selling electricity products distinguished by their environmental attributes—seeks to develop a private market for renewable energy driven by consumer demand for green products. Debate has centered on the ability of such a market to provide a significant level of support for renewable energy sources. This paper examines experience to date with green power markets in the United States, providing an historical overview, reviewing product offerings, assessing customer response, and calculating overall support for renewable energy. While market research shows that a majority of the populace states a willingness to pay a premium for renewable energy, early experience with green power marketing shows that those attitudes have not yet translated into large-scale behavior change, tracking experience in other environmental product markets. While a niche market for green power does exist, the data presented in this paper indicate that the collective impact of customer-driven demand on renewable generation has been modest thus far. Several lessons on how to potentially improve the prospects of green power marketing are discussed.

Introduction

Concern for the environment among the American populace is well documented. Moreover, since the late 1980s, individuals have been increasingly given the opportunity to incorporate environmental concerns into their own purchasing behavior, from recycled paper and biodegradable packaging to organic foods and sustainably harvested timber. With numerous businesses now clamoring for a piece of the environmental marketplace, there is no doubt that consumers are increasingly inundated by environmental messages. Echoing these marketing practices, within a certain thread of the marketing literature there appears to be a growing consensus that the green market is significant and that companies can profit by improving environmental performance and developing green products (Ottman 1998). And yet, a troubling disconnect between consumers' environmental attitudes and behaviors has emerged. While over 50% of adults in the United States are concerned about the level of pesticide residue on food products, for example, only 18% say they look for food that is pesticide-free and just 2% of overall produce sales in the U.S. are organic (Hartman Group 1996). Likewise, despite high levels of stated interest, the majority of consumers purchase green products only when they are offered at a competitive price and with no degradation of quality or convenience. Getting commuters out of their single passenger cars and into mass

transit or carpooling has been similarly intractable. Few activities beyond recycling have shown a close connection between general environmental attitudes and individual behaviors. —

With the advent of customer choice in the U.S. electricity sector, yet another opportunity arises to explore whether and to what extent individuals are willing to voluntarily pay more for products that provide public environmental benefits. While the electricity sector contributes heavily to the nation's environmental woes, customer surveys consistently show strong support for renewable energy and a stated willingness to pay a premium for those resources (Farhar 1993). With customer choice, individual consumers across the United States are being given the opportunity to act on these stated preferences. Today, over fifty utility programs offer electric ratepayers a "green power" option in a regulated context, linking customer payments to the supply of renewable electricity. At the same time, as retail electricity markets have opened for competition in California, Pennsylvania, Massachusetts, Rhode Island, New Jersey, and Maine, competitive green power marketers have sought to attract customers away from their traditional utility service with renewable energy products.

As with environmental marketing more broadly, there has been considerable debate over the likely success of green power marketing in stimulating renewable energy development and thereby achieving environmental gains. Green power marketing—the business of selling electricity products distinguished by their environmental attributes—has been heralded by some as potentially offering significant new market opportunities for renewable electricity generation (Nakarado 1996), thereby reducing the need for more traditional public policy support of clean energy technologies. Others argue that green power marketing is unlikely to have a consequential impact on renewable energy development. The cost of marketing green products, the intangible nature of green power, and the traditional logic of economics that individual consumers act to maximize their own well being (not the well being of society) when making such product choices, are frequently noted as fundamental barriers to the development of this market (Rader & Short 1998; Wiser 1998).

The aim of this paper is to contribute to current debates on the effectiveness of green power marketing in meeting renewable energy and environmental objectives. To meet this aim, we critically review and analyze the status and impacts of U.S. green power marketing to date. Our analysis covers both regulated green pricing programs and competitive offers in restructured markets. Aggregated data on program development, product offerings, customer response, and the impact of green power sales on renewable supply are presented. We also assess some of the crucial variables that affect demand for green power and the quality of green power products. We conclude with a discussion of the role that green marketing has played and might play in the development of renewable energy sources and the achievement of environmental objectives. Data used in this paper come from surveys and interviews with green power participants, secondary literature sources, and the authors' professional experience in these markets. Much of this data has been presented in a more detailed fashion in a series of EPRI and LBNL reports (e.g., Holt 2000a; Holt 2000b; Wiser et al 1999).

Utility Green Pricing Programs

History and Overview

Green pricing programs offer electricity ratepayers the ability to support renewable energy through voluntary payments to their regulated utility. First introduced in 1993, utility

green pricing programs initially grew out of market research showing that a majority of individuals support renewable energy, and in many cases state a willingness to pay more for it. Green pricing programs were originally viewed by utilities as a way to tap into customer support for renewables and experiment with the use of renewable electric generation with little risk to utility shareholders. Now, as many states begin to move towards retail competition in the electricity sector, green pricing programs are increasingly viewed by regulated utilities as one way to prepare for the rigors of an impending competitive market.

Interest among utilities in green pricing programs has grown steadily since 1993, as illustrated by Figure 1. What began as three vanguard programs in 1993 has grown to over 50 programs by the end of 1999, available to the customers of about 140 utilities.¹ Green pricing programs are now offered in 28 states, and in nearly every region of the U.S. with the exception of the Northeast (where the advent of retail competition has reduced utility interest in regulated green pricing programs). Collectively, these programs offer green power choices to nearly 20% of the residential households in the United States.

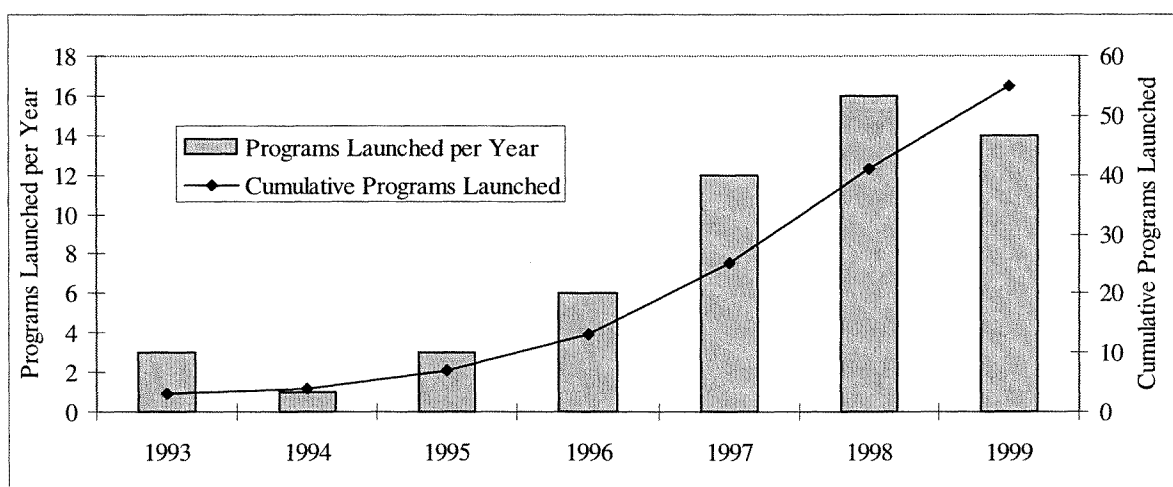


Figure 1. Number of Green Pricing Programs Launched

Product Offerings

The variety of possible approaches to structuring green pricing programs has led to a range of product offerings. Four general program types can be identified:

- energy tariffs (34 programs),
- contribution programs (10 programs),
- capacity tariffs (3 programs), and
- finance programs (3 programs).

Energy tariff programs are the most common, charging a cents-per-kilowatt-hour premium based on a specific amount of renewable energy delivered to the grid. These programs may be sold in energy blocks (e.g., 100 kWh of wind power) or as a percent of customer use (e.g., 50% renewable energy). The Public Service Company of Colorado

¹ Some programs are offered to the electricity consumers of multiple utilities, such as programs that are marketed jointly by several utilities or those that are offered through distribution cooperatives.

(PSCo), for example, has popularized the sale of renewable energy “blocks”, which represent 100 kWh/month of 100% new wind energy for a premium of \$2.50 per block. **Capacity tariffs**, on the other hand, support the development of a specific amount of installed renewable capacity, charging customers a premium based on the number of capacity blocks they wish to reserve. **Contribution programs** rely on voluntary donations that are not specifically tied to either delivered energy or installed capacity. A number of utilities, for instance, allow their ratepayers to contribute to the development of solar installations and educational material on or near schools. Finally, **finance programs** use monthly customer payments to lease or finance, and install, customer-sited photovoltaic (PV) systems.

Of the 50 programs in place at the end of 1999, 17 support wind energy, 16 PV, 3 hydroelectricity, 2 landfill gas, 10 a blend of resources, and 2 are undeclared. Solar PV is the only resource to be sold under all four generic types of programs, and accounts for all of the contribution, capacity tariff, and finance programs. Wind power is sold through 50% of the energy tariff programs. Due to the nature of most green pricing programs, in which resources are developed based on customer response, almost all of the capacity brought on line under these programs is incremental or “new” renewable energy, which is generally considered environmentally superior to products that re-package pre-existing renewable capacity.

Product prices vary significantly across programs. Energy tariff programs have an average premium of approximately 2.5¢/kWh, with a range from as low as 0.5¢/kWh to as high as 5¢/kWh. The capacity tariff programs (which support PV installations), on the other hand, range in price from as low as \$3/month for 100 watts to as high as \$3.5/month for 50 watts. (Assuming a 15% capacity factor for PV, this results in a price range of 27¢/kWh to 64¢/kWh). For those programs on which data is available, Table 1 presents the average monthly payments of green power customers, which is affected by the product premium and the amount of renewable energy a customer opts to purchase.

Table 1. Average Monthly Payments for Utility Green Pricing Programs

Program Type	Avg. Monthly Payment	Sample Size
Energy Tariff	\$6.04	21
Capacity Tariff	\$7.78	2
Contribution	\$2.19	6
Finance	\$50.00	1

Source: Holt, 2000a.

As is evident from this data, ¢/kWh premiums for energy tariff programs are considerably lower than for capacity tariffs, though the range in prices is substantial. Average monthly customer payments for both types of programs are similar, exceeding the voluntary contribution programs but far lower than the finance programs. Finally, we should note that these premiums do not always cover the complete cost of the program; marketing and overhead costs are often cross-subsidized by non-participating ratepayers or utility shareholders, allowing much of the premium to go towards renewable generation.

Customer Response

While the majority of the green pricing programs are open to both the residential and non-residential sectors alike, residential customers have historically been viewed as the

primary market. By the end of 1999, utility green pricing programs were collectively serving approximately 110,000 residential customers. While not common practice, those programs that have actively marketed to non-residential customers have seen some success in attracting participation by a wider variety of customer types. By way of example, small commercial participants account for 38% of the wind power sold by Traverse City, whereas 20% of the sales in PSCo's WindSource program come from non-residential customers. Overall, however, we estimate that fewer than 1,000 non-residential customers were being served by green pricing programs by the end of 1999.

In judging the overall success of green pricing programs, these gross numbers of customers can be misleading as they give no indication of the number of customers that could participate if they so wished. Consequently, residential response is often gauged by percent market penetration, or the number of participants divided by the number of customers eligible to participate.²

Collectively, with 110,000 residential customers participating and a total of 20 million eligible to participate, residential market penetration equals just 0.6% nationwide.³ Residential penetration, however, varies considerably by program and program type. As shown in Table 2, the average market penetration is highest for energy tariff programs and lowest for capacity tariffs.⁴

Table 2. Average Residential Market Penetration by Program Type

Program Type	Market Penetration	Sample Size
Energy Tariffs	1.8%	21
Contribution Programs	0.6%	7
Capacity Tariffs	0.1%	3

Source: Holt, 2000a.

Figure 2 shows that the range of residential market penetration by program also varies considerably. Within the first few years of program initiation, a utility can expect residential market penetration from as low as 0.1% to perhaps as high or higher than 5%; with modest marketing, energy tariff programs can easily exceed 1% penetration. What factors, other than program type, impact overall participation rates? Unfortunately, the data show an ambiguous or unexpected relationship among several variables. For instance, though one would expect to see participation decline as premiums increase, if anything, the data suggest that for an average monthly premium of between \$1 and \$10, the reverse holds true. Similarly, one would expect that programs that have been in existence for a longer period would see higher customer participation than newer programs. Yet, while participation certainly increases over time, two of the three programs with the highest level of participation achieved that participation in less than a year. The data suggest that perhaps the

² Some programs either limit participation or target their marketing specifically to a subset of the total customer base. Where effective eligibility numbers are specified, they are used as the base in calculating market penetration; if not available, the entire customer base is used, thereby artificially reducing penetration numbers.

³ All data presented on market penetration are from Holt (2000a).

⁴ We note, however, that the market penetration of a number of programs is constrained by the size of renewable energy projects. PV programs, in particular, may not be able to supply electricity to more than a small percentage of their overall customer base given small PV project sizes.

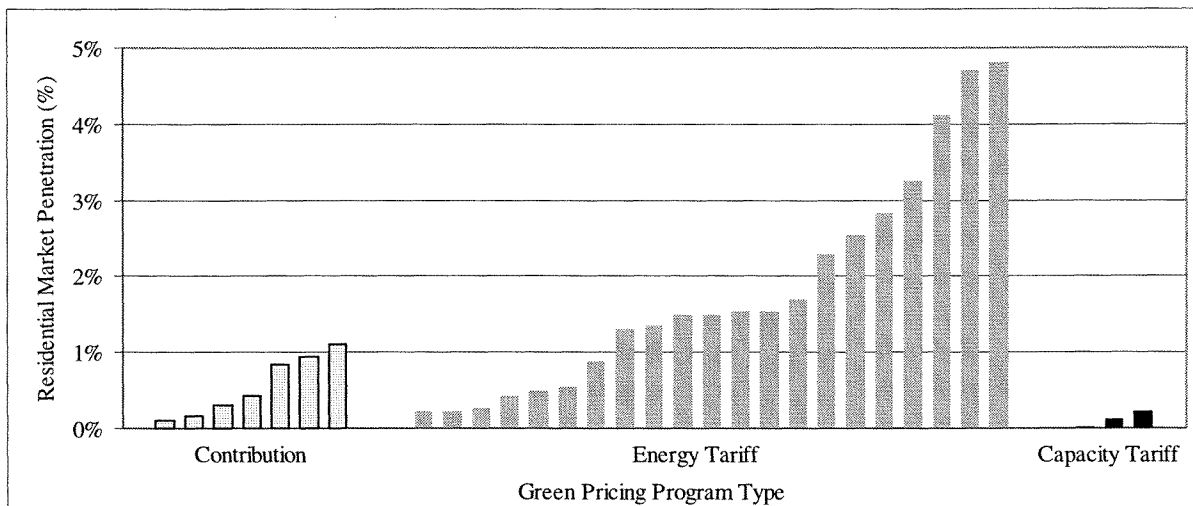


Figure 2. Residential Penetration Rates by Program and Program Type

quality of the product and how well it is marketed, the credibility of the utility offering the program, or the ease of participation are more important determinants of participation than are other variables. One variable that does seem to impact customer participation rates is the size of the utility, with smaller utilities consistently outperforming larger utilities. For example, all three of the utility programs that have achieved over 4% participation are run by small utilities,⁵ suggesting that smaller utilities, which are often publicly-owned municipals or cooperatives, may have a marketing advantage over their larger utility counterparts.⁶

Support for Renewable Energy

In total, through 1999, customer demand for green power across utility green pricing programs offers support for a total of about 120 MW of renewable capacity, of which about 108 MW (or 90%) represents incremental “new” renewables. Of the 120 MW, roughly 59.5 MW is wind energy, 2.4 MW is solar PV, 8.5 MW is landfill gas, 14 MW is hydro, and 35 MW is a blend (including all of the previous resources plus biomass).⁷ Using standard capacity factors for these technologies, this represents a total of approximately 50 average MW of renewable capacity.⁸ At an assumed average premium of 2.5¢/kWh, this amount of capacity yields a total annual premium of about \$11 million going to renewable generation serving green pricing programs.

⁵ The highest performer has fewer than 150,000 total customers, while the other two have fewer than 50,000 and fewer than 10,000 total customers.

⁶ Possible reasons for this difference include higher credibility of the utility, ease of marketing to smaller communities, a high degree of local pride, and a friendlier community attitude towards green power.

⁷ These numbers may be somewhat understated, as some programs purchase wholesale renewable energy as needed rather than install capacity.

⁸ The average MW is a measure of capacity assuming that renewable generating facilities operate full time (i.e. have a 100% capacity factor), and therefore yields a conservative estimate of the true capacity supported by the green market.

Green Power Marketing in Competitive Markets

History and Overview

Retail choice is emerging as an important driver of the U.S. electricity industry. Nearly half of all states have either opened their markets to retail competition—thereby allowing customers to select a new retail electricity provider—or have developed firm plans to move toward competition in the future.⁹ California, Massachusetts and Rhode Island have been open to retail competition for two years, and Pennsylvania has been open for over a year. Maine and New Jersey have each been open for a matter of months. Though green power marketing began with monopoly utility green pricing programs, retail choice brings with it the possibility of an expanded and more creative set of green products as competitive retail electricity providers vie for customers. Without continued regulation of product offers, however, customer confusion and deception are also a distinct possibility.

Results to date from these markets have been mixed: while the overall level of residential customer switching has been sluggish, green power products have generally captured a sizable segment of those customers that have switched. Some have criticized the environmental value of the green power products being offered to consumers. The size and strength of the green power market has also been shown to vary significantly depending on the particular set of regulatory rules and public policies established in a state. While the green markets in Massachusetts and Rhode Island have been nearly non-existent, for example, Pennsylvania and California's markets have continued to attract modest interest. Green power marketing in New Jersey and Maine has just begun, with little data to report thus far.

In general, the slow rate of overall customer switching can be attributed to several factors. First, the cost of attracting and signing-up smaller customers has been found by marketers to be prohibitive in many instances, thereby reducing marketing activity and/or squeezing or eliminating profit margins. Second, regulatory rules have been established in a way that limits the cost savings available to customers that switch providers. In particular, California, Rhode Island, and Massachusetts established low "default generation service prices" (the price a customer pays for electricity service if they do not switch providers), leaving competitive marketers little opportunity to offer price savings. Finally, even where savings have been available, the savings are often not sizable enough to convince customers to spend the time necessary to compare electricity offers and select a new service provider.

Where a meaningful green market has emerged, it appears to have been based on government incentives or a high default service price. California's green power market, for example, has been supported by a sizable subsidy (1.25¢/kWh for the first half of 2000) offered by the state for the sale of renewable energy products, called the "customer credit." Because of this credit, several marketers have been able to offer green power products at a slight *discount* to the price a customer pays if they stay with their utility provider, making renewable energy directly competitive with conventional power. Pennsylvania's green market, on the other hand, offers few incentives to specifically favor renewable energy purchases. Default rates, however, have been high in some Pennsylvania utility service territories, allowing green power products to gain a foothold in areas where, despite carrying a premium over other competitive offerings, they are still competitively priced relative to what a customer pays by remaining with the existing utility provider.

⁹ The U.S. Congress has also begun to discuss national restructuring legislation.

Overall, fifteen retail marketers offer green power products to residential and/or small commercial customers in the competitive markets of California, Pennsylvania, Massachusetts, Rhode Island, New Jersey, and Maine. California's market contains nine green power marketers, followed by six in Pennsylvania, three in New Jersey, and one in Massachusetts, Rhode Island, and Maine. Nationwide, two marketers have captured the lion's share of the residential green power market, GreenMountain.com and Commonwealth Energy, both of which are active in California and Pennsylvania. GreenMountain.com has demonstrated the most commitment to becoming a nationwide player in the green market.

Product Offerings

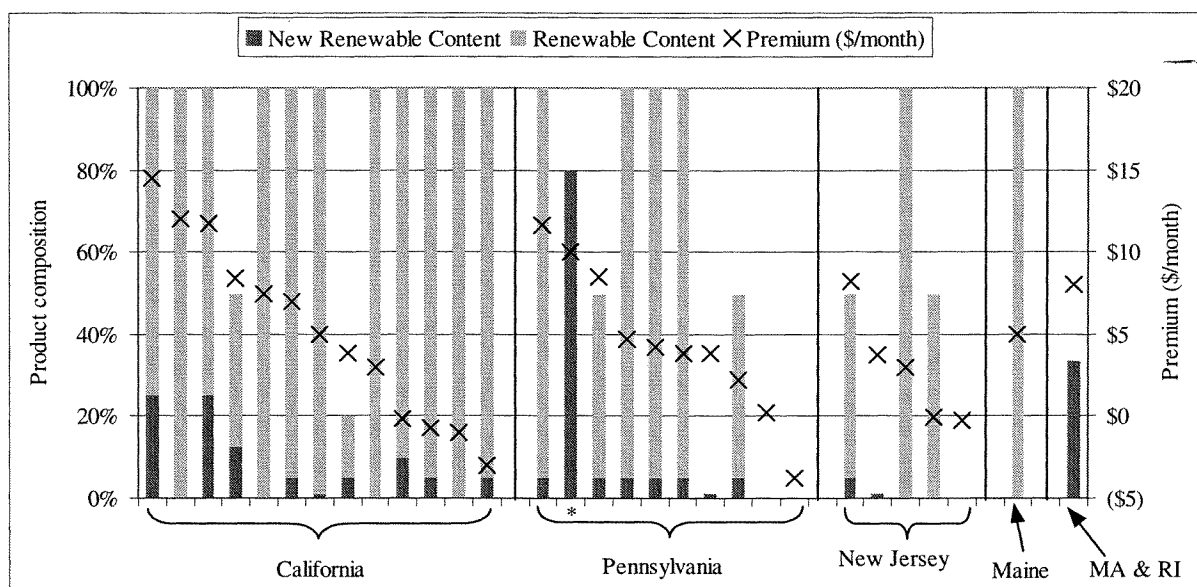
Currently, thirty green products are marketed by the fifteen retail marketers targeting the residential and small commercial customer classes. Thirteen are sold in California, ten in Pennsylvania, five in New Jersey, and one in Massachusetts, Rhode Island, and Maine. A significant majority of these products contain substantial portions of "eligible" renewable energy as defined by Green-e certification criteria¹⁰: wind, biomass, geothermal, small hydro (< 30 MW), and solar power. Specifically, seventeen of the thirty products contain 100% eligible renewable energy, and six contain between 50% and 100% eligible renewable energy. Fifteen of these products are Green-e certified. Seven products contain less than the Green-e minimum of 50% eligible renewable energy content. Three of these products include no eligible renewable energy, instead consisting of large hydropower or the retirement of emissions allowances. Geothermal and biomass facilities serve the bulk of product offerings in California, while biomass (especially landfill gas) and small hydro are most prevalent in Pennsylvania and New Jersey. Wind and solar power have also been marketed in some products. Figure 3 provides a graphical overview of current product offerings.¹¹

Unlike utility green pricing programs, the renewable portion of the competitive green power products is predominantly served by existing renewable energy facilities, which has been a major source of criticism of the green market (Rader 1998). The majority of existing facilities may be in little or no need of additional support to continue viable operations. Accordingly, while relatively inexpensive to incorporate into a green product, the immediate, incremental environmental benefits of purchasing such output are low. In response to this criticism, several marketers are beginning to differentiate their products based on the amount of new renewables content; twenty of the thirty products currently offered to residential and/or small commercial customers include some amount of new renewable generation. Increasing amounts of new renewable generation will likely be seen as the market matures and as marketers strive to comply with Green-e certification criteria requiring a minimum of 5% new renewable content in the second year of retail competition and escalating over time.

As shown in Figure 3, the pricing of these thirty products varies widely. To a great extent, this variation is a result of a number of public policies and regulatory decisions. As noted earlier, California provides extensive subsidies to renewable generators and green

¹⁰ Green-e is a voluntary renewable electricity certification program run by the Center for Resource Solutions, a San Francisco-based non-profit organization. Green-e currently certifies products in California, the mid-Atlantic, and New England and is active in other newly-forming competitive markets.

¹¹ Price data for the Pennsylvania products are provided for the PECO service territory, where most of the green marketing activity has focused. New Jersey premiums reflect products offered in Conectiv's service territory. All pricing data are calculated based on 500 kWh/month electricity usage.



*This product is offered in 400 kWh/month blocks only to non-residential customers (the graph assumes a 500 kWh/month load).

Figure 3. Green Power Product Offerings in Competitive Markets

marketers selling renewable energy-based products, thereby allowing certain products to be sold at a discount to utility default service. Pennsylvania and New Jersey currently provide far fewer subsidies to renewable generators and green power marketers, but high default service prices in some service territories have allowed marketers to offer green power at a discount or small premium to utility service. Massachusetts, Rhode Island, and Maine all have low default service rates, and consequently the only green products offered are sold at a premium. The overall range of product premiums varies from a discount of \$3.75 per month to a premium of \$14.45 per month for an average household consuming 500 kWh/month.

Customer Response

As a subset of the overall residential direct access market, green power is doing rather well. Overall residential customer switching, however, has been slow:

- In **California**, through April 2000, only 165,000 residential customers (or 1.9% of all eligible residential customers in the state) have switched providers after two years of retail choice. Nearly all who have switched are currently being served by a green power product, however, a direct result of the incentives offered by the state. Because of these incentives, the majority of these customers have either selected a green power offering at a discount to the utility default rate or have been “upgraded” to green power by their energy service provider in order to capture the customer credit.
- **Pennsylvania’s** overall electricity market has been more robust, with roughly 430,000 residential customers switching providers through March 2000, representing 9% of all eligible residential customers in the state. Approximately twenty percent of these – about 80,000 or 1.6% of eligible customers – have chosen a green power product, though most have selected a “light” green product consisting of 1% landfill gas and 99% natural gas. Approximately 20,000 customers have selected a product with over 50% renewable energy content.

- **Massachusetts and Rhode Island** have seen only negligible customer switching overall (approximately 0.2% of residential customers have switched in both markets),— with perhaps 1,000 green power purchasers combined.
- **New Jersey and Maine** have only been open for retail competition for a short period. Overall residential customer switching in New Jersey through April 2000 has equaled about 69,000. Customer switching data in Maine has not yet been reported, but switching has been slow. Though green power is now offered in both states, the number of green power customers is unknown, but expected to be small.

In total then, approximately 670,000 residential customers, or 3.4% of all eligible direct access customers, have switched suppliers nationwide, and nearly half of those who have switched (250,000 or 1.2% of all eligible customers) are receiving green power.

Finally, we should note that, while not the primary target of most green power marketers, approximately 40,000 commercial, industrial, and institutional facility meters are being served with a green power product in California, representing approximately 50% of all green power demand in the state. As in the residential market, a significant portion of this non-residential switching activity has been driven by the state's renewable energy incentive program. In Pennsylvania, non-residential customers are estimated to constitute approximately 15-20% of total green power demand.

Support for Renewable Energy

Because many green power products contain less than 100% "eligible" renewable energy, the number of customers switching to green power does not readily translate into substantial support for renewable energy. This is particularly true in Pennsylvania, where it is estimated that perhaps 60,000 of the 80,000 customers choosing green power have selected a product whose renewable energy content is 1% or less.

Based on the customer switching data presented above and a few assumptions about which products are being selected, the competitive green power market is supporting a total of roughly 280 average MW of renewable energy. Pennsylvania, which is typically hailed as the most robust market for green power based on customer switching data, accounts for 20 average MW (less than 10% of the total), while California claims roughly 260 average MW. Massachusetts and Rhode Island together account for perhaps 0.5 average MW and, while data for Maine and New Jersey is not yet available, green power demand in these states has been limited so far. California's significant contribution towards the total amount of renewables supported can largely be attributed to the impacts of the customer credit.

An important metric for the success of the green power market is its ability to stimulate investment in new renewable energy facilities. As indicated in the preceding survey of products, however, most of the 280 average MW is coming from existing renewable resources. Just 20 MW of new renewable capacity (8 average MW) is currently serving the green market (19 MW of wind, 270 kW of solar, and a couple MW of landfill gas), with at least another 20 MW under development.

Another way to gauge the success of the green power market is to look at its financial support of renewable generation facilities. Data from the Automated Power Exchange (APX) in California shows that the wholesale premium for existing renewable generation has averaged about 0.26¢/kWh over the price of conventional power in the past year. Assuming

similar premiums in Pennsylvania and other states, and making several assumptions about the higher premiums commanded by new wind and solar facilities, the estimated 280 average MW of renewable capacity supported by the green power market receives less than \$10 million per year in above-market payments. It is not clear, however, how much of this revenue is returned to the generators and how much is kept by wholesale marketers.

Marketer profitability is perhaps another indicator of the sustainability of the green power market, as there would be no market without retailers willing to sell green power. Based on data from the APX, green power marketers in California pay an average wholesale premium of roughly 0.26¢/kWh and receive the customer credit of 1.25¢/kWh, locking in a gross profit margin of just under 1¢/kWh if they price their product at the default generation price. Assuming similar profit margins in Pennsylvania and other states, the green market generates about \$30 million per year nationwide. However, high start-up and customer acquisition costs, which in the early days of the California market ran upwards of several hundred dollars or more per customer, have thus far overwhelmed profit margins from power sales, prompting a number of marketers to abandon the residential market while others look for less-costly approaches to marketing their products and other ways to improve turnover.¹²

Improving the Prospects for Green Power: Lessons Learned

Experience to date with competitive green power markets and utility green pricing programs suggests that this is a market that will be built slowly, not one with immediately strong underlying demand. Residential participation rates in the early years after product launch have seldom exceeded 3%, with many programs not reaching 1% penetration. Demand most often must be created through effective customer education and intensive marketing of high-quality products – activities which, when undertaken solely by marketers or utilities, greatly increase customer acquisition costs, thereby reducing the profitability and the attractiveness of the market. At least some portion of these costs – particularly those associated with educating consumers about customer choice in general – can be defrayed by states conducting effective customer education campaigns as part of their restructuring plans. Pennsylvania's Public Utilities Commission did just that, aggressively encouraging ratepayers to switch suppliers. Perhaps at least partly in response, 9% of all eligible customers in Pennsylvania have switched suppliers, as opposed to about 2% in California, where the funds spent by the state on customer education were targeted towards consumer protection rather than encouraging switching.

A more probable cause of the disparity in switching rates, however, appears to be differences in the regulatory “rules-of-the-game.” As discussed by Wiser (1999), green power marketers believe that the first priority for regulators and legislators interested in seeing the green market develop should be to design the basic regulatory rules in ways that allow overall retail competition to emerge, minimize barriers to entry, and encourage customer switching. The design of default service pricing is viewed as particularly crucial. Figure 4 shows the relationship between default service pricing and residential switching rates in California, Massachusetts, Rhode Island and the various Pennsylvania service territories. Clearly, the level of residential switching is a function of the default rate for

¹² Affinity marketers and the internet have proven to be popular low-cost marketing alternatives, while marketers have also begun to search for ways to “bundle” other products (e.g., telecommunications, energy efficiency, natural gas) with their traditional electricity services.

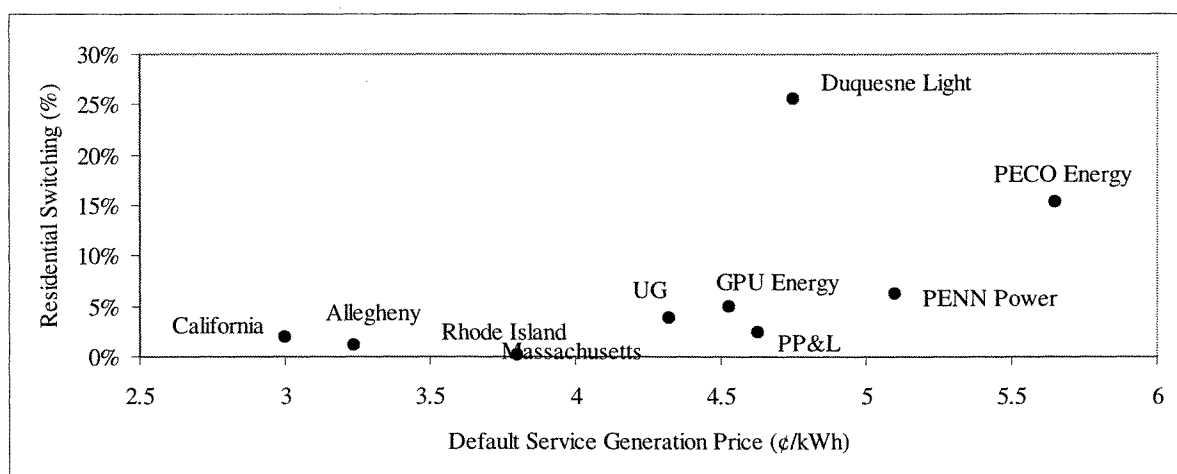


Figure 4. Effect of Default Generation Price on Residential Switching

generation service. As mandatory rate cuts and stranded cost recovery affect the default rate, careful consideration should be given to the effects of these policy decisions and market rules on the development of a robust competitive market.

As experience in California – where the customer incentive has been the primary driver behind the green market – illustrates, financial incentives to support green power products can play an important role in offsetting the market-stifling effect of a low default rate and stimulating the development of the green power market (Byrne 2000). If the incentive is large enough, as in California, green power may even be priced competitively with conventional power products. If the default rate is low enough to inhibit customer switching in general, however, or if the financial incentive is temporary, then public policy support may do little but temporarily prop up a market with little underlying promise. More effort is clearly required by state policymakers in the design of such incentives.

Although most marketing efforts to date have targeted the residential sector, green power purveyors would be well advised to look to the non-residential sector as well. Recent experience suggests that some small and large businesses, as well as municipal, state, and Federal government facilities, are interested in purchasing green power. Experience with several green pricing programs, as well as evidence from Pennsylvania and California, suggest that these customers could easily constitute 20% of total green power demand. Non-residential customers are attractive clients for several reasons. First, non-residential customers often purchase large amounts of green power, translating into more cost-effective marketing. Second, non-residential purchasers are often high-profile businesses or organizations that choose to publicize their switch to renewables through press conferences or press releases, providing positive media exposure and free advertising to the chosen marketer or green pricing program in particular, and to the green power market in general. Finally, marketers or utilities can sometimes secure a longer-term contract from non-residential customers than they can in the residential sector, thereby reducing market risk.

Finally, green power demand will only translate into environmental improvements if the products being marketed as “green” provide true environmental benefits. Moreover, unlike some personal environmental behaviors (e.g., recycling), green power is an entirely intangible product and does not allow for facile verification of environmental value by

consumers. Unfortunately, competitive market pressures have resulted in some degree of “green-washing” among green power providers, particularly during two retail competition pilot programs in New England where several products were marketed based on hollow green claims (Wiser et al. 1999). Product quality has increased over the past two years, in part due to the emergence of environmental disclosure requirements and green power certification programs in markets open to retail competition. And yet, there remains a need for further product improvement. For example, the most popular green product in Pennsylvania contains only 1% renewable energy, and the amount of new renewables capacity serving competitive green products is lower than one might hope. Clearly, if green marketing is to make a meaningful contribution towards public renewable energy and environmental goals, purveyors and advocates of green power will need to continue to strive for environmental upgrades in product design.

Conclusions

While a niche market for green power clearly exists, the data presented in this paper indicate that the collective impact of customer-driven demand on the renewable generation market has been modest to date. As with other environmental products, a sizable disconnect exists between stated attitudes toward environmental products and actual demand for those products (Kempton 1993). While market research shows that a majority of the U.S. populace states a willingness to pay a premium for renewable energy, early experience with green power marketing shows that those attitudes have not yet translated into large-scale behavior change. Only a small fraction of American consumers have thus far demonstrated a willingness to voluntarily make a personal financial sacrifice by selecting a higher-priced green power offering. As with other green product markets, price, performance, and convenience concerns appear to dominate consumer behavior (Ottman 1998).

Roughly 40% of all U.S. households currently have access to a green power product, split almost equally between utility green pricing programs and competitive green power markets. Only about 1%, or 360,000 of those eligible households, are being served by a green power product today. With 50 average MW serving utility programs and 280 average MW supporting the competitive market, a total of about 330 average MW of renewable power is currently serving green markets nationwide. Of this total, 50 average MW, mostly from utility green pricing programs, is new capacity brought on line to meet customer demand.

Compared to the existing amount of non-hydro renewables capacity in the U.S. (16,000 MW) or to the projected impacts of more traditional state and federal renewable energy policies (see Wiser, Porter & Clemmer 2000), this raw data shows a modest contribution by green power marketing to date. The analysis also strongly suggests that full reliance on the green power market to meet national renewable energy objectives would be premature; traditional forms of public policy support will continue to be needed for the commercialization and maturation of the renewables industries.

We believe that it remains too early, however, to draw *definitive* conclusions about the contribution that the green power market might make towards renewable energy development objectives over the long run. After all, the green market—and the larger market for retail electricity service—is still in its infancy, with only a few years of experience in the most mature markets. Making long-term projections of the impact of green marketing based on this experience is challenging, at best. Market penetration could stagnate at 2-5% of

residential demand, or it could grow steadily over time, consistent with the development of other product markets and environmental behaviors. Twenty years ago, for example, only 10% of the U.S. municipal solid waste stream was recovered for recycling, while today nearly 30% is recycled. Supportive public policies and curbside recycling programs have no doubt played a vital role in this growth, yet at the same time such success would not have been possible without the voluntary efforts of millions of consumers. The percentage of financial assets that adhere to socially responsible investment criteria has also grown steadily, recently reaching 13% of the total market. Similarly, since the opening of the long-distance telephone market in 1984, competitors have captured over half of AT&T's market share – not in great leaps and bounds, but rather through a gradual and steady increase averaging 5% per year.

The fundamental challenge to making a long-term projection of the viability of green power marketing is that we do not yet know why individuals do or do not make the financial sacrifice to purchase green power products. Economic theory generally suggests that the majority of individuals are fundamentally selfish, interested primarily in their own well-being and not altruistic enough to contribute significantly towards public goods as consumers. If this is the case, customer-driven green power markets that are based on higher-cost renewable energy products will only thrive if a fundamental shift in the moral and ethical character of our society comes about; in its stead, *collective* public policy efforts will necessarily continue to be the sole or dominant method of achieving environmental improvements. If, on the other hand, there is a latent, sizable group of consumers that can be motivated to make a personal financial commitment to purchase environmentally preferable products, then a more substantial green market may develop with time, educational and marketing resources, and certain enabling public policies.

Finally, while we have focused primarily on tangible indicators of market success, it can be argued that the value of green power markets extends beyond the immediate and measurable support for renewable generation. First, the green power market may offer the renewable energy industries a durable, sustainable market for their products that is not entirely dependent on the whim of government policy. Second, while renewables development in the U.S. has historically focused on a few key regions of the country, green marketing is stimulating demand for renewable energy in diverse regions of the country. Such diverse, regional development, no matter how small, may be important in its own right. Besides giving a broader array of market participants around the country experience with renewable energy, developing projects throughout the U.S. demonstrates to the public the possibilities of renewable energy in their own communities and may enhance state and local collective policy efforts. Finally, the publicity surrounding restructuring and the marketing efforts of green power marketers may also serve to educate the public about the environmental impacts of conventional electricity generation and the benefits of renewable energy. Such education could be crucial in creating a national political climate conducive to the acceptance of supportive renewable energy policies.

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