

# Status of the U.S. Market for Green Power

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## ABSTRACT

The advent of electric utility deregulation has created a market for green power; electricity generated in whole or in part from renewable resources. Green power satisfies both the environmental yearnings of its purchasers and the need of its sellers to differentiate their product offerings. While green power has captured a significant percentage of those residential and small commercial customers that have left their host utility, the percentage of all eligible customers in competitive markets that have chosen green power is still very small.

This paper examines the development of competitive markets for green power in four states that have deregulated their electric utilities - California, Pennsylvania, New Jersey, and Massachusetts. The attributes of each of these state markets are characterized relative to creating barriers and incentives for the development and sale of green power. While multiple attributes clearly contribute to the development of green power markets, the most critical one is the overall development of the competitive market. In turn, overall competitive market development is driven largely by the price differential between the default service price relative to wholesale market prices.

## Introduction

Despite an initial burst of enthusiasm and interest when competitive, retail green power products were first offered during the New Hampshire retail pilot in 1996, the green power market has been slow to develop in the U.S. This pace can be attributed in part to the nature of green power products, regulatory treatment of green power during electric utility restructuring, and the marketing objectives and activities of green power providers. As important in examining the development of green power has been the slow maturation of overall retail electricity markets - the growth of green power is significantly constrained by the overall development of the retail electricity markets in which it competes. Though competitive green power markets may not have developed as fast as some had predicted, one out of every four customers receiving electricity from an alternative power supplier is purchasing green power.<sup>1</sup> These green customers, however, represent less than one percent of all electricity customers nationwide. While green power has demonstrated an ability to garner significant market share in certain states, it remains to be seen what role green power will play as existing competitive markets mature and the rest of the country deregulates their electricity markets.

In this paper we examine the principal drivers of competitive retail green power market development. To illustrate our observations we characterize the status of green power

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<sup>1</sup> This includes the customers in California who were switched over to a green power product after their original switch to Commonwealth Energy's system power product.

markets in four states which are fully open to retail competition. This paper examines both general retail and green power market development in California, New Jersey, Pennsylvania and Massachusetts. The success, or lack thereof, of green power varies considerably even within this small sample of states.

### **Key Green Power Market Drivers**

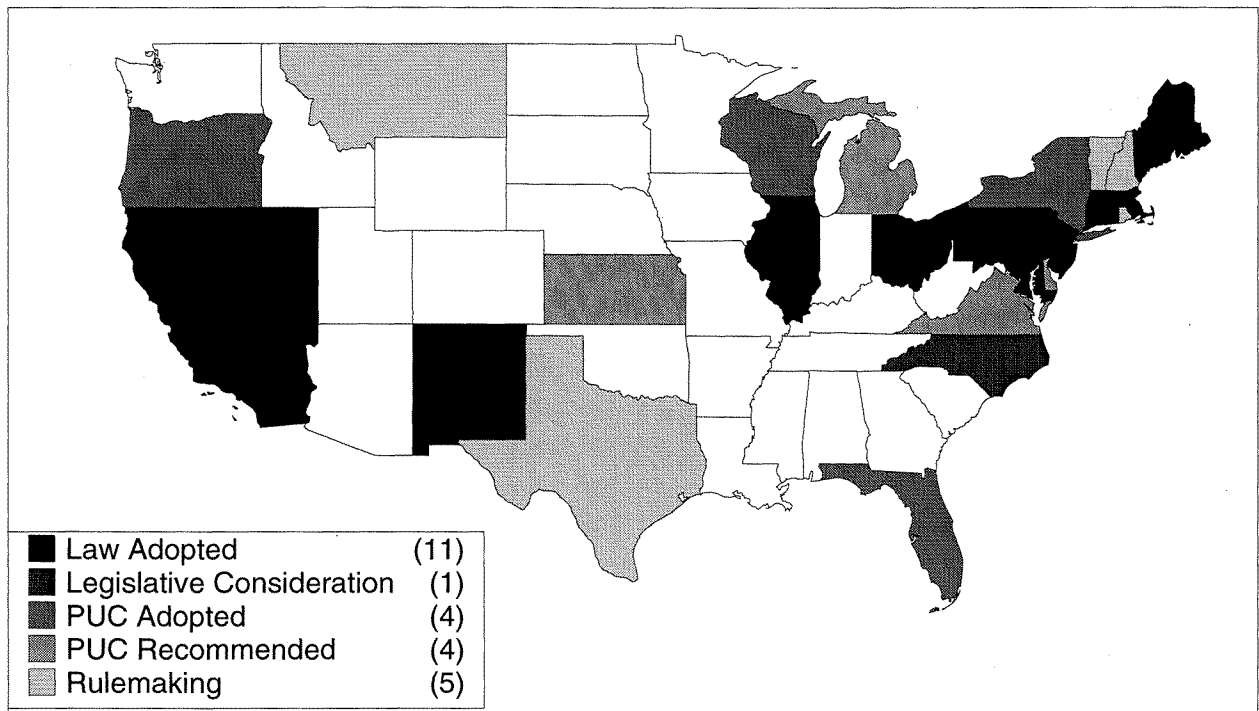
The single most important factor affecting the success of green power markets is the default service price relative to the wholesale market prices. The difference between the default service price and the wholesale price determines not only the interest of competitive suppliers to enter and offer supply choices, including green power, but also the ability of suppliers to earn margins and/or offer customers discounts from current rates. The greater the difference between the two, the greater the ability of suppliers to earn margins and/or offer discounts. The level of the green premium that suppliers charge for green power is also determined in part by the difference between default service and wholesale prices. The smaller the spread between the two, the greater the green premium will have to be to and vice versa. Even in a state such as California where a significant customer credit for green power exists, this premise holds true since the customer credit in essence increases the spread between the default service and wholesale prices and therefore creates customer switching activity.

However, there are a host of other factors that can have significant effects on the market for renewables including labeling and disclosure, certification, renewables policies such as the Renewable Portfolio Standard and System Benefits Charge, the renewable energy resources in the region or state, customer experience with utility green pricing programs, transmission pricing and policy, and monetary incentives. The presence or absence of any one of these will not make or break a green power market, but they can and do significantly drive green power markets.

**Definitions.** In general, “green power” is a term synonymous with renewable energy resources and denotes that the electricity has fewer negative environmental attributes such as air pollutants and nuclear waste than electricity from traditional sources. In different regions and states of the country, however, the terms have come to mean different things to different people. How various states define “green power” and “renewables” will drive green power markets in very important ways. The resources that can be sold into green markets will obviously be affected and therefore will impact product costs and prices which in turn affect customer purchase decisions. These decisions will also be driven by customer attitudes towards the resources they are offered. Finally, for the purposes of this paper, the discussion of green power market development is restricted to competitive retail markets, and does not address green pricing and other green product offerings in regulated utility markets.

**Disclosure.** One requirement for competitive markets to flourish is the ability of customers to have sufficient information to make informed choices. Credible and standard product information that enhances customer protection is key to building successful retail electric markets, particularly green power markets. Standardized disclosure and labeling

requirements, when properly designed, enable customers to compare products on an apples-to-apples basis. Figure 1 shows the status of disclosure activity in the continental U.S.



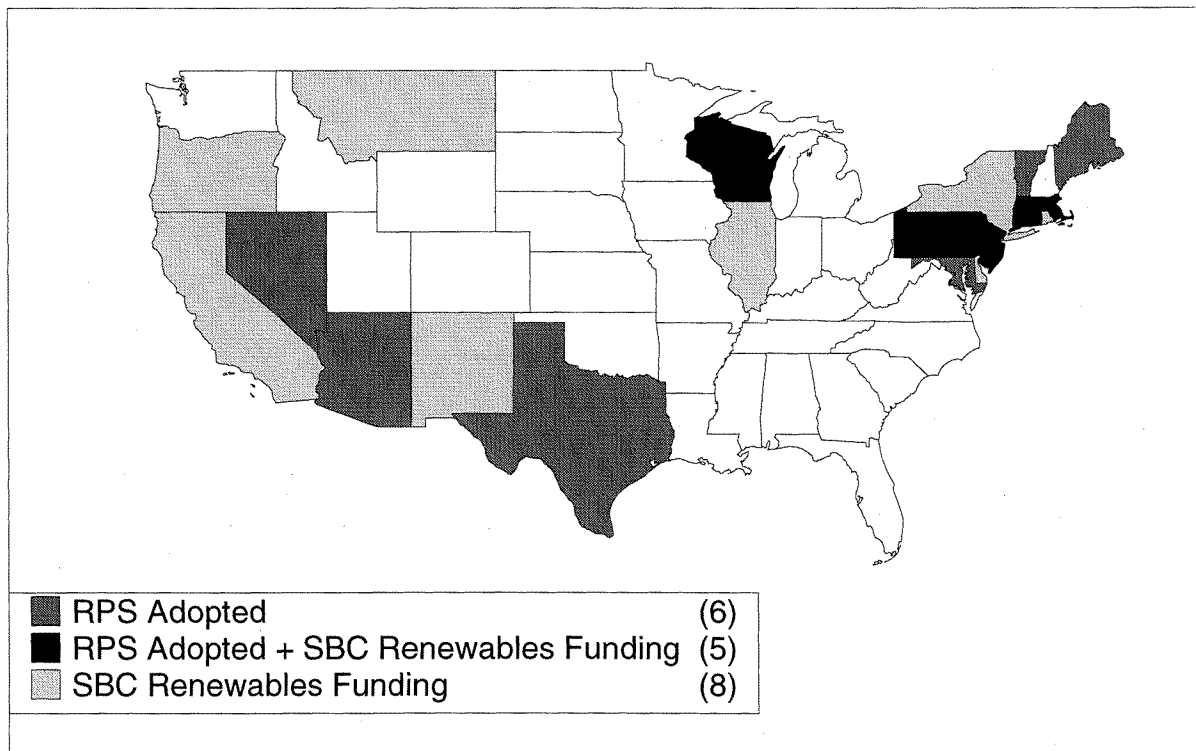
**Figure 1. Information Disclosure Activity**

**Certification.** Voluntary certification programs can serve to promote consumer confidence and encourage consumers to learn about and purchase green renewable electricity. One such program is the Green-e Renewable Electricity Program administered by the Center for Resource Solutions, a non-profit organization based in San Francisco, California. Consumers can use the Green-e Certification logo to quickly identify electricity products that meet an objective standard for renewable energy supply. To meet the Green-e requirement, products must contain at least 50% renewable energy resources as well as a certain percentage of new renewables resources.

**Existing Resources.** As newly developing green power markets emerge, marketers do not have captive customer bases and must proceed cautiously as they procure renewable energy resources for their products. Most green power marketers at the outset of new markets rely heavily on existing renewable resources as these resources are generally cheaper and come with more favorable terms (i.e. shorter contract terms). In some areas, however, there is not an abundance of existing resources from which to purchase power. Risk for green marketers in these areas is greater because they must build higher levels of new generation in the early stages of the market and some marketers may not be willing to take on that risk initially. A sufficient amount of existing resources will help to ensure the success of green power markets as they begin to develop across states. It should be noted, however, that exclusive reliance on existing resources also opens up green marketers to criticism that they are not doing anything to introduce new renewables to displace dirtier resources (Rader 1998).

**New Resources.** The potential for new generation is an important factor for the development of green power markets. Customers have stated a preference for new, green power resources, and a willingness to pay more for green power offerings containing new renewable resources. In response, competitive suppliers have used the presence of new green power resources as a means to further differentiate their product offerings, and as justification to charge a higher price for these green power products. Further, as noted above, green-e certification requires a minimum new renewable product content. This requirement increases annually.

**Renewables Policies.** With the move towards competitive electric markets, renewable energy faces the risk that these new markets will be dominated by lower-cost fossil fuel generation. And while the costs of many renewables are falling, they have not fallen sufficiently to compete with fossil fuels when their environmental benefits are not taken into consideration. Two public policies, the Renewables Portfolio Standard (RPS) and the System Benefits Charge (SBC), are designed to help ensure a place for renewables in a restructured marketplace (Figure 2). These policies, along with Net Metering provisions and policies related to distributed generation, will have a significant impact on new markets for renewable energy resources.



**Figure 2. State RPS and SBC Activity**

**Transmission Pricing and Policy.** There are several issues related to transmission pricing and policy that greatly affect the development and economic viability of renewable energy projects. In the absence of open access transmission tariffs, renewable energy generators can face multiple access fees to transport electricity across multiple jurisdictions. This

phenomenon, known as the “pancaking of fees”, is a significant impediment to the development of renewables as renewable resources must sometimes be developed a significant distance from transmission lines and customer load. New transmission policies and pricing schemes, however, have been developed under open access tariffs to facilitate competitive markets. Even under open access transmission tariffs, renewables still face barriers in some areas of the country. For example, within the PJM and ISO New England control areas, generators under 1 MW cannot schedule directly into the ISO creating barriers for small, renewable generators.

**Green Pricing Experience.** Successful green power marketers will have to spend significant amounts of their marketing budgets to educate customers on renewables and their environmental benefits. Green customer experience with renewables and green pricing prior to the opening of competitive electric markets may help prepare markets for green power choice with less money required for education. However, customer experience with green pricing may be viewed differently from a green marketer perspective. Some marketers view utility green pricing as tightening the utility’s grip on green customers, thereby increasing the utility’s market power. Marketers may feel that they will have to spend even more (not less) on marketing to get the customer to switch.

**Monetary Incentives.** Most renewable energy resources are not cost competitive with traditional forms of generation, in large part because the environmental costs of traditional supply are not fully internalized to their price, and the benefits of renewable energy are likewise not taken into account. The costs of several renewable resources, however, are declining, and some are approaching cost-competitiveness, even without considering external costs and benefits (Flavin and Lenssen 1994). Monetary incentives can give certain types of resources that are close to being competitive the needed “push” to put them on par with cheaper, and many times dirtier, generation. By bringing the price of renewables down, these incentives allow green power marketers to offer green products at a lesser premium, thereby attracting more customers.

## **California**

As of May 15 2000, only 222,548 (2.2%) of the total 10.1 million customer accounts in California had switched suppliers since the electric market opened in March 1998. Of the total switching population, the majority are residential (164,636 ) and small commercial (38,195) customers. However, the residential switchers only represent 1.9% of total residential customers and only 2.3% of the direct access load (kWh). Similarly, the small commercial (<20kW) switchers represent only 3.9% of total small commercial customers and 5.3% of the direct access load. In comparison, the 1,009 large industrial users (>500kW) that have switched represent 19.3% of the industrial customers and 34.6% of the industrial direct access load (California Public Utilities Commission 2000).

The overwhelming majority, 85%, of these residential and small commercial customers are being served by a green power marketer (Byrne 2000). Green power has not only had significant mass market appeal, but has attracted a growing number of large commercial and industrial customers, including MCI WorldCom, Los Angeles World

Airports, Fetzer Vineyards, and Toyota Motor Sales. Local governments have also begun to play a major role in the green power market, with over 100 municipal entities in California purchasing approximately half of the green power in the state. The total level of green power activity has prompted the construction of a handful of new renewables projects including nearly 20 MW of wind as well as a 132-kW PV project.

There are several green power marketers currently active in the state including GreenMountain.com, Commonwealth Energy, Go-Green.com, and Utility.com serving both residential and business customers.<sup>2</sup> Utility.com's 100% renewable GreenPlanet product is the first Internet-only green power product. PG&E Energy Services currently offers green products only to business customers. Commonwealth Energy and GreenMountain.com hold the large majority of the market with approximately 70,000 and 40,000 residential and small commercial customers; respectively. In addition, there are wholesale green power providers including the Automated Power Exchange, New West Energy, and PacifiCorp.

Several other green power marketers, active since the market opened, have now exited the residential market. Enron Energy Services exited the residential market early on, while Edison Source, the unregulated affiliate of Southern California Edison, dropped out in November 1999 in an effort to improve the profitability of Edison Source's parent Edison Enterprises. PG&E Energy Services also recently exited the residential market. In addition, the California Public Utilities Commission recently suspended Keystone Energy Services' supplier license citing failure to meet requirements for financial viability and technical and operational viability.

Green power rates range between 5% less and 20% higher than the standard utility rate in PG&E's service territory based on an average bill of \$60 per month. Both Utility.com and Commonwealth Energy offer discounted green power products, while GreenMountain.com offers two premium green products with between 5% and 25% new renewables.

### **What is Driving the California Green Power Market?**

Two important forces are driving the market for green power in California: a market structure that sets the default service price equal to the wholesale price of power and the Renewable Customer Credit.

Restructuring rules in California mandate that utilities must pass the wholesale market price through to retail customers with no mark-up. This wholesale price pass-through has stagnated the electric market with many suppliers finding it difficult to offer any customer discounts. However, the Renewable Customer Credit, funded through the state's System Benefits Charge (SBC), allows green power to be sold at a discount to utility standard rates, making green power one of the only discount options available to small customers.<sup>3</sup> Commonwealth Energy Services, realizing the opportunity the customer credit created, switched all 38,000 customers it had attracted to a green power option six months after

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<sup>2</sup> Several other marketers are registered as Renewable Electric Service Providers, but do not appear to be active.

<sup>3</sup> The credit was recently reduced from 1.5 cents/kWh to 1.25 cents/kWh because the program has been attracted so many customers and funds were likely to dry up before the end of the transition period in 2002.

entering the market with standard system power products. A recent study reports that 55% of California green customers are purchasing discounted service, 30% of which are commercial customers and 25% are residential (Byrne).

The green power market in California has been successful relative to the overall competitive market, in large part due to the Renewable Customer Credit. However, the basic market rules have stifled any meaningful level of competition. The future success of the green power market rests on the state's ability and willingness to reshape these underlying market forces.

## **Pennsylvania**

Of the total 5.2 million customer accounts in Pennsylvania, just over 10% or 535,445, had selected an alternative supplier as of April 2000, including almost 430,000 residential customers. One in five of the total switchers and nearly one in four of residential switchers have selected a green power supplier.

Though activity in the residential market has been strong, commercial and industrial activity has been less than in California. However, some C&I accounts, including Kinko's, and more than a dozen state government accounts, have selected a green power provider. The total level of activity has prompted the installation of several new renewables projects including a 10-MW wind farm currently under construction as well as several small PV projects.

There are currently four active green power marketers in the state—GreenMountain.com, Conectiv Energy, the Energy Cooperative Association of Pennsylvania, and Mack Services Group—though GreenMountain.com holds the overwhelming majority of green market share. GreenMountain.com has become a major force to contend with in the Pennsylvania market, attracting nearly 1 in 5 of all switchers. In addition, Conectiv recently reported that of the 70,000 customers it has acquired in Pennsylvania, 20,000 are purchasing its green power products.

Green power products in Pennsylvania are currently being offered between 3% below and 28% above the default service price in PECO's service territory for products with between 50% and 100% renewables. GreenMountain.com is the only marketer specifically offering a percentage of new renewables in its product mixes.

### **What is Driving the Green Market in Pennsylvania?**

The overall level of switching is much higher than seen to date in California due to the level of shopping credits in some service territories. For example, the shopping credit for 1999 in PECO's service territory was 5.65 cents/kWh, leaving ample margin for alternative suppliers. As the overall level of switching has been much higher than in any other market opened to competition, the overall level of green power activity has been high as well. Even without the types of monetary incentives available to suppliers and customers in the California market, the green power market has met with considerable success. GreenMountain.com has continually asserted that as long as there is sufficient switching activity, it will be able to cast its green net and capture a significant number of customers capitalizing on the pent-up market demand for cleaner energy sources.

## **New Jersey**

Of the four states examined, the competitive New Jersey retail electricity market is the most recent, with the market having been fully opened to all customers on August 1, 1999. Through March 16, 2000, the New Jersey Board of Public Utilities reported that 81,923 accounts switched, representing 2.4% of total customer accounts and 12.1% of total load. By number of customer accounts, 2.0% of residential customers and 5.3% of commercial and industrial customers have switched. Based on load (MW), approximately 1.6% of residential customers and 18.8% of C&I customers have switched.

The New Jersey green power market is only now being developed. GreenMountain.com announced at the end of March that as of April 4 it would have two green power products available in New Jersey. EcoSmart contains 50% large hydropower, 49% natural gas, and 1% of new renewables derived electricity. The EnviroBlend offering is Green-e certified and contains 50% large hydropower and 50% renewables, including 4% wind. Conectiv recently announced the availability of two Green-e certified renewable electricity products. Nature 50 contains 51% renewables and 49% conventional power, including coal and nuclear. Nature 100 is 100% renewable, with 50% from small hydropower and 50% from wood and other biomass. Conectiv's non-renewable retail electricity offering in New Jersey costs 4.99cents/kWh for a 16 month contract. In comparison, Nature 100 costs 6.29cents/kWh and Nature 50 costs 5.69cents/kWh.

The GreenMountain.com New Jersey offerings cost 6.55cents/kWh and 5.65cents/kWh for EcoSmart and EnviroBlend, respectively. Both of these products also have a monthly \$3.95 customer charge. Public Service Electric and Gas customers will pay a 20 percent premium for EcoSmart and a 5.5% premium for EnviroBlend. For GPU customers, the premiums are 24 % and 8.4 %, respectively, for EcoSmart and EnviroBlend. (The Record Online 2000)

### **What is Driving the Green Market in New Jersey?**

Until recently, the prospects for any green power market in Jersey were unclear. GreenMountain.com, the nation's most visible green power marketer, and with a significant presence next door in Pennsylvania, had refused to enter the New Jersey market until the state's "wet signature" rule was amended or deleted. This rule requires a customer's signature to be affixed to any agreement to switch generation suppliers. GreenMountain.com, like many other power suppliers targeting residential and small commercials, has relied heavily on both telephone and Internet recruitment. While neither of these two approaches are banned under New Jersey restructuring law, a customer must ultimately mail or fax an agreement with a signature affixed. This requirement was seen by GreenMountain.com and others as a significant barrier to market entry.

Recently, however, the BPU has expressed a willingness to reconsider its position on the wet signature requirement. GreenMountain.com reacted optimistically to these pronouncements by announcing its green power offerings in the state.

Providing incentives for all power marketers are the relatively high costs for the basic generation service credit in New Jersey. This credit is the price of generation and



transmission from the electric distribution company (EDC) and is the amount avoided when purchasing electricity from a competitive Electric Generation Supplier. These costs vary by utility and by customer class, and are slated to increase for the next several years. In 2000, the basic generation service credit ranged from 5.65 cents/kWh to 5.86 cents/kWh for non-time-of-use residential customers. While these prices are comparable to those in Pennsylvania, margins are significantly smaller in New Jersey.

## **Massachusetts**

Massachusetts was the first state in the nation to fully open its electricity markets to retail competition on March 1, 1998. Since then there has been very little visible mass marketing of electricity choice to residential and small commercial customers. Through the end of January 2000, only 1,831 residential customers had switched; 0.1% of both customer accounts and customer sales (kWh). In contrast, 11.4% of large C&I customers had switched, representing 18.2% of large C&I sales.

To date, there is no true green power offering in Massachusetts. AllEnergy does offer its ReGen Renewable Power Upgrade. This offering supplements, rather than replaces, basic generation service from the electric distribution company. The payment for ReGen allows AllEnergy to develop renewable energy resources. Customers can purchase 2,000 kWh blocks of ReGen for \$8 per block for the first block and \$6 per block for additional blocks. These charges are in addition to whatever generation costs the customer pays to the electric distribution company. AllEnergy has made investments in landfill gas generation, photovoltaic installations and is seeking permits for a wind turbine.

Other green power marketers, including GreenMountain.com, have expressed interest in the Massachusetts market, but are taking a wait and see position at this time.

### **What is Driving the Green Power Market in Massachusetts?**

The Massachusetts restructuring legislation ensured ratepayer savings, though in doing so it limited the near-term attractiveness of Massachusetts to competitive suppliers. At the start of retail competition, Massachusetts generation prices were set so low as to prevent power suppliers from making an adequate margin on retail electricity sales. Over time, these generation prices have risen and noticeable levels of switching have occurred in the larger customer classes where smaller margins can be offset by larger volumes. For small customers, the current wholesale price structure in Massachusetts is only now becoming favorable for marketing to smaller customers. Much of the recent residential marketing and recruitment has been by Internet companies like essential.com.

The Massachusetts green power market has also been impeded by a lack of ratepayer funding to support renewable power development. The Massachusetts restructuring legislation earmarked a systems benefit charge dedicated to renewable power development. However, an on-going law suit has challenged the constitutionality of the mechanism to collect the funds. To date, approximately \$100 million has been collected and remain largely unspent. When finally made available, these funds could provide considerable support to green power development in Massachusetts.

## Summary of Market Drivers

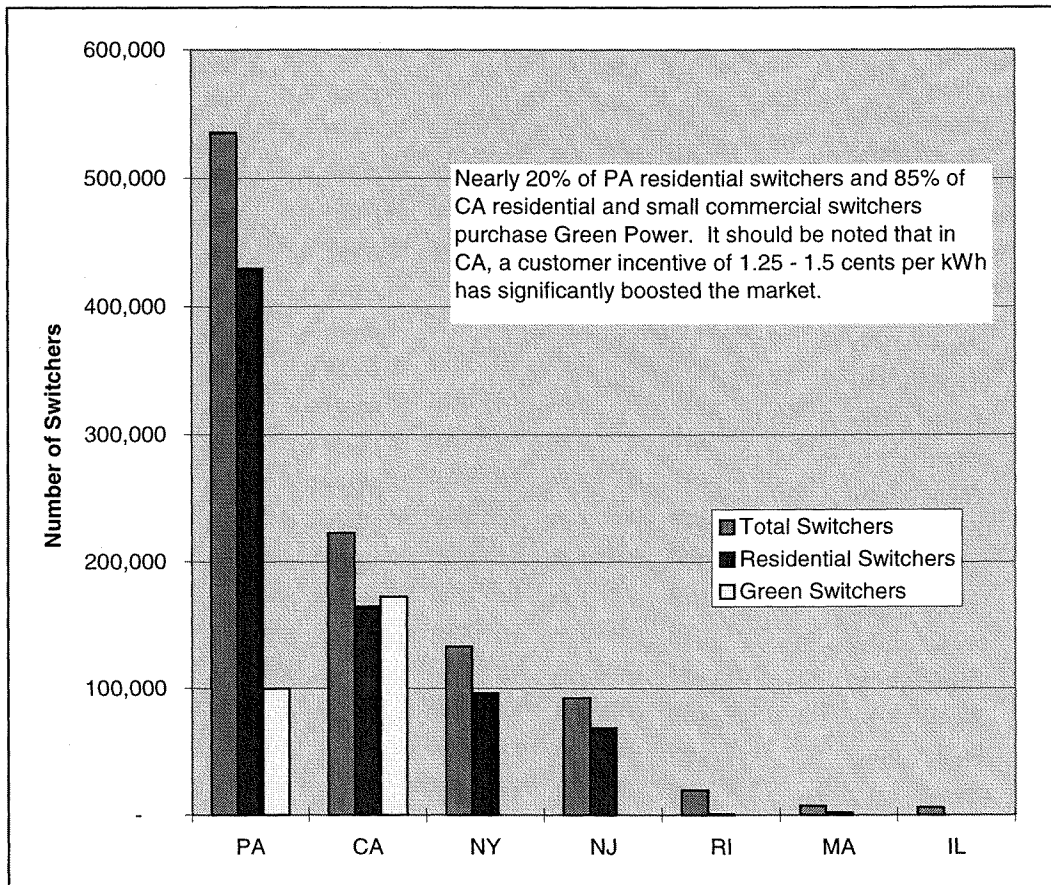
Table 1 summarizes the key green power market drivers in the four states examined.

**Table 1. Summary of Green Power Market Drivers in Key States**

	California	Pennsylvania	New Jersey	Massachusetts
Default Service Price	default price = wholesale power price; no margin without REC	varies by territory; between 3.2 and 5.65 cents/kWh; good margins in some territories	Most residential shopping credits are above 5 cents/kWh but margins are poor	Default prices have been lower than wholesale prices, but rising in some territories
Definitions	Renewables	None	Renewables	Renewables
Disclosure	Generation mix	Not required	Generation mix, emissions, and efficiency	Generation mix and emissions
Certification	Program active	Program Active	Standards adopted	Standards adopted
Transmission Pricing/Policy	Lack of transmission investment	PJM 1 MW minimum	PJM 1 MW minimum	localized pancaking
Existing Resources	Substantial	Small amounts	Small amounts	Small amounts
New Resources	Potential for large amounts of new	Potential for small amounts of new	Potential for small amounts of new	Potential for small amounts of new
Renewables Policies	SBC, net metering, DG	Varies by service territory	RPS and SBC; net metering; CTC exemptions for DG	RPS and SBC; net metering; CTC exemptions for DG
Customer Experience	No IOUs; one muni	None	None	None
Monetary Incentives	Customer and generator incentives	Varies by service territory	May be available	May be available

## Conclusions

Despite generally low levels of switching activity in retail electric markets, except perhaps in Pennsylvania, green power has proven itself to be one of the few successful methods for differentiating generation services. More than one in four customers who have selected an alternative supplier are now being served by green power supply (Figure 3). Not only have significant percentages of residential switchers turned to green power suppliers, many commercial and industrial customers have signed up as well.



**Figure 3. Total, Residential, and Green Switchers<sup>4</sup>**

The level of the default service price has shown itself to be one of the key drivers for the success of overall competitive and green power markets - higher default prices lead to higher levels of market activity, including green market activity. Policies and programs set up to boost the market for renewables also play a key role in the development and success of green power markets. However, the ultimate success of green power markets rests on ability of suppliers to offer benefits to customers, and this can only be done if there is a sufficient difference between the default service price and the wholesale price of power.

As can be seen from the California market, the combination of very low default service prices and monetary incentives created relative success for the green power market, but in the context of an extremely stifled overall competitive marketplace. The very low levels of switching activity in New Jersey and Massachusetts also demonstrate the effects of low default service prices. And despite some strong renewables policies and programs in these states, green power markets remains stagnant. Alternatively, in Pennsylvania, the default prices were set relatively high in some service territories, and even without statewide policies and programs (except certification) to boost the market for renewables, the green power market has been very successful.

<sup>4</sup> The number of green switchers in New Jersey and Massachusetts is not currently available.

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