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## ABSTRACT

### FACTORS AND STATE ELECTRIC UTILITY DEREGULATION POLICY INFLUENCES ON GREEN POWER MARKETERS

by  
Richard Orlusky

The electric power industry has been restructuring over the last several years to allow market competition in purchasing electric power. Power generation that was traditionally provided by the local electric utility has been deregulated in order to introduce customer choice. The renewable energy sector of the power industry will have to compete with conventional fossil fuel power generators in this market. This research focused on factors and state deregulation policies that are of importance to Green Power Marketers in a retail power market. Green Power Marketers providing service in California, Pennsylvania and New Jersey retail power markets were surveyed to obtain information for the topic. The research indicates Green Power Marketers believe “state deregulation policies” are of primary importance to retail competition. The “state deregulation policy” Green Power Marketers most prefer is a competitive “shopping credit” that encourages customer switching. Lastly, Green Power Marketers do not favor Federal regulatory standards or definitions for Green Power.

**FACTORS AND STATE ELECTRIC UTILITY DEREGULATION POLICY  
INFLUENCES ON GREEN POWER MARKETERS**

by  
**Richard Orlusky**

**A Masters Thesis  
Submitted to the Faculty of the  
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In Partial Fulfillment of the Requirements for the Degree  
Master of Science in Environmental Policy Studies**

**Department of Humanities and Social Sciences**

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**APPROVAL PAGE**

**FACTORS AND STATE ELECTRIC UTILITY DEREGULATION POLICY  
INFLUENCES ON GREEN POWER MARKETERS**

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*Earth... .*

*Its creation cannot be saved nor sacrificed*

*It reconciles its forces of the living with that of the physical*

*Its history continues to prove less predictable than its future*



## ACKNOWLEDGEMENT

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## CHAPTER 1

### INTRODUCTION

#### 1.1 Statement of Objectives

In 1998 several states with high electric rates began to legislate the deregulation of their electric utility industries in an effort to lower rates. In a deregulated market, retail suppliers of electricity will have to compete for customers. It is uncertain how deregulation will impact the renewable energy sector of the power generating industry. The renewable power sector is a developing industry in the United States, requiring continued capital investment, infrastructure improvement and technological advancement. Power generation costs from renewable power sources may be less competitive in a deregulated market compared to power generated by conventional fossil fuel electric power generating sources. Fossil fuel power plants have been in use for decades and benefit from an established technology, developed infrastructure and readily available fuel supply.

The environmental benefit of renewable power is that air pollution emissions are non-existent or minimal compared to fossil fuel power generation. More importantly, by virtue of the power being “renewable,” these power generators do not rely on finite natural resources such as coal, oil and gas. Therefore, renewable energy sources are recognized as “Green Power” which shall be the term referred to in this research. The environmental benefits from this sector of the power industry may not be realized if electric utility deregulation results in declining consumer demand for renewable energy.

However by identifying mechanisms in retail market competition that could stimulate greater demand for renewable energy or “Green Power,” the industry could increase capital investments in areas of infrastructure, operations and technology. Over time these capital investments could reduce the cost of renewable power production. Thus, if market competition could equate to increased renewable power demand the industry could become more cost competitive with conventional power generation sources.

This research will focus on identifying those factors and state electric utility deregulation policies that are of importance to marketers providing “Green Power.” The term “Power Marketing” refers to the assortment of financial or physical transactions associated with the delivery of electric services to retail customers. The “Marketer” need not have ownership of electricity transmission, generation and distribution facilities. The “Marketer” primarily acts as a contractual intermediary (Sioshansi and Altman, 1998).

Green Power Marketers in California, New Jersey and Pennsylvania are the focus of this research because their respective electric utility power sectors have been fully opened to retail competition for at least one (1) year. To perform this research, hypotheses were developed to test the significance of state deregulation policies on Green Power Marketers providing services in these states. Green Power Marketers in these states were then presented with a survey questionnaire to elicit feedback regarding the topic. Three (3) hypotheses were established as subjects of this research as follows.

- **First Hypothesis:** Green Power Marketers believe “state deregulation policies” are of primary importance to competing in a retail market. How a state enacts utility deregulation into legislation may be of importance for Green Power Marketers trying to compete in an open retail power market. A variable set was developed to test this hypothesis (Refer to Section 3.5.1). This hypothesis was designed to evaluate overall market influences on Green Power Marketers in a competitive market.
- **Second Hypothesis:** Green Power Marketers believe the “shopping credit” is the “state deregulation policy” initiative of most benefit in their ability to compete in a retail market. The “shopping credit” allows Green Power Marketers to offer its product to consumers at a rate (cents/kWh) competitive with the default utility rate (cents/kWh) structure (Refer to Section 2.6.1). Thus, the rate (cents/kWh) adopted as the “shopping credit” under deregulation can provide an incentive for customers to change electric suppliers. A variable set was developed providing a number of “state deregulation policy” options that Green Power Marketers could select from to determine which variable was of most benefit (Refer to Section 3.5.2).
- **Third Hypothesis:** Green Power Marketers prefer non-governmental renewable product content standards over government defined standards. Defining what can be considered “Green Power” can differ depending on the region of the country. For example, some areas of the country such as the Pacific Northwest have large hydropower energy resources. Other regions in the country consider biomass, wood burning and waste-to-energy as renewable energy resources.



Moreover, there is no standard for what type of sources can comprise the power mix being marketed as “Green Power.” Many Green Power Marketers offer a power mix, combining both renewable power and conventional power. This hypothesis was designed to evaluate, from a Green Power Marketer perspective, which was more important a governmental role or non-governmental role in developing renewable energy standards.

## **1.2 Electricity Deregulation Overview**

Electric utility deregulation legislation has been under consideration in many states across the U.S. since 1992. This consideration has been the result of federal government regulatory actions, economic forces, and improvements in electric power technology. Federal actions included the Energy Policy Act (EPACT) P.L. 102-486 in 1992, followed by the Federal Energy Regulatory Commission (FERC) Orders 888 and 889 in 1996. These regulatory actions were designed to encourage competition in the wholesale power market. As discussed below, these Federal regulatory actions also prompted states to consider deregulation and allow retail competition (USDOE/EIA, 1996).

States have the jurisdiction to authorize franchises and regulate retail electric rates. State regulation allowed electric utility companies to operate as regulated monopolies. Electric utility companies could “bundle” or organize for the purpose of owning and operating electric generation plants, transmission systems and distribution lines within their designated franchise service area. These franchises were obligated to serve all the customers within the franchise service area and were guaranteed a rate of return subject to state approval.

State electric deregulation legislation acts to “unbundle” these services into the following components: (1) power generation, (2) transmission and distribution and, (3) metering and billing (USDOE/EIA, 1996). In most cases the goal of state deregulation legislation is to enable the “retail” customer to choose the energy provider and type of energy they wish to purchase. The local electric utility would retain the operation and maintenance of the transmission and distribution services. Thus, by allowing residential, commercial, and industrial customers to obtain the best price for the electricity they wish to purchase, the states are encouraging competition and lower prices for retail consumers.

### **1.3 Electric Utility Background and Deregulation Factors**

Electric utilities have been regulated monopolies under state and federal jurisdictions for the better part of the 20<sup>th</sup> century. The Public Utility Holdings Company Act (PUHCA) enacted in 1935 designated the Securities and Exchange Commission (SEC) to address the structural problems inherent with large electric holding companies. During the 1930’s the SEC restructured the large holding companies that exerted excess control over the nation’s electric and gas distribution networks which provided the present day electric utility company framework (USDOE/EIA, 1996).

State jurisdiction over this industry provided regulation for retail electric markets and authorized franchise areas for the electric utility companies to operate. State regulatory commissions were set up to issue franchise licenses for the electric utility company operating in a designated area. They guaranteed a rate of return to the electric utility company for generating, transmitting, and distributing electricity within its designated franchise service area.

Over the past thirty (30) years several factors have developed which helped alter this structure. These factors included: (1) the establishment of major power grids across the country, (2) the construction of nuclear power plants, (3) the high cost of fossil fuels during the 1970's energy crisis, and (4) technological advancements in gas-turbines (Van Doren, 1998).

Electric utility companies were structured to generate and transmit power within their designated franchise areas. Thus, power transmission was fragmented into regional services. The interconnected power grid was established after a severe power outage event in the Northeast in 1965. The Northeast power outage was aggravated by the lack of interconnected power grids that could transmit electricity over long distances and thereby alleviate the power blackout. In response, the National Electric Reliability Council (NERC) was established in 1968. NERC coordinated the development of an interconnected power grid system for the country. Three (3) networks were established in the U.S.: (1) the Eastern interconnected system, (2) the Western interconnected system, and (3) the Texas interconnected system. As a result, electric utilities in the continental U.S. were interconnected with at least one other utility (Perl, 1997).

The interconnected power grid enabled utilities to purchase electricity from other electric utilities outside its service area. The practice of purchasing wholesale power was used to overcome shortages and increase the availability of power during peak demand times in different service areas. The development of the interconnected power grid would facilitate deregulation because it provided the infrastructure for making electricity available across the country.

Similar to the interconnected power grid, nuclear power came of age in the 1960's. Nuclear power was projected to be a new, low cost power supply. However, more stringent safety requirements, regulations, and intensive capital costs in construction resulted in nuclear power becoming one of the most expensive power sources in the country (Van Doren, 1998). Utility companies that constructed nuclear power plants had to recover their costs. As a result, customers in service areas supplied with nuclear power incurred higher electric rates. This situation, in part, led to the increasing disparity in power costs between states and electric utility service areas. The disparity in power costs between states caused large industrial customers to lobby state legislators for electric utility deregulation.

The Public Utilities Regulatory Act (PURPA) of 1978 also had unintended consequences for the electric power industry. PURPA was enacted in response to the energy crisis of the 1970's. Policymakers, concerned with U.S. reliance on foreign oil, developed strategies to stimulate alternate power sources and technology within the country in order to reduce this dependence. PURPA required electric utilities to purchase power generated by independent producers, like renewable energy providers, at a price equivalent to the price it would have cost the utility to generate the same amount of power (USDOE/EIA, 1996). The premise of this provision, given its historical context, was to support alternate power generation within the U.S. because it was assumed that the cost of fossil fuels would continually increase. One result of PURPA was that utilities purchased long term contracts with independent producers under the assumption that fossil fuel prices would keep rising.

In actuality, the cost of fossil fuels began to drop throughout the 1980's and into the 1990's, thus burdening some utilities with contracts requiring them to pay independent producers for power that did not reflect true market value (Perl, 1997). This scenario contributed to the disparity in power costs between states and utility service areas. PURPA also encouraged independent power generators to develop cost effective methods to produce electricity. The most successful was gas turbine technology. In some high cost power states such as in California and the Northeast, gas turbines could be built and operated more cost effectively than purchasing power from the existing local electric utility company (Van Doren, 1998). As a result large industrial power users began to consider the prospect of self-generating electrical power with gas turbine technology. Moreover, under the provisions of PURPA and the Energy Policy Act of 1992, these industrial generators could sell any surplus power they generated. Utilities were faced with the prospect of losing industrial customers and revenue.

Thus, the regulated monopoly paradigm that had been established in the 1930's was losing relevancy in the 1990's U.S. economy. These factors made electric utility deregulation technologically possible and economically advantageous. Deregulation could introduce retail competition in the power market in an effort to lower prices and open up new opportunities for alternate power suppliers, including Green Power Marketers.

Along with technological and infrastructure improvements, regulatory reform for the electric utility industry was also necessary to realize competition in the retail power market. First the wholesale power market was deregulated by federal action in the early 1990's. The wholesale power market functioned by allowing electric utility companies to sell power outside their service areas to help other electric utilities meet demand for

additional power. Thus population growth and development could occur in certain markets without the construction of new power generating sources. However, both access to the power transmission grid and the rates at which power could be bought and sold were regulated by federal agencies.

During the 1990's federal regulatory action enabled competition in the wholesale energy market by the passage of the Energy Policy Act of 1992 (EPACT), and FERC Final Order 888 and 889, in 1996. These federal actions created a new entity known in the power market as the exempt wholesale generator (EWG). EWGs were allowed to access the wholesale power market as non-utility power generators. The EWG could sell power to any electric company in the country in need of additional power to meet demand. However, the electric utility companies were not required to purchase power from EWGs as existed under PURPA. Therefore, EWGs would need to generate power at a competitive price in order to enter the electric wholesale purchasing market (USDOE/EIA, 1996).

Lastly, FERC Order 888 and 889 required utilities to open their transmission facilities at "just and reasonable rates," which effectively allowed EWGs to market power anywhere in the country. In summation, EPACT, and FERC Order 888 and 889, addressed some fundamental regulatory issues in the wholesale power and transmission market, along with developing a regulatory framework for states considering the deregulation of their retail power markets.

## 1.4 Renewable Energy Power Overview

Renewable power sources typically include water, wind, solar, geothermal, biomass, waste-to-energy and landfill gas. Prior to deregulation activity, the renewable power industry developed primarily with the support of federal policy. The U.S. became increasingly concerned with its reliance on foreign oil during the energy crisis of the 1970's. This dependency on foreign oil resulted in several policy strategies to stimulate the domestic development of renewable energy sources (USDOE/EIA, 1998). Table 1 presents electricity consumption in 1998 by all fuel sources in the United States. Table 2 presents the contributing renewable energy sources for power generated in the United States during 1998 (USDOE/EIA, 1999). These tables indicate that renewable power sources supply a relatively small percentage of the total power consumed in the country. This data also demonstrates that increased market share could be realized by renewable power sources if they could become competitive with fossil fuel generators in a deregulated retail power market.

**Table 1**  
**1998 U.S. Renewable Energy Consumption Compared to Other Fuel Sources**

Petroleum	Natural Gas	Nuclear	Coal	Renewable(s)
39%	29%	8%	23%	8%

Source: Electric Power Annual 1998, Volume II DOE/EIA-0348 (98)/2, December 1999.

**Table 2**  
**1998 Contributing Sources of Renewable Energy Consumed**

Hydropower	Biomass	Solar	Geothermal	Wind
50%	43%	1%	5%	<0.5 %

Source: Electric Power Annual 1998, Volume II DOE/EIA-0348 (98)/2, December 1999.

## CHAPTER 2

### PREVIOUS RESEARCH AND FINDINGS

#### 2.1 Green Power Marketer Findings

Electric utility deregulation is a relatively recent occurrence in the United States. There has been limited research on policy factors that Green Power Marketers would prefer in a deregulated market. The research that has been performed indicates several general findings regarding Green Power Marketer preferences (Riser, 1999).

Marketers believe that profitable green power markets will only develop if a solid foundation of supportive market rules and facilitation efforts exist. Green Power Marketers favor public policies that support Green Power markets even with the potential of new market opportunities that may become available as a result of deregulation. Green Power Marketers indicated little support for a single policy approach but support a variety of competitive market rules and Green Power policies (Riser, 1999). Another study identified that Green Power Marketers are attempting to service a developing market in which customer preferences are still not well understood. Thus, public policy can be an important factor in the success or failure of Green Power Marketers (Wiser and Pickle, 1998).

Marketers consider establishing price competition and encouraging customer switching as first priorities. Green Power Marketers consider the development of market rules that allow price competition among energy suppliers to be an important factor in an open retail market. Market rules that bolster price competition and encourage customer switching are considered critical to Green Power Marketers (Riser, 1999).



Marketers are somewhat leery of governmental sponsored or mandated public information programs. Several deregulation policies include provisions for mandatory disclosure and certification of the power being offered. Some policies also require environmental disclosure of the emission characteristics of the power being offered. Green Power Marketers do not seem to disfavor these policies as long as they are not overly cumbersome and are relatively inexpensive to implement. Moreover, Green Power Marketers generally disfavor governmental definitions and standards for Green Power (Riser, 1999).

Marketers often oppose three specific renewable energy policies that may have negative impacts on their profitability. Green Power Marketers disfavor local governments becoming the default electric utility providers. Green Power Marketers also indicated that customers should not be able to purchase Green Power from the default electric utility. Lastly, the majority of Green Power Marketers did not favor incorporating renewable energy portfolio standards for energy marketers providing service in an open retail market (Riser, 1999).

## **2.2 Renewable Energy Cost Data**

The average cost of renewable energy sources versus other sources of energy like coal are difficult to quantify due to uncertainty in forecasting economic conditions, fuel costs and operational assumptions. Tables 3 and 4 provide cost data from two different sources. The first study was performed for the Center for Energy and Economic Development (CEED) by Resources Data International (RDI) in 1995 (Table 3).

The CEED is an organization for industry groups such as coal (Swezey and Wan, 1995). The second study was performed by the National Renewable Energy Laboratory (NREL) in response to the CEED 1995 study (Table 4). The CEED data contends renewable energy sources will cost the nation \$52 billion above the most competitive power alternative over the next 15 years. The NREL study calculates that renewable energy would be \$1.9 billion above the most competitive power alternative over the next 15 years (Swezey and Wan, 1995). The NREL demonstrated the CEED cost data associated with operations of coal fired plants could be disputed with data from the “Electric Power Research Institute” (EPRI), a research and development organization for the electric utility industry, and the U.S. Energy Information Administration (EIA). Data from these sources lowered the CEED cost disparity for renewable energy over the next 15 years by \$8.6 billion. Second the NREL reported the CEED study did not account for improvements in renewable energy technology that would result in lower costs over the next 15 years. Hence, the NREL used energy cost data from the U.S. Department of Energy (DOE) reflecting these savings over the next 15 years. This data lowered the CEED study cost disparity by another \$31.6 billion.

Lastly, the NREL reported that the CEED study did not allow for growth in market share for renewable energy technologies over the next 15 years that could further decrease costs. This data further lowered the CEED study cost disparity by another \$9.9 billion. Thus, the overall NREL assessment of the CEED cost study lowered the above market cost for renewable power generation as compared to coal fired power generation from \$52 billion to \$1.9 billion over the next 15 years (Swezey and Wan, 1995).

The data cases indicate that quantifying generation costs for renewable energy is highly variable and may be difficult to estimate. However, both the CEED and NREL cases indicate renewable power may be somewhat less competitive in terms of cost with conventional power generation sources such as coal over the next 15 years.

**Table 3 RDI Levelized Cost of Energy Scenario (cents/kWh)**

Year	Coal	Waste to Energy	Biomass	Wind	Geo-Thermal	Photo-Voltaic	Solar Thermal
1995	4.2	9.3	11.6	6.8	8.8	27.4	21
1996	4.2	9.3	11.6	6.8	8.8	27.4	21
1997	4.2	9.3	11.6	6.8	8.8	27.4	21
1998	4.2	9.3	11.6	6.8	8.8	27.4	21
1999	4.2	9.3	11.6	6.8	8.8	27.4	21
2000	4.2	9.3	11.6	6.8	8.8	27.4	21
2001	4.2	9.3	11.6	6.8	8.8	27.4	21
2002	4.2	9.3	11.6	6.8	8.8	27.4	21
2003	4.2	9.3	11.6	6.8	8.8	27.4	21
2004	4.2	9.3	11.6	6.8	8.8	27.4	21
2005	4.2	9.3	11.6	6.8	8.8	27.4	21
2006	4.2	9.3	11.6	6.8	8.8	27.4	21
2007	4.2	9.3	11.6	6.8	8.8	27.4	21
2008	4.2	9.3	11.6	6.8	8.8	27.4	21
2009	4.2	9.3	11.6	6.8	8.8	27.4	21
2010	4.2	9.3	11.6	6.8	8.8	27.4	21

(Source: Swezey and Wan, 1995)

**Table 4 NREL Levelized Cost of Energy Scenario (cents/kWh)**

Year	Coal	Waste to Energy	Biomass	Wind	Geo-Thermal	Photo-Voltaic	Solar Thermal
1995	5.4	8.2	8.5	5.3	5.2	21.8	10.5
1996	5.4	8.2	8.4	5.1	4.9	20.7	10.1
1997	5.4	8.2	8.3	4.8	4.7	19.6	9.7
1998	5.4	8.2	8.2	4.6	4.5	18.5	9.4
1999	5.4	8.2	8.2	4.3	4.2	17.5	9.0
2000	5.4	8.2	8.1	4.1	4.0	16.4	8.6
2001	5.4	8.2	8.0	4.0	4.0	15.7	8.5
2002	5.4	8.2	7.9	4.0	3.9	15.1	8.4
2003	5.4	8.2	7.7	4.0	3.9	14.4	8.3
2004	5.4	8.2	7.6	3.9	3.9	13.7	8.2
2005	5.4	8.2	7.5	3.9	3.8	13.1	8.1
2006	5.4	8.2	7.5	3.8	3.8	12.2	8.1
2007	5.4	8.2	7.4	3.7	3.8	11.3	8.1
2008	5.4	8.2	7.3	3.6	3.7	10.5	8.1
2009	5.4	8.2	7.3	3.6	3.7	9.6	8.1
2010	5.4	8.2	7.2	3.5	3.7	8.7	8.1

(Source: Swezey and Wan, 1995)

### 2.3 Consumer Preference

Green Marketing implies some electric customers may prefer purchasing Green Power because of the public benefit to the environment. Product differentiation can be an important marketing tool for competing Green Power Marketers in an open retail power market. Green Power Marketers may attempt to compete by contrasting their “Green Power” product from competitors. Consumer research studies on attitudes regarding the willingness to pay some premium for renewable power indicates the majority of respondents, 52% to 92%, would pay a slight premium for Green Power. This research further indicates that consumer preference for purchasing renewable power increases with education (Farhar, 1999).

The research also indicates that the primary market for Green Power Marketers is in the residential sector, which may account for up to 75% of the Green Power sales revenue (Wiser and Pickle, 1998). However, larger power customers may be responsive to Green Power purchases to promote a corporate image of environmental responsibility to their customers. These companies could also allow for some marketing opportunities for Green Power Marketers (Rader and Short, 1998).

Retail competition will allow consumers unprecedented choice in the type of power they wish to purchase. Retail energy suppliers may wish to sell electricity as Green Power to appeal to a market of consumers that value such “Green” products. Electricity is an essential service, and for the first time consumers will have the choice to purchase a more environmentally friendly product or a cheaper, more polluting power source.

## **2.4 Renewable Energy Transmission Issues**

The current cost structure or “tariffs” for accessing the transmission power grid may put renewable generated power at an economic disadvantage. Transmission tariff structure can directly impact the price of renewable energy. Transmission servers typically charge what is referred to as “take or pay” tariffs that are based on the transmission capacity the power generator wishes to reserve and the distance the energy must travel. Power generators purchase transmission capacity in advance, and pay for the amount of transmission capacity and distance traveled irrespective of how much power is transmitted through the grid during this period. This tariff structure may be a disadvantage for some renewable energy generators such as wind and solar power generators due to the intermittent nature of the power (USDOE/EIA, 1998). For example, wind power is dependent on weather. This creates difficulties in predicting how much transmission capacity a wind power generator will utilize. With the “Take or Pay” tariff structure, wind power generators must pay for the full amount of capacity reserved, not for the amount of capacity actually utilized. Thus, the tariff structure does not take into account the nature by which renewable energy is generated. The research indicates Green Power Marketers favor transmission tariffs pricing policies that do not disadvantage the intermittent, low capacity power generators (Wiser, Fang, Porter and Houston, 1999).

## **2.5 Green Marketing Product Standards**

With competition in retail power markets, concern developed over potential deceptive advertising practices and Green Power claims. Presently, there are no federal government standards for Green Power Marketers. Some non-governmental entities such as the

Green-E program have attempted to set standards for Green Power Marketers. However there are no federal regulations requiring marketers to comply with these standards, and some states do not require disclosure of power mix and sources. For example, a marketer was found to be advertising an “Eco-Smart” product consisting of 99% natural gas. Arguably, this type of power generation is less polluting than coal power generation. However, natural gas would still not be considered a Green Power source by most consumers (Glaser, 1999).

The Green-E renewable electricity program was organized by the Center for Resource Solutions, a not-for-profit organization. The Green-E program is a national voluntary certification and verification program for “green electricity products.” The Green-E program is not administered or monitored by state or federal governments. The purpose of the program is to allow consumers to make educational choices about the power they purchase. The Green-E is a logo, as set forth by the Center for Resource Solutions, that can be used by Green Power Marketers providing they comply with the following general requirements:

- 50% of the electricity supply for the product comes from renewable electricity resources. Renewable electricity resources include power sources generated from the sun, water, wind, and biomass and geothermal.
- Any non-renewable part of the product being marketed must have lower air emissions than the electricity mix would have had if the customer had not switched (air emissions include: sulfur dioxide, nitrogen oxides and carbon dioxide).
- The company offering the product agrees to abide by the Green-E program’s code of conduct, which requires providers’ disclose the sources of electricity they are selling.

- The product does not contain any nuclear power other than what is contained in system power purchased for the eligible product's portfolio.
- One year after deregulation, the product must contain at least 5% new renewable electricity. This requirement increases to 10% in the next year. Green-E intends to increase the new renewable requirement 5% each year until 25% of the total product content is from new renewable resources.
- The company offering the product agrees to undergo a biannual review to ensure they are not making any false or misleading advertising statements about their products.
- The company offering the product agrees to conduct an annual third party process audit to ensure that they have purchased enough renewable power to satisfy what they sold to customers.

In addition the Green-E program sets specific fuel standards for Green Power Marketers in States that have opened their retail market to competition. Green-E has developed certification programs for Green Power Marketers wishing to market in Pennsylvania and California. A Green-E certification program for Green Power Marketers in New Jersey is under development at present time.

## **2.6 California, New Jersey, Pennsylvania Policy Review**

The following sections examine State electric utility deregulation policies for New Jersey, Pennsylvania and California. The following section provides a review of some key terminology used to explain state policy factors that may affect Green Power Marketers in a competitive retail electricity market.

## 2.6.1 Terms and Discussion

**2.6.1.1 Default Generation Service/ Shopping Credit.** The price (cents/kWh) set by regulators which can be charged to electricity customers that do not wish to change energy suppliers. Utility deregulation “unbundled” electric services into three (3) specific areas: transmission, distribution, and generation. Traditionally, a customer would receive a single bill from the utility company. This electric bill reflected all the “bundled” costs for these services. In deregulation, the component making up the “unbundled” generation cost in the customer’s electric bill can be purchased from an energy supplier other than the utility. This deregulation policy recognizes that some customers may not wish to change energy suppliers. Therefore, provision for a default generation service was enacted. This default generation service is usually provided by the existing utility.

For example, state “A” sets the default generation service price at 4 cents/kWh. The best competing price by retail energy supplier “B” is 5 cents/kWh. In this scenario, there is little incentive for a customer to switch service because the customer would be paying 1 cent/kWh or 20% more for the same power. However, what if state “A” sets the default generation price at 6 cents/kWh and retail energy supplier “B” can provide electricity for 5 cents/kWh. In this scenario, the customer would save 1 cent/kWh or 16% from the price they would pay from purchasing the default generation service. This scenario provides the cost conscious customer with an incentive to switch energy suppliers. Thus, the default generation service rate is referred to as the “shopping credit.” Not only does the “shopping credit” allow the consumer to compare price with the default generation service price, but it also allows them to compare price with other retail energy providers competing for customers in the same market.



**2.6.1.2 Environmental Disclosure.** The momentum for the development of competitive retail electricity markets brought about concern by environmentalists that customers would not know the type of power and environmental characteristics of the electricity being purchased. Disclosing, this information could assist customers in making decisions regarding the type of power they wished to purchase. Customers wishing to purchase renewable energy could then comparatively shop among energy suppliers providing power in that market. As a result some state policy efforts require energy suppliers to provide information on such items as emissions data and fuel sources.

**2.6.1.3 Green Power Marketer Standards.** There is no universally accepted standard for defining “renewable energy.” Defining what can be considered a renewable power source can differ depending on the region of the country. For example, some areas of the country like the Pacific Northwest have large hydropower renewable energy resources. Other regions in the country consider biomass, wood burning and waste to energy as renewable energy resources. In addition, there are no standards for what type of sources can comprise a power mix being marketed as a Green Power product. Moreover, many Green Power Marketers offer a power mix combining both renewable power and conventional power. Combining power sources may allow the Green Power Marketers to be more cost competitive with conventional power suppliers.

The lack of standards may also reflect that renewable power generation is not yet widely enough available for retail power suppliers to offer as a one hundred percent (100%) renewable energy product. There is no standard for the allowable percentage of conventional fossil fuel power that could be included with a renewable power mix and

still be marketed by Green Power Marketers as a Green Power product. The lack of standards may mislead consumers who believe they are purchasing an environmentally friendly product. The Green-E certification, a non-governmental program, attempts to address these concerns.

**2.6.1.4 Green Power Marketer.** Deregulation policy has required electric services to become unbundled into transmission, distribution and generation. The generation portion of this service is that segment of the cost for electricity that state regulators wish to lower by competition. The competing Green Power Marketer is the entity which tries to compete with the “default generation service” and other retail energy suppliers for customers and market share. Electricity is considered an essential service. For the first time in the history of the power industry, customers can be offered a choice in considering the environmental consequences of the power they decide to purchase.

**2.6.1.5 Consumer Education Programs.** State regulators recognized that consumer awareness regarding choice is a key component in encouraging a competitive retail energy market. Utility monopolies regulated by state commissions have been entrenched in everyday life for so long, most customers assume that they are the only means in which they could receive their electric power service. In deregulation, the default utility service provider is usually the former electric utility company within that service area. This may provide a built-in advantage for the utility company. Competing energy suppliers, including Green Power Marketers, must convince customers to switch from the reliable power service they enjoyed for decades. Retail energy suppliers wishing to enter the market considered this scenario an unfair competitive advantage for the existing

electric utility companies. Therefore, state deregulation policies were enacted to inform consumers that electric utility deregulation allows them a choice in selecting a power supplier. Consumer education may also be an important factor because Green Power Marketers typically operate on thin profit margins. State mandated consumer education and outreach programs can facilitate customer switching. State sponsored consumer education programs can lower advertising costs for the competing Green Power Marketers trying to engage new customers. Savings in advertising costs can be passed on to customers in the form of lower rates.

**2.6.1.6 Minimum Renewable Energy Portfolio Standards.** Some state policies have included requirements for energy providers to offer a minimum renewable energy content in their power mix. The percentage of renewable energy content the energy provider must offer typically begins in the two percent (2%) range. State policies for mandating minimum renewable energy content may or may not be beneficial for competing Green Power Marketers. These policies may enhance overall renewable energy power generation capacity because they mandate a market for “renewable energy.” However, “minimum renewable portfolio standards” may in effect result in unwanted competition for Green Power Marketers. Competing retail energy suppliers may advertise to potential customers that they are complying with state requirements and are providing a “Green Power” product. Customers may be confused between the actual Green Power Marketers wishing to market Green Power as a product and the competing retail energy suppliers who advertise a Green Power product in the context of complying with “minimum renewable portfolio standards.”

**2.6.1.7 Rate Reductions.** The impetus for electric utility deregulation was to reduce the high cost of power to customers by introducing competition. Some states included rate reductions with retail competition legislation to further benefit consumers. Thus, rate reductions were also included with state electric utility deregulation legislation. However, rate reduction policy can impact retail competition if the reductions result in lowering overall default generation service prices to levels where other suppliers cannot compete. Rate reductions may also confuse customers trying to decide whether there is any value in switching energy suppliers. Since customers are already receiving a rate reduction, they may not understand the additional benefits of switching energy providers.

**2.6.1.8 Renewable Energy Rebate.** At the present time, California is the only state to implement a rebate program for customers purchasing renewable energy. This policy allows customers to receive a rebate applied to their electric bill for purchasing renewable energy, which in effect lowers cost and improves the competitiveness of Green Power Marketers in the California market. California has a large renewable energy sector compared to the rest of the country, and the viability of this sector upon electric utility deregulation was of concern to policymakers.

## **2.6.2 New Jersey Electric Utility Deregulation Policy Review**

The New Jersey legislature enacted “The Electric Discount & Energy Competition Act PL 1999” on January 25, 1999, to introduce retail energy supplier competition in New Jersey. The New Jersey retail market was opened up for competition throughout the entire state in October 1999. The New Jersey Board of Public Utilities (BPU) was

designated as the primary agency to implement the regulation. The New Jersey Department of Environmental Protection (NJDEP) was given some statutory authority regarding renewable energy definition and environmental disclosure provisions. New Jersey has four (4) regulated electric utility companies: PSEG, GPU, Connectiv, and Rockland. New Jersey's restructuring legislation allows these electric utility companies to continue to provide default electricity generation service for customers that do not wish to choose a competing retail energy supplier. The existing utility company will also continue to maintain the transmission and distribution services for the customers in its service area.

**2.6.2.1 New Jersey - Default Generating Service Rate/Shopping Credits.** New Jersey enacted "shopping credits" for each of the four (4) utility service areas to encourage competition between the default energy provider and competing retail energy provider. The "shopping credits" for New Jersey's residential customers are identified on Table 5.

**2.6.2.2 New Jersey - Environmental Disclosure.** New Jersey requires retail energy suppliers to disclose to all customers the energy resources used in the generation of the power being purchased. New Jersey requires retail energy suppliers to use a standard label. The label has three components: (1) the fuel sources for the power, (2) the amount of pollution or emissions produced by the fuel sources, and (3) the energy conservation efforts for the electricity product being offered.

**2.6.2.3 New Jersey - Consumer Education.** New Jersey restructuring included education and outreach programs for customers. The BPU in consultation with the Division of Consumer Affairs, was authorized to provide consumer education services on utility restructuring. The NJEnergy Choice web page and hotline were established. The NJ RatePayer Advocate also developed resource information on electricity deregulation. Lastly, utilities were required to notify each of its customers that choice in generation service was available.

**2.6.2.4 New Jersey - Rate Reductions.** New Jersey required rate reductions in each utility service area (Refer to Table 5). Beginning in August 1, 1999, New Jersey's restructuring included a combination of phased in, mandated rate reductions, to be offered by the existing utilities and phased in energy tax reductions through July 31, 2003. The mandated rate reductions in each utility service area ranged from 5% to 13.9%. The rate reductions apply to all customers in New Jersey. Rate reductions can be a factor in the competitiveness of Green Power Marketers because rate reductions may lower the price the default energy provider can charge its customers. Thus, Green Power Marketers must compete with this lower default energy provider rate.

**2.6.2.5 New Jersey - Minimum Renewable Energy Requirements.** New Jersey restructuring legislation has set forth minimum renewable energy content standards for electric suppliers. The act requires that 2.5% of the kWh sold in New Jersey by an electric power supplier be from Class I or Class II renewable energy sources. Furthermore, beginning January 1, 2001, a minimum of 0.5% of the kWh sold in New

Jersey must be from Class I renewable energy sources (Refer to Section 2.6.2.6). The percentage of Class I renewable energy sources is to increase by January 1, 2006, to 1% of the kilowatt-hours sold in New Jersey. This percentage is to increase 0.5% each year until January 1, 2012, when 4% of the kWh sold in New Jersey shall be from Class I renewable energy sources. These requirements may be satisfied by participating in a renewable energy-trading program approved by the BPU, in consultation with NJDEP.

**2.6.2.6 New Jersey - Renewable Energy Definitions.** Class I renewable energy” means electric energy produced from solar technologies, photo-voltaic technologies, wind energy, fuel cells, geothermal technologies, wave or tidal action, and methane gas from landfills or a biomass facility, provided that the biomass is cultivated and harvested in a sustainable manner. “Class II renewable energy” is defined as electric energy produced at a resource recovery or hydropower facilities. “Class II renewable energy” facilities must be approved by the commissioner the Department of Environmental Protection.

### **2.6.3 Electric Utility Deregulation Policy Review - Pennsylvania**

The Pennsylvania “Electric Generation Customer Choice and Competition Act (HB1509)” was enacted on December 2, 1996. The legislation phased in retail access over a three-year period beginning January 1999. The Pennsylvania Public Utilities Commission (PUC) was designated as the agency to implement the restructuring of the electric utility industry. Pennsylvania has seven (7) utility companies comprising nine (9) service areas including Allegheny, Duquesne, PECO, PP&L, Penn Power, Metropolitan Edison and PA Electric. Pennsylvania restructuring legislation allows these electric

utility companies to continue to provide default electricity generation service for customers that do not wish to choose a competing retail energy supplier. The existing utility company can also continue to maintain the transmission and distribution services for the customers in its service area.

#### **2.6.3.1 Pennsylvania - Default Generating Service Rates/Shopping Credits.**

Pennsylvania enacted “shopping credits” to encourage competition between the default energy provider and competing retail energy providers, including Green Power Marketers. The “shopping credits” for New Jersey’s residential customers are identified on Table 5.

#### **2.6.3.2 Pennsylvania - Environmental Disclosure.**

Pennsylvania requires limited consumer information on renewable energy information. Energy suppliers are required to provide their customers with information on fuel mix. The legislation stipulates that energy suppliers must provide adequate consumer information in a manner sufficient to enable customers to make informed choices. However, unlike New Jersey and California no emissions data or standard label is required.

#### **2.6.3.3 Pennsylvania - Consumer Education.**

Pennsylvania’s restructuring provided funding of \$14 million dollars for education and outreach. Advertising components included television, radio, web page, direct mail, community based organizations, advisory councils, political and church leaders, hotlines, special interest groups, schools, press (newspapers, cable, special programming), town meetings, workshops, fairs and trade shows.



**2.6.3.4 Pennsylvania - Rate Reductions.** Pennsylvania's restructuring resulted in rate reductions for some of the utility service areas. Rate reductions ranged from 0.0 % to 8.8% (Refer to Table 5). Rate reductions can lower the price of electricity the default energy provider can charge its customers. Green Power Marketers must then compete with this lower default energy provider rate.

**2.6.3.5 Pennsylvania - Minimum Renewable Energy Requirements.** Pennsylvania's restructuring legislation set forth that 2.0% of the electricity supplied must be obtained from renewable energy sources. The legislation also stipulates that the mix of renewable energy content is to increase by 0.5% each year. However, this requirement may be lowered if it is determined that the cost of renewable sources increases the overall cost of the power portfolio by more than 2% over what the cost would be without renewable energy sources.

**2.6.3.6 Pennsylvania - Renewable Energy Definition.** Solar, Photovoltaic energy, solar thermal energy, wind power, low head hydropower, geothermal energy, landfill and mine based methane gas, and sustainable biomass energy.

#### **2.6.4 California Electric Utility Deregulation Policy Review**

California experienced some of the highest electrical rates in the country and was the first to open its energy sector to retail competition. The "California Electricity Industry Restructuring Act", Assembly Bill 1890, enacted in 1996, opened the energy sector to full retail market competition in March 31, 1998. Approximately 80% of the electricity service in California is provided by three utilities. They are regulated by the California

Public Utilities Commission (CPUC) which includes PG&E, SCE, and SDG&E. However, the energy sector restructuring approach differs somewhat from the New Jersey and Pennsylvania model. The key differences from the New Jersey and Pennsylvania programs were that California created an Independent System Operator (ISO) and Independent Power Exchange (PX). The ISO was created to direct electricity transmission service throughout the state. The objective of the ISO is to ensure that fair access to California's electric transmission system is afforded to all electric generators and to prevent any particular buyer or seller of electricity from blocking access to others who utilize the transmission system.

The PX functions to balance total supply with the total demand for power in the state of California. The PX solicits bids from power generators and the lowest bidder is selected until the PX has enough of a supply to meet the request from the buyers of power in the state. The electricity price is based entirely on the cost of generating the power and the price a power company determines another entity will pay for its power. During peak demand periods such as the summer, the PX may not reflect the lowest cost to generate power, but rather the cost the generator feels the buyer will pay.

In addition, the PX price does not include costs associated with retail activities such as customer service, metering, billing and overhead. In the California model, the PX price provides the basis by which customers evaluate whether to consider switching to a competing retail energy provider such as Green Power Marketers. However, the PX price primarily consists of the wholesale cost of electricity which the default energy provider passes on to its customers. Any competing retail energy provider, including Green Power Marketers that wish to compete for electricity customers in California

must therefore be competitive with the PX rate. However, unlike the default energy provider the competing retail energy provider, as a business function, must take profit and administration charges such as billing and metering into account when it attempts to compete with the PX rate.

**2.6.4.1 California - Default Generation Service Rates/ Shopping Credits.** The California restructuring model differs from the New Jersey and Pennsylvania models by the creation of the PX used to calculate electric charges to customers. The term “shopping credit” is not used in the California utility restructuring model. However, for comparative purposes with New Jersey and Pennsylvania the “shopping credit” in California represents the extent to which a competing Green Power Marketers can compete with the PX price. The California Office of RatePayer Advocate proposes that 3 cents/kWh be used as an estimate for comparing basic generation services with competing retail energy providers. However the PX price is affected by California’s 1.5 cent per kWh rate subsidy for renewable power purchases. Customers and competing retail energy providers can perform cost evaluations based not only on the PX cost, but also on the cost savings incorporated by the rate subsidy. The establishment of California’s independent Power Exchange differs from New Jersey and Pennsylvania which established “shopping credit” as the basis for retail competition.

**2.6.4.2 California - Environmental Disclosure.** California has extensive disclosure requirements. California requires retail energy suppliers to disclose to all customers the energy resources used in the generation of the power being purchased. California requires retail energy suppliers to use a standard label designed by the California Energy

Commission (CEC). This information is to be provided to the customers at least four times per year. The “power content label” covers generation mix, emissions, price and price volatility, contract terms, and supplier qualifications. The label provides consumers with reliable information about energy sources, enabling them to compare products.

**2.6.4.3 California - Consumer Education.** California’s restructuring requires implementation of a Customer Education Plan. A budget of \$89.3 million was allocated for this effort. The purpose was to inform customers of the changes in the electric industry. The plan used mass media, Internet, and direct mailing.

**2.6.4.4 California - Rate Reductions.** California restructuring enacted a 10% rate reduction for residential and small commercial electricity customers. Rate reductions can be a factor because these reductions may lower the price the default energy provider can charge its customers. The competing retail energy power supplier including Green Power Marketers, must then compete with this lower default energy provider rate.

**2.6.4.5 California - Minimum Renewable Energy Requirements.** California deregulation enacted no “Minimum Renewable Energy Requirements.”

**2.6.4.6 California - Renewable Energy Rebates.** California set aside a \$81 million-dollar customer benefits fund. This fund provides a 1.5 cent/kWh rebate for residential and small customers that purchased renewable power from providers registered by the California Energy Commission. The rebate program is funded until January 1, 2002. The goal of the program is to assist the renewable power industry in becoming self-sufficient after a period of four years.

#### 2.6.4.7 California - Renewable Energy Definition Summary.

- Biomass and Waste-to-Energy - Biomass fuels are residues produced from logging, mill operations, and the manufacture of wood, pulp, paper and fiberboard, agricultural field and orchard crops, livestock and poultry growing operations, food processing and demolition (urban wood waste). Waste fuels include combustible residues from industrial process, municipal solid waste (garbage) including tires.
- Geothermal - Geothermal electricity is produced using heat from deep within the earth (often evidenced by the presence of hot springs or geysers). This heat is captured and used to turn an electric generation turbine.
- Solar - Solar electricity can be generated in two ways. The first way involves capturing the heat energy from the sun. The second way produces electricity using Photovoltaic cells. Photovoltaic cells convert energy from sun light into electricity.
- Small hydroelectric (30 megawatts capacity or smaller) - Hydroelectric plants transform the energy of falling water into electrical energy through the use of waterwheels or hydraulic turbines. Small hydroelectric facilities may use either small dams or river flows to harness the energy of the moving water. Federal law defines small hydroelectric as having a capacity of 30 megawatts or less, and California uses this definition for the purpose of the power content label, as well as other programs.

**Table 5**  
**New Jersey, Pennsylvania, California Residential Power Service:**  
**Rate Reductions and Shopping Credits**

State	Default Utility Service Area	% Rate Reduction	Shopping Credit
New Jersey	PSE&G	6% to 18.9% by 2003	5.86 cents/kWh
	Connective	6% to 15% by 2003	5.70 cents/kWh
	GPU	6% to 16% by 2003	5.70 cents/kWh
	Rockland	7% to 16.6% by 2003	Estimate: 5.0 cents/kWh
Pennsylvania	Allegheny	2.5%	2.43 cents/kWh
	Duquesne	None	4.80 cents/kWh
	GPU-Met. Edison	2.5%	4.525 cents/kWh
	GPU-PA Electric	3.0%	4.528 cents/kWh
	PECO	8.0%	5.65 cents/kWh
	PP&L	4.0%	4.61 cents/kWh
California	Penn Power	None	None
	PG&E	10%	PX price (3 cents/kWh)
	SCE	10%	PX price (3 cents/kWh)
	SDG&E	10%	PX price (3 cents/kWh)

Source: NJ Division of Rate Payer Advocate, PA Office of Consumer Advocate, CA Office of Rate Payer Advocate

## CHAPTER 3

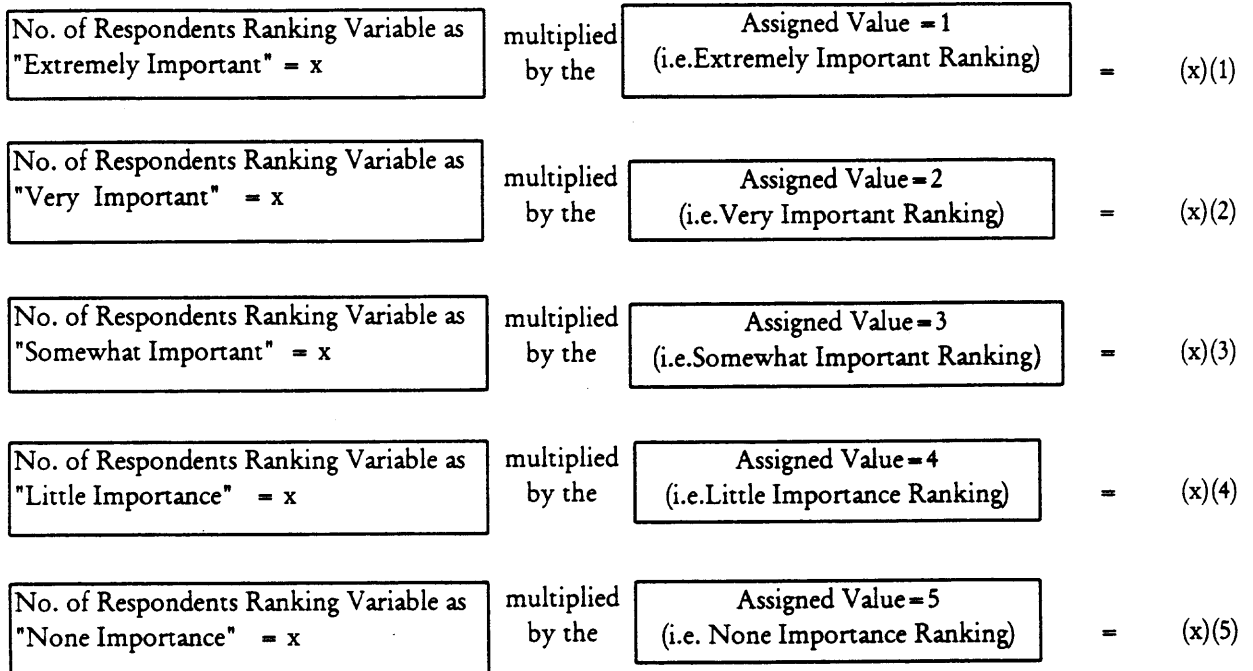
### METHODOLOGY

The methodology for this research began with the formation of several hypotheses. A sample population was then identified to test these hypotheses. A survey questionnaire was designed, using a combination of variable test sets, in order to collect data and evaluate the hypotheses. The variables identified in the survey questionnaire were based on previous investigations and state deregulation policy initiatives adopted in the legislative process for California, New Jersey and Pennsylvania. The sample population selected to test these variables included registered Green Power Marketers in these states. These states were chosen because they were among the first in the country to open their electric utility industry to retail market competition and as such provided a unique opportunity to research the experience of Green Power Marketers. Figure 1 presents the method by which the variables were analyzed upon receipt of the data collected from the completed survey questionnaires. Figure 2 presents a flow diagram identifying steps used to develop the survey questionnaire.

#### 3.1 Study Population

The study populations used in the survey were energy providers registered in California, Pennsylvania and New Jersey marketing Green Power. These states maintain web pages with listings of the energy providers registered to supply power as a result of the enactment of electric utility deregulation. The population targeted for this research were those energy providers that supply power from renewable energy sources commonly referred to as Green Power.

**Figure 1**  
**Mean Value Calculation Example**



**Therefore:**

Total Number of Respondents = (x) + (x) + (x) + (x) + (x)  
 (Respondent) (Likert Value) = (x)(1) + (x)(2) + (x)(3) + (x)(4) + (x)(5)

$$\text{Mean} = \frac{(x)(1) + (x)(2) + (x)(3) + (x)(4) + (x)(5)}{(x) + (x) + (x) + (x) + (x)}$$

**Example Calculation:** Variable "State Deregulation Policy"

Likert Scale Ranking	Number of Respondents	
Extremely = 1	8	1 x 8 = 8
Very = 2	1	2 x 1 = 2
Somewhat = 3	0	3 x 0 = 0
Little = 4	1	4 x 1 = 4
None = 5	0	5 x 0 = 0
Total = 10		Total = 14

Therefore:

14 / 10 = 1.4 "Mean" Value for this Variable and

1.4: "Mean" value is most closely related to "Extremely Important" on the Likert Scale.



### 3.2 Limitations

State electric utility deregulation is in its early stages of enactment across the United States. The survey population for this research included registered Green Power Marketers in New Jersey, Pennsylvania and California. Ten (10) registered Green Power Marketers responded to the survey questionnaire. Three (3) of the four (4) Green Power Marketers in Pennsylvania responded. One (1) of the two (2) Green Power Marketers in New Jersey responded. Six (6) of the sixteen (16) Green Power Marketers contacted in New Jersey responded. Six (6) of the sixteen (16) Green Power Marketers contacted in California responded. Therefore, out of a study population of twenty two (22) possible participants, a total ten (10) participants responded to the survey questionnaire or approximately (45%) forty-five percent of the available population. The limited number of respondents was attributable to several factors. Some suppliers verbally indicated that their corporate policy was not to respond to surveys. Repeated e-mails and phone messages to other prospective respondents did not yield any contact.

Some suppliers stated that while they continued to be registered as Green Power Marketers, they no longer offered the product. Moreover, Green Power Marketers as a sector exhibit a degree of variability. Green Power Marketers can differ based on the type of power mix they are supplying. Some offer one hundred percent renewable power, and some offer varying percentages of renewable power and conventionally generated power. Some Green Power Marketers provided services in only one (1) of the three (3) states included in the study. Respondents may not recognize policy issues in states where they are not actively marketing. The corporate structure of the Green Power Marketers may also be a factor. Some Green Power Marketers were part of large utility companies prior

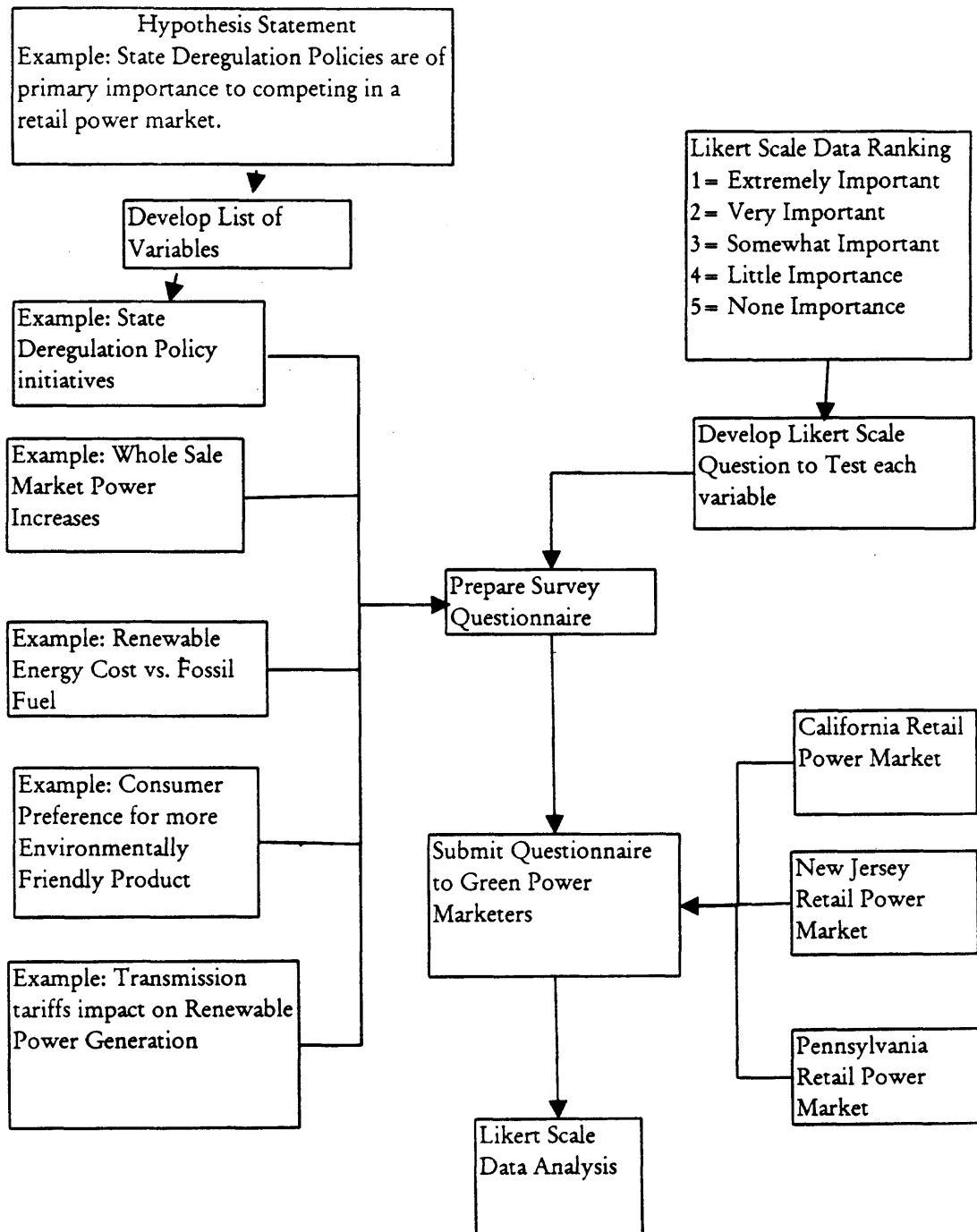
to deregulation. These Green Power Marketers may have advantages in brand name recognition and in readily identifiable customer base. The ability for Green Power Marketers to compete in a deregulated market is still unclear. Cost competitiveness and regulatory policy can dissuade new Green Power Marketers from entering the market. This limits the number of potential Green Power Marketers available for research. However basic research in this area is necessary to provide critical information to state lawmakers on important policy issues facing the renewable power industry in a deregulated market.

### 3.3 Survey Development

The survey questionnaire was designed to obtain information from the identified study populations by collecting Likert Scale data and eliciting feedback in response to several open question topics. Refer to Figure 2.

- Likert Scale data - The range for each question was ranked from one (1) to five (5). A ranking of one (1) being “extremely important,” two (2) “very important,” three (3) “somewhat important,” four (4) “little importance,” and five (5) “none importance.”
- Open Question Topics - Survey participants were requested to comment on both the lack of consumer activity in switching power suppliers in New Jersey’s retail market and the impact recent increases in wholesale power costs could have on Green Power Marketers. Open questions also included company profile topics in order to ascertain the type of customer the company was marketing, such as residential, commercial or industrial sectors.

**Figure 2**  
**Survey Questionnaire Development Flow Chart**



### 3.4 Survey Administration

Green Power Marketers registered in California, New Jersey and Pennsylvania were identified and contacted initially by phone and then by e-mail. The survey questionnaire was then transmitted by e-mail to prospective recipients for completion. The respondents targeted for the survey were the business development and marketing professionals employed by the Green Power Marketers registered in the states reviewed above. The survey respondents were instructed to return the completed survey questionnaire via e-mail. Every possible effort was used to contact non-respondents, including phone calls and follow-up e-mails.

### 3.5 Variable Discussion

#### 3.5.1 First Hypothesis Variable Test Set

The first set of variables (Refer to Table 6) can be considered industry-wide related factors confronting Green Power Marketers competing with conventional fossil fuel power generators for market share. Using Likert ranked scale data collection methods, these variables were designed to determine of what importance “state deregulation policy” was ranked in comparison to other factors confronting Green Power Marketers.

- State Deregulation Policy - States retain the legal authority to regulate retail electricity service within their borders. The structure of state electric utility deregulation is therefore a function of what policies state lawmakers incorporate into legislation. Public policy and support for Green Power may be of importance to Green Power Marketers (Riser, 1999)

- Renewable Energy Cost versus Fossil Fuel - Electricity generated from fossil fuels can be produced at lower prices than renewable power sources (Refer to Tables 3 & 4). Therefore Green Power Marketers may be at a disadvantage marketing to cost sensitive consumers (Sweezy and Wan, 1995).
- Consumer Preference for More Environmentally Friendly Product - Consumers may wish to purchase renewable energy at a slight premium. To these consumers, the beneficial consequences to the environment for purchasing “renewable power” are more significant than cost (Farhar, 1999).
- Transmission Tariffs - Electricity generators are charged a transmission fee for sending electricity across the electric transmission grids crisscrossing the country. The tariff structure was developed with conventional fossil fuel power generation as the predominate user of the power grid. This tariff structure may disadvantage renewable power generators due to the intermittent nature of the power they generate, such as wind and solar energy (USDOE/EIA, 1998).
- Wholesale Electric Market Prices - The wholesale market for power affects the overall ability for Green Power Marketers to pay for transmission service. Green Power Marketers often provide a mixture of renewable and conventional power. During peak demand times for power, such as in the summer months, the price of conventionally generated wholesale power can increase precipitously. This can increase the price of the power mix Green Power Marketers are supplying, thus affecting their competitiveness.

### 3.5.2 Second Hypothesis Variable Test Set

The second variable set (Refer to Table 6) includes specific deregulation policy initiatives enacted by New Jersey, Pennsylvania and California. Using Likert ranked scale data collection methods, this variable set was designed to determine the importance of “shopping credits” in comparison to other policy issues affecting Green Power Marketers.

- Rebates - The policy of offering subsidies or rebates. Power customers choosing to purchase renewable energy receive a credit on their electric bills. This policy is designed to reduce the cost of renewable energy and provide an incentive for the price sensitive consumer to purchase renewable power.
- Consumer Education - Policy of state sponsored education programs and public outreach efforts used to inform customers of electricity deregulation. Public education can be an important factor for Green Power Marketers with relatively low market shares. Public education can help reduce advertising costs for Green Power Marketers.
- Consumer Shopping Credits – Policy of setting default utility service prices. The default price is the cost of electricity that state regulators allow an existing utility to charge customers that do not wish to switch energy providers. A default price that is not competitive with retail electricity prices provides little incentive for cost conscience consumers to switch energy providers.

- Environmental Disclosure - Policy that requires all electricity providers to disclose the sources or power generation they are supplying. Therefore customers can compare energy products and the sources from which the electricity is being generated such as nuclear, coal, oil, gas or renewable.
- Rate Reductions – Policy of incorporating electricity rate reductions for all or some consumers in the electric utility restructuring legislation.
- Minimum Renewable Energy Portfolio Requirements - Policy of incorporating a minimum renewable energy content requirement to be provided by all electricity suppliers. Thus, all electricity providers marketing in a state enacting this policy must include some portion of their power mix from renewable energy sources.

### 3.5.3 Third Hypothesis Variable Test Set

The third variable set (refer to Table 6) was designed to determine the extent to which Green Power Marketers surveyed in California, Pennsylvania and New Jersey are interested in the federal government defining renewable energy content standards. Using Likert scale data collection methods, a variable set was developed for Green Power Marketers to rank the importance of governmental and non-governmental entities in setting renewable energy content standards.

- Green-E label – The Green-E label certification is a non-profit program that certifies that the product the Green Power Marketers are selling meets certain performance criteria. Green Power Marketers must register for this label and comply with the standards set forth in the certification process prior to marketing their product with the Green-E label.

- National Definition of Renewable Energy – California, Pennsylvania and New Jersey have defined renewable energy sources differently. Non-governmental entities have also developed standards for Green Power Marketers. The federal government has not established any standards by which Green Power Marketers must comply. The discussion under consideration is regarding what role the federal government should have in Green Power Marketing (Riser, 1999).
- Federal Legislative Initiatives – The discussion is whether federal action regarding retail deregulation efforts would be of importance to Green Power Marketers. Congress has introduced numerous bills on utility market restructuring including S.1401, H.R.655, H.R.1230, S.722, H.R. 1960, S.687, S.37 and S.2287. Policy aspects regarding federal renewable energy initiatives pertaining to these “congressional bills” can be categorized into the following: (1) requiring renewable portfolio standards, (2) developing renewable energy trading programs, (3) allowing consumer choice, and (4) authorizing states to assess charges to fund renewable energy programs. The executive branch, similar to some of the legislative proposals, support “renewable energy portfolio standards,” a national public benefits funds net metering, and consumer information programs. These “federal initiatives” have not been acted upon at this time and are currently a low priority issue for the U.S. Congress.



Table 6 Variable Identification and Method of Measurement

VARIABLE IDENTIFICATION	METHOD OF MEASUREMENT
First Hypothesis Variable Test Set	
1. State Deregulation Policy	Likert Scale Ranked 1-5
2. Renewable Energy Cost Competitiveness	Likert Scale Ranked 1-5
3. Consumer Preference for Environmental Product	Likert Scale Ranked 1-5
4. Transmission Tariff Structure	Likert Scale Ranked 1-5
5. Regional Wholesale Power Market Prices	Likert Scale Ranked 1-5
Second Hypothesis Variable Test Set	
1. Renewable Energy Subsidies	Likert Scale Ranked 1-5
2. Consumer Education Programs	Likert Scale Ranked 1-5
3. Consumer Shopping Credits	Likert Scale Ranked 1-5
4. Environmental Disclosure Requirements	Likert Scale Ranked 1-5
4. Rate Reductions	Likert Scale Ranked 1-5
5. Minimum Renewable Energy Portfolio Standards	Likert Scale Ranked 1-5
Third Hypothesis Variable Test Set	
1. Green-E Seal Certification	Likert Scale Ranked 1-5
2. National Definition Standard for Renewable Energy	Likert Scale Ranked 1-5
3. Federal Legislation	Likert Scale Ranked 1-5

Note:

Likert Scale Ranking

- 1 = Extremely Important
- 2 = Very Important
- 3 = Somewhat Important
- 4 = Little Importance
- 5 = None Importance

## CHAPTER 4

### DATA RESULTS

#### 4.1 Likert Scale Data Results

Survey questionnaires were received from a total of ten (10) retail Green Power Marketers in New Jersey, Pennsylvania and California. Table 7 “Survey Questionnaire Response Summary” categorizes the collected Likert scale data for each variable. Each column totals the number of respondents that ranked the variable from one (1) to five (5) in importance. For example, the variable “state deregulation policy” identified that eight (8) of the ten (10) respondents ranked this variable as “extremely important,” while two (2) participants ranked the variable of “little importance” and “none importance” respectively. The total number of values inputted in each row equates to the total number of participants responding to that variable question in the survey questionnaire. The variable with the lowest mean in the variable test set was evaluated as the variable of most importance to the respondents completing the survey questionnaire.

##### 4.1.1 First Hypothesis Variable Test Set Results

The lowest calculated arithmetic “mean” in this variable set yielded a value of 1.4, which correlated to the “state deregulation policy” variable. This result seems to support the hypothesis statement in Section 1.1 that “state deregulation policy” is an important factor in a Green Power Marketers ability to compete in an open market with conventional electric power generators. The variable “state deregulation policy” ranked more important than “consumer preference for environmental product” and “cost competitiveness” with conventional sources of electric power generation.

Table 7 Survey Questionnaire Response Summary

LIST OF VARIABLES	Extremely Important (1)	Very Important (2)	Somewhat Important (3)	Little Importance (4)	None Importance (5)	Mean
FIRST HYPOTHESIS VARIABLE SET						
State Deregulation Policy	8	1	0	1	0	1.4
Cost Competitiveness	0	7	2	0	1	2.5
Consumer Preference For Environmental Product	5	3	2	0	0	1.8
Transmission Tariff Structure	0	1	3	2	4	4
Regional Wholesale Power Market Prices	5	2	3	0	0	1.8
SECOND HYPOTHESIS VARIABLE SET						
Subsidies	1	5	3	0	1	2.5
Consumer Education Programs	2	4	1	2	1	2.6
Consumer Shopping Credits	4	3	0	0	2	2.2
Environmental Disclosure Requirements	1	3	4	1	1	2.8
Rate Reductions	3	1	1	1	4	3.2
Minimum Renewable Energy Portfolio Standards	4	1	5	0	0	2.5
THIRD HYPOTHESIS VARIABLE SET						
Green E Certification	3	2	1	4	0	2.6
Federal Definition Standard For Renewable Energy	1	3	1	4	1	3.1
Federal Legislative Initiatives	1	4	3	2	0	2.6

This data suggests that an important driver for retail Green Power Marketers competitiveness in a deregulated market is in fact the policies set forth by states as they consider deregulating their respective electric utility monopolies.

#### **4.1.2 Second Hypothesis Variable Test Set Results**

The lowest calculated arithmetic “mean” in this variable test set yielded a value of 2.2, which correlated to the “shopping credits” variable. This result seems to support the hypothesis set forth in Section 1.1 that the “shopping credit” is of primary importance to Green Power Marketers’ ability to compete in an open market. The second variable test set was overall fairly evenly distributed, with “mean” values ranging from 2.5 to 3.2. The “shopping credit” variable ranked slightly more important than consumer education programs, state subsidies, and minimum renewable energy portfolio standards.

#### **4.1.3 Third Hypothesis Variable Test Set Results**

The third hypothesis variable test set offers some observations. Two (2) of the three (3) variables in this set, “Green-E certification” and “federal legislation,” both had the same calculated arithmetic “mean” value of 2.6. The variable “national definition standard for renewable energy” had the least favorable “mean” value of 3.1. This suggests that Green Power Marketers favor non-governmental entities being more involved with developing renewable energy standards, but also support some “federal initiatives” to facilitate the utility deregulation process. In addition, the third hypothesis variable data test set suggests Green Power Marketers favor “Green-E certification” standards over “federal standards” for defining renewable energy content standard. However, Green Power Marketers seem to support some “federal legislative initiatives” for facilitating the

deregulation of the utility monopolies. This data suggests Green Power Marketers may favor some “federal legislative initiatives” which offer more opportunity to expand the overall renewable energy market size. However, Green Power Marketers are less supportive of federal involvement in adopting renewable energy standards. This data seems to support the hypothesis statement in Section 1.1 that Green Power Marketers favor non-governmental renewable product standards over government enacted standards.

#### **4.1.4 Likert Scale Data Analysis**

The Likert scale data research was designed to determine, from a Green Power Marketers’ perspective, what variables are of most importance in their ability to compete in a deregulated market. The Likert scale data collected seems to support the premise that Green Power Marketers feel “state deregulation policy” is “extremely important” to their ability to compete. The state policy initiative ranked most important to Green Power Marketers was the “shopping credit.” Lastly, Green Power Marketers favored some “federal legislative initiatives,” but with a non-governmental role in setting product content standards and definitions for renewable energy sources.

## **4.2 Open Question Results**

The open question portion of the survey questionnaire comprised two (2) topics. The first question requested participants to comment on what factors can be attributable to Pennsylvania demonstrating a much higher rate of consumer switching energy suppliers as compared to New Jersey. Survey participants indicated several factors were attributable to the lack of customers switching energy providers in New Jersey.

The first factor to be considered was the “wet signature” requirement in New Jersey. This policy required Green Power Marketers to obtain handwritten signature approvals from potential customers prior to switching their electric generation service. Green Power Marketers commented that the additional cost and time required to solicit handwritten signatures from perspective customers resulted in the New Jersey market being less attractive. Pennsylvania allowed customers to switch by using the Internet. Recently the federal government enacted “electronic signature” legislation to which New Jersey responded by abolishing the “wet signature” requirement. Several survey respondents expressed dissatisfaction with New Jersey’s “consumer education” program. Respondents indicated this program focused disproportionately on consumer protection, instead of emphasizing consumer choice. This format may have resulted in reducing customer interest in switching electric generator suppliers. Respondents also commented on the fact that wholesale power rates increased just as the New Jersey retail electric market opened for competition. Another respondent stated that power transmission constraints into New Jersey, in contrast to Pennsylvania, exacerbated the wholesale market power prices.

The second question requested respondents to comment on the impact recent wholesale power price surges in California and New York could have on Green Power Marketers. Survey participants indicated that increases in wholesale power prices resulting in higher electric bills for customers could pressure state lawmakers to disfavor enactment of utility deregulation legislation. The lack of utility deregulation activity could reduce the potential overall market size in which Green Power Marketers could compete. Other respondents indicated that rising wholesale power prices could also

benefit Green Power Marketers. As wholesale power generation costs rise, Green Power Marketers may become more competitive with conventional power.

The survey questionnaire included a section where Green Power Marketers could identify in which segment of the power market they are actively competing. The research data indicated nine (9) of the ten (10) respondents were marketing to “residential” customers. All ten (10) of the respondents were marketing to “commercial” customers. Five (5) of the ten (10) respondents were marketing to “industrial” customers. In addition, two (2) of the ten (10) respondents were marketing in more than one state. The data suggests a large number of respondents marketing to the “residential” customers, and relatively few Green Power Marketers marketing to the “industrial” sector.

The responses are supported by previous research as discussed in Section 2.3 “Consumer Preference.” Interestingly, a large number of Green Power Marketers are marketing services to “commercial” customers. This data may be a topic for additional research. A total of seven (7) of the ten (10) respondents indicated they were Green-E certified in New Jersey, Pennsylvania or California. This equates to a seventy percent (70%) participation in the Green-E certification process by Green Power Marketers included in the study. This data may support the research that Green Power Marketers favor non-governmental entities in developing product standards for Green Power (Riser, 1999).

## CHAPTER 5

### DISCUSSION AND CONCLUSIONS

#### 5.1 Data Assessment Comparison with Previous Investigations

The data for this research indicates several commonalities with previous research performed in this area of study. Most Green Power Marketers servicing California, New Jersey and Pennsylvania ranked “state deregulation policy” as “extremely important” in comparison to other variables such as the cost of renewable power versus fossil fuels, consumer preference, and transmission tariff issues. It is significant that Green Power Marketers did not rank cost competitiveness of their product as the most important driver in a competitive retail market. Instead, the regulatory framework in which Green Power Marketers may compete was considered of most importance.

The research suggests that a niche retail market may exist for consumers who wish to purchase power, including paying premiums, based on the environmental benefits of the product (Farhar, 1999). The data is also consistent with findings (Riser, 1999) that Green Power Marketers favored a supportive public policy role for Green Power. The policies enacted into state deregulation legislation seem to be of most concern to Green Power Marketers. Respondents servicing California, New Jersey and Pennsylvania were also provided with a set of “state deregulation policy” initiatives to rank in importance. This data set indicated that most respondents ranked a competitive “shopping credit” more favorably in comparison to other variables such as state subsidies, consumer education, environmental disclosure and renewable energy portfolio standards.



Ranking the “shopping credit’ favorably, is consistent with other findings (Riser, 1999) that indicated Green Power Marketers preferred price competition that encouraged customer switching. A “shopping credit” that is competitive with the default utility provider price for electricity may stimulate consumers to shop for an alternate power supplier. Shopping may allow consumers to learn what products the market is offering, including Green Power. Policies that support consumer shopping for power in conjunction with state policies supporting consumer education programs also appear to be an important factor for Green Power Marketers. Most respondents ranked “consumer education programs” as “very important” to Green Power Marketers. This is consistent with findings (Farhar, 1999) that related a competitive market with consumer education programs could benefit Green Power Marketers by informing customers of their product.

Lastly, the research indicated most respondents servicing California, New Jersey and Pennsylvania ranked the “Green E certification,” a non-governmental process for certifying Green Power Marketers, more favorable than “federal standards for renewable power.” This data supports the findings (Riser, 1999) which related Green Power Marketers are leery of government sponsored or mandated public information program. This variable test set also indicated most respondents ranked “federal legislative initiatives” as “very important” to Green Power Marketers. This is consistent with the findings (Riser, 1999) indicating Green Power Marketers favor public policy that is supportive of renewable power. In summation most Green Power Marketers in California, New Jersey and Pennsylvania seem to favor the “Green E certification” process over “federal standards for renewable power.”

## 5.2 Policy Implications

Green Power Marketers consider “state deregulation policy” of primary importance in their ability to compete in a deregulated electricity market. This data indicates that state lawmakers can greatly impact the long-term viability of the renewable power industry. State policies that provide customers with an incentive to switch from a default power generator appears to be of significant importance to the renewable power industry’s ability to increase market share.

State deregulation policy will be an important impetus in creating a market for Green Power Marketers in the future. Increased demand for Green Power can create more capital for the industry to invest in technology, plant and equipment. By increasing generation capacity, economies of scale could result in even lower costs for purchasing Green Power. Moreover, increased power generation by renewable power sources could be accomplished with less impact on air quality, in contrast to power generation from fossil fuel sources such as coal and oil.

Green Power Marketers favor federal government action on deregulation but not regulation in the context of setting renewable energy performance and compliance standards. Discretion should be provided to non-governmental entities in developing renewable energy standards which may better reflect the availability of local and regional renewable power resources. State deregulation policy is one component of a dynamic process in the transformation of the emerging market for purchasing electricity. This research provides information on identifying some key policy preferences and concerns of Green Power Marketers in a deregulated retail electricity market.

Lawmakers and other interested parties in states which have not yet passed, or are considering, utility deregulation in their own state may wish to review this data in the context of how policy affects the Green Power Marketer segment of the electric power market. Competing for market share with large, well-established, lower cost conventional power suppliers will remain a challenge for Green Power Marketers. Continued federal support in the form of tax incentives could assist the development of the renewable power technology. State policy that encourages robust retail competition may improve the market share of Green Power Marketers. New entrants into the deregulated electric supplier market may not have the operating income to advertise and actively promote their Green Power product. The ability to sign on new customers using the Internet can reduce marketing and advertising costs. Brand recognition is an important factor for any product being marketed. Properly implemented state sponsored consumer education programs that encourage customer choice may improve the prospects for Green Power Marketers.

**APPENDIX**  
**SURVEY QUESTIONNAIRE**

The following survey questionnaire was electronically transmitted to Green Power Marketers registered in California, New Jersey and Pennsylvania. Survey respondents were instructed to return the completed survey questionnaire by e-mail.

## RENEWABLE ENERGY SURVEY QUESTIONNAIRE

(September 2000)

From: Richard Orlusky, New Jersey Institute of Technology

NAME OF COMPANY:

Contact (Optional):

1. Does your company currently market renewable energy in the following states?

California:	<input type="checkbox"/> Residential	<input type="checkbox"/> Commercial	<input type="checkbox"/> Industrial
Pennsylvania:	<input type="checkbox"/> Residential	<input type="checkbox"/> Commercial	<input type="checkbox"/> Industrial
New Jersey:	<input type="checkbox"/> Residential	<input type="checkbox"/> Commercial	<input type="checkbox"/> Industrial

2. Below are some factors affecting Renewable Energy providers in a deregulated energy retail market. How would you rank the importance of each factor to your ability to compete in the States lists above?

a. State Deregulation Policy:

<input type="checkbox"/> 1. Extremely Important	<input type="checkbox"/> 2. Very Important	<input type="checkbox"/> 3. Somewhat Important
<input type="checkbox"/> 4. Little Importance	<input type="checkbox"/> 5. Not Important	

b. Renewable energy cost versus fossil fuels:

<input type="checkbox"/> 1. Extremely Important	<input type="checkbox"/> 2. Very Important	<input type="checkbox"/> 3. Somewhat Important
<input type="checkbox"/> 4. Little Importance	<input type="checkbox"/> 5. Not Important	

c. Consumer Preference for more environmentally friendly products:

<input type="checkbox"/> 1. Extremely Important	<input type="checkbox"/> 2. Very Important	<input type="checkbox"/> 3. Somewhat Important
<input type="checkbox"/> 4. Little Importance	<input type="checkbox"/> 5. Not Important	

d. Transmission Tariffs that do not take into account the variable nature of power production for some renewable energy sources:

<input type="checkbox"/> 1. Extremely Important	<input type="checkbox"/> 2. Very Important	<input type="checkbox"/> 3. Somewhat Important
<input type="checkbox"/> 4. Little Importance	<input type="checkbox"/> 5. Not Important	

e. Regional wholesale electric market price increases:

- \_\_\_ 1. Extremely Important    \_\_\_ 2. Very Important    \_\_\_ 3. Somewhat Important  
 \_\_\_ 4. Little Importance    \_\_\_ 5. Not Important

Comments (if any) on items in questions #2 above?

3. Below are some State Deregulation Policy initiatives which may affect the marketing of Renewable Energy Suppliers. How would you rank the importance of each factor to your ability to compete?

a. State Subsidies for consumers purchasing Renewable Power:

- \_\_\_ 1. Extremely Important    \_\_\_ 2. Very Important    \_\_\_ 3. Somewhat Important  
 \_\_\_ 4. Little Importance    \_\_\_ 5. Not Important

b. Consumer Education Programs on Renewable Power:

- \_\_\_ 1. Extremely Important    \_\_\_ 2. Very Important    \_\_\_ 3. Somewhat Important  
 \_\_\_ 4. Little Importance    \_\_\_ 5. Not Important

c. Consumer Shopping Credits that allow retail competition with the default energy provider:

- \_\_\_ 1. Extremely Important    \_\_\_ 2. Very Important    \_\_\_ 3. Somewhat Important  
 \_\_\_ 4. Little Importance    \_\_\_ 5. Not Important

d. Environmental Disclosure requirements:

- \_\_\_ 1. Extremely Important    \_\_\_ 2. Very Important    \_\_\_ 3. Somewhat Important  
 \_\_\_ 4. Little Importance    \_\_\_ 5. Not Important

e. State mandated Rate Reductions for electricity customers:

\_\_\_ 1. Extremely Important    \_\_\_ 2. Very Important    \_\_\_ 3. Somewhat Important  
 \_\_\_ 4. Little Importance    \_\_\_ 5. Not Important

f. Do you feel State requirements for minimum retail “Renewable Energy Portfolio Standards” are of importance to renewable energy marketers?

\_\_\_ 1. Extremely Important    \_\_\_ 2. Very Important    \_\_\_ 3. Somewhat Important  
 \_\_\_ 4. Little Importance    \_\_\_ 5. Not Important

4a. Does your Company have the Green-E seal certification in any of the following states?

\_\_\_ New Jersey    \_\_\_ Pennsylvania    \_\_\_ California

b. How important do you feel the Green E seal certification is in regards to your marketing of renewable power?

\_\_\_ 1. Extremely Important    \_\_\_ 2. Very Important    \_\_\_ 3. Somewhat Important  
 \_\_\_ 4. Little Importance    \_\_\_ 5. Not Important

c. How important do you feel a nationally accepted standard of how renewable energy is defined would impact your ability to market in different states?

\_\_\_ 1. Extremely Important    \_\_\_ 2. Very Important    \_\_\_ 3. Somewhat Important  
 \_\_\_ 4. Little Importance    \_\_\_ 5. Not Important

d. How important do you feel the enactment of any Federal Electric Utility Deregulation legislation by the U.S. Congress is to your ability to market renewable energy?

\_\_\_ 1. Extremely Important    \_\_\_ 2. Very Important    \_\_\_ 3. Somewhat Important  
 \_\_\_ 4. Little Importance    \_\_\_ 5. Not Important

Comments (if any) on items in question #4 above:





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