

Green Pricing Resource Guide

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About AWEA:

Since 1974 the American Wind Energy Association (AWEA) has promoted wind energy as a clean source of electricity for consumers around the world.

The Association is an industry clearinghouse, utilizing the following vehicles for communicating about wind energy: legislative efforts and updates, education and communication efforts, annual industry conference, wind energy publications, and a membership directory.

AWEA offers a variety of memberships for companies and other organizations involved with wind energy, and also invites individuals to become Wind Energy Advocates.

For more information, visit AWEA's web site at <http://www.awea.org>. This web site is visited more than 1,200 times per day and is the premier source of news, research information, education materials, answers to technical and policy questions, and access to wind energy publications. New online information is posted regularly.

Preface

Green power markets today are characterized by three types of sellers:

- Electric utilities that offer their franchise customers a green power option, often referred to as green pricing;
- Energy marketing companies that offer green power competitively in restructured markets, usually distinguished as green power marketing; and
- Marketing companies that sell the attributes of renewable energy (such as cleaner electricity production, support for renewable energy generators, fuel price stability and emission reductions), called variously tradable renewable certificates, renewable energy credits or green tags.

The first two types of sellers offer a delivered electricity product (customers buy electricity while supporting renewable energy), while the third offers the benefits of renewable energy without delivering electricity to the customer that buys the certificates. In practice, these distinctions may be blurred—for example, by a utility affiliate competing in restructured markets, or by certificate providers partnering with utilities to rebundle renewable energy certificates with commodity electricity for a delivered green product. Further, a few utilities are currently selling renewable energy certificates to both their electricity customers and to other buyers not in their electric service territories.

This guide focuses on utility green pricing programs, although most of the insights apply or can be adapted to green power marketing in restructured markets, and to a much lesser extent to renewable energy certificates. Nevertheless, the Guide is written for utilities as the primary audience. This audience may be important at least for the next few years because restructuring of state electricity markets has slowed since the occurrence of problems in California retail markets and abuses in wholesale power markets, and because of the general lack of customer switching in those states that have reformed their electric industry.

This Green Pricing Resource Guide is a major revision to the first edition prepared in 1996 and published by The Regulatory Assistance Project. A great deal has happened in the green pricing market since the first programs were introduced in 1993:

- The number of green pricing programs has grown to about 90, and these programs are offered by over 300 utilities, many of them working cooperatively on the same program.
- There is greater variety in program design. The first programs were contribution programs, whereas now there are many more energy-based programs.
- Programs have also incorporated a wider variety of value-added features, and experimentation continues.
- There is also greater innovation in program promotion. Utilities have seen how green power has been marketed in competitive markets, and they are learning about partnering with local environmental stakeholders.
- Given time and learning, a few utility programs have now met or exceeded 5% residential market penetration.

Given this expanded activity, most of the chapters are completely revised to reflect experience. Only Chapter 10, Market Research Methods, remains largely unchanged.

Despite its achievements, green power still has a long way to go, especially in continued program promotion, reducing customer acquisition costs, and responding to customer demand. And because utilities continue to show interest in developing new green pricing programs, this Guide is offered as a resource to help them meet their goals.

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1 WHY OFFER A GREEN POWER CHOICE?

Why would a utility offer green pricing? There are several possible answers to this question. In particular, green pricing allows utilities to fulfill a few key goals.

Satisfy customers

Perhaps the most obvious reason to offer green pricing is because customers want it. Market research surveys show 50-80 percent of respondents favor having the option of buying cleaner renewable energy—even if they choose not to participate. (Farhar 1996)

Utilities that use renewables in their electricity generation mix receive higher customer approval ratings. Sixty-four percent of customers who responded to one survey indicated, “Has experience with clean/renewable energy” as a top quality of a green power provider. (Farhar 1999)

Customer satisfaction derives not just from renewable energy and its environmental benefits, but also from stable bills. Another group of customers, not necessarily the same as the green customers, are very interested in price protection. (Pokorny 1994) If the program is designed with this goal, energy from renewable resources can be marketed as a guarantee against rate increases from fuel price volatility.

Satisfy shareholders

If the utility is investor-owned, offering a green power option as part of a larger environmental strategy may boost earnings. According to a report by Innovest Strategic Value Advisors, “leading environmental companies in the electric utility sector had an average 10 percent greater annual shareholder return than that of other companies during the past three years.” (Energy Customer Management 2002)

Earn public relations benefits

The offer of and continued support for green power choice can be an easy way to get positive public relations value. Related to customer and shareholder satisfaction, positive PR can also result in support and recognition by regulators.

Gain competitive advantage

What is competitive advantage? Simply put, it is the ability to attract or retain customers when they have the option of choosing an energy supplier. If customer choice is not a feature of the local electricity market, then this reason is closely related to customer satisfaction. If customer

choice is allowed, or will be introduced in the not-too-distant future, then competitive advantage becomes more critical.

Surveys have shown that green-pricing program participants are considerably more loyal to their utility than are customers as a whole. (Farhar 1999) If restructuring and customer choice is on the horizon, this could be especially important.

There is no single electricity product or service that will attract or retain customers. Instead, one product may be what three percent of customers want, another may be attractive to four percent and a third may be what five percent are looking for. These market penetrations add up and pretty soon, after a lot of hard customer research, product segmentation and program marketing, larger and larger numbers of customers begin to feel their interests and values are being internalized by their utility. (Pokorny 1985) Multiple products should appeal to a broader spectrum of customers.

Even if utilities maintain their retail electricity monopoly, they may still face competition for the provision of renewable energy benefits. With the introduction of renewable energy certificates in the past few years, customers can now choose to demonstrate their support for renewable energy by purchasing renewable energy certificates from non-utility marketers.¹ This would especially be the case if customers really want a green choice but their utility does not offer it. In that case, customers may go outside the utility to satisfy their interest, and the utility would lose its competitive advantage.

Educate customers and utilities themselves

Green pricing programs benefit both the supply and demand sides of the electricity industry by presenting both with valuable learning experiences. Particularly in competitive markets, green pricing helps educate customers in the following ways.

- The availability of a green power choice may help customers get used to the idea of different electricity products being delivered over the same distribution lines.
- Green pricing demonstrates that choosing renewable resources has no effect on the reliability of electricity delivery.
- With a green pricing program in place, customers have the chance to learn about the environmental impacts of different energy sources.

Through green pricing, utilities, renewable developers, and other non-utility electricity suppliers gain new skills.

- Green pricing allows utilities to gain commercial operation experience with renewables, which could later result in increased reliance on renewables. (Swezey & Bird 2001) This experience could also be important if utilities feel that federal or state renewable energy requirements may be imposed in the future.

¹ Renewable energy certificates represent the environmental and other attributes (for example, carbon emission reductions) that consumers may value. The attributes are unbundled from the electricity and sold separately from delivered electricity service.

- Utilities gain knowledge of how to succeed in a competitive market environment by developing green pricing programs. They learn how to differentiate products, segment customers, and create a flexible product or service infrastructure. And they hone their skills in market research, advertising and promotion, billing, and customer communications.

Improve environmental performance

Utilities that increase the percentage of renewable energy in their supply portfolio are generally recognized for reducing their environmental footprint. As a further expression of environmental progress, many utilities are preparing annual environmental performance reports. Beyond the supply resource mix, key environmental indicators include tons of emissions from owned or purchased generation.

Introducing more renewable energy generation can help reduce emissions, although claiming emission reductions can be complicated. Many states are establishing greenhouse gas registries in which utilities and other companies can record measurable and verifiable reductions in carbon and other greenhouse gas emissions. A few states allow renewable energy to earn emission reduction credits as part of the state implementation plan for reducing nitrogen oxide emissions. For sulfur dioxide emissions, the Clean Air Act Amendments of 1990 established a cap and trade program as part of the acid rain program. Under this program, SO₂ emission allowances are fixed in number, with the result that a reduction in SO₂ from using a cleaner energy source would allow a utility to emit more at a polluting plant, or to sell the allowance to other polluters. While this may benefit the utility, total emissions may remain unchanged.

Claims of emission reductions are further complicated by the fact that customers who buy green power expect to receive the carbon offsets, emission reduction credits and other environmental, social and economic benefits. The customers and the utility supplying the green power cannot both own the offsets, credits and other benefits at the same time. Nevertheless, even if the utility cannot claim the environmental benefits directly, it can be recognized for the environmental improvements that its green pricing program has facilitated.

Promote electricity price stability

In recent years, natural gas has been the fuel of choice for most new additions to electricity generating capacity. Gas prices, however, have proven unstable, with a few periods of very high prices. By contrast, several renewable resources have no fuel costs. By adding renewable energy to its resource mix, a utility can moderate price fluctuations in its overall supply portfolio, just as a mix of stocks and bonds reduces risk in a financial portfolio.

Utilities typically might buy a financial hedge to ensure a fixed price for gas over some future period. According to one study, this insurance policy costs about 0.5 cents per kWh. (Bolinger & Wiser 2002) This suggests that wind or other free-fuel resource is worth up to one-half cent more than the expected spot market price of natural gas without the insurance policy.

Of course, a utility offering a green pricing product can shield participating customers from fuel price volatility, to the extent that these customers are not causing the utility to purchase fuel.

Many customers may find this quality as compelling as the environmental benefits that also accompany green power. Austin Energy's *GreenChoice* program is a good example. Subscribers pay a fixed green power charge rather than the normal fuel charge on the amount of green power they buy. The green power charge remains fixed for the term of the utility's renewable energy contracts, which is generally 10 years.

Meet state requirements

Some states require their utilities to offer green pricing:

- **Washington:** Washington's electric utilities have been required to offer customers green pricing options since January 1, 2002. Washington green pricing programs must use energy from a clean sources such as wind, solar, geothermal, landfill gas, wastewater treatment gas, biomass, low-impact hydro, and wave or tidal action.
- **Minnesota:** Shortly following the signing of the Washington bill in May 2001, Minnesota enacted a law requiring the state's electric utilities to offer customers the opportunity to purchase power generated from renewable sources or "high-efficiency, low-emission distributed generation, such as fuel cells or microturbines fueled by a renewable fuel."
- **Oregon:** Under Oregon's 1999 restructuring law, large customers can switch suppliers, but small customers cannot. Instead, investor-owned utilities are required to offer a menu of choices to their residential and small commercial customers. The Oregon PUC has approved three types of renewable energy options for Portland General Electric (PGE) and PacifiCorp small customers. Two of the three options are marketed by Green Mountain Energy, while the third is marketed by the utilities themselves.
- **Iowa:** Beginning January 1, 2004, Iowa electric utilities, including those not regulated by the Iowa Utilities Board (IUB), will be required to offer green power options to their customers. Iowa utilities can offer contribution or energy tariff programs.
- **Montana:** In July 2001, Montana adopted an energy bill that includes a requirement for regulated electric utilities to offer an opportunity to purchase "a separately marketed product composed of power from renewable resources," defined as biomass, wind, solar, or geothermal resources.
- **New Mexico:** Finally, in December 2002, the New Mexico Public Regulation Commission adopted a rule as part of its Renewable Portfolio Standard rulemaking that requires all utilities in the state to offer a green pricing option.

If electric industry restructuring continues to stall, blocking customer choice of suppliers, expect other states to require utilities to offer customers a green choice. On the other hand, if utilities are concerned about such requirements, initiating green power options may reduce the chance of mandatory requirements.

2 GREEN PRICING CONCEPTS

It is important to clarify the fundamental concepts of green pricing before exploring green pricing experience. These concepts should be kept in mind when planning and implementing a green pricing program.

Most people with a casual awareness of green pricing think of it simply as a utility offering renewable energy for an incremental price in addition to regular electricity rates. But there are other aspects of the offering that merit close examination. Key to these is the concept of cost-effectiveness.

Cost-effectiveness

Simply stated, a resource is cost-effective if its benefits are greater than its costs. If the benefits outweigh the costs, then the resource will lower the long-run cost of providing electricity service to customers. If a renewable resource is cost-effective, therefore, it should be purchased or developed as part of the utility's resource acquisition plan. If it is not cost-effective, then it may be a candidate for green pricing. For this reason, a utility green pricing option costs more than standard electricity service.

Does green power have to charge a premium?

A price premium may not be necessary or desirable in a restructured market, which is why we use the term green power marketing for that situation. In contrast to utility green pricing, green power marketing need not be limited to renewable energy that costs more than its benefits, because prices in competitive markets are based on value, not on cost, and marketers do not have a "rate base." If renewable energy costs less than another source of supply, a competitive marketer would likely want to include it in its resource portfolio to lower its cost. The marketer then has to decide whether to promote the product as cleaner *and* cheaper, or to sell it at a higher price based on its greater value (because of its environmental benefits) to customers. The marketer's decision will depend on competitive pressures on price, consumer recognition of greater value and willingness to pay more, and on the marketer's objectives (for example, greater market share vs. greater profitability).

Price premiums

For utility green pricing, the price premium should be based on the difference between the cost of the utility's least-cost plan and a plan that includes more renewables.² For this reason, the least cost plan or avoided cost is as important to setting the premium as is the cost of the renewable resource and program expenses. The avoided cost is not the average cost of existing resources or

² The premium may also include marketing and administration costs, but the focus here is on resource comparisons.

the short-term spot market cost of resources. It is the cost of a new cost-effective resource that the utility would otherwise acquire. Avoided cost may also be interpreted as the value of benefits that the green pricing resource would provide to the utility.

The price premium should not imply that renewables are inherently expensive because green pricing assumes a utility is already purchasing all cost-effective renewables as part of its least-cost plan. All customers pay for the resource up to the break-even point of cost-effectiveness, but only those who purchase the green option pay the premium (see also Chapter 14 on Pricing).

Losing Sight of Green Pricing Principles

It is all too easy to lose sight of what is cost-effective and what is not when green pricing principles are not fully understood or recognized.

One utility proposed to charge its customers \$2.50 per block of 100 kWh of wind, including both energy and marketing costs. A company spokesperson said that the reason for the premium is that the cost of developing new wind is significantly more expensive than the costs of the utility's existing plants. (Peterson 2002) This is a comparison of apples to oranges—the cost of a new plant compared to the cost of plants already built and operating.

At the same time, the company estimated that the cost of new wind is 2.5 to 3.5 cents per kWh, while the cost of a new coal plant is 3.5 to 5.0 cents per kWh, and the cost of a new combined cycle natural gas plant is 3.5 to 4.5 cents. (Peterson 2002) In this assertion, one new resource is being compared to another, and wind is cheaper. If the coal or natural gas plants represent the utility's avoided costs, wind does not need a premium at all because it is a cost-effective resource acquisition for all customers.

Although the newspaper report of this case may not tell the complete story, the article does point to some common confusion.

In general, utilities should compare future options against each other rather than future costs with embedded or average costs. In other words, the program should be priced so that the green option reflects the difference between incremental cost of a planned new resource and the new renewable resource being considered for green pricing, not the difference between average system costs and the new renewable. In this example, wind is estimated to be less expensive than either natural gas or coal, so wind should be built and charged to all ratepayers, not offered as a green pricing option.

It may be argued that a utility does not need new resources, in which case the avoided cost could be merely the avoided operating cost of existing plants. But this condition would not last indefinitely. The avoided costs might be low for a few years, but eventually most utilities will need more capacity and will be looking at adding new resources.

Green pricing results in the utility relying more on renewables than would otherwise be cost-effective, the key word being *otherwise*. Green pricing should not be a substitute for the utility investing in renewable resources that are already cost-effective. It is not fair to ask green customers to pay for something the utility should be doing anyway.

Integrated resource planning

In the 1980's, utilities began to use the concept of least-cost planning to determine what resources to acquire. The idea behind least-cost planning is to acquire the resources that cost the least. Utility commissions in many states required regulated utilities to incorporate a formal least-cost planning process called integrated resource planning (IRP) into their resource planning, taking into explicit account risk, resource diversity and environmental impacts.

What does IRP have to do with green pricing? IRP is important to green pricing because it is the process by which a utility establishes its avoided costs, and avoided costs are important because green pricing is based on the incremental cost of renewable resources above the utility's avoided costs. In particular, utilities should focus on long-run avoided costs if they are making investments in new capacity and energy. IRP is also the way that a utility determines which renewable energy projects should be developed on cost-effectiveness grounds alone, and which would instead be appropriate to consider in a green pricing program.

Avoided cost

The benefits or value of a particular resource are measured by estimating what costs will be avoided by the addition of the resource. For example, some other generating resource may not be constructed, or some existing resource may not have to be operated. Transmission and distribution upgrades may be avoided depending on the location of the resource or the loading on a substation. Environmental costs not included in the price of the resource may also be avoided. All of these avoided costs, or benefits, are part of the value of the project.

Green pricing does not change a utility's need to calculate avoided costs, nor does it change the way it calculates avoided cost. The calculation of avoided cost can be improved through an understanding of the following points:

- True avoided costs are unique to each resource project.
- Avoided costs may include more than the traditional avoided energy and capacity costs.
- Even intermittent resources have capacity value.

The most common misunderstanding about avoided cost is that it is a single number. If this were true then every resource would have the same value. But there are many factors determining the worth of a resource, including dispatchability, contract duration, the plant's impact on required reserve margins, the impact on fuel diversity, the allocation of financial and operating risks, the cost of future environmental regulations, and others.³

The value of a particular resource (or its avoided cost) may be determined by adding it to the stack of resources found cost-effective in the utility's integrated resource plan. The avoided costs

³ See David Moskovitz and Peter Bradford, "Paved With Good Intentions: Reflections on FERC's Decisions Reversing State Power Procurement Processes," *The Electricity Journal*, August/September 1995, pp. 62-68.

will be an output of that modeling exercise. If this analysis is not practical, then the long-range avoided costs reported in the utility’s most recent integrated resource plan may be used.

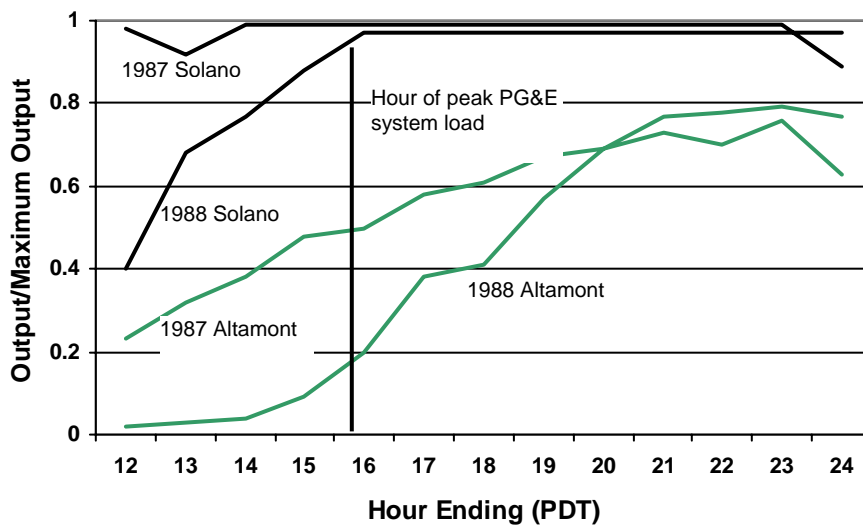
Capacity value

Do renewable resources have capacity value? Sometimes renewable resources, especially those that rely on an intermittent resource such as wind, solar, or run-of-river hydro, are thought to have no capacity value because they are not dispatchable—they cannot be turned on and off by a system operator to meet peak demand. The wind plant, for example, generates only when the wind blows.

The lack of dispatchability of an intermittent resource, however, is not the same thing as a lack of capacity value. Capacity value is determined by the coincidence of generation with peak demand. When the capacity of a renewable resource meets customer demand at its peak point, the resource is said to have high capacity value.

Consider the two wind plants Altamont and Solano, shown in Figure 2-1. The chart shows that for both 1987 and 1988, Solano was producing at nearly full capacity at the time of system peak, meaning that it can be credited with nearly 100% capacity value. In contrast, Altamont was producing at about 50% and 20% of capacity for those same years. This does not mean that Altamont has no capacity value, however. Instead, it should be credited with 50% and 20% of its capacity potential.

Figure 2-1. Wind Plant Output During PG&E Peak Load Days

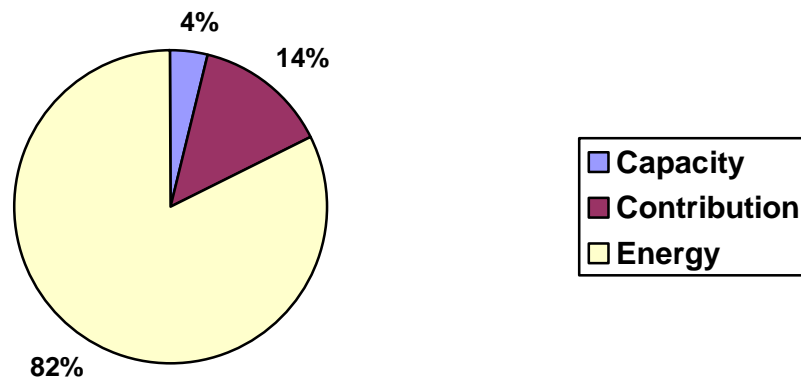


Source: RAP 1994

3 TYPES OF GREEN POWER PRODUCTS

There are three main types of green pricing products—contribution programs, capacity-based programs, and energy-based programs. These three types of programs are shown in Figure 3-1 as a percent of the total number of utility green pricing programs. Another option more recently introduced to the green pricing scene is tradable renewable energy certificates, which combine aspects of both contribution programs and energy-based programs. Non-utility marketers are leading the sale of certificates, but a few utilities offer a certificates product to their electricity customers and others. The energy-based approach tends to be the most widely used by utilities and non-utility markets alike, and represents more than 75 percent of utility programs currently in use or in development. (Swezey & Bird 2001)

Figure 3-1. Program Types as Percent of Green Pricing Programs



Contribution programs

Contribution programs are designed to allow customers to contribute to a utility-managed fund for renewable energy project development. Customers choose the amount of their monthly donation in most contribution programs, but some utilities set minimum contribution levels as high as \$6 per month. Customer contributions may be tax deductible if utilities set up separate nonprofit entities to administer the program. (Swezey & Bird 2001)

Contribution programs are not usually used to meet the customer’s electricity needs with green power, but instead to fund the installation of renewable energy projects in prominent locations

within the community. As of February 2002, 15 utilities offered contribution programs. (GPN 2002) Most of these support the development of solar photovoltaic projects, and a few support a mix of resources, including wind.

Almost all of the contribution program projects have been relatively small, with the exception of the *PV Pioneers I* green pricing program created by Sacramento Municipal Utility District (SMUD). Since 1993, SMUD has developed about 1.9 MW of rooftop PV system through *PV Pioneers I*. In this case, however, the installed capacity is not totally due to customer contributions. Installations have been heavily subsidized by the utility to promote PV market development and achieve system cost reductions. (Swezey & Bird 2000, 2001)

In terms of number of participants, the most successful contribution program is the *Renewable Energy Trust* developed by Public Service Company of Colorado (now Xcel Energy) in 1993. As of December 2002, approximately 9,420 customers, representing more than 1 percent of the utility's residential customers, contribute to the program through tax-deductible contributions or a bill round-up option. The program has helped fund more than 60 solar energy projects in the utility's service area, including 29 systems at local schools. (Swezey & Bird 2001)

Although solar is the most commonly used resource for contribution programs, several utilities have modified contribution programs for other resources. Washington-based Benton County Public Utility District has a contribution program to help pay the above-market costs of a 1-MW purchase from a landfill methane facility. Cedar Falls Utilities supports the operation and maintenance of three 750-kW wind turbines by asking its customers to donate \$2.50 each month. The turbines were installed by a group of seven Iowa municipal utilities. (Swezey & Bird 2001)

Capacity-based programs

Customers can purchase a fixed block of renewable electric capacity through capacity-based programs, for example paying \$3 for a block of 50 Watts. This approach has so far been used only for supporting solar photovoltaic projects, primarily because PV-generated electricity is considerably more expensive, on a per kWh basis, than other renewable resources.

Only four utilities currently offer capacity-based programs: Detroit Edison sells 100 Watts for \$6.59 per month; Gainesville Regional Utilities offers a block of 50 Watts for \$3 per month; and Alabama Power and Gulf Power (both subsidiaries of Southern Company) offer 100 Watts for \$6 per month. Capacity purchased through a green pricing program is usually much lower than the capacity necessary to meet all the customer's electricity needs. (Swezey & Bird 2000)

Arizona Public Service (APS) started a capacity-based program with a solar-capacity charge, but later switched to an energy-based rate. APS originally offered 100-watt blocks of solar capacity for approximately \$3 per month, but switched to offering 15-kWh blocks of solar electricity for \$2.64 per month (17.6 cents/kWh). APS made the switch so it would be easier for customers to keep track of the amount of solar energy they receive. (Swezey & Bird 2001)

Energy-based programs

Energy-based (also called energy tariff) programs allow customers to choose a fixed amount or percentage of their electricity requirements from renewable sources. Fixed amounts are usually measured in 100-kWh blocks. Utilities with energy-based programs let customers receive up to (and sometimes exceeding) 100 percent of their electricity from green power.

The green pricing premiums charged in energy-based programs vary from 0.7 cents/kWh to as high as 17.6 cents/kWh. The upper end of the range represents programs offering only solar energy, which can be several times more expensive than other renewable sources. Consequently, most utilities with solar-based programs use the contribution or capacity-based pricing approaches.

Energy-based programs are by far the most numerous type of green pricing program, and wind energy is the predominant renewable resource sold. Of the 69 energy-based programs, the energy resources offered are wind (39), landfill gas (4), solar (2), geothermal (1), and a combination of resources (23). Wind energy tends to be the most popular resource for energy-based programs, mostly because it works well financially for utilities with access to good wind resources and also because customers recognize and value wind generation. (GPN 2002)

Combining resource types diversifies the renewable resource mix and lets utilities take advantage of multiple locally available resources. Wisconsin Electric combines landfill methane, wind, wood and small hydro. Tennessee Valley Authority and Austin Energy use landfill methane, wind and solar.

Some utilities have combined the contribution and energy-based approaches. Through these programs, customers pay a premium tied to an existing resource in order to support the development of new renewable resources. For instance, the City of Bowling Green owns a 6-MW share of a recently installed hydro project. It charges participants a premium of 1.38 cents/kWh—the above market cost of the project—so they can receive up to 100 percent of their energy needs from hydropower. The program revenues are then used to develop new solar or wind resources. (Swezey & Bird 2001)

Renewable energy certificates

Buyers of green power usually assume that the environmental benefits of green power accompany the electricity itself. However, renewable energy certificates (also known as green tags or tradable renewable certificates) explicitly separate the attributes from the electricity. Renewable energy certificates represent all the attributes of a unit of energy (such as one MWh), not the energy itself.

While the concept of separating energy from its benefits is relatively new, we nonetheless have experience in trading environmental benefits through sulfur dioxide emission allowances or

nitrogen oxide emission reduction credits. Renewable energy certificates work in a similar manner.

From a utility's perspective, the chief advantage of renewable energy certificates is that they avoid generation scheduling and energy delivery costs. For resources that are distant to a utility, transmission costs of delivering energy to the utility's grid may be significant. In addition, utilities may benefit from competitive pricing for certificates at the wholesale level. Until the certificate trading market is more transparent, however, this latter benefit may not be fully realized.

Renewable energy certificates may be used at the wholesale or the retail level. At the wholesale level, a utility may purchase certificates from a generator or a wholesale marketer, and use the certificates to rebundle with the utility's system power. The attributes "green up" the kWh sold by the utility to its green pricing customers. In this case the use of certificates need not be explained to retail electricity customers because the certificates are used with a delivered electricity product. (There may be disclosure requirements, however—see below.)

Renewable energy certificates may also be sold at retail as a stand-alone product, meaning that they are sold unbundled separate from electricity service. If a utility were selling unbundled certificates, it would be selling support for renewable generation, not green power itself, and it would need to be clear about this to its customers. Generally, however, the utility will prefer to offer a delivered green power product, meaning that the attributes remain bundled with the electricity service. This would be the case especially if the energy from the renewable generating facility is delivered to the utility grid or to the regional power pool.

Certificate Marketers

Aquila
Bonneville Environmental Foundation
Community Energy
Missouri River Energy Services
Native Energy
PG&E National Energy Group
Renewable Choice Energy
Sterling Planet
Sun Power Electric
3 Phases Energy Services
Waverly Light & Power

From a consumer's perspective, the advantage of renewable energy certificates is that certificates make it possible for all Americans to support renewable energy, regardless of where they are located, whether their utility offers a green pricing choice (and whether that choice appeals to the consumers) and whether their state is open to retail competition. This is possible because there is no physical constraint of reliance on transmission grids. Using certificates, the benefits of renewable energy can be provided to customers who are far from generating plants.

The credibility of products that rely upon renewable energy certificates depends to a large extent on independent and verifiable accounting or certificate tracking systems. New England and Texas have developed such systems, and PJM and the Western Interconnect have similar projects in the works.

Which product type to use

Determining the best possible product type to offer depends on the demographics of the customer population, the types of renewable resources available in the area, and the goals of the utility. In fact, there may not be a single “best” product type. Contribution programs, energy-based programs, capacity-based programs, and tradable renewable energy certificates each have their own unique advantages and disadvantages. Different products may be more attractive to different market segments. A range of green power products—in hopes of meeting as many different customer needs as possible—could be most effective. But for a utility starting a green power venture for the first time, it is probably best to focus on one product initially. Later, one or two more products may be added based on experience and careful market research.

Disclosure for all product types

With any green power product (except for renewable energy generators sited on customer premises), customers won’t get green electricity delivered to their homes. Instead, their purchase of green power will provide financial support to renewable energy generators. It is important to explain this to customers so they are not misled or confused.

If the product is a renewable energy certificate, the utility or seller should also explain that the product supports renewable energy production but is not itself electricity. For example, certificate providers might state that “For every unit of electricity generated, an equivalent number of renewable certificates is produced. The purchase of renewable certificates offsets conventional electricity generation in the region where the renewable generator is located.” Because the certificates could originate in any region or anywhere on the globe, a utility or anyone selling certificates should disclose the state (and perhaps the specific generators) where the certificates were generated. Most green customers will want to know this information.

4 WILLINGNESS TO PAY

Among the first questions asked by utilities that are considering offering a green power option are, “Do customers want green power?” and “How much are customers willing to pay?” Numerous surveys have attempted to answer these questions. However, customers do not always act as they indicate in surveys. This chapter explores this problem and summarizes available market research. Surveys, market simulations, pilot programs, and market experience to date help determine willingness to pay.

The chapter closes by placing willingness to pay in the context of long-term rather than short-term market penetration results. Unless noted otherwise, references to “customers” are meant to imply residential customers.

National surveys

In national studies, market research shows consistently strong support for products or services that improve environmental quality. The most comprehensive compilation of this research, published in 1993, is a review of nearly 20 years of public opinion surveys relating to energy, the environment and other related topics. (Farhar 1993). This database of more than 600 surveys concluded that 56 percent to 80 percent of American voters indicate they would be willing to pay more for renewable energy or for environmental protection.

Likewise, when asked for opinions, 47 percent to 62 percent of *non-residential* customers indicate an interest in green power even if it costs more. (Holt et al. 2001) Sixty-two percent of residential customers and 65 percent of non-residential customers agree that using new renewable energy is “the responsible thing to do for the future, even if it costs more now.” (Farhar 1999)

Customers are more likely to say they are willing to pay if a specific amount is given, so it may be more effective to analyze surveys that use actual monetary amounts. The Electric Power Research Institute (EPRI) conducted a survey of 18,000 residential customers in 1997. The survey found that 84 percent of all utility customers said they would choose green power and pay a five percent differential. Seventy-six percent said they would pay a ten percent differential, and 71 percent said they would pay a 15 percent differential. (EPRI 1997)

Another survey shows that two-thirds of residential customers state that they are willing to pay at least \$1 or more every other month for electricity from renewable sources; 58 percent are willing to pay at least \$3 every other month; and 52 percent are willing to pay at least \$5 every other month. (Farhar 1999)

Willingness to pay is subject to interpretation, however. Survey responses often depend on how the questions are posed. Unless it is stated clearly that support for renewable energy is an individual option, affirmative responses to willingness to pay questions may depend on whether respondents assume that all customers would be paying for more renewable energy. One survey found that seventy-four percent of residential respondents and 80 percent of commercial respondents favored spreading the cost of new renewable sources over the rate base. (Farhar 1999) Other surveys have also found preference for sharing the cost of environmentally beneficial energy, rather than supporting it through voluntary programs. (Wiser 2002)

Some research indicates that more customers are willing to give up price *decreases* rather than pay extra for renewable energy. This notion has been supported by findings from an EPRI study of small business customers. Close to 40% of respondents stated that they would forgo a 15% discount to purchase green power, while only about 18% said that they would be willing to pay a 5% premium for the same green product. Respondents generally seemed to think that keeping their bills the same with the added benefit of environmental improvement is a good deal. (Kalweit & Peterson 1999)

Utility research

Individual utility research, specific to the marketing and promotion of renewable energy, confirms the general attitudes and customer willingness-to-pay levels revealed in the national surveys.

For example, three-quarters of PacifiCorp customers surveyed want the utility to provide environmentally friendly power. About one-third said they would pay a 20% premium for a 100% renewable product as shown in Table 4-1.

Table 4-1. Percent of PacifiCorp Customers Willing to Pay More for Green Power

Premium	50% green product	100% green product
10% higher price	38%	48%
20% higher price	23%	36%

Source: Market Strategies 1999

The Tennessee Valley Authority commissioned a telephone survey of end-use customers in 1998 and found that 84% felt that TVA should offer a green power option, even if they themselves do not participate. Forty-three percent said they would definitely look into a green power option if it were offered, and an additional 42% said they probably would look into it. No specific cost premiums were mentioned. (Ross 1999)

Dakota Electric Association did a survey that showed that its customers wanted their utility to support renewable energy and that 17 percent of them would pay significantly more for wind power. (Cliburn 1999)

A Tri-State Generation & Transmission Cooperative survey showed that customers who say they would pay more for green power varies from co-op to co-op, from 7 to 25 percent, but the region-wide average is 13 percent of all customers. (Cliburn 1999)

Sacramento Municipal Utility District (SMUD) reported willingness to pay for three market groups, including commercial and industrial customers.

Table 4-2. Percentage of Customers Willing to Pay More for SMUD to Invest in Renewable Resources

Customer group	5% more	10% more	15% more	20% more
Residential	43%	27%	16%	7%
Business	38%	20%	10%	3%
Industrial	8%	0%	0%	0%

Source: SMUD 1995

Madison Gas & Electric (MG&E) contacted a large sample of residential customers via mail to determine the market penetration for a wind project. While this survey involved a comparison of responses to a hypothetical offer, it is different from the others because it also tested the response to an actual offer. Table 4-3 shows that the percentage responding to the actual offer was consistently less than the response to the hypothetical offer. It also shows that 23% to 47% of those responding to the actual offers were willing to pay a modest monthly premium of \$2 to \$8.

Table 4-3. Percent of MG&E Customers Willing to Pay for Wind

Monthly Cost	Hypothetical Offer	Actual Offer
\$2	61%	47
\$4	58	35
\$8	50	23
\$12	36	18
\$16	35	18
\$20	29	16
\$24	31	8

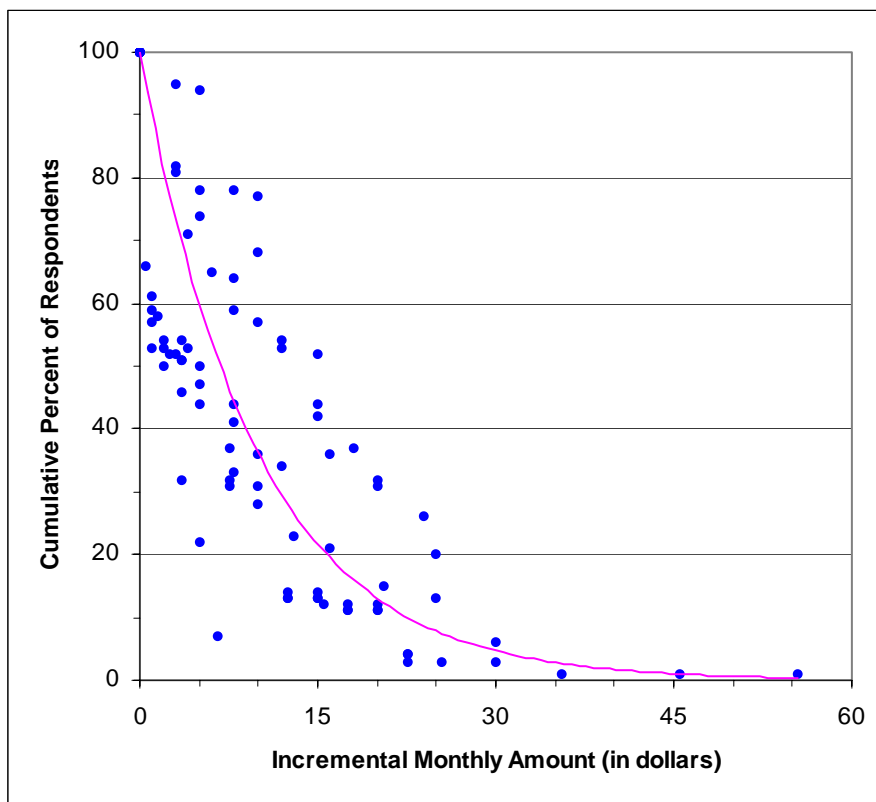
Source: Champ and Bishop 1998. Note that this survey involved different samples for each premium amount, so the percentages do not add to 100%.

Aggregate Utility Results

Figure 4-1 shows an aggregated willingness-to-pay curve created by the National Renewable Energy Laboratory. It illustrates an inverse relationship between incremental monthly amount and cumulative percent of residential respondents. As might be expected, according to survey responses, the more the incremental cost per month, the smaller percentage of respondents who would be willing to pay that amount.

The graph includes 95 data points and 12 surveys. Based on the data in the curve, an average of 70% of respondents are likely to say they are willing to pay at least \$5 more per month. An average of 38% are likely to say they are willing to pay at least \$10 more per month, and an average of 21% are likely to say they are willing to pay at least \$15 more per month. (Farhar 1999)

Figure 4-1. Aggregated Utility Market Research Data on Willingness to Pay for Electricity from Renewable Resources



Source: Farhar 1999

According to the author, “It is likely that any utility market survey asking residential customers about willingness to pay more for renewable energy will exhibit a similar pattern of results.” (Farhar 1999) This is probably true in any new market for green power, but the curve on NREL’s graph could change as utilities and consumers alike gain more experience with green pricing.

Willingness-to-pay gap

What people say in response to surveys, and what people do in real life, is very different. While 56% to 80% of people say they would pay more for renewable energy, typically only 1% to 2% choose to do so when given the opportunity, although there are some examples in the US of over 5% market penetration. Byrnes et al. (1995) compared the results of market surveys and opinion polls to the results of the earliest green pricing program introductions and market simulations.⁴ They found that only about 12 to 15 percent of customers who had said they would be willing to pay premiums to support renewable energy programs actually signed up when they were given the opportunity.

There are a variety of possible explanations as to why market research overstates consumer willingness to pay. One problem may lie with flaws in the surveys themselves. Common survey errors (Byrnes et al. 1995) include failure to:

- Explain the connection between renewable resources and environmental benefits.
- State a specific amount requested of respondents to help generate new renewable energy.
- Explain clearly how respondents' payments would be collected and administered. If it is too confusing to customers, it is easier for them to do nothing.
- Detail how the program works, including time frame.
- Assure respondents that the program is realistic and can be accomplished in the suggested time period.
- Contrast the programs' costs and benefits with alternative programs currently in use.

Other reasons why surveys overstate actual consumer response include:

- It is easy to say yes when you don't have to put real money on the table. Peoples' attitudes towards the environment may be supportive, but they are faced with many demands on their pocketbooks and cannot satisfy them all.
- In a real marketing situation, there is often a lack of awareness of the offer, and a lack of detailed information about the product, that can lead to non-responsiveness.
- Environmental benefits are public goods. It may be more difficult to get people to buy something they cannot own, and they may assume someone else can pay for the public goods—the "free rider effect."
- Electricity, whether produced by a coal plant or by solar photovoltaics, is a product that consumers cannot see. It is intangible, in the background, and usually taken for granted.
- Market research reveals there is a lack of understanding about some of the basics behind the concept of green pricing, such as the current mix of resources used to generate electricity,

⁴ Programs included Public Service Company of Colorado (PSCo) and Sacramento Municipal Utility District. Market simulations were conducted with customers of PSCo, Wisconsin Public Service and an undisclosed entity.

what renewable energy resources are, which ones are competitive today, and which are within reach in the near future.

- Green electricity is a new type of product, not just a new variety of a commonly understood product like breakfast cereal. Introducing a new type of product requires time to produce consumer awareness and understanding.
- Customers are prone to giving the answers they consider to be socially responsible, whether or not they actually would do as they claim (a phenomenon sometimes called “strategic bias”).
- Differences in survey techniques and behavior research methods contribute to the gap. Market tests and simulations often provide more accurate insight into the market penetration for green power.

Of course, the green power programs themselves may be designed or marketed with insufficient appeal to consumers.

Market simulations and field studies

If opinion surveys overestimate consumer willingness to pay, a better indication of the potential comes from market simulations and field studies. In these studies, consumers are given a real opportunity to buy green power, with adequate product description, pricing and utility identification. The few such analyses available indicate that perhaps 10% to 20% of residential consumers would be willing to pay extra for green power, given awareness and full knowledge of the offer. (Wiser et al. 2001) An example of a field test is the Madison Gas & Electric survey summarized in Table 4-3 above.

Green power market experience

Actual market experience with green pricing programs, of course, does not benefit from full awareness and knowledge. The average market penetration (including both residential and non-residential customers) is about 1.3%. About half of the green pricing programs currently offered have a market penetration less than 1%, for a variety of reasons:

- Many of them are new and have not reached their full potential.
- Many of them are limited by small generating projects, and have not expanded their renewable energy capacity.
- Many of them have made only minimal promotion and marketing efforts.

The top utility programs with the highest market penetration are listed in Table 4-4.

It is worth noting that most of the top ten in Table 4-4 are small and publicly owned utilities. Although it is naturally the largest utilities that have the highest number of green power participants, the small utilities seem to achieve higher market penetration more easily. This may be because they are closer to their customers, they enjoy greater trust and credibility as publicly owned utilities, and their communication networks are tighter and more personal. Smaller

utilities tend to be customer-owned, as in municipal utilities or rural electric cooperatives, and this sense of ownership may also contribute to greater participation on a percentage basis. At the same time, the presence on the list of the Los Angeles Department of Water and Power, the nation's largest municipal utility, indicates that it is possible for a large utility to achieve a high level of participation through effective product positioning and marketing.

Table 4-4. Top Ten Utility Customer Participation Rates (December 2002)

Rank	Utility	Program	Participation Rate	Program Start
1	Moorhead Public Service	Capture the Wind	5.8%	1998
2	Orcas Power & Light Cooperative	Green Power	5.5%	1999
3	Los Angeles Department of Water and Power	Green Power for a Green L.A.	5.2% ¹	1999
3	Holy Cross Energy	Wind Power Pioneers Local Renewable Energy Pool	4.9%	1998
5	Central Electric Cooperative	Green Power	3.7%	1999
6	Madison Gas and Electric	Wind Power Program	3.6%	1999
6	Sacramento Municipal Utility District	Greenergy PV Pioneers	3.6%	1997
8	Preston Public Utilities	Wind Power	3.4%	2000
9	Cass County Electric Cooperative	Infinity Wind Energy	3.1%	1999
10	Cedar Falls Utilities	Wind Energy Electric Project	3.0%	1999
10	Eugene Water and Electric Board	EWEB Wind Power	3.0%	1999

Source: National Renewable Energy Laboratory, Green Power Network, at <http://www.eere.energy.gov/greenpower/topten.shtml>

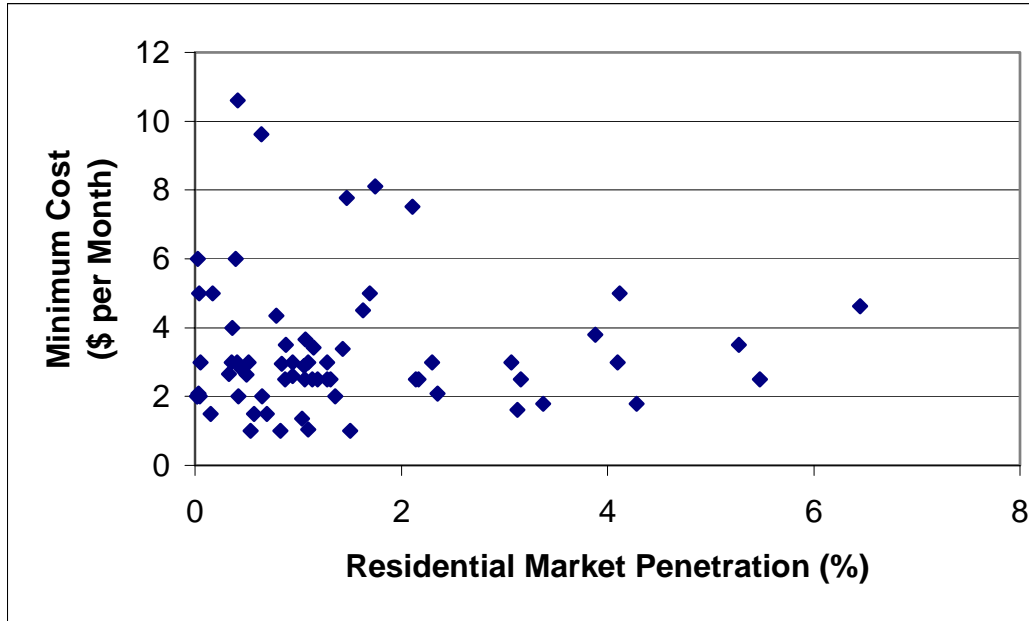
¹ **About half of the total are low-income customers that receive existing renewables at no extra cost.**

Although roughly 40 percent of all U.S. households have access to either a regulated or competitive green power product, overall market penetration is still modest at less than two percent. (Wiser et al. 2001) Only a well-designed program, properly introduced and marketed and adequately supported and sustained over a period of several years, will establish how big the market truly is.

One final note on willingness to pay: the aggregate willingness to pay curve shown in Figure 4-1 illustrates a sensitivity to price that conforms to expectation—the higher the price premium, the

lower the percentage of customers who say they would pay that amount for green power. In the experience of utility programs, however, there does not appear to be much correlation between the premium and market penetration, if the premium is in the range of *up to* \$10 per month. Figure 4-2 compares the minimum monthly cost to participate, to the market penetration for 66 utility programs. Instead of a downward sloping line, it shows no particular trend as the monthly cost increases. It should be emphasized that this is only within a fairly narrow cost range. Nevertheless, similar results are found when analyzing premiums on a cents/kWh basis.

Figure 4-2. Monthly Cost vs. Market Penetration



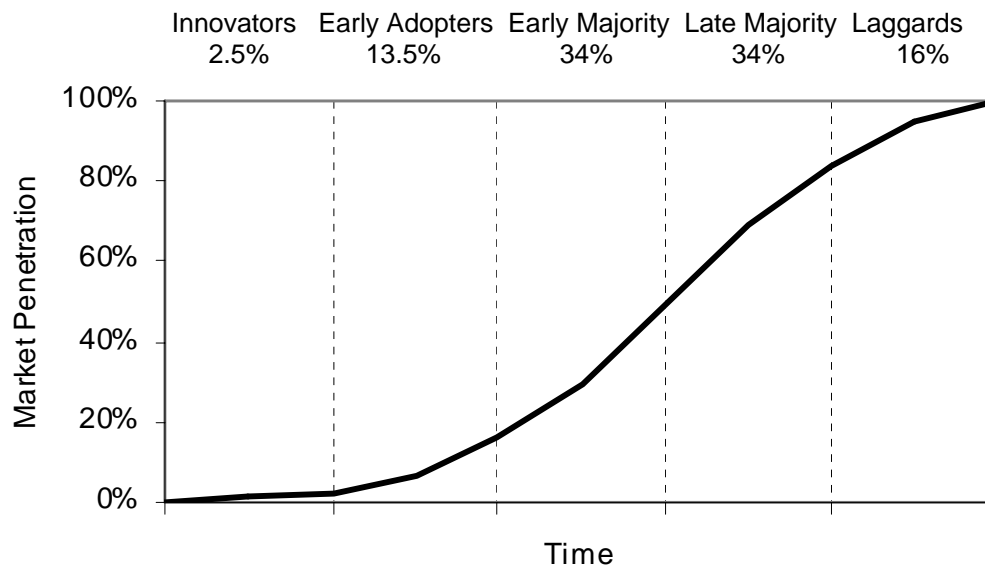
Source: Bird et al. 2003

Given the results in Figure 4-2, what influences market penetration if not the monthly premium? Market penetration and willingness to pay may depend more on program design and value-added features, how well the program is marketed, utility credibility, and the length of time the program has been offered, as the next section illustrates.

Product diffusion

One of the most important things to remember about green pricing is that, like any other new product, it will take time to develop fully. Other new markets have shown that it takes 10 to 20 years for a new product to pass through all the phases of the product diffusion S-curve, illustrated in Figure 5-1.

Figure 4-3. The Product Diffusion Curve



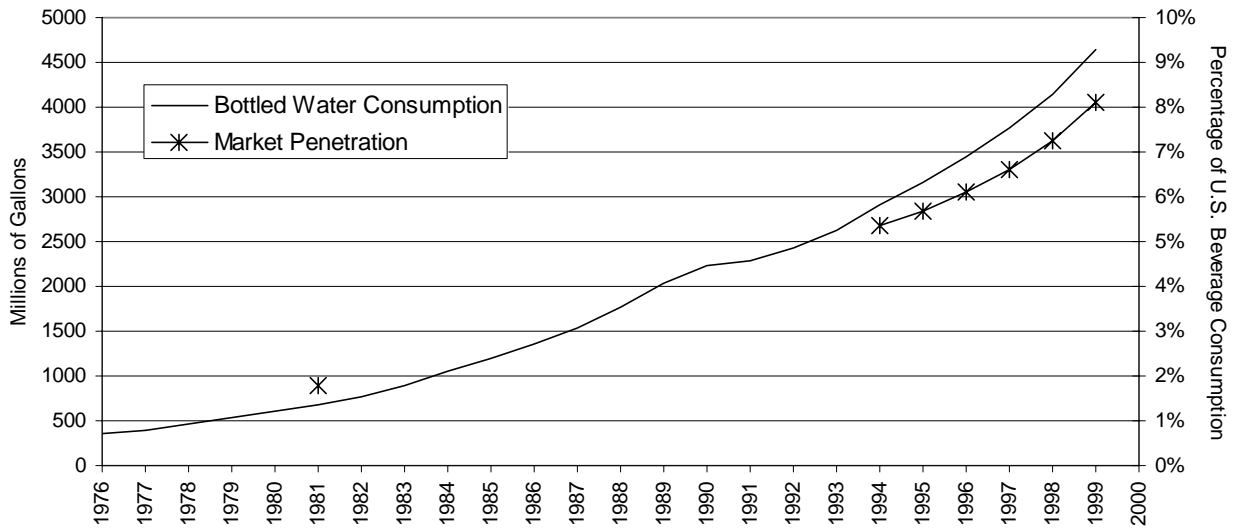
Source: Rogers 1992

The product diffusion curve is characterized by a slow initial market entry, then rapid growth before tapering off at higher penetration levels. The market stages of development, growth, maturity, and decline are represented by the product diffusion curve. The rate of product diffusion depends on many different things, including anticipated cost reductions, consumer awareness, and the understanding and possible removal of market barriers. (Wiser et al. 2001)

Experience with the long-distance telephone market provides insight into the future of the green power market. The competitive long-distance market has experienced increases of 2% to 4% each year over the past 20 years, and it took more than 15 years for competitors to gain control of roughly half of AT&T's market share. (Wiser et al. 2001)

The bottled water industry provides another parallel scenario, illustrated in Figure 5-2. Bottled water has been the fastest growing segment of the entire beverage industry over the past few years. The bottled water market grew by 9.5% in 1997, compared to 2.5% for fruit beverages, 0.8% for beer, and 3.3% for soft drinks. Bottled water sales then rose another 9.8% in 1998 and 12.1% in 1999. According to Beverage Marketing Corp., a New York-based consulting firm, this brought annual sales to more than \$5 billion. Nonetheless, it took nearly 20 years for the bottled water market to grow from 2% percent to 8% in the overall beverage market. (Wiser et al. 2001)

Figure 4-4. Bottled Water in the United States



Source: Wisner et al. 2001

These examples indicate that it will take a long time to achieve significant market penetration for green power.

The market for another relatively new product enforces yet another important point—that it is challenging to turn positive attitudes towards clean energy into positive action. The main problem with selling organic foods in the past few years has been that it is difficult to translate widespread support into actual market results. (Wisner et al. 2001) The same problem is occurring with green pricing. Most surveys show that roughly 50% to 80% of respondents would support an environmentally-beneficial electricity program, yet the actual market penetrations for green pricing are usually below 2%. It will take time, careful product design and targeted marketing to translate that widespread support into actual participation.

5 UNDERSTANDING THE MARKET

Before planning a green pricing program, a utility should have some understanding of its customer base. Many customers don't know what "renewable energy" means, and others are not aware of green power or why they should care. Further, it is useful for utilities to understand which customers are more likely to buy green power. Not all customers share the same values and interests. Therefore an understanding of different market segments can lead to more cost-effective targeted marketing. Finally, it is helpful to understand how long it may take to achieve significant levels of customer participation in green pricing programs.

This chapter first examines customer awareness, knowledge and attitudes. It then reviews market segmentation and green power participant characteristics.

Customer attitudes and knowledge

The widely quoted Roper Starch Green Gauge offers insights into residential customer attitudes that help define the market for green power. The percentage of the population that named pollution as a top concern has increased considerably from 1982 to 2000, reaching 22% in 2000. (Leinberger 2001)

In the same study, 57% named human health protection as one of their top one or two reasons to protect the environment. Forty-nine percent named resource protection for future generations as one of their top reasons. Forty-three percent named depletion of energy resources as a "very serious concern."

With respect to electric utilities, another national survey undertaken in 1997 found that the public expects utilities to care a lot about the amount of:

- air pollution they create (86%);
- water pollution they create (86%);
- nuclear waste they create (85%);
- renewable resources such as hydropower, solar and wind (78%). (Winneg et al. 1998)

Most people do not know much about electricity supply, except the approximate amount of their total monthly bill. Seventy-seven percent don't know how many kilowatt-hours (kWh) they use, and 87% don't know how much they are charged per kWh. (Winneg et al. 1998)

Most consumers do not know much about their sources of electricity. Less than half of the consumers in any region were able to name any one of the top three generation sources. In fact,

they think it is much cleaner than it actually is. About 10% of consumers in all regions think that solar energy is one of the top three sources of electricity. Seventeen percent in the West, and 2% to 3% in the rest of the country, think that wind is one of the top three generation sources. Many consumers believe that hydro is one of the top generation sources in the East (44%), Midwest (26%), South (39%) and West (51%). (Winneg et al. 1998) These statistics suggest a need for substantial education. If consumers don't recognize the problem, they won't be motivated to buy cleaner energy.

According to Green Mountain Energy, the most active national green power marketing company, many consumers don't understand what renewable energy is. About the closest they can come to an explanation is "something like recycling." For this reason, Green Mountain tries to stick to naming the resource, such as wind, water or the sun.

In addition to a lack of knowledge or misinformation, there may be other reasons that explain consumers' environmental inaction. Green Gauge 2000 found that the top three reasons were: "I'm too busy to make changes," at 54%; "environmental products are too expensive," at 49%; and "large companies, not people like me, should take action," at 47%. Another noteworthy reason is, "others aren't sacrificing, there's little I can do alone," at 33%. (Leinberger 2001)

Each of these arguments can be overcome with good program design and effective marketing. Consumers need to be assured that one person *can* make a difference, and that it can be done at little extra cost.

Market segmentation

There is no single profile of a customer who is likely to buy green power. Rather, there are many different types of customers exhibiting different levels of "greenness." Several organizations have analyzed customer attitudes, tendencies, and characteristics in order to create different categories that, when combined, embody the green power market.

Roper Starch identifies five different groups: True Blue Greens (11 percent), Greenback Greens (5 percent), Sprouts (33 percent), Grouzers (18 percent), and Basic Browns (31 percent). True Blue Greens are the most concerned and most active, while Greenback Greens are willing to fight environmental problems with consumerism and paying more for pro-environmental products. Sprouts are the oldest group and are the environmental fence-walkers. Grouzers are concerned and are willing to do some inexpensive, non-intrusive activities, but make the most excuses for doing more. Basic Browns are the least educated and feel that the environment is not their problem. (Leinberger 2001) The characteristics of these segments are summarized in Table 5-1.

Table 5-1. Roper Green Gauge 2000 Market Segments

	True Blue Greens (11%)	Greenback Greens (5%)	Sprouts (33%)	Grouzers (18%)	Basic Browns (31%)
Characteristics	<ul style="list-style-type: none"> •Politically active (75% most likely to vote) •Well educated (40% college grad) •Follow environmental records of large corporations •More environmentally active •More likely to contribute money to environmental groups or write a politician •More apt to live in the Northeast and Midwest 	<ul style="list-style-type: none"> •Highest household income •White collar and executive professionals •Youngest group (mean age 39) •62% female •More apt to live in the Northeast or West 	<ul style="list-style-type: none"> •Oldest group (mean age 46) •More apt to live in the South and West 	<ul style="list-style-type: none"> •Most likely to have kids at home •More apt to live in the South and Midwest 	<ul style="list-style-type: none"> •Lowest household income •Least well educated •Least politically active •50% live in the South

Source: Leinberger 2001

The Electric Power Research Institute (EPRI) created its own market segments from research conducted in 1997. EPRI’s segments include Radical Greens (4 percent), Alarmists (11 percent), Any Greens (11 percent), Parochials (10 percent), Bottom Liners (27 percent), and Don’t Cares (37 percent). These characteristics are presented in detail in Table 5-2. (EPRI 1997)

These two national market-segmentation studies show two or three core green segments and one relatively large segment of latent greens waiting to be presented with products that appeal to their special concerns—such as local community interests, supplier or product credibility, or near-term environmental issues such as health effects. Other segments are plainly uninterested, or might be willing to buy green power if it costs only a small amount more, or if it does not require much thought or effort. (Holt and Wisner 1999)

Table 5-2. EPRI Residential Market Segmentation for Green Power

	Radical Greens (4%)	Alarmists (11%)	Any Greens (11%)	Parochials (10%)	Bottom Liners (27%)	Don't Cares (37%)
Attitudes	<ul style="list-style-type: none"> •Passionate commitment to environment •Technology important but must be controlled •Willing to defer gratification •Confidence in institutions •Sense of control over life •Independent 	<ul style="list-style-type: none"> •Near term fear about personal health & safety, not long term fate of the earth •Anxious about dependence on dangerous substances •Skeptical about technology •Risk averse •Low sense of control over life 	<ul style="list-style-type: none"> •Concerned but confused about environmental issues •High faith in technology •Will pay small premiums for green if it is readily available and convenient 	<ul style="list-style-type: none"> •Concerned about community impacts – health, economy, traffic, rather than environmental issues per se 	<ul style="list-style-type: none"> •Seek low cost, efficiency and productivity •Believe in technological solutions •Skeptical of institutions •Sense of control over life •Desire resource conservation, environmental safety, & convenience 	<ul style="list-style-type: none"> •Believe resource selection is someone else's problem •Don't oppose green power but don't support it either •Wide variety of sources are acceptable •Will buy green power if it requires no effort or price premium
Green Power Interests	<ul style="list-style-type: none"> •Strict definition of green—most renewables •Exclude nuclear, coal, waste to energy 	<ul style="list-style-type: none"> •Resource exclusions (nuclear and fossil fuels) more important than inclusions (renewable energy) •Less tolerance for waste to energy and gas 	<ul style="list-style-type: none"> •No strict definition of green sources •Less positive re: renewables, less negative re: other sources 	<ul style="list-style-type: none"> •Green energy accepted if no immediate negative effects on local community and provide for local economic development •NIMBY may be a factor 	<ul style="list-style-type: none"> •Skeptical of performance and adequacy of green sources, which are also viewed as potentially expensive •Would buy green at same or lower cost 	<ul style="list-style-type: none"> •Don't care about energy sources unless there are gross impacts
Demographics	<p>More likely to be:</p> <ul style="list-style-type: none"> •Women •Homeowners •Older adults •Rural •Larger households 	<p>More likely to be:</p> <ul style="list-style-type: none"> •Older, smaller homes •Renters •Larger households •Children present 	<p>More likely to be:</p> <ul style="list-style-type: none"> •Higher incomes and education •Larger home •Single male head of household •Urban •Professional or executive 	<p>More likely to be:</p> <ul style="list-style-type: none"> •Lower incomes and education •Smaller homes and households •Renters •Older adults •Female head of household or full time homemaker 	<p>More likely to be:</p> <ul style="list-style-type: none"> •Profile similar to households overall 	<p>More likely to be:</p> <ul style="list-style-type: none"> •Younger adults (25-44)

Source: EPRI 1997

Who buys green power?

There has been much debate about which segments are most likely to buy green power, and which segments from which studies have the most accurate characteristics. Some of these characteristics are summarized in Table 5-1 and 5-2. This section summarizes a few additional data points that may help utilities planning a marketing campaign.

A survey conducted by Boulder-based Platts Research & Consulting concluded that 16 million U.S. households (17%) are much more likely than average to purchase green energy (Friedman 2002). These households belong to Platts' "top 10" list of residential segments most likely to buy green power. On top of this list is a segment called Urban Achievers - mid-level income (median \$40,000 per year) white-collar, ethnically diverse urban couples and seniors often residing near public universities. Platts identified higher education as a good demographic predictor of green energy participation. While the top 10 segments can be found in every region of the country, interest in green power is particularly strong in the Northeast region of the United States.

Green Mountain Energy, the biggest green power marketer to date, concludes that buyers are slightly more likely to be women, have children under 18 living at home, be well-educated, open to change, PC owners and Internet users, and concerned about a variety of issues. (Savage 2002)

PacifiCorp, which serves customers in five states with widely varying demographics, undertook its own market segmentation study. (Market Strategies 1999) It found a green segment (16%) with the following characteristics:

- More Internet users (56%) than any other segment
- More suburban residents (41%) than any other segment
- Better educated (23% have a graduate degree compared to 11% overall)
- Most work full-time (72% versus 60% overall)
- More likely to be either single or divorced than any other segment
- Reflect the utility's typical customer in terms of lifestyle segments (percent baby boomers, gen-x, and retirees)
- Slightly above average household incomes
- More likely to purchase organic food

One consistent characteristic is a higher level of education. Those with college or advanced degrees are more likely to have some understanding of the environmental impacts and benefits of different energy resources. Higher income often correlates with higher levels of education, but is not necessarily an indication of interest in green power. Having children under 18 living at home seems to be consistent throughout many surveys. People who are raising children are generally more concerned about energy resources for future generations than those without children, but they may also have less time to pay attention to issues such as green power.

Non-residential customers

Although many utilities think of their residential customers when marketing green power, and most market research focuses on the residential sector, utilities should not overlook green power sales to commercial, industrial and institutional customers as well. In some utility programs, these customers account for 40% of total green power sales.

Customer attitudes expressed in the Roper Green Gauge reveal that customers want businesses to be conscious of their environmental impact and to take action to prevent negative impacts. For example, 76% of the Green Gauge 2000 respondents agreed that every large company should be required to prepare an annual statement of its impact on the environment. Such attitudes should give non-residential customers an extra reason to consider green power in order to improve their reputation and credibility in the eyes of their customers: “Americans see a role for individuals in helping the environment, but they would like corporations to take more of a leadership role in pro-environmental efforts.” (Leinberger 2001)

Leadership can be a motivating factor at a local level and at a national level. Small businesses in Traverse City, Michigan, buy green based on the personal beliefs of their owners. They do it because “it’s the right thing to do.” (Holt 1997) They also want to demonstrate civic leadership and support for a local wind turbine. Traverse City is a vacation destination that depends on a clean environment, and businesses want to reinforce that image.

At a national level, for-profit companies and non-profit organizations buy green power for a variety of reasons. (Holt et al. 2001) The most important are:

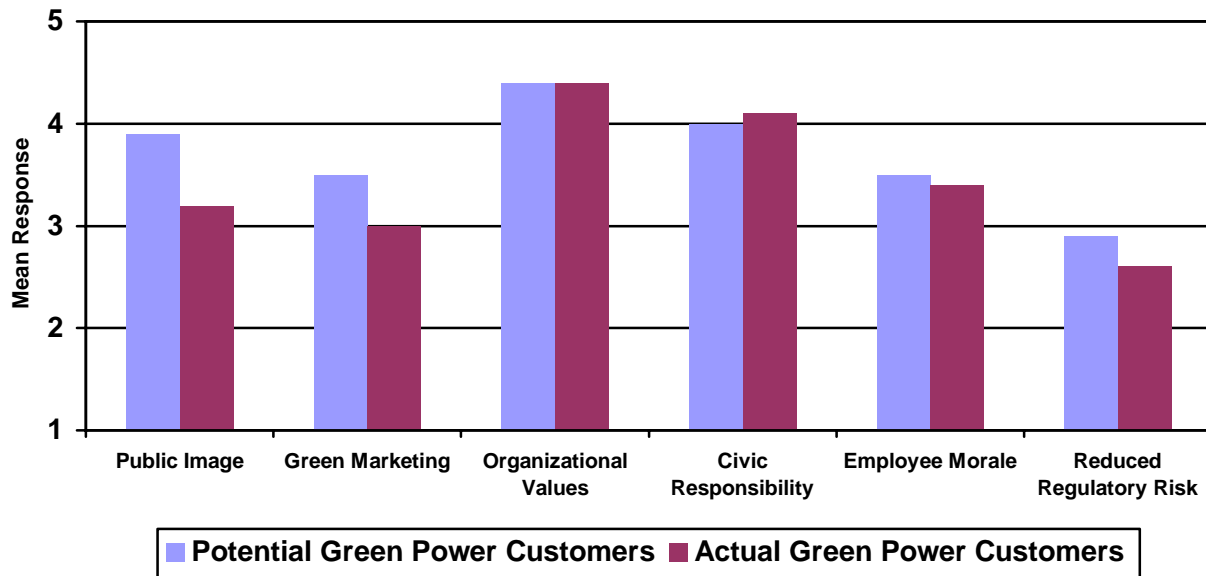
- Organization values, interpreted as “Our organization feels a strong and pervasive commitment to public health and the environment.”
- Civic responsibility, meaning they know they are important to the communities in which they are located, and feel a responsibility to be community leaders, not just for the environment.
- Public image or public relations value.

Of moderate importance are the following motivations:

- Enhanced employee pride in an organization that is giving back to the environment.
- Green marketing to environmentally-conscious customers, also including shareholders and other constituents.

The relative importance of possible motivations to non-residential customers is summarized in Figure 5-1. A rating of 1 = not important, and a rating of 5 = very important. Responses are shown for two groups of non-residential customers, one that is already purchasing green power, and a second that was thought to be potentially interested, so this does not represent a random sample of the population of non-residential customers.

Figure 5-1. Relative Importance of Motivations to Two Non-Residential Groups



Source: Holt et al. 2001

In terms of non-residential market segmentation, about the most that can be said is that there are differences between large and small, and between those that serve retail customers and those that engage in manufacturing or wholesale trade. The differences relate to motivations and to perceived barriers. Large companies, for example, are more interested in public relations benefits than small ones. Also, manufacturing companies with large energy bills are more cost-sensitive. Finally, wholesale trade with no direct link or branding to retail customers may perceive fewer public relations benefits than retail trade.

There are also some specific non-residential segments, such as colleges and universities, and governmental agencies at all levels, that exhibit a stronger interest in green power. In response to the interest in public recognition by some companies, the US Environmental Protection Agency created the Green Power Partnership, a voluntary recognition program for organizations that buy green power.⁵ This may be perceived as a benefit to many companies or organizations.

Underlying any non-residential interest in green power is the fact that the purchase has to be consistent with organizational or corporate environmental goals. Without strong and clear environmental policies, other factors are usually insufficient to motivate a green power purchase.

⁵ For more information on the EPA's Green Power Partnership, see <http://www.epa.gov/greenpower>.

6 PLANNING A GREEN PRICING PROGRAM

There is a great deal to consider when developing a green pricing program. This chapter provides an overview of the process, and subsequent chapters cover some aspects in more detail.

Our comments on planning may seem more relevant to a larger utility, especially one that has separate staffs devoted to research and planning, communications and marketing, and power supply planning. A small utility, however, should consider each of these functions, even if there are only a few individuals involved. For them, the coordination effort will be considerably easier. In some instances, a number of small utilities may work together, or with their wholesale supplier, to plan a joint program. In that case, coordination and complexity increases again, although individually each utility may have only one or two people involved in planning.

Before making any decisions, all those involved, from generation planning to marketing, and from research to customer service, should meet to identify questions, issues and concerns. Most utilities have a least a few people that are skeptical about whether green power can really be differentiated from commodity electricity, whether customers will pay more for it, whether renewable resources are readily available, and how much they cost. It is best to get these issues out in the open early on so that they can be addressed.

An effective approach at this early stage is an informational workshop with presentations from outside green power specialists. Presenters might include green power program managers from other utilities, staff from the National Renewable Energy Laboratory, the Center for Resource Solutions, the Electric Power Research Institute, the American Wind Energy Association or other renewable energy trade associations. The workshop might cover topics such as the value and market potential for green power, case studies from other utilities, product marketing experience, third party accreditation of the program, and policy and regulatory issues.

One question will be whether to invite people from outside the utility. For this first meeting, if the utility is unsure of its interest, and to encourage frank airing of concerns, perhaps only in-house personnel should be invited. If utility management has already made a tentative decision to develop a program, then other stakeholders could be invited. These might include, for example, representatives of local environmental groups and regulatory staff. They should be engaged at some point anyway, and the earlier, the better.

If it is known in advance that there are some serious differences of opinion, or relationships with outsiders are strained, then it might be helpful to consider bringing in someone independent to facilitate the discussion.

Organizing for planning

There are several major tasks that must be addressed in planning a green pricing program. They are not always the same, nor must they be divided this way, but they are likely to include:

- Market research and evaluation
- Stakeholder involvement
- Power supply
- Program design
- Customer communications and marketing
- Implementation and administration

We will say more about each of these in other chapters, but it is important to identify who is responsible for each task area, and there needs to be an overall coordinator as well. All relevant parts of the utility organization should be involved, but responsibility should be delegated throughout the organization to encourage buy-in. If there are a large number of stakeholders, both within and outside the utility, it may be useful to establish different working groups for each task area.

Each of these task areas will raise a number of questions and issues. In many cases, one issue cannot be resolved immediately because the answer depends on something else. It is important to track progress on all the interlocking tasks, and one way to do this is to create a project task list and schedule. This can be as simple as a list of subtasks, or as detailed as a schedule using project management software such as Microsoft Project. Such a tool serves as a reminder about tasks and when they need to be done. It also highlights what tasks are on the critical path—those that will delay the overall completion of the planning process if they are not finished as planned.

Perhaps the hardest part of creating a project schedule is anticipating all the little subtasks that will arise, and then determining which ones are dependent on others. Other chapters will describe in more detail some of these questions and issues.

Planning insights

Utility experience planning green pricing programs reinforces the saying that “the devil is in the details.” The big picture lessons, however, have to include the following:

- New renewable resource supply often takes the longest time, whether a utility develops and owns new generation or issues a Request for Proposals (RFP) and enters into a power purchase agreement. This is because regardless of ownership, the development of new power supply is fraught with unexpected delays. Therefore, it is critical to get started on resource development as early as possible.

- Unless the resource choices are obvious, however, it is important first to do some market research and determine customer resource preferences (as well as uncover negative biases) before issuing an RFP for supply.
- Resource planners will need estimates from program marketers about the expected demand for green power. Planners should base these estimates on other utility experience rather than on attitude-based consumer surveys.
- Utility planners should work closely with environmental stakeholders to gain their support for the program early in the planning process.
- Other stakeholders, such as retail distributors for a wholesale utility, or regulators for investor-owned utilities, can be extremely important in convincing top management to support specific program recommendations.
- As always, top management interest and support is a prerequisite, especially when it comes to taking a risk on long-term resource commitments.
- The relationship between green power and corporate renewable and environmental policy should be clear and understood.

Probably utility staff will have already conducted some secondary research on the state of green pricing, but if not, the best and most comprehensive resource is the Green Power Network (GPN), a maintained by the National Renewable Energy Laboratory for the US Department of Energy, at <http://www.eere.energy.gov/greenpower>. The GPN has green pricing literature, news articles, program descriptions and critical analysis of green power markets, all of which is valuable to planning a program.

7 STAKEHOLDER INVOLVEMENT

The environmental community plays a major role in the success of green pricing programs. Past examples have shown that a strong partnership between the utility and stakeholders has many benefits, especially if the partnership is created early on in the development of a program. There may be other stakeholders in addition to environmental advocates. Consumer advocates (either non-governmental organizations or state attorneys or appointees charged with protecting consumer interests), environmental health advocates such as the American Lung Association, renewable energy industry stakeholders, and utility regulators all may wish to be informed or involved in the development of a green pricing program.

Pros and cons of stakeholder involvement

Stakeholder involvement brings mostly benefits, but there are some attendant risks as well. The first benefit of involving stakeholders in the development of a green pricing program is that it helps identify issues that a utility should consider in planning the program. Since many of these stakeholders represent market segments to which a utility will want to promote the program, early involvement becomes a kind of informal market research.

By giving stakeholders an opportunity to voice their concerns, a utility can make program decisions with a better understanding of the likely reactions of stakeholders. Likewise, there should be no surprises to the stakeholders if they have been included in planning all along the way to a final program.

If a utility undertakes market research in support of program design, stakeholders can review and provide input to survey questions and focus group discussion guides. Because stakeholders do not work within the utility, they often bring a different perspective that adds value to the research. They can also help screen marketing messages being considered as a kind of testing ground. Again, different sensitivities, especially from representatives of a target audience, can help avoid costly pitfalls.

The involvement of stakeholders is the best way to gain their public support. Without their involvement, there is a risk that the very groups that should be expected to support the program will instead criticize it publicly. Utilities need the support of local stakeholders not only to avoid bad press but also to reinforce and even increase product credibility.

If the involvement leads to a trusting relationship, local environmental groups may agree to help market the program. Not only does this allow the program to be promoted in more locales or venues, it also lends credibility in some market segments, and may lead to some free media.

It is better to address environmental, consumer and regulatory concerns by partnering with interested stakeholders from the start rather than by arguing with them at the finish. Nevertheless, this partnership requires an openness and willingness to listen and to be influenced. This applies to both the utility and stakeholders. Thus, the risk of stakeholder involvement is that a utility may not be that open to stakeholder input. A commitment to stakeholder involvement implies some sharing of influence, if not control. While the utility retains ultimate decision-making responsibility for decisions about program design, if it is unwilling to accommodate the views of stakeholders, then the involvement is not very meaningful, and the nascent partnership may be lost. If there has been an adversarial relationship between the utility and some stakeholders in the past, continued tensions could undermine a fragile relationship if the partnership is not taken seriously and treated accordingly. (Mayer et al. 1999)

Involvement process

One way to involve stakeholders from the beginning is to set up forums to inform various stakeholders about the proposed program, and to seek stakeholder input as to how the program should be designed. It is important to give them a forum to speak, at least one-way if not in a dialogue. But a utility should not wait until most of the planning is already finished. If a utility holds a meeting and tells stakeholders what the product will be, then there will be little opportunity to influence the program design. Asking for input will be perceived as insincere and will not be taken seriously.

A more significant effort to involve stakeholders would invite them into planning meetings to discuss preferred renewable resources, product design and pricing, marketing messages and promotion plans.

Another approach is through the development of green pricing accreditation standards. (See Chapter 13 for a more detailed discussion of accreditation.) Accreditation of a utility green pricing program requires first a stakeholder process that brings utilities and renewable energy advocates from a state or region together to agree on a set of standards. Through the process, which can be facilitated by the Center for Resource Solutions, stakeholders develop statewide or regional minimum standards by which an individual utility program may be judged. A utility may then apply to the Green Pricing Accreditation Board to determine whether its program meets the standards and may be accredited.

While the goal of this process is ultimately to achieve increased credibility through third-party accreditation, the process provides an opportunity for a utility to work with stakeholders on the types of eligible renewables, the minimum purchase quantity per customer, the marketing parameters, disclosure of information about electricity generation, and a verification process. It is possible to develop these generic standards even as a specific utility program is being developed, so it is clear from the outset that a utility program should meet the standards.

If stakeholder involvement has gone well through one or another of these approaches, other opportunities to continue and increase the partnership will become obvious, to the benefit of the green pricing program.

Examples of stakeholder involvement

Xcel

One of the most widely quoted stakeholder-utility partnerships is that between Public Service Company of Colorado (now Xcel) and the Land and Water Fund of the Rockies (LAW Fund--now Western Resource Advocates). The LAW Fund influenced the design of PSCo's *Windsource* program, and then organized community-based marketing activities to encourage customer participation, primarily in the Boulder-Denver area.⁶

The LAW Fund has helped increase awareness and education through its grassroots campaign. More people have been able to learn about the program due to the diversity of participation. Thousands more Colorado households are now aware of the environmental implications of their energy choices and other available options thanks to community presentations and newsletters. Customers have had the opportunity to sign up for the program on the spot at many of the activities, which would not have been possible without the assistance of PSCo's major stakeholders. Their combined efforts also led to an additional 25 MW of renewable generation. (Mayer et al. 1999)

Several utilities have enjoyed free positive media as a result of such a partnership, and PSCo is no exception. Local newspapers and television stations have done many stories concerning the PSCo-LAW Fund partnership. The media have found it to be an effective news angle.

The authors of *The Grassroots are Greener: A Community-Based Approach to Marketing Green Power* sum up the benefits of the partnership as follows.

In the course of selling wind power to businesses, the LAW Fund and PSCo learned how to work together as a team, and the partnership started to run more smoothly. This involved open-mindedness and a willingness to respect different organizational goals and beliefs—protecting the environment for the LAW Fund versus making a profit for PSCo. (Mayer et al. 1999)

Wisconsin Electric

Not all partnerships have enjoyed smooth relations from day one. Some started off as adverse relationships, but Wisconsin Electric (now We Energies) has been able to turn its loudest critics into its biggest supporters by showing initiative and willingness to compromise.

Wisconsin Electric launched its program in 1996 expecting that local environmental groups would applaud its initiative. Instead the utility was criticized for selecting existing renewable projects from out of state, for selling an overpriced product, and for the Public Service Commission's lack of hearings on the proposed program. Negative press dominated program

⁶ See the LAW Fund web site at <http://www.lawfund.org>

coverage. This led to the utility and the local groups sitting down to discuss their differences and to create a partnership.

Since signing a Memorandum of Understanding (MOU) in March 1998, Wisconsin Electric has been actively working with Wisconsin's Environmental Decade and RENEW Wisconsin. Media coverage of the company's program, Energy for Tomorrow, has been overwhelmingly positive as a result.⁷

Together, the three organizations have agreed to guidelines such as, "Marketing efforts should be undertaken to include commercial and industrial customers in the program," and; "Energy sold under the program should be derived from a portfolio of resources; no one energy source should account for more than 75 percent of the capacity committed to the program."

More recently, Wisconsin utilities and stakeholders have worked together to develop state-wide accreditation standards, and both Wisconsin Electric's Energy for Tomorrow program and Wisconsin Public Service's NatureWise program have been accredited.

Tennessee Valley Authority

When the Tennessee Valley Authority first broached the idea of a green pricing program with the Southern Alliance for Clean Energy (SACE), they initiated a wary but willing partnership. SACE (then called the Tennessee Valley Energy Reform Coalition, or TVERC) was TVA's principal environmental critic. TVERC berated TVA for its nuclear and coal investments and their environmental impacts in the Tennessee Valley. (Holt 2000a) Today, SACE helps support the program, Green Power Switch, because it has had a seat at the planning table, and TVA has listened. SACE continues to participate in a steering committee for the program. SACE actively promotes the program through its newsletter, partnering with local distribution utilities that participate in Green Power Switch, and staffing a booth at local fairs and other events.⁸ Because of the stakeholder process that TVA initiated, TVA became one of the first utilities in the country to obtain accreditation for its green pricing program.

North Carolina Utilities

The most recent example of stakeholder involvement in green pricing claims two additional characteristics. The non-profit Advanced Energy Corporation of North Carolina led a team of stakeholders to create the first state-wide green pricing program, called NC GreenPower. It is also one of the few examples of a program that was developed with the input of local stakeholders from the beginning.

Under the auspices of the deregulation Legislative Task Force and the NC Utilities Commission, North Carolina's utilities, environmentalists, state regulatory staff, the State Energy Office, the state Attorney General's Office, energy scientists, and green power suppliers worked together for a year to create NC GreenPower.

⁷ See the Renew Wisconsin web site at <http://www.renewwisconsin.org>

⁸ See the SACE web site and its coverage of green power at <http://www.cleanenergy.org>

Under the program, customers can choose between two products. The first, intended for the mass market, offers a block of 100 kWh from new renewables for \$4 per block per month. The second product, intended for large volume purchasers, offers a block of 100 kWh from existing and new renewables for \$2.50 per block, but these customers must purchase at least 100 blocks per month. All utilities—Carolina Power & Light, Dominion North Carolina Power, Duke Power, ElectriCities and the North Carolina electric cooperatives—will use their billing systems to collect the revenue. NC GreenPower, a subsidiary of Advanced Energy, is charged with program administration.⁹

⁹ For more information see <http://www.advancedenergy.org/greenpower/index.html>

8 CONSUMER RESOURCE PREFERENCES

There are many factors to consider when choosing which energy resources to include in a green pricing program. Among those factors are availability of resources locally or in the region, the cost of the resources (including state or federal financial incentives or subsidies), the experience and capability of the utility with different resources and technologies, and perhaps most importantly, customer preferences.

If possible, a utility should do some market research in its service area to see what its customers really want. This may not be feasible for the program's budget, however, so research into customer resource preferences as reported from other research is included in this chapter.

What do customers really want?

Customer preferences, as expressed in surveys or other market research, will vary with different market segments. One group of customers may have a different idea of which resources are green than another group of customers, but some common preferences do exist.

Throughout most research, solar and wind energy have consistently ranked among the top choices. In the words of one EPRI study, "Solar, wind, and tidal are almost always seen as clean, readily available, free, natural, and renewable. These power sources epitomize 'green,' and serve as archetypes for the category." On a scale of 1 to 10, where 10 means extremely friendly to the environment, wind was rated 9.18 and solar was rated 9.12 (EPRI 1997). The same report indicates a strong customer consensus about the "greenness" of these two resources. Hydropower, both micro-hydro and traditional hydro, carry less consensus but the customer perceptions range from green to neutral. Perceptions of geothermal and biomass resources range from green to non-green.

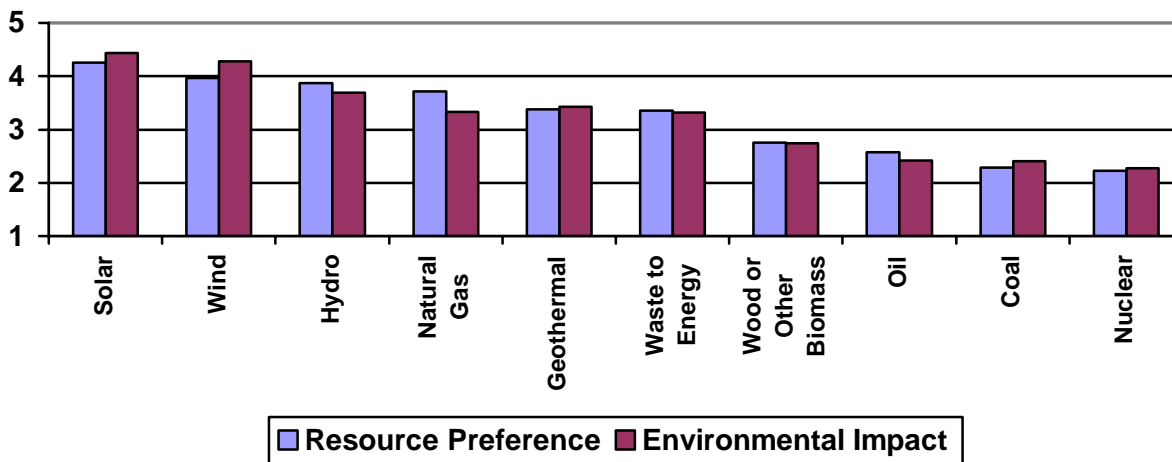
Most people have a mental image of hydropower resources and believe that their electricity is already generated from this resource. Among environmental groups, however, hydro development and operation can be a sensitive issue, so it is best to talk with these stakeholders about resources in general and about hydro in particular if a hydro project is contemplated.

Biomass encompasses so many different types of resources that consumer reactions can vary widely just from different interpretations alone. Utilities considering biomass resources should be specific about the resource, and explain it to customers.

A study conducted by The National Council on Competition and the Electric Industry found similar results to the EPRI survey. Figure 8-1 shows that solar and wind were ranked first and second, respectively, for energy source preference and resources that are the least harmful to the environment. On a scale of 1 to 5, where 5 is most preferred, solar scored 4.26 and wind scored

3.97 as the most preferred energy sources. In terms of harm to the environment, where 5 is “not at all harmful to the environment,” solar scored 4.44 and wind scored 4.28. Figure 8-1 shows the results across all energy sources tested, and reveals a clear link between energy source preference and perceived environmental impact. (Winneg et al. 1998)

Figure 8-1. Consumer Preferences and Environmental Impact Scores for Energy Sources



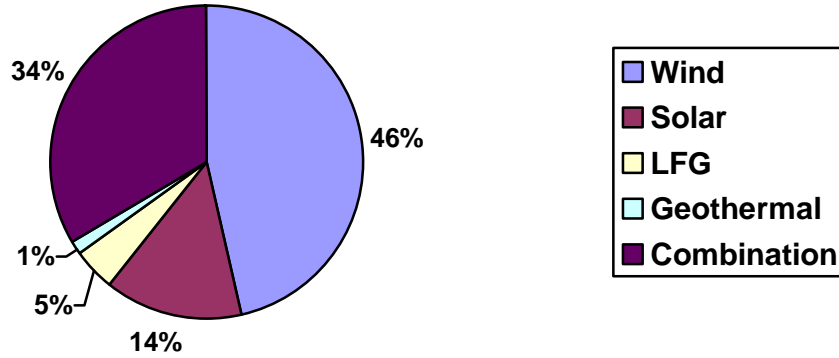
Source: Winneg et al. 1998

Solar energy is much more expensive than wind energy, giving wind energy a competitive edge because price is almost always important to customers. At the same time, siting is more of a concern for wind power than it is for solar power. Siting of any project must be handled carefully, with full public consultation and careful environmental research, otherwise positive acceptance can be overturned by the Not In My Back Yard (NIMBY) syndrome.

Customer preferences and utility choices

Perhaps as a reflection of customer preferences, utility green pricing programs have usually focused on wind and solar resources. Forty programs market wind alone, 12 market solar energy or support for solar projects, four market electricity from landfill methane gas, one program markets geothermal, and 29 programs market a combination of renewable resources, usually including wind or solar in the mix. Resources represented in all green pricing programs (contribution, capacity and energy-based programs) are illustrated in Figure 8-2.

Figure 8-2. Resources Used in Green Pricing Programs



Source: NREL 2002

Even where a blend of resources are offered, promotional literature often emphasizes customer-preferred resources such as wind and solar.

Consumers have also indicated on several surveys that they would want their green pricing program to use only new renewable energy. Customers are generally skeptical of utilities repackaging energy generated from existing renewable facilities and marketing it as a new green power option—especially if it comes with a premium price. Why should they pay more for something they are already getting? Recognizing this preference, almost all utility green pricing programs offer only new resources, that is, resources developed specifically to serve this premium market.

9 ESTIMATING DEMAND

At some point during development, program planners must address the question of supply. Supply planners need to know how much energy and capacity to build, and what types of resources. Because supply planning often takes the longest time in program development, it is important to estimate demand early. This chapter addresses how to estimate demand.

Calculating demand

The calculation of demand depends on the type of product to be offered. (See Chapter 3 for a discussion of product types.)

With contribution programs, utilities generally do not acquire supply in advance of program promotion. How many and what type of projects can be undertaken depends on how much money is collected through contributions. With this program type, estimating demand is not so critical. Sometimes a specific project is named in advance, such as a small photovoltaic solar project, and it is not undertaken until sufficient funds have been collected. This poses low risk for the utility, but it may be harder to promote contributions for something that will be constructed at an indefinite time in the future. It would be a good idea for a utility to estimate average monthly contributions, and set a goal for how many customers are needed to reach a monetary threshold, and then promote the program with that goal in mind.

Similarly, the few capacity-based programs are all solar projects of relatively small size. One can easily calculate how many customers are needed to subscribe the capacity of a specific project.

Most green pricing programs, however, are based on the sale of energy, and these programs pose a bit more of a challenge in estimating how much energy or capacity to acquire. Energy-based programs are offered as supplying a customer-chosen percentage of green power (percent of load) or as a fixed block of electricity (for example, 100 kWh) for a fixed price. Calculating demand varies slightly depending on which program design a utility chooses, but either way, the calculation is very simple. The hard part is in choosing the right assumptions.

Residential Demand

The first calculation is intended for use by utilities planning a program in which customers choose a specific percentage of their energy load to be generated from renewable resources. (The percentage may also be fixed at, for example, 100% or 50%, so the customer has no choice other than to participate or not to participate.) The equation is as follows.

Equation 1

Annual renewable energy supply needed = total residential customers x % participation x average monthly energy use x 12 months x average % of load that is chosen as green power

The second calculation is intended for use by utilities planning a program in which customers can choose how many blocks of energy they wish to buy. The equation is as follows:

Equation 2

Annual renewable energy supply needed = total residential customers x % participation x number of kWh per block x average number of blocks purchased per month x 12 months

Non-Residential Demand

Demand estimates can be further refined to include demand by commercial, industrial and institutional customers. If the program is open to these non-residential customers, and the utility plans to market the program to these customers, their demand should be taken into account. This can be done in several ways. Commercial and industrial customers can be included in the equation by:

- Substituting non-residential customer numbers and average energy use into Equation 1 or 2.
- Calculating non-residential demand as a percent of residential demand.
- Adding in a discrete estimate of demand based on direct knowledge of a few large customers.

The first approach is the most difficult because there is little reliable data about what percentage of non-residential customers will purchase green power. Also, unlike the homogenous class of residential customers, there is great variability in the size of non-residential customers. Using average non-residential load may yield misleading results.

There are, however, several data points about non-residential demand as a percentage of residential or total green power demand, so the second approach may be preferable.

Small rural utilities with just a few large customers may prefer the third approach based on their own knowledge of their customers, or on informal discussions with these customers.

For both residential and non-residential demand, it is preferable to project demand over a multi-year period. This will give supply planners a much better idea of how much supply must be acquired. Obtaining very small increments of green power on a year-by-year basis can be very difficult, and is more costly than making a larger purchase that would justify a larger project, say a multi-turbine project rather than one wind turbine at a time. This may come with some risk to a small utility, but there are often opportunities to share risk with other utilities also interested in a green pricing program, or to sell excess renewable energy certificates to other marketers.

Utilities should expect demand to grow over the years, given two conditions: there is a steady supply that is able to increase as demand increases, and there is an effective marketing campaign sustained during the length of the program.

Finally, the methods described in this chapter explain how to estimate demand for green power, but the methods are only as good as the assumptions, which we turn to next.

Assumptions

Some of the data needed for Equations 1 and 2 above are readily available, specifically the number of residential customers, and their average monthly electricity use. In this section we will discuss the remaining terms in the equations.

The safest way to estimate demand is to examine utility experience and penetration rates. Behavior is a better indicator of demand than opinions expressed in surveys. Geographic and social factors should also be taken into consideration.

Percentage residential participation. This assumption is the most important driver in the demand for green power. (Wiser et al. 2001) Program experience, as summarized in Chapters 4 and 5, suggests that participation rates as high as 5% may be achieved, but that rates less than 2% are the norm, and many programs are still below 1%. A conservative assumption might be to increase participation by 0.5% per year, while a more aggressive assumption would be to achieve a 1% increase per year. Small utilities may do better (achieve higher rates in a shorter time) if the program is promoted well through personal networks and local organizations.

Average percentage of residential load that is provided as green power. This assumption is easy if the utility offers only one option, such as 100%. If the utility offers several options (such as 25%, 50%, 75% and 100%), then it is more difficult to judge because there are only a few data points. At one time, one utility found that about half its participants chose 25%, while the other half chose 75% or 100%. In one competitive market, it appears that consumers tended to choose either the lowest-cost green product, or one of the strongest green products. This suggests two market segments: people that want to feel good about themselves for the least cost, and others who feel strongly enough that only the best green product will do. Of course, one could bound the analysis by the lowest and highest possible options, or pick a midpoint.

Average number of blocks purchased by residential customers. This assumption will also range from the minimum (one block) to the equivalent of 100% of participant energy use. In terms of blocks, if each block is 100 kWh and average use is 800 kWh per month, this means the high end would be eight blocks. A conservative estimate would be that each participating customer will purchase only one block, while an aggressive assumption would be that each participant will purchase three blocks, depending of course on the cost of the block. The Tennessee Valley Authority's Green Power Switch program sells an average of 1.7 blocks to its customers, at a cost of \$4 per block.

Non-residential as a percentage of residential demand. In several markets where non-residential customers have been approached, non-residential demand has accounted for a significant share of either total green power demand or of residential demand. Although non-residential participants may be few in number, they represent from 20% to 50% of the green power sales. In the TVA territory, non-residential sales took off faster than expected so that it represented at one time over 60% of total sales, and is now at about 45% after residential sales have had a chance to catch up. A reasonable assumption for planning purposes might be that non-residential demand will represent 20% of total green power sales (25% of residential demand). This may be conservative for an urbanized area with lots of non-residential customers, but may be ambitious

or unrealistic for a rural service territory with little commercial load. Nevertheless, even small businesses can contribute to demand for green power (see text box).

For more details on assumptions in estimating demand, see *Forecasting the Growth of Green Power Markets in the United States*. (Wiser et al. 2001)

Traverse City: A Non-Residential Case Study

Traverse City Light & Power (TCL&P) benefited greatly from the participation of local businesses. Although this small utility does not have any really large customers, 26 small businesses signed up for the output of a single wind turbine before it was fully subscribed. Although the 26 small businesses account for only 9% of participating customers, their demand represents 38% of total subscribed demand for the wind energy (Holt 1997).

Of the 26 businesses, a wide range of business types participate. The businesses that signed up for the green power option include several retail stores, professional services, a couple of non-profits, a couple of restaurants, a dance studio, and a financial institution. Most of the business owners made this decision for personal environmental reasons. Additionally, many businesses found the green power option an obvious choice because Traverse City is a popular vacation destination, and its tourism industry depends largely on a clean environment.

Does price matter?

Intuition, if not economic theory, would suggest that the higher the price of green power, the lower the number of customers who will choose to participate. This notion is supported by the aggregate willingness to pay curve illustrated in Figure 4-1 in Chapter 4. Based on the available evidence to date, however, program experience does not support this theory. As Figure 4-2 illustrates, residential market penetration does not appear to depend on price when the monthly cost of green power falls within the range of \$2 to \$10. Consumers may be more sensitive to price when they are faced with competitive choices. Also, other factors are important to market penetration, including program design and promotional efforts.

When considering the role of price in determining residential market penetration, Wiser et al. (2000) concluded that “the data suggest that perhaps the quality of the product and how well it is marketed, the credibility of the utility offering the program, or the ease of participation are more important determinants of participation.”

Converting to capacity

After completing its estimate of energy demand, a utility will need to convert this to capacity. This conversion will require decisions, or at least assumptions, about the type of resource(s) and technology that will be used, and the annual capacity factor for the technology. In the case of wind, the capacity factor will be site-specific. The equation is simple:

Equation 3

$$\text{Capacity} = \text{estimated demand (kWh)} / 8760 \text{ hours} / \text{capacity factor}$$

10 MARKET RESEARCH METHODS

Market research is important because customer opinion can vary from region to region. Before undertaking market research of their own, however, utilities should search for and review what has already been done by others. Where results are consistent, it may not be necessary to repeat that research. For example, past market research shows:

- Widely shared concern for the environment, but a great need for customer education.
- A majority of consumers are unfamiliar with renewable energy sources and terminology, but they express a preference for environmentally safe sources.
- A majority of consumers say they are willing to pay more for clean energy.

Instead of repeating this research, utilities may wish to focus their limited research budgets on questions about product design, added-value features, marketing messages. Nevertheless, we recognize that utility management often wants to be reassured that customer attitudes and preferences are relevant to its service area.

After conducting secondary research, the next step in market research is to clarify the research goals. What are the questions you want to answer? Your answers will help determine the research methods. Some research goals might include the following (and we include some standard questions that we think are already answered to a large extent):

- What importance do customers place on environmental quality?
- What are customer attitudes towards renewable energy?
- What are customer perceptions of the utility as a provider of a green product? Do they consider the utility credible?
- How much customer education is required? What sources of information do customers base their responses on? What is the customers' level of knowledge about the utility's energy resources and about renewable resources in particular?
- How much are customers willing to pay for green pricing and how big is the green pricing market?
- How should the program be designed and marketed? What features of a green pricing program would motivate different types of customers to participate?
- What resources do consumers in your region prefer?
- What types of customers are most likely to participate?
- What are the most effective and credible source of information to consumers?

This chapter suggests different methods for collecting information about customers that is useful for planning a green pricing program. This chapter serves as a source of ideas to help planners and managers decide what they need to know and how they can go about getting that information. It is not intended to dictate research design. After studying this chapter, readers should be able to better articulate what they want from market research. Nevertheless, a market research specialist should be engaged to help prepare and carry out a specific research design.

The methods described fall into three categories:

- **Focus groups** reveal issues.
They are good for planning additional market research and program planning.
- **Market surveys** reveal attitudes.
 - *Opinion surveys* determine awareness and perceptions.
 - *Contingent valuation* estimates willingness to pay.
 - *Conjoint analysis* reveals preferences and willingness to pay, good for program design.
- **Market tests** and simulations reveal behavior.
They are good for real experience packaging and promoting a green product

We also include an example of product concept testing conducted by Portland General Electric.

Focus groups

A focus group is a discussion among a small number of consumers (usually six to ten). Discussion topics are those that researchers want to gain insight into customer perceptions. A facilitator leads the focus group, working from an outline of the topics. Focus groups are ideal for identifying issues, concerns and perceptions, but results cannot be generalized because the group is small and not randomly selected. Information gathered from focus groups can be used to frame questions for survey research, to choose words that are commonly understood, to avoid negative connotations, and to suggest program or product designs.

Example: Colorado utility

The purpose of these focus groups was “to explore customer perceptions of and interests in renewable energy, and methods customers might find appealing for funding these resources.” (Baugh et al. 1994) Each discussion lasted 90 minutes. They began with introductions, a statement of the purpose of the discussions, and an explanation of the ground rules. Various topics were then introduced and discussed.

For example, part of the discussion explored participants’ responses to renewable energy using the following questions:

- What does the term “renewable energy” mean?
- How do you feel about the development of renewable energy sources?
- What do you believe to be the greatest advantages of renewable energy options?
- Which is most important, environmental protection or resource conservation?
- Who do you believe will benefit the most from renewable energy options?
- What do you believe to be the greatest disadvantages of renewable energy options?
- What sort of costs, both financial and social, will be required to develop most renewable energy options?
- What role would you like to take (or have you taken) regarding environmental protection and resource conservation?

These kinds of questions are open-ended. The answers are not constrained in any way. As a result, the discussion may reveal attitudes and perceptions that were unforeseen.

Other topics covered were attitudes towards volunteerism, how the funds should be collected, how participants would want to be recognized, preferred methods of communication to participants, and collaborations (between the utility and government, between the utility and its customers, and the role of commercial and industrial customers) in the development of renewable energy.

The focus groups also explored green pricing concepts by reading a description of a program, followed by discussion of these questions:

- What most impressed you about the description, and influenced your decision regarding the optional rate?
- Was there any additional information you would have liked to have had to help you with your decision?
- How do you feel about this concept?
- What is appealing/not appealing about the concept?
- How much is 10 MW?
- What would be a good title for a program like this?

Pros and Cons of Focus Groups: Open-ended questions allow the utility or sponsor to learn a lot about how customers think about products and programs. The facilitator can dig deeper and ask for further clarification because the discussions are interactive. Focus groups are useful to the development of market surveys and market tests. However, it is impossible to learn from focus groups alone whether the targeted market will react the same way as the handful of people in the discussion group.

Market surveys

Market surveys are intended to obtain information representative of the population under consideration. Three different approaches are described here:

- Opinion surveys
- Contingent valuation
- Conjoint analysis

The purpose of each approach is described and illustrated with questions that might be posed to customers. The questions are presented as illustrations only. In any market research, the actual questions used require careful consideration. Planners should carefully choose wording and the order in which the questions are asked. Questions need to avoid bias, use language that is easily understood, and be presented in a way that lends itself to the kind of numerical analysis that might be desired.

The examples show that the three survey approaches are not mutually exclusive, and can be combined. Still, combining objectives and approaches has a cost in terms of complexity and time—both in planning and in the execution of the research.

Opinion Surveys

Opinion surveys are used to determine customer attitudes and perceptions. Examples of this approach to market research include customer satisfaction surveys. The utility industry has commissioned a series of customer surveys covering topics such as customer attitudes towards environmental threats, towards their utilities' performance, and their commitments to environmental quality.¹⁰

The National Renewable Energy Laboratory published an extensive review of opinion surveys relating to energy and environmental policy. (Farhar 1993) This compilation of questions from a wide variety of polls is the source for many of the example questions shown below.

1. How would you rate the overall quality of the environment compared to how it was five years ago? (*better, worse, or same*)
2. At the present time, do you think environmental protection laws and regulations have gone too far, or not far enough, or have struck the right balance?
3. Some people say that the progress of this nation depends on an adequate supply of energy and that we have to have it even though it means taking some risks with the environment. Others say the important thing is the environment, and that it is better to risk not having

¹⁰ See, for example, the many reports and presentations by Gene Pokorny of Cambridge Reports/Research International prepared for the Edison Electric Institute.

enough energy than to risk spoiling our environment. Are you more on the side of adequate energy or more on the side of protecting the environment?

4. Do you favor or oppose relaxing environmental controls to produce more energy?
5. We are faced with many problems in this country (or state), none of which can be solved easily or inexpensively. I'm going to name some of these problems and for each one I'd like you to tell me whether you think we're spending too much money on it, too little money, or about the right amount. (*Improving and protecting the environment; increasing the nation's energy supply.*)
6. I'm going to read you a list of major environmental problems and I'd like you to imagine that you could pay a \$50 tax increase (or substitute increase in rates paid per year) to solve each of these problems. For each problem that I mention, please tell me whether you would definitely be willing to pay an extra \$50 in taxes to solve that problem, whether you might be willing, whether you probably would not be willing, or whether you definitely would not be willing to pay an extra \$50 in taxes (rates) to solve this problem: (*Air pollution; the depletion of the ozone layer; development of new energy sources such as solar and wind power; dealing with the greenhouse effect—the gradual warming of the earth; acid rain.*)

This could be made more explicitly applicable to electricity generation from renewable energy resources, for example, Would you be willing to pay extra for non-polluting resources such as wind energy, energy from the sun, or hydropower?

7. Advances in new technologies that use the wind or the sun to produce electricity make it possible to produce electricity or a portion of our electricity in ways that cause much less pollution but which in some cases still cost more to produce. If your utility made this cleaner power available, would you be willing to pay \$10 a month more for it?

Pros and Cons of Opinion Surveys: This approach elicits general attitudes and perceptions about environmental problems and the types of things customers would support to help improve the environment. It also provides general insight into willingness to pay (WTP). On the other hand, quantitative results for WTP are probably the least reliable because they are based on uncertain levels of customer understanding. Attributing willingness to pay to only the top group of respondents (e.g., very committed, strongly support, will definitely investigate) will provide a more realistic estimate of eventual customer action.

Contingent Valuation

Contingent valuation is a method used when market forces do not signal the value of a good, either because markets do not exist or because they function imperfectly (Baugh et al. n.d. See also Mitchell and Carson 1989). This approach has been used especially to place value on environmental benefits that cannot be purchased by individuals and limited to purchasers. Examples of such benefits include air and water quality improvements.

In a contingent valuation survey, questions are posed directly in terms of willingness to pay for the product, as in, “Would you be willing to pay \$10 per month for...?” The initial amount suggested is randomly selected from several possible starting points. If the respondent answers “yes” to the first question, the interviewer may repeat the question with a higher amount, perhaps doubling the first amount. If the answer to the first question is “no,” the interviewer may repeat the question with a lower amount, perhaps half of the original amount. Surveyors can then calculate the boundaries of willingness to pay from this information.

Example: Colorado utility

The utility initially conducted five focus groups to help understand attitudes and opinions, as well as to help frame the questions for a telephone survey. The subsequent telephone survey reached 400 customers and included the following questions (some are shortened or paraphrased).

The survey team created several options, one for each renewable resource. Customers were asked to indicate their level of support for each option. Two of these options are presented below to show how much information customers were given.

1. Photovoltaic Solar Power. This form of solar energy converts sunlight to electricity. This is the most expensive renewable source to construct, but the least expensive to operate.
(Strongly Oppose to Strongly Support, scale 1-7)
2. Wind power. Windmills or turbines transform the power of wind into electricity. Wind farms are somewhat expensive to construct, but operating and maintenance costs are very low.
(Strongly Oppose to Strongly Support, scale 1-7)

Then customers were asked to rank order a list of these renewable energy options.

Next, customers were given a scenario (three paragraphs long) for each renewable option. Here is one example:

3. A wind power site that generates 20 MW of electricity can be built in the vicinity of Anytown. This would supply the electricity needs of about 10,000 homes or about 27,000 people. The wind power sites would cost about \$20 million to build, compared to \$10-\$15 million for a coal fired plant that would produce the same amount of electricity, but the wind turbines are somewhat less expensive to operate.

A reasonable way to compare fossil fuels and wind power is to consider that generating 20 MW of electricity using fossil fuels typically results in annual air emissions of about 70 thousand pounds of particulates, 900 thousand pounds of sulfur dioxide, and 500 thousand pounds of nitrogen oxides. This is equivalent to burning about 100 million pounds of coal. These air emissions and burned fuel represent about one percent of the utility's electric production. Generating the same 20 MW using wind power would produce no air emissions and burn no fossil fuels.

To make wind power a reality in Anytown, the utility is considering offering an optional household electric rate. This new service is more expensive, but the additional money will be used only to purchase electricity generated by wind sources that are less harmful to the environment. As public demand for this renewable electric generation grows, the utility will upgrade and expand these wind power sites.

The surveyor then proceeded with further questions.

4. To have the air quality and conservation benefits from producing 20 MW of wind power electricity, would your household purchase this premium power for an additional \$ X per month on your electric bill? (*Various fixed amounts were suggested. If the customer answered yes, a higher amount was suggested, also in the form of a question. If the customer answered no to the first question a lower amount was asked.*)
5. Follow up: Why do you say that?

More attitude questions were asked (*Strongly Oppose to Strongly Support, scale 1-7*), such as:

6. I would be willing to purchase renewable electricity at a higher price, even if those who don't pay will get the same environmental benefits.
7. In the past year I have chosen not to buy one or more products that might harm the environment.
8. The best contribution I can make to the environment is reducing the energy I use, rather than paying to develop renewable energy.
9. I believe that even though renewable energy may cost more now, these costs will go down in time.
10. It would be better for my utility to develop renewable energy than the state or federal government.

Pros and Cons of Contingent Valuation: In terms of WTP and customer reactions to the offer of a green pricing product, this approach is an improvement over opinion polls because it provides a description, albeit limited, of the resource and the product. At the same time, the length of some of these questions shows how difficult it can be to provide a lot of information *to* the customer in a telephone interview whose primary purpose is to elicit information *from* the customer. If the information is unfamiliar, it may not be easily or quickly absorbed to enable a reliable response.

This approach attempts to determine WTP by asking direct questions, and they must be worded carefully to minimize bias. The results nevertheless probably overstate WTP because customers are not required to spend actual money. This overstatement could be reduced by focusing only on customers indicating the strongest commitment.

Conjoint Analysis

The purpose of a conjoint analysis is to determine customer preferences for different energy mixes or program designs, and their willingness to pay for these preferences. Conjoint analysis surveys sometimes use computer interactive interviews in which customers answer trade-off questions about possible alternate products, and other times rely on mail or other survey techniques. These trade-off questions are "used to elicit customer preferences for utility investments in green products where these products are defined as a collection of attributes or features." (Wood et al. 1995)

Example 1: Several Wisconsin utilities

This example combined focus groups and computer interactive pre-tests to refine the computer interview and to prepare background materials used in the interviews. The background material is necessary so that the interviewees feel able to answer the questions. Completed interviews numbered 472.

The utilities wanted insight into their customers' knowledge, attitudes and opinions, and willingness to pay.

For knowledge, direct questions were asked to ascertain how accurate customers' knowledge is about such things as:

- the primary source of energy used to generate electricity
- the environmental effects of different energy sources
- the link between air pollution and incidence of cancer
- how many inland lakes have fish consumption bans
- whether air pollution from coal power plants has been increasing or decreasing over the past ten years.

The answers reveal how much information utilities may need to present to customers so they can understand utility choices that affect the environment.

For attitudes and opinions, more direct questions were asked, such as:

- What is the most harmful source of pollution?
- What is the second most harmful source?
- How concerned are you about air pollution in Wisconsin?
- Do you believe acid rain is a serious problem in Wisconsin?
- Is your utility putting the right amount of effort into protecting the environment?
- What distance would you prefer to locate your home/farm/business from a coal power plant?
- What's the most important factor influencing this decision or preference?

Finally, for willingness to pay, the consultant asked a series of questions in the following format. Remember that these appear on a computer screen in front of the customer so he or she has time to contemplate the response.

Which do you prefer?

Scenario 1	Scenario 2
Decrease in number of lakes with fish consumption bans: 20 (10%)	No change in number of lakes with fish consumption bans
Respiratory cases decrease: 5,000 (0.03%)	Respiratory cases stay the same as today
Increase in monthly electric bill: 40%	No change in monthly electric bill

Strongly prefer left

1

2

3

4

5

Strongly prefer right

6

7

Example 2: New York utility

This approach used a two-step survey. First, the utility conducted 900 random telephone surveys to test knowledge and opinions and to ask direct contingent valuation questions. The results from this step were then used to construct a green index for those surveyed. The second step followed up with computer interactive interviews of 116 of these customers, weighted towards the so-called green customers.

Again, these customers were asked trade-off questions in the same format as above:

Which do you prefer?

Program 1	Program 2
You pay a \$6 monthly premium	You pay a \$1 monthly premium
Minimum level of customer participation required	No minimum level of customer participation required
Reduces SO2 pollution in particular	Reduces several types of air pollution

Strongly prefer left

1

2

3

4

5

Strongly prefer right

6

7

Pros and Cons of Conjoint Analysis: Trade-off questions give richer information about customers' relative preferences for different program designs and are important to developing a new utility product. This approach not only gets at the attributes that appeal to customers, but

econometric analysis can be used to estimate willingness to pay without asking directly, "Would you be willing to pay \$ X more each month for cleaner air?" In the New York example, the estimates of WTP from both the direct questions (contingent valuation) and the trade-off questions (conjoint analysis) resulted in similar estimates. (Miedema 1995) But in both cases the WTP based on customer intentions probably overstates their actual WTP, again because customers are not spending real dollars.

Market simulations and field tests

It may not be enough just to ask customers how much they would be willing to pay for clean energy because of the gap between what people say they will do and what they actually do when given the opportunity. Behavioral research methods may be required to obtain a more accurate estimate of what customers *will* do. These methods include market simulations and controlled field tests.

Market simulation research attempts to determine what consumers will actually do when presented with an offer that they believe is real, but in fact it is offered only to elicit a response rather than to sell a product. As described by Byrnes et al. (1995), customers are mailed an offer to participate in a green pricing program and are not yet told that it is a simulation. Customers are given materials describing the program and the terms of the offer, and are asked to return a pledge or registration card. The return of the registration card is the basis for estimating actual program participation.

In contrast to a market simulation, a field test places a real product in the field but for a limited population. Careful monitoring of responses, and follow-up with respondents to understand what they liked or didn't like about the offer, lead to corrections in promotion, product placement or product design.

Example: Portland General Electric (PGE)

PGE tested the response of customers to a real opportunity to support the development of wind energy. First, PGE explored several different product concepts with focus groups. Then, instead of conducting surveys and testing consumer reactions to hypothetical or proposed programs, PGE introduced two mini-pilots in early 1995 to test consumer attitudes through actions. PGE initiated one of the pilots in conjunction with US Bank. Consumers were solicited for three products: Certificates of Deposit (CDs), debit cards and credit cards. All three products were marketed with the theme "Share the Wind." The credit and debit cards featured the "Share the Wind" logo as well as the bank and utility logos and the VISA logo, and the CDs were also co-branded. The bank promised to contribute 1% of every purchase made with the credit card, one-half of 1% of every debit card purchase and 1% of the opening balance for a CD to the Share the Wind Fund dedicated to purchasing wind in Oregon. (Weijo & Boleyn 1996)

The bank wanted to make sure that the utility customers who were offered the products were good credit risks, so PGE pre-screened the customers using utility records. The bank needed a relatively large number of customers to make the test worthwhile because the test required training the bank's customer service personnel and modification of the bank's customer

statements. PGE used two of its billing cycles to select about 21,000 customers. These customers were sent the offer by direct mail.

The second field test asked customers to allow the utility to round up the customer's bill to the next whole dollar, with the money in the "penny jar" going to renewables, amounting to about \$6 per customer per year. This solicitation was mailed to 2,000 residential customers via direct mail, as a billing insert, and with the US Bank offer, to see if customers would respond differently.

The results of these two field tests were mixed. PGE's hope for a 3% response rate from the US Bank products fell far short with a response rate of under 1%. This did not generate enough revenue to justify the cost of the program. The credit card was the most popular with a penetration of around 1.3%. The certificate of deposit was not popular, and the debit card was an unfamiliar financial product at the time. (SRC 1995)

The penny jar pilot, on the other hand, performed well. The penny jar contributions were automatic and reliable and customers liked rounded bills. About 45% of the customers included in the test were aware of the program and 4.37% of those agreed to participate. This is an overall response rate of 2%, equal to PGE's performance hurdle for this pilot. (GP Newsletter 1995)

Pros and Cons of Market Simulations and Field Tests: Market simulations and field tests are likely to provide a more realistic estimate of customer participation than surveys. Simulations, however, risk alienating and confusing customers when they learn that the offer is not bona fide. Interested customers might be mollified if they are told that they will be contacted when a product is available. Market tests, in which a product is actually sold and delivered, do not suffer from this liability, but they require careful planning and additional resources to implement and track. Champ and Bishop (1998) provide a good example.

Product concept testing

Prior to its limited market tests, PGE generated seven product concepts using focus groups and in-house brainstorming. The concepts, each written on a separate board, were presented to 300 residential customers in one-on-one interviews. In addition to soliciting comments about the appeal of each concept, interviewers collected demographic information about the respondents.

With this information, PGE developed a profile of the likely buyers of each product. Two are shown below:

Product 1	Product 2
Affinity Credit Card Share the Wind label	Affinity Check Card Share the Wind label
Target: <i>Clark and Stephanie Wise</i>	Target: <i>Jim Now</i>
<ul style="list-style-type: none">• 28 years old• Just getting started in life• Renters• Want to do the right thing• Resent the “generation X” label• Have one kid and plan to have more• Recycle if it’s convenient• Read nutrition labels• Educated, astute and practical• Use revolving credit• Outdoor recreation is a priority• Hero: Bill Gates.	<ul style="list-style-type: none">• 24 years old• Renter• No immediate plans• Was in a Mountain Dew commercial• Drinks Coors Light and dark coffee• Past credit problems, or doesn’t want a credit card• Interested in future technology• Hero: Sting

Later, one of the seven concepts was actually field-tested. By using the ratio of customer-stated likelihood of participation to actual participation (27 percent of those expected to sign up actually did so), PGE was able to estimate the market penetration of each of the other concepts. (Weijo and Boleyn 1996; Weijo 1996)

Additional market research considerations

Much market research is iterative. One approach alone is usually not enough to decide whether to offer a new product or what product would be most appealing to the target market. Focus groups can start the process, identify issues, help frame questions, uncover confusing terminology and suggest ways to design the product. Large surveys are more appropriate from which to generalize about the population being studied. Each approach has its own strengths and weaknesses, and the selection of a particular approach should depend on the goals of the study. What is it you want to learn? Sometimes more information leads to follow-up questions.

Program planners and market researchers can plan and fine-tune a program only so far before giving it the real-world test. But even after the initial program is launched, market research is not finished. As soon as the initial results start coming in, planners should stop trying to figure out what customers ought to do and instead focus on what the actual customers are doing and why. They should become guided by the market itself rather than by their model of the market. Only by studying current buyers can they know who is buying and why they are buying. (Pokorny 1987)

There is a lot to be said for good market research. There is also something to be said for not duplicating research that has been done numerous times elsewhere. If different studies have shown roughly consistent results, it is probably not necessary to do another study of that kind. The paralysis of analysis can become a reason for not getting out and testing the market. The best learning often comes from doing.

11 PROGRAM DESIGN

There are a number of issues that rise to the surface when designing a program. These issues include:

- What program type will be used? Will the program be presented as a contribution, an energy-based or capacity-based tariff, or as a renewable energy certificate?
- What value-added features will be included with the green electricity product?
- How can utilities make green electricity tangible?
- How can utilities motivate customers to support a public good?
- How can utilities avoid the risk of customers dropping out of the program?
- How can program credibility be enhanced?

This chapter discusses these issues. Other program design issues include resource selection and pricing. These are discussed separately in Consumer Resource Preferences (Chapter 8) and in Willingness to Pay (Chapter 4) and Pricing (Chapter 14).¹¹

Choice of program type

Early on, the utility should decide what type of program to use. Types to be considered are energy-based tariffs, capacity-based tariffs, and contribution programs. Renewable energy certificates are another option. This choice could be explored in focus groups, so that customer preferences could be taken into account, but there are other factors to consider as well.

Energy-based programs are the most obvious choice for utilities because utilities already deliver electricity to customers, and any renewable resources developed for the program will be connected to the utility grid. Nevertheless, there may be reasons for or against the different program types that we describe here.

Contribution Programs

There are several advantages to a contribution program.

- People are already familiar with the concept of contributing money to charities that use the donations for a specific purpose. Because of this familiarity, the contribution program is easy to explain.

¹¹ For many examples of program design, visit the Green Power Network maintained by the National Renewable Energy Laboratory for the US Department of Energy at <http://www.eren.doe.gov/greenpower>.

- In most contribution programs, customers can choose how much they want to give each month. The utility may provide some options, such as \$2, \$4 and “other,” but customers still select the amount they are willing to contribute. In a few cases, utilities may establish one amount so the customer’s choice is either yes or no.
- Contribution amounts can be set very low, so that it is easy for customers to participate. The bill round-up to the next whole dollar, for example, requires only a few cents per month.
- Finally, a contribution program may be the easiest to accommodate in a utility billing system.

The weaknesses of contribution programs include the following.

- Because monthly payments to a contribution program are the smallest of any of the program types, contribution programs create the lowest revenue per customer of all the program types.
- While in theory the low revenue per customers could be overcome by higher customer participation, contribution programs, on average, have lower market penetration rates than do energy-based programs.¹²
- Vague or unspecific promises about how the contributions will be used may discourage participation. Utilities offering a contribution program should express a clear commitment about what they will install, preferably naming the projects in advance.
- Contribution programs tend to reinforce the view that renewable energy is not cost-effective and require charity, whereas higher prices for delivered renewable generation can be justified as having greater value because of environmental advantages.
- Donations tend to fluctuate with the economy and in response to perceived environmental threats.¹³

Energy-based Programs

The advantages of energy-based programs include the following:

- Purchase of energy reinforces the idea of a transaction in which a unit of electricity is bought as opposed to a donation to a charity.
- Regular purchase of a product builds brand loyalty to the provider of the product.
- A utility already sells electricity, and this is the same service with additional added-value features.
- Energy-based programs have the highest participation rates, on average, of any of the program types.

¹² Capacity-based programs are usually limited by the size of solar projects so their market penetration is the lowest, and there is little utility experience with renewable energy certificates at this time.

¹³ A study of donations to 29 US environmental groups, based on the groups’ tax records, found that economic conditions (unemployment rates) and political climate (whether there was a Republican president) were important influences on green giving. (Richer 1995)

- Average revenue per customer is also among the highest.
- Energy-based programs are easily the most popular program type among utilities.

Among the weaknesses of an energy-based program:

- Selling green electricity requires a considerable amount of public education. People are less clear about purchasing electricity as a product even though they do it every day. They cannot see electricity, yet they “consume” it for lighting, refrigeration and television. To most people, electricity is a thing whose only attribute is to power technology.
- Green power is not delivered to each participating customer’s meter. Instead, it is delivered to the grid that all customers use. This too is part of the education process.

Percentage vs. block products

Utilities electing to offer an energy-based program face another product design choice: whether to offer green power as a percentage or a block product. Both products may charge the same price for a kilowatt-hour of green power, but the monthly cost may be variable or fixed.

With the percentage product, the monthly cost varies depending on the customer’s total electricity usage. For example, the product might contain 50% renewable energy for a fixed per-kWh premium, but the monthly cost will depend on how many kWh are used. Or the utility could let its customers choose whether their electricity supply will contain 25%, 50% or 100% renewable energy. Each option would come with a different price premium. The 100% renewable option might cost an extra 2 cents per kWh, the 50% option could cost an extra 1 cent per kWh, and the 25% option could cost an extra 0.5 cents per kWh. Although the price per renewable kWh is the same in each option, the cost is spread over all kWh purchased.

In contrast, a block product would offer green power in blocks of energy (such as 100 kWh) for a fixed price per month. Customers could choose how many blocks they wish to purchase. The number of blocks purchased would have no certain relationship to how much electricity the customer uses each month. The customer’s decision about how many blocks to purchase might be guided by some notion of typical monthly energy use, but is not dependent on actual energy use, and the monthly cost does not vary with actual energy use.

In addition to the contrasting features of variable vs. fixed cost, another consideration in selecting a percentage product or a block product is the different product certification standards for each. Green-e, the primary green power product certification standard in the United States, has different requirements for what it calls a blended product (analogous to the percentage product) and for the block product. For example, the certification standard for block products requires a minimum of 75 kWh of new renewables per block (an exception may be made for a block of solar energy). The certification standard for blended (percentage) products, on the other hand, requires a minimum of 15% new renewables. Further, the emissions from the non-renewable portion of the blended product must not exceed the emissions rate for net system power. See Chapter 13 for more details.

The arguments for each approach are summarized in Table 11-1.

Table 11-1. Percentage Products vs. Block Products

Percentage Product	Block Product
<ul style="list-style-type: none"> • Serves full load of customer, although the percentage supplied by green power may be less than 100% • Cost is presented in somewhat familiar terms of cents/kWh, easily compared to price of electricity • Can offer choices of 25%, 50%, 75% or 100% renewable energy so customers can choose according to their willingness to pay 	<ul style="list-style-type: none"> • Gives customers a lot of flexibility in choosing how many blocks to purchase. • Known monthly costs because each block costs a fixed monthly amount • Very affordable because of this choice flexibility • Doesn't create higher premiums in high-electricity-use months because the number of blocks purchased does not vary with electricity use
<p>Examples:</p> <ul style="list-style-type: none"> • Traverse City Light & Power, 100% wind energy at 1.58 cents/kWh premium • Wisconsin Electric, choice of 25%, 50% or 100% renewable energy mix, at 2 cents/kWh premium 	<p>Examples:</p> <ul style="list-style-type: none"> • Tennessee Valley Authority, 150 kWh blocks of methane gas, wind and solar, \$4/block per month • PacifiCorp, 100 kWh blocks of wind energy, \$2.95/block per month

In either case of a percentage product or a block product, utilities must also decide whether to offer a single resource or a mix of resources. This decision will depend on customer perceptions and preferences, resource availability, and cost. One advantage of offering a mix of resources is that a utility can adjust the resource mix or the percent renewable to achieve a desired price point.

Capacity-based Programs

There are only a few programs based on selling capacity from renewable resources to consumers. The advantages of the approach are:

- Packaging the product as a unit of capacity (50 or 100 Watts) makes a resource that has a high energy cost affordable. This is why all capacity-based programs are solar programs. However, not all solar programs are capacity-based programs.
- Selling capacity to a specific project promotes the concept of ownership and loyalty to that project.
- Based on the little data available, some capacity-based programs have been able to realize high average monthly revenue from participants.

The weaknesses of this approach are:

- Capacity-based programs have the lowest market penetration of any of the types of programs, although low market penetration is not inherent to capacity-based programs. The low market penetration is due in large part to the small solar projects that are undertaken. Because they are small, only a small number of customers can participate, and most utilities have been slow to respond to demand with additional new projects.
- It is difficult to explain the concept of capacity to customers, because that is not what they pay for when they buy electricity. Although people might relate to a 100-Watt light bulb, that may trivialize the impact of their purchase.

Renewable Energy Certificates

Renewable energy certificates could be purchased at the wholesale level and rebundled with commodity electricity to create a delivered energy product of the types described above and in Chapter 3. In this section, however, we refer to renewable energy certificates as a stand-alone retail product.

A utility could offer its customers a green option in the form of renewable energy certificates separate from electricity service. Renewable energy certificates are a relatively new concept, and as a result there are only two utilities that currently offer to sell certificates at retail. There are, however, ten non-utility marketers that offer retail renewable energy certificates, and utilities should study these products if they are considering offering certificates. These retail certificate marketers may also be interested in partnering with utilities to sell the benefits of renewable energy. The strengths of retail certificate products are:

- By purchasing certificates separately from electricity, transmission costs may be avoided. This is especially important if the renewable energy would otherwise have to be transmitted through several different transmission regions.
- The transactions may be simpler because the utility purchasing certificates at wholesale for resale to retail customers does not have to worry about integrating an additional and potentially intermittent energy resource into its system.
- Because certificates are unbundled from delivered electricity, certificates can be sold outside the utility's service territory to buyers who are not customers of that utility, potentially expanding the market.

As a utility product, renewable energy certificates also have some weaknesses:

- Because they are new, and because they are even more abstract than green power (though essentially the same), certificates are more challenging to explain---education is important.
- Until certificates become more commonplace, credibility may be an issue. Customers may wonder why their electric utility can't or doesn't sell delivered green electricity.
- At first glance, since no product (electricity) is being delivered locally, it is hard to distinguish between certificates and charitable contributions.
- Tracking the creation and ownership of certificates, and verifying trades, is something that is generally acknowledged to be important to market credibility, yet such tracking systems do not yet exist in all regions.
- Lacking a liquid market for certificates, it may be challenging to find certificates for resale.
- Certificates may come from generation located far away. This may not be credible to consumers, or if credible, it may not satisfy their desire for local environmental benefits.

Generally, we believe that a utility will prefer to offer a delivered green power product, meaning that the attributes remain bundled with the electricity service. In particular, this would be the case if the utility owns the renewable generating unit and the energy from the facility is delivered to the utility grid or to the regional power pool.

The Role of Utility Billing Systems

Another important consideration in choosing a program type is the ability of the utility's billing system to handle the added charge. With a contribution program that allows a customer to check a box indicating a monthly contribution amount, can the system accommodate this choice? Can the system accommodate an automatic bill round-up to the nearest dollar? Some programs allow customers to choose how many blocks of energy or capacity they wish to buy. The amount of money is then fixed per month until the customer drops out of the program. Billing systems may accommodate an additional fixed charge, but can it accommodate one that varies for each customer? If an energy-based program offers renewable energy for a percentage of customer electricity use, this may appear to be another tariff or rate classification, which could have implications for billing systems. In choosing a program type, utilities should think about the ability of their billing systems to accommodate billing for a differentiated product.

The type of bill may also be a factor. Small utilities that use postcard billing rather than envelope billing may not be able to squeeze another line into a small space.

Program features

Some green power benefits—especially the environmental benefits—are public benefits, meaning they are shared by all customers regardless of whether they participate in the program. To motivate customers to buy green power, it is important to include value-added features in the product design. In fact, the choice of program type (just described) and the selection of value-added features are probably the most important decisions that program planners will make.

Value-added features offer private benefits to those who participate in the program. The question of what private benefits or value-added features to build into the program offers a good opportunity for market research, to find out what features are most important to customers. The answer is not so clear-cut, and therefore individual market research on this question could be a beneficial use of limited research funds.

In a competitive environment, it is added value that allows a company to attract or retain customers. In the promotion of a utility program, it is added value that will motivate greater participation in the program.

Many consumers today still think of electricity as a commodity where one kWh is indistinguishable from another, and where price is the only dimension of importance. Green power adds value by differentiating the kWh product. Although many consumers have indicated that they would pay more for the added value of green power, clean energy may not be strong enough by itself to motivate participation. Customers who pay for this product may not know for sure that they are getting green electricity. They cannot keep the resulting cleaner air to themselves because the environmental good they are buying is a public benefit. For these reasons it is important to include other attractive features with the green electricity product.

Green pricing experience to date provides examples of such features (see also Swezey and Bird 2001).

Education. Many green pricing programs, especially solar programs, offer educational opportunities for the community. For example, the Wisconsin Public Service SolarWise program installs solar photovoltaic systems on high schools, and provides a curriculum and other learning opportunities to educate students about solar energy.

Tax deductibility. A value added feature that is unique to contribution programs is that contributions may be tax deductible. This feature requires that the contributions be made to a legally-eligible non-profit organization that administers the funds. Public Service Company of Colorado established the Renewable Energy Trust for such a purpose.

Rate stability. Most green power resources have zero fuel costs and are not subject to the fuel price adjustments that most utilities use to cover unexpected price increases in purchased fuel. In addition, long-term contracts with renewable resource providers can lock in a stable price, again because there are no purchased fuel costs. These benefits of avoided price risk could be shared with participants in a green pricing program by ensuring that they will be protected from fuel price increases for the portion of green power that they buy. Austin Energy does just that with its GreenChoice program (see text box). At one time the fixed premium of the renewable energy became less than the general energy supply costs due to the unexpectedly steep escalation of natural gas prices.

Austin Energy Marketing Material– the Private Benefits of Fuel Price Protection

Austin Energy customers who subscribe to GreenChoice will see the normal fuel charge on their power bill replaced by a green power charge. Because of our 10-year contracts, the green power charge will remain fixed until 2011 - while the standard fuel charge reflects current prices for fossil fuels, which can change.

Subscribing to GreenChoice is a simple step you can take to help protect air quality. You can take advantage of plentiful natural resources while establishing a hedge against volatile fossil fuel prices.

Your low green power charge will not change.

An electric bill consists of two main parts: the energy charge, which pays for power plants, power lines, and the cost of maintaining them; and a fuel charge, which pays for the fossil fuel (coal, natural gas) used to produce the electricity you use.

Natural gas prices have been higher in recent years but are now closer to historic averages. When natural gas prices have risen, all electric utilities, including Austin Energy, have had to increase fuel charges.

GreenChoice subscribers pay a fixed green power charge that will stay fixed until 2011, even if natural gas or other fossil fuel costs should rise again.

Here's how it works.

As a participant in the GreenChoice program, you will see the standard fuel charge on your electric bill (currently 1.77 cents per kWh) replaced by a GreenChoice charge of 2.85 cents per kilowatt-hour (kWh) of electricity used. This means that you will be paying about one cent more per kWh for the renewable energy power provided by GreenChoice. For an average residential subscriber (based on using 1,000 kWh per month), GreenChoice costs about \$10.00 more per month.

Join GreenChoice for a cleaner future!

From Austin Energy web site: <http://www.austinenergy.com/greenchoice/>

Related products. Utilities can offer valuable related products with the purchase of green power. Los Angeles Department of Water and Power (LADWP), for example, offered customers two free compact fluorescent light bulbs when they enrolled. (This premium may also benefit the utility by reducing the need for new generation.) Tennessee Valley Authority offers its residential customers a free home energy audit to identify cost-savings opportunities. Utilities could also do joint promotions with local or regional merchants. By signing up for green power, for example, customers could receive a discount certificate that can be used at participating

stores, or for specific products such as compact fluorescent lights, camping equipment, water filters, or toxic-free paints. This effort requires program sponsors to seek out and make arrangements with retailers of environmentally oriented products.

Recognition. Some market research shows that recognition is appreciated but is not a motivating factor in residential customer decisions to participate in green pricing. (Decision Research 1992) Still, the key to an attractive product is the combination of features or attributes of the program, and participant recognition may help. Participants might be invited to project dedication ceremonies, or might display a bumper sticker, which of course is additional advertising for the program. Participants in Sacramento Municipal Utility District's PV Pioneers program receive meaningful and lasting recognition because the program places PV systems on residential rooftops. It may be a status symbol for early adopters.

Public recognition is more important to businesses and other non-residential customers. Numerous utility programs list participating businesses on the program web site and in program newsletters. Several programs also provide window stickers that businesses can display. Businesses may be featured in case studies, on billboards or in paid newspaper advertising.

Local recognition is usually sufficient for small businesses, but larger companies that serve regional or national markets may benefit from national recognition for their green power purchase. For this level of recognition, utilities could work with regional environmental groups to sponsor awards for large purchasers, or with the US Environmental Protection Agency's Green Power Partnership. This program is established specifically to provide recognition for corporate leadership in buying green power (see text box).

Green Power Partnership

EPA's Green Power Partnership is a voluntary program designed to reduce the environmental impact of electricity generation by promoting renewable energy. The Partnership will demonstrate the advantages of choosing renewable energy, provide objective and current information about the green power market, and reduce the transaction costs of acquiring green power.

Commercial, nonprofit, and public organizations can become Partners by committing to procure an amount of renewable energy that is proportional to their annual electricity use. In return, EPA will provide a network of providers and Partners, technical information, and public recognition.

EPA recognizes organizations that switch to green power as environmental leaders who are establishing the choice for renewable energy as the next step in sustainable business practice. Partners receive national recognition through awards and press announcements. Partners also gain access to a Green Power Partnership logo that can be used in corporate outreach and media materials. EPA works with each Partner to tailor an individual communications plan. A Partner's plan might include press events, advertisements, and internal company communications. Partners also gain access to a Green Power Partnership logo that can be used in corporate outreach and media materials.

<http://www.epa.gov/greenpower>

Further environmental improvement. Many green power participants appreciate that their dollars create more environmental bang for the buck, in addition to the direct benefits from buying green power. Both Portland General Electric and PacifiCorp offer an option that supports salmon habitat restoration while purchasing 100% renewable energy. Half of the revenue from PGE's Salmon-Friendly Power supports projects that restore and protect local salmon habitat, and these funds have been matched by the Oregon Watershed Enhancement Board. Waverly (Iowa) Light and Power sells renewable energy certificates from wind, and will use the revenue to develop additional wind projects.

Further environmental improvement also means that new renewable resources are developed that collectively displace dirtier, fossil fuel-based electricity generation. Moorhead (Minnesota) Public Service states that participants will displace the one-third of their electricity that now comes from coal with wind-generated electricity, while the remaining two-thirds will come from hydropower. By emphasizing that participation will directly reduce the amount of coal burned to make electricity, Moorhead Public Service highlights a real benefit to participants.

ENMAX: Creating a Green Club

ENMAX of Calgary created a Green Club as a means to attract residential customers to its program called Greenmax. Greenmax participants automatically become members of the Green Club, which makes the clubmember eligible for value-added offers and discounts at participating businesses. The Green Club thus creates tangible, private value to participants.

Partners in the Green Club are retail businesses that:

- Commit to purchase green power from ENMAX
- Provide an ongoing discount or one-time special discount on their products or services
- Provide space for a point-of-sale display that holds Greenmax literature
- Link to the ENMAX web site from their web site

The businesses that are Green Club partners receive the following benefits:

- Vendor signage identifying them as a Green Club partner
- Inclusion in all residential Greenmax marketing--bill inserts, direct mail, web site, newsletter
- Involvement of ENMAX in events and promotions
- Exclusivity—only one business from each retail industry can be a Green Club partner

Residential customers benefits:

- Sport Swap Ltd—20% discount off the regular price of any service (up to a maximum of \$25). Valid for labor only & one bike or pair of skis per visit. 10% discount off all store-owned, regularly priced merchandise.
- Golden Acre Garden Sentres—10% discount on regular-priced merchandise at Calgary locations.
- GreenGate—10% discount on all regularly priced products “excluding collectibles.”
- Kananaskis Mountain & Waterton Lakes Lodges—\$20 off the best available room rate (not including packages). Cannot be combined with any other promotion or discount.

Tangibility

Green power is a largely unseen and intangible product, but there are ways to design a program to make it feel more tangible. Evidence from existing programs shows that several aspects of tangibility can be used to make the program more appealing.

First, designing products with private benefits, as described above, certainly makes green power more tangible. Tangibility can also be created when the specific resource and project is described, the location of the renewable project is known and can be seen or visited, and if a focus on community pride is built into the project.

It is important to identify the resource used and project described from the onset of the program. Customers may be interested in the general idea of green power, but when they are given specific information about how the program revenues will be used, they are more likely to seriously consider signing up. Not knowing the project in advance results in a vague marketing message and undermines tangibility.

Most utilities with green pricing programs identify the resource, the technology and to varying degrees the location of their green-funded projects. Solar projects on community buildings are an easy way to make green power visible and more tangible. Traverse City Light and Power and Moorhead Public Service both erected wind turbines in their service territories, which are small to begin with, so the renewable project is close by for all to see.

It is not always easy to site renewable energy products in the communities where the power is sold, however. If the only good wind sites are 100 miles or more away, it will be tough to create visibility and community pride. One utility handled this challenge with imagination. Peninsula Light Company serves the small community of Gig Harbor in western Washington, and offers a mix of wind and hydro green power to its customers. The wind power, however, is generated far away. So Penlight, acknowledging the adage that seeing is believing, invited its members to take an overnight Wind & Wine bus tour to see a wind park in eastern Washington, and sample some of the region's best wines. Forty members got to climb into the base of one of the wind towers, where wind speed and power output is recorded. They also toured two wineries (with lots of taste testing), and even got in a round of golf.

Paying for a public good: reducing the free-rider effect

Although research has shown that 50% to 80% of polled customers indicate that they would pay more for green power, many believe that it is not worth investing in if only a portion of the population pays for something that is enjoyed by all. Three options have been suggested to help minimize the free-rider effect, and thus, to encourage customers to pay for a public good. (Schulze 1994)

One way to reduce free-riding is to establish a provision point. A provision point is a threshold that must be met (in dollars or number of participants) for a specific project to be undertaken. According to this theory, consumers who care about the provision of renewable energy will have a stronger incentive to buy because they know that if they do not, the project may not be

undertaken. Fort Collins (Colorado) Light and Power followed a similar path when it announced its wind program in 1996. Fort Collins encouraged expressions of interest until a cut-off date, and stated “Based on public interest, a decision will be made to proceed or not to proceed on the project after that.” It also said, “Wind power will be produced using one, two or three wind turbines, depending on the number of customers who choose to subscribe for the service.” (Fort Collins 1996)

A second program design option to increase willingness-to-pay for a public good is the inclusion of a money-back guarantee (it could also introduce some doubt in the customer’s mind about the utility’s commitment to the project). This guarantee promises to give back money paid if the provision point is not met. This reduces the risk to the participant of paying and then having nothing to show for it because not enough people signed up. This promise was followed by one of the earliest effort at green pricing by Niagara Mohawk Power. Unfortunately, Niagara Mohawk’s program launch and timing suffered from a combination of complications so that the program was quietly shut down, but the utility did refund the money already paid.

A third method is a rebate of excess contributions above cost. Payments made in excess of the cost of the project would be returned on a proportional basis. If payments have not yet started but people have signed up to pay a specified amount, that amount could be reduced proportionately when billing begins. Alternatively, additional projects may be undertaken with any extra money. Some contribution programs are undertaken to support the development of a specific renewable energy project, but others, such as Xcel’s (Colorado) Renewable Energy Trust, continue to accept contributions to pay for additional installations. Minnesota’s Cooperative Power Association, now Great River Energy, and several of its distribution cooperatives offered customers the opportunity to sign up for 100 kWh blocks of wind energy for \$4 extra per month. Later, when bids came in lower than expected, and a state subsidy became available, they dropped the price to \$2 a block. Participants were invited to double their purchase for the same price, and almost all did so. (Sturgis 1997)

Wiser and Pickle (1997)¹⁴ also offer several suggestions for overcoming the free rider effect of a public good such as green power:

- Take advantage of community and social pressures.
- Assure customers that they can make a difference.
- Emphasize customer retention.
- Enhance private value.

By using the mechanisms described in these reports, green power utilities and marketers should be more successful at marketing renewable electricity.

¹⁴ Available at <http://raccoon.lbl.gov/EA/pubs/eappubs.taf?function=Find&num=1260>

Customer contracts

Some utilities are concerned about the risk of customers dropping out of a green pricing program. This is an issue because utilities have to make long term commitments—either to build or to buy—for the output from new renewable generation. If customers drop out and are not replaced, the utility and either its customers or shareholders are left holding the bag for the extra cost of the electricity.

To address this concern, some utilities have required that residential customers sign up for one to three years, and commercial customers for as long as 10 years. These commitments, however, are usually meant as a pledge rather than a legally binding obligation. If the language sounds too onerous or legalistic, it might be considered too risky and deter customers from participating. In any event, term commitments should release participants who move out of the service territory.

Term commitments were seen more frequently in earlier programs, before there was much experience with customer behavior. Participant drop-out rates have been low, usually owing to customer relocation. Many utilities today do not require any term commitment at all, recognizing that most of the early adopters are personally very interested and supportive of clean energy.¹⁵

Program credibility

The credibility of the sponsoring utility is a key factor to the success of a green pricing program, even if low credibility is unrelated to the offer of green electricity. Public attitudes towards the utility may stem from negative publicity over high rates, rate increases, management problems, massive layoffs, threatened insolvency, and problems with nuclear plant operations or generally unresponsive customer service. All can create suspicions about the motivations of a utility that offers a new product, especially if it costs more.

For their part, utilities and other electricity suppliers should be aware that they are subject to Federal Trade Commission truth-in-advertising laws just like manufacturers of other consumer products. See, for example, the Environmental Marketing Guidelines for Electricity developed by the National Association of Attorneys General. (NAAG 1999) This means that suppliers must be able to substantiate their claims of green or environmental improvement from the sale of power from whatever renewable energy they might be advertising.

Program sponsors will have to explain to customers how program costs are calculated, how the money is spent, how specific renewable projects are selected, the utility's own contribution to the renewable projects, how the program will be monitored, what the utility is already doing (and will continue doing) absent the program, and how this program will make a difference.

¹⁵ If utilities are purchasing renewable energy supply at the wholesale level, however, they may still need to make long-term commitments to make new projects financially viable.

Credibility can also be addressed in large part through the use of third-party certification, accreditation standards, and stakeholder involvement For more on these subjects, see Chapter 7 “Stakeholder Involvement” and Chapter 13 “Certification and Accreditation.”

12 SUPPLY OPTIONS

Having considered consumer resource preferences (see Chapter 8), locally available energy resources, and utility technical experience and financial capabilities, the utility must embark on acquiring green power supply. As already mentioned in Chapter 6, Planning a Program, supply acquisition can be very time-consuming and is susceptible to unexpected turns and delays.

One of the reasons that supply planning can take a long time is that the emphasis is on the development of new renewables. It is not simply a matter of buying pre-existing renewables from the grid. Although this would be convenient, renewable energy is not always available, and more important, consumers are more motivated if they feel their purchase will improve environmental quality.

The development process for new renewables involves research, source selection, site evaluation, resource measurements, site selection, legal review, environmental impact assessment, acquiring environmental permits, public information sessions, site preparation, equipment manufacturing and delivery, construction and commissioning. Unless sites have already been evaluated, utilities should not expect to be ready to sell new renewable energy sooner than one or two years after initiating the planning process.¹⁶

There are two basic supply acquisition options: build, own and operate a renewable generation site, or acquire supply through a power purchase agreement with an independent power producer. Utilities should expect a lengthy and challenging supply development process regardless of how they choose to acquire resources.

There are also variations on these two options. For example, a utility could contract with a developer for a turnkey project, in which the developer does most or all of the development work, and transfers the project (ownership and operation) to the utility only after the plant is up and running. Or the utility could own the project, but pay a developer to build the project and continue to operate and maintain it as well.

Finally, utilities have the option of purchasing renewable energy certificates and rebundling them with undifferentiated electricity to create a green power product. If new renewable energy from local generators is not available, however, it is unlikely that certificates from local generators would be available, meaning that certificates would have to come from more distant sources.

¹⁶ This is not a guide to resource development, and we do not cover these issues further here. For more information about wind permitting and siting, see the National Wind Coordinating Committee, Permitting of Wind Energy Facilities: A Handbook (rev. 2002) at <http://www.nationalwind.org/pubs/permit/permitting2002.pdf>

Build and own

Utilities can build and own the renewable energy projects that supply electricity for their green pricing programs. All solar photovoltaic projects installed to support utility green pricing programs have been owned and operated by the utilities relying on them for green power. There are a few instances, however, where competitive marketers have purchased the output of solar PV projects in long term contracts.

The advantages of utility ownership are that the utility has the greatest control over generation operation and performance, and it benefits from developing direct technical knowledge and capabilities with the new technologies. Also, a utility may have access to lower cost capital than a private developer. A large utility may be able to finance from the balance sheet rather than from project financing, and a publicly owned utility will have access to tax-exempt financing.

There may also be tax advantages. An investor-owned utility may benefit from the federal Production Tax Credit, if it has a tax liability. Publicly owned utilities may receive the federal Renewable Energy Production Incentive payments, although the availability of this financial incentive depends on annual Congressional appropriations.

There are some drawbacks to this supply option. When a utility owns and operates its green power project, it assumes direct financial risk. (Wan et al. 1998) If a utility has little experience with the technology, it may lack critical expertise, for example, in evaluating alternative wind turbines to match the wind regime at the selected site. Of course, a utility can hire consultants with the necessary expertise, as well as obtain expert advice from equipment manufacturers and installers. Also, publicly owned utilities that own wind projects could not benefit from the Production Tax Credit or accelerated depreciation (see also Bolinger et al. 2001).

Utilities can spread the risk of ownership by partnering with other utilities interested in developing a green pricing program. Other utilities could either own a share of the new generating project, or they could agree to purchase a portion of the output from the project. Eugene Water and Electric Board and PacifiCorp are two such utilities that own a share of an early wind project in Wyoming. Tri-State G&T and Great River Energy Cooperative are two wholesale electric cooperatives that worked jointly with several of their members to develop wind projects. These member distribution cooperatives sell the electricity through green pricing programs. In some cases the program design and marketing are done jointly as well.

Purchased power

A number of utilities have signed power purchase agreements for renewable energy supply, including Austin Energy, Basin Electric Power Cooperative, Fort Collins Utilities, Great River Energy, Southern Minnesota Municipal Power Agency, and Tennessee Valley Authority, to name just a few.

There are several advantages to acquiring supply through a power purchase agreement. Project developers, if they have done several projects before, may have greater expertise and recognize and avoid pitfalls. Thus they may be able to work through the process more efficiently and cost-

effectively. A power purchase agreement shifts some of the risk to the developer or generator. It may allow the utility to concentrate on other aspects of program planning and retail marketing.

Through a solicitation, utilities may be able to reduce the time required to obtain green power supply. Some developers may have projects partly developed or on hold, awaiting a major purchase commitment before beginning the permitting process. If the site assessment and selection has already concluded, that could knock a year off the supply development process. Still, until they have more information, utilities should plan for lengthy power supply acquisition.

There are also financial considerations. If a utility has no tax liability or is not taxable, there may be an advantage in third party ownership of wind turbines. In fact, outside investors with tax liabilities are sometimes brought in on purpose to take advantage of the Production Tax Credit and accelerated depreciation. This can reduce the cost to the purchasing utility. For a financial analysis of the “buy versus build” decision, see Bolinger et al. (2001). The study authors found that the decision hinges on the availability of the Production Tax Credit and the amount of the Renewable Energy Production Incentive available.

As with any option, there are some disadvantages. Although utilities may avoid the financial risks involved with building and owning their own projects, they may have to pay a higher price for the delivered renewable energy because the risk has been shifted to the other party. Also, a privately owned, third-party generator may have a higher cost of capital. (Wan et al. 1998) Finally, by contracting for supply, the utility may lose an opportunity to learn about the operation and maintenance of an unfamiliar technology.

If a utility chooses to solicit resource proposals, the Request for Proposals (RFP) should be explicit about key parameters. For example:

- How much energy or capacity is the utility looking for? This will require an estimate of demand for green power. Larger quantity will usually result in lower costs due to economies of scale.
- What resources will be considered, and what ones will not? This may require some market research into customer preferences prior to issuing the RFP.
- How long a term will the utility consider for the purchase agreement? Usually a longer contract term (10-20 years instead of 2-5 years) will result in lower risk to the developer-generator and a lower price to the purchasing utility.
- Will the utility consider purchasing renewable energy certificates instead of electricity? The same RFP could be used to entertain both types of proposals.
- Must the resources be eligible for Green-e accreditation? Eligible resources provide more flexibility should the utility wish to pursue accreditation.
- Does the utility require certain emission standards be met for any biomass resources? Depending on the combustion technology, biomass may emit significant nitrogen oxides. Not only would this be a problem in a non-attainment area, it would also be inconsistent with an environmentally-preferred product.

Does the utility want an option to expand the capacity of the generating facility as demand for green power grows? This would be particularly appropriate for wind projects, and may influence site selection. It could also influence developers to be more interested in a small project if they believe there is a possibility that it could grow and spread fixed costs over more kWh.

RFPs and power purchase agreements should be explicit about which party will own the generation attributes—the associated renewable energy certificates or the emissions offsets that may have monetary value. Usually, it is the purchaser (in this case the utility) that will receive the attributes, and will retire them as the green power or renewable energy certificates are sold to retail consumers. But the important thing is to be clear about ownership to avoid any disputes.

Alliances for supply

There is an alternative way for a utility to offer green power, and that is through a marketing partner. It is not included as one of the two major supply options because it combines aspects of both and is unique as of 2002.

A few utilities have formed alliances with retail marketing companies that want to sell green power in the utilities' service area. Marketing companies do not have the opportunity to sell electricity directly to consumers in these markets unless they partner with utilities. Partnering with utilities allows marketing companies to reach more people and sell to customers who already have an established relationship with the utility company. From a customer standpoint it feels less risky because customers can switch supply without leaving their long-standing electricity provider.

The state of Oregon requires that utilities offer three green pricing choices to their small customers. PGE and PacifiCorp directly offer one option, and contract with a green power marketer to provide—and market—the other two. Instead of contracting for green power supply, these two utilities issued separate RFPs to select a marketing company, which is responsible for obtaining supply. Green Mountain Energy won the bid for both products for both utilities. Green Mountain is motivated to market its products because it does not get paid unless it makes green power sales, yet it maintains a cooperative relationship with the contracting utility.

Niagara Mohawk obtains its green power supply through three competitive green power providers. As a result of a merger agreement with National Grid, Niagara Mohawk notifies its customers of green power choices offered by three providers—Community Energy, Inc, Green Mountain Energy, and Sterling Planet Inc. Like green pricing, the charge is shown as an extra charge line item on the Niagara Mohawk bill, but unlike green pricing, the supply is offered and marketed by the competing green power providers.

In closing this chapter, there does not seem to be an overriding advantage for any of these options. The best choice ultimately depends on the goals of the utility and its capabilities. Utilities should expect setbacks and contingencies with any choice. This is why it is so important to start the process as early as possible.

13 CERTIFICATION AND ACCREDITATION

Certification and accreditation are ways of judging whether or not a green power product or program meets certain standards. They also give consumers confidence that the certified product results in real environmental benefits. The standards are developed by an independent third party, usually with the input of all interested stakeholders. Marketers or utilities wishing to have their product or program certified must of course satisfy the standards, and also pay a fee to the third party for its review, promotion of the certification brand or mark, and audit of results.

Third-party certification is a prime example of an added-value feature. It increases product value by attaching a credible stamp of approval to the green power product. In addition to product standard requirements, certification programs reduce false or misleading advertising by providing information to potential consumers in a visible and easily understood way. (Wiser 1999)

Utilities may be able to obtain credibility from the endorsement of regional stakeholders if these stakeholders are well-known, credible and organized. As described in Chapter 7 on Stakeholder Involvement, the input of outside organizations early in the planning process can greatly enhance the credibility of both the program and the utility.

The principal organization offering green power certification and accreditation in the US is the non-profit Center for Resource Solutions (CRS) based in San Francisco. CRS developed the renewable energy branding program called Green-e (see <http://www.green-e.org>).



Green-e offers three types of third-party certification: product certification, program accreditation, and certification of renewable energy certificates (RECs). This chapter explains the differences in the application of these terms, and how they relate to utility programs.

Product certification

As used by CRS and Green-e, product certification applies to green power products offered in competitive markets. As such, the term certification is not generally used to apply to utility green pricing programs, but the concept was established first in competitive markets.

Green-e product certification was introduced in California in 1997 in anticipation of a competitive market. The program was established in Pennsylvania in 1998, and expanded in 1999 to cover New Jersey, Maryland, and Delaware. Green-e certification standards are now also available in New England, Texas, Ohio, and New York.

Because the Green-e certification standards are developed for states and regions using an open stakeholder process, different states and regions may have different standards, especially with respect to the definition of eligible resources. Nevertheless there are some common minimum standards applying to products and the providers of the products:

Product Requirements

When the Green-e logo is displayed next to an electricity product, the product must meet the following requirements:

- For a blended (percentage) product, at least 50% of the electricity supply must come from one or more of these eligible renewable resources: solar electric, wind, geothermal, biomass, and small or certified low-impact hydro facilities.
- The product must meet the Green-e requirement (percentage) for new renewable resources.
- For a block product, generally each block must contain a minimum of 150 kWh per month of 100% new renewable resources.
- If a portion of the electricity is non-renewable, the air emissions must be no greater than those produced by conventional electricity.
- No specific purchases of nuclear power are permitted in the product.

Electricity Provider Requirements

Electricity providers selling Green-e certified electricity are required to abide by the Green-e Code of Conduct, which governs participation in the Green-e Program. Specifically, electricity providers must:

- Make full disclosure of the percentage and type of renewable resources in their electricity product.
- Present product pricing and contract terms in a standardized format, for easy comparison.
- Submit their marketing materials for review twice a year so Green-e can ensure they are not making false or misleading claims.
- Undergo an annual independent audit to verify product content claims and ensure enough renewable power has been purchased to meet customer demand.

Although an extensive investigation has not yet been performed to determine the impact of Green-e certification, it is evident that it has had an effect on the products available in the marketplace. As of September 2002, there were 19 green power products offered in competitive markets, 14 of which were certified by Green-e. Because Green-e is the most active and well-known certification program for competitive products, many marketers seek Green-e certification because they feel that they cannot afford to be without it.

Program accreditation

The Green Pricing Accreditation Program is a regulated-market companion to the Green-e certification program. The term “accreditation” applies to utility green pricing programs, and was created by the Center for Resource Solutions to distinguish it from certification of competitive products (see <http://www.resource-solutions.org>). Although the two terms, as presently used by CRS and Green-e, are distinct, it seems likely that over time they will merge.

The Green Pricing Accreditation Program includes minimum accreditation standards that address issues such as resource content, product pricing, marketing costs and performance targets, disclosure, regulatory approval, and termination. These minimum standards include:¹⁷

- Eligible renewable resources include biomass, geothermal, small hydroelectric (< 30MW), solar, wind and ocean-based generating resources.
- Renewable energy generated in response to any mandatory requirement to construct or contract for the renewable energy is not eligible.
- Blended products that serve 100% of a customer’s load must include at least 15% new renewables, and block products must include at least 75 kWh of new renewables (solar block products may be an exception).
- Contribution programs are generally not eligible for accreditation.
- Accredited programs based on blended products must be as clean or cleaner (per kWh emissions of SO₂, NO_x, and CO₂) than system power.
- No specific purchases of nuclear power are permitted in the program.
- The price of accredited products should not exceed direct program costs plus overhead.
- Accredited programs generally should not charge customers for the cost of green power until the new renewable resources are operational and supplying power.

As with green power product certification, these standards may be set more strictly by state or regional stakeholder groups.

Accreditation allows stakeholders to help shape the green pricing programs in their state. Utilities can participate in the development of accreditation standards as a way to obtain stakeholder input to its program. If a utility uses this process, it is but a simple step to nominate the program for accreditation.

Accredited green pricing programs to date include TVA’s Green Power Switch, We Energies’ Energy for Tomorrow, Wisconsin Public Service Corporation’s NatureWise, and Santee Cooper’s Green Power. Advanced Energy is currently pursuing accreditation for NC GreenPower in North Carolina. Accreditation standards have also been adopted in Colorado,

¹⁷ Higher standards may be adopted by local stakeholders. For full details, see Center for Resource Solutions, Accreditation of Green Pricing Programs, Final Criteria (Version IX), October 11, 2002 at <http://www.resource-solutions.org/pdf/GPAC.pdf>

Iowa, and Minnesota but as this is written, no utilities there have sought or received accreditation for their programs.

Certification for renewable energy certificates

A few utilities may choose to market renewable energy certificates (RECs) to their own customers as well as to consumers outside their service territories. If they do, they should also be aware of the potential to obtain Green-e certification of RECs.

Green-e standards for certifying RECs were developed through a series of national meetings and review drafts. While these standards are intended to be national rather than regional, in green pricing regions (meaning regulated states), local stakeholder groups must nominate and approve any certificate product sold by local utilities. Some of the key standards are summarized here:¹⁸

- Eligible resources are solar electric, wind, geothermal, hydro certified by the Low Impact Hydro Institute, landfill gas, digester gas, and specific forms of biomass.
- Only certificates from new renewables will be certified.
- Certificates must be sold in blocks of at least 150 kWh/month, or blocks representing at least 25% of a customer's monthly energy use.
- All environmental attributes must be included with the certificates; only fully aggregated certificates will be certified.

Certification standards and audits for RECs ensure that no two certificates represent the same kWh of energy. A certificate registry or tracking system is the best way to prevent fraud and double counting. Such systems identify where the renewable energy was generated, when it was generated, and from what type of source it was generated.

As with the other types of third-party certification, certification of RECs lets marketers use the widely publicized logo in their promotion and advertising, which may help customers become familiar with the idea of tradable certificates.

As of December 2002, 12 marketers (including two utilities) offered 15 certificate-based products, and seven of these were certified by Green-e. These providers are Aquila, Bonneville Environmental Foundation, Community Energy, Renewable Choice Energy, Sterling Planet, Sun Power Electric (product currently available in New England only), and 3 Phases Energy Services.

¹⁸ For a complete statement of the Green-e certificate standards, see http://www.green-e.org/pdf/trc_standard.pdf

14 PRICING

When planning a green pricing program, one of the biggest challenges is how to price the green power. There are many issues to be considered when addressing this question.

A fundamental decision with respect to pricing green power is whether the price should be based on the cost or on what the market will bear. Charging what the market will bear is appropriate where there is direct competition for retail customers, because competition helps to keep the price down. In a monopoly market where utilities have the right (and the obligation) to serve all customers in franchise areas, however, competition does not exist, and hence the green pricing program should be based on the cost to provide the green option.

What are the costs? The cost of providing green power will depend on the cost of generation, promotion and administration.

Generation cost

Generation cost depends on the quality of the resource, the technology chosen to convert the resource to electricity, the subsidies available, and in many cases, economies of scale.

Renewable resources vary in the amount of energy that they can generate. Even within a particular resource such as wind, the output will vary significantly with the average wind speed. Since wind speeds vary from one location to another, it follows that a utility can get more energy from a project located where wind speeds are higher. The more energy that can be generated from a given project, the lower the energy cost. Thus to minimize energy costs (and green power premiums), utilities should seek to develop sites with the best wind resources.

In different ways, the same holds true for other renewable resources. Landfills, for example, are not created equal when it comes to their potential to yield methane gas for electricity generation, and different regions of the country have different levels of solar insolation for photovoltaic electricity generation.

Renewable resources for the most part are free, the exception being biomass, and therefore green power costs are based on technology costs and to a much lesser extent on site acquisition, preparation and project development. This is why renewable resources are often referred to as capital-intensive—most of the cost per kWh is based on technology costs, and does not include fuel costs.

Technology costs also vary, even for converting the same type of resource to electricity. Therefore it pays to investigate alternative equipment carefully.

The size of the project can also have an impact on the cost. There are certain fixed costs to project development—for infrastructure and permitting—that can be spread over more kilowatt-hours if the project is bigger. A wind project, for example, may require increased substation capacity, access roads and interconnection regardless of size. Legal costs can also be significant. Economies of scale should be considered with most renewable energy projects as a way to lower energy costs. If a utility is too small to support a larger project with its own customers, it should consider selling excess generation to other utilities that may need green power for their own programs.

Finally, generation costs should also take into account any federal and state subsidies that may be available. At the federal level, the production tax credit (or the renewable energy production incentive for publicly owned utilities), currently adjusted for inflation at 1.8 cents per kWh, is important to wind. Many states offer tax incentives for various renewable resources, and some states have established renewable energy funds that provide opportunities for project developers to compete for various types of financial benefits.¹⁹ All of these can help lower the cost of green power to participating customers.

Promotion and administration costs

One frequently asked question is, “How much should we spend on marketing and promotion?” There is no simple answer to this question. One approach to figuring out the answer, however, is to plan the desired kinds and frequency of promotional activities, and ask an advertising agency or communications experts to estimate the cost. This cost can be compared to generation costs, or in terms of \$ per kWh, to the total green power premium that would result.

There are not many benchmarks for comparison. The first judgment would be whether the estimated promotion costs seem reasonable. Some regulators have set a limit on marketing costs at 20% of the green pricing premium. This number is arbitrary, based only on an opinion of acceptability. Small utilities have spent from \$20,000 to \$50,000 per year (there is insufficient data to present a reliable average), one medium-sized utility spent about \$200,000, and large utilities have undoubtedly spent more.²⁰ A few utilities with service territories that cover several states, and therefore that require multiple media markets, have probably spent over one million dollars. Finally, the Los Angeles Department of Water and Power has spent approximately \$2 million per year on marketing for the first three years of its program. (BWG 2002)

Utilities would do well to remember that the quality and persistence of marketing efforts will heavily influence market penetration and the number of customers that sign up. Unfortunately, utilities often skimp on promotional activities to the detriment of program performance.

Utilities are not used to spending money to get customers to participate in programs, but green power is a product like many others that are competing for consumer attention. No one should assume that just because a high percentage of customers say they would like to buy cleaner

¹⁹ For a comprehensive listing of renewable incentives, see the Database of State Incentives for Renewable Energy (which also now includes information on federal incentives), at <http://www.dsireusa.org>.

²⁰ Holt (2000a) reported that utilities responding to a survey showed an average marketing budget of \$65,000/year.

energy that they will beat a path to the utility's door to do it. Instead, utilities have to take it to their customers and sell it.

Administration costs vary with the size of the utility. A survey of utility green pricing programs in 1999 found that the 16 utilities that responded devoted on average about one full-time-equivalent person to program administration. (Holt 2000a)

Closely related to the cost of promotion and administration is the question of who should pay those costs. Many green pricing programs are approved on the basis that no costs will be incurred by non-participants. This is a reasonable approach given that green pricing will cost more.

There are arguments on the other side, however. Some people argue that the promotion of green power provides consumer education about renewable energy and the environmental impact of electricity generation and use. They argue further that all customers share in the environmental benefits of renewable energy generation, and that these public benefits justify rate-basing the cost of promotion and administration.

Including a portion of the program costs in rates paid by all customers would have the effect, of course, of lowering the green pricing premium. Perhaps one way to answer the question of who should pay these costs is to look at how the utility handles the promotion and administration costs of other voluntary customer programs related to education, safety, or civic activities.

Another way to stretch marketing budgets would be to incorporate some green power marketing into overall utility marketing, by mentioning the green power program as one of several activities the utility is engaged in, and showing images of the renewable resource.

Setting the green power premium

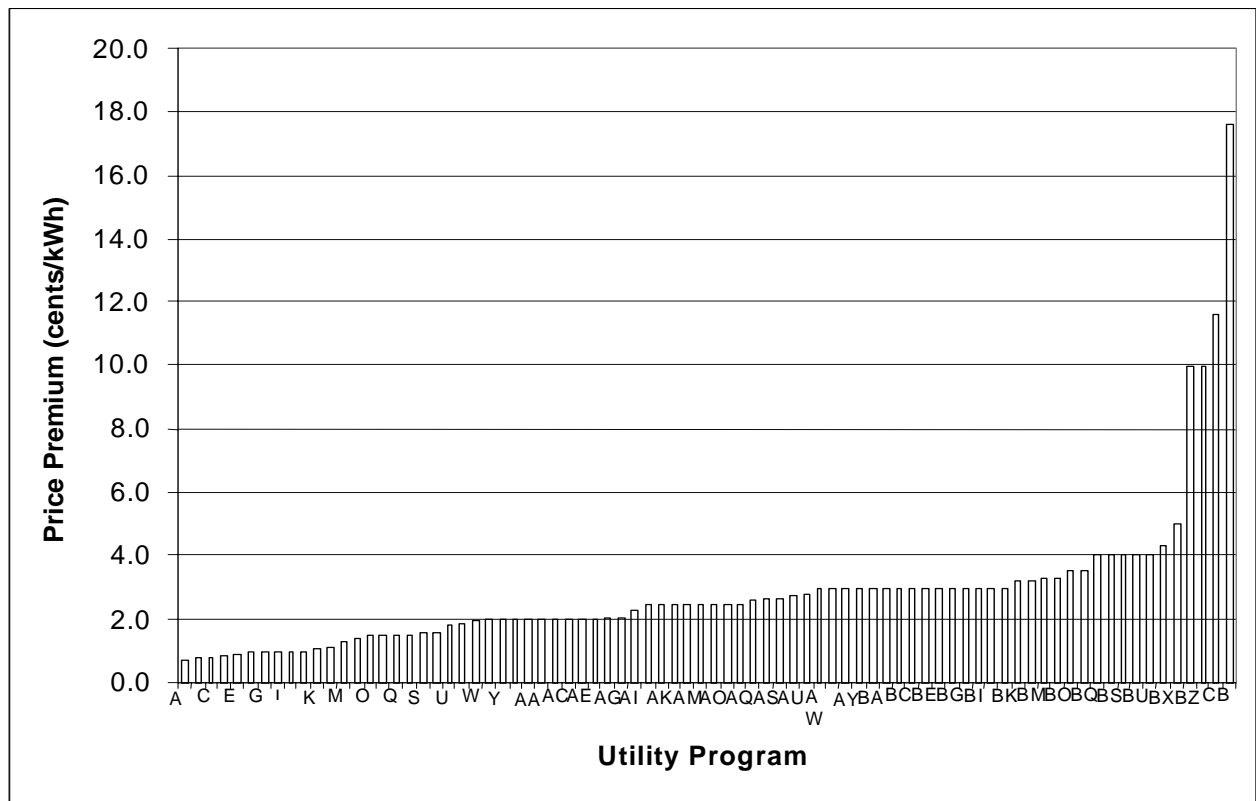
Once the costs that must be included in the price are known, the utility has to decide how quickly it should recover the costs. It could decide to amortize the costs over 10 years, 15 years, or 20 years or longer. The answer is in part tied to how much risk the utility is willing to accept. There is less immediate risk with front-loading (a shorter amortization period), but this will increase the price that must be charged and may lead to lower customer participation rates. The answer should also take into account how the utility would amortize other generation resources. If generating resources are generally amortized over their useful lives, then renewable generation should be treated the same. If this results in a 20-year amortization period, it could lower the price of green power.

The price premium (see Chapter 2 on Green Pricing Concepts) is the incremental cost—the difference between the cost of the green power and the utility's avoided costs. Avoided costs are the costs of a new cost-effective resource that the utility would otherwise acquire. It is not the average price of existing resources, or the retail rates charged to customers.

Most utilities will have their own financial models that will help them make these calculations, and in some cases will have an integrated resource plan that considers resource alternatives and projects a series of avoided costs into the future.

To help utilities benchmark the premiums they are considering, Figure 12-1 shows the price premiums charged by 66 utility programs. They range from 0.9 to 17.6 cents per kWh, while the average is 2.87 cents and the median is 2.5 cents per kWh.

Figure 14-1. Green Pricing Premiums, 2002



Source: Bird 2003

15 MARKETING CONTENT AND MESSAGES

Marketing is essential to make customers aware of the program and to encourage them to sign up. The marketing material created for a program, however, must be effective in order to entice customers. The principles behind the marketing, the messages portrayed through text and images, and the way they are presented are all important determinants of effective marketing. This chapter provides advice on persuasive content and summarizes common green power messages, while the next chapter focuses on marketing channels and outreach methods.

Marketing and promotion positions the product versus the competition or, lacking competition, in relation to customer needs. It should tell customers how this product will help solve their problems or concerns. It should not emphasize the features of a new technology that would interest an engineer.

Before deciding on marketing messages, it is important first to know your audience. Marketing can then be targeted to the people who will be exposed to the message and who are most likely to respond. After doing some secondary research and coming up with some ideas, it would be a good idea to test proposed marketing messages and visual materials with focus groups of the target audience. While there are no guarantees, this may help avoid wasting money on a promotional campaign that falls flat.

Marketing strategies

Identify the Problem and Offer a Solution

Marketing materials should explain to consumers what the problem is. Most people do not think about air pollution when they use electricity, they only make the connection when they stop to think about it—if then. One aspect of marketing is education. Some competitive marketers have sharply contrasted a picture of a smoggy yellow sky or smoke billowing from smokestacks, with a clean white wind turbine against a clear blue sky. It is not so easy for a utility to market against itself, especially when it believes that it is making good progress in reducing emissions from fossil-fired power plants. Nevertheless, the problem should be defined so that consumers will have a reason to act. Then, of course, identify the product—green power—as a solution to the problem.

Develop 3-5 Key Messages

Utilities should develop a few key messages that they want to get across, and identify several “proof points” that will support the messages. These proof points may be data or relevant examples.

SMUD's Greenergy program started with assumptions or insights about its target audience, and then identified key messages based on what the utility wanted the target audience to believe, as shown in Table 15-1.

Table 15-1. SMUD Targeted Messages

What Target Currently Thinks	What We Want Them to Believe
<ul style="list-style-type: none">• Likely not know about Greenergy• Concerned about energy crisis. Feeling disenfranchised• Use Jamba as food or dessert• Health and fitness oriented	<ul style="list-style-type: none">• Joining Greenergy costs as little as \$3 a month• Joining helps the energy crisis because 40% of the premium builds new plants• Joining Greenergy gets them free Jambas• Joining helps the environment

Source: Burke 2001

Identify Benefits and Added-Value Features

Marketing should identify specific benefits and added-value features, giving customers a tangible reason to sign up.

Austin Energy emphasizes the price protection afforded by its program. "GreenChoice subscribers will pay a low, fixed green power charge that will not increase until 2011, even if natural gas or other fossil fuel costs should continue to rise."

Sacramento Municipal Utility District customers can buy green energy from a new landfill methane to energy project. SMUD also sells an additional value: "In a continuing effort to support renewable energy, 40 percent of the Greenergy premium you pay helps secure new power plants fueled by renewable resources, like sunshine and wind."

The Tennessee Valley Authority and its distribution companies offer potential energy savings to program participants. "When you fill out the Green Power Switch enrollment form, you'll also receive the free *energy right* home evaluation form. The *energy right* program is a cooperative effort between your local public power distributor and TVA that helps consumers make their homes more energy-efficient. It will provide you with a customized analysis of your home electricity use and detailed suggestions for potential savings.

How to Communicate Green with Impact

- Educate
- Empower consumers with solutions
- Appeal to consumers' self-interest
- Provide performance reassurance
- Consider a mix of media

Source: Ottman 1998

A number of utilities and green power marketers quantify the benefits, and put them in terms customers can easily understand, by comparing the purchase of green power to avoiding air emissions from driving a car a certain distance, or planting an acre of trees.

Other utilities offer specific consumer benefits. For example, EnMax, a utility in Alberta, created a Greenclub card that gives customers added-value offers, discounts, and information at participating businesses. The card is given to every customer who signs up for EnMax's green power program. The Greenclub cards say, "Think green, save some green."

SMUD's partnership with Jamba Juice offers another example. One of SMUD's pamphlets advertising its green power program declares in colorful letters, "5 free smoothies with Greenergy! Sign up for SMUD's Greenergy and you'll receive a card good for five free smoothies." The connection between fruit-filled smoothies and green electricity is made clear in further literature: "You drink Jamba Juice for a healthier mind and body; why not join Greenergy for a healthier environment?"

Be Specific about Marketing Claims

Utilities promoting green power programs, like any company making product claims, must be careful not to overstate claims that could mislead consumers. Federal Trade Commission laws and rules require that product claims be clear, provide full information, and include qualifying conditions close to the more general claim. Marketers must be able to justify their claims, and have documentation on the claim at the time the claim is made.

State attorneys general are generally responsible for enforcing the FTC law. In response to environmental marketing claims about electricity, the National Association of Attorneys General (NAAG) prepared a set of guidelines for environmental marketing of electricity.²¹ This guide includes a number of hypothetical marketing examples and describes what is acceptable and what is not. Any company selling green power would be wise to become familiar with this document.

What makes a great ad?

- Well targeted
- Leads with benefits
- Simple and clear
- Name and product prominent
- Believable
- Call to action

Keep It Simple

Many customers are unfamiliar with electricity terms. Text should avoid jargon and use terms that the average consumer can understand. For example, use "pollution-free" electricity rather than "renewables." (Savage 2002) Another approach is to use specific terms such as wind energy, water power, or solar energy.

²¹ National Association of Attorneys General, Environmental Marketing Subcommittee of the Energy Deregulation Working Group, *Environmental Marketing Guidelines for Electricity*, December 1999, available at http://www.eren.doe.gov/greenpower/naag_0100.pdf

Beyond terminology, keeping the message itself simple is a help to consumers, who will spend very little time trying to figure out the message. The question-and-answer model works well because it gets the point across without confusing the customer with technical terminology. (Bolding 2002)

Customers don't necessarily understand kWh. Most customers don't know how many kWh they use per month or what the price per kWh should be. (Bolding 2002) So even if the premium is 2 cents/kWh, utilities should try to help customers put that in perspective, such as \$5 a month for the average home, or about the cost of a meal at McDonald's.

A SMUD ad combines two major design fundamentals. It succeeds in attracting attention while remaining simple. (Bolding 2002) The ad shows a bag of garbage with an outlet on the side of the bag. An electric cord is about to plug into the bag of garbage. The message is "One person's garbage is another person's electricity!" playing on the well-known phrase.

Repetition Helps

Advice from Green Mountain Energy

- Start small—don't try to accomplish too much in the beginning
- Stay focused
- Spread resources and leverage dollars (don't spend all your money on one thing)
- Put metrics in place (track response, and be results-oriented)

Source: Grossman 2001

An important fundamental of green power marketing, as with any type of marketing, is to repeat the message. The more times a consumer is exposed to a message or a slogan, the more likely they are to remember it, and thus, the more likely they are to eventually act on it. Sometimes direct text is more effective than elaborate visuals, although visuals initially attract the attention of consumers (Bolding 2002). Also, getting the same information through different channels and in different formats influences memory retention.

Call to Action

Marketing material should urge customers to act now. Material should explicitly describe several ways the customer can join the program, either by mailing a printed sign up form, faxing a sign up form, making a toll-free telephone call, or visiting the company's web page for online sign up. Joining a green pricing program should be easy.

For example, the final line of a pamphlet reads, "One person can make a difference. Call us at 1-877-WE-R-GREEN, visit us at www.earthchoice.com." (EarthChoice)

Another ad that clearly lists the signup options is as follows. "So make a clean break from the energy of the past. To sign up for Clean Choice, call **toll free 1-888-743-5123**, or mail back the enclosed reply form or fax it to 1-888-317-4743. You can even sign up at our web site, where you'll find more enlightening information on clean power." (PG&E Energy Services)

Be Consistent

Another important principle of effective marketing is to keep the messages consistent. If messages are not consistent, the utility runs the risk that one set of messages might cancel out the others or confuse the audience so much that they doubt the credibility of the company and program. (BEF 2001)

Green power marketing should be coordinated with the utility's overall marketing. Not only does this promote consistency of message, it can also save money through volume discounts on printing and advertising, and can incorporate references to the green power program in any broader communications effort.

Use Humor Carefully

Humor is very frequently used in other types of product advertising. The most memorable advertisements are usually the ones that make us laugh. However, it is more difficult to use humor with the green power market. The emotional connection tends to work better for this market, but if a joke must be used in marketing, make sure you know the type of humor your audience will appreciate and relate to, and whether they will understand the joke (Bolding 2002). And of course, make sure that it remains factual. Customers are already confused about certain aspects of green power.

An example of a Green Mountain Energy ad that uses a little humor yet remains factual, displays a visual of several wind turbines in a row. (Bolding 2002) The text reads, "100% Pollution-free electricity. Yeah. That's what the big fans are for."

Natural Packaging for a Natural Product

Many companies print their promotional material on recycled paper, on special paper with pulp grains still in it, or use a lot of green and blue colors, following the rule that a natural product should be advertised in "natural packaging" (Bolding 2002). For example, the "Salmon-Friendly Newsletter" states, "This newsletter is printed on 100% de-inked post consumer waste. (Salmon-Friendly Power)

An environmentally friendly product that is marketed using heavy white coated paper may not only appear to be an insult to the environment, it may also cause speculation about how much money is being spent on promotion rather than on renewable energy supply.

The Secret to Avoiding Backlash

- Position green products and programs as part of a corporate policy of environmental excellence
- Promote responsible consumption
- Consider the environmental impact of your marketing methods
- Use meaningful claims

Source: Ottman 1998

Images

Research has found that customers respond to the most familiar and aesthetically pleasing renewable images. Wind and solar images are the most popular. (Bolding 2002) Utilities should be careful not to mislead, however. If the green power does not contain wind or solar, those images should not be used.

Tacoma Power uses the image of a green frog on its advertising, combining several aspects of nature to portray a “natural” image. Another example from Flathead Electric Cooperative uses stylized images of wind, water, and the sun.

Common themes

There are several themes that continue to reappear in green power marketing materials. Each serves as a potential reason to participate in a green pricing program.

Help Future Generations

One of the most common messages used in green power marketing is that buying green power will help future generations. The cover of a Salmon-Friendly Power pamphlet advertises, “Children will thank you...Salmon Friendly Power,” and shows a little girl holding up handfuls of yellow daisies (Salmon-Friendly Power, Pacific States Marine Fisheries Commission, For the Sake of the Salmon). Images like the child holding flowers focus on the emotional aspect of advertising.

Another such ad shows a baby looking at and reaching towards a model of Earth. The ad reads, “POWER FOR THE FUTURE,” “Ask not what your planet can do for you...ask what you can do for your planet!” (EarthChoice)

Improve the Environment

An even more obvious message used in green power marketing is that buying green power improves the environment. This type of message should be tailored to the market segment or region, providing specific information about the effects of buying green power in the region in question. (Holt 2000b)

For example, one message says, “By reducing the use of fossil fuels and nuclear power, green energy can help us decrease air and water pollution, protect natural ecosystems, and eliminate hazardous waste handling and storage.” (Conectiv)

Another ad proclaims, “Did you know that the electricity an average California household uses results in 5,300 pounds of carbon dioxide emissions every year?” Then later in the text, a solution is offered: “While we can’t solve the problem entirely, we can make a significant difference. You see, our power blends are dramatically cleaner than generic California electricity. And if every household in California switched to our 75% renewable blend, it would be the air quality equivalent of PLANTING 1.2 BILLION TREES.” (Green Mountain Energy)

Improve Human Health

The connection between buying green power and good health has been used in many marketing messages. Data has shown that reduction in harmful air emissions has an effect on the severity and frequency of respiratory disease and asthma. One simple message gets this point across effectively: “Breathe easier—make the right choice.” (Keystone Energy Services)

Even YOU Can Make a Difference

A popular message is that individual customers *can* make a difference by signing up. Market surveys have shown that many potential customers are skeptical that their participation will have any impact on the environment. Messages that directly address this skepticism have been effective for many utilities, given that they are detailed and specific (Holt 2000b). For example, “In the first year, a consumer spending only \$8 a month can displace greenhouse gases equivalent to those created by a workday commute of 20 miles per day round trip. Participation of four such customers would be the equivalent of taking a late model car off the road for an entire year.” (AllEnergy)

Technologically Innovative

Another theme often used in connection with the previously mentioned messages is that buying green power supports new technologies. In this “age of technology,” being on the edge of innovative technologies is important to many consumers.

An example of this type of message, in connection with the message that buying green power helps the environment, is as follows. “When you buy from us...you’re voting for the Earth with your checkbook. And in response we’re supporting the construction of new wind turbines in California and the largest network of solar arrays in Pennsylvania. What could be more powerful?” (Green Mountain Energy)

Seven Steps to Creative Marketing

1. Find the inherent drama within your offering. Something about your offering must be inherently interesting or you wouldn’t be putting it up for sale.
2. Translate that inherent drama into a meaningful benefit. People buy benefits, not features. Even if you have four or five benefits, stick with one or two—three at most.
3. State your benefits as believably as possible.
4. Get people’s attention. Be sure you interest them in your product, not just your advertising. The advertising should not be more interesting than your product.
5. Motivate your audience to do something. You must tell people exactly what you want them to do.
6. Be sure you are communicating clearly. Test your advertising. Zero ambiguity is your goal.
7. Measure your finished advertisement. Is it effective and does it sell? Is it cost-effective?

Levinson 1993

16 MARKETING METHODS AND CHANNELS

In Chapter 15, “Marketing Content and Messages,” we focused on advice for marketing campaigns, with an emphasis on the messages, the pitch and presentation. In this chapter, we focus on the marketing channels or methods that may be used to reach customers. The marketing and promotion methods described encompass all variety of customer communications, including education, earned media or public relations, targeted sales, grassroots marketing, partnerships, community events, public speaking and paid media advertising.

A review of green power promotional activities reveals that just about everything has been or is being tried, including mass marketing, targeted marketing, community outreach, special events, marketing partnerships and earned media. In many cases, however, these activities seem like random efforts that are not properly coordinated or evaluated.

Which ones are right depend on which are most cost-effective, and which are cost-effective depends in part on the market being served. There is hardly a utility that has not used bill inserts to inform its customers about a green pricing program. Many utilities have tried newspaper advertisements at least once, and many have found community outreach and partnerships to be especially rewarding. Unfortunately, many utilities have failed to promote their programs adequately or smartly. To promote well, utilities need to be creative, using opportunities that they know of in their communities, tracking their success, and building on those efforts that are determined to be the most cost-effective.

A survey of publicly owned utilities with green pricing programs asked program managers which marketing channels were most cost-effective per customer switch. (Lieberman 2002) Responses were tabulated using a 4-point scale where 1 = poor and 4 = excellent. The results are summarized in Table 16- 1. For a more specific example from one utility, see also Table 18-1 in Chapter 18 on Program Evaluation.

Effective promotion is likely to vary by customer sectors:

- Residential customers receive mass marketing, targeted by needs and demographics.
- Small commercial customers receive mass marketing, but targeted by a mix of needs and business type.
- Large/medium commercial customers deserve a highly segmented approach, targeted by business type.
- Large commercial and industrial customers get individual attention where promotion is personal.

Table 16-1. Cost-Effectiveness Ranking of Marketing Channels

Marketing Channel	Mean Response
Bill inserts	3.29
Co-branding/Partnership	3.00
Direct mail	2.95
Newsletter	2.88
Television	2.56
Radio	2.45
Newspapers	2.35
E-mail	2.33
Magazines	2.33
Call center – inbound	2.25
Web site	2.19
Events	2.04
Billboards	2.00
Call center - outbound	0 (not used)

Source: Lieberman 2002

Smart utilities will ensure that marketing, advertising and outreach efforts are well-coordinated. In fact, they should be part of an overall strategy, based on a clear articulation of the strategic goal, whether that is to educate consumers, create brand awareness or increase sales.

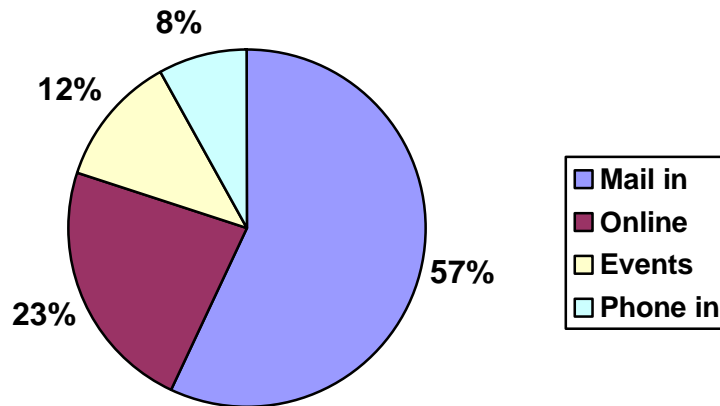
Although there are many approaches and options, Green Mountain Energy—probably the most experienced green power marketer—advises that a utility or marketer not try to accomplish too much in the beginning, with additional advice in the accompanying text box. (Grossman 2001)

- Start small
- Stay focused
- Plan carefully
- Don't spend all your money on one approach
- Leverage your dollars
- Make sure metrics are in place to track results

Integrating promotional themes and consistent messages across all mediums being used will help reinforce the message. One way to do this, especially for larger organizations, is to create a cross-functional team (marketing, sales, customer care, public relations, advertising, events, and legal to review marketing claims) that meets regularly. Another good way to reinforce the message is to coordinate the timing of activities. For example, a news release should appear simultaneously at your web site, or telemarketing should immediately follow direct mail or print advertising.

Most of ENMAX's sign-ups for Greenmax come from tear-offs from bill inserts, point of sale displays, and brochures picked up at events, as shown in Figure 16-1.

Figure 16-1. Source of Sign-Ups for Greenmax



Source: Howland 2002

Mass marketing

If mass media advertising is used, the advertising messages should be derived from market research. Because mass media advertising can be expensive, test marketing is important to refine the messages for maximum effectiveness. The right advertising methods are those that are the most effective per dollar expended--in other words, those that provide the lowest cost per sale.

Most utilities use their access to bills to provide program inserts or messages on the bills. Some include a short blurb on the program in utility newsletters that are usually included with bills.

All but the smallest utilities have a web site, although some utilities make better use of it than others for promoting their green pricing program. Web sites are flexible because they can contain enormous amounts of information. Web sites do not have to be especially flashy and sophisticated, although it is desirable that customers be able to sign up online.

According to ENMAX, 23% of its Greenmax green pricing customers have come from online sign ups, even though that is not where the customers first heard about Greenmax. (Howland 2002)

Beyond the ability to sign up online, two things are particularly important about web sites. First, a site must be well organized and easy to navigate, especially if it contains a lot of information. Second, the content should be updated frequently so the site will be worth revisiting.

For paid media, there are several options, and budgets are often a determining factor. Television is not necessary for most utility service areas, and it is usually prohibitively expensive. Sevier

County (Tennessee) Electric Cooperative, however, used a cable channel that was not nearly as costly as the major network stations.

Knoxville Utilities Board bought billboard space at several key spots and thereby attained good recognition, but billboards cannot explain much and cannot sign up customers. KUB painted one of its trucks with the same logo as was used on the billboards, and used the truck at community events. Also, in conjunction with TVA, KUB bought newspaper ads and inserts and aired radio promotions. (Rhines 2002)

Similar to billboards, some communities with mass transit afford an opportunity to place placards both on the exterior and inside buses or trains. The Portland, Oregon light rail system purchases green power and carries the message, "Ride the Wind," promoting both the program and its purchase simultaneously.

Brochures are another form of mass marketing that can be used in special mailings as well as for take-aways at fairs and other community events.

Targeted marketing

Continuing the Knoxville example, KUB tracked information about its early adopters and then focused on those segments for targeted marketing, using a mail campaign. (Rhines 2002) KUB also worked with local environmental groups to identify and target potential subscribers. One thing KUB did that is not uniformly done by utilities is to train service technicians to cross-sell to customers during service calls. This is a very targeted and personal approach.

Another personal approach is door-to-door canvassing. Most utilities have not tried this, but a few competitive marketers in the US have experimented with it. Competitive marketers overseas in the United Kingdom have also used this technique more extensively and very effectively to get customers to switch, although some have been taken to task for unfriendly pressure tactics. It has been used successfully by the Land and Water Fund of the Rockies, an environmental partner with Public Service Company of Colorado, to sell to small businesses.

Small utilities especially could make good use of a personal letter from the head of the utility. In smaller communities these individuals are usually well known, and the personal appeal could be very effective.

A number of larger utilities have attempted market segmentation studies and used that information to target direct mail to customers with an expected higher propensity to be interested in green power. Sometimes this is based on demographics of education and income, and sometimes it is based on behavior such as membership in food cooperatives, or subscribers to gardening magazines. Some of this behavioral information is available through purchased mailing lists.

It is unclear whether telemarketing has been used cost-effectively to sell green power. Several utilities have reported trying it, and Green Mountain Energy has used it somewhat in competitive markets, but the effect is not known publicly. In a survey of public utilities, none reported using

outbound telemarketing. (Lieberman 2002) In-bound call centers, however, are sometimes used to promote green power sales.

Affinity group newsletters can be a cost-effective way of targeting potential customers. Environmental organizations may be unwilling to provide their mailing lists, but they are usually willing to include an article about the green power option in their newsletter. They may also be willing to include a brochure in a special mailing that the utility pays for, without direct access to the mailing list.

The larger the customer, the more appropriate it may be for targeted marketing. KUB approached selected businesses, including outdoor and sporting goods stores, bicycle shops, allergists, natural food stores, landscape, tree-trimming and pest control companies. It worked with University of Tennessee student groups to target businesses in the campus area, and solicited larger companies through its Key Accounts staff. (Rhines 2002)

Written case studies about good customer experiences provide credibility and security, especially for commercial sales. These case studies can be targeted to important commercial segments. A case study from a peer business can often be effective with others in the same business sector.

Community outreach

Community outreach activities are where utilities can excel without large budgetary outlays, although organizing such activities can require significant staff resources for planning and coordination. Outreach activities create public awareness, help educate customers, and provide an opportunity to sell to potential participants. Just as important, outreach activities are a good way to earn free media coverage, which amplifies awareness and messages.

There are many examples of community outreach. Many utilities staff booths at fairs, festivals and home shows, where they hand out literature, answer questions and try to make sales. Knoxville Utilities Board established sales booths at recycling and waste drop-off points.

Green Mountain Energy co-sponsors the annual Earth Day Festival in Houston, Texas. The festival raises money for the Houston Parks and Recreation Department and environmental charities serving the Houston community, and includes environmental education and live musical entertainment.

A speakers bureau may be useful for making presentations to community groups. Whether it results in sign-ups and a cost-effective use of staff time should be measured.

Public events celebrating the ground-breaking for a generation project, or the commissioning of a generating project are effective in bringing

Knoxville Utility Board's Advice

- Try new ideas and measure impact
- Continue efforts that are working
- Benchmark with other successful programs
- Compare notes with community-based organizations
- Evaluate segment penetration and develop processes to capitalize on performance

Rhines 2002

out supporters and the curious, and also attract media. Periodic tours of the facilities are also a means of community outreach.

Xcel (Colorado) arranged with a local television station to install a camera at its wind farm at Ponnequin. It is used in spots about the wind farm during the weather segment of the news. This helps to bring the wind project into the homes of customers.

Special events

Utilities and marketers can create or sponsor unusual special events that earn free media and reinforce a position of environmental responsibility while educating consumers about environmental issues and the availability of green power. Partnerships with schools naturally appeal to local community news coverage.

Wisconsin Public Service, for example, created an annual Solar Olympics in which high school teams compete in activities to test their knowledge of solar energy. The teams design and construct solar-powered cookers, water heaters and model cars, and participate in a “solar jeopardy” quiz game, solar essay contests, solar building design, marketing campaigns and T-shirt design.

Green Mountain Energy has co-sponsored a high school cross-country solar car race, the Winston Solar Challenge. Originated by the Winston School of Dallas in 1993, this event helps educate young people about the potential of the sun and other renewable energy sources. It draws teams from around the US, Mexico and Puerto Rico.

The Los Angeles Department of Water and Power sponsors an annual Run for a Green LA, which in 2002 is expected to attract over 5,000 runners. The race promotes LADWP's Green LA environmental initiatives including Green Power for a Green LA. LADWP also sponsors an annual Green LA Art Contest as part of its efforts to raise the environmental awareness among the younger generation. Students from grades K-12 can participate in this art contest to help LADWP communicate about green power to its customers. Winning entries are highlighted as part of the green power campaign. Prizes range from \$250 to \$2,000 in Savings Bonds for students or student teams. Additional awards are also provided to students' teachers and schools.

As described in Chapter 11, Peninsula Light Company in western Washington state sponsored an overnight Wind & Wine bus tour to visit a wind farm in eastern Washington, and sample some of the region's best wines. Touring the wind farm and two wineries, plus a little recreational golf, brought good publicity to the program and satisfaction to the members who participated.

Green Mountain Energy has also tried other means of getting attention to its company. Never shy about creating something splashy and newsworthy, it rented a hot air balloon with its name emblazoned on it and floated it across the state of New Hampshire in its first foray into retail marketing. In California, it rented the Veggie Wagon, a minibus that runs on vegetable oil and has a solar PV panel on the top, as an educational device and attention-getter at events.

Opportunities are best known in each local area, but special events are really only limited by the imagination and resources.

Partnerships

Partnerships to promote a green pricing program can take various forms, including grassroots marketing, co-marketing products, and discounts on other products.

Grassroots marketing may be undertaken by local environmental partners (see Chapter 7, Stakeholder Involvement). With their credibility as environmental advocates, and the fact that they are independent of the utility, they can be particularly effective in reaching and convincing some market segments that otherwise might be uninterested or skeptical. The best known example of this is the partnership between the Land and Water Fund of the Rockies (LAW Fund -now Western Resource Advocates) and Public Service Company of Colorado (now Xcel). In this partnership, the non-profit LAW Fund used grassroots organizing techniques to reach a broader set of potential customers, while the utility relied upon more traditional marketing channels such as paid advertising, direct mail and bill inserts. (Mayer et al. 1999)²²

The grassroots campaign involved more than the LAW Fund. In 1999, eight non-profit organizations used the campaign materials to educate customers about the environmental benefits of green power. Grassroots methods included staffing tables at local events, door-to-door sales to small businesses, and supporting University of Colorado students in their campaign to raise fees for the purchase of wind power.

Other important environmental partnerships include that of RENEW Wisconsin with Wisconsin utilities, and the Southern Alliance for Clean Energy and its member organizations in their support for TVA's Green Power Switch program.²³

ENMAX, the Calgary-based utility, created a partnership based on co-marketed products and discounts for its Greenmax program. The Green Club Card offers green power buyers a discount at participating business partners. (For a more complete description, see Chapter 11, Program Design). ENMAX reports that 26% of survey respondents that originally expressed neutral or negative interest in Greenmax expressed positive interest in Greenmax when it was combined with the discounts from other companies. (Howland 2002)

Another form of partnership is illustrated by Green Mountain Energy's offer of frequent flyer miles for purchasing the company's green power products. No longer running, it was an attempt to reach still another market segment (frequent fliers) by appealing to their interest in accruing credits.

²² The full report cited is at the Renewable Energy Policy Project, http://www.repp.org/repp_pubs/articles/resRpt08/grasgrnr.pdf

²³ See <http://www.renewwisconsin.org> and <http://www.cleanenergy.org> for more information about the activities of these groups in relation to green power.

Earned media

Earned media is sometimes spoken of as free media, meaning coverage that is not paid for, unlike advertising. While the newspaper story, radio interview or TV coverage is free, the attention is not entirely free as the title “earned media” implies. It requires planning and staff time to pull off. Media coverage may be earned through many of the community outreach activities described above. Sometimes earned media can be created by writing an op-ed column for a newspaper, or arranging a magazine article as TVA did for *Southern Living*.

Prepared case studies of happy customers can also earn media coverage. Grossman (2001) asserts that customers are your greatest weapon. Regrettably, sometimes reporters are too busy to do much research on their own, so utilities may have to provide media with information about satisfied customers.

Grossman (2001) also recommends that the program sponsor brainstorm story ideas that would interest media. The approaches should be targeted further to specific media (TV, radio, print news). Marketing, sales, customer care, and advertising departments or consultants should all be included in the brainstorming, to get all perspectives. The ideas have a better chance of being picked up if they leverage or relate to relevant news or trends. A good rule of thumb is to ask yourself, “Would it interest me?” and “Can it stand out through all the clutter and noise?”

Case Study in Communications: Green Mountain Energy Texas Launch

For the launch of its green product in Texas, Green Mountain Energy adopted a three-tiered communications program:

1. Promote awareness of clean air and environmental tie-in.
 - Launched Texas Fresh Air Project
 - Partnership with American Forests and donation of 10,000 trees
 - Help restore damaged forest ecosystems and contribute to clean air in the state
 - Complement the environmental choice Texans make when choosing 100% pollution-free wind power
2. Consumer outreach grassroots event in Dallas to build awareness and create visuals (grassroots events get media attention).
 - Super Earth, company “spokesearth”, interacted with consumers to discuss cleaner electricity
 - Handed out tree seedlings and collateral to complement Texas Fresh Air Project announcement
 - Messengered seedlings to Austin, Houston, and Dallas media with press kits
 - Extensive pitching/follow up with media; hired AP stringer; produced B-roll tape
3. Strategic, ongoing media relations campaign to create buzz. Aggressive media relations campaign.
 - Weeks, months leading up to pilot program launch
 - Interviews and background sessions with print and broadcast media in primary markets
 - Interviews with media in smaller markets
 - Ongoing pitching, follow-up

Results

- Met with 14 different reporters in primary and smaller markets
- More than 20 stories ran in key markets
- Repeated broadcast coverage
- All five Dallas stations covered event
- Key messages were picked up; connections made between GME and cleaner air
- AP photo was picked up
- Most prominently featured marketer by media during the week of pilot launch

Lessons

- Visual/publicity stunt in advance works (Super Earth and seedlings)
- Visual element gets attention
- Grassroots media relations good for filling marketing gap in smaller markets
- Creating a news hook provided an edge
- Being integrated with company position and messages is essential
- Being coordinated with marketing is key
- Planning and being strategic is a must
- Having trained spokespeople is essential

Grossman 2001

17 CUSTOMER RETENTION

Once customers have enrolled in a green pricing program, utilities should be careful not to take them for granted. No one will continue to pay for something indefinitely without a reminder of the value provided by the purchase.

Green pricing participants in a TVA-sponsored focus group were especially eager to know about progress with the Green Power Switch program. They suggested a newsletter to keep them informed. In fact, a number of utilities distribute a newsletter to program participants, and all but the smallest utilities have a web site with information about the program.

Whether through a mailed newsletter or a web site, updating participants on the progress and benefits of the program creates a sense of momentum that is key to motivating them to continue with their purchasing behavior. Knowing that others are joining them, that the program is growing, that new renewable projects are being undertaken—all these things reinforce customer actions and make them feel good about participating.

A specially created newsletter might be mailed only to participants, separate from the utility bill. Care should be taken not to make the newsletter too glossy—customers may wonder if too much money is going into communications to the detriment of new renewables, and heavy-coated white paper will contradict the environmentally-friendly intent of the program.

Some utilities may choose to include updates on the program in their regular newsletter that is usually included with electric bills. This approach reaches all customers, and has the advantage of raising awareness and interest among non-participating customers. The disadvantage is that it is limited in how much information can be conveyed.

Another option is to rely on the utility web site to provide updates on the program, but this is less than ideal because it requires action by the customers to seek the information. It would be better if the utility could obtain the email addresses of participants to e-mail them updates or to alert them to new information at the web site. If a web site is the principal means of communicating with customers, it is important not to let the information go stale. Frequent revisions with news, statistics and relevant stories make it more interesting and worth checking back.

Reinforcing the purchase

To communicate a sense of momentum in the program, several utilities routinely include program statistics in their newsletters. By showing a growing number of customers, utilities convey the idea that “you are not alone, you are part of a growing movement.” By showing increasing renewable capacity and generation, they convey the idea that “you are making a difference in the environment.”

Feature stories would of course change with each newsletter. Examples of feature stories include:

- Special events, such as groundbreaking or commissioning of new renewable projects, wind project site tours, renewable energy fairs, or Earth Day activities.
- Educational activities, such as an elementary school poster contest on a renewable energy theme, or a high school solar bake-off or model car race.
- Future plans for expanding new renewable projects.
- Community leaders, such as businesses that buy green power.
- Other environmental issues, such as habitat restoration or global warming.

Several excerpts from newsletters are shown in the text boxes.

Awards Received

Eleven companies and organizations—including **New Belgium Brewing Company** and **Kinko's**—received the First Annual Green Power leadership Awards presented this summer by the U.S. Department of Energy, the Environmental Protection Agency and the Center for Resource Solutions.

The green power purchasers were recognized for their role in building demand for electricity generated by renewable sources.

“These top U.S. companies, along with communities and prestigious universities, are setting an example for how we can use electricity without hurting the environment,” said Jan Hamrin, executive director of the Center for Resource Solutions. “Purchasing green power is critical if we are to increase our energy supply while protecting our natural resources.”

New Belgium Brewing Company made a 10-year commitment to purchase approximately 2 million kilowatt-hours of wind energy per year, equivalent to 100 percent of its electrical energy needs.

Kinko's (based in Ventura, CA) has purchased renewable power in 10 states. Last year, **Kinko's** purchased 15.6 million kilowatt-hours of renewable energy—equivalent to about 5.9 percent of its entire electric energy demand.

Congratulations, **New Belgium** and **Kinko's**!

--City of Fort Collins Utilities, *Watts in the Wind*, Fall 2001

EWEB Windpower Generates Subscribers

On the first anniversary of the introduction of EWEB Windpower -- Earth Day, 2000 -- the program is being touted by EWEB staff and customers alike as an unqualified success.

For years, EWEB customers have communicated with their utility through surveys and focus groups on the issue of energy resource planning. A clear majority supports continued conservation, with the addition of new renewable resources such as solar and windpower. Specific reasons include the local economic benefits of conservation and the sustainability of renewable resources like wind and solar energy, all of which result in cleaner air and a better environment.

Today, over 2,600 EWEB customers have expressed their support for the environment by subscribing to EWEB Windpower, and over 40 percent of the available wind energy already has been assigned.

"The program is going very well," says EWEB Energy Management Services Manager Mat Northway. "Other communities that have started selling windpower view two percent of total customers participating as a success. So far, EWEB's subscription rate is nearly four percent and growing."

Why is wind power so appealing? A number of traits make wind generation an attractive option, but by far the most compelling argument is its low environmental impact.

Customers are choosing EWEB Windpower because it's a simple way to make a big difference. Most of EWEB's electricity is produced using hydropower. However, to provide enough power for its customers, EWEB must buy additional power, some of which is generated using fossil fuel at coal-fired power plants and natural gas turbine generators around the Northwest.

In the case of power produced by a coal-fired plant, generating just one kilowatt hour of electricity can release two pounds of carbon dioxide into the atmosphere. The energy needed to supply the typical EWEB customer (15,000 kilowatt hours annually) would release 15 tons of carbon dioxide each year if produced from a coal-fired power plant.

EWEB customers have already signed up for nearly 10 million kilowatt hours (kWh) per year of windpower. By investing in an environmentally benign power source like EWEB Windpower, you can use the economic power of the marketplace to start replacing the electricity produced by polluting power plants. Eventually, as power from polluting power plants becomes harder to sell, it will become unprofitable for power producers to make. Today, you can control where your utility dollars go, and help start this process by directing your utility payments to the most environmentally responsible power plants and away from those that simply pollute.

"The fact that we've achieved even our current level of success underlines the special concern for the environment that is shared by our community," adds Northway.

--Eugene Water and Electric Board, *Fresh Air Journal*, Spring 2000

The Switch Is On at the Johnson City Power Board

By Angela Shrewsbury of the JCPB

At the beginning of this year, the Johnson City Power Board (JCPB) kicked off its Green Power Switch program with a “green breakfast,” followed by a “green PowerPoint presentation.” The following week, in order to increase awareness about Green Power Switch, an incentive program was put into play, and employees were encouraged to attend a “green hot dog lunch.” During the lunch, those serving not only dressed in green, but also painted “GP” on their faces. The face-painting and free lunch definitely captured employees’ attention. The incentive program theme was “The Switch Is On,” and employees could qualify to receive cash or time-off incentives based on the number of green power blocks they sold to commercial and residential customers.

In addition to rallying employees for Green Power Switch, the JCPB marketing staff has been busy spreading the word in the community. Green power has been introduced to the community via various public meetings with schools, civic clubs, and other organizations such as the Sierra Club and Southern Alliance for Clean Energy. The community meetings have been well received, and media coverage has been phenomenal. An advertising campaign was also coordinated and included radio advertisements, print ads in various publications, bill inserts, messages on customers’ bills, and lobby posters. In its first two months, JCPB sold blocks to 110 residential and five commercial customers, surpassing its original signup goal. On average customers are buying 2.5 blocks of green power per person, the highest average in the Tennessee Valley.

--Tennessee Valley Authority, *Green Power Switch News*, Vol. 2, No. 2—Spring 2002

18 PROGRAM EVALUATION

The purpose of a program evaluation generally is to determine the impacts of the program and to determine how the program might be improved. A program evaluation might also be undertaken to reassess the market—consumer awareness, understanding and satisfaction—following a year or more of program promotion.

This chapter suggests some possible goals and objectives, and then considers how progress can be measured, including data sources and tracking systems necessary to facilitate the evaluation.

Goals and objectives

The first step in any program evaluation is to establish clear goals for the program. It is better to establish explicit goals during program planning so that the information necessary for evaluation can be identified. Without explicit goals, one can still evaluate a program, but judging its success requires at least an implicit value judgement.

Some hypothetical goals include for example:

- Increase the amount of renewable energy on the electric system
- Improve the environment
- Increase customer awareness of the green pricing program
- Maximize participation and satisfy participating customers
- Achieve cost-effective customer acquisition

These goals are rather general, and should be backed up with more detailed objectives. It is easier to determine success if the objectives are quantified. For example:

Increase the amount of renewable energy on the electric system

- Add X MW of new wind generating capacity in (state).
- Generate XXX MWh from these new resources.
- Sell XXX MWh to green pricing participants
- Generate XX % of utility sales from renewable energy

Improve the environment

- Reduce NOx emissions by X%

- Reduce CO₂ emissions by Y%
- Reduce SO₂ emissions by Z%

Increase customer awareness of the green pricing program

- Achieve XX% awareness among residential customers

Maximize participation and satisfy participating customers

- Achieve X% residential market penetration/XXX number of participants
- Achieve sales of XXX MWh to non-residential customers/XXX number of participants
- Obtain positive attitudes by participants about sign-up, communications, price, environmental benefits, etc.

Achieve cost-effective customer acquisition

- Determine profiles of participating market segments
- Acquire customers at an average cost not to exceed \$XX

Metrics and data sources

These objectives indicate, for the most part, what metrics will be used to measure success in meeting the goals. The next step is to identify, in advance of launching the program, the data sources for these metrics. In some cases it will be obvious, but it is important that data collection and tracking systems be developed in advance of program launch. Tracking systems need not be expensive or complex. A spreadsheet or a relational database should suffice.

For energy impacts, data sources include nameplate ratings for generators, metered generation data, and sales data.

Environmental impact data will require either measurements or estimates of emissions from the green power generators, and baseline emissions data—what you are comparing to. The latter can be difficult. The US Environmental Protection Agency maintains a very useful database on emissions called eGRID. Although this data lags current information by about two years, it is very helpful in that it provides emissions data, in tons per MWh, at the facility, utility and state levels. The utility and state emissions data is, however, average data, and may not represent marginal emissions from generators that are most likely to be backed off the system when the renewable generators are producing. Many fossil plants have continuous emission monitoring devices, but not necessarily on all generating units. Utilities could estimate emission factors for generators operating on the margin, but they should be sure to document how the baseline emissions calculation was done, and update it each year.

Customer participation data should come from the program tracking database. Utilities should also be careful to collect basic information about each participating customer to facilitate market segmentation and follow-up interviews. This requires special effort to determine what

information about customers can realistically be collected on sign-up forms and from telephone sign-ups (for example, children at home, income ranges, hobbies, etc.). Consumers often are asked to provide this type of information with registration cards when they purchase something, but of course it is not always returned. Utilities may decide just to rely on zip code or census block demographic data, or if they have purchased targeted mailing lists, this information may already be available to them. The minimum desirable information is probably participant contact information to facilitate customer follow-up surveys.

The cost of customer acquisition should be carefully tracked. Utilities should devise ways to identify what promotion customers are responding to, and should track the response to each separately. That way the cost per customer acquired can be determined for each and the most cost-effective methods can be identified and continued, and the least cost-effective methods can be eliminated. Acquisition costs in the \$100 per customer range are probably typical, though this information is hard to get because it is usually not tracked carefully. Some programs have spent well over \$100, while the best performers are probably at \$50 or under per customer. Table 18-1 shows an example of customer acquisition costs for Sacramento Municipal Utility District.

Program evaluation could also rely on benchmarking—a comparison to the best performers among other utility green pricing programs. Some of this information—the highest number of participants, highest market penetration, the highest renewable energy sales, and the lowest price premiums for green power—is maintained by the National Renewable Energy Laboratory and published as the “top ten” lists at the Green Power Network web site.

Although most of the evaluation focus is external (market awareness, customers satisfaction, quantitative results), it can also be beneficial to conduct a process evaluation from the perspective of internal actors. For example, can the efficiency of the signup process be improved? Can the means by which program data is collected and transmitted to the program database manager be streamlined? Evaluators might interview utility telephone staff to ensure they have enough information to answer customer questions, or customer service reps to see if they have any suggestions for collateral material that would be useful in their customer contacts, or the people who input data needed for the program tracking database.

One other task should be performed for each program. At least annually, utilities should report to their customers and green pricing participants how much green power has been generated, and how much has been sold to green pricing participants. In fact, accreditation of a utility green pricing program requires that data be provided that supports an audit of supply and demand. Obviously, supply should be equal to or greater than demand, or participants are paying for something they are not getting. Some utilities track this information on a monthly basis. Projections of supply and demand can also be used to indicate when a utility should begin planning its next phase of green power supply.

The Tennessee Valley Authority launched its green pricing program Green Power Switch in 2000. A summary of TVA’s initial evaluation plan is shown in Table 18-2. Note that objectives and evaluation activities may have changed since this plan was created, in response to lessons learned or new priorities.

Table 18-1. SMUD 2000 Program Evaluation Report (Sample)

Sales Channel	Date	Target Population	Sales Customers	Response Rate	Cost	Cost per Customer
Call Center	Ongoing	45,000	10	0.02%	-	-
Customer Retention	Ongoing	800	5	0.63%	-	-
KVIE Magazine Ad	Feb-00	40,000	6	0.02%	\$1,200	\$200
Envelope	Mar-00	450,000	-	-	\$8,000	-
Bangtail	Mar-00	450,000	901	0.20%	\$12,240	\$14
Radio	Mar-00	450,000	-	-	\$22,755	-
CSUS Earthday	Apr-00	12,000	22	0.18%	\$2,383	\$108
Direct Mail (brochure with bumper sticker)	Apr-00	10,000	136	1.36%	\$14,110	\$104
Trade Show	May-00	-	6	-	-	-
Day in the Zone (event)	Jun-00	17,000	31	0.18%	\$20,468	\$660
Direct Mail (oversize brochure Nexus CD)	Jul-00	11,711	78	0.67%	\$9,552	\$122
Raley's Display	Jul-00	500,000	28	0.01%	-	-
Bangtail	Jul-00	450,000	774	0.17%	\$12,240	\$16
Direct Mail (BRC/letter: 1 st class)	Aug-00	14,500	200	1.38%	\$9,425	\$47
Direct Mail (BRC/letter: bulk)	Aug-00	15,500	198	1.28%	\$8,525	\$43
Zoo Direct Mail	Aug-00	10,500	7	0.07%	\$10,500	\$1,500
SFNC	Sep-00	3,000	17	0.57%	\$5,200	\$306
Direct mail (BRC/brochure: 1 st class)	Sep-00	7,000	86	1.23%	\$8,750	\$102
Direct Mail (BRC/brochure: bulk)	Sep-00	8,000	88	1.10%	\$9,200	\$105
Zoo Day	Sep-00	3,000	5	0.17%	\$1,000	\$200
Bill Insert	Oct-00	450,000	440	0.10%	\$8,000	\$18
Mower Letter	Nov-00	1,100	47	3.18%	\$600	\$13
Mailer 11/27	Nov-00	5,000	74	1.48%	\$2,500	\$34
TOTALS			SALES		EXPENSE	CAC AVG
			3,159		\$166,648	\$53

Source: Burke 2001

Table 18-2. TVA Evaluation Outline

Objective	Metric	Data Requirements/Sources
1. Improve environment	Quantity of green power sold (kWh) Avoided emissions resulting from green power sales Energy efficiency impacts achieved in conjunction with green power	Distributor reporting of green power sales Conversion factors for air emissions from regional coal facilities Survey of participating customers
2. Grow renewable energy supply in the Valley	Capacity installed of solar, wind and landfill gas resources Energy produced by each plant	Supply contracts/facility nameplate ratings Busbar meters (wind and landfill gas) Solar system monitoring data
3. Engage Power Distributors	At least one distributor participant in each TVPPA district in year one Increase number of participating distributors by 45 in year two Distributor satisfaction	TVA/Distributor agreements signed Distributor interviews
4. Launch in year 2000	Launch on or about Earth Day 2000 Generation on-line four to six months after launch	Press announcements
5. Satisfy participating customers	Number of participants 1% of eligible residential customers signed up 5% of green energy sales to non-residential customers per Distributor Opinions and attitudes of participants about: <ul style="list-style-type: none"> ▪ Sign-up ▪ Communications ▪ Price ▪ Environmental benefits ▪ Delivery of product ▪ Customers service ▪ Impact of future loyalty ▪ Other 	Distributor monthly reports to TVA Survey of participating customers at multiple points: <ul style="list-style-type: none"> ▪ Sign-up ▪ Departure ▪ Mid-point of Market Test
6. Increase customer awareness of Green Power	At least 25% of customers aware of the Green Power program in service areas of participating Distributors Interest in future program participation	Random survey of participating Distributor customers

Source: TVA 1999

19 THE CONSTELLATION OF SUCCESS

Program experience suggests price is not the only determinant of program success. Based on a review of utility market research and observation of many green pricing programs, the following ten elements form a constellation of success, as shown in Figure 19-1.

1. **Quality.** Good quality programs:

- **Rely on careful market research.** Most attitude surveys show strong support for the environment generally, and a willingness to pay more for renewable energy in particular. Utility research should focus on customer resource preferences, product design and marketing messages.
- **Incorporate added-value features.** Added value may be provided by protection against rate increases, customer recognition programs, qualification for tax deductions if the program is set up as a contribution, as early-adopter status of a PV system on your roof, through discounts on related products or services, or by some combination of methods.
- **Emphasize new renewables.** Most utility programs offer only electricity generated from new renewable capacity, built to serve voluntary demand. This provides greater assurance that purchases will benefit the environment.
- **Charge a reasonable price.** In regulated markets, the price should be based on cost, not what the market will bear, because there is no competition to help keep prices down.

2. **Credibility.** The credibility of both the utility and the product affects consumer interest. Utility credibility can be affected by:

- **The external environment.** Rate increases, nuclear power plant operational problems, massive downsizing, major mergers, can all influence consumer perceptions of a sponsoring utility.
- **The handling of marketing and administrative costs.** Successful sponsoring utilities spend enough to create visibility and momentum, but not so much to detract seriously from investment in new generation. What they do spend is targeted and monitored for cost-effectiveness.
- **Partnerships with community and environmental groups.** Marketing partnerships formed with outside groups interested in environmental improvement through green pricing help “get the word out” and adds credibility to the sponsor. Such partnerships may also focus media attention on the program.

Product or program credibility can be affected by:

- **The amount of new renewables added to the system.** Customers look for the development of new renewable resource supply through a green pricing option because they want to feel they are contributing to the improvement of environmental quality. Why should customers pay extra for existing renewable energy supply that has simply been repackaged and re-marketed?
- **Third-party certification.** Environmental endorsements and the involvement of active local stakeholders in program development can help increase the credibility of the product or program. Accreditation of green pricing programs enhances credibility because it demonstrates that the program meets standards that are acceptable to local stakeholders.

3. Simplicity. A successful program is easy to understand. Technical terms are avoided or explained, and entry and exit from the program is as simple as a phone call or at most a short registration card. The details of the option should be clear and up front. A required customer commitment, if necessary because the sponsor is unwilling to assume risk, should not be so onerous as to deter participation. Choosing a new electricity service is befuddling enough without added confusion.

4. Marketability. Although green pricing has come a long way since its conception, it is still considered a niche market. Segmentation and targeted marketing are important. Just because customers say they are willing to pay more for renewables does not mean they will rush to buy when green power is offered. Promotion is essential, and like retail product or service advertisements, repeated exposure is necessary for success. One press release or bill stuffer is not enough.

5. Strategy. Utility sponsors in particular must have a strategy for how green pricing fits into their long-range plans and future restructuring directions. This requires a leader with a vision (top management support is key). These organizational plans will help determine how best to position the green offer — as a competitive strategy, a customer service, regulatory appeasement or technology experience.

6. Tenacity. Success will require perseverance and a long-term perspective to take green pricing from a niche market to mainstream. It will require public education about energy resources and their environmental impacts, outreach to environmental and other potentially allied groups, and follow-through on marketing plans. Low levels of participation in the early years (less than 1%) may be realistic for the introduction of new products that are unfamiliar to consumers, but with continued effort, education and promotion, a 5% participation level (or greater) can be achieved.

7. Tangibility. Although customers cannot see green electricity, renewable energy offered from projects that are specific as to resource, technology and site make them more real. Specificity creates a sense that customers could go out and “kick the tires” of what they are buying. Bundling features that add private value (in addition to the public goods benefit of a cleaner environment) make the product more tangible. The more private benefits provided with the purchase of a green pricing product, the more willing the customer will be to pay extra.

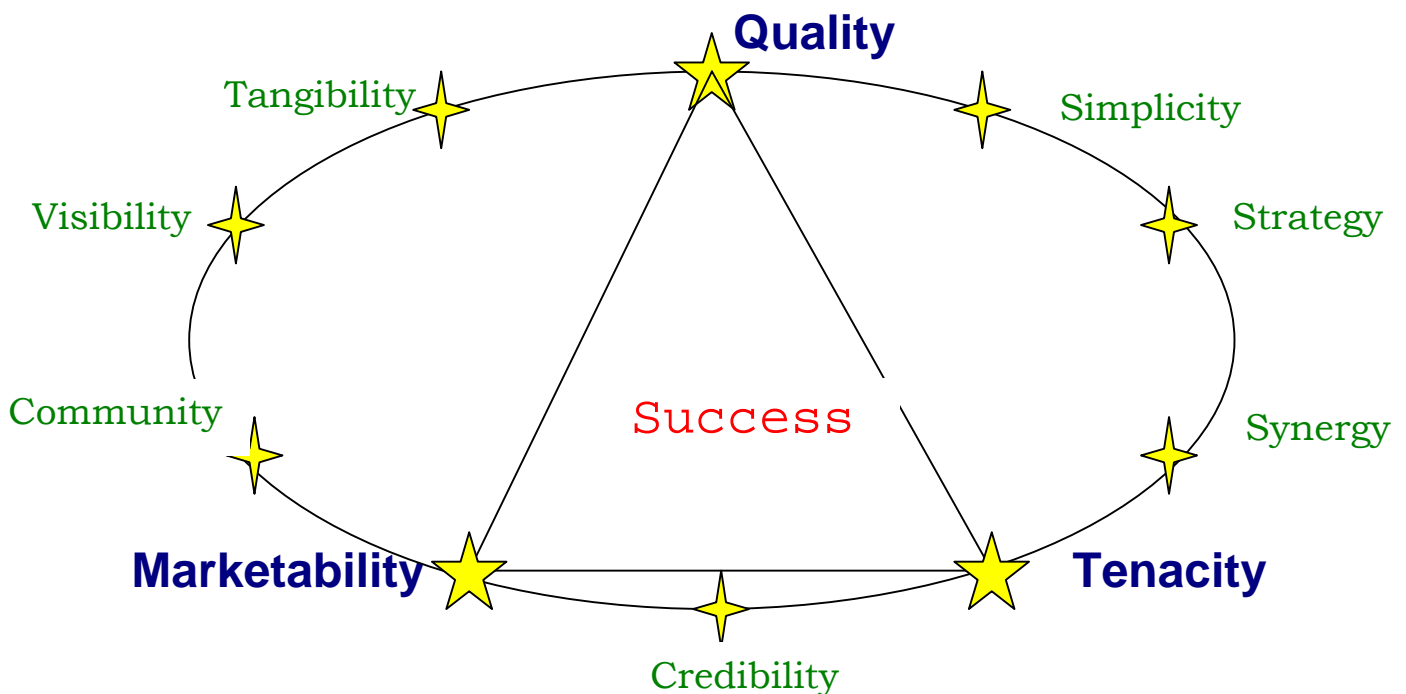
8. Visibility. Visibility reinforces tangibility and can be achieved in several ways. First, locating a renewable project close to the potential market is desirable though not always possible. If the project is located specifically to provide significant transmission or distribution system benefits, the potential market may be close at hand. Second, a bigger project will attract more attention and create a bigger impression. Third, multiple sites make the project visible to more customers.

The involvement of well-known businesses can also add visibility to the program. Announcements made by Toyota and Starbucks —among many others— prove that big-name businesses involved in green pricing can create positive buzz for the program.

9. Community. Relating to visibility, project location can provide a community focus. Community cohesion and pride in “our” renewable project can support community-based marketing. Community-based programs may achieve higher participation levels, especially in smaller communities. However, community-based marketing can also work in larger areas if executed efficiently. A large, investor-owned utility could work with a small community and focus marketing efforts there for a project located nearby.

10. Synergy. Several marketers and utilities have developed several green products to appeal to different market segments. The idea behind this approach is that there should be something for everyone. Even the “Don’t Cares” of EPRI’s market segment study (EPRI 1997) could be targeted if the right message is delivered. This variety should help reinforce awareness of all options, just as roaming charges, monthly minutes, and wireless web raise awareness of telephony choices.

Figure 19-1. The Constellation of Success



20 REFERENCES

Barrington-Wellesley Group (BWG), 2002. Evaluation of the Green Power and Public Benefits Programs of the Los Angeles Department of Water and Power. Prepared for the City of Los Angeles City Controller, Final Report. August.

Baugh, Keith, Brian Byrnes and Clive Jones, 1994. "Research Fuels Public Service Co. of Colorado's Development of a Customer-Driven Renewable Energy Program." *Quirk's Marketing Research Review*, May.

Baugh, Keith, Clive Jones and Brian Byrnes, n.d. "Evaluating Customer Willingness to Pay for Demand-Side Management Programs Using the Contingent Valuation Method." *Proceedings of the EPRI/EUMRC 5th Biennial Marketing Research Symposium*, 91-99. Dallas, Texas: Electric Power Research Institute.

Bird, Lori, 2003. Information provided from January 2003 NREL survey of green pricing programs.

Bird, Lori, Ryan Wiser and Scott Olson, 2003. Information provided from January 2003 survey of green pricing programs and forthcoming NREL/LBNL report.

Bolding, Keri, 2002. "Methods to the Madness: Developing Effective Green Power Marketing Messages." Presentation at Southeast Green Power Summit, Raleigh, NC, May 8.

Bolinger, Mark and Ryan Wiser, 2002. "Quantifying the Value that Wind Power Provides as a Hedge against Volatile Natural Gas Prices." Presented at Windpower 2002, Portland, OR.

Bolinger, Mark, Ryan Wiser and William Golove, 2001. *Revisiting the "Buy versus Build" Decision for Publicly Owned Utilities in California Considering Wind and Geothermal Resources*. Berkeley, Calif.: Lawrence Berkeley National Laboratory, October.

Bonneville Environmental Foundation (BEF), 2001. Green Power Marketing Manual, "Marketing Green Power to End Users."

Burke, Jim (SMUD), 2001. "Green Power Marketing Fundamentals." Presentation at Sixth National Green Power Marketing Conference, Portland, Oregon, August 1.

Byrnes, Brian, Clive Jones, Keith Baugh and Maribeth Rahimzadeh, 1995. "Talk is Cheap: Electric Customer Willingness to Pay for Environmental Externalities." Unpublished paper distributed at SolTech '95, San Antonio, Texas. April.

Champ, Patricia and Richard Bishop, 1998. *Wind-Power Program Participation, Developing Predictive Models*. Report 179-1. Madison, WI: Energy Center of Wisconsin, December.

Cliburn, Jill, 1999. "The Green Choice," *Rural Electrification*, September.

Decision Research, 1992. Summary of Green Power Research Results. Prepared for New England Power Service, August.

Electric Power Research Institute (EPRI), 1997. *Green Power Guidelines, Volume 1: Assessing Residential Market Segments*. TR-109192-V1. Palo Alto, CA: Electric Power Research Institute, December.

Energy Customer Management, 2002. "A Matter of Service, or Perception?" July/August, p. 9.

Farhar, Barbara, 1993. *Trends in Public Perceptions and Preferences on Energy and Environmental Policy*. Golden, Colorado: National Renewable Energy Laboratory.

Farhar, Barbara, 1996. "Energy and the Environment: The Public View." *REPP Research Report No. 1*. College Park, Md.: Renewable Energy Policy Project.

Farhar, Barbara, 1999. *Willingness to Pay for Electricity from Renewable Resources: A Review of Utility Market Research*. Golden, Colorado: National Renewable Energy Laboratory.

Fort Collins Light and Power, 1996. Press release, "Wind Power Pilot Program."

Friedman, Barry, 2002. "Market Research Survey II: Finding Green Energy Buyers" E Source Green Energy Service, GE-11 July 2002.

Green Power Network (GPN), 2002. <http://www.eren.doe.gov/greenpower>.

Green Pricing Newsletter, 1995. Gardiner, Maine: The Regulatory Assistance Project. No. 2, May.

Grossman, Marci (Green Mountain Energy Company), 2001. "Getting Your Message Out...The Power of Integrated Communications." Presentation at Sixth National Green Power Marketing Conference, Portland, Oregon, August 1.

Holt, Edward., 1997. *Green Power for Business: Good News from Traverse City*. Research Report No. 1. College Park, MD: Renewable Energy Policy Project, July.

Holt, Edward, 2000a. *Green Pricing Update 1999*. TR-114211. Palo Alto, California: Electric Power Research Institute.

Holt, Edward, 2000b. *Green Power in Competitive Markets*. EPRI-TR 114210. Palo Alto, California.

- Holt, Edward, and Ryan Wiser, 1999. *Understanding Consumer Demand for Green Power*. Washington, DC: National Wind Coordinating Committee.
- Holt, Edward, Ryan Wiser, Meredith Fowlie, Rudd Mayer and Susan Innis. 2001. *Understanding Non-Residential Demand for Green Power*. Washington, DC: National Wind Coordinating Committee.
- Howland, Theresa., 2002. "Successful Green Power Marketing Strategies." Presentation at Green Power Marketing Conference, Calgary, Alberta. April 3.
- Kalweit, Bruce and Terry Peterson, 1999. *Green Power Guidelines: Volume 2, Assessing the Small- and Medium-Sized Business Market Segments*. TR-109192-V2. Palo Alto, CA: Electric Power Research Institute.
- Leinberger, Paul, 2001. "Roper Green Gauge 2000." Presentation at Sixth National Green Power Marketing Conference, Portland Oregon, August 1.
- Levinson, Jay, 1993. *Guerrilla Marketing*. Boston: Houghton Mifflin Company.
- Lieberman, Dan, 2002. *Green Pricing at Public Utilities: A How-to Guide Based on Lessons Learned to Date*. San Francisco, Calif.: Center for Resource Solutions, October.
- Market Strategies, 1999. PacifiCorp Satisfaction, Loyalty and Segmentation Research, Green Summary. February.
- Mayer, Rudd, Eric Blank and Blair Swezey, 1999. *The Grassroots are Greener: A Community-Based Approach to Marketing Green Power*. Report Research Report No. 8. Washington, DC: Renewable Energy Policy Project, July.
- Miedema, Allen, 1995. "New Product/Service Design: NMPC Green Products Case Study." Presented at Green Pricing Workshop, Florida Public Service Commission, December 6.
- Mitchell, Robert and Richard Carson, 1989. *Using Surveys to Value Public Goods, The Contingent Valuation Method*. Baltimore: The Johns Hopkins Press for Resources for the Future.
- National Association of Attorneys General (NAAG), 1999. "Environmental Marketing Guidelines for Electricity." Environmental Marketing Subcommittee of the Energy Deregulation Working Group, December.
- National Renewable Energy Laboratory (NREL), 2002. List of utility green pricing programs as of June 2002 at Green Power Network, <http://www.eren.doe.gov/greenpower>
- Ottman, Jacquelyn, 1998. *Green Marketing: Opportunity for Innovation*. 2nd edition. Chicago: NTC Business Books.

Peterson, Susan, 2002. "Xcel to introduce 'green pricing' wind power program." *Star Tribune*. Minneapolis, Minnesota, May 10.

Pokorny, Gene, 1985. "The Marketing of Customer Satisfaction." Presented to Edison Electric Institute Joint Executives Symposium, Phoenix, Arizona, November 14. Cambridge, Mass.: Cambridge Reports/Research International, Strategic Publication Series No. 209.

Pokorny, Gene, 1987. "Earning Customer Satisfaction by Marketing Energy Efficiency." Presented to Energy Management Division Conference, Electric Council of New England. Bretton Woods, New Hampshire, August 10.

Pokorny, Gene, 1994. "Doing More with Less: Building Customer Loyalty Through Targeted Service Differentiation." Presented to International Symposium on the Future of the Electrical Power Industry, Toronto, Canada, February 8. Cambridge, Mass.: Cambridge Reports/Research International, Strategic Publication Series No. 239.

Regulatory Assistance Project (RAP), 1994. Renewable Energy Presentation to North Dakota Public Service Commission, May 4.

Rhines, Darrin, 2002. "Green Power, the Power to Change the World." Presentation at Southeast Green Power Summit, Raleigh, NC, May 8.

Richer, Jerrell, 1995. "Green Giving: Factors Influencing donations to U. S. Environmental Groups." *Resources*, No. 121, published by Resources for the Future, Fall.

Rogers, Everett, 1992. *Diffusion of Innovations*. New York, NY: The Free Press.

Ross, Susan, 1999. "Green Power for the Tennessee Valley." Presentation at Fourth National Green Power Conference, Philadelphia, Pennsylvania, May 11.

Sacramento Municipal Utility District (SMUD), 1995. "Achieving Municipal Power Goals in a Competitive Age," *1995 Integrated Resource Plan*, IV: 1-59.

Savage, John (Green Mountain Energy), 2002. "Identifying Your Customer Base." Presentation at Southeast Green Power Summit, Raleigh, NC, May 8.

Schulze, William, 1994. Green Pricing: Solutions for the Potential Free-Rider Problem. Available from the author, Cornell University, (607) 255-9611.

Sturgis, Jane (Dakota Electric Association), 1997. Personal communication, October 3.

Swezey, Blair and Lori Bird, 2000. *Green Power Marketing in the United States: A Status Report*. NREL/TP-620-28738. Golden, Colorado: National Renewable Energy Laboratory.

Swezey, Blair and Lori Bird, 2001. *Utility Green Pricing Programs: What Defines Success?* NREL/TP-620-29831. Golden, Colorado: National Renewable Energy Laboratory, September.

Synergic Resources Corporation (SRC), 1995. "Green Pricing Programs Receive a Mixed Customer Reception," *Energy Services Marketing Letter*, 1:5, December 11.

Tennessee Valley Authority (TVA), 1999. Request for Proposal, RFP-259433, Green Power Market Test Evaluation. Chattanooga, Tenn.: Tennessee Valley Authority, December 3.

Wan, Y., Blair Swezey and Ashley Houston, 1998. *Utility Green Pricing Tariffs*. NREL Topical Issues Brief, Peer Review Draft. Golden, Colorado: National Renewable Energy Laboratory, May.

Weijo, Rick, 1996. "Believe in the Possibilities." Presentation at DOE/EPRI Green Pricing Workshop, Golden Colorado, April 12.

Weijo, Richard and Douglas Boleyn, 1996. "Product Concept and Field Test of Green Marketing Programs." *Proceedings of the 1996 ACEEE Summer Study*, 8:215-220. Washington, DC: American Council for and Energy-Efficient Economy.

Winneg, Kenneth., Herrmann, Melissa, Levy, Alan, Roe, Brian, 1998. *Summary Report, Baseline Survey: Consumer Knowledge, Practices, and Attitudes: Electric Utility Deregulation and Consumer Choice*. Gardiner, Maine: The Consumer Information Disclosure Series, The Regulatory Assistance Project.

Wiser, Ryan, 1999. "Greening the Electricity Industry: The Green-e Certification Program." Peer review draft.

Wiser, Ryan, 2002. "Public Goods and Private Interests: The Role of Voluntary Green Power Demand in Achieving Environmental Improvements." Doctoral Dissertation in Energy and Resources. Berkeley, Calif.: University of California, Berkeley.

Wiser, Ryan, Mark Bolinger and Edward Holt, 2000. "Customer Choice and Green Power Marketing: A Critical Review and Analysis of Experience to Date," *Proceedings of the ACEEE Summer Study on Energy Efficiency in Buildings*, 2000.

Wiser, Ryan, Mark Bolinger, Edward Holt and Blair Swezey, 2001. *Forecasting the Growth of Green Power Markets in the United States*. NREL/TP-620-30101. Golden, Colorado: National Renewable Energy Laboratory.

Wiser, Ryan and Steven Pickle. 1997. *Green Marketing, Renewables, and Free Riders: Increasing Customer Demand for A Public Good*. Berkeley, Calif.: Lawrence Berkeley National Laboratory.

Wood, L., M. Bala, A. Kenyon, W. Desvousges, F. Johnson, E. Fries, M. Kelleher and T. McClive, 1995. "Evaluating the Market for Green Products: Measuring Customers' Willingness to Pay." *Proceedings of Energy Efficiency and the Global Environment: Industrial Competitiveness & Sustainability*, 201. Newport Beach, California: February 8-9.

