

# NRECA White Paper on Renewable Energy



## EXECUTIVE SUMMARY



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## Introduction

With an ever-changing regulatory environment and seemingly countless implementation options, formulating a renewable energy policy can be a daunting task for any cooperative. This paper is meant to serve as a guide to cooperatives to help them make informed decisions about renewable energy. It will cover the main issues of importance related to green power, including the market for renewable energy, trends in generation and consumption, responding to member-generator requests for interconnection, regulatory and legislative requirements, and specific case studies of other cooperatives' experiences with green power.

### 1. Why is it important To Be Knowledgeable about Renewable Energy?

#### A. Consumer Interest

Consumer interest in renewable energy has grown steadily in recent years. This interest has been fueled by government entities, environmental groups, farm groups, manufacturers of renewable energy technologies, and others who promote renewable energy by arguing that it can offer enormous environmental and economic benefits at reasonable costs. These groups encourage consumers to install their own generation equipment and to pressure their utilities to sell green power. It is no surprise, therefore, that cooperatives are receiving inquiries from residential, business, and public/institutional consumer-owners interested in renewable energy.

#### B. Regulatory/Legislative

Most cooperative managers are aware that there are numerous state and federal laws and regulations relating to renewable energy. Federal law requires most utilities, including most cooperatives, to interconnect with and purchase the output from certain "qualifying facilities" (QFs), which includes most renewable generators with a capacity of 80 MW or less. There are also a multitude of state laws and regulations relating to renewable energy, including renewable portfolio standards, interconnection and net metering mandates, and a broad range of incentives. Moreover, like end-use consumers, state and federal regulators and legislators are showing increased interest in renewable energy.

#### C. System Benefits

Under the right conditions, generators can offer benefits to rural cooperatives. For example, installation of photovoltaic (PV) systems on long, heavily loaded radial lines has helped avoid system upgrades or new line installations in Arizona.

#### D. Power Supply

A broad, balanced power supply portfolio can help cooperatives reduce their power supply costs and risks. Renewable energy can provide one part of a balanced portfolio. It is important, however, to understand that not all power is created equal. While electricity generated from renewable sources such as biomass or hydropower may be suitable for baseload generation, wind and solar are not very good substitutes. Wind and solar energy are intermittent suppliers of electricity. However, there are regions in the United States where renewable energy resources are able to give a strong showing based on costs that are on a par with the traditional generation resources. Furthermore, in cases where costs

are not competitive, the higher costs associated with renewable energy may be outweighed by their noneconomic benefits to the cooperative.

## 2. What Are Cooperatives Doing With Renewable Energy?

In 2005, NRECA's membership adopted a new resolution on renewable energy. Among other things, the resolution expresses cooperatives' support for R&D of renewable energy, the responsible inclusion of cost-effective renewable resources in the energy portfolio, the development of policies and procedures for the interconnection of consumer-owned generation, and efforts to educate policymakers and the public about renewable energy. In fact, co-ops around the country have already been in the forefront with respect to all of these activities.

### A. Research and Development

The NRECA's Cooperative Research Network (CRN) has studied and reported on a variety of renewable energy topics dating back nearly 10 years, when it published a report that evaluated a commercial photovoltaic powered pumping system. Since that time, CRN has developed software tools to help co-ops assess and apply distributed generation—particularly wind—and provided reports on a variety of topics, such as green power opportunities for co-ops, the impacts of wind generation on bulk power systems planning, and solar livestock watering with standard well pumps.

### B. Investing in Their Own Renewable Generation

Building naturally on their role as generators of electricity, G&Ts have invested in renewable energy generation projects—both owned by the cooperative and by third parties.

### C. Buying Renewable Energy from Another Developer in Bulk

Several cooperatives, including Basin Electric and Western Farmers Electric, have chosen to purchase substantial quantities of renewable energy from for-profit developers based on economic, operational, and administrative considerations. These arrangements have been largely spurred by the federal production tax credit, which has provided a cost advantage to for-profit renewable energy producers, relative to cooperatives.

### D. Buying Renewable Energy from Consumers

Many cooperatives purchase renewable energy from member-owners with renewable generation equipment. For example, Garkane Energy, which serves members in Southern Utah and Northern Arizona, has developed policies that allow it to purchase consumer-owned renewable generation.

### E. Cooperating with Other Utilities

A group of cooperatives in Georgia has developed an innovative arrangement to acquire the renewable energy they sell to their member-owners. Seventeen cooperatives banded together in 2001 to create Green Power EMC—an entity that exists to provide renewable energy to its member cooperatives for sale to end-users. Eleven more co-ops have joined since then, and together the 28 Green Power member co-ops now offer renewable energy to approximately 1.2 million households in Georgia.

#### F. Selling Renewable Electricity at Retail

Co-ops often get involved with renewable energy by selling it to their residential and commercial/institutional consumers. More than 300 distribution co-ops have some kind of renewable energy offering for their members. There are, however, a variety of ways in which cooperatives have chosen to structure their pricing system. Generally, this process involves charging a premium for renewable energy to account for its higher production costs relative to traditionally generated electricity. Where renewable energy is price-competitive, some co-ops have simply included it in their portfolios as a good supply choice.

#### G. Educating Consumers, Regulators, and the Media

In systems with G&Ts, the G&T often has taken the lead in educating interested parties on cooperative involvement with renewable energy. At other times, statewide organizations have assumed this role. Distribution cooperatives also have become involved in educating their members and others about the costs and benefits of renewable energy. These cooperative outreach and education efforts have taken the form of Web site information, bill stuffers, advertisements in media, public events, and other means.

#### H. Fostering Community and Economic Development

As discussed above, renewable energy can have a positive impact on community and economic development. Distribution cooperatives play a key role in this relationship in that they will undoubtedly be involved in either purchasing or wheeling the green power produced by their consumer-owners or independent power producers in their service territories. If a mutually beneficial financial arrangement can be agreed upon, renewable energy generation can be a win-win situation for consumer-generators and co-ops.

### 3 Types and Characteristics of Renewable Resources

The definition of “renewable,” or “green,” often is in the eye of the beholder. Many state and federal renewable energy programs define “renewable energy” differently. Trade and farm groups also define renewable energy in different ways to promote their specific agendas. Under most state renewable portfolio standards, renewable energy sources include biomass, wind, geothermal, solar thermal, photovoltaic, fuel cells using renewable fuels, small hydropower, landfill gas, ocean wave, ocean thermal, and tidal current. Note that large hydropower projects—while certainly based on a renewable resource—often are not considered “green” for regulatory purposes. NRECA, however, has opposed this arbitrary definition and has urged a broader definition. In its 2005 resolution, NRECA stated its support for “power developed from renewable resources that naturally replenish, utilize residual materials, or recycle waste. Renewable resources include hydro (both low head and high head), landfill methane, geothermal generation, manure digesters, wind, solar, biomass, wood, oilfield-stranded gas, waste coal, and others.”

#### A. Wind

Wind power is the fastest-growing form of electricity generation in the United States, with generation growth rates of 24% per year over the past five years and installed capacity of nearly 4,000 MW. Moreover, the growth of wind generation has been widespread throughout the United States, with utility-scale wind power plants now located in 27 states.

#### B. Biomass

Biomass is the largest non-hydro renewable form of electricity generation in the United States, with 9,733 MW of installed capacity in 2002. While exact definitions of biomass can vary, it is generally said to include electrical generation based on burning of plant materials, wood, and wood waste (5,886 MW), landfill gas collection, and burning of municipal solid waste (MSW) (3,308 MW) and a variety of smaller categories, including agricultural waste gas collection (539 MW). Biomass generation is quite similar to traditional generation in that it usually involves direct-fired power plants that produce steam used to turn turbines, which generate electricity. The main difference is the fuel, with organic materials or reclaimed gases used to create steam, rather than fossil or nuclear fuels.

#### C. Geothermal

Geothermal generation techniques use the heat trapped below the earth's surface to generate electricity. There are several ways in which a geothermal resource may be used to generate electricity. For areas where high-quality steam can be piped from the ground and directly used to turn turbines, dry steam plants are most efficient. If high-temperature water reservoirs are present, flash steam plants—which instantly turn hot water to steam by bringing it from high pressure to low-pressure areas—may be more effective. Lastly, if underground water reservoirs are of a more moderate temperature, they can be used to vaporize liquids with boiling points lower than water, creating steam to turn generating turbines.

#### D. Hydroelectricity

Hydropower is the largest source of renewable electricity generation in the United States, with nearly 80,000 MW of capacity. It provides cost-effective electricity from a proven renewable resource with no greenhouse emissions and can be used as a source of base load or peaking power. Importantly, hydropower is also, by far, the largest source of renewable energy to cooperatives. Hydroelectric generation involves using the kinetic energy in moving water to turn turbines that generate electricity.

#### E. Solar

While the total capacity of solar generation in the United States is small, it is important to cooperatives, as consumers may decide to install solar electric systems at their homes, farms, or businesses. Solar electricity generation can be divided roughly into two categories. First, concentrated solar power systems collect heat from the sun and use that heat to generate steam to turn generator turbines. Second, photovoltaic (PV) systems, which often are installed in residential homes and commercial establishments, directly convert light energy to electricity using semiconductor technology. While there are currently only 392 MW of installed solar generation capacity in the United States, its

popularity with residential consumers make solar electricity one of the most attention-worthy forms of renewable energy for cooperatives.

#### 4. Government Activity

##### A. Federal Mandates

###### 4.A.1. Public Utilities Regulatory Policies Act (PURPA)

Facing an energy crisis, Congress enacted PURPA in 1978—a law that established some of the most important regulations affecting the generation of renewable electricity. In order to achieve its goal of promoting electricity generation from alternative energy sources, Section 210 of PURPA requires utilities to interconnect with certain qualifying generating facilities (QFs), sell the QFs backup electricity at a just and reasonable rate, and purchase excess generation from the QFs at the utility’s avoided cost. Importantly, most nonutility-owned generation facilities of less than 80 MW in capacity and based on renewable technologies such as wind, solar, and biomass are considered QFs. Practically, this means that utilities—including cooperatives—are required to buy the output of certain consumers who choose to generate electricity using renewable energy.

Following enactment of the Electricity Modernization Act of 2005 (EMA), some utilities, including some cooperatives, will be able to apply to the Federal Energy Regulatory Commission (FERC) to be exempted from the purchase and sale obligations in PURPA Section 210.

###### 4.A.1.1. All-Requirements Contracts

Most distribution cooperatives have entered into requirements contracts with G&Ts to reliably meet the energy needs of their members. Under such contracts, a distribution co-op agrees to purchase its full power requirements from a G&T and the G&T agrees to meet the full demand of the distribution co-op’s members. Co-ops should be aware, however, that an all-requirements contract does not preclude or protect them from being required to purchase qualifying generation under PURPA or other federal or state laws.

###### 4.A.1.2. Implementation Plans

All state public utility commissions and non-state rate-regulated electric utilities (PURPA Sec. 210(f)(2)) were required by PURPA to adopt implementation plans. Many states and most utilities, however, have probably not reviewed their implementation plans since they were adopted, despite significant industry-wide and co-op specific changes since 1978. It is important that cooperatives review their plans to make sure they are still consistent with law and still protect their financial interests. And, because G&Ts and distribution cooperatives often must work together to implement PURPA, the whole system may need to review their PURPA implementation plans together.

##### 4.A.2. Federal Power Act

###### 4.A.2.1. FERC jurisdiction under the Federal Power Act

Section 201 of the Federal Power Act gives FERC jurisdiction over transmission in interstate commerce and wholesale sales in interstate commerce. Unless it is a QF under PURPA, a renewable generator that sells power at wholesale is a public utility subject to FERC jurisdiction, even if a consumer owns the generator. As such, it

would have to file a tariff at FERC governing the rates, terms, and conditions of its wholesale sales and would have to comply with numerous other FERC requirements.

#### 4.A.2.2. Implications for Cooperatives

As explained above, FERC only regulates transmission service by a few large cooperatives. That means that, depending on how FERC implements EPAct, most distribution cooperatives will never need to worry about FERC regulation. Nevertheless, a few large distribution cooperatives and approximately 26 large G&Ts may be subject to FERC rules with respect to interconnection with renewable generators and wheeling of the output from renewable generation.

#### 4.A.2.3. FERC Interconnection Rules

If a cooperative is FERC jurisdictional, it will be subject to two interconnection rules recently issued by FERC. One rule governs interconnections of generators with capacities greater than 20 MW (Order No. 2003), and the other governs interconnections of all generators with a capacity no larger than 20 MW (Order No. 2006). These rules were designed to eliminate disagreements associated with responsibility for interconnection and system upgrade expenses.

#### 4.A.2.4. FERC Wheeling Requirements

Those cooperatives subject to full FERC jurisdiction as public utilities must file Open Access Transmission Tariffs with standardized terms and conditions for transmission service. Even cooperatives that are not considered public utilities may still submit “reciprocity tariffs” with FERC that include terms and conditions identical to or superior to the terms and conditions in the standardized OATT.

### B. State Requirements

#### 4.B.1. Interconnection Requirements

As with FERC at the federal level, many states have drafted their own interconnection rules. Some states, such as Nevada, only specify the technologies and sizes of generators automatically eligible for interconnection. Most states have detailed interconnection requirements only for a small category of residential renewable generation. Others—including New York, California, and Ohio—have adopted detailed interconnection rules covering every aspect of the interconnection process, including the procedures, contracts, and technical engineering standards in their interconnection regulations. The Dsire database lists interconnection rules for every state and can be accessed online.

#### 4.B.2. Renewable Portfolio Standards

Approximately 22 states have enacted RPS. These portfolio standards compel covered utilities to acquire a stated percentage of the energy they sell from specific renewable resources. The selection of resources, the deadline for meeting different percentages, the percentages themselves, and other details vary widely among the various state standards and proposals.

#### 4.B.3. Net metering or net billing

At least 39 states require some utilities to purchase the output of some DG under net metering tariffs. Typically, net metering provides that distribution companies must install a meter that rolls forward when the consumer takes power off the grid, and rolls backward when the customer injects energy into the grid from its own generation.

#### 4.B.4. Other State Mandates

As an alternative to portfolio standards, some states have simply mandated that utilities offer green power to those customers who are willing to purchase it at a premium. This means that the G&Ts serving cooperatives in those states have had to acquire renewable resources so that they will be available in the event that any consumers request it. Other states—primarily those with retail competition—have required utilities to disclose on a periodic basis the generating resources that they used to serve consumers in the previous period, the emissions characteristics of those resources, and, in some cases, also the actual emissions associated with the energy produced in that period. While these mandates increase the availability of information to consumers, they also increase the burden of record keeping for co-ops.

### C. Federal Incentives

#### 4.C.1. Federal Production Tax Credit

The federal government currently offers a renewable production tax credit of 1.5 cents per kWh for wind and closed-loop biomass, which has been adjusted for inflation to 1.9 cents per kWh.<sup>1</sup> Because of their nature as not-for-profit organizations, however, cooperatives are largely unable to benefit from such incentives. This restriction has limited the full potential for development of renewable energy in communities served by co-ops and municipal utilities, freezing out potential market participants. Moreover, it has prevented incentives from serving their purpose of increasing utility participation and making renewable generation technologies more affordable.

#### 4.C.2. Clean Energy Bonds

The Energy Policy Act of 2005 provides electric cooperatives and public power systems with “clean renewable energy bonds” that provide an incentive comparable to the Production Tax Credit that is available for private developers and IOUs. In essence, a clean renewable energy bond offers cooperatives interest-free loans for financing qualified energy projects. Qualified energy projects include wind, closed-loop biomass, open-loop biomass (including agricultural livestock waste), geothermal, solar, municipal solid waste (including landfill gas and trash combustion facilities), small irrigation hydropower, and hydropower. The Energy Policy Act specifies that the Secretary of Treasury will issue regulations not later than 120 days after enactment. The Act was signed into law on August 8, 2005.

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<sup>1</sup> The federal production tax credit was recently extended by Congress and will be funded through Dec. 31, 2007.

#### 4.C.3. Renewable Energy Production Incentive

The Renewable Energy Production Incentive (REPI) is an appropriations program created in 1992 to offer cooperatives and municipalities the same 1.9 cents/kWh production tax credit that is available to IOUs and private developers through the tax code. REPI has been chronically under-funded, however, leaving many renewable generators unable to collect the incentive they had been promised. NRECA supports more reliable incentive programs such as “clean renewable energy bonds.” It is noteworthy, however, that REPI was reauthorized under the Energy Policy Act of 2005 through 2026. Appropriations may continue, but the program will most likely remain under-funded or may be terminated once not-for-profit utilities begin to take advantage of the clean renewable energy bonds.

#### 4.C.4. Federal Grant and Loan Programs

There are a wide range of grant and loan programs from the federal government to encourage renewable energy generation. Perhaps the largest of these is the loan guarantee program offered by the Department of Agriculture’s RUS. Under this program, RUS guarantees loans from the Federal Financing Bank, Rural Utilities Cooperative Finance Corporation and National Bank for Cooperatives, on behalf of cooperatives or public utility districts. The assurance that the loan guarantee provides to lenders allows cooperatives to obtain preferential interest rates on their loans, thereby decreasing their borrowing costs. Notably, the yearly amount of loan guarantees made available for renewable electric generation projects is \$200 million.

#### 4.C.5. R&D Funding

The Energy Policy Act of 2005 authorizes DOE to fund energy-related R&D programs through programs in Renewable Energy and Energy Efficiency among others authorized in the final energy bill. The bill envisions steadily increasing budgets for all of these programs including a more-than doubling of the renewable energy budget from \$380 million in FY 2005 to \$852 million in FY 2009. However, the authorization bills only contain suggested funding levels and do not actually provide funding. The FY 2006 request and appropriations for these programs will fall far short of the authorized levels, making large increases in appropriations in FY 2007 unlikely.

### D. State Incentives

#### 4.D.1. State Tax Credits and Rebates

States offer a wide range of incentives to producers of renewable energy. These incentives can include personal and corporate tax credits or deductions, as well as credits on property taxes or sales taxes paid when purchasing renewable generation equipment. Cooperatives can familiarize themselves with the full range of incentives available in their states by reviewing the Database of State Incentives for Renewable Energy, available online at [www.dsireusa.org](http://www.dsireusa.org).

#### 4.D.2. State Grant and Loan Programs

Seventeen states offer loan programs for renewable energy projects and 20 offer some form of grant program.

## 5. Responding to Consumer-Owned Renewable Generation

As discussed above, cooperatives may have a legal obligation to interconnect renewable distributed generation systems to the grid. First, if the generator is a QF under PURPA, the co-op is required by law to interconnect the generation system to the grid and purchase its excess output at avoided cost. Second, Section 210 of the Federal Power Act may require the cooperative to interconnect to any generator that intends to sell electricity in the wholesale market. Third, state laws may require interconnection. Even when no legal obligation exists, co-ops may offer interconnection because they recognize that it is an important issue to their members, or because they recognize that a positive approach can prevent angry members, bad press, lawsuits, and/or new regulations.

### A. How To Prepare for Interconnection Requests

The key to successful interconnections is preparation. As discussed in more detail below, and in great detail in NRECA's "DG Interconnection Tool Kit," it is helpful if co-ops have developed a full interconnection package before the first consumer walks in the door with a proposed project.

#### 5.A.1. Initial Research

Cooperatives should conduct their initial research regarding distributed generation well before they are approached with an interconnection request.

#### 5.A.2. Board Policy

In light of the information obtained in the initial research process, the co-op's board of directors can determine the broad strategy that the cooperative will pursue and communicate this strategy to managers and employees.

#### 5.A.3. Implementation

Once the board has decided the co-op's direction, the co-op staff must implement that policy with appropriate interconnection contacts, applications, procedures and rates.

## 6. Selling Green Power

### A. Explanation of Green Tags

Renewable energy certificates, or green tags, are products that represent the "renewable" element of renewable generation. When a wind farm generates electricity, for example, it can be considered to be producing two products: kWh and "renewable characteristics" represented by green tags. These two products can then be sold together or separately. In fact, the "renewable characteristics" can be broken off from the kWh and sold at a geographically distant location—without the need to transmit the actual kWh.

### B. Applications for Co-ops

#### 6.B.1. Satisfying Environmental Regulations

One of the primary benefits of green tags to cooperatives is that they may—where permitted—allow co-ops to comply with renewable energy regulations, without actually installing capacity or purchasing power from a renewable generator.

### 6.B.2. Selling Green Tags to Wholesale or Retail Customers

Even where no mandated portfolio standards exist, green tags can be useful to co-ops that would like to offer renewable energy to their members, but are unable to produce or purchase renewable generation directly. Since there is no way to separate renewable and traditionally generated electricity on the grid, purchasing green tags provides the same environmental benefit as purchasing electricity from a co-op with its own renewable generation.

## C. The Market for Renewable Energy

In order for cooperatives to be successful in selling renewable energy to their members, they must be familiar with the various segments of the market. As discussed below, different strategies may be necessary to market green power to different types of consumers.

### 6.C.1. Households

A market for renewable electricity products already exists in the form of environmentally conscious residential consumers. These consumers are characterized by a willingness to pay premium prices in exchange for the collective environmental benefits associated with renewable energy.

### 6.C.2. Commercial/Institutional

Another potential market for renewable electricity is among businesses that wish to purchase green energy in order to be perceived as environmentally friendly. While it may seem unlikely that businesses, with their profit-driven motivation, would be interested in purchasing renewable energy, major corporations—including Toyota, Kinko's, and Whole Foods—already have become significant purchasers of green products. In fact, inquiries from businesses sometimes serve as the catalyst for co-ops' initiation of renewable energy programs.

### 6.C.3. Public Sector/Government

Government entities interested in promoting renewable generation should not be overlooked as potential buyers of renewable energy. Federal agencies—including the Departments of Energy, Transportation, and Interior—as well as divisions of the armed forces; the states of Washington, New York, Pennsylvania, Tennessee, and California; and cities such as Seattle, Chicago, and Santa Monica, all have become major purchasers of green power. Moreover, Executive Order 13123 requires federal agencies to obtain 2.5% of their electricity needs through renewable energy.

## 7. Challenges for Renewable Energy

While involvement in renewable energy activities can offer numerous benefits, several drawbacks to renewable energy limit the role it can play in meeting the nation's demand for power. These obstacles can be found on the supply side, in the form of low load factors and a lack of transmission infrastructure, as well as the demand side, where a

lack of public awareness about renewable energy can frustrate efforts to market green power.

#### A. Low Load Factors

While certain renewable technologies, such as biomass and geothermal can serve as continuously operating base load capacity, others—especially wind and solar—are subject to the uncertainties of weather, leading to low capacity factors.

#### B. Gauging Market Demand Is Difficult

Some market surveys conducted before the implementation of a renewable energy program have indicated support levels well over 50%. Once push came to shove, however, and customers were asked to show their support by paying premium prices for it, the participation rate was only 1%. Clearly, this divergence between survey responses and actual participation can make planning for renewable energy programs difficult.

#### C. Lack of Adequate Transmission Infrastructure

The areas with the greatest wind potential tend to be far from major load centers, meaning that additional generation must be transmitted significant distances before it can be used. For example, while North Dakota has great potential as a wind-generating area, additional power produced there would need to be sent across Minnesota to Minneapolis or Chicago to be consumed.

#### D. Consumers Lack Information about Renewables

Unfortunately, consumers tend to lack accurate information on renewable energy. This can lead to difficulties both for co-ops trying to sell it and those being asked to buy it from consumers with distributed generation systems.

#### E. Selling Green Power

For co-ops selling renewable energy and seeking to expand the market for this product, a lack of consumer education can be a massive obstacle to success. First, the co-op's members may not even know they are eligible to purchase it. Additionally, even if they are aware of the existence of a renewable energy program they may not understand why renewable energy—which is based on fuels that are “free”—costs more than traditionally generated electricity.

#### F. Buying Renewable Energy

Encouraged by overly optimistic sales pitches from sellers of renewable generation equipment, some members have chosen to install distributed generation equipment without a full understanding of its costs and benefits. This can lead to member dissatisfaction if they install an economically infeasible generation system. Moreover, this scenario can create difficulties for co-ops if members attempt to gain higher prices for their excess power through lawsuits.

### 10. Conclusion

The cooperative system has reached a critical point in the evolution of the renewable energy market. While renewable energy supplies only a fraction of the

country's electricity demand, consumer and political interest have made it an increasingly important segment of the electricity industry. Through legislative and regulatory activity, as well as consumer interest, co-ops will be coming under increased pressure to incorporate renewable energy into their operations.

Cooperatives, therefore, face a choice as to how to respond to the growing support for renewable energy. They can choose to oppose the expansion of renewable energy options in the electricity market. This decision, however, could cause irreparable harm to cooperatives' reputations with consumers and regulators. It also could significantly limit the ability of co-ops to participate in the regulatory and legislative process.

Alternatively, if co-ops seek creative ways to make renewable energy work for their members, the rewards could be substantial. The public and policy-making communities will view co-ops as responsible partners in the quest to provide reliable, cost-effective power in a way that minimizes harm to the environment. This respect could then translate into increased clout with policy-makers and increased respect from consumers.

Renewable energy offers unique opportunities and challenges for every co-op. Managers must, therefore, begin to consider how their co-ops can best incorporate it into their operations and how they will respond to member requests related to renewable technologies. Through preparation, co-ops can ensure that they will not be caught off guard by renewable issues, but will instead be able to continue to offer outstanding service to members through renewable energy.