UTAH DEPARTMENT OF COMMERCE
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UTAH'S NET METERING PROGRAM

BEST PRACTICES, PROGRAM BARRIERS, AND RECOMMENDATIONS

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UTAH
LIFE ELEVATED

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Purpose of Report: The Public Service Commission seeks to understand why net metering participation rates appear to be low. This report addresses Commission concerns by examining the components of Utah's net metering law, identifying potential barriers that inhibit participation, assessing the attributes of other State net metering policies with relatively high participation rates, and recommending potential strategies to deal with the Utah-specific barriers.

Conclusions/Recommendations:

The success of Utah's net metering program depends on the following factors:

- Full support from the Governor
- Strong leadership from the Commission
- A direct focus on goals
- Attractive incentive programs

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EXECUTIVE SUMMARY

This report is in response to a request from the Utah Public Service Commission (Commission) to the Division of Public Utilities (Division) to evaluate the status and level of participation in Utah's net metering program. Specifically, the Commission wanted to understand why program participation rates are, in fact, so low. The Commission asked the Division to identify potential barriers to Utah net metering participation and to investigate potential strategies that might enhance program participation and effectiveness.

Best Practices

The Energy Policy Act of 2005 (Epact) requires all States to consider a net metering program by 2008 or explain why their existing program is sufficient.[1] The Division reviewed various net metering programs in other States in order to discover best practices and net metering programs that have produced successful results. The Division also looked at factors that might be potential barriers to participation. The Division reviewed available literature in the field, technical publications, and industry studies.

[1]Energy Policy Act of 2005, Pub. L. No. 109-58, 119 Stat. 594.

Net Metering Barriers

With Utah's current statute and tariffs in mind, the Division identified specific barriers that may discourage program participation and explain the low customer application rates in Utah. First, our current net metering program is not economically attractive due to Utah's already low electric rates and a variety of other factors. Second, the caps on allowable generation may be too low. Third, there is a lack of public outreach and consumer information available for the public. Fourth, the standards for interconnection of the components may be too stringent. In other words, if the program was economical and Utah ratepayers were aware of the program and its benefits, net metering would possibly have a higher participation rate in Utah.

Potential Solutions

Given our review of the available literature and programs in other states, the Division determined that success in net metering programs has been associated with the following strategies and best practices that will be discussed at length in this report:

- Generous incentives, including rebates and tax credits to offset the cost of renewable energy investment
- Clearly defined program goals that focus on information, education, and public outreach to encourage participation
- A streamlined customer application process in conjunction with simplified interconnection and liability standards
- Expanding the pool of eligible participants by raising the caps on the maximum generation capacity allowed among applicants
- Strong support from political leaders and the State commissions

This report concludes with several recommendations to the Commission, such as further investigation and study of the program, opening a new investigative docket, and implementing a public outreach program throughout the State.

ISSUE IN BRIEF

The Division identified five primary barriers potentially inhibiting participation in Utah's net metering statute. First, net metering may not be economically attractive. Factors such as low relative energy prices, high capital costs for development of self-generation, and modest, lapsing credits appear to be significant determinants affecting participation. Second, the cap on available cumulative generating capacity may be too low. Likewise, the statutory limits on the size of each individual self-generation system may also be too low. While these caps may help minimize revenue loss to the relevant utility, they may also serve to limit the number of potential participants. Third, there may be a lack of political support, public outreach, and consumer information about net metering opportunities. If more Utah ratepayers were made aware of the program and its benefits, participation could be higher. Fourth, stringent system design, component, and interconnection requirements may be excessive and could discourage broader-based participation.

Finally, the insurance requirements to indemnify participants against liability should be reviewed to ensure that insurance costs do not become a barrier to participation.

BACKGROUND

In 2002, the Utah Legislature passed a law requiring all electric utilities and cooperatives operating within the State to allow eligible customers the option of connecting their renewable energy systems to the electric grid. This legislation, commonly known as the "Net Metering" law, was formally signed by Governor Mike Leavitt in March 2002 and was implemented in 2003. However, since its inception, program participation appears to be low. As of 2004, only 10 eligible customers opted to participate in the program. The data for Utah in 2005 shows an increase, however, to a total of 30 participants.[2]

As a result, the Utah Public Service Commission (Commission) requested the Division of Public Utilities (Division) to evaluate the level and status of participation in Utah's net metering programs. Specifically, the Commission asked us to determine why program participation rates are relatively low and to recommend strategies to enhance program effectiveness and participation rates.

Net metering is a program that enables utilities to measure and bill for the net electricity consumption or generation of their customers with small generating facilities. This is accomplished either by allowing a meter to turn backward, or by using two meters--one to record consumption and one to record generation and then manually subtracting the two readings. The difference constitutes the net credit to the customer. Without net metering, small customer-owned generators are usually treated by electric utilities as if they were qualifying facilities (QFs) under the Public Utility Regulatory Policies Act of 1978 (PURPA) and subsequent implementation rules by the Federal Energy Regulatory Commission (FERC). For relatively small generating facilities, net metering may be a more attractive alternative than having to

[2]Energy Information Administration, Form EIA-861. U.S. Net Metering Customers by State and Customer Class, 2005.

comply with federal and state requirements necessary to qualify as a QF. However, net metering customers still must enter a net purchase and sale agreement with the relevant utility. These customers pay retail rates for the energy they use, and the company reimburses customers at the utility's avoided cost for the energy they produce.

Laws and regulations that establish net metering practices now exist in 40 States. The Energy Information Administration (EIA) has collected data and recorded net metering program participation from 2002 to the present. The EIA data shows that, as of 2005, there is a total of 21,146 customers using net metering programs in the nation.[3] As far as Utah participation is concerned, Rocky Mountain Power has 3 commercial and 26 residential electric participants.

Also, as part of the EPACT, State regulatory authorities are required to consider new PURPA standards including one standard concerning net metering. The Utah Commission is currently in the process of deciding whether it will implement the PURPA net metering standard or whether Utah currently has an equivalent standard. Therefore, the information in this report may prove informative to that process (see Utah Commission Docket No. 06-999-03).

[3]EIA, Form-861.

ANALYSIS

Barriers to greater net metering participation and effectiveness include policy, economic, and technological barriers. Specifically, the Division identified and grouped these into five primary barriers that potentially inhibit greater participation in Utah's net metering statute. First, net metering may not be economically attractive. Factors such as low relative energy prices, high capital costs for development of self-generation, and modest, lapsing credits appear to be significant determinants affecting participation. Second, the cap on available cumulative generating capacity may be too low. Likewise, the statutory limits on the size of each individual self-generation system may also be too low. While these caps may help minimize revenue loss to the relevant utility, they may also serve to limit the number of potential participants. Third, there may be a lack of political support, public outreach, and consumer information about net metering opportunities. If more Utah ratepayers were aware of the program and its benefits, participation could be higher. Fourth, stringent system design, component, and interconnection requirements may be excessive and could discourage broader-based participation. Finally, the insurance requirements to indemnify participants against liability issues should be reviewed to ensure that insurance costs do not become a barrier to participation. Each of the five primary barriers is discussed.

Economic Barriers

The economic factors associated with net metering appear to pose significant barriers to participation. These economic barriers include Utah's low relative energy prices, high investment costs, and modest net generation credits. Low relative energy prices and modest net generation credits are barriers that specifically relate to Utah's program. These factors combine to make it more difficult for a participant to recoup the investment costs of a self-generation system.

Low electricity rates appear to be a strong disincentive to participation. Levelized self-generation costs per kilowatthour (kWh) typically exceed Utah's current electric rates. For example, research conducted by the Renewable Energy Policy Project (REPP) show that levelized costs for residential photovoltaic systems are about 7

cents higher than current electricity rates in Utah.[4]

REPP research shows that a typical 1 kilowatt (kW) photovoltaic system costs about $7,150 installed.[5] On average, this same system generates about 47,250 kWh of power over its 25-year useful life. This equates to a simple net cost of about 15 cents/kWh. The REPP study lists benefits that are avoided energy, capacity, carbon dioxide emissions and sulfur dioxide emissions costs, and a hedge value for future prices. These benefits total about 11 cents/kWh, which results in a net loss of about 4 cents/kWh.[6] Thus, without incentives, rebates, or other subsidies, the investment cost of many such systems outweighs the benefits.

Also, under the Utah statute, customer credits for net electricity generation (NEG) accumulated during the calendar year expire at year end. In addition, the credit received is at the company's avoided cost, which is significantly lower than the retail rate it typically charges. Under net metering, a participating customer pays retail rates for the energy they use and the company credits them at a rate that is at least equal to the utility's avoided cost for the energy they produce in excess of consumption. The differences between a utility's retail rate and the avoided cost can be substantial. For example, Rocky Mountain Power's current avoided cost rate is approximately 4 cents less than its retail rate.[7] These modest, lapsing credits may likewise have a constraining effect on potential participation.

Utah's statute is relatively simple and does not proscribe incentives geared at making net metering more economically viable. Other states use a number of economic incentives or potential "best practices" to make net metering feasible. New Jersey's program uses tax incentives, progressive rebates, and surcharges to create incentives for investment in small-scale renewable energy.[8] The New Jersey statute provides for a "Societal Benefits Charge" levied on all public utility customers. It also provides for a rebate program that compensates participants for each kilowatthour of electricity generated by small

[4] Renewable Energy Policy Project. July 2003, Case Study: Arizona, www.crest.org/articles/static/1/binaries/Arizona%20Case%20Study.pdf.

[5] *Ibid.*

[6] *Ibid.*

[7] Rocky Mountain Power, Electric Service Schedules No. 1 and 37.

[8] Dworkin, Michael, "Freeing the Grid: How Effective State Net Metering Laws Can Revolutionize U.S. Energy Policy," Network for New Energy Choices, Report No. 01-06, November 2006.

solar, wind, and biomass generators. Likewise, in California, net metered solar and wind systems with a generating capacity of up to 200 kW qualify for a State tax credit. This credit is equal to the lower of either 15 percent of the cost paid for the purchase and installation, or $4.50 per rated watt of the solar or wind energy system.[9]

The effect of low relative energy prices appears to be the dominant factor affecting the economic viability of self-generation and subsequent participation in Utah's net metering program. Testimony provided by REPP suggests that investment in self-generation will occur only if system costs are comparable to the expected cost of electricity from their utility provider.[10] Consequently, the Commission may consider conducting an in-depth evaluation of the pros and cons of incentives or other measures such as those found in the New Jersey or California programs. Implementation of such practices will likely have an economic impact on participating utilities. As a result, in addition to the benefit of net metering, the recommended analysis should weigh the effect against the array of potential incentives considered.

Capacity Limits

The caps on available cumulative self-generating capacity and the limits on the size of each individual system may be too low, create investor uncertainty, and could ultimately bar greater program participation. Currently, an electrical corporation may discontinue making a net metering program available when the cumulative generating capacity of customer generation reaches the equivalent of 0.1 percent of the utility's peak demand that occurred in 2001, which equates to 3,515 kW.[11] In addition, the statute limits individual generating capacity to a maximum of 25 kW.[12]

While Utah's current participation is well below the statutory caps, capacity limits can artificially restrict the expansion of ongoing renewable generation and create uncertainty for new customers considering net metering. For example, customers have no way of knowing when capacity limits will be met, so they cannot effectively plan

[9] California Public Utilities Commission Energy Division, "Update on Determining the Costs and Benefits of California's Net Metering Program as Required by Assembly Bill 58," March 29, 2005.

[10] Beck , Fred, "Comments Submitted to the Florida Public Service Commission: Undocketed Workshop on Florida Renewable Technologies Assessment," Renewable Energy Policy Project, July 2, 2002, p. 1.

[11] Rocky Mountain Power, Electric Service Schedule No. 135.

[12] UCA §54-15-102 (2)(a), p. 97.

for future self-generation investment. Neither can they be certain that these investments will qualify for net metering.

The baseline New Jersey and California programs have fewer restrictions on available system capacity. New Jersey places no limit on maximum generation. Until recently, California capped system capacity at 0.5 percent of peak load. By mid-2006, California's three major utility companies were all close to reaching the cap, and analysts determined the program would have exceeded the limit before year end. As a result, the California State Assembly recently amended their net metering statute to raise the enrollment cap to 2.5 percent of a utility's aggregate peak demand.[13]

Both New Jersey and California allow higher levels of generation capacity for each individual system. New Jersey caps individual generating capacity at 2 megawattts (MW) for both residential and commercial users while California limits capacity to 1 MW for all classes and also provides for biogas generation up to 10 MW.[14] The New Mexico Public Regulation Commission recently amended their rule governing small power production and increased the limit for net metering systems from 10 kW to 80 MW.[15]

The Commission should consider evaluating the statutory cumulative generation cap to determine if the current 0.1 percent limit at 2001 peak load reasonably addresses future goals and potential demand. A similar analysis should be considered for the current 25 kW individual generation capacity limit. Increasing the eligible facility size may prompt larger nonresidential customers to invest in self-generation systems and thus encourage broader-based participation.

Program expansion would affect the revenue stream of participating utilities. However, utility revenue losses may be offset as expanded program participation may serve to mitigate rising demand for new generation resources. This could help to reduce or defer capital development costs. An analysis should include an in-depth evaluation of potential effects to all involved participants.

[13] Dworkin.

[14] Interstate Renewable Energy Council "Connecting to the Grid Project," State and Utility Net Metering Rules and Programs Project website, www.irecusa.org/connect, October 2006.

[15] *Ibid.*

Lack of Political Support and Public Awareness

It appears that there is little effort among policymakers to promote widespread participation in Utah's net metering program. In addition, the current statute does not outline how information about the program is to be made available to the public-at-large. Consequently, Utah's limited program participation may be due to a lack of public awareness of the programs benefits, requirements, and opportunities. Program success may also be contingent on the willingness of policymakers to articulate clear goals and adopt policies that encourage greater participation in net metering programs.

The Division found that New Jersey's experience with net metering serves as a "best practice" baseline with respect to political support. Much of the New Jersey program's success can be attributed to strong support from State policymakers. New Jersey's Governor convened a Renewable Energy Task Force to determine how the State could increase its consumption of renewable energy. The Task Force concluded that the State should double its requirements for renewable energy production by 2008. It also recommended a statewide goal of producing 20 percent of its energy from renewable sources by 2020.

To help meet these goals, the New Jersey Board of Public Utilities recommended the implementation of a net metering program that encouraged greater energy production from renewable sources. The current New Jersey program places no cap on cumulative generation and has one of the nation's highest limits – 2 MW – of individual generation capacity. These program components were adopted to promote greater use and reliance on renewable energy.

Once policies are adopted, public outreach efforts should be made more accessible. Utah's net metering statute does not specify how information about the program is to be made available to the general public. As a result, there may be a lack of broad-based understanding about the program and how it works. Researchers from the Mid-Atlantic Distributed Resources Initiative (MADRI) found that many utilities may resist providing information about net metering due to potential revenue losses that they may sustain.[16] MADRI found that this is a contributing factor to the lack

[16] Yih-huei Wan, and H. James Green, "Current Experience with Net Metering Programs," Green Power Network Online Report, May 1998, http://www.eere.energy.gov/greenpower/resources/pdfs/current_nm.pdf.

of public understanding of net metering and the potential benefits that may accompany participation.

Utah's executive branch has organizations capable of promoting greater program participation. The Governor's Energy Policy Advisor is tasked with the goal of promoting renewable energy programs and policies. Similar efforts are championed by the State Energy Program at the Utah Department of Natural Resources. These organizations could lead efforts to promote greater awareness. In addition, the Commission could consider adding language to the current statute that defines how information about net metering should be disseminated to the public-at-large.

Interconnection/Components

Utah's net metering stature requires each self-generation system to meet stringent system design, component, and interconnection standards. There is concern that these requirements may be excessive, exclude several types of common self-generation systems, and ultimately could discourage broader-based participation.

Utah's statute requires each self-generation system to include an inverter that converts direct current (DC) power into alternating current (AC) power, which is compatible with the power generated by the utility.[17] The statute also requires the inverter to be designed, tested, and to be UL certified to UL1741 and IEEE929 standards.[18] In addition, participants may be required to install additional components or equipment to meet applicable safety, power quality, and interconnection standards necessary to protect public safety and maintain system reliability.[19]

However, common self-generation systems such as micro-hydro or small wind generators are not controlled by inverters. As a consequence, they are not eligible for net metering under the Utah statute. In fact, most of the mechanically driven AC generation systems do not require an inverter. These systems may operate safely if equipped with a safety disconnect device that fully isolates the system from the grid. These devices are widely accepted, and do not cause "islanding" or power quality problems.

Currently, small generators without inverters must apply as Qualifying Facilities (QF) because the definition of "customer generator" requires the generation facility to be controlled by an inverter.

[17] UCA, p. 97.

[18] *Ibid.*

[19] *Ibid.*

However, the QF process is more rigorous and requires significantly more time, study, and investment.

The New Jersey Board of Public Utilities recognized the need for more flexible interconnection standards that simultaneously provide for safety and system reliability, while reducing the number of interconnection barriers. The New Jersey Board of Public Utilities modeled its net metering program on standards developed by the Interstate Renewable Energy Council (IREC) and FERC. IREC recommends adopting interconnection standards that are commensurate with system size and system type. It bases these standards on interconnection procedures and agreements developed by the National Association of Regulatory Commissions (NARUC), FERC Order 2006, and recommendations issued by the MADRI.

Specifically, the New Jersey program allows for distributed generation (DG) up to 2 MW. Using the standards listed above, the New Jersey program does not disqualify generation systems that do not require an inverter for control. Consequently, micro-hydro or small wind generators under 2 MW can qualify with the requisite interconnection components. In sum, New Jersey's standards allow all DG technologies under 2 MW to interconnect and impose a minimal application fee.

The New Jersey Public New Jersey Board of Public Utilities also found that previous component requirements were excessive with respect to safety and system reliability. Accordingly, the New Jersey statute prohibits utilities from requiring unnecessary and expensive additional safety equipment.[20]

The Commission could propose legislation amending the statute requiring an inverter for all systems. This would allow more potential participation from sources that include micro-hydro and small wind generators. This may encourage greater program participation, as non-inverter controlled systems would not be subject to the more burdensome QF process.

Research has found that with screening standards such as those adopted by New Jersey, interconnection can be made with no adverse effect on safety or system reliability.[21] There may be concerns about safely isolating non-inverter

[20] Dworkin.

[21] 18 CFR Part 35, "Standardization of Small Generator Interconnection Agreements and Proceedures," p.15, FERC, May, 2005.

systems from the grid. The Commission could resolve this issue by directing participants to provide utility company access to all interconnection equipment.

Insurance/Liability

Because of potential injury and property damage liability risks associated with interconnection of net metering systems, many State commissions allow utilities to impose additional insurance requirements on net metering customers. There is a concern in many such States that these additional requirements are often costly and excessive. While insurance does not appear to be a significant barrier to Utah's program, some additional study into indemnification issues may be warranted to prevent future problems.

Under Utah's net metering statute, no additional liability insurance is required from a participating customer who provides all equipment necessary to meet applicable local and National standards regarding electrical and fire safety, power quality, and interconnection requirements.[22] Rocky Mountain Power's net metering service tariff states that the company "shall not be liable directly or indirectly for permitting or continuing to allow an attachment of a net metering facility, or for the acts or omission of the customer-generator that causes loss or injury, including death, to any third party."[23] This language is consistent with the statute.[24]

Many of the liability issues may already be addressed through a participant's homeowner insurance policy. However, this is not entirely clear. For example, some electrical corporations require customer-generators to carry additional comprehensive general liability policies with $100,000 per occurrence in coverage to protect the utility from being held financially responsible for problems caused by interconnection net metering systems.[25] Such additional insurance cost clearly increases the financial burden of customers.

Renewable energy technologies manufactured and installed in compliance with National interconnection standards have proved to be save, reliable, and effective in preventing electrical failures. As a result, additional insurance requirements may be unnecessary and will only discourage customers from investing in renewable generation systems and ultimately participating in

[22] UCA, p.98.

[23] Rocky Mountain Power, Electric Service Schedule No. 135.

[24] UCA, p.98.

[25] Murray City Corporation, "Net Metering Pilot Program Interconnection & Service Agreement," July 1, 2006.

net metering programs.

Unlike most State programs, New Jersey allows all types of DG technologies under 2 MW to interconnect. However, they do not require customers to purchase additional liability insurance. Several States, including Utah, prohibit utilities from imposing any additional insurance requirements for compliant net metering participants.

It appears that the current statute does not present a participatory barrier with respect to customer insurance requirements. The code effectively prevents electrical corporations from imposing additional liability insurance requirements on customers who install and operate their system in compliance with accepted standards. However, the Commission should review the statute to ensure there is enough clarity regarding indemnity among all net metering participants and determine if the statute will effectively prevent unnecessary liability requirements in the future.

CONCLUSIONS AND RECOMMENDATIONS

In summary, the following factors led to more successful programs, as evidenced by the highest customer participation rates of the 40 States that currently have net metering programs in place:

- Full support from the Governor
- Strong leadership from the Commission
- A direct focus on goals
- Attractive incentive programs

After analyzing available data and case studies, the Division recommends several strategies, solutions, and possible courses of action that the Commission might choose to adopt.

First, the Division recommends that State policymakers consider these potential strategies and best practices that have worked well in other States to determine if Utah's program should be enhanced. Clearly, the feasibility of adopting and implementing these or other strategies depends on a number of relevant factors unique to Utah, such as our low relative energy prices, company opposition (or support), and political backing. The Division recommends continued research in greater detail in order to consider issues that are

specific to Utah.

Second, since net metering programs are relatively new, we recommend studying net metering programs in the future as more data become available. Specifically, the feasibility of enrollment caps and system size limits should be assessed.

Third, developing strategies to access the costs and benefits of net metering is part of a much larger effort that could be undertaken by opening a new docket. Other stakeholders could file comments and help to quantify the costs and benefits of customer and utility-side procurement options, to set proper rebate levels, and assess cost-effectiveness of various rate and financial incentives as well as other programs. This process appeared to work well in other states. Public comments and testimony were filed as part of an inclusive framework for setting up net metering. At that point, the Commission could review the findings and decide on appropriate changes or other courses of actions.

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