

## DISCUSSION

Today, many homes and businesses cannot capture the full benefit of the electricity they generate through wind turbines or solar panels. Lack of incentives, high costs, and complex installation have slowed the growth of residential renewable generation.

Net metering offers a solution. In a net metering program, consumers create their own energy through small scale wind production, solar panels or another renewable source and are given a credit on their electricity bill for excess production sold back to the grid. By allowing these home energy producers to sell surplus energy back to the grid, states can promote energy generation and lower energy consumption.

There are a number of elements to an effective net metering program. First, the most effective and affordable programs allow produced electricity to spin consumers' meters backward, which captures the full retail price of electricity produced without incurring the cost of an additional meter. Second, efficient programs use an annual billing cycle to adjust for seasonal change. For instance, owners of solar panels usually produce more energy in the summer than in the winter, and the proceeds in the summer may exceed a consumer's actual bill. Instead of losing the credit for any energy produced above and beyond the producer's energy bill, annual billing allows this credit to be applied to bills in the winter months when consumer production is lower and bills are higher. Finally, effective programs aim to open net metering programs to all consumer classes, expand system size limits to at least 2 megawatts, and allow excesses to roll over from one month to the next.

The Public Utility Regulatory Policies Act of 1978 (PURPA), part of the National Energy Act, encouraged reliance on renewable energy rather than on fossil-fuel based energy, and set the stage for the sale of excess renewable energy. Under PURPA home power generators, known as Small Power Producers or SPPs, are allowed to produce their own electricity to meet their needs. The act also created a market for electricity produced by non-utility entities. Under PURPA, if a consumer generates more power than they need, electric utilities are required to buy the excess power from these producers at the "avoided cost" rate, which is the cost the utility would incur were it to generate or purchase power from another source. To measure this excess electricity, participants purchase and install a second meter, which is monitored by the utility, and they are issued monthly checks for the power sold.

PURPA was amended in 2005 to include a provision for net metering. Section 1251(a) (11) of the Energy Policy Act of 2005 requires that, by 2008, all public electric utilities be prepared to offer net metering to any interested customer upon request. Under net metering, the process is simpler than many arrangements resulting from PURPA. Customers who produce electricity in excess of their needs can use this excess to offset electricity used at other times during the billing period. In practice, excess electricity produced through solar or wind collection will spin the existing electricity meter backwards, effectively banking the electricity until it is needed by

## About CSI

The Center for State Innovation (CSI) believes every state can achieve shared prosperity, environmental sustainability, and efficient democratic government. We offer evidence-based, outcome-measured, fiscally prudent strategies for doing so.

A non-partisan, not-for-profit institution, CSI provides many types of assistance to state executives interested in implementing progressive policies.

To learn about CSI's Policy Briefings, Strategy Academies, and other services offered at no cost, visit [www.stateinnovation.org](http://www.stateinnovation.org).

the customer. In other words, the customer is billed only for the net energy consumed during the billing period, and the customer has the benefit of the full retail value of all the electricity produced.

Currently, most states do have net metering laws, but there are wide discrepancies in the structure and implementation of these laws. These discrepancies limit the environmental and health benefits associated with net metering. These provisions include:

- Restricting certain classes of customers (commercial, non-profit, agricultural) from eligibility
- Limiting the size of eligible renewable energy systems
- Preventing customers from receiving credit for excess electricity
- Capping the total number of participants
- Discriminatory fees and standby charges
- Unreasonable and redundant safety requirements
- Requiring unnecessary additional insurance
- Not promoting the program to eligible customers

A fully realized and effective program would allow a broad access to net metering with a minimum of administrative restraints.

## COSTS

Since consumers who elect to generate power from renewable sources will be able to use their current electric meters and utility services, the only cost associated with net metering is the indirect 'cost' of reduced demand by utility customers. This demand-reduction may be incorrectly viewed by some utilities as a revenue loss as customers who generate a portion of their own electricity are purchasing less from the utility. Usually, this decreased revenue to the utility is comparable to the 'loss' resulting when customers reduce their electricity use by investing in energy efficient lighting, appliances and heating and cooling equipment.

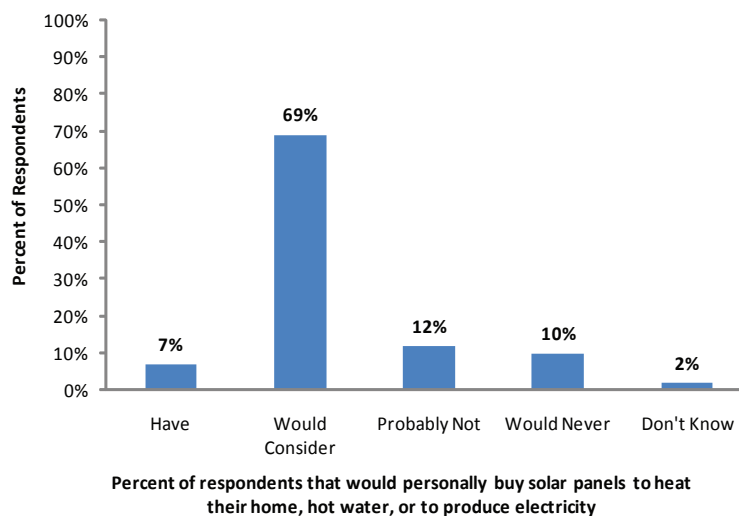
Not only are the costs of net metering minimal, there are financial benefits for both the utility and the consumer. Under net metering, consumers "bank" generated power rather than selling it to the utility at the wholesale or 'avoided cost' price. This means consumers are capturing the retail value of the power they generate. Depending on the difference between the 'avoided cost' and retail prices and the amount of excess electricity produced, the American Wind Energy Association reports that a consumer with a 10 kilowatt wind energy system will save between \$10-40 more per month with net metering. Under PURPA, utilities are required to purchase electricity that customers generate beyond their consumption at the 'avoided cost' price. Without net metering this often meant that the utility had to incur the administrative and accounting costs of monitoring a second meter for producer customers and issuing monthly checks for amounts as little as 5 cents. With the efficiencies of net metering, utilities can save \$25 per account per month.

## PUBLIC PERCEPTION

Opinion polls and the experiences of utilities' green pricing and marketing programs have demonstrated the public's desire to support clean energy options and their willingness to pay more for them. People understand the dangers of global warming, and in a 2002 national survey cited in a United Nations Development Report, the most-identified solution to global warming was renewable energy (33%). Net metering rewards consumers who reduce reliance on fossil fuel generated power. Participation in existing programs demonstrates growing interest, and according to the U.S. Energy Information Administration the number of participants in net metering programs nationwide increased by 34% between 2004 and 2005. Interest continues to grow; in 2007, a study by the Yale Center for Environmental Law and Policy found that 76% of Americans are interested in generating renewable energy through residential solar panels. Only 10% of respondents said that they would never buy such a device (See chart below).

### CHART

**Responses to Residential Renewable Energy**



Source: Yale Center for Environmental Law and Policy

## TALKING POINTS

### *How can we be sure that these small-scale generating systems are safe?*

The National Electrical Code regulates all small-scale generating systems. The NEC established and enforces safety requirements, but owners may also monitor their own systems. Any certified electrician should be able to assess the safety of a system using a UL listed inverter and other equipment.

### *Can customers really use their existing meters to take advantage of net metering?*

Most residential and small commercial electricity customers use a standard kilowatt-hour meter that can accurately register the flow of electricity in either direction. This capability means that net metering happens automatically. A customer's meter spins forward when the customer uses more electricity than is being produced, and spins backward when the customer is producing more electricity than is needed. The meter registers the net amount of energy produced or consumed during the billing period.

### *Why is the length of the billing cycle important?*

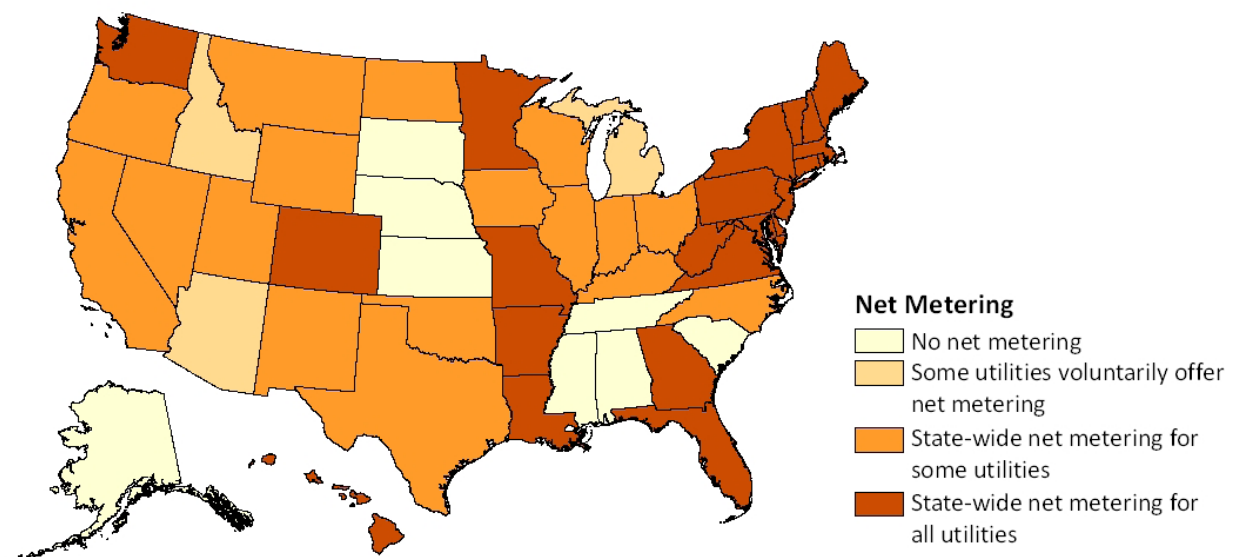
Wind and solar energy are intermittent resources. Most customers may not be using power as it is being generated, especially since solar and wind energy levels can fluctuate throughout the year. Net metering allows participants to receive full value for the electricity they produce without installing expensive battery storage systems. This will heighten consumer interest in renewable energy because it directly affects the economics of and pay-back period for the initial investment, creating a greater economic incentive.

### *Doesn't net metering create a subsidy for people who produce their own power?*

This is a risk that states should address. Even if consumers produce more energy needed to run their home, they still rely on the utility companies to collect and distribute excess energy, maintain electricity meters, and bear administrative costs. However, in states that have already adopted Utility Rate Decoupling policies this economic inequality is appropriately addressed because the fixed costs of maintaining utilities is billed separately from the energy itself.

## WHO ELSE IS DOING IT?

Net metering is available in 42 states plus the District of Columbia, but the requirements, limits and laws of these programs vary greatly from state to state, and the details of state net metering programs change rapidly as new legislation is proposed and negotiated. Some states are expanding their programs while others are adding limits or restricting availability. While there has been a general trend towards relaxing limits on generation, including more consumer classes, and month-to-month roll over with excess purchased annually, some states have taken actions which have the consequence of restricting consumer-generated renewable energy. The Interstate Renewable Energy Council maintains a comparison table of state policies that is updated monthly, and is an excellent resource for parties looking to learn more about state-specific action.



- Currently, twenty-two states have state-wide net metering for all utilities (Arkansas, Delaware, Colorado, Connecticut, Florida, Georgia, Hawaii, Louisiana, Maine, Maryland, Massachusetts, Minnesota, Missouri, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, Vermont, Virginia, Washington, West Virginia).
- Seventeen states have state-wide net metering for some utilities (California, Illinois, Indiana, Iowa, Kentucky, Montana, Nevada, New Mexico, North Carolina, North Dakota, Ohio, Oklahoma, Oregon, Texas, Utah, Wisconsin, Wyoming).
- In three states, utilities voluntarily offer net metering (Arizona, Idaho, Michigan).

## SPOTLIGHT ON INNOVATION

*Tennessee:* While Tennessee does not have a net metering program, the Tennessee Valley Authority and its partners do offer a more favorable dual-metering option to residential and small-commercial consumers through the Green Power Switch Generation Partners program. Under this program, TVA will purchase the entire green power output at \$0.15 per kWh, and the consumer will receive a credit for the power generated. Residential users may also qualify for a \$500 incentive to offset start-up costs.

*Colorado:* 2008 Colorado HB 08-1160 created net metering in Colorado. The net metering program has no limit on enrollment, the system size limit is 2 megawatts, and monthly excess kWh are credited to customer's next bill until the end of a calendar year when the utility pays customers at a rate equal to the average hourly incremental cost for that year.

*New Jersey:* The Electric Discount and Energy Competition Act, 1999 New Jersey Chapter 23, established net metering in New Jersey. The program, as part of New Jersey's Clean Energy program, has no limit on enrollment, the system size limit is 2 megawatts, and monthly excess kWh are credited to customer's next bill at the retail cost rate until the end of a 12-month billing cycle at which time the utility pays customers at the avoided-cost rate.

## WHAT CAN YOU DO?

For states with no or very limited net metering programs, a task force could be created to assess the interest in net metering and the requirements that would be reasonable for the state program.

State Executives can support net metering legislation to establish or expand net metering, focusing on including all classes of energy producers/consumers, roll-over policies for monthly production that are paid out annually, and raising the limits on system size. The Interstate Renewable Energy Council provides model net-metering rules to help utilities create effective programs

Finally, governors and other executives can publically support the use of renewable energy and commend consumers who work to reduce reliance on fossil fuels.

## RESOURCES

### Policy Reports

#### American Wind Energy Association

- Frequently asked questions  
<http://www.awea.org/faq/>

#### Center for Renewable Energy and Sustainable Technology

- Net Metering: New Opportunities for Home Power  
[http://www.repp.org/repp\\_pubs/articles/issuebr2/index\\_ib2.html](http://www.repp.org/repp_pubs/articles/issuebr2/index_ib2.html)

#### Energy Information Administration

- Estimated U.S. Net Metering Customers by State and Customer Class, 2004 and 2005  
<http://www.eia.doe.gov/cneaf/solar.renewables/page/greenprice/gptable64.pdf>
- Green Pricing and Net Metering Programs 2005  
[http://www.eia.doe.gov/cneaf/solar.renewables/page/greenprice/green\\_pricing.html](http://www.eia.doe.gov/cneaf/solar.renewables/page/greenprice/green_pricing.html)

#### Federal Energy Regulatory Commission

- <http://www.ferc.gov/default.asp>

#### Interstate Renewable Energy Council

- IREC State-by-State Net-metering Table  
<http://www.irecusa.org/index.php?id=90>

#### National Conference of State Legislatures

- Net Metering – Fact Sheet  
<http://www.ncsl.org/print/energy/netmfs.pdf>

#### National Fire Protection Association

- NFPA 70: National Electrical Code  
<http://www.nfpa.org/aboutthecodes/AboutTheCodes.asp?DocNum=70>

#### Network for New Energy Choices

- “Freeing the Grid: How Effective State Net Metering Laws Can Revolutionize U.S. Energy Policy”  
[http://www.newenergychoices.org/uploads/FreeingTheGrid2007\\_report.pdf](http://www.newenergychoices.org/uploads/FreeingTheGrid2007_report.pdf)

#### State Environmental Resource Center

- Net Metering – Background  
<http://serconline.org/netmetering/background.html>
- “Net Metering – Talking Points”  
<http://serconline.org/netmetering/talking.html>

#### U.S. Department of Energy

- “Current Experience With Net Metering Programs”  
[http://apps3.eere.energy.gov/greenpower/resources/pdfs/current\\_nm.pdf](http://apps3.eere.energy.gov/greenpower/resources/pdfs/current_nm.pdf)

- State Energy Alternatives - Net Metering  
[http://apps1.eere.energy.gov/states/alternatives/net\\_metering.cfm](http://apps1.eere.energy.gov/states/alternatives/net_metering.cfm)
- "Renewable Energy Data Book"  
[http://www1.eere.energy.gov/maps\\_data/pdfs/eere\\_databook\\_091208.pdf](http://www1.eere.energy.gov/maps_data/pdfs/eere_databook_091208.pdf)

### Opinion Polls

#### Human Development Report

- Fighting climate change: Human solidarity in a divided world  
[http://hdr.undp.org/en/reports/global/hdr2007-2008/papers/leiserowitz\\_anthony.pdf](http://hdr.undp.org/en/reports/global/hdr2007-2008/papers/leiserowitz_anthony.pdf)

#### Yale Center for Environmental Law and Policy

- February 5 - 11, 2007 Study  
<http://environment.yale.edu/news/5305-american-opinions-on-global-warming>

### State Programs

#### Green Power Switch Partners

- <http://www.tva.com/greenpowerswitch/partners/>

#### New Jersey's Clean Energy program

- <http://www.njcleanenergy.com>

### State Legislation

#### Colorado

##### Colorado HB 08-1160

- [http://www.state.co.us/gov\\_dir/leg\\_dir/olls/sl2008a/sl\\_65.htm](http://www.state.co.us/gov_dir/leg_dir/olls/sl2008a/sl_65.htm)

#### New Jersey

##### 1999 New Jersey Chapter 23

- [http://www.njleg.state.nj.us/9899/Bills/PL99/23\\_.PDF](http://www.njleg.state.nj.us/9899/Bills/PL99/23_.PDF)

##### 2007 New Jersey Chapter 300

- [http://www.njleg.state.nj.us/2006/Bills/PL07/300\\_.HTM](http://www.njleg.state.nj.us/2006/Bills/PL07/300_.HTM)

#### Tennessee

##### Tennessee Valley Authority

- 48 Stat. 58-59, 16 U.S.C. sec. 831  
[http://www.tva.gov/abouttva/pdf/TVA\\_Act.pdf](http://www.tva.gov/abouttva/pdf/TVA_Act.pdf)

### Model Legislation

#### Environmental Law and Policy Project

- Model Net Metering and Interconnection Standards for Renewable Energy Systems  
<http://elpc.org/category/clean-energy/interconnection-standards>

Interstate Renewable Energy Council

- IREC Model Interconnection Standards and Procedures  
[http://www.irecusa.org/fileadmin/user\\_upload/ConnectDocs/IC\\_Model.pdf](http://www.irecusa.org/fileadmin/user_upload/ConnectDocs/IC_Model.pdf)
- IREC Model Net-Metering Rules  
[http://www.irecusa.org/fileadmin/user\\_upload/ConnectDocs/NM\\_Model.pdf](http://www.irecusa.org/fileadmin/user_upload/ConnectDocs/NM_Model.pdf)

National Conference of State Legislators

- Net Metering - Sample Legislation  
<http://www.ncsl.org/programs/energy/Linksample.htm#netm>

**National Legislation**

Cornell University Law School

- Chapter 46 - Public Utility Regulatory Policies  
<http://www4.law.cornell.edu/uscode/16/ch46.html>

U.S. Department of Interior

- Energy Policy Act of 2005  
<http://www.doi.gov/iepa/EnergyPolicyActof2005.pdf>