U.S. DEPARTMENT OF ENERGY | Energy Efficiency & Renewable Energy

Net Metering

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Overview

- Net metering definition and key considerations
- Net metering information on Database of State Incentives for Renewables & Efficiency (DSIRE)
- State net metering program examples
- Example renewable project steps
- Meter aggregation and virtual net metering
- Distributed generation cost/benefits studies
- Resources and other information

Net Metering Definition

For electric customers who generate their own electricity, net metering allows for the flow of electricity both to and from the customer – typically through a single, bi-directional meter. When a customer's generation exceeds the customer's use, electricity from the customer flows back to the grid, offsetting electricity consumed by the customer at a different time during the same billing cycle. In effect, the customer uses excess generation to offset electricity that the customer otherwise would have to purchase at the utility's full retail rate. Net metering is required by law in most U.S. states, but state policies vary widely.

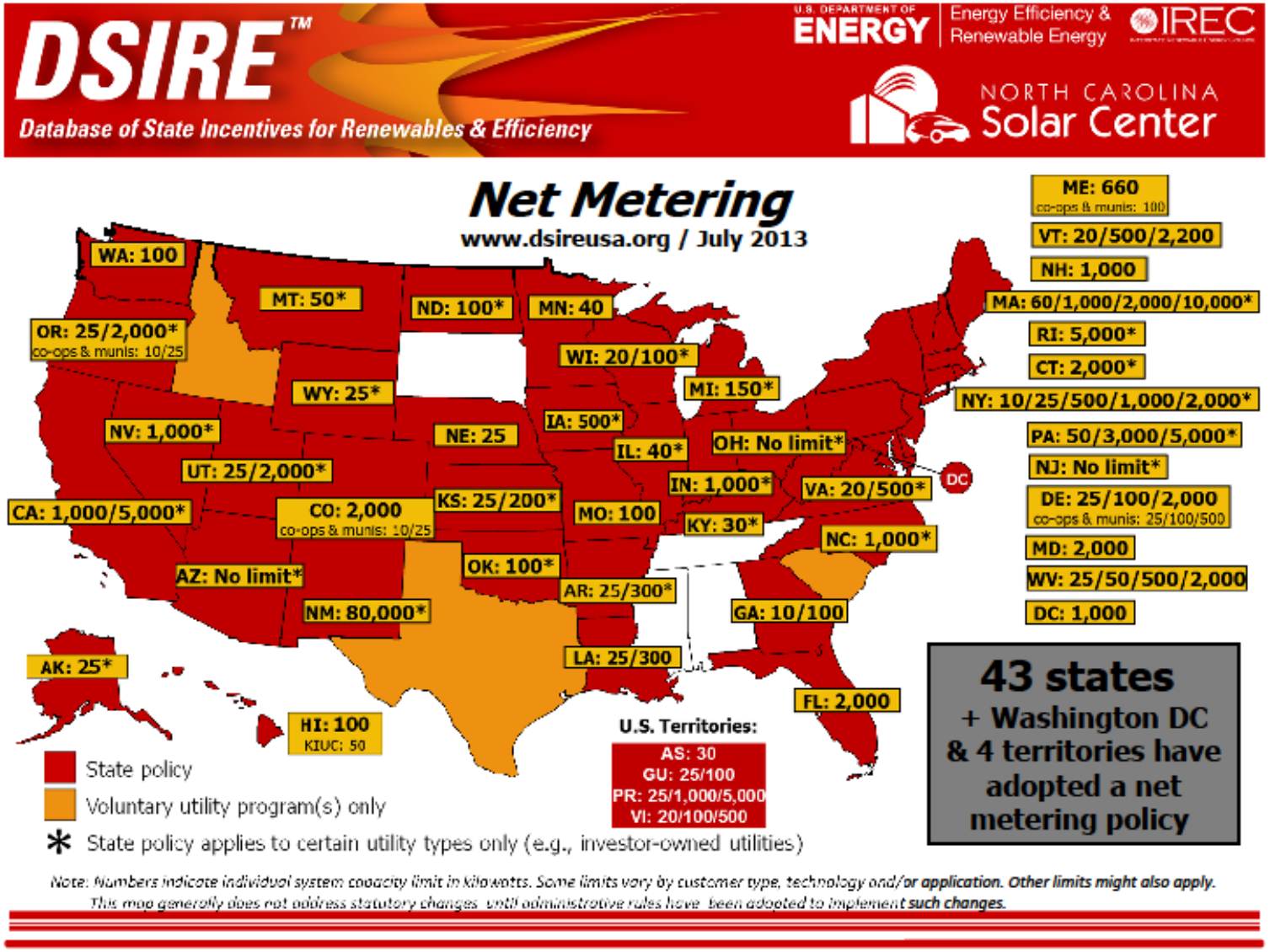
Source: Database of State Incentives for Renewables & Efficiency (DSIRE) - http://www.dsireusa.org/glossary/

Net Metering Considerations

Research net metering rules carefully!

- Eligibility – ensure that your project fits the criteria
  - Allowable technology
  - Maximum project size (referred to as “system capacity limit” on DSIRE)
  - Customer type
  - Utility - IOU vs. public utility
- REC ownership
- Treatment of net excess generation
- Additional fees such as standby charges (if any)
- Aggregate capacity limit
- Contractual requirements

http://www.dsireusa.org/documents/summarymaps/net_metering_map.pdf



DSIRE - Net Metering Information for Colorado

http://www.dsireusa.org/incentives/incentive.cfm?Incentive_Code=CO26R&re=1&ee=0

Net Metering

Like 3

Last DSIRE Review: 09/26/2012

Program Overview:

State:	Colorado
Incentive Type:	Net Metering
Eligible Renewable/Other Technologies:	Solar Thermal Electric, Photovoltaics, Wind, Biomass, Hydroelectric, Geothermal Electric, Recycled Energy*, Small Hydroelectric, Fuel Cells using Renewable Fuels
Applicable Sectors:	Commercial, Industrial, Residential
Applicable Utilities:	All utilities (except certain small municipal utilities)
System Capacity Limit:	IOU customers: 120% of the customer's average annual consumption. Municipality and co-op customers: 25 kW for non-residential; 10 kW for residential.
Aggregate Capacity Limit:	No limit specified
Net Excess Generation:	Credited to customer's next bill at retail rate. After 12-month cycle, IOU customers may opt to roll over credit indefinitely or to receive payment at average hourly incremental cost. Municipality and co-ops provide annual reconciliation at a rate they deem appropriate.
REC Ownership:	Customer owns RECs
Meter Aggregation:	Allowed for IOU customers
Authority 1:	C.R.S. 40-2-124
Authority 2: **Date Enacted:** **Date Effective:**	C.R.S. 40-2-127 6/5/2010 6/5/2010
Authority 3:	C.R.S. 40-9.5-118
Authority 4: **Date Enacted:** **Date Effective:**	4 CCR 723-3, Rule 3664, 3665 12/15/2005 7/2/2006

Summary:

Example State Net Metering Programs

Net metering policies vary widely. Examples:

- Some states (such as Texas) do not have a net metering policy
  - Must find other options for excess electricity sale: ex. Register as a Qualified Facility and sell power under Public Utility Regulatory Policies Act of 1978 (PURPA)
    - Usually at utility's avoided cost (a wholesale rate) or a negotiated rate

- New Mexico
  - **REC Ownership:** Utility owns RECs
  - **Net Excess Generation:** Credited to customer's next bill at avoided-cost rate or reconciled monthly at avoided-cost rate
  - **System Capacity Limit:** 80 MW
  - **Aggregate Capacity Limit:** No limit specified

Example State Net Metering Programs

- Colorado
  - **Net Excess Generation:** Credited to customer's next bill at retail rate.
    - IOUs: At end of year customers can roll over credit indefinitely or receive payment at average hourly incremental cost
    - Municipality and co-ops: annual reconciliation at a rate they deem appropriate
  - **System Capacity Limit:**
    - IOU customers: 120% of the customer's average annual consumption.
    - Municipality and co-op customers: 25 kW for non-residential; 10 kW for residential
  - **Aggregate Capacity Limit**: No limit specified

- New Jersey
  - **Net Excess Generation:** Generally credited to customer's next bill at retail rate; excess reconciled annually at avoided-cost rate
  - **System Capacity Limit:** No capacity limit specified, but system must be sized so that energy production does not exceed customer's annual on-site energy consumption
  - **Aggregate Capacity Limit**: No limit specified (Board of Public Utilities may limit to 2.5% of peak demand)

Example State Net Metering Programs

- California
  - **Net Excess Generation (NEG):** Credited to customer's next bill at retail rate.
    - At end of year customers can roll over credit indefinitely or to receive payment at 12-month average spot market price (for 7 am to 5 pm)
    - If customer makes no affirmative decision, credit is granted to utility with no compensation for customer
  - **System Capacity Limit:** 1 MW
  - **Aggregate Capacity Limit:** 5% of aggregate customer peak demand (statewide limit of 500 MW for fuel cells)
  - **REC Ownership:** Customer owns RECs. If customer receives NEG payment at end of year, then utility owns RECs associated with the NEG
  - **Restriction on Additional Fees**
    - No new or additional charges (demand, standby, interconnection, minimum monthly, etc.) beyond those of other customers in the rate class to which the eligible customer-generator would otherwise be assigned
    - CPUC ruling that technologies eligible for net metering (up to 1 MW) are exempt from interconnection application fees and initial/supplemental interconnection review fees

Example Renewable Project Steps

Research net metering policies for your state/utility on DSIRE, then confirm all information with your utility. (From DSIRE home page, click on your state, then scroll down to the Net Metering section under "Rules, Regulations & Policies". Or, look for your state on http://www.dsireusa.org/incentives/index.cfm?SearchType=Net&&EE=0&RE=1)

- Step 1: Does the state have a net metering policy and does the net metering policy apply to your utility? Does it apply to federal agencies and your customer class?
- Step 2: Does your project qualify for net metering (renewable type and size)?
- Step 3: Consider net metering policy details such as REC ownership, net excess generation rules, applicable charges, etc.
- Step 4: Does the state/utility have meter aggregation, virtual net metering, and/or community renewables programs?
- Step 5: Compare estimated renewable generation to electricity load to determine if net metering is required. If so, estimate net excess generation at the end of each month and the end of the year. "Right size" the system accordingly.
- Step 6: Discuss contractual requirements and net metering details with utility. Ask about other important policy and interconnection issues.

Meter Aggregation And Virtual Net Metering

Meter Aggregation and Virtual Net Metering

- Meter aggregation - a renewable energy project can offset the electricity load of a customer with multiple meters
  - Example: A solar project at a federal site offsets the loads of buildings that are separately metered

- Virtual net metering/group billing - multiple customers receive benefits of a net-metered RE project, with resulting bill credits allocated across the participating customer bills
  - Examples:
    1. Federal campus with multiple agencies that are separately metered and receive benefits from a ground-mounted solar project on campus
    2. Renewable project at one agency site benefits another federal agency site within the same utility service territory
    3. Multiple stores in a shopping mall receive benefits from solar project on the mall roof

Meter Aggregation and Virtual Net Metering Programs

- Meter Aggregation: Colorado, Delaware, Massachusetts & California

- Virtual net metering/group billing
  - Vermont: 22 groups in Central Vermont Public Service and Green Mountain Power service territories have formed to share the output of a renewable energy system with system sizes ranging from 1.5 to 199 kW

- NREL report has more information
  http://www.nrel.gov/docs/fy12osti/54570.pdf

- California Meter Aggregation:
  - Virtual net metering allowed for multi-tenant properties
  - Meter aggregation allowed for local governments if all participating accounts receive a time-of-use rate
  - Meter aggregation may be allowed for all customers with multiple meters on parcels of land contiguous to the location of the renewable energy system (pending CPUC and other approvals)

Distributed Generation Costs and Benefits

Distributed Generation Cost/Benefits Studies

- Clean Power Research - “Net Metering: Quantifying Benefits and Sharing Costs”
  - PowerPoint that includes potential alternatives to Net Metering (Value of Solar, Cost of Services)
  - http://www.cleanpower.com/wp-content/uploads/Net_Metering-PVAmericaEast-Feb13.pdf

- Electric Power Research Institute (EPRI) - Three-phase initiative to provide stakeholders with information and tools that will be integral to four key areas of collaboration. This work is explored in a concept paper titled: “The Integrated Grid: Realizing the Full Value of Central and Distributed Energy Resources”
  - http://www.epri.com/Our-Work/Pages/Integrated-Grid.aspx
  - http://www.epri.com/abstracts/Pages/ProductAbstract.aspx?ProductId=000000003002002733

Distributed Generation Cost/Benefits Studies

- Interstate Renewable Energy Council (IREC): "A REGULATOR'S GUIDEBOOK: Calculating the Benefits and Costs of Distributed Solar Generation"
  - Offers lessons learned from RMI paper and then proposes a standardized valuation methodology for PUCs to consider implementing in future studies
  - http://www.irecusa.org/wp-content/uploads/2013/10/IREC_Rabago_Regulators-Guidebook-to-Assessing-Benefits-and-Costs-of-DSG.pdf

- NREL: "Regulatory Considerations Associated with the Expanded Adoption of Distributed Solar"
  - A paper intended to help regulators understand the options and issues associated with regulatory models/rate design alternatives available to address the challenges posed by the transition toward increased adoption of distributed PV
  - http://www.nrel.gov/docs/fy14osti/60613.pdf

- Rocky Mountain Institute (RMI): "A Review of Solar PV Benefit & Costs Studies"
  - Reviews 16 DPV benefit/cost studies to assess what is known and unknown about the categorization, methodological best practices, and gaps around PV benefits and costs
  - http://www.rmi.org/elab_empower

Resources and Other Information

- DSIRE Net Metering Policies
  - http://www.dsireusa.org/incentives/index.cfm?SearchType=Net&&EE=0&RE=1

- "A Guide to Community Shared Solar: Utility, Private, and Nonprofit Project Development" (NREL)
  - http://www.nrel.gov/docs/fy12osti/54570.pdf

- Distributed Generation Interconnection Collaborative (DGIC)
  - http://www.nrel.gov/tech_deployment/dgic.html

NREL facilitates the Distributed Generation Interconnection Collaborative (DGIC) with support from the Electric Power Research Institute (EPRI) and Western Area Power Administration (WAPA) to foster knowledge sharing on distributed photovoltaic (PV) interconnection practices, research, and innovation to:

- Identify and overcome data and informational gaps
- Address process and technical challenges
- Enable informed decision-making and planning for the anticipated rise in grid-connected, distributed PV resources.

Become a Member
DGIC members are included in monthly informational meetings and discussions related to distributed PV interconnection practices, research, and innovation.

For information about becoming a member, contact Kristen Ardani.

Monthly Meetings

Monthly meetings consist of discussions—presented in a webinar format—focused on specific PV interconnection practices and related research. Meetings are typically held the last Wednesday of each month, from 11:30 a.m. to 1 p.m. MST, unless otherwise noted.

Upcoming Meeting
Apr. 30, 2014

Minimum Day Time Load Calculation and Screening

This meeting will feature Babak Enayati, Chair of Massachusetts DG Technical Standards Review Group (TSRG), Dora Nakafuji, Director of Renewable Energy Planning at Hawaiian Electric Company (HECO), and Anthony Hong, Director of Principal Distribution Planning at HECO. Participants will learn about the Massachusetts Technical Standards Review Group's recommendation to adopt 100% minimum day time load screen and provide an example of how minimum day time load data is gathered and incorporated into the screening process.

Register.

View the schedule of meetings

Prior Meetings and Presentations

Date	Companies	Presentation
Apr. 2, 2014	SDG&E, PG&E	Innovation in the Interconnection Application Process
Feb. 20, 2014	PEPCO Holdings Inc.	Alternate Strategies for Pre-Application Reporting and Fast Track Analysis
Dec. 17, 2013	NREL, EPRI, WAPA	DGIC Overview
Oct. 21, 2013	Southern California Edison	A Utility's Perspective on the Interconnection Process

Additional Resources

See examples of how utilities are analyzing and establishing interconnection practices through work done by the Massachusetts Technical Standards Review Group.

Questions?

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