Engaging Utility Regulators on Solar Policies

Urban Sustainability Directors Network Webinar

Carl Linvill, PhD
Principal
The Regulatory Assistance Project®

clinvill@raponline.org
(775) 450-0603
www.raponline.org
The Regulatory Assistance Project (RAP) is a global NGO providing technical and policy assistance to government officials, agency staff, and others on energy and environmental issues.

- Foundation-funded; some contracts
- Non-advocacy; no interventions
Outline

• Role of Investor Owned Utilities and Regulators
• Ratemaking Basics
• System Impacts of Distributed Generation
• Regulatory Policies to Advance Solar
  • Net Energy Metering
  • Community Solar
  • Interconnection
  • Resilience
Roles of Utilities

- Provide service to anyone who requests it
- Adhere to strict safety standards
- Adhere to reliability standards
- Provide adequate service
- Be responsive to customer needs
Roles of Economic Regulators

- Extensions of legislatures, executing powers granted in statutes
- Regulate in “the public interest”
- Ratemaking – Revenues and Pricing
- Planning – Procurement and Prudence
- Service quality standards
- Aspire to make processes transparent and accessible
Ratemaking Basics

• “Cost of Service” approach:
  • Total costs for providing service are recovered, plus reasonable return on investment

• Regulators concerned with ‘just and reasonable’ rates
  • Sufficient but no more than necessary to cover costs and return on investment
Utility Revenue Requirement: “The Capital Bias”

Revenue Requirement (aka Cost-of-Service) = Capital Investments (Cap-ex) + Operating Expenses (Op-ex)

“Rate Base” x Rate-of-Return (Interest on Shareholders’ “Loan”) = $1 x 10% = $1.10

Pass-Through, No Rate-of-Return = $1 = $1
Utility Revenue Requirement: Discourages Distributed Energy Resources

Revenue Requirement (aka Cost-of-Service) = Capital Investments (Cap-ex) + Operating Expenses (Op-ex)

Both reduce kWh sales => raises rates

Distributed Generation = less need for cap-ex = lower earnings

Energy Efficiency = more op-ex & less need for cap-ex
Power Supply Impacts of DG

- Total electricity consumption: no change
- Total utility power supply: decrease
  - Avoided line losses
  - Customer self-supply
  - Customer excess generation
  - Could reduce utility generation or power purchases
- Peak demand/load shape/resource adequacy
- Note: Negligible impacts at low penetration
Distribution System Impacts

- At high deployment, distributed solar affects power quality, reliability, and safety on the local distribution system
- Location specific, changes over time
- Strategies and solutions are available for avoiding & mitigating negative impacts
  - Smart inverters
  - Grid investments
  - Storage
  - EV’s and smart charging
Government Policy: A Major Influence on Solar Deployment

<table>
<thead>
<tr>
<th>Regulatory and State Policies</th>
</tr>
</thead>
<tbody>
<tr>
<td>Net Energy Metering (NEM) / Other DG Tariff Policies</td>
</tr>
<tr>
<td>IRP and Renewable Portfolio Standards (RPS)</td>
</tr>
<tr>
<td>Decoupling</td>
</tr>
<tr>
<td>Shared solar/community solar programs</td>
</tr>
<tr>
<td>Interconnection policies</td>
</tr>
<tr>
<td>Incentive regulation</td>
</tr>
</tbody>
</table>

And State and Local Action on Resilience
Net Energy Metering (NEM)

A billing mechanism that compensates residential and commercial customers for the solar power they export to the electricity grid.

• Most commonly used tariff design for customers with behind-the-meter PV
  • More than 90% of all U.S. rooftop PV, and nearly all residential PV systems
• More than 40 states have adopted some form of a NEM policy

• NEM policies vary widely by state, notably with respect to
  • The amount of credit awarded to customers for net excess generation in a billing period.
  • The amount of time that the credit is valid
Community Solar

An arrangement in which customers subscribe to or own shares of an off-site PV array and are compensated (e.g., on-bill credit) for the electric production of their portion of the PV system.

Source: Smart Electric Power Alliance (SEPA)
Interconnection Policies

The technical and administrative linking of a generator to the utility grid. The interconnection process is a series of required steps that verify a (PV) system’s compliance to utility technical and administrative requirements.

- Adherent to state-level standards
- Efforts underway to streamline the interconnection process
  - Online portals, simplified forms, stipulated fees/timelines
- Utility main concerns and objectives
  1. Safety
  2. Reliability
  3. Exported power is measurable; required voltage, frequency, and power quality are met
  4. Only certified equipment is used
Collaborative Planning for Resiliency

Some cities and counties are building microgrids that support local grid resiliency. Many of these projects include solar energy resources. The US military is developing solar-based microgrids to ensure energy security and continued operation during emergencies and prolonged outages.

Notable examples:

- Buffalo
- Salt Lake City
- Military Bases
A Few Key Advantages of Using Solar for Emergencies/Resilience

✓ Increasingly cost-effective compared to diesel-fueled backup generators
✓ Not dependent on fuel storage or functioning fuel delivery supply chain following a disaster
✓ Minimal maintenance required
✓ Generates electricity and can provide grid services during routine (non-emergency) operations
✓ Partnership opportunities for host, utility, and third parties to share benefits and minimize costs
Concluding Thoughts

Collaborative Approaches for Working with Your Utility and Your Utility’s Regulator?

**Strategies:**
1. Perform a resource situation analysis
2. Articulate community wants
3. Assess the short term
4. Assess the long term
5. Build a collaborative tactical plan

**Tactical Ideas:**
- Net Energy Metering
- Community solar
- Interconnection
- Microgrids for resiliency
Other Resources

- Electricity Regulation in the US: A Guide (RAP)
- Grid-Connected Distributed Generation: Compensation Mechanism Basics (NREL, LBNL, RAP)
- Focusing the Sun: Considerations for Designing Community Solar Policy (NREL)
About RAP

The Regulatory Assistance Project (RAP)® is an independent, non-partisan, non-governmental organization dedicated to accelerating the transition to a clean, reliable, and efficient energy future.

Learn more about our work at raponline.org