Getting the Incentives Right for Renewables

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Ted Kury
Director of Energy Studies
Public Utility Research Center
University of Florida

Public Utility Research Center

Research

Expanding the body of knowledge in public utility regulation, market reform, and infrastructure operations (e.g. benchmarking studies of Peru, Uganda, Brazil and Central America)

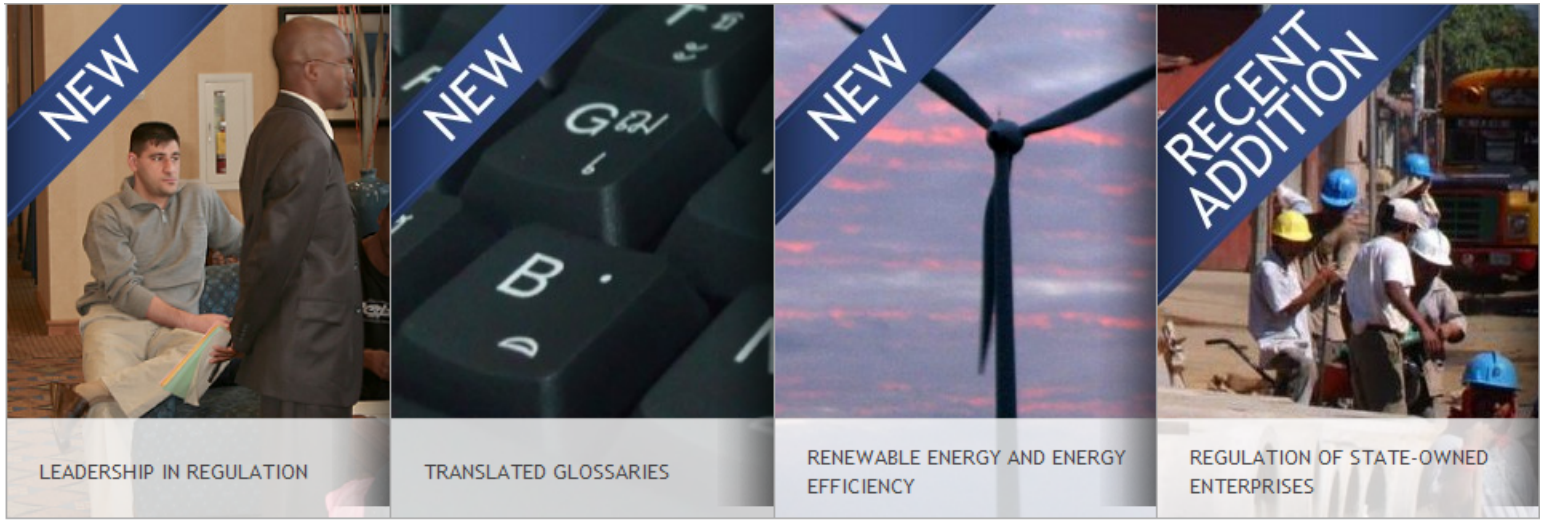
Education

Teaching the principles and practices that support effective utility policy and regulation (e.g. PURC/World Bank International Training Program on Utility Regulation and Strategy offered each January and June)

Service

Engaging in outreach activities that provide ongoing professional development and promote improved regulatory policy and infrastructure management (e.g. in-country training and university collaborations)

The Body of Knowledge on Infrastructure Regulation



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The Revenue Requirement

- Utility's cost to provide electricity service
- Basically comprised of three elements
  - Fair return on the capital invested in the assets necessary to provide service
  - Prudently incurred operating expenses (fuel, purchased power, O&M, A&G)
  - Value of depreciation on assets
- Rates are designed to produce revenues that match the costs to provide service

But What About Now?

2000 kWh

500 kWh

Compensating Distributed Generation

- Net Metering
- Feed-In Tariffs
- Value of Solar
  - Austin (TX) Energy
  - State of Minnesota

Net Metering

- Household production is 'netted' against consumption when calculating the final bill (in our example, 1500 kWh)
- Customers compensated at the retail per kWh rate for all generation
- Doesn't require bi-directional metering
- Variant programs (net billing, broadly) requires bi-directional metering and compensates household at a rate distinct from retail

Feed-In Tariffs

- From the project development side, a criticism of net metering is that it doesn't provide a predictable revenue stream (as rates change)
- Feed-in tariffs are a guaranteed rate over a fixed time period
- Can be set by a regulator (Germany or Spain) or through a competitive bidding process (South Africa)

Austin Energy Value of Solar

- Incorporates several building blocks
  - Avoided fuel cost
  - Avoided O&M for peaking units
  - Avoided capital costs of generation, transmission, and distribution
  - Avoided cost of environmental compliance
- Currently calculated at 10.9¢ per kWh
- Current per kWh rates for residential customers range from 4.9¢ to 14.6¢ (depending on monthly consumption and season)
- Customers also pay a monthly fixed charge, and per kWh regulatory fees and systems benefits charges

Minnesota Value of Solar

- Uniform state-wide methodology
- Austin Energy's building blocks with a few additions
  - Costs to regulate voltage and frequency
  - Local tax revenue tied to solar jobs
  - Credit for wholesale market price reduction
  - Aid in disaster recovery
- Value of solar must be calculated annually for each utility
- As of February 2016, no Minnesota utility has adopted value of solar in lieu of net metering

Other Solutions

- Grid access fees have met with mixed results
- Curacao and Aruba have implemented fixed monthly fees (along with net metering) for rooftop solar installations
- Arizona Public Service proposed an increase in fees to solar customers from $0.70 per kW to $3.00 per kW in April 2015, but withdrew the request in September (regulator has since opened a value of solar docket)

Conclusions

- All methodologies have strengths and weaknesses rooted in the economics, engineering, and technical constraints (such as metering infrastructure)
- Any misalignment of the costs and benefits is not fair to either the owners of distributed generation or the other customers
- Important to align these costs and benefits as closely as possible given each system's constraints