Utility Perspectives on Renewable Energy

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About Frontier Associates

• At Frontier Associates, we work on the demand side of energy markets
  – Energy efficiency and distributed renewable energy programs
  – Demand response programs
  – Innovative rates and pricing strategies
  – Research into new energy-efficiency technologies

• Based in Austin, and most of our work is in Texas and neighboring states

• Our staff of 35 has assisted nearly every major electric and natural gas utility in Texas, Oklahoma, Arkansas, Colorado, and New Mexico

• Active contracts with CPS Energy and every investor-owned utility in the state

• That said, I don’t speak for any of them!
Utility Perspectives

• Renewable energy affects the entire traditional value pipeline – generation, transmission, distribution, retail – and utilities face unique opportunities and challenges within each.

• There are many different kinds of utilities in Texas, each with different motivations and issues concerning renewable energy.

• My focus will be on utility energy efficiency programs and portfolios, which primarily address distributed, customer-owned solar, though other models are also prevalent and growing.

• Utilities offer incentives to customers who invest in and deploy equipment that reduces energy consumption and peak demand.

Utility Roles
- Generation
- Transmission
- Distribution
- Retail

Utility Types
- Investor-Owned
- Municipal
- Rural Electric Cooperative
- Generation/Transmission Cooperatives
Utility Perspectives

Inside/Outside ERCOT
~85% of all kWh in Texas
~20 million customers

Competitive Areas
~75% of all kWh in Texas
~15 million customers

Electric Cooperatives
65 coops + 9 GTCs
~3 million customers

Municipal Utilities
71 munis
Cost Effectiveness

• Utility incentives generally must be shown to be cost-effective, at the measure, program, and/or portfolio level

• Cost effective means that the net present value of economic benefits exceeds the net present value of economic costs. This may be resolved at the level of:
  • Program participants, and non-participants (Participant and ratepayer impact tests)
  • The utility itself (Utility cost test)
  • All utility ratepayers (Total resource cost test)
  • Society as a whole (Societal cost test)

• Benefits may include:
  • Avoided energy and capacity costs
  • Avoided transmission costs
  • Tax credits

• Costs may include:
  • Program administration costs
  • Incentives paid
  • Participant costs
Other Factors

In addition to cost-effectiveness, a utility’s energy efficiency program portfolio must also consider:

- Balance of offerings for all customer segments
- Budget limitations
- Energy and emissions savings goals/targets
A Growing US Solar Market

U.S. Solar Market Insight Report, Q3 2016, GTM Research and SEIA
Declining Installed Costs

![Graph showing declining median installed price with time](Image)

- Residential
- Non-Residential ≤500 kW
- Non-Residential >500 kW

Installation Year: 1998 to 2015

2015$/W_{dc}

Tracking the Sun IX, LBNL, August 2016
Texas Residential PV Incentives

Incentive Level Offered, $/Wdc

- AE Res
- CPS Res
- Oncor Res
- Entergy Res
- TNMP Res
- AEP-TCC Res
- AEP-TNC Res
- SWEPCO Res

Texas Commercial PV Incentives

Incentive Level Offered, $/Wdc

- Oncor Comm
- Entergy Comm
- TNMP Comm
- AEP-TCC Comm
- AEP-TNC Comm
- SWEPCO Comm
- EPE Comm

Year:
- 2008
- 2009
- 2010
- 2011
- 2012
- 2013
- 2014
- 2015
- 2016
- 2017

Current Incentive Levels:
- $3.00
- $2.50
- $2.00
- $1.50
- $1.00
- $0.50
- $0.00
Closing Thoughts

• Achieving cost effective energy efficiency is becoming more difficult and more expensive for utilities, due primarily to:
  • Improvements in building systems and technologies
  • Higher baselines against which savings are measured
• Solar is one of a few technologies for which the baseline is remaining constant (mostly*) and costs to consumers and utilities are declining
• Solar’s position within utility energy efficiency program portfolios is therefore becoming stronger over time

* Codes requiring new homes to be designed to consume zero net energy may eventually reduce the benefit of solar to utilities by raising the baseline
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