

Distributed Generation and the Retail Utility of the Future

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United States Department of Energy

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Foundational Policies Supporting Distributed Generation

- 30% Federal Investment Tax Credit (ITC)
- Renewable Portfolio Standards
 - In AZ, 15% by 2025, 30% DG Carve-out
 - Largely met, or will be within a few years.
- Net Energy Metering (NEM)
 - Underpins DG value proposition
 - In AZ, \$5 surcharge approved by the ACC in 2013; other states beginning to address whether to assess these charges. Some, like Utah, have rejected them.

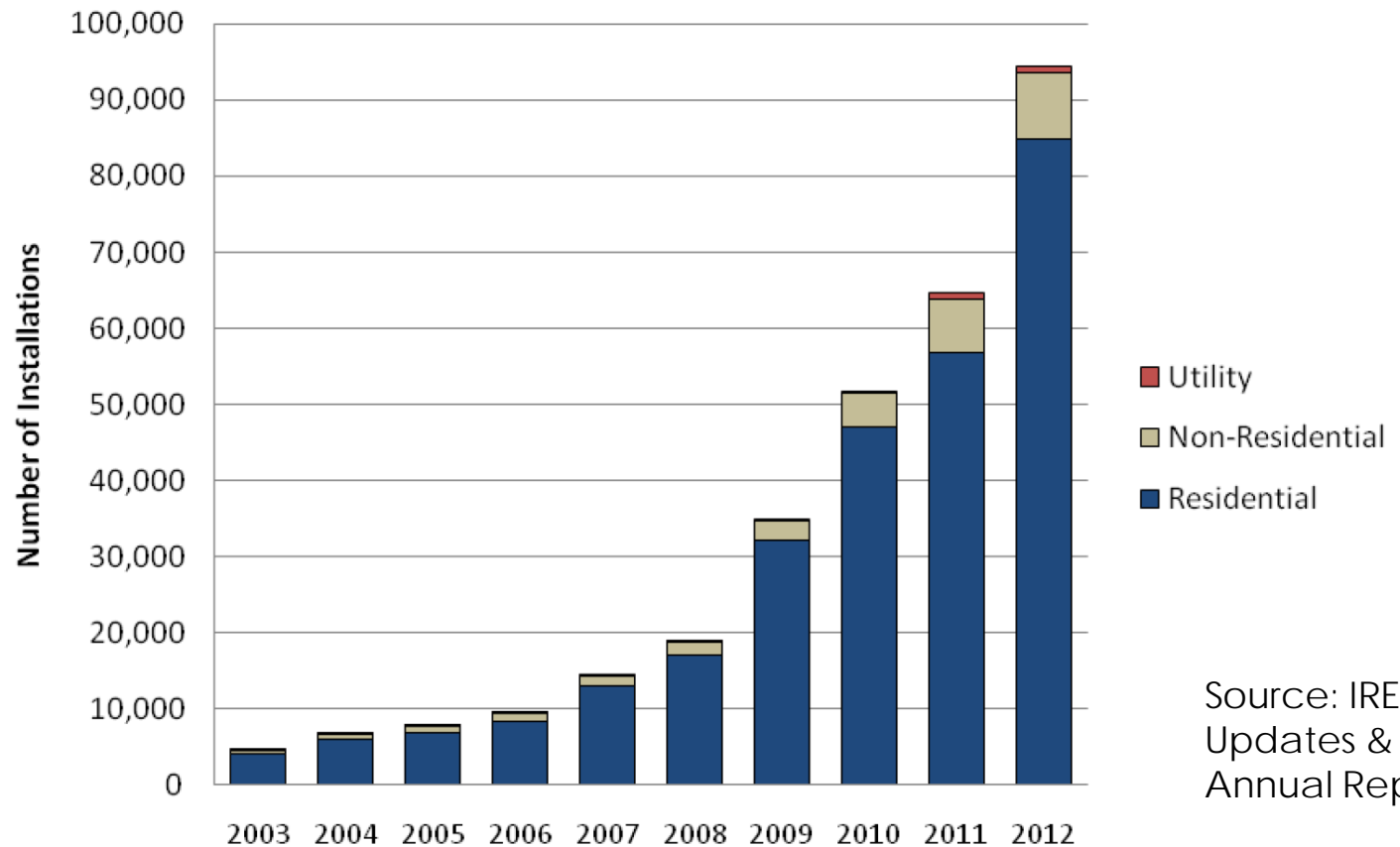
Foundational Policies Supporting Energy Efficiency

- Energy Efficiency Resource Standards
 - E.g. In Arizona, 22 percent (cumulative) of retail sales by 2020.
- State and Local Building Energy Codes
- Federal and State Appliance Standards

Other Policies/Venues Affecting Utilities and Third Party Companies

- EPA Rulemaking on Carbon Pollution
- Value of Solar Dockets
- Utility of the Future Dockets
- Rate Design Proceedings
- Resource Planning and Procurement

DG Penetration Rises Nationally



Source: IREC 2013
Updates & Trends
Annual Report

Utilities with High PV Penetration

Munis and Coops

Investor-owned Utilities

Net metered PV systems (as % of total customers) in 2012

6.0%
5.0%
4.0%
3.0%
2.0%
1.0%
0.0%

Kauai Island...

City of Hercules

City of Roseville

City of Palo Alto

City of Healdsburg

Washington...

Maui Electric

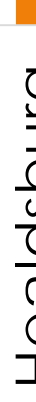
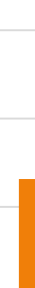
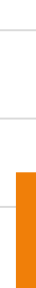
Hawaiian Electric

HI Electric Light

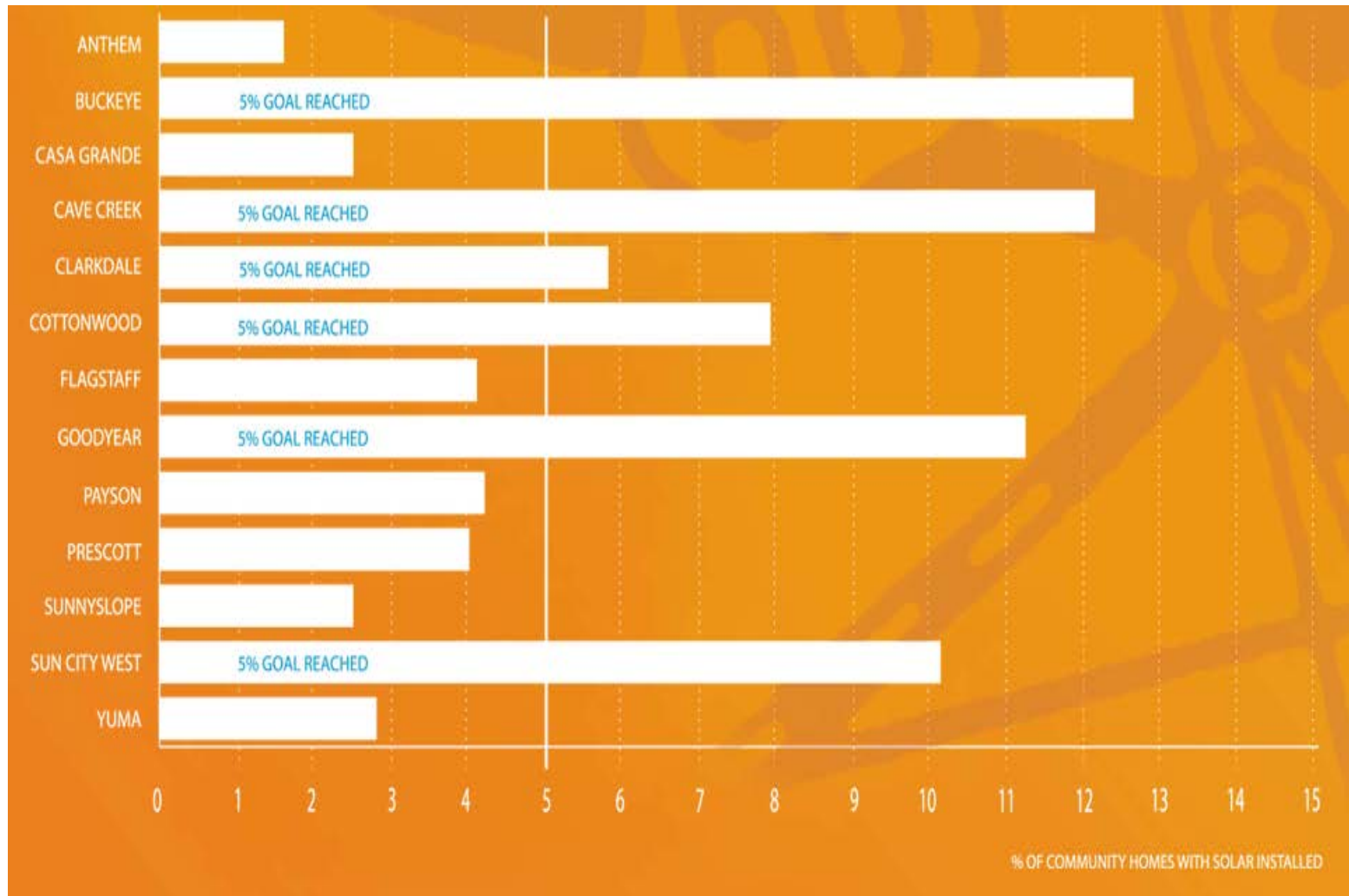
SDG&E

PG&E

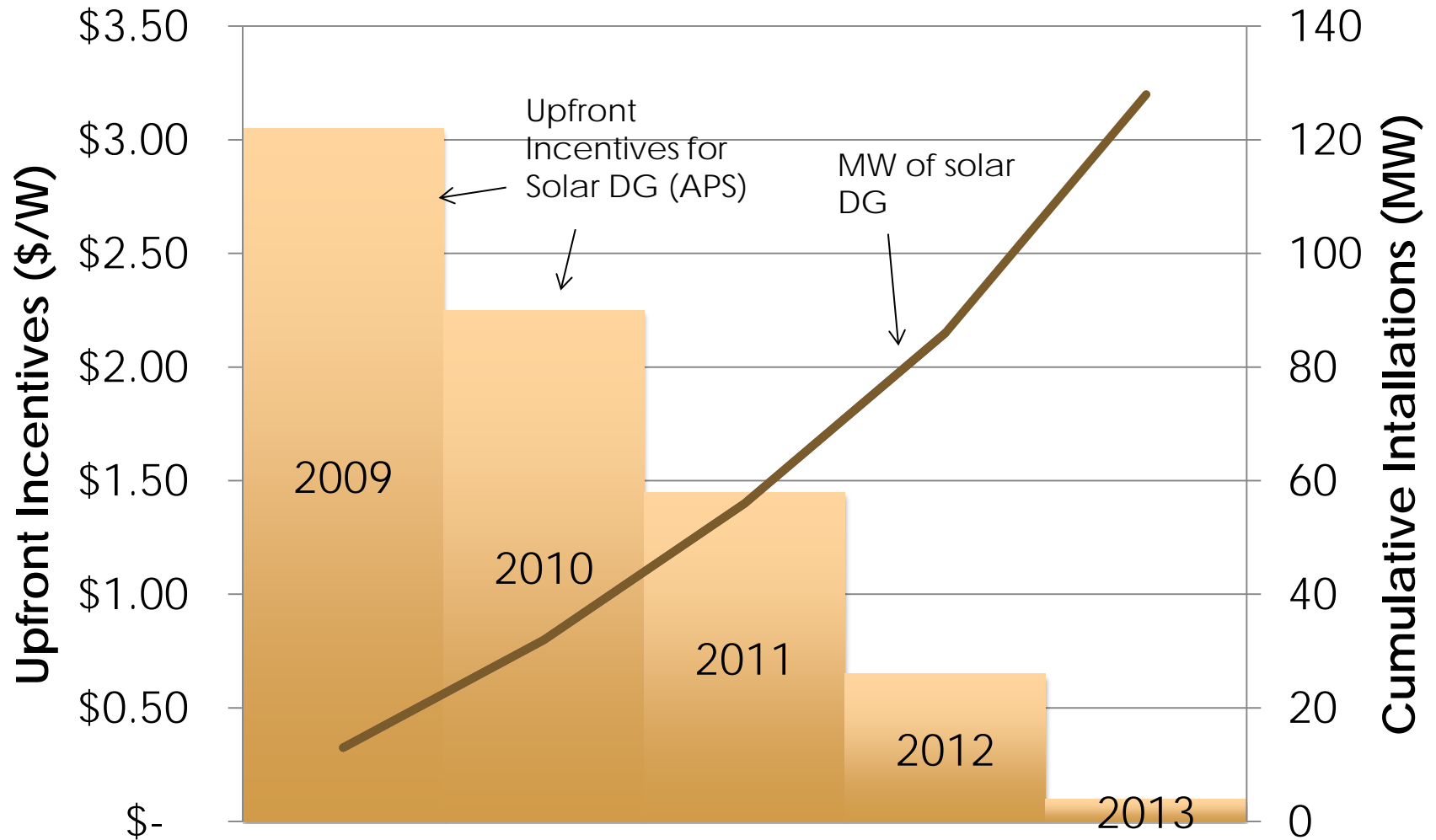
AZ Public Service



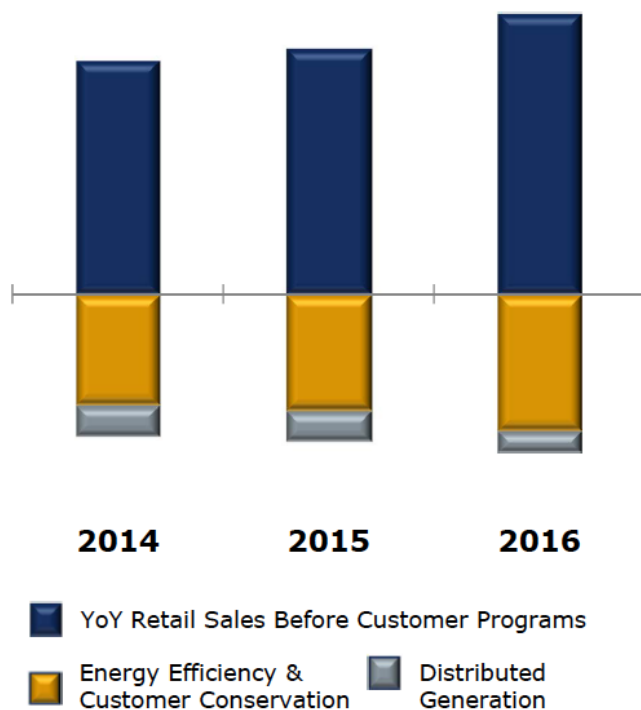
Arizona Solar Hotspots



Residential DG in APS Service Territory



RETAIL SALES GROWTH (WEATHER-NORMALIZED)



- Weather-normalized retail sales growth about 1% for 2014-2016 after impacts of energy efficiency, customer conservation and distributed renewable generation initiatives (excluding Lost Fixed Cost Recovery)

Distributed Generation (DG) Impact

- DG makes up 0.5% (or less) of the negative impact to retail sales growth as shown in the chart; equates to approximately 60 GWh out of our total retail sales of over 28,000 GWh
- Average residential rooftop solar system produces 10,000 – 12,000 KWh per year (average metro-Phoenix customer's usage is nearly 15,000 KWh)

The Fight over Net Metering in AZ



The Fight over Net Metering in AZ

- 2009 – 2012: Rooftop solar increased from 1,000 to 18,000 APS residential customers (~2%).
- July 2013: APS proposes \$50-100/month bill increase for NEM customers.
- Unprecedented campaign-style spending for and against NEM (~\$5 million spent).
- Dueling solar PV benefits studies: 4 ¢/kWh (APS) to 24 ¢/kWh (solar industry) vs. ~14 ¢/kWh retail rate
- Nov 2013: Commission decides to add \$0.70/kW charge for new NEM customers (~\$5/month).
- As of June 2014, APS has 26,800 residential PV systems. Q2 2014 installations on par with Q2 2013.

Where are the tipping points?



Wind PPA
prices
< existing
system
costs in CO



ELM to
increase
asset
utilization



>1 Million
Nest
thermostats
sold



Upfront
incentives
= \$0 in CA
& AZ

- Significant customer benefits...& changing expectations
- Limited growth in utility rate base
- These tipping points cause us to ask: ***Are changes to traditional cost-of-service utility model beneficial?***

Changing the central focus:

FROM:

Did customers pay the correct amount for what they got?

TO:

Are customers getting what they want?



*Utility and
Regulatory Models
for the Modern Era*

by Ron Lehr

What Do AZ Customers Want?

- 62% of voters say that solar is the first energy source they would encourage AZ to use more of.
- 60% of Republican primary voters said they would be less likely to vote for a candidate who voted to end solar programs.
- Nearly 90% of customers support a state renewable energy standard.
- 9 in 10 people say renewable energy is worth the additional cost to develop it.

Sources:

- 2013 Colorado College “Conservation in the West Poll” conducted by Fairbank, Maslin, Maullin, Metz & Assoc. and Public Opinion Strategies:
- 2013 Public Opinion Strategies Poll.
- 2011 APS/Morrison Institute Informed Perception Project Report:

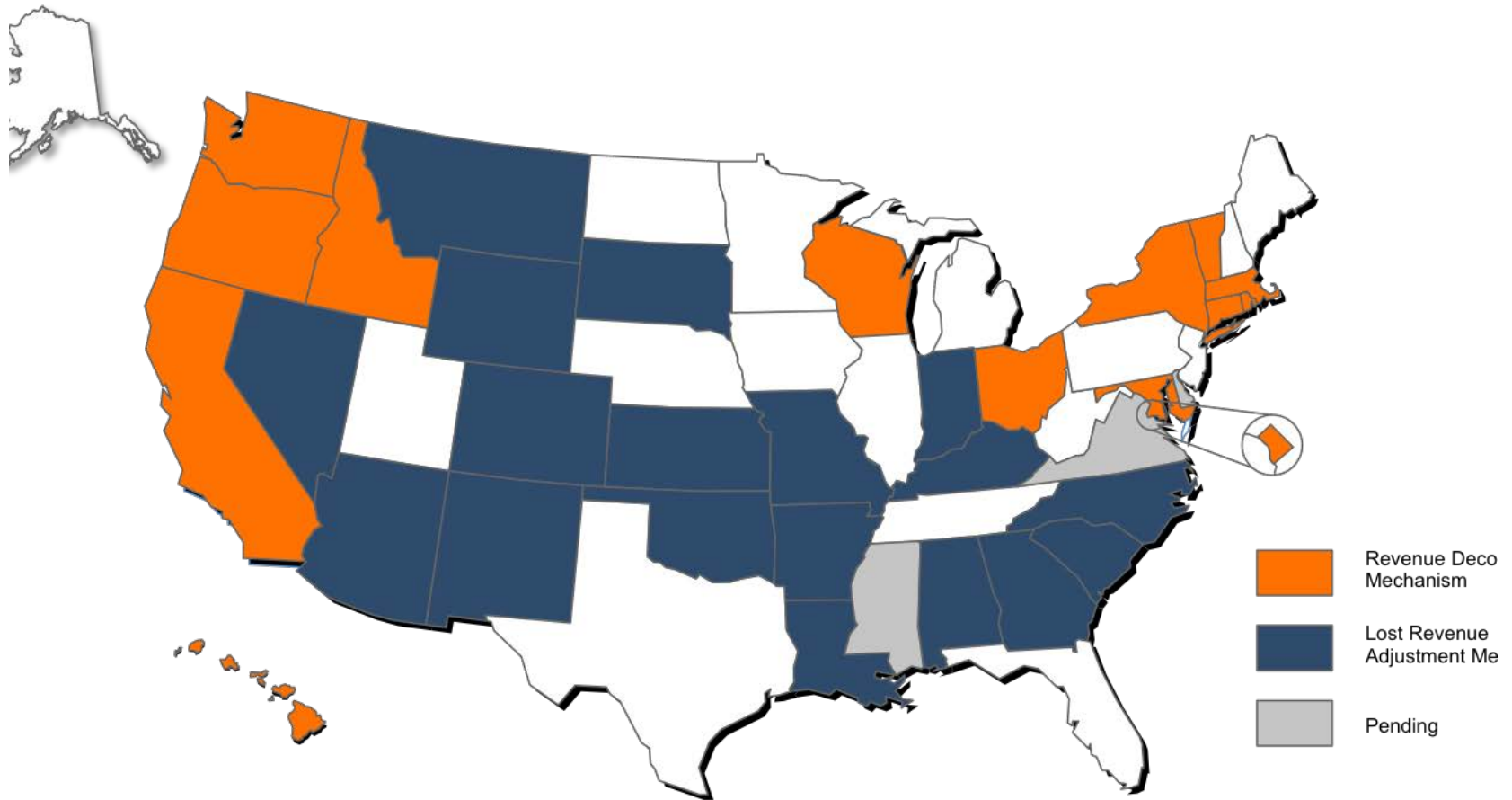
Inquiries into Changing the Utility Model and Incentives

- New York State
- Hawaii
- Arizona Corporation Commission – Comm. Bob Burns' Emerging Technologies Docket
- Powering Tomorrow Initiative
- Scenario Planning with Utilities: ASU and RMI

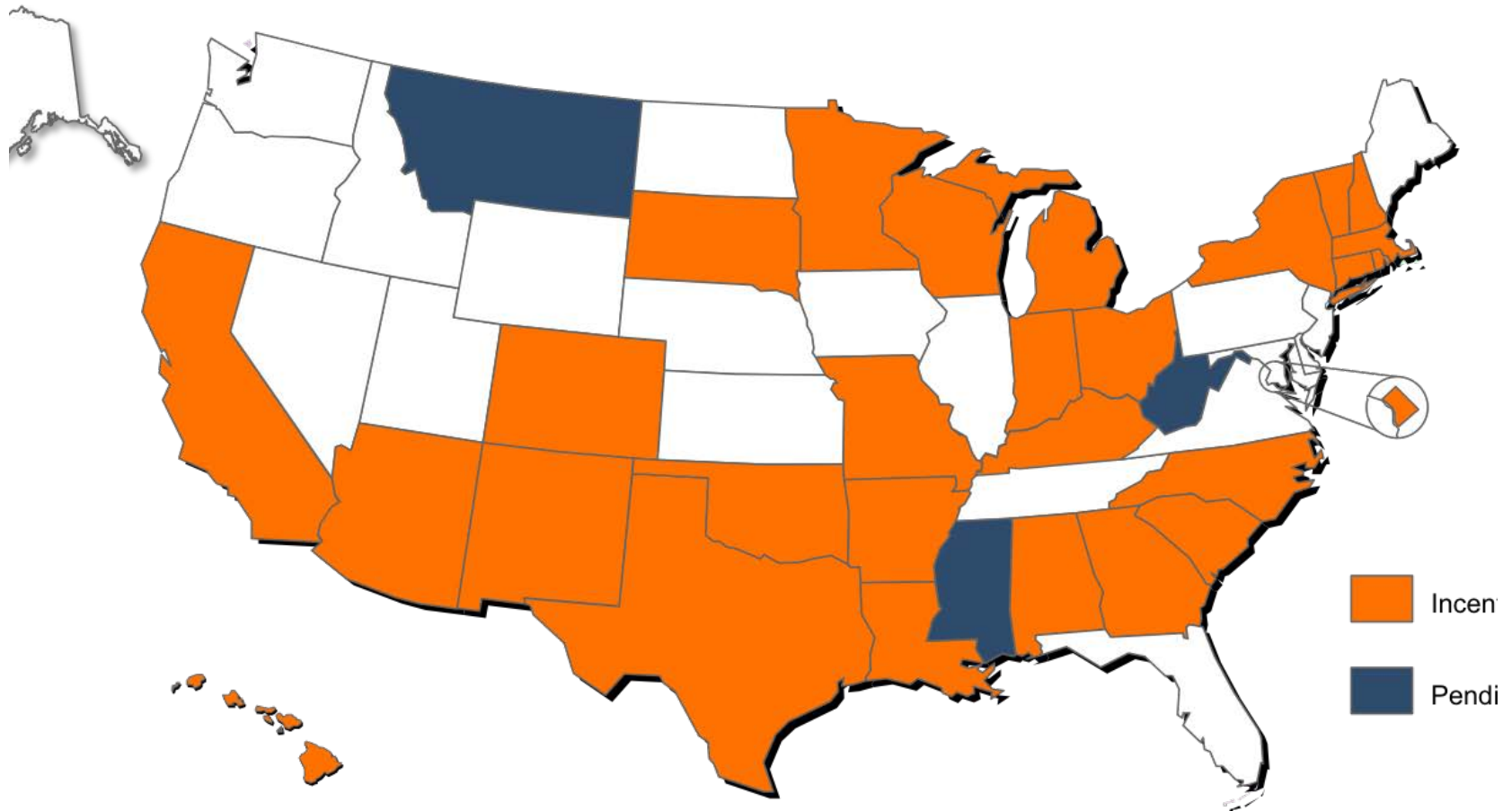
Emerging Changes to the Regulatory Model

- Ratemaking variants (e.g. decoupling, lost-fixed cost recovery)
- Performance Based Incentives (e.g. EE, RE)
- Long-term system planning (e.g. RIIO, Illinois)
- Utility ownership & cost recovery of distributed assets (e.g. microgrids, utility-owned DG)
- Decentralization of utilities → wires only;
- New York's REV

Lost Revenue Adjustment & Revenue Decoupling



EE Performance Incentives



Xcel Shared Savings tied to RE Procurement

- Xcel in Colorado exceeded RPS goal and accumulated excess RECs.
- Earned \$62 million from off-system REC sales (in 2009-2011).
- Shared savings mechanism enabled revenue split between company and customers.

ComEd 10-year Performance Plan Goals

Category	Performance Goal
Frequency of customer interruptions	Improve system-wide SAIFI by 20%.
Duration of customer interruptions	Improve its system-wide CAIDI by 15%.
Service reliability targets	Increase # of customers who exceed the service reliability targets by 75%.
Estimated bills	Reduce the number of estimated electric bills by 90%.
Minority-owned and women-owned business enterprises (MWBE)	Increase its capital expenditures paid to MWBE contractors by 15%.

- Penalties invoked for not meeting targets.
- Required to be eligible for formula rates (vs. periodic rate cases).
- Established via extremely controversial legislation (governor veto overridden).

Utility DG Ownership Proposals

- APS has proposed to own 3000 systems, “rent” rooftops of customers, in return for \$30 bill credit.
 - Substitute for proposed 20 MW utility-scale solar project.
 - Designed to meet 2009 rate case Settlement Agreement provision (~10% RE required by December 2015).
 - Request for expedited approval (by Sept, 2014)
- TEP proposal: own 600 customer-sited rooftop solar systems, customer would receive a guaranteed rate of approximately \$99 over the next 25 years (based on an historical usage calculation).
- Duke Energy Proposal
- Southern California Edison Proposals
- Divided opinions within local industry

Utility DG Ownership Proposals (con't)

“Because TEP would own and operate the systems, it can employ a distribution management program to control the inverters, providing voltage and frequency control to benefit the grid and all customers. The Company can direct systems to areas of the local grid where DG benefits can be maximized and negative impacts can be minimized.”

Source: TEP, July 2014,
<http://images.edocket.azcc.gov/docketpdf/0000154472.pdf>

Changes to resource planning (i.e. decentralization)

- Will all resources be able to compete effectively?
(e.g. via all-source RFPs, capacity markets, etc.)

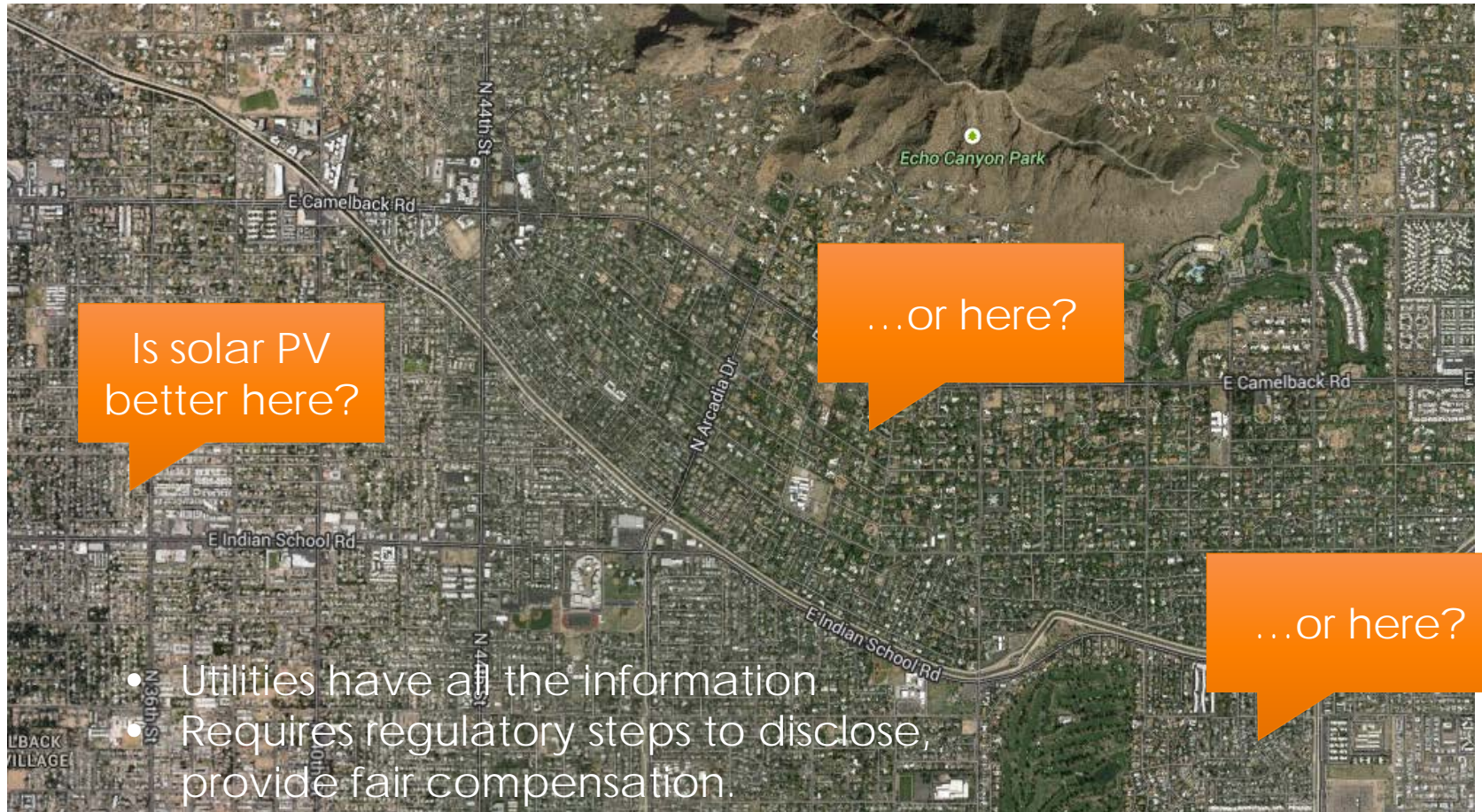


VS.



- Colorado all-source RFP as one example

Integrated Distribution Planning



Utility of the Future Center at ASU

- Led Scenario Planning exercises
- Powering Tomorrow Initiative: create model code of regulations to be tailored state by state.
- Survey of new regulatory models for the State-Provincial Steering Committee and Committee on Regional Electric Power Cooperation