



THE
Vote Solar
INITIATIVE

R.U.C.O.

Net Metering Workshop

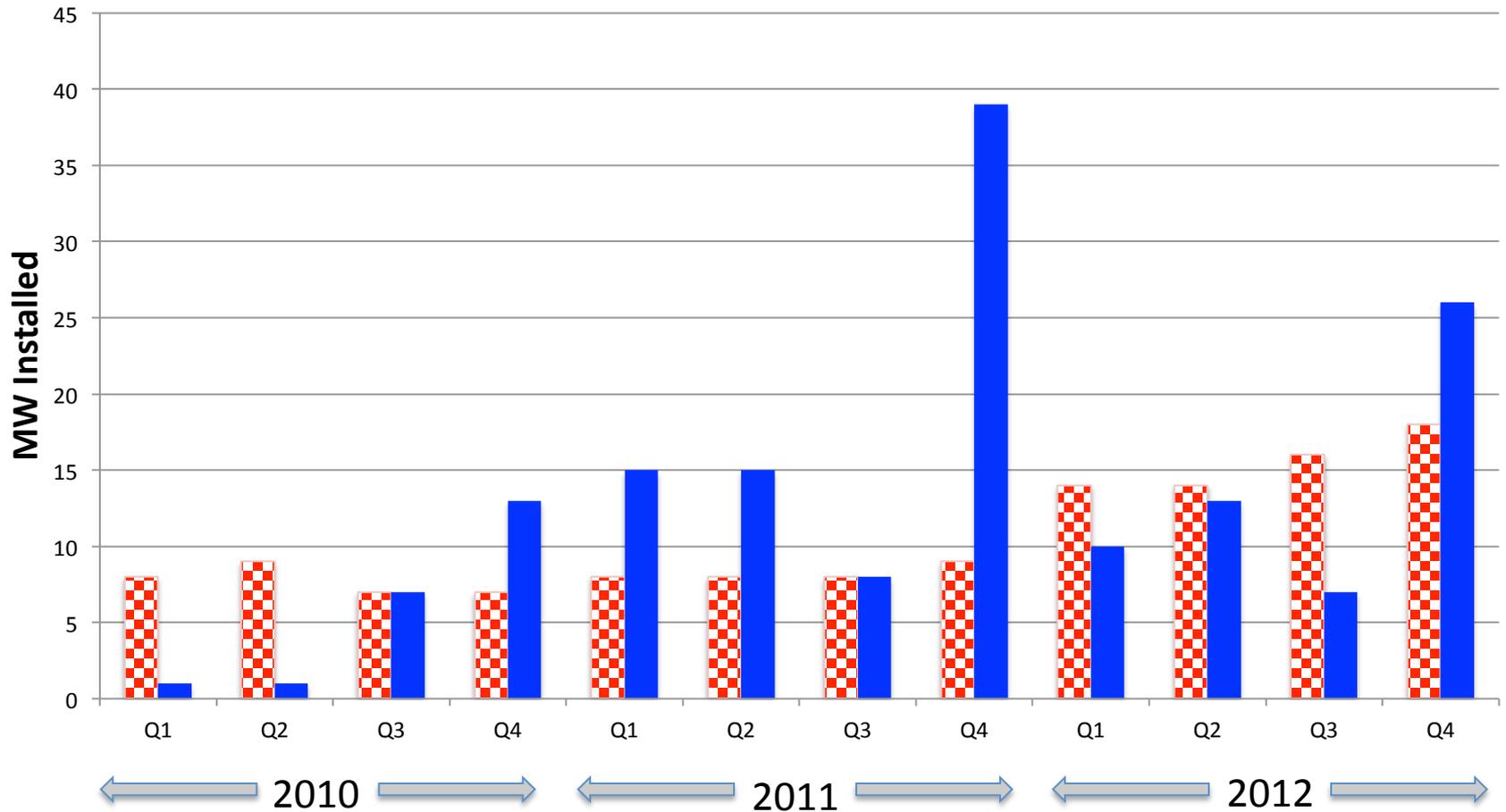
May 29, 2013

Outline

- Introduction
- Rates and Rate Design
- Non-rate Benefits of Distributed Solar
- Cost and Benefits
- Business Model Implications

Arizona Distributed Solar

Residential Commercial



Rates, Rate Design & Cost Recovery

- Based on Test Year, with *pro forma* adjustments, designed to recover costs incurred during time the rates are in effect => future costs;
- For classes with kWh-based rates, any sales reduction or *increase* for any reason can lead to under or *over* recovery of fixed costs;
- For classes with kW-based rates, fixed costs are recovered through a separate charge, largely unaffected by on-site solar generation.

Demand Rates

Typical Customer

- 178 kW peak load
- 178 kW solar system

- Average annual demand revenue loss = 9%

Impact of Solar Generation on Commercial Customer Peak Demands

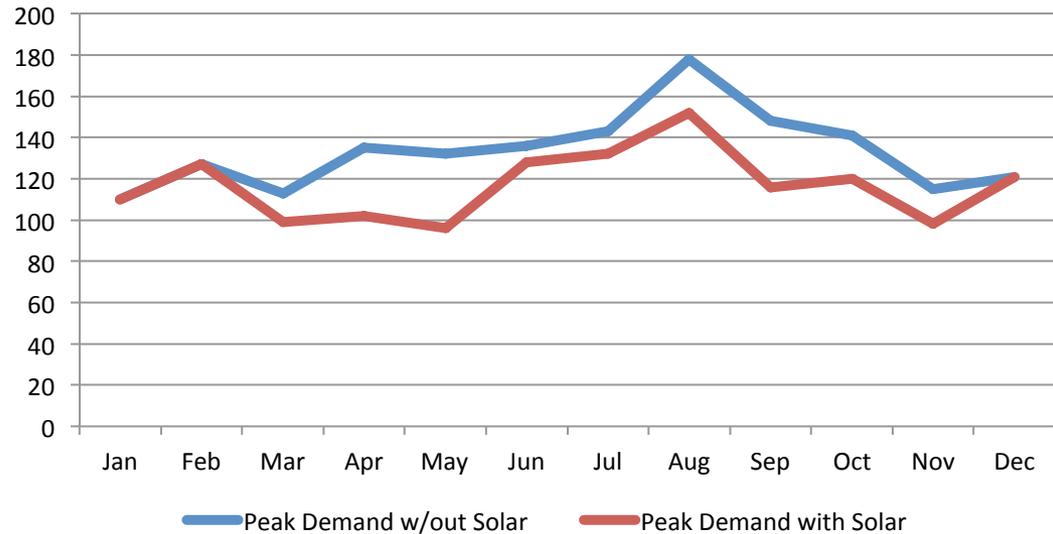
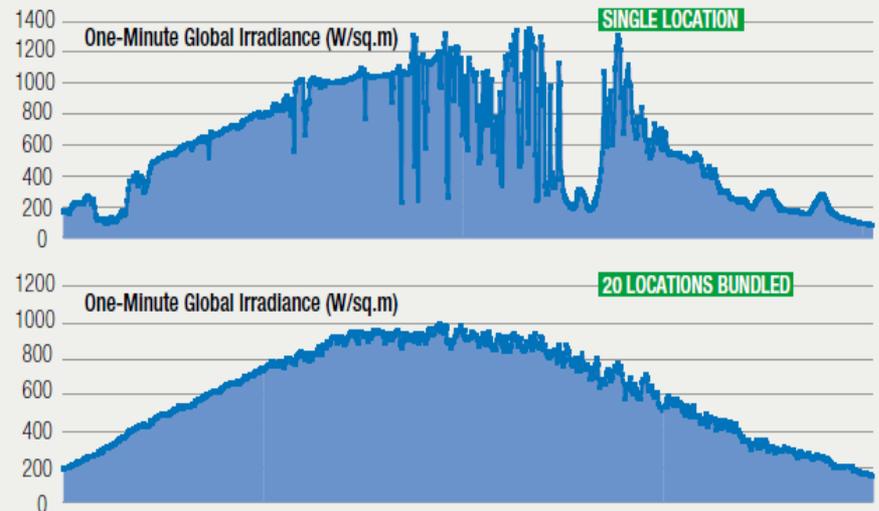


Fig. 1

REGIONAL DISPERSION AND RELIABILITY



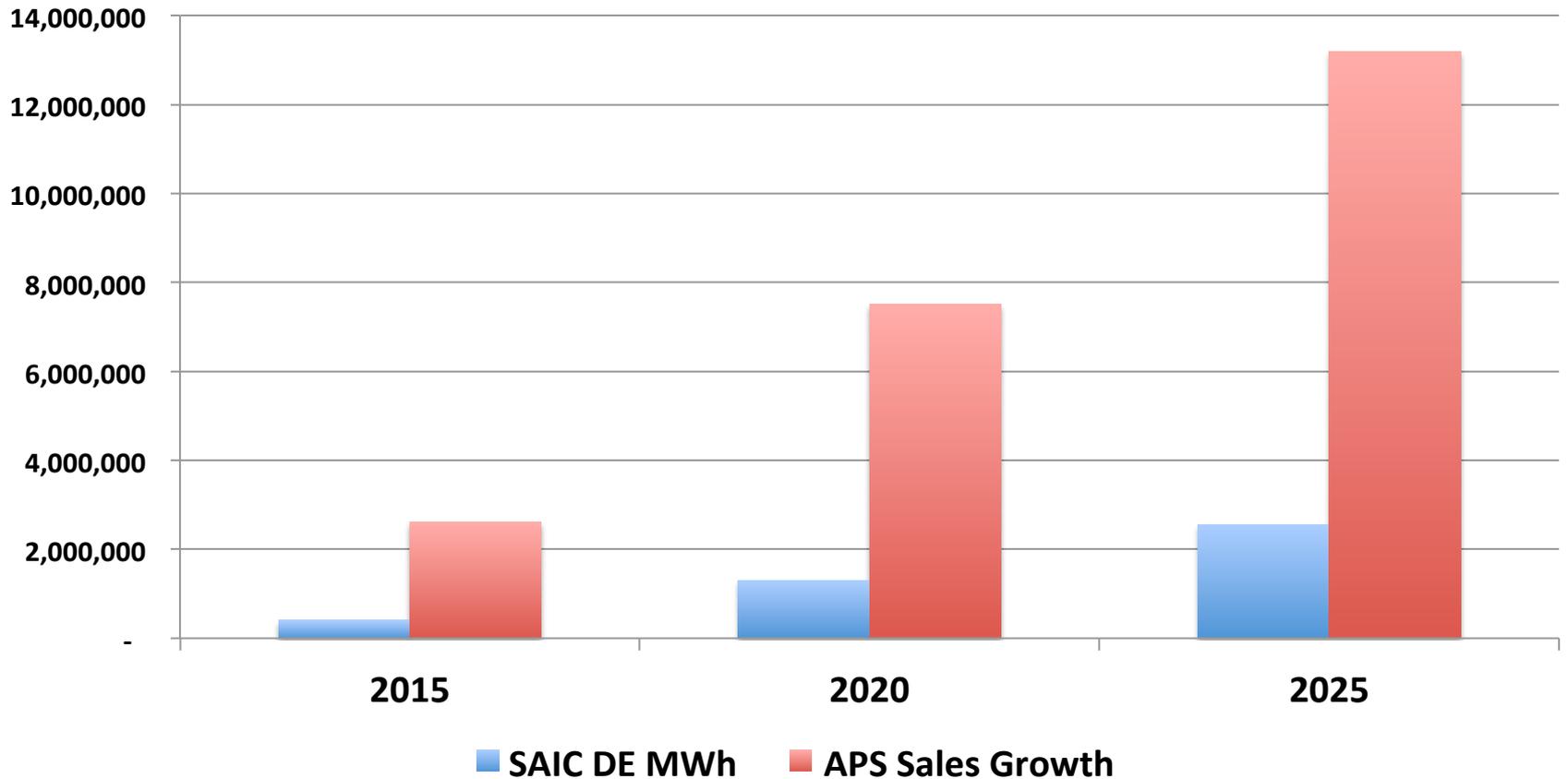
Comparing the solar irradiance at one location on a single partly cloudy day (top) to that of 20 locations dispersed over approximately 100 square miles illustrates how system-wide distribution greatly reduces variability in solar energy.

Cost Recovery

- APS & TEP have instituted LFCR to assure fixed costs are recovered despite EE/DG-related sales *reductions*
- APS/TEP are promoting the notion of cross-subsidies
- Existing cross-subsidies
 - Profit differentials by class
 - Low-income discounts
 - Intra-class cost differentials
 - Locational differentials

Maintaining Perspective

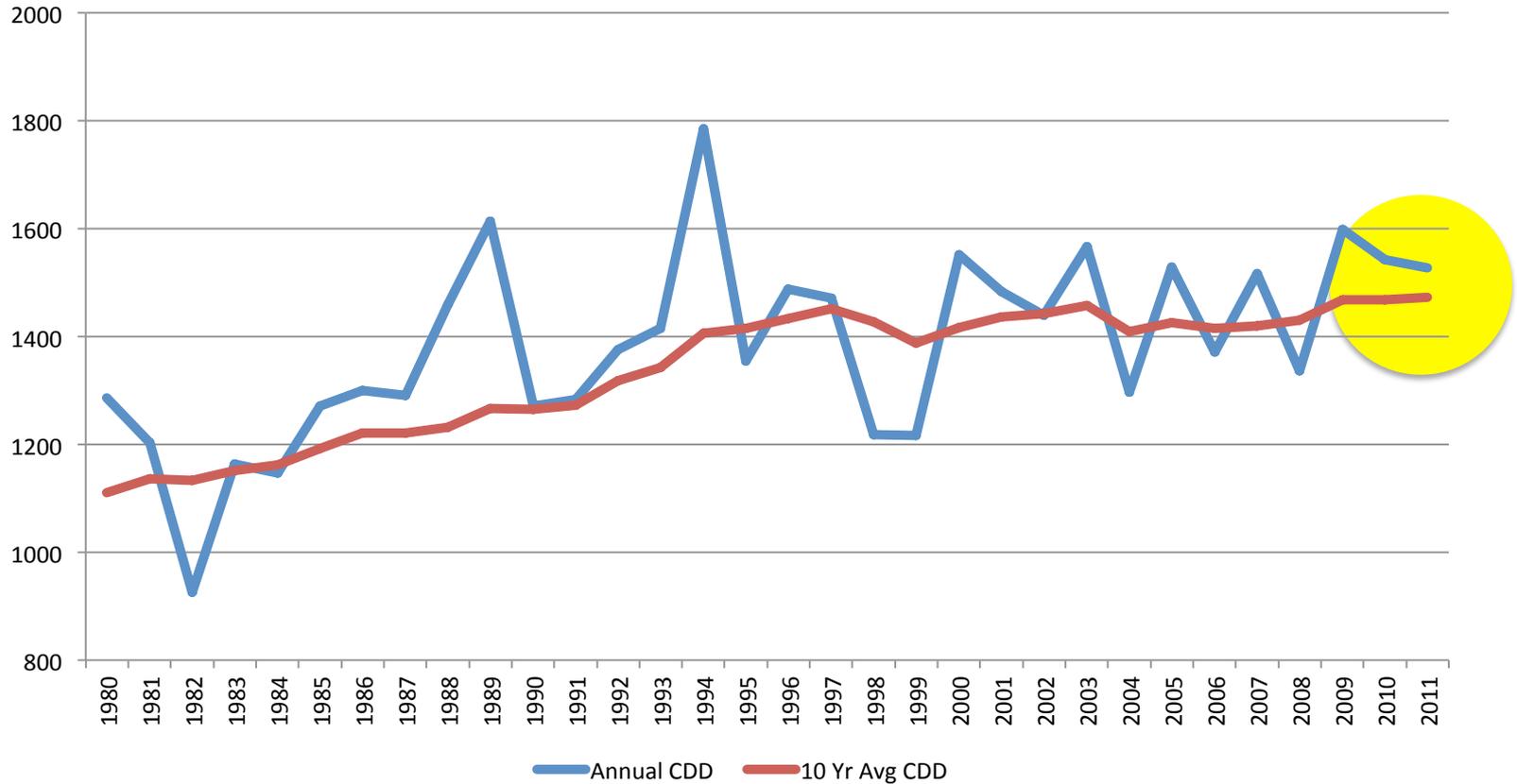
Comparison of Incremental DE Generation with Sales Growth



Example 2

Weather Normalization

Cooling Degree Days
1980-2011



Broader Benefits of Distributed Solar:

The ACC's *Legislative Role*

- Provides customer choice to Arizonans
- Creates jobs & economic development
 - Highest solar jobs per capita in the country
- Keeps energy dollars in the state
 - About 5% of fuel for APS's conventional generation comes from within Arizona
- Enhances energy security
 - DOD testimony in the RECs docket emphasized the importance of DG for energy security
- Environmental & Water

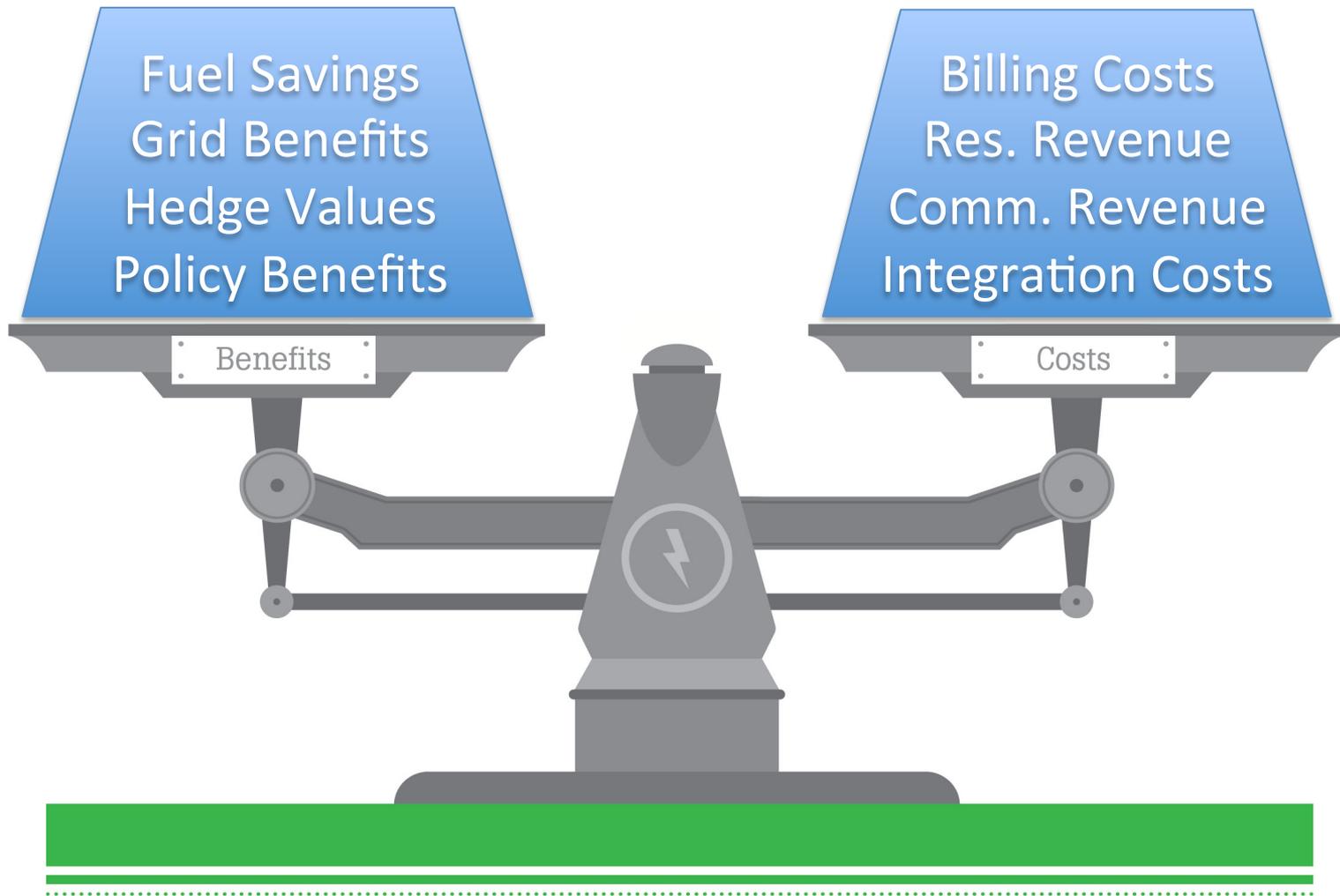
Public Support for Solar

Four separate public opinion surveys conducted by APS and the Morrison Institute for Public Policy in May 2011 revealed that 94% of APS customers support increasing the use of solar energy.

Do you think that as a country, the United States should put more emphasis, less emphasis, or about the same emphasis as it does now on producing domestic energy from each of the following sources—
[RANDOM ORDER]?

| <i>2013 Mar 7-10</i> <i>(sorted by “more emphasis”)</i> | More emphasis | Less emphasis | Same emphasis | No opinion |
|--|--------------------------|--------------------------|--------------------------|-----------------------|
| Solar power | 76 | 10 | 12 | 2 |
| Wind | 71 | 12 | 16 | 1 |
| Natural gas | 65 | 10 | 24 | 2 |
| Oil | 46 | 32 | 21 | 1 |
| Nuclear power | 37 | 32 | 28 | 3 |
| Coal | 31 | 41 | 25 | 3 |

Net Cost or Net Benefit?



Recap

- Neither APS nor TEP is losing money.
- Rates are blunt and imprecise, and contain policy and non-policy driven subsidies.
- Solar DE penetration is small
- Solar provides extensive non-rate related benefits, and Arizonans (and Americans generally) strongly support increased use of solar resources
- Solar provides customer choice

What's the problem?

This form of customer choice is a threat to the incumbent providers.

The Changing Landscape

- Recent flat sales, combined with infrastructure additions, leads to large rate increases
- Restructuring & competition
- Game-changing technologies
 - Demand response
 - Distributed solar & advanced inverters
 - Viable small scale storage & CHP
- Initial response: Assure cost-recovery
- Secondary response: Slow the development

Preparing for the Future

- Consider EE/DE as a real resource
 - E.g. encourage load shift to solar generation
- Strategic deployment of distributed solar to enhance grid & operations
- Advanced technologies to shape load to resources, provide ancillary services
- Analyzing & planning for two way flows of electricity on the grid
- Five-year solution

Thank You!

Rick Gilliam

The Vote Solar Initiative