Public Power (and the Rest of the Utility Industry!) Is Entering a Time of Great Change

Four factors driving this change:

• Evolving customer preferences
• New technologies
• Increasing regulation
• Utility workforce issues
APPRA Strategic Initiatives

- Communicate the value of public power
- Public Power Forward
- Address adverse impacts of federal regulation
- Improve cyber and physical security
- Focus on research and development
- Help meet utility workforce challenges
What Is Public Power Forward?

Helping public power utilities prepare for a new era in electricity through

• Research
• Education
• Advocacy
• New tools & technologies
Why Public Power Forward?

• Traditionally, utilities have stayed on their side of the meter

• Retail electric customers now have more choices with new technologies (on both sides of the meter)

• New industry entrants — can be both competitors and service provider partners

• Public power utilities strive to be the service providers of choice in their communities
Member Toolbox

- **Policy research and analysis**: What DOE, states, and other utilities/sectors are doing on distributed generation, demand response, energy efficiency

- **Education & tools**: Options, case studies, best practices, resources

- **Advocacy**: Ensure policymakers and thought leaders understand public power’s views

- **Communication toolkits**: Educate retail customers and community stakeholders and policymakers
Tools from APPA, Decisions by Members

Members need to decide whether, when and how to revise services, rate structures and operations/infrastructure to:

- Offer retail customers more options
- Modernize utility operations
- Ensure interests of all customers are protected and financial viability of the utility is maintained (many funded by municipal debt)
Innovation

Public power customers, even in small communities that are remote from the frontlines of electric restructuring, are very interested in new technologies and green energy.
There Are Limitations…

Public power utilities are very interested in creative micro-projects, are but less able to support original research and development and large-scale pilot projects; they are not making rate base investments for the return they generate.

Many smaller public power utilities are only now modernizing their IT and OT, and customer interface/metering infrastructures.
U.S. Solar Prices Are Falling

Source: Solar Energy Industries Association
U.S. Solar Installations Are Rising

Source: Solar Energy Industries Association
U.S. Wind Installations Are Rising

Source: American Wind Energy Association
U.S. Generation Capacity Additions by Fuel Type, 2015

- Wind: 46.38%
- Natural Gas: 37.49%
- Solar: 12.39%
- Coal: 0.02%
- Hydro: 0.96%
- Other: 2.76%
Future U.S. Capacity: Plants Under Construction and Permitted

- Natural Gas: 49.25%
- Wind: 24.50%
- Solar: 11.54%
- Nuclear: 8.25%
- Hydro: 1.13%
- Coal: 3.04%
- Other: 2.29%
Public Power and Solar

• Dramatic growth since 2014
  – Direct ownership
  – Utility-scale purchased power
  – Non-utility generation
  – Community solar

• 1,169 MW solar capacity in public power communities

• Nearly 8 percent of total installed U.S. solar capacity as of June 2015
Factors Driving Future Transition

- Renewables poised for significant growth
- Energy storage and other technologies not yet commercially viable (but coming!)
- Emerging suite of conventional and advanced customer-side technologies
  - smart thermostats and grid-connected appliances *that can*
  - save customers money *and*
  - make more efficient use of the grid
Distributed Energy and Grid Modernization

DER’s and Grid Modernization Strategy

Customer DER Resources
- Optimizing shared value of customer resources (lifecycle, operational characteristics)
- Getting rates, incentives to provide right investment and operational signals

Grid Assets
- Defer unnecessary grid investments with DERs
- Grid and equipment upgrades that are designed for a DER future

Grid Operations
- Visibility and control of DERs through integrated platforms
- Grid automation and optimization

SMUD
# The New Utility Business Model: The Continuum

<table>
<thead>
<tr>
<th>Business Model</th>
<th>Today</th>
<th>Model 1</th>
<th>Model 2</th>
<th>Model 3</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Centralized, cost-of-service model</td>
<td>Full service provider</td>
<td>Platform provider</td>
<td>Poles &amp; wires business</td>
</tr>
<tr>
<td>Customer Relationship</td>
<td>Largely 1-way, Some net metering for solar</td>
<td>Driver of DER (selling &amp; procuring, customized energy solutions)</td>
<td>Facilitate connecting DER providers with customers</td>
<td>NA</td>
</tr>
<tr>
<td>Services</td>
<td>Energy, transmission, distribution planning and operations, Traditional utility incentive programs, Low income and med rates/programs</td>
<td>Same as today, plus Distribution grid operations (dispatching, balancing), DER integration, Full service bundling</td>
<td>Grid planning and operations (dispatching, balancing), DER integration</td>
<td>NA</td>
</tr>
<tr>
<td>Assets</td>
<td>Central generation, Poles &amp; wires</td>
<td>Central generation, Poles &amp; wires, DER</td>
<td>Poles &amp; wires</td>
<td>Poles &amp; wires</td>
</tr>
<tr>
<td>Revenue Sources</td>
<td>Traditional energy and demand payments with some fixed charges</td>
<td>Energy &amp; capacity payments (rates &amp; price signals), DER sales</td>
<td>Transaction fees, Integration service fees</td>
<td>Fixed distribution charges (asset rent)</td>
</tr>
</tbody>
</table>

3rd party vendor-driven investment, value & revenue potential

Utility-driven investment, value & revenue potential

[SMUD](#)
The Public Power Forward Strategy

- Exogenous policy directives (federal and state)
- Market forces
  - Prices/availability
  - Alternative supply
  - Bulk power system access/constraints
- Customer and community preferences
- Utility strategic risk management strategy

Public Power Community Grid Modernization Plan

- Services offerings
- Business partnerships
- Resource planning
- Distribution system planning and operations
- Consumer education and community outreach
- Rate design and customer expectations
Future State Strategy: Goals

• Align customer, utility, and third-party supplier interests at grid-edge
• Capture benefits of DERs and other new technologies through integration into operations
• Deploy new utility business and operations technologies
• Reflect real economic costs and risks in rates and service offerings
• Manage financial, operational, and enterprise risks
Future State Strategy: Actions

• Product offerings: value-based pricing of services
• DER deployment based on grid value
• Advanced IT/OT platforms
• Balanced portfolio of utility scale, community and customer resources (Big Box and Homegrown!)
• Coordinated operations across bulk power, distribution utility and customer interfaces
• New business standards and practices
• Manage risk exposure in wholesale markets
Public Power Forward 2016 Projects

- Paper on consumer perspectives on Utility 2.0
  - Content: Paper would discuss consumer perspectives on Utility 2.0 issues, including rate design and new models. Includes case studies on utility consumer outreach as well as input from customer advocates.
- Expected completion: June
Public Power Forward 2016 Projects

• White paper on value of solar
  - Content: Paper would compare and contrast alternative approaches, identifying similarities and differences, focusing on structure of value equations and estimated values for key variables, and explain disparate results.

• Expected completion: September
Public Power Forward 2016 Projects

• White paper on rate design alternatives
  – Content: pros and cons of different residential customer rate designs to send good price signals to customers, recover revenue requirements, manage rooftop solar risk/cross-subsidies and support future PPF innovations. Options will account for differences in member size, sophistication, metering infrastructure and interest in PPF/renewables.

• Expected completion: Rate design model - May; white paper - October
Public Power Forward 2016 Projects

• White paper on alternative Utility 2.0 Proposals
  – Content: Provides an overview of most salient aspects of state restructuring proposals in 2-3 jurisdictions (e.g., NY, CA, MN). Compare and contrast alternative approaches. Discuss possible implications for public power.
  
  ▪ Expected completion: December
Public Power Forward 2016 Projects

• Community Solar A-Z Guide
  – Content: Guide would provide comprehensive overview of all considerations utilities must make when considering community solar. Will offer both technical guidance and case studies.
  ▪ Expected completion: December
Your Input is Welcome!

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