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Updates from the Field

National Governors Association
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And Economic Growth Has Decoupled from Energy

Source: 
Energy in Context, 
15 March 2015
Clean Energy is Cheaper Energy

U.S. Natural Gas Electric Power Price

Wind cost declines since 2009

66% drop in wind energy prices since 2009

Solar cost declines since 2009

85% drop in solar energy prices since 2009

Source: U.S. Energy Information Administration

Lazard’s Levelized Cost of Energy Analysis v. 5-10 tech-weighted avg. of high/low ranges
Power Sector Jobs Have Shifted

*Figure 12. Electric Power Generation Employment by Technology, Q2 2015 - Q1 2016*

The Grid is Getting Much Cleaner…

Electrified Devices “Get Cleaner” Along with the Grid

![Graph showing lifetime efficiency of 55-gal. water heaters, ISO NE](image)

- Electric resistance WH
- Natural gas WH
- Heat pump WH

Time (years)
What is **Beneficial** Electrification?

1. Saves Customers Money Long-Term; New Services
2. Reduces Environmental Impacts
3. Enables Better Grid Management

**NOT just load growth!**
“Duck Curve” and Workplace EV Charging

Source: Jim Lazar, RAP
Clean Energy: Resilience for Free?

Provide energy, capacity, & ancillary services during routine daily operations

- Increasingly cost-effective
- Not dependent on fuel storage or supply chain
- No emissions
- Reasonable maintenance requirements
- Many partnership opportunities to share benefits & minimize costs
- Greater opportunity for control, self-reliance

We may be able to get resilience for low cost or free:
- Apply EE to minimize DER and storage needs
- Design microgrid and controls to meet emergency needs and to extract maximum value during routine operations
Power Sector Transformation (PST): Sankey Diagram – Vermont 2015→2050

Courtesy Dr. Asa Hopkins from the Vermont Comprehensive Energy Plan, Planning and Energy Resources Division, Public Service Department
Disruptive Forces Transforming Electricity

Aggregation, Digitization, Management of Demand

Artificial Intelligence, Deep Machine Learning

Information & Network Effects

Source: Chandu Visweswariah, Utopus Insights Inc.
Transactive Energy Is Already Here

“The project is but one example of how rapidly spreading technologies like rooftop solar and blockchain are upending the traditional relationships between electric companies and consumers, putting ever more control in the hands of customers.”

Airbnb or Uber/Lyft for electricity?
Power Sector Sea Change

• Past 100+ years: Generation followed load
  - Supply met inflexible demand

• Today+: Electricity demand can be managed
  - Load will follow available, cheap, clean generation

• Manage supply and demand => a “market”

• Where markets exist and data is transparent, how important is the “regulatory compact”?

• Cheaper, cleaner, flexible, resilient resources rule
But Risks Also Loom…

- Creating still more stranded costs
- Perpetuation of kWh-throughput business model and existing rate designs
- Hitching to the electrification bandwagon
  - Coupling it to central station; fossil infrastructure
- Regulatory awareness, issues, delays
- Transactive energy and storage become economic first => Bypass? => Problems…
RAP’s US Team Strategic Focus Areas

- Regulatory Reform (PBR and Rate Design)
- DERs and “EE 2.0”
- Beneficial Electrification
- Transactive Platforms

“Skate to where the puck will be.” (Gretsky)
About RAP

The Regulatory Assistance Project (RAP)® is an independent, non-partisan, non-governmental organization dedicated to accelerating the transition to a clean, reliable, and efficient energy future.

Learn more about our work at raponline.org
Additional Slides
Suggestions for Policymakers (1)

DOs:

- Develop communications infrastructure
  - Broadband in some form

- Initiate power sector transformation, distribution system planning, and/or grid modernization plans
  - NY REV, CA, RI, MD, MN, IL, MI, etc.

- Ensure DERs have full access to markets

- Pursue beneficial electrification; plan for storage

- Re-conceive business models (PBR/decoupling), cost allocation, rate designs, etc.

- Involve stakeholders
Suggestions for Policymakers (2)

DON’Ts:

rà Beware risk of further stranded costs to consumers
  • Pipeline projects
  • New central generating stations

rà Exercise caution:
  • New transmission lines

rà Days numbered: Capacity Markets
  • Energy-only markets appear to work well (e.g., ERCOT)
  • Capacity markets have consumers pay twice

rà Don’t delay!
  • If transactive and storage become economic first, bypass will occur, creating political problems...
A Different Kind of Existential Threat

Nevada votes to end NV Energy monopoly

By Danielle Ola | Nov 10, 2018 11:01 AM GMT | 2

Amidst an exodus of Vegas' biggest casinos from NV Energy, a baili vote solidifies the movement to market deregulation. Source: NV Energy
Some Utilities Catching On…

- **Green Mountain Power (VT)**
  - Completely “gets it”

- **Southern California Edison**
  - Has a plan to help meet CA climate and AQ goals by electrifying the state's transportation, water and space heating sectors while doubling carbon-free electricity

- **Xcel Energy - Colorado**
  - 30% RE by 2020; #1 utility wind energy provider for a decade; 35% lower CO2 from 2005 by 2020; top 10 in EE

- **Great River Energy (MN, coop G&T)**
  - Transitioning its resource portfolio toward an innovative and lower-carbon future (27% lower CO2 from 2005)
SCE: GHG Reductions Across Sectors to Reach 2030 Goals

Source: Southern California Edison, November 2017