Disruptive Challenges Facing Electric Utilities

March 26, 2014

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Premise of “Disruptive Challenges” Paper

• Public policy promotes a range of programs (e.g. EE, DR, NEM) that are inconsistent with the utility revenue and business model
  
  • Does not provide utilities’ with incentives to achieve policies consistent with investor expectations for stability/growth
  
  • Programs often challenge/impair a utilities’ competitive position due to customer rate impacts, including cross subsidies
  
• Given potential for new technologies to disrupt the customer relationship, business and financial risks to investors will increase
  
• Regulators, policy makers and stakeholders require information to adopt solutions balancing customer interests, policy & financial considerations
  
• Utilities’ must re-assess their business model and approach to policy proposals to mitigate adverse impact on utility business and embrace opportunities from changing landscape
Examples - Disruptive Innovation

<1990

<1990

>1990

>2007

Polaroid Instant Camera

Digital Camera

Smartphone

Rotary Telephone

Flip Phone

iPhone
Example--Electric Utility Sector Disruptive Threat

<2000 → 2010+ → ???

- Coal-fired power plants
- Solar panels on rooftops
- Electric vehicle

[Images of industrial plant, solar panels, and electric car]
Global-National-Regional Clean Energy Issues

- **Global Issues**
  - Solar policy is causing havoc on European Power Generating Utilities
    - High Feed-in Tariffs >> Increased Solar Installations >> Reduced fossil generation >> Lower power prices
    - Large European Utilities stock prices down 50% from ‘08 peak (E.on down 75%) and credit ratings for 5 of top 10 have moved lower

- **USA Trends**
  - Solar is nascent, but gaining penetration in high priced markets and SW USA
  - Distribution utilities to date have been spared by x-subsidies (by non PV customers)
  - Merchant power prices impacted by shale, weak demand, energy efficiency and renewables
    - Merchants without offtake agreements >> weak power prices >> 50%+ decline in equity value

- **Regional Trends for PV Solar**
  - Western USA: rapid growth due to policy support, high electric prices and higher efficiency rates
  - Central USA: except Colorado, slow development – affordable electricity and lower PV efficiency
  - Northeast USA: policy support and higher electric rates vs. lower PV efficiency – moderate growth
  - Southeast USA: less policy support and attractive electric prices – nascent market activity
    - Southeast states typically lack RPS and NEM policy (43 NEM states; but not GA,AL,MS,SC)

  - Electric price trends suggest competitive technology risks will be a factor in the future

  - **However, increasing utility rates and declining renewable system costs will bring challenges throughout USA**
A confluence of factors are posing disruptive threats to utility business models
Electricity Demand
(Source:EIA)
Efficiency Alternatives and Share

(25 + categories tracked)
EEI Capital Expenditures Projections

Notes: Total company spending of U.S. Shareholder-Owned Electric Utilities
Projections based on publicly available information and extrapolated for companies reporting fewer than three projected years (6% in 2014 and 2015).
Financial Risks of Sector Dynamics

• Revenues/Profitability
  • Slower growth in revenues from sales growth (*key*—revenues based on kWh sales)
  • Increased need for rate increases to support capital spend in slow growth economy
  • Competitive position challenged by rate increases which pressures sales growth

• Capital Investment
  • Generation assets represent stranded investment risk in a DG environment
  • Distribution investment may also be at risk as customers move to DG and potentially disconnect from the grid (not yet likely, but cheap battery storage could enable)
  • 30+ year assets should be evaluated as to recovery risk and timeframe

• Security Valuation
  • Near-term: utilities with growing rate base are attractive to investors
  • Longer-term: valuations and credit ratings will be challenged if/when Disruptive factors become a material risk
Impact of Financial Issues Raised by DERs

• Customers
  • Who pays and should pay for cost of Grid not recovered due to DERs and NEM?

• Regulated Utilities
  • How to value Capacity and Energy in DG environment?
    • NEM provides x-subsidy from Non-PV participants to PV Participants
    • Is intermittent clean energy = retail value of fully costed utility G,T and D services
  • Passing costs from PV to non-PV participants increases risk of “vicious cycle”
  • Customers will only accept policy goals up to a limit before they and regulators pushback on utility rate increases

• Merchant Power Generators
  • Adversely impacted by declining load demand>> declining power prices & earnings
Financial Market Perspectives

• Not focused on disruptive challenges impacting electric utilities at this time due to low penetration of DG/EE

• Analysts continue to focus on ratebase growth model
  • Investor confidence in regulatory compact
  • Ratebase drives earnings growth
  • Concern that economic and financial market conditions will challenge cost of capital
  • Concern that slow economic growth will result in lower earned ROE’s

• Markets will not focus on disruptive challenges until impact on customers and business is meaningful (e.g. 5+% of sales)
  • Likely that California utilities will lead the way and provide case studies/ lessons

• Meaningful disruptive in-roads would force significant change to the electric utility business model and structure of rate regulation
Lessons Learned—Telephone Sector

• Background
  • Break-up of Bell System in 1982 to foster competition in long distance service
  • Telephone Act of 1996 sought to create competition amongst similar networks

• Impact
  • New technologies have changed nature of service (e.g. mobile, voice over internet)
  • Pricing of product transitioned to a fixed fee model (consistent with cost structure)
  • Telephone now being bundled with higher margin services
  • Incumbents have consolidated to drive scale and fund product offerings
  • New entrants have been high flyers and subsequently crashed/acquired
  • Cable providers are capturing market share of telephone product

• Similarities with Electric Industry
  • Rate regulation pre-competition
  • High fixed cost networks that evolved with a unit volume pricing model
  • Commodity service with expectations of high reliability
Lessons Learned-Telephone Sector (Contd)

• Lessons
  • New entrants can dis-intermediate regulated markets
  • Customers can cut their connection to a monopoly service provider
  • Usage based pricing for high fixed cost networks increases risk
    • Utilities should consider other revenue models and billing structures
  • Opportunity to add or bundle services enhances customer value proposition (e.g. appliance and HVAC service, energy efficiency services)
  • New technologies can quickly gain share if price point is compelling (e.g. Voice over Internet such as Skype)

• Verizon/ATT Experience
  • Lost 50-55% of traditional wireline customers in last 6 yrs.
  • Wireless customers increased by > 66% in same time
  • Broadband service has increased significantly– Verizon up 650%; ATT up 35%
  • Verizon share price has increased 33% over timeframe (vs. +20% for S&P 500); ATT down
  • “A” credit rating with ~ 50% less debt to cash flow than comparable electric IOU
US PV Installations and System Price
(Source: SEIA)
McKinsey View on PV Cost Curve

Best-in-class installed system cost (no margins)
$ per watt peak, 2011 dollars

Levelized cost of electricity\(^1\)
$ per kilowatt hour, 2011 dollars

- Polysilicon price decline
- Productivity
- Procurement
- Scale
- Incremental technology improvements

2011–15

2016–20

Optimized system design

6%
8%
2%
10%
6%
4%
1%
1%
5%
6%
Solar PV for distributed generation is approaching an inflection point in the United States.

US distributed solar-PV economic potential
Gigawatts (GW)

- Range of economic potential
- Base case with 30% ITC

- Base case
- Low-cost case

Total installed system cost, $ per watt peak

10–20 GW in 2012

Economic potential by state, 2020
GW

Total = 193
Strategic Considerations to Disruption

• Ratemaking/Recovery of Investment
• Capital Deployment
• New Business Initiatives
Industry Ratemaking Alternatives

> Near-Term Alternatives:
  - Seek transition to form of straight fixed-variable pricing (i.e. increased facility charges) to reduce financial risk of recovery of costs or potential for stranded GTD
  - Revise net metering programs to align with cost of service provided customers and value of customer generation provided to grid
    - Potential DG customer grid connection charge to address cost of service provided
  - Consider meaningful incentives to deploy efficiency programs
    - Revenue potential from energy services provided to customers (other than kwh)
  - Seek decoupling to offset impact of sales volume declines on near-term earned returns (e.g. future recovery (payment) of under (over) recovery of revenues)
  - Assess/address stranded investment implications of GHG limitations

> Longer-Term:
  - Consider exit fee for distributed customers or fully exiting customers
  - Assess depreciable lives to mitigate stranded cost risk, as appropriate
  - Request cost of capital premium to reflect increased risk
  - Potential to adopt UK style of regulation that increases prices net of inflation and productivity
Strategic Capital Deployment Considerations

• How to deploy capital to mitigate stranded cost risk
  • Investment in existing generation?
  • Potential to divest assets prone to high stranded cost exposure?
  • Incremental resources required- own vs. PPA?
  • Investment in T&D– consider susceptibility to stranded cost risk?
  • How to assess and address future potential stranded investment vs. reliability mandate?

• Is Cost of Capital allowed sufficient given 30+yr investments with stranded cost risk?

• Accessing capital necessary to maintain/upgrade G-T-D infrastructure
  • Impact of Disruption on Cost of Capital likely to be significant (e.g. Telephone Experience)

• Managing capital investment to maintain competitive utility rates
  • Can rates be restructured to mitigate stranded cost risk?

• Are there new business lines that can create an opportunity from disruptive forces?
  • Potential to own and ratebase resources behind the meter (e.g. DG, efficient appliances)
Identifying Sustaining Growth Opportunities

• Growth in services provided is key to economic prosperity (e.g. increased volume of services or enhanced value add)

• Price increases and operating cost reductions creates earnings, but may not provide sustaining growth impact
  • Price increases creates competitive business risk & feeds “vicious” cycle
  • Cost reductions may impact service quality if not tied to process improvement

• Creating sustaining growth:
  • New services
  • Incentives to accelerate policy objectives
  • Investing in capital assets that reduce operating costs (e.g. meter reading, oil to gas generation upgrades)

➢ Meeting customer needs is key to success of growth initiatives
Potential New Business Initiatives

• Potential to own distributed generation systems
  • Utilities’ have low cost of capital (EIX announcement re Clean Power Finance)
  • Opportunity to expand customer relationship

• Potential for Utility Scale Solar Projects and CHP Ownership
  • Utility Scale offers advantages to Rooftop PV: cost/watt; system optimization; inclusiveness
  • Utilities competitive position is somewhat impaired by normalization requirements
  • Customer vs. Utility owned vs. Virtual/Community Solar model
  • Increasing focus on DG due to grid reliability concerns due to extreme weather risks, cyber risks, etc.

• Electric Vehicle Charging and Optimization Business

• Potential to own other behind the meter assets (e.g. efficient appliances, energy efficient network assets)

• Providing energy efficiency services
  • Home energy audits and ongoing efficiency management performance
  • Installation/maintenance of energy efficiency networks
  • Appliance warranty service expansion
  • Expand geographic and customer footprint
    • Hedge against disruption in core service territory
    • Position to adjust to potential changes in core markets
Developing a New Utility Playbook

A. Update Ratemaking Structure
   x Volumetric Rates, Cross Subsidies
   ✓ Value of Grid and Capacity vs. Energy

B. Align Customer-Policy-Investor Value Add
   ✓ Provide Services Customers Value
   ✓ Incentives to Accelerate/Achieve Policy

C. Identify Sustaining Growth
   ✓ Growing Volume and Services Opportunities
   ✓ Technology Driven Operating Cost Savings

D. New Utility Services
   ✓ DER’s (own/operate Renewables & CHP)
   ✓ Customer Energy Management Systems
   ✓ Owning/Servicing Assets “Behind the Meter”

E. Outreach to Stakeholders
   ✓ Develop New Model
   ✓ Educate Customers & Policymakers
   ✓ Realize Policy Support and Approvals to Implement