The Truth is Out There

What is Really Going on in the Electric Industry?

Scenario

- Declining electric intensity
- Declining load growth
- FC vs. VC
- Peak Growth vs. Total Usage
- Increasing storms and weather events
- Energy Market Evolution?
- Rise in Real Price of Energy?
- Potential for Conservation?
- Automation and Micro-technology?
Declining Demand Growth
Figure 2.2 EIA Data: Storm Events

Year 2003 2004 2005 2006 2007 2008 2009 2010 2011
Storm Events 20 40 60 80 100 120 140

Standard Deviation Range Designated

Billion-Dollar Weather/Climate Disasters

Count 2 4 6 8 10 12 14 16

Source: National Oceanic and Atmospheric Administration (NOAA)
What are the Factors

Utility of the Future

- Demand Growth
- Grid Modernization
- Automation Technology
- Rate Design
- EV and V2G
- Reliability and Resiliency
- Performance Metrics
- Smart loads
- Smart Meters
- Customer Growth

The relationship between oil and gas has changed

Oil and Gas

Updated: Mar 21, 2014

Correlation between gas and oil dissipated
Transition in World Views

Old World View
- Universal Access
- Safe
- Reliable - Deliver those Kwh
- Affordable - Can buy Kwh

New World View
- Carbon Constrained world
- Electricity is going to be more expensive - affordability Access
- Attitudinally the role of consumption or conservation - optimize value
- Resilience in face of variability - the new reliable

Old World View - The Home as Consumer
- Source and sink mentality
- Design of system pushing power down the line
- Regulatory mentality
  - Natural monopoly
  - Native load
  - Obligation to serve
- Benevolent Paternalism - Don’t think just consume
Did We have a policy

The roots of our current difficulties extend back to our energy policy which has been at least an implicit part of our national action for 40 years. While many critics have contended that our troubles lay in the absence of an energy policy, for 4 decades we have lived under the guiding principle that American consumers shall be furnished their total demands for energy at the lowest reasonable cost.

While several actions unrelated to this policy have contributed to today’s crisis, its overtones are heard on several primary counts. Bourgeois, unrestrained demand for energy was taken almost as a sacred cow. Hold down the price to the consumer; grant incentives through the utility rate system for higher volume users; don’t include environmental or social costs which might discourage use. Conservation of energy was virtually an unknown phrase a year ago—except to those who correctly foresaw what was coming. And meanwhile our annual energy growth rate jumped from 2.8 percent in the 50’s to 4.2 percent in the 60’s to 4.9 percent since 1970.

Where did we start to go wrong

Another reason I did not want to sell current was that from my experiments, I knew that the incandescent lamp was only the beginning and there were great possibilities of enormously increasing its economy.

But for some reason... the selling of current was introduced, thus destroying all chances of the company’s gaining any benefit in (lamp) improvements; in fact, such improvements were a disadvantage, which in my mind is a poor business policy for the company and for the public.


Thinking About Service Needs

- Selling service
- Selling commodity
- Now selling services again
  - Can those new services be sold on a 1950s grid
Grid Paradox

- There is the claim that The Grid is Dead
- Yet articles appear asking us to live on the edge of the grid
- Technology has changed the game
- Competition is not suppliers aggregating loads (retail or wholesale)
- The next competitive wave is technology supply to end users
- The real value of the grid is that it connects these market players
- We may in fact need to Centralize control in order to decentralize the market

Transactive Energy

“The term “transactive energy” is used here to refer to techniques for managing the generation, consumption or flow of electric power within an electric power system through the use of economic or market based constructs while considering grid reliability constraints. The term “transactive” comes from considering that decisions are made based on a value. These decisions may be analogous to or literally economic transactions.”
Transition from world where we passively meet a customer driven demand to a world where we control Demand

Utility of the Future- Home as Power Plant

- Grid as platform-the Laminar World
- Who is responsible to reliability? I think it is the Disco!
- How to price these services? LMP on distribution grid?
  - ISO doesn’t want to go down to distribution level?
- Home as power plant-Prosumer?
- Utility customer partnerships
  - Utility behind the meter
    - Callable resources
    - Dedicated resources
    - Emergency resources
The Home as Power Plant

- Investments in DG- Solar, Natural Gas, Propane, Wind
- Investments in Smart Appliances
- Investments in Energy Management Systems
- Investment in Battery Systems
- Investment in EV-V2G
- Investments in Home Design- Passive solar, tightening envelope

What Will Customers Expect

- More effective participation in use and sale decisions
- New products and solutions
- Maintain power quality and system resiliency
- Optimize asset utilization- As Suppliers to the Grid
- Maintain communications with the home
Implications for Regulation

• Core and Non-Core Services?
• Open access and Imputation?
• Transactive services and menu of contracts?
• Outcome focused Regulation
  • Performance or Incentive Regulation
  • Metrics for Core and Non-Core
  • Performance Measures
    • Degree of Transactive Services
    • Range of Services
    • Values Customer Receives

What Are the Questions Regulators and Industry Must Face?

• Is there a threat to the business as usual model of a utility?
• Is it disintermediation or refocused intermediation in the future?
• What is the role of transactive markets and how will we regulate it?
• Home as power plant is the next frontier for competition.