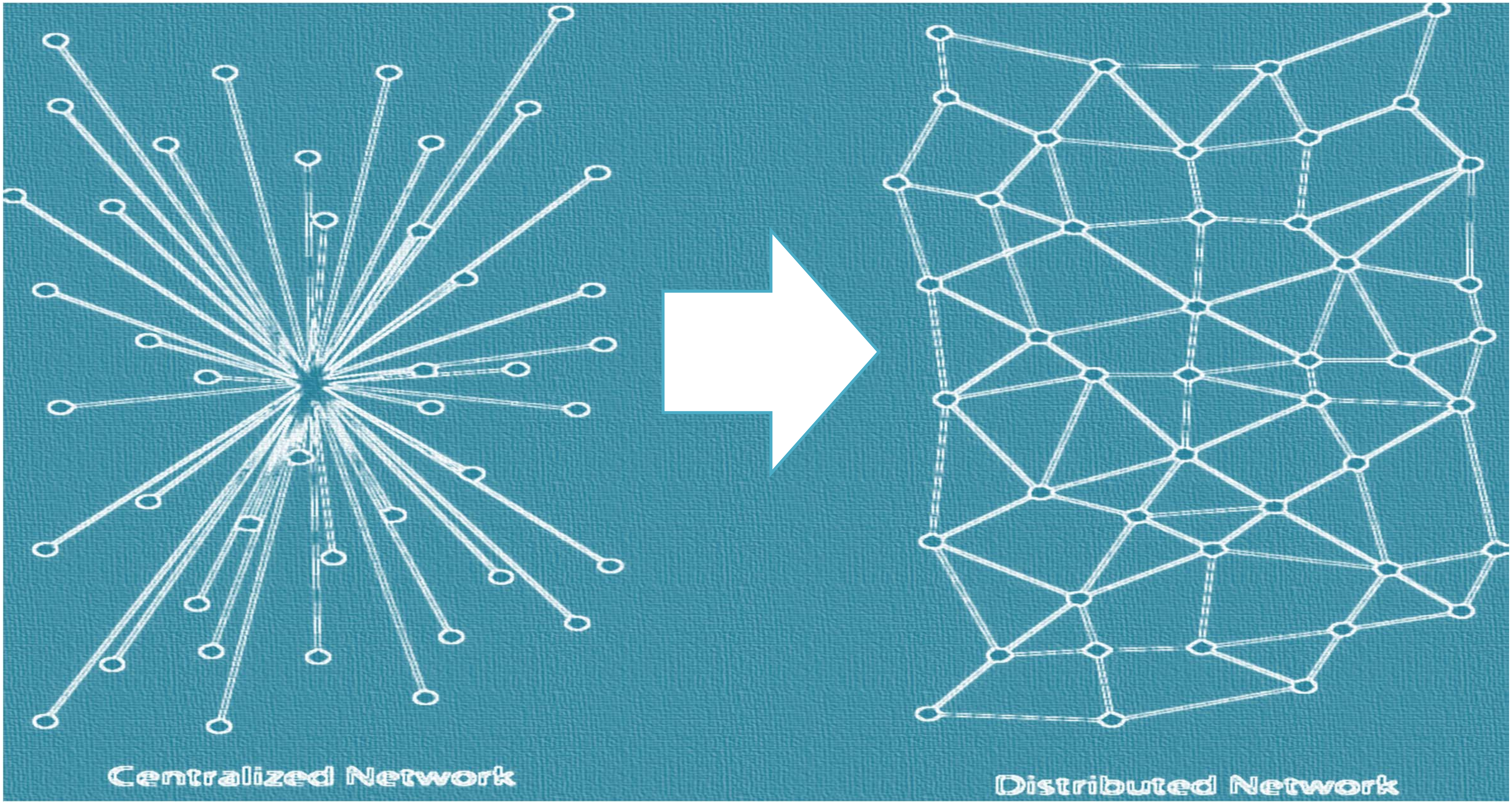
Business Models and Compensation Framework for the Utility Transformation

August 16, 2017



1. The Utility Business Model: What's The Problem?

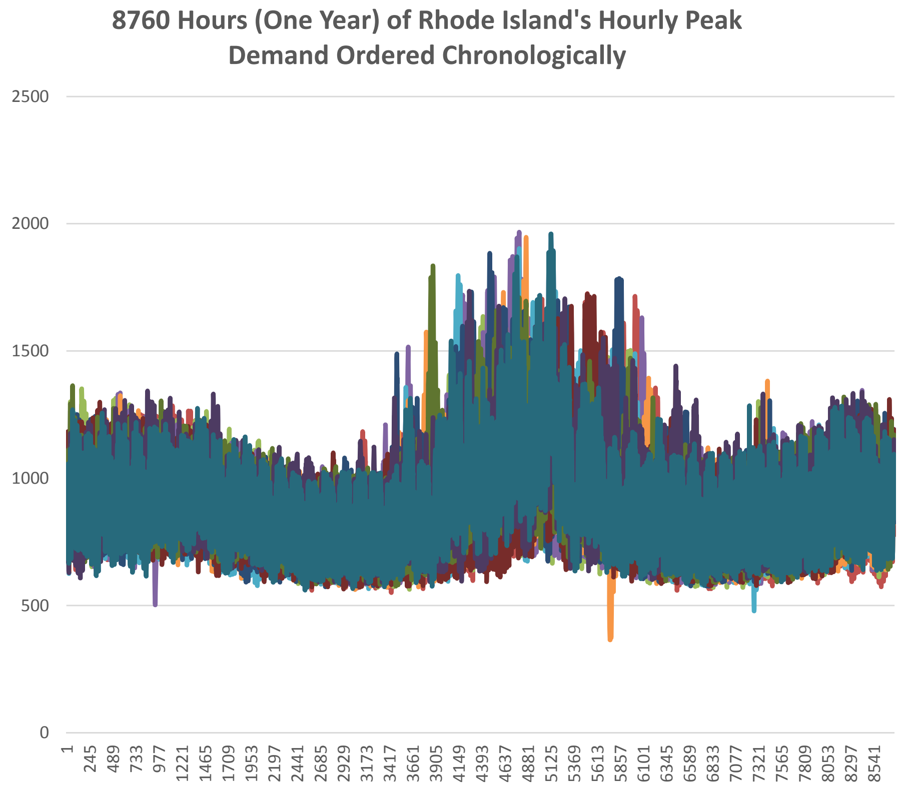
- Today's utility compensation creates a bias for one-way, capital-intensive solutions
- In the future, the utility will need to do many new things, managing information as well as infrastructure.
- Looking ahead, the utility does not have the financial incentives to build the tools it will need to do many of these new things

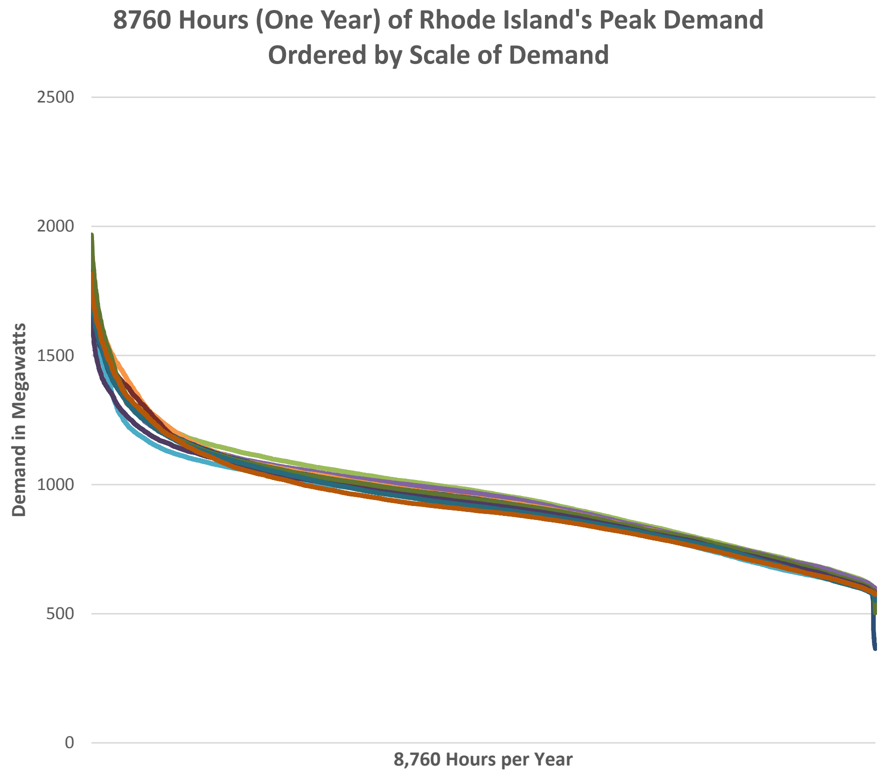
Peak Demand in Rhode Island's Electric System

Reducing the greatest 48 hours results in an 11% drop in system peak.

Reducing the greatest 200 hours results in an 21% drop in system peak.

Reducing the greatest 876 hours results in a 38% drop in system peak.





Flaws in the Compensation Framework of Current Utility Business Model

- Cost of service ratemaking
- One-year forward test year
- Revenue decoupling.

- ***Rate case frequency***. The ability to submit a rate case whenever the utility chooses can erode the utility's incentive to improve performance and contain costs..
- ***Incentive to build rate base***. Utilities have an incentive to increase their rate base, because this will lead to a higher allowed return on equity, a disincentive to promoting DER.
- ***Reluctance to invest in innovative technologies***. Utilities are reluctant to invest in new or innovative technologies, because of risks associated with post-investment prudence reviews. This might hinder a utility's incentive to invest in certain DERs or technologies that support them, such as advanced metering infrastructure, data collection and management systems, and communication systems.

So, How Do We Fix It?

2. The Elements of a Better Utility Business Model

- Multi Year Rate Plan

- Performance Incentive Mechanisms

- Potential Models of Innovation Partnership
  - Connectivity
  - Meters
  - Data Analytics
  - Beneficial Electrification, especially EV charging

- Iterate to Improve and Refine

3. Multi Year Rate Plans

Multi-year rate plans (MRPs) are a ratemaking construct designed to strengthen utility financial incentives to operate efficiently, make sound investments in capital and non-capital expenditures, and pass reduced costs on to customers. Two key elements that distinguish MRPs from cost-of-service ratemaking are:

- A rate case moratorium that prevents the utility from having frequent rate cases; and
- an attrition relief mechanism (ARM) that allows for utility rates (or revenues) to increase between rate cases

Multi Year Rate Plans Components: Straw Proposal

Rate case moratorium.

Attrition relief mechanism.

Cost trackers.

Treatment of capital costs.

Earnings sharing mechanism.

Adjust allowed ROE

4. Performance Incentive Mechanisms

1. Existing Mechanisms: Distributed Energy Resources

2. System efficiency

3. Network Support Services

R.I's Existing Performance Incentive Mechanisms

Table 1. Comparison of Existing Incentive Mechanisms for 2017

Program	Program Costs (2017$)	Shareholder Incentives				
		(2017$)	(% of cost)	(basis points)	(% of net income)	(% of net bens)
EE - Electricity	88,511,000	4,425,550	5.00%	24	4.5%	3.6%
EE - Gas	27,751,000	1,387,550	5.00%	8	1.4%	5.4%
SRP	400,300	20,015	5.00%	0	0.0%	-31.8%
Long-Term Contracts	72,275,022	1,987,563	2.75%	11	2.0%	---
DG Standard Contracts	7,063,354	194,242	2.75%	1	0.2%	---
RE Growth DG Facilities	1,821,337	31,873	1.75%	0	0.0%	---
RE Growth SolarWise	---	---	1.75%	---	---	---
Total	197,822,013	8,046,794	4.07%	44	8.1%	

Performance Incentive Mechanisms: Defining Goals

To design performance incentive mechanisms, first set clear goals.

- Control the long-term costs of the electric system:
  - Increase system efficiency
  - Deploy temporal and locational optimized DER

- Give customers more energy choices:
  - Engage customers in programs
  - Develop network support & data-informed services

- Build a flexible grid able to integrate more clean energy generation:
  - Deploy temporal and locational optimized DER
  - Create internal capabilities to support connectivity, data analytics and new partnership models

System Efficiency Metrics

Metric	Purpose	Formula
Transmission peak demand	Indicate the extent to which peak demand affects transmission costs	Rhode Island's monthly contribution to the ISO coincident peak
Distribution peak demand	Indicate the magnitude of distribution peak demand	Monthly peak distribution demand, by sectors
Substation peak demand	Indicate the extent to which specific substations are stressed	Percent of capacity utilized on targeted substations, during distribution monthly peaks
DG-friendly substations	Indicate the portion of substations that are capable of readily installing DG facilities	Ratio of substations that can accept DG without upgrades to all substations
Distribution load factor	Indicate the portion of distribution sales that occur in peak hours	Ratio of retail sales during peak hours to retail sales in all hours
Customer load factor	Indicate customer demand relative to energy	Ratio of distribution sales during peak hours to distribution sales in all hours, by customer sector
Time-varying rates	Indicate penetration of time-varying rates	Percent of customers on time-varying rates, by customer sector
CO_2 intensity	Indicate intensity of CO2 emissions from customers	CO_2 emissions per customer, by sector

Distributed Energy Resources Metrics

Metric	Purpose	Formula
Energy efficiency	Indicate participation, savings, and cost effectiveness of EE programs	Percent of customers served, annual & cumulative
		Energy savings, annual and lifecycle
		Capacity savings, annual and lifecycle
		Program costs per energy saved ($/MWh)
Demand response	Indicate participation, savings, and cost effectiveness of DR programs	Percent of customers served, annual
		Capacity savings, annual and cumulative
		Program costs per capacity saved ($/kW)
Distributed generation	Indicate penetration and type of DG installations	Percent of customers with DG, annual & cum.
		DG installed capacity
		DG capacity by type (PV, CHP, small wind, etc.)
Electricity storage	Indicate penetration of storage technologies, and ability to help mitigate peaks	Percent of customers with storage, annual & cum.
		Storage installed capacity
		Percent of customers with storage technologies enrolled in demand response programs
Electric vehicles	Indicate penetration of EVs, and ability to help mitigate peaks	Percent of customers with EVs
		Percent customers with EVs enrolled in DR programs

Network Support Services Metrics

Metric	Purpose	Formula
Advanced metering capabilities	Indicate penetration of advanced metering functionality	Percentage of customers with AMF, by sector
		Percentage of energy served through AMF, by sector
Interconnection support	Indicate performance of DG installation and DG study	Average days for customer interconnection
		Percent difference between study cost estimate and final cost to DG developer
Customer access to customer information	Indicate customers' ability to access their usage information	Percent of customers able to access daily usage data, by sector
		Percent of customers able to access hourly or sub-hourly usage data, by sector
Third-party access to customer information	Indicate third-parties' access to customer usage information	Percent of customers able to provide data to third-parties
		Percent of customers who have authorized third-parties to access data
Third-party access to distribution information	Indicate third-parties' access to distribution system info	Targets for providing heat maps and other relevant system data
Distribution System Planning	Indicate the ability of distribution planning to support networks.	Accuracy and accessibility of heat maps and data portal functionalities.
Customer Engagement	Indicate the success of utility mechanisms to connect customers with third parties.	Customer engagement survey from customers on specific platforms with third party vendors, or a transactional conversion rate

5. Partnership Models and Capabilities for the Transition……

- Potential Models of Innovation Partnership
  - Connectivity and Cyber
  - Meters
  - Distribution Data Analytics
  - Beneficial Electrification, especially EV charging

Connectivity and Cyber

- Utilization of shared communications infrastructure:
  - Use of public next generation connectivity as an anchor tenant
  - Ownership of a communications infrastructure with sales to other infrastructure customers
  - Participation in a special purpose vehicle as a layer to support multiple infrastructure applications

Meters

- National Grid has identified ownership of the meter as an important “line in the sand”, motivated by a need to control reliable billing.
- Ownership and control are not barriers to allowing one or more third parties to operate the meter as a platform for data-based services
- The license to operate such a platform could become a source of revenue for National Grid

Distribution Data Analytics

- The distinction between “data” and “information” are now established in other jurisdictions, with data as a public access common and information as the digested and improved product for market use.
- The emergent data and information portal could become a source of revenue for National Grid
- DER developers would have access to some data without charge and might subscribe to have access to other information
- Would other providers be able to also offer data services?

Beneficial Electrification: EV Charging

Electric vehicle charging stations represent an opportunity for the utility to earn revenue from a number of non-volumetric services, including:

- subscription fee services,
- installation services,
- charging station coverage maps, and others