Decoupling and Utility Demand Side Management

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Overview

- National Grid
- Expectations for the “Utility of the Future”
- Needs of the “Utility of the Present”
- Evolving Regulatory Framework
- Decoupling
- “Advanced” Decoupling
- Aligning Interests
National Grid – US

- Second largest utility in US*
- Distributes electricity to 3.3 million customers
- Services 1.1 million customers of Long Island Power Authority (LIPA)
- Provides natural gas to 3.5 million customers
- Currently owns over 4,000 MW of generation, dedicated to LIPA

*Based on customer numbers; includes the servicing of LIPA’s 1.1 million customers
The “Utility of the Future”

- Increasing customer, regulator & policymaker focus on
  - Managing rising and volatile cost of energy
  - Reducing greenhouse gas emissions and other environmental impacts of energy use
  - Deploying advanced technologies

- Expectation that utilities will play a key role
  - Delivering energy efficiency and demand side programs
  - Facilitating renewable energy development
  - Building the “smart grid”
The Utility of the Present

- Continuing obligation to provide safe, reliable and efficient service
- Increasing need for investment to replace and refurbish aging/deteriorating infrastructure
- Facing uncertain financial markets

While stepping up to meet new expectations…
Regulatory Environment

- Increasing recognition that traditional regulation not working for customers or utilities
  - Disincentive to pursue energy efficiency, demand side resources, renewables, smart grid
  - Inadequate to support increasing investment
  - Negative financial impact on utilities
- Regulators and policymakers discussing need for change
Elements of New Regulatory Framework

- Decoupling
- Positive incentives for utility energy efficiency
- Capital adjustment mechanisms
- Productivity incentives
- Adequate (industry standard) return
Regulatory Support for Utility Demand Side Management

- **Revenue decoupling** breaks the link between sales and revenues
  - Rates are adjusted periodically so utility is collecting (only) the amount of revenue allowed by regulators
  - To remove disincentives to aggressive utility implementation of energy efficiency
  - To facilitate other demand side resources, including distributed renewable energy

- **Positive energy efficiency incentives** to encourage excellent performance and focus management attention
Full Revenue Decoupling

- Full revenue decoupling (as opposed to partial) does not distinguish among reasons for changes in sales
  - E.g., energy efficiency, weather, economic activity
- If actual revenues are greater than allowed, rates are adjusted downward
- If actual revenues are less than allowed, rates are adjusted upward
Fixing Revenues v. Rates

- Revenue decoupling and traditional rate setting both start with a cost-based determination of the allowed revenues.
- Approaches differ in whether rates (P) or revenues (R) are fixed.

\[ P \text{ (rate)} \times Q \text{ (sales)} = R \text{ (revenues)} \]

- Rates Fixed
  - “Traditional” Ratemaking
    - Total Revenues Vary with Use

- Total Revenues Fixed
  - Ratemaking with Revenue Decoupling
    - Rates Vary to Avoid Over- or Under-Recovery
Implications of Decoupling

- Under traditional ratemaking, utilities typically rely upon rising revenues from growing sales to recover increasing costs of operation and capital.
- Decoupling eliminates this source of revenue to cover costs.
- Current market environment exacerbates the challenges of covering costs.

**Price Indices for Distribution Plant and Consumer Goods**

**Sources:**
Investment Needed Today … and To Meet Future Expectations

- BAU investment for reliability projected at 4.5% (nominal) per year
- Modernization of grid could cost an additional $220 billion
Constraints of Traditional Regulatory Framework

Revenue (driven by rising sales) grows at a slower rate than the revenue requirement needed to recover capital expenditures. The gap between revenue requirements and revenues billed reflects a structural deficiency given the regulatory framework and market conditions.

Periodic rate cases bring revenues back in line with revenue requirements assuming rates are set using a future test year.

The cumulative deficiency between actual revenues and the revenue requirement needed to cover capital expenditures grows over time.

Industry-wide Hypothetical Revenue Requirement and Revenues, Delivery Capital Investment, Future Test Year, 2011 to 2030 ($ Million)

- Revenues not sufficient to recover costs of investment
- Frequent rate cases needed to keep revenues in line with costs

Source: Analysis Group calculations.
Supporting Needed Investment

- Revenue decoupling advances energy efficiency and demand side resources

- But it eliminates sales growth to fund needed investment between rate cases (however, even that sales growth is insufficient to match increasing investment need)

- To provide cost recovery for needed capital investment
  - **Future test years** and multi-year rate plans
  - **Reconciling cost adjustment mechanisms** for capital expenditures between rate cases
Addressing Increasing Costs

- Adjustments designed to track changes in costs
  
- Capital costs – Adjust revenues given actual capital expenditures as approved by the commission
  
  - Adjusts timing of revenue recovery but not the amounts approved for recovery
  
  - Under traditional ratemaking, capital expenditures would roll into rate base in next rate case

- Operations and maintenance costs – Adjust revenues to level of inflation and level of utility productivity (similar to PBR)
"Advanced" Decoupling: Capital Cost Adjustments

- General Rate Case
  - Base Distribution Rates
  - Capital Investment Placed Into Service
    - Class-Specific ¢ per kWh CapEx Factors
    - Unique to Mass. Electric’s RDM
    - Increases annually assuming CapEx exceeds depreciation expense allowance from last general rate case
  - Billed Revenue to ATR Reconciliation
    - Uniform ¢ per kWh RDM Factor

= Distribution Rates Billed to Customers in the Following Year
Capital Cost Adjustment Mechanisms

- Future test years and multi-year rate plans
- Reconciling capital cost adjustment mechanisms
  - Capital cost adjustment with a cap on expenditures
  - Partial capital cost adjustment
  - Capital cost adjustment with performance incentives
  - Targeted infrastructure capital cost adjustment
- Features provide incentive for efficient investment
Without revenue growth from increased sales to cover increasing capital costs, another mechanism is needed between rate cases.

### Capital Cost Adjustment Mechanism with a Cap on Expenditures

<table>
<thead>
<tr>
<th>Proportion of Benchmark capital Expenditures</th>
<th>Proportion of Annual Capital Expenditures Considered in capital Adjustment Mechanism</th>
<th>Example: 100 M Benchmark</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt;145%</td>
<td>0%</td>
<td>$150M</td>
</tr>
<tr>
<td>130% to 145%</td>
<td>25%</td>
<td>$140M</td>
</tr>
<tr>
<td>115% to 130%</td>
<td>50%</td>
<td>$125M</td>
</tr>
<tr>
<td>100% to 115%</td>
<td>75%</td>
<td>$110M</td>
</tr>
<tr>
<td>&lt;100%</td>
<td>100%</td>
<td>$95M</td>
</tr>
</tbody>
</table>

Example: When actual spending is $125 million, capital expenditures considered in the adjustment mechanism are: 100%*$100 M + 75%*$15 M + 50%*$10 M = $116.25 M
“Advanced” Decoupling: Incentives for Efficient Operation

- Incentives for efficient operations
  - Indexing of operations and maintenance costs for inflation, less a productivity offset
- Reliability, service quality, customer satisfaction indices
- Reconciling adjustment for highly variable costs, costs beyond utilities’ control, and incremental programs subject to significant cost uncertainty
- Supports aggressive utility approach to system needs to the benefit of customers
The “Look Back” portion of the process

A

RDR Plan Revenue Reconciliation (for each Class) 
¢/kWh

The “Look Ahead” portion of the process

B

RDR Plan Revenue Adjustment (for each Class) 
¢/kWh

The annual RDR Plan adjustment

C

RDR Plan Adjustment Factor (by Class) 
¢/kWh

Annual Target Revenues (“ATR”) = the sum of:

1. Adjustment for Net Inflation: reflecting change in inflation over two previous years less 0.5% productivity offset, plus
2. Adjustment for Cumulative Net CapEx since the rate case
3. Adjustment for Current Year Net CapEx: set at 75% of average annual historical Net CapEx in two prior years

* Note that the first RDR Plan filing occurs at the end of 2010, for an RDR Plan Revenue Adjustment Factor to go into effect on January 1, 2011.
Adequate Return on Investment

- Increasing investment to replace, refurbish and modernize the grid
- Uncertain financial markets
- Adequate returns on equity (ROE) essential to attract capital needed for investment
  - Decoupling and mechanisms for timely recovery do not warrant lower returns
  - Adjusting returns downward undermines the effectiveness of these mechanisms
- Need to assess ROE on case by case basis
Common Misconceptions about Decoupling

- **Misconception #1**: Revenue decoupling systematically shifts risks from the utility to customers
  - Decoupling allows customers and utility to share risks associated with weather and other factors outside their control that change energy use.

- **Misconception #2**: Revenue decoupling guarantees the utility’s earnings
  - Decoupling provides revenue stability but does not guarantee earnings since utility still must manage operational costs and cost-side risks.

- **Misconception #3**: Revenue decoupling will lead to large swings in rates.
Decoupling Adjustments Have Typically Been Small


* Impact of Mass. Electric’s first RDM reconciliation filing, excluding effects of Capex provision, is a decrease of ~0.2% to a 500 kWh per month residential bill.
Distribution Rate Adjustments
Offset by Commodity Reductions

Commodity and Distribution Rates Under Proposed Alternative Ratemaking in RI
RDM and Comprehensive RDR Plan (with Inflation and Capital Cost Adjustments)
Conclusion

- Achieving objectives for Utility of Future requires alignment of customer, policy and utility interests

- Regulatory framework must encourage demand side management and efficient investment in infrastructure
  - To capture benefits and reduce costs for customers in the long run
  - To address climate and environmental objectives
  - To maintain safe, reliable and efficient energy services