Electric Power Distribution

- Major Milestones

<table>
<thead>
<tr>
<th>Thomas Edison</th>
<th>Electric Streetcars</th>
<th>World War II</th>
<th>Post WW II</th>
<th>Clean Air Act</th>
</tr>
</thead>
<tbody>
<tr>
<td>1880’s</td>
<td>1900-30</td>
<td>1941-45</td>
<td>1950-60</td>
<td>2009</td>
</tr>
</tbody>
</table>
Thomas Edison

Thomas Edison's first successful light bulb model, used in public demonstration at Menlo Park, December 1879

Electric Streetcars

Manchester, New Hampshire

Circa 1877

Circa 1905

1926-1940

Kilowatt Energy Sales

Source: Edison Electrical Institute Statistical Bulletins 1935 & 1955
World War II

Electricity in War and Peace

Source: Edison Electrical Institute
Statistical Bulletins 1945
Post WWII

• The Readjustment Period
  – End of wartime demand
  – Preparation for increased electrical use
    • Stores
    • Homes
    • Industries
  – Revert from wartime use to civilian use.
Post WW II

Kilowatt Energy Sales in Billions

Source: Edison Electrical Institute Statistical Bulletins 1955
A Bathtub Curve
Aging Example A

An equal amount of equipment exists in each vintage and the probability of failure is constant during the middle phase.

Because an equal amount of equipment exists in each vintage, as the portfolio enters the final phase, the increasing exposure to failures directly follows the slope of the bathtub curve.
Underground Cable

Underground Residential Developments address Environmental Considerations

PSNH Crew installing Underground Cable

Source: PSNH 1969 Annual Report
Royal Crest Estates

Source: PSNH 1969 Annual Report
This portfolio has a concentration of equipment in a few vintages.

Similar to the prior example, its failure exposure is stable (although larger) during the middle phase.

Upon entering the final phase, the concentration will drive a dramatic increase in failure exposure.
Age Profile

PSNH Distribution Substation Transformer Age Profile

Number of Transformers

Installation Date

American Clean Energy and Security Act

  - “The legislation will create millions of new clean energy jobs, save consumers hundreds of billions of dollars in energy costs, promote America's energy independence and security, and cut global warming pollution,” said Chairman Waxman.
Greenhouse Gas Reductions

- Reductions over the 2005 emission levels as proposed in the House Bill #2454

<table>
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<th>Year</th>
<th>Reduction</th>
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<tr>
<td>2010</td>
<td>3%</td>
</tr>
<tr>
<td>2020</td>
<td>17%</td>
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<tr>
<td>2030</td>
<td>42%</td>
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<tr>
<td>2050</td>
<td>83%</td>
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Provisions of the Act

- Energy Efficiency Initiatives
- Smart Grid Advancement
- Plug-in Electric Vehicle Incentives
Risks for Regulated Utilities

1. Environmental compliance
2. Regulatory recovery
3. Liquidity
4. Credit
5. Volatile commodity prices
6. Competition
7. Reliability-related compliance
8. Employee benefits
9. Economic downturn
10. Renewable portfolio compliance
11. Human resources
12. Capital expenditure requirements
13. Overly high debt levels

Compiled by the Deloitte Center for Energy Solutions
February 2009
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The Perfect Storm

Environmental Compliance

Smart Cars

Electric Grid

Equipment

Aging
Smart Grid Technology

1. Self Healing
2. Motivates Customers
3. Secure
4. Power Quality
5. Distributed Generation & Storage
6. Enables market
7. Optimizing Assets & Efficiency
The Future
Questions