Indiana Electricity Price Projections

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Presented to:
Indiana Chapter
International Association of Electrical Inspectors
Lafayette, IN

February 21, 2013
Indiana Electricity Requirements

- Retail sales by investor owned and not-for-profit utilities
- Includes estimated transmission and distribution losses
- Growth rates
  - 2011 forecast: 1.30%
  - 2009 forecast: 1.55%
  - 2007 forecast: 2.46%
Why Do We Project Slower Growth?

• 2011 forecast indicates higher levels of energy efficiency than previous forecasts for three reasons
  – utility sponsored programs due to regulatory requirements
  – federal standards
  – customer-driven efforts in response to increasing prices
Indiana Resource Requirements

- Resources may be provided by conservation measures, contractual purchases, purchases of existing assets, or new construction.

- Existing resources are adjusted into the future for retirements, contract expirations, and IURC approved new resources.
Indiana Real Price Projections (2009 $)

- Effect of inflation removed
- Average across sectors for IOUs
- Includes the cost of new resources
- Does not include cost of expected EPA regulations
  - unless utility has already taken steps or included costs in data request
Why Do We Project Increasing Prices?

- Cost of new resources to meet future demand
- Cost of extending the lifetimes of existing generation
- Cost of complying with environmental rules
Characteristics of Indiana Electricity Generation

• Mostly coal-fired
  – roughly 85% of our electricity comes from coal

• Mostly older units
  – almost all of our coal fleet is at least 30 years old

• Potentially affected by future environmental regulations
Environmental Regulations

- SUFG performed a follow up study of the expected impacts of recent, proposed, and expected EPA regulations
  - Cross-State Air Pollution Rule
  - Mercury and Air Toxics Standards
  - Greenhouse gases
  - Cooling water
  - Coal ash
Cross-State Air Pollution Rule

- Final rule issued in July 2011
- August 2012 – Court of Appeals (D.C. Circuit) vacates rule
- October 2012 – U.S. EPA requests rehearing from full Court of Appeals
- Reduces emissions caps for sulfur dioxide ($SO_2$) and nitrogen oxides ($NO_x$) in 2012
- Further reductions in 2014
Mercury and Air Toxics Standards

- Final rule issued in December 2011
- Replaces court vacated Clean Air Mercury Rule
- Reduces emissions from mercury, acid gases, and other pollutants
- Prevents release of 91% of mercury
- Expected to go into effect in 2015-16
Greenhouse Gases

• Final rule issued in March 2012
  – after SUFG study released
• Establishes carbon dioxide (CO$_2$) emissions standards for new fossil-fueled electric utility generators
• Output-based standard of 1,000 pounds of CO$_2$ per MWh
  – Cannot be met with current coal-fired technology without carbon capture
Cooling Water Intake Structures

- Proposed rule issued in April 2011
- Final rule expected in June 2013
- Intended to reduce damage to aquatic life
  - impingement – trapping against inlet screen
  - entrainment – drawn into cooling system
- Compliance actions include enhanced screening, reducing water flow rate, and installing cooling towers
- Uncertainty over timing
Coal Combustion Residuals

- Proposed rule issued in June 2010
- No date has been released for final rule
- In response to concerns over the potential failure of coal ash facilities
- Two options
  - classify as special hazardous waste (~2020)
  - regulate as non-hazardous waste (~2018)
SUFG Study Inputs

- Model inclusion of SO$_2$ scrubbers (wet FGD), NO$_x$ control (SCR), and mercury control (activated charcoal injection with bag house)
- Conversion of cooling water systems to recirculating
- Conversion of ash disposal from wet to dry
Retire vs. Retrofit

• For each unit, if the cost of retrofitting was greater than the cost of replacing it with a natural gas combined cycle facility, the unit was considered retired for the study.

• If not, the retrofit costs were included.

• Approximately 2,280 MW modeled as retired.
Results

- EPA Rules
- 2011 Base

History
Forecast

Year

Cents/kWh (2009$)


8 kWh (2009$)
4 6 Cents/
Comparison to Base Forecast (2009 cents/kWh)

<table>
<thead>
<tr>
<th>Year</th>
<th>2011 Base</th>
<th>EPA Rules</th>
<th>Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>2015</td>
<td>7.80</td>
<td>8.14</td>
<td>4.4%</td>
</tr>
<tr>
<td>2020</td>
<td>8.74</td>
<td>9.96</td>
<td>13.9%</td>
</tr>
<tr>
<td>2025</td>
<td>8.67</td>
<td>9.76</td>
<td>12.5%</td>
</tr>
</tbody>
</table>
Caveats

- Uncertainty in EPA rules
- Impact on transmission investment
- Fuel switching option
- Accuracy of price elasticity modeled
- Macroeconomic effects
- Technological innovations
- Compliance strategies
- Engineering considerations
- Materials and labor premiums
- Efficiency and outage impacts
What Does This Mean To You?

- Electricity rates are expected to increase significantly through the end of the decade
- This makes alternatives to simply buying electricity from the local utility more attractive
  - energy efficiency
  - customer-owned, distributed generation
Further Information

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