The Economic Downturn – Lessons on the Correlation between Economic Growth and Energy Demand

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presented by
Doug Gotham
State Utility Forecasting Group
“It’s the economy, stupid”

- Attributed to James Carville during the 1992 presidential election campaign

- Applicable to Indiana’s current energy situation
Data Sources & Availability

- Electricity Sales
  - Energy Information Administration (Department of Energy)
- Gross Domestic Product
  - Bureau of Economic Analysis (Department of Commerce)
- Little data available for 2009
Indiana - an Industrial State

• In 2008, Indiana accounted for 2.9% of the nation’s retail electricity sales
  – 11th most in the U.S.

• But Indiana accounted for 4.8% of the nation’s industrial sector retail electricity sales
  – 4th most in the U.S.
2008 Industrial Demand as Percentage of Total
2008 Industrial Electricity Sales (million MWh)
# Industrial Model Sensitivities

<table>
<thead>
<tr>
<th>10 Percent Increase In</th>
<th>Causes This Percent Change in Electric Use</th>
</tr>
</thead>
<tbody>
<tr>
<td>Real Manufacturing Product</td>
<td>10.0</td>
</tr>
<tr>
<td>Electric Rates</td>
<td>-4.8</td>
</tr>
<tr>
<td>Natural Gas Price</td>
<td>1.4</td>
</tr>
<tr>
<td>Oil Prices</td>
<td>0.9</td>
</tr>
<tr>
<td>Coal Prices</td>
<td>0.2</td>
</tr>
</tbody>
</table>

Source: SUFG 2009 Forecast
2008 Residential Electricity Sales (million MWh)
Residential Model Sensitivities

<table>
<thead>
<tr>
<th>10 Percent Increase In</th>
<th>Causes This Percent Change in Electric Use</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of Customers</td>
<td>11.1</td>
</tr>
<tr>
<td>Electric Rates</td>
<td>-2.4</td>
</tr>
<tr>
<td>Natural Gas Price</td>
<td>1.0</td>
</tr>
<tr>
<td>Distillate Oil Prices</td>
<td>0.0</td>
</tr>
<tr>
<td>Appliance Price</td>
<td>-1.8</td>
</tr>
<tr>
<td>Household Income</td>
<td>2.0</td>
</tr>
</tbody>
</table>

Source: SUFG 2009 Forecast
2008 Commercial Electricity Sales (million MWh)
### Commercial Model Sensitivities

<table>
<thead>
<tr>
<th>10 Percent Increase In</th>
<th>Causes This Percent Change in Electric Use</th>
</tr>
</thead>
<tbody>
<tr>
<td>Electric Rates</td>
<td>-2.5</td>
</tr>
<tr>
<td>Natural Gas Price</td>
<td>0.2</td>
</tr>
<tr>
<td>Distillate Oil Prices</td>
<td>0.0</td>
</tr>
<tr>
<td>Coal Prices</td>
<td>0.0</td>
</tr>
<tr>
<td>Electric Energy-weighted Floor Space</td>
<td>12.0</td>
</tr>
</tbody>
</table>

Source: SUFG 2009 Forecast
2008 Total Electricity Sales (million MWh)
Changes in Indiana Electricity Sales from 2007 to 2008

- Residential sector: -1.9%
- Commercial sector: -0.8%
- Industrial sector: -3.2%
- Total: -2.2%
Was it the Economy?

• Indiana Gross Domestic Product dropped by 0.6% from 2007 to 2008

• But the summer of 2008 was considerably cooler than 2007, which affected electricity demand
  – Cooling degree days in Indianapolis dropped by 30% from 2007
Indiana Real Gross Domestic Product and Total Electricity Sales
2009 – Effects were More Pronounced

• Economic impact largely confined to last quarter of 2008
• Economic impact was felt across all 4 quarters of 2009
• The summer of 2009 was even milder
  – cooling degree days were down another 11% from 2008
U.S. Gross Domestic Product (trillions of 2005 dollars)
Annual Change in U.S. Electricity Sales

- **Industrial**
  - 2007-08: -1.8%
  - 2008-09: -12.6%

- **Commercial**
  - 2007-08: 0%
  - 2008-09: -1.0%

- **Residential**
  - 2007-08: -0.9%
  - 2008-09: -1.2%

- **Total**
  - 2007-08: -0.8%
  - 2008-09: -4.2%
U.S. Retail Industrial Electricity Sales (TWh)

- 2007
- 2008
- 2009
U.S. Retail Residential Electricity Sales (TWh)
U.S. Retail Commercial Electricity Sales (TWh)
U.S. Retail Total Electricity Sales (TWh)

- 2007
- 2008
- 2009
EIA April Short-Term Outlook

• U.S. residential electricity sales increased by an estimated 7.6% in the 1st quarter of 2010 relative to the 1st quarter of 2009
  – colder weather caused much of the increase
EIA April Short-Term Outlook

• EIA projects U.S. total electricity consumption to increase by 2.9% in 2010 and again by 1.2% in 2011
  – note: sales and consumption are not interchangeable, but they do tend to follow each other closely
Further Information

• State Utility Forecasting Group
  – http://www.purdue.edu/dp/energy/SUFG/

• Energy Information Administration
  – http://www.eia.doe.gov/

• Bureau of Economic Analysis
  – http://www.bea.gov/