Environmental & Economic Conflict

UT Energy Week

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Environmental Objectives vs. Efficient Markets

• Efficient market design and performance ensures the lowest cost for the consumer
• Addressing climate change is important
• Climate friendly resources have not typically been market friendly
  — Subsidies distort pricing outcomes
  — Variable output disconnected from demand; Dispatch
  — Measurement & Verification (does it really exist?)
• How do we achieve our environmental objectives and maintain efficient markets?
Figure 59: Summer Renewable Production

Increasing Needs for Flexible Gas Capacity

Figure 12: Highest Three Hour Net Load Ramping Day

Source: “Impacts of Environmental Regulations in the ERCOT Region”, ERCOT.
Growth in Demand Response and Energy Efficiency

- ~7 Million Smart Meters recently installed in ERCOT
- Retail Electric Providers, like NRG, are now offering competitive products which compensate customers for demand response
- Customer adoption is growing significantly

<table>
<thead>
<tr>
<th>Product (code)</th>
<th>ESI IDs 06/15/2013</th>
<th>ESI IDs 09/30/2014</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Residential</td>
<td>C&amp;I</td>
</tr>
<tr>
<td>Peak Rebate (PR)</td>
<td>2,410</td>
<td>58</td>
</tr>
<tr>
<td>Time of Use (TOU)</td>
<td>135,320</td>
<td>328</td>
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<tr>
<td>Other Load Control (OLC)</td>
<td>13,606</td>
<td>14</td>
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<tr>
<td>Real-Time Pricing (RTP)</td>
<td>288</td>
<td>4,358</td>
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<tr>
<td>Block &amp; Index (BI)</td>
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<td>23,928</td>
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<td>Other Voluntary DR Product (OTH)</td>
<td>169</td>
<td>1,554</td>
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<td>Four Coincident Peak Advisory (4CP)</td>
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<td>35</td>
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<tr>
<td>Total</td>
<td>151,793</td>
<td>30,275</td>
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</table>

The balance between environmental objectives and efficient markets must be maintained

Prefer the use of market structures to incentivize behavior to meet environmental objectives over use of regulation

Proposed ERCOT market design changes:
  — Future Ancillary Services Market: Incentives for flexible technology
  — Real-time Co-optimization of Energy and Ancillary Services: Improved price formation and ancillary service value
  — Multi-Interval Real-time Market: Improved economic commitment of quick start resources and demand response

Are these market structure reforms enough? Not likely