Benefits of Going Green: If too good to be true, then what do we do?

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Outline

- Caveats & context
- Defining the problem we’re trying to solve
- Public perception vs. reality
- Comparing benefits and costs
- What should we do?
Caveats & Context

- My direct experience related to renewable energy and energy efficiency
    - 1981 SERI Solar/Conservation Study concluded:
      - Conventional energy consumption across all sectors could be reduced by 25% by the year 2000.
      - Cost would be $800 billion (but be much less than the projected $1 trillion cost of coal and nuclear investment for the utility sector alone).
  - Demand-Side Planning 1985-1990
    - What types of programs are cost-effective?
    - How to integrate DSM into utility systems planning & operations?
    - How to design incentives to make reducing energy sales profitable?

- Questions and issues are back
What’s the problem we’re trying to solve?

• Which goal is primary?
  ◦ Energy independence
  ◦ Reducing carbon emissions
  ◦ Reducing the cost of energy

• Could have very different implications for:
  ◦ How should we get there
  ◦ How much it might cost
  ◦ Who should pay
Public Perception: A recent survey indicates strong public support for a “green strategy” (U.S. Results)

<table>
<thead>
<tr>
<th>Statement</th>
<th>Percent who agree/disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td>Should alternative energy be emphasized more?</td>
<td>88% - support</td>
</tr>
<tr>
<td>Should utilities be required to use alternative energy, <strong>even if costs might be greater in the short run?</strong></td>
<td>66% - support</td>
</tr>
<tr>
<td>Will alternative energy will be cheaper in the long-run than the cost of conventional fuels? Or will it cost so much that it will “hurt the economy?”</td>
<td>79% - cost less 18% - cost so much it hurts</td>
</tr>
<tr>
<td>Should government tax inefficient appliances?</td>
<td>43% - support 52% - oppose</td>
</tr>
<tr>
<td>Should nuclear power be emphasized more or less?</td>
<td>42% - more 31% - less 25% - same</td>
</tr>
<tr>
<td>Should new coal or oil-fired power plants be emphasized more or less?</td>
<td>25% - more 49% - less 22% - same</td>
</tr>
</tbody>
</table>

Will the benefits of going green exceed the costs?

- It's hard to believe the net costs relative to conventional technologies could be zero (absent unforeseen technological change)
  - Factors driving up projected costs of conventional technologies will also affect the costs of renewable technologies
  - Some major known costs have yet to be estimated (ex: interconnection costs and regulation costs associated with large amounts of wind generation)
  - It’s very likely that costs will be much greater than the general public appears to believe
- What are the costs and risks of not doing it?
Perils of long-term forecasting: 1987 forecast* of long-run avoided costs for the year 2000 were $120/MWh vs. $40/MWh actuals.

*New York Public Service Commission Approved forecasts of long-run avoided costs for Niagara Mohawk.
A few observations on what to do next

- A more thorough benefit/cost analysis needs to be undertaken
  - Such an analysis will be a daunting undertaking
  - Process would nevertheless greatly inform the debate
  - What’s the alternative?
- We seem to have a better handle on the problem than we do the solution(s):
  - If the problem is global climate change
  - And the source of the problem is the consumption of fossil fuels
  - A carbon tax seems like a really good idea
- We can and should do more to promote efficient electricity pricing
In praise of high prices . . .

- In many debates about industry structure, high prices are used as evidence that markets “aren’t working”
- If our goal is to promote energy efficiency, prices that reflect marginal costs plus the cost of environmental externalities are helpful; prices that are too low are part of the problem

### Own-price elasticities* of electricity demand

<table>
<thead>
<tr>
<th></th>
<th>Short Run</th>
<th></th>
<th></th>
<th>Long Run</th>
<th></th>
<th></th>
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<tbody>
<tr>
<td></td>
<td>Mean</td>
<td>Low</td>
<td>High</td>
<td>Mean</td>
<td>Low</td>
<td>High</td>
</tr>
<tr>
<td>Residential</td>
<td>-0.3</td>
<td>-0.2</td>
<td>-0.6</td>
<td>-0.9</td>
<td>-0.7</td>
<td>-1.4</td>
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<tr>
<td>Commercial</td>
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<td>-0.2</td>
<td>-0.7</td>
<td>-1.1</td>
<td>-0.8</td>
<td>-1.3</td>
</tr>
<tr>
<td>Industrial</td>
<td>-0.2</td>
<td>-0.1</td>
<td>-0.3</td>
<td>-1.2</td>
<td>-0.3</td>
<td>-1.4</td>
</tr>
</tbody>
</table>

Appendix

Electricity Price Elasticity Estimates for Time-Differentiated Pricing

Distribution of Price Elasticity Estimates under time-varying rates
Synopsis of Price Elasticity Estimates
for time-varying rates, by sector and type of rate design

Electricity Price Elasticity Estimates - Range and Mass Central Points (Absolute Values) for 15 Studies

Points are mass center, lines the values range (where appropriate)

Own-price elasticity (all others substitution)