Incentivizing the Adoption of Gas-Fueled Emerging Technologies with Pricing Tools

Léa Grausz, Associate
The Brattle Group
Residential and commercial gas consumption has been stagnating since the 1990s

Source: EIA US Natural gas consumption by end use.
Residential and commercial gas uses have been dominated by space heating, cooking...

Source: AGA advertisement from the 1940s
… and water heating

Source: British Gas Council advertisement from the 1950s
Yet use per customer is declining

- More stringent codes and standards
- Increase in energy efficiency initiatives
- Emergence of the “green” generation

Source: American Gas Association, Table 6-13.
As consumption falls, unitary fixed cost increase, reducing gas competitiveness.
Is there a way out of this vicious cycle?

- The status quo will inevitably lead to a declining demand
- “Gasification” or the emergence of new uses has the ability to sustain growth

![Natural Gas Vehicle?](image1)

![Natural Gas Air Conditioning?](image2)
There is a lot unknown about the future of the energy industry.

Map of Drivers and Output Relationships

- AMI
- Economic Well-Being
- Public Policy
- Natural Gas Prices
- Electricity Prices
- Customer Education and Awareness
- Penetration Rate of New Technologies
- Competition between Gas and Electricity
- Gas Use Per Customer
- Electric Use Per Customer
- Number of Gas Customers
- Number of Electric Customers

Natural Gas Prices

Electricity Prices

Economic Well-Being

Public Policy

AMI

Customer Education and Awareness

Penetration Rate of New Technologies

Competition between Gas and Electricity

Gas Use Per Customer

Electric Use Per Customer

Number of Gas Customers

Number of Electric Customers
Opt-in rates to incentivize emerging gas uses can encourage new growth

- **Standard rates** → communicate price signal to a broad range of customers
  - e.g., residential customers typically use gas for space and water heating

- **Opt-in rates** → tailored to incentivize emerging gas uses to encourage new growth

**Why?**

- Price signal for *long-term decisions*

- **Lower marginal costs**: if system capacity is under utilized and marginal cost of additional consumption is less than the average cost paid by the customers, opt-in rates can offer discounts in comparison to the standard rate
Several utilities have already implemented opt-in rates for emerging gas uses

<table>
<thead>
<tr>
<th>Utility</th>
<th>Off-peak Seasonal Rate for Gas AC</th>
<th>Off-peak Seasonal Rate</th>
<th>NGV Refueling Rate</th>
<th>Distributed Generation Rate</th>
<th>Rate for Other Emerging Technologies</th>
<th>LNG Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Atlanta Gas Light</td>
<td>•</td>
<td>•</td>
<td>•</td>
<td>•</td>
<td>•</td>
<td></td>
</tr>
<tr>
<td>Atmos Energy</td>
<td>•</td>
<td>•</td>
<td>•</td>
<td>•</td>
<td>•</td>
<td></td>
</tr>
<tr>
<td>Columbia Gas</td>
<td>•</td>
<td>•</td>
<td>•</td>
<td>•</td>
<td>•</td>
<td></td>
</tr>
<tr>
<td>Con Edison</td>
<td>•</td>
<td>•</td>
<td>•</td>
<td>•</td>
<td>•</td>
<td></td>
</tr>
<tr>
<td>LG&amp;E</td>
<td>•</td>
<td>•</td>
<td>•</td>
<td>•</td>
<td>•</td>
<td></td>
</tr>
<tr>
<td>National Fuel Gas</td>
<td>•</td>
<td>•</td>
<td>•</td>
<td>•</td>
<td>•</td>
<td></td>
</tr>
<tr>
<td>Niagara Mohawk</td>
<td>•</td>
<td>•</td>
<td>•</td>
<td>•</td>
<td>•</td>
<td></td>
</tr>
<tr>
<td>Nicor Gas</td>
<td>•</td>
<td>•</td>
<td>•</td>
<td>•</td>
<td>•</td>
<td></td>
</tr>
<tr>
<td>NIPSCO</td>
<td>•</td>
<td>•</td>
<td>•</td>
<td>•</td>
<td>•</td>
<td></td>
</tr>
<tr>
<td>NYSEG</td>
<td>•</td>
<td>•</td>
<td>•</td>
<td>•</td>
<td>•</td>
<td></td>
</tr>
<tr>
<td>People's Gas</td>
<td>•</td>
<td>•</td>
<td>•</td>
<td>•</td>
<td>•</td>
<td></td>
</tr>
<tr>
<td>PG&amp;E</td>
<td>•</td>
<td>•</td>
<td>•</td>
<td>•</td>
<td>•</td>
<td></td>
</tr>
<tr>
<td>Philadelphia Gas Works</td>
<td>•</td>
<td>•</td>
<td>•</td>
<td>•</td>
<td>•</td>
<td></td>
</tr>
<tr>
<td>RG&amp;E</td>
<td>•</td>
<td>•</td>
<td>•</td>
<td>•</td>
<td>•</td>
<td></td>
</tr>
<tr>
<td>SDG&amp;E</td>
<td>•</td>
<td>•</td>
<td>•</td>
<td>•</td>
<td>•</td>
<td></td>
</tr>
<tr>
<td>SoCalGas</td>
<td>•</td>
<td>•</td>
<td>•</td>
<td>•</td>
<td>•</td>
<td></td>
</tr>
<tr>
<td>Virginia Natural Gas</td>
<td>•</td>
<td>•</td>
<td>•</td>
<td>•</td>
<td>•</td>
<td></td>
</tr>
<tr>
<td>Yankee Gas</td>
<td>•</td>
<td>•</td>
<td>•</td>
<td>•</td>
<td>•</td>
<td></td>
</tr>
</tbody>
</table>
Some examples of opt-in rates

- **Con Edison** offers an opt-in rate for **refueling of NGVs** at the customer’s premises with the option to use compressed natural gas.

- **Philadelphia Gas Works** offer an opt-in rate for gas fueled **seasonal equipment** (e.g., AC) to non-residential customers and requires separate metering.

- **NYSEG** has three opt-in rates for **distributed generation** (gas-fueled small scale generators) – one for residential, one for non-residential owned small DG systems, and one for non-residential owned medium DG systems.

- **SoCalGas** has an opt-in rate for **all emerging technologies** with a 10% discount on volumetric charges and/or an up-front billing credit.
Utilities can design an opt-in rate by answering seven questions

1. What is the goal of the rate?
2. Which customers are targeted?
3. Which technologies are targeted?
4. Should separate metering be required?
5. For how long should the opt-in rate be made available?
6. How should the rate be designed?
7. Test in a pilot study: should any parameters be adjusted?
Léa Grausz is an associate in The Brattle Group’s San Francisco office. Ms. Grausz has experience in dispute resolution and regulatory proceedings in energy markets, including: upstream natural gas long-term contracting and pricing; gas pipeline ratemaking; and liquidity assessment in global oil and gas markets. She also has experience working on tariff design for electricity and natural gas; incentive regulation for electric and gas utilities; and assessment of the impact of demand-side management programs.

Prior to joining The Brattle Group, Ms. Grausz worked for four years for Engie in Paris, France where she performed economic analysis for price negotiations and contract arbitrations for long-term gas supply contracts.