DISPATCHING DIRECT USE
Achieving Greenhouse Gas Reductions & Energy Savings
What’s Different Today?

Trillion Cubic Feet

Shale resource not assessed separately

+125%

American Gas Association
Generation: A Familiar Story

The graph illustrates the trends in electricity generation and natural gas burn over the years from 2011 to 2016. The x-axis represents the months and years, while the y-axis shows the generation in GWh/d and Nat gas burn in Bcf/d. The graph shows the fluctuation in generation and burn with peaks and troughs throughout the years.

Legend:
- Green bars: nat gas burn (RHS)
- Blue line: coal generation (LHS)
- Red line: nat gas generation (LHS)
A LESS FAMILIAR STORY: DIRECT USE

“Direct Use” means space conditioning, water heating, cooking, & clothes drying
Why Direct Use?

- The **full potential** of natural gas as a tool for greenhouse gas emissions reduction is unrealized.

- The production, delivery and use of natural gas to buildings is **highly efficient**: more than 90% of available energy makes it to the burner tip.

- Natural gas is a **low-carbon fuel** with the promise of delivering significant emissions reductions when used directly in a variety of applications.

- Natural gas is an **affordable energy resource**.

- The United States has an **unrivaled natural gas infrastructure** base that serves 70 million households and businesses.
Average household consumption of natural gas has **dropped by half** since 1970.

Residential Natural Gas Use per Customer, Weather Normalized (Mcf)

Source: Energy Information Administration, AGA Calculations
Natural Gas Used Directly In Homes and Businesses Reduces Greenhouse Gas Emissions

Space Heating System Carbon Dioxide Emissions
(Ton CO2 per 100 MW Useful Energy Consumption)

- Electric Furnaces: 74
- Oil-fired Furnaces: 45
- Air Source Heat Pumps: 31
- Gas-Fired Furnaces: 27

Source: MIT *Future of Natural Gas*
Appliance efficiencies Energy STAR compliant.
Extraordinarily Efficient
Comparing Residential Water Heater Efficiency*

**Energy Cost**
- **Natural Gas**: $275 annually
- **Electric Resistance**: $576 annually

**Full-Fuel-Cycle Energy Consumption**
- **Natural Gas**: 26.2 MMBtu annually
- **Electric Resistance**: 49.8 MMBtu annually

**CO₂ Emissions**
- **Natural Gas**: 1.5 tons annually
- **Electric Resistance**: 2.9 tons annually
<table>
<thead>
<tr>
<th></th>
<th>Natural Gas</th>
<th>Electricity</th>
<th>Oil</th>
<th>Propane</th>
</tr>
</thead>
<tbody>
<tr>
<td>Space Heating</td>
<td>$643</td>
<td>$1,054</td>
<td>$1,201</td>
<td>$2,003</td>
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<td>Other</td>
<td>$315</td>
<td>$744</td>
<td>$805</td>
<td>$636</td>
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<td><strong>Total</strong></td>
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<td><strong>$1,798</strong></td>
<td><strong>$2,006</strong></td>
<td><strong>$2,639</strong></td>
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</tbody>
</table>

Customers will, on average, spend less for space heating, water heating, cooking, and clothes drying using natural gas than using any other energy source.
Natural Gas Pipelines

Legend
- Interstate Pipelines
- Intrastate Pipelines

Source: Energy Information Administration, Office of Oil & Gas, Natural Gas Division, Gas Transportation Information System
States that allow financial incentives for fuel switching within energy efficiency portfolio

Source: AGA Energy Efficiency Survey
Puget Sound Energy offers incentives of up to a $3,550 rebate to switch home and water heating sources to natural gas. Customers are able to switch from to any natural gas provider.

In both Washington and Idaho, Avista Utilities Electric to Natural Gas Conversion Program provides a fuel efficiency rebate to eligible residential electric customers who heat their homes and water with Avista electric and switch to natural gas.

WHAT’S BEST FOR THE CUSTOMER?
Limits and Constraints on Natural Gas Direct Use

- Lack of access to natural gas service.
- First cost purchase and installation of gas equipment and appliances.
- Misaligned incentives resulting in less energy efficient and economic consumer choices.
- Inconsistent policies in regulatory and programmatic approaches.
Direct and Distributed Use of Natural Gas

Policy Considerations

• Encourage government agencies, state public utility commissions, state legislatures and utilities to jointly develop innovative policies and regulations that better align costs and benefits over the life cycle of consumer equipment.

• Provide consumers with the best available information on comparable energy options through the use of enhanced appliance and equipment labeling, including carbon footprint information.

• Develop and incorporate full fuel cycle analysis into energy policy, regulation and energy efficiency metrics.
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