Trends in the Use of Natural Gas in U.S. Households 1987 to 2001

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“The opinions and conclusions expressed herein are solely those of the authors and should not be construed as representing the opinions or policy of any agency of the United States Government.”
Data Used: Residential Energy Consumption Survey

- Approximately 5,000 Household Personal Interviews - Household and Housing Unit Data (Actually Measure Home)
- Rental Survey
- Suppliers Survey – Consumption and Expenditures
- End Use Estimation
Number of Households Using Natural Gas, 2001

- 62% of 107 Million U.S. Households
- 4.7 Tcf of Natural Gas (7.3 Tcf Industrial)
- 48.5 Million are Single-family Homes
- 38% of Demand is in the Midwest

Source: EIA, 2001 RECS.
Natural Gas End-Use Demand in U.S. Households, 2001

Source: EIA, 2001 RECS.
Household Natural Gas Demand
1987 to 2001

Most of the HH decline (1997-2001)

Households Using Natural Gas
Natural Gas Demand per Households
Total Natural Gas Demand

Source: EIA, 1987 and 2001 RECS.
FACTORS AFFECTING NATURAL GAS DEMAND

- Prices
- Weather
- Building Codes
- Appliance Efficiency Standards
- Household Characteristics such as income, and age of householders
- Others such as age and type of home, and etc.
## Natural Gas Prices and Weather Indices 1987=1

<table>
<thead>
<tr>
<th></th>
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</thead>
<tbody>
<tr>
<td>Space Heating Demand per Household</td>
<td>0.97</td>
<td>1.06</td>
<td>1.00</td>
<td>0.83</td>
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<td>Natural Gas Real Prices</td>
<td>0.92</td>
<td>1.32</td>
<td>0.93</td>
<td>1.24</td>
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<tr>
<td>Average Heating Degree Days</td>
<td>0.94</td>
<td>1.13</td>
<td>1.10</td>
<td>0.99</td>
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### 1997 and 2001 Comparison
- 34 percent price increase
- Average HDD was 10 percent less
- Demand 18 percent less

Notes: Real prices are in 2000 dollars; Heating-degree days are for households using natural gas space heat only.

Sources: Bureau of Economic Analysis – Table 1.1.9 Implicit Price Deflators; EIA, 1987, 1990, 1993, 1997, and 2001 RECS.
Building Codes
Householder’s Perception of Insulation and Drafts in the Home, 2001

Source: EIA, 2001 RECS.

% Well or Adequately Insulated

Year of Construction

Source: EIA, 2001 RECS.
The intensity for older home may have been higher if older homes’ heating equipment had not been replaced.

Source: EIA, 2001 RECS.
### Appliance Efficiency Standards, 2001

#### Year Home Constructed by Age of Space Heating Equipment

<table>
<thead>
<tr>
<th>Percent</th>
<th>&lt; 10</th>
<th>10-19</th>
<th>&gt;= 20</th>
<th>Don’t Know</th>
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<tr>
<td>Before 1950</td>
<td>32</td>
<td>18</td>
<td>33</td>
<td>17</td>
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<tr>
<td>1950-1959</td>
<td>40</td>
<td>19</td>
<td>31</td>
<td>10</td>
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<tr>
<td>1960-1969</td>
<td>33</td>
<td>15</td>
<td>38</td>
<td>14</td>
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<td>1970-1979</td>
<td>32</td>
<td>10</td>
<td>44</td>
<td>13</td>
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<tr>
<td>1980-1989</td>
<td>21</td>
<td>62</td>
<td>8</td>
<td>10</td>
</tr>
<tr>
<td>1990-2001</td>
<td>87</td>
<td>11</td>
<td>0</td>
<td>2</td>
</tr>
</tbody>
</table>

Source: EIA, 2001 RECS.

Many older homes replaced their space heating equipment with more efficient units.
Indirect Demand for Natural Gas

Natural Gas Used for Generation of Electricity, 1987-2001

Note: Data represents utilities and independent power producers.
Source: EIA, Table 8.3 d, *Annual Energy Review 2002.*
Indirect Demand for Natural Gas

Average Electricity Demand in U.S. Households, 1987-2001

Indirect Demand for Natural Gas

Household Electricity Consumption

• During the 1987-2001 period the number of households using electricity as a main space heating fuel increased by 73 percent—reflective of the rapid growth of heat pump use, mainly in the South and the West.

• In 1987, 63 percent of homes had air conditioning, compared with 76 percent in 2001. There was a change in the mix of air-conditioning from room to central air conditioning.

• In 2001, households used 42 percent more electricity for appliances than in 1987.

Source: EIA, 2001 RECS.
Indirect Demand for Natural Gas

Distribution of Household Electricity Consumption, 2001

- Appliances: 65%
- Space Cooling: 16%
- Space Heating: 10%
- Water Heating: 9%

Source: EIA, 2001 RECS.
Natural Gas Demand in the Future

- Between 2002 and 2025 EIA, projects household natural gas demand to increase by 0.9 percent per year.
- Natural gas demand for electricity generation is projected to grow even faster, 1.8 percent per year.
- Some of the natural gas-fired electricity generation will be for households’ demand for electricity.

In the future, if this “indirect” demand continues and expands as is forecasted, there will be implications in terms of supply and price increases that will affect those who directly use natural gas in the household sector and other sectors as well.