**Demand Destruction:**
A New Multi-client Study by Global **Insight**

Presentation Agenda

- Introduction to issues and study definition
- Why is the study important and timely
- Study content
- Who should participate?
- Pricing and timetable
- Global **Insight** Qualifications
Introduction and Study Definition
Demand Destruction: 
A New Multi-client Study by Global Insight

Study Definition

Natural gas demand in the U.S. will continue to grow. While there are several alternative development patterns for new gas supplies, Global Insight believes that limited lower-48 capacity means a higher and more volatile long-term gas price plateau. This in turn means significant shifts in market demand, particularly among gas-intensive industries.

This new multi-client study will develop future gas price scenarios and provide an in-depth industry-by-industry and sector-by-sector assessment of the future demand impacts of each scenario.
Why Now?
US Natural Gas Supply: An almost certain shortfall in lower-cost domestic supplies

Natural Gas Demand Outpaces Production

Graph showing the increase in Total US Demand and US Production over time from 1980 to 2020.

- Total US Demand: Red line
- US Production: Blue line
Gas Production From US Fields: Rapid field depletion and increasingly costly reserve replacements

.. and recent drilling increases have produced only limited results

Change in US Natural Gas Production Versus Gas Directed Rotary Rigs in Operation

Change in BCF Number of Rigs

Increasing Drilling

Decreasing Production

Production Rigs
**Canadian Production: Stalled in 2002, is it also limited in the future?**

![Nova and Alliance Pipeline Receipts graph](chart)

- **Ladyfern Startup**
- **Dec/Jan Down 300 Million Cubic Feet per Day YOY**

<table>
<thead>
<tr>
<th>Month</th>
<th>Jan-98</th>
<th>Jul-98</th>
<th>Jan-99</th>
<th>Jul-99</th>
<th>Jan-00</th>
<th>Jul-00</th>
<th>Jan-01</th>
<th>Jul-01</th>
<th>Jan-02</th>
<th>Jul-02</th>
<th>Jan-03</th>
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<tbody>
<tr>
<td>Receipts (Billion Cubic Feet per Day)</td>
<td>12.0</td>
<td>12.5</td>
<td>13.0</td>
<td>13.5</td>
<td>14.0</td>
<td>13.5</td>
<td>13.0</td>
<td>12.5</td>
<td>12.0</td>
<td>11.5</td>
<td>11.0</td>
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</tbody>
</table>
New Resources: Migrating to more remote, more technically challenging sources – meaning higher gas costs ahead

Source: EIA/NPC
..and capacity limits mean more price volatility and a premium on managing sales and acquisitions.
High Prices and Volatility: Some demand will certainly be “destroyed”

- Phases of “Demand Destruction
  - Substitution
  - Conservation
  - Efficiency
  - Move to low cost area

- …but more than one price scenario is possible

- …and for each scenario there are many uncertainties
  - At what pace?
  - In which sectors?
  - In which industries?
  - Where?
Study Content
The Starting Point: Global Insight’s Base-case Outlook for US Energy

Long-term outlook through 2020 including:

- Economic Growth Outlook
- Environmental Premises
- Gas Demand by Region and Sector
- Gas Supply Volumes and Cost Estimates including:
  - Conventional Gas
  - LNG
  - Coal-bed Methane
  - Frontier Gas
- Regional Gas Pricing
- Base-case Assumptions on Demand Destruction versus History
A Scenario Approach: Alternative views of future supplies and prices will be a core of the study

- Critical uncertainties driving development of US gas price scenarios:
  - Global oil prices
  - Pace of LNG development
  - Coal-bed methane
  - Opening of restricted drilling areas (e.g. ANWR)
  - Alaskan gas pipeline

- Study will include up to two distinct alternative future supply and price scenarios

- Each scenario will be fully analyzed for comparison to Base-case outlook
At the Core of the Analysis Will
Detailed Demand Destruction Analysis for Each Scenario

◆ Analysis by industry for major gas-consuming industries (including power gen) will include:
  ◆ Gas intensity relative to output value
  ◆ Fuel flexibility and short-term switching ability
  ◆ Competitive pressures and economics
    – Non-gas fired competitors
    – Offshore competitors with access to low-cost gas
  ◆ Expected industry responses

◆ Analysis by region including sector detail on:
  ◆ Residential/Commercial
  ◆ Industrial
  ◆ Electric Utilities
Physical Deliverables

- Interim multi-media conference call presenting scenarios for discussion and comment
- Final report documenting Demand Destruction analysis and results
- CD ROM containing study data
- Optional on-site presentation of study results
- Optional customization of results to specific market geography and sector/industrial composition.
I. North American Natural Gas Base-case Forecast
   • Economic Growth
   • Environmental Premises
   • Regional and Sectoral Demand
   • Gas Supplies
     – Conventional Supplies
     – LNG
     – Frontier Volumes
   • Regional Prices

II. Alternative Supply and Price Scenarios
   • Lower 48 Conventional Gas Productive Capacity
   • Moving Up the Supply Cost Curve
     – Deep offshore
     – Frontier and Arctic
     – LNG
     – Coal-bed Methane
   • Scenarios for Future Supply and Price
Outline of Study Analysis and Deliverables (Continued)

III. Potential for Natural Gas Demand Destruction by Industry and Sector
   • By Sector:
     • Residential
     • Commercial
     • Industrial
       – Petrochemicals – Ammonia
       – Methanol – Aluminum
       – Iron and Steel – Other Industry
   • Power Sector
   • For Each Sector/Industry:

<table>
<thead>
<tr>
<th>Short-term Alternatives</th>
<th>Long-Term Alternatives</th>
</tr>
</thead>
<tbody>
<tr>
<td>Historical gas/oil switching</td>
<td>Industrial &amp; generation migration</td>
</tr>
<tr>
<td>Multi-fuel power plants</td>
<td>Alternative technologies</td>
</tr>
<tr>
<td>Multi-feed petchem plants</td>
<td>Power emphasis on coal and nuclear</td>
</tr>
<tr>
<td>Environmental limits</td>
<td>Economic impacts</td>
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<tr>
<td>Dispatch options in power</td>
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<tr>
<td>Intermittent operations</td>
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</tbody>
</table>
Outline of Study Analysis and Deliverables (Continued)

IV. Scenario summaries by region and sector
   • Apply results of III to each region/sector
   • Same region/sector breakdown as in Base-case
   • Comparisons to Base-case to estimate regional and sectoral long-term and short-term demand responses
   • Recheck price scenario consistency

V. Summary and Conclusions
Who Should Participate in This Study?
## Gas Supply Segments

<table>
<thead>
<tr>
<th>Segment</th>
<th>Analysis and Benefits Provided</th>
</tr>
</thead>
<tbody>
<tr>
<td>Producers</td>
<td>Future price scenarios; Changing logistics patterns; Changing seasonal demand patterns; Competitive position of alternative suppliers</td>
</tr>
<tr>
<td>Pipelines</td>
<td>Future throughputs; Changing seasonal demand patterns; Regional demand shifts</td>
</tr>
<tr>
<td>Storage Operators</td>
<td>Changing seasonal demand patterns; Regional demand shifts; New seasonal price patterns</td>
</tr>
<tr>
<td>Local Distribution Companies &amp; Power Sector</td>
<td>Customer risks; Changing seasonal demand patterns; Region-specific demand shifts; Customizable to LDC, EU market area.</td>
</tr>
</tbody>
</table>
## Other Gas Segments

<table>
<thead>
<tr>
<th>Segment</th>
<th>Analysis and Benefits Provided</th>
</tr>
</thead>
<tbody>
<tr>
<td>Industrial Gas Consumers &amp; Power Sector</td>
<td>Future price scenarios; Evaluation of competitive impacts vs. other domestic players and imports; Future seasonal supply curtailment risks</td>
</tr>
<tr>
<td>State Governments</td>
<td>Assessment of regional winners and losers; Vital information for formulating industrial development &amp; retention policies and outlook for tax revenues</td>
</tr>
<tr>
<td>Federal Government</td>
<td>Help assess potential economic and security impact of offshore migration of critical industries, e.g. petrochemicals</td>
</tr>
<tr>
<td>Financial Institutions</td>
<td>Future price scenarios; Which industries (and by inference companies) will be subject to competitive threats linked to high gas prices; Opportunities for new gas-based derivatives</td>
</tr>
<tr>
<td>Industry Associations</td>
<td>Vital information for formulating lobbying and public relations agendas</td>
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</table>
Pricing and Timetable
Study Pricing

- **Study participation**
  - Subscribers by May 15: $20,000\(^1\)
  - Subscribers after May 15: $25,000\(^1\)
- **Optional on-site presentation**: $5,000\(^2\)
- **Custom tailored application**: Varies\(^2\)

1. $4000 Discount for full US Energy Service Subscribers
2. Requires study subscription
Global Insight
Ideally positioned for this study
Global Insight Qualifications

The Leaders of the Project Team each have over 25 years experience in North American and global energy market analysis. Each has been involved in developing Global Insight’s energy modeling, data, and analysis tools as well as preparing numerous previous studies in natural gas market development. These experienced team leaders will be joined by other experts and analysts from within the Global Insight economics and energy analysis staff.

Global Insight’s Global Energy Group is recognized for its integrated economic/market analysis, pricing analysis, comprehensive industry sector forecasts, and objective treatment of regulatory and competitive issues. With 25 staff divided between Lexington, London, and Paris, the Energy Group’s clients consist of most of the world’s large power, gas, and oil companies, as well as many governmental agencies.

Global Insight, Inc. provides the most comprehensive coverage of countries, regions and industries available from any source. Global Insight brings a common analytical framework and a consistent set of assumptions to these diverse capabilities and products. Global Insight also provides a broad range of consulting capabilities covering market analysis, business planning, investment strategy, risk assessment, infrastructure analysis, policy evaluation, and economic development and impact. The combination of expertise, modeling assets, data repository and analytical software tools delivers actionable solutions that address specific client problems. The company has over 3,000 clients in industry, finance and government around the world with $70 million in revenues, over 500 employees and 30 offices covering North and South America, Europe, Africa, the Middle East and Asia.
## Project Team

<table>
<thead>
<tr>
<th>James Osten</th>
<th>Mary Novak</th>
<th>Dennis Eklof</th>
<th>Kemm Farney</th>
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<tbody>
<tr>
<td>Principal</td>
<td>Managing Director</td>
<td>Exec. Managing Dir.</td>
<td>Principal</td>
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</tbody>
</table>
| • More than 25 years in energy analysis with Global Insight  
• Responsible for Global Insight N. American Gas Analysis  
• Expertise in LNG, risk management, fundamental analysis  
• Director of numerous studies in global energy markets  
• Economics degrees from Univ. of Wisc. and Boston College | • More than 20 years in energy analysis with Global Insight  
• Specialist in regulatory issues, policy analysis and economic impact studies  
• Expertise in all aspects of N. American and European energy economics  
• Economics degrees from Catholic Univ. of Amer. And Univ. of Maryland | • More than 35 years of in energy analysis and project management with Global Insight, CERA, DRI, and Exxon  
• Expertise in international oil and gas markets including LNG, refined products, and petrochemicals  
• Experienced in developing markets and related investment strategies  
• BES and PhD from Johns Hopkins University | • 25 years experience in US power analysis with Global Insight and a large electric utility  
• Responsible for US electricity market analysis and utility consulting practice  
• Expertise in econometrics, utility load forecasting, power sector economics, and power regulatory developments  
• Ph.D from Florida State University |

### Other Key Project Contributors

| Margaret Rhodes, Senior Economists, US Energy  
Rom Runiewicz, Principal, Steel Service  
Shawn Intorcio, Managing Director, N. American Power | Frantz Price, Managing. Dir., Industry Practices  
John Dean, Senior Assoc., N. American Coal  
Phil Hopkins, Sr. Economist, US Regional Economics |
Global Insight is confident that this new multi-client study will provide crucial insights into the long-term future of the North American gas market at a time of heightened concern over future gas supplies. We look forward to your participation in this important study.