National Petroleum Council

Global Oil and Gas Study

Status Update

December 5, 2006
Study Origins

2005

- **June** Secretary Bodman speech to NPC members
- **October** Secretary Bodman study request to NPC
- **November** Agenda Committee recommends acceptance
- **December** Membership concurrence via ballot
  
  Executive Committee established

2006

- **April** Coordinating Subcommittee established
- **May** Global Committee established
- **June** NPC approval of Study Work Plan
1. What does the future hold for global oil and natural gas supply?

2. Can incremental oil and gas supplies be brought on-line, on time, and at a reasonable price to meet future demand without jeopardizing economic growth?

3. What oil and gas supply strategies and/or demand-side strategies does the Council recommend the United States pursue to ensure greater economic stability and prosperity?
Study Principles

• Not another “grassroots” energy forecast.

• Gather and analyze public and aggregated proprietary data.

• Input solicited from a broad range of interested parties.

• Emphasize long-term conditions, not near-term volatility.

• Recommendations supported by sound data and science.

• All study teams work within scope and on time.

• Full compliance with antitrust laws and regulations.
Study Approach

• Engage and include broad cross section of resources
  - NPC Membership and Global Committee
  - Coordinating Subcommittee and Task Group members
  - Subgroup participants
  - Expert panels
  - Workshops Briefings / Outreach
  - One-to-One dialogue

• Advise the Secretary of Energy
  - Policy recommendations will be developed by all study groups for review and approval by the NPC after completion of data analysis, interpretation, and findings.
Study Representation
(Coordinating Subcommittee, Task Groups & Subgroups)

~250 Individual Study Participants
Study Scope

Policy Options

- Global Supply
- Global Economy
- Global Demand
- Technology Advances
- Alternative Energy
- Environmental Considerations
- Geopolitics
Study Task Groups

Technology

Geopolitics & Policy

Supply

Demand
Study Cross-Cutting Subgroups

- Carbon Management
- Macroeconomics
- Refining & Manufacturing Biomass
- Resource Endowment
- LNG & GTL
- Non-Proprietary Data
- Cultural, Social, & Economic
- Stationary Efficiency
- Conventional Recovery
- Unconventional Hydrocarbons
- Transportation Efficiency
- Coal Technology
- Coal Management
- Carbon Management
- Technology Development & Deployment
- Geopolitical Issues Analyses

Efficiency
- Parallel Studies
- Infrastructure
- Hydrogen
- Data Evaluation
- Data Evaluation
- Coal Impact
- Exploration
- Deepwater
- Human Resources
- Nuclear
- Government Role
- Regional

Coordinating Subcommittee
- Supply
- Demand
- Technology
- Geopolitics & Policy

Global Oil and Gas Study
Supply Task Group – Approach

• Evaluate a broad range of public and aggregated proprietary oil and gas supply outlooks, including fuel and power dimensions.

  ➢ Define key rates and factors of the conversion system from geologic resources to reserves, production, manufacturing and infrastructure.

  ➢ Summarize assumptions and findings for the range of supply projections and assess outcomes for probability, shape, and timing of supply curves.

  ➢ Assess supply variables to economic, technology, geopolitical, and environmental factors.

• Develop policy recommendations with Geopolitics & Policy Task Group.
Framing Questions

- What is the range of projections for world energy supply over the next 25 years?
  - What are the key drivers underlying the supply projections?
- What is the range of projections for oil and gas production over the next 25 years?
  - What are the key drivers?
    - Resource endowment
    - Recovery/conversion rates
    - Technology
    - Geopolitical
    - Environment
    - Infrastructure
    - Economics and expectations of future returns
- Are there projections of infrastructure limitations for any energy resource?
  - How might such projections be alleviated – detailed discussion for oil and gas, high level for all other?
- How have historical projections compared to actual?
Framing Questions (cont’d)

- What do other independent studies/forecasts project for coal contribution to energy supply over the next 25 years? (by the Coal Subgroup of the Technology Task Group)

- What do independent studies/forecasts project for non-hydrocarbon energy supplies over the next 25 years?
  - Biomass (by the Biomass Subgroup of the Supply Task Group)
  - Nuclear (by the Nuclear Power Subgroup of the Technology Task Group)
  - Solar, wind, hydro, geothermal (by the Stationary Efficiency Subgroup of the Demand Task Group)

- How quickly might industry bring on new discoveries and discovered but undeveloped fields considering regulatory, investment capacity, technology and other factors?

- What additional data and/or future work could help reduce the uncertainty associated with global energy endowment and timing to convert the endowment into production capacity?

- What are the costs and externalities of future energy supply options?
  - Unconventional oil and gas resources
  - Renewables
  - Advanced coal technologies
Demand Task Group – Approach

• Collect historic world primary energy demand data by region.
• Analyze historic data back to 1970.
• Gather public and aggregated proprietary demand outlook data to 2030.
• Evaluate EIA data as pilot prior to expanding full data analysis.
• Revise data collection and evaluation methods as necessary.
• Evaluate demand data from data aggregation effort.
• Develop policy options related to demand.
• Integrate demand policy options into Study policy effort.
Demand Task Group Framing Questions

• What is the range of projections for world energy demand to 2030?
• What are the key drivers underlying the demand projections?
  ➢ Economic activity
  ➢ Demographics
  ➢ Use patterns
  ➢ Efficiency
  ➢ Environmental
  ➢ Politics and Policy
• How have historical projections compared to actual?
  ➢ What have been the significant drivers of differences?
• What is the potential for efficiency measures to affect demand?
• What is the potential for environmental concerns to affect demand?
• What are possible changes in fuel use patterns?
  ➢ What would be the demand/environmental effects?
  ➢ What would be the infrastructure implications?
Technology Task Group – Approach

- Identify and organize Subgroups around technical themes.
- Ensure broad participation in theme work sessions.
- Cooperate closely with other Task Groups.
- Engage NPC and non-NPC expertise on nuclear, coal, and renewables.
- Engage consumer groups and autos on efficiency issues.
- Cooperate with DOE to utilize past work on select topics.
Technology Task Group – Approach (cont’d)

• Develop views of:
  - Time horizons
  - Research budgets
  - Human resources
  - Technology penetration

• Develop policy recommendations with Geopolitics & Policy Task Group.
Framing Questions

Framing questions will be applied to the following impact areas:

- Technology Impact On Conventional Oil And Gas Recovery And Production
- Deepwater
- Exploration Technology
- Unconventional Hydrocarbons
- Coal Technology
- Nuclear Power
- CO₂ Sequestration And Environmental Mitigation Technology
- Transportation Efficiency, Including Technology Impact On Fuel Efficiency
- Oil And Gas Technology Development And Deployment
- Technology Impact On Human Resource Requirements And Impact Of “Big Crew Change” On Talent Pool
- Role Of U.S. Government In Technology Development And Deployment
- Enhanced Oil Recovery
Framing Questions

- What is the range of technology assumptions in the projections surveyed?
- What have been the key historical impacts of this technology in the past 25 years?
- How might these technologies affect world energy supply/demand over the next 25 years?
  - What significant advances in this technology are currently being pursued?
  - What significant advances might occur by 2030? For each of these potential advances:
    - What would be the impact?
    - How might the potential advance be accelerated?
    - What would be the cost and value delivered?
    - How much could the advance be accelerated?
    - What are the risks and roadblocks?
    - How might environmental impacts and constraints enhance or threaten this advance?
    - How might this advance specifically impact the USA?
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Geopolitics & Policy Task Group - Approach

• Conduct literature review of geopolitical analyses.

• Establish and populate “core” geopolitics team as well as regional working groups.

• Expand outreach to include NGOs, environmental, diplomatic, and academic communities.

• Develop framework for identifying and analyzing key geopolitical trends and issues (globalism, security, environment, governance, etc.) across national, regional and global lines.

• Review design and outcomes of selected past policies.

• Establish and populate “core” policy team, including representatives from other Task Groups and expanded policy advisors group to:
  
  ➢ Integrate Supply, Demand and Technology findings into policy discussions
  ➢ Identify and analyze policy options
  ➢ Develop range of policy recommendations
Framing Questions

- What is the range of geopolitical assumptions in the projections surveyed?
- How might sovereign national, regional and global policy decisions affect global supply and demand outlooks?
  - Globalism, environment, security, governance?
  - How might policy decisions affect energy investment?
  - Can resource nationalism succeed and deliver adequate energy supplies?
- What have been the key attributes of the energy markets over the past 25 years?
Framing Questions (cont’d)

- How might the energy markets change significantly over the next 25 years?
- How might environmental/sustainability issues affect the pace and timing of new energy supply development and fuel choices?
- How could U.S. policy be modified to avoid, mitigate, manage, or exploit market or political changes affecting energy supply and demand?
  - What mechanisms might the U.S. use to affect global energy supply/demand and fuel choice?
Study Outreach

- Principle is to inform & solicit input from a broad range of interested parties
  - U.S. Executive Branch agencies
  - U.S. Congressional committees
  - State and local governments
  - Foreign energy ministries, ambassadors, and national oil companies
  - NGOs including consumer and environmental groups
  - Academia and professional societies
  - Energy and other industries

- Outreach process developed and being conducted through:
  - Briefing sessions by study participants
  - Expert panels
  - Public website information
  - Information sharing among NPC study groups
  - DOE official approaches to U.S. agencies and foreign governments
  - Routine follow-up with all engaged parties
  - Compliance with all anti-trust laws and guidelines
Study Activity to Date

• Resourced and launched Task Groups / Subgroups.
• Developed phase I communications plan and process.
• Commenced domestic and international outreach.
• Developed process to collect, aggregate, and protect proprietary data.
• Commenced public and proprietary data gathering.
• Initiated cross-functional integration:
  ➢ Technical & Geopolitical Findings
  ➢ Data
  ➢ Policy Development
  ➢ Report Writing
Study Forward Plan

• Complete Phase I outreach activities.

• Complete analysis of public and aggregated proprietary data:
  ➢ Development of supply / demand-side strategies

• Complete technical and geopolitical teams’ findings.

• Accelerate policy development & report writing process.

• Finalize sustainable long term communications rollout plan.

• Continue to conduct periodic reviews:
  ➢ Weekly CSC leader conference calls
  ➢ CSC and Task Group Integration Workshops
  ➢ Milestone reviews with Global Committee

• Develop draft report 1Q07, final report end of June ‘07.