

Perspectives on Natural Gas



By

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Session 10

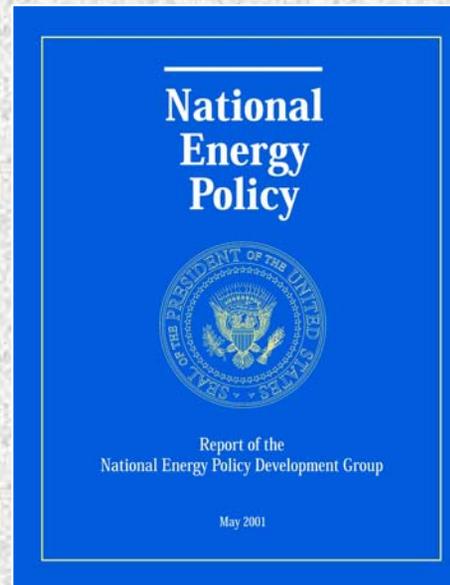
Phoenix, AZ

February 10, 2004



National Energy Policy (NEP) Drivers for Fossil Energy

- ◆ **Energy for a New Century**
- ◆ **America's Energy Infrastructure**
- ◆ **Strengthening Global Alliances**





Drivers for Supply

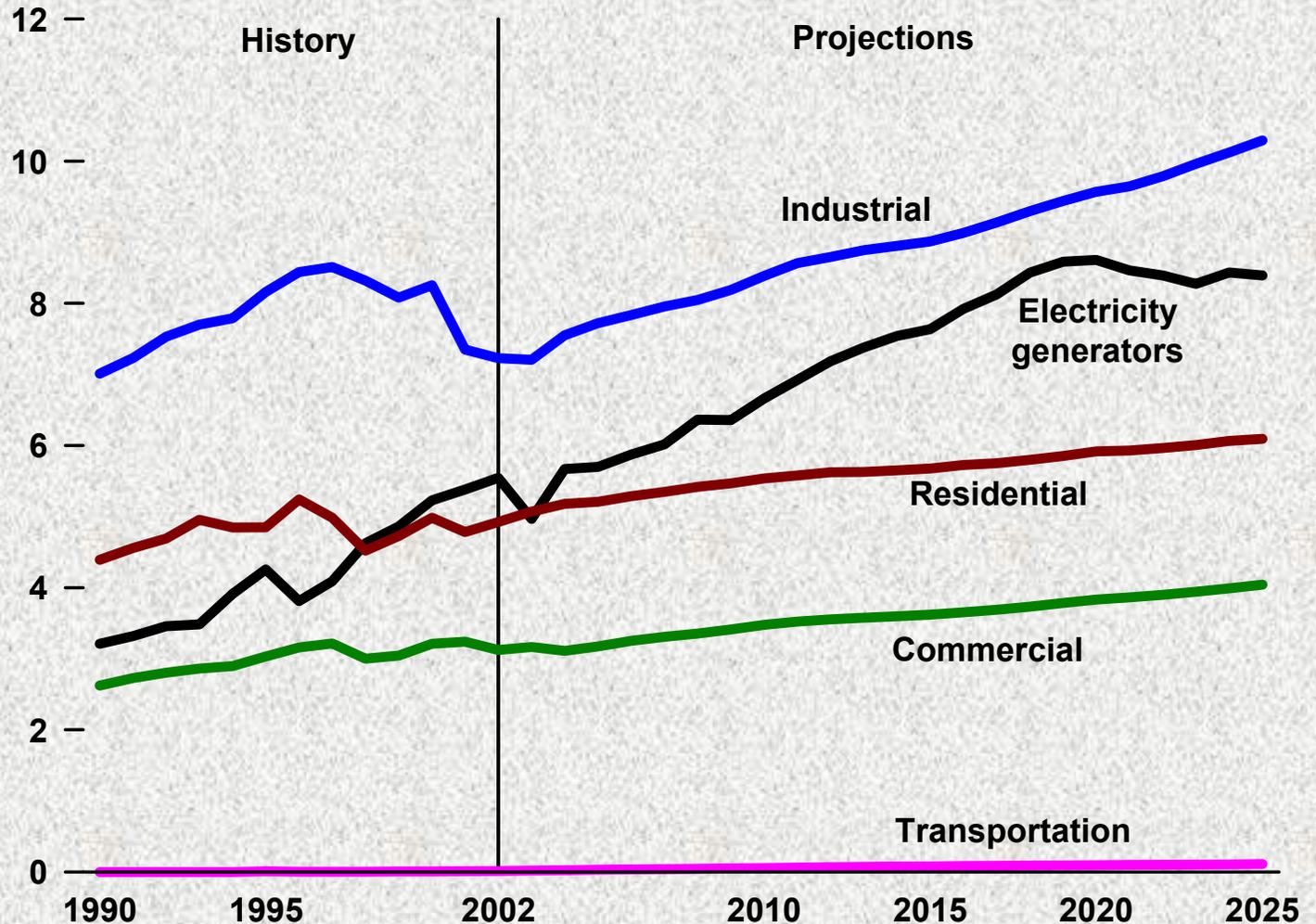
In the next 20 years:

- ◆ **Demand projected to grow from 98 quads to 136 quads**
 - Oil demand will increase by 45 percent
 - Electricity demand will increase by 40 percent
 - Natural gas demand will increase by 39 percent
- ◆ **We need 38 quads of additional supply**



U.S. Natural Gas Consumption by End-Use Sector (Tcf)

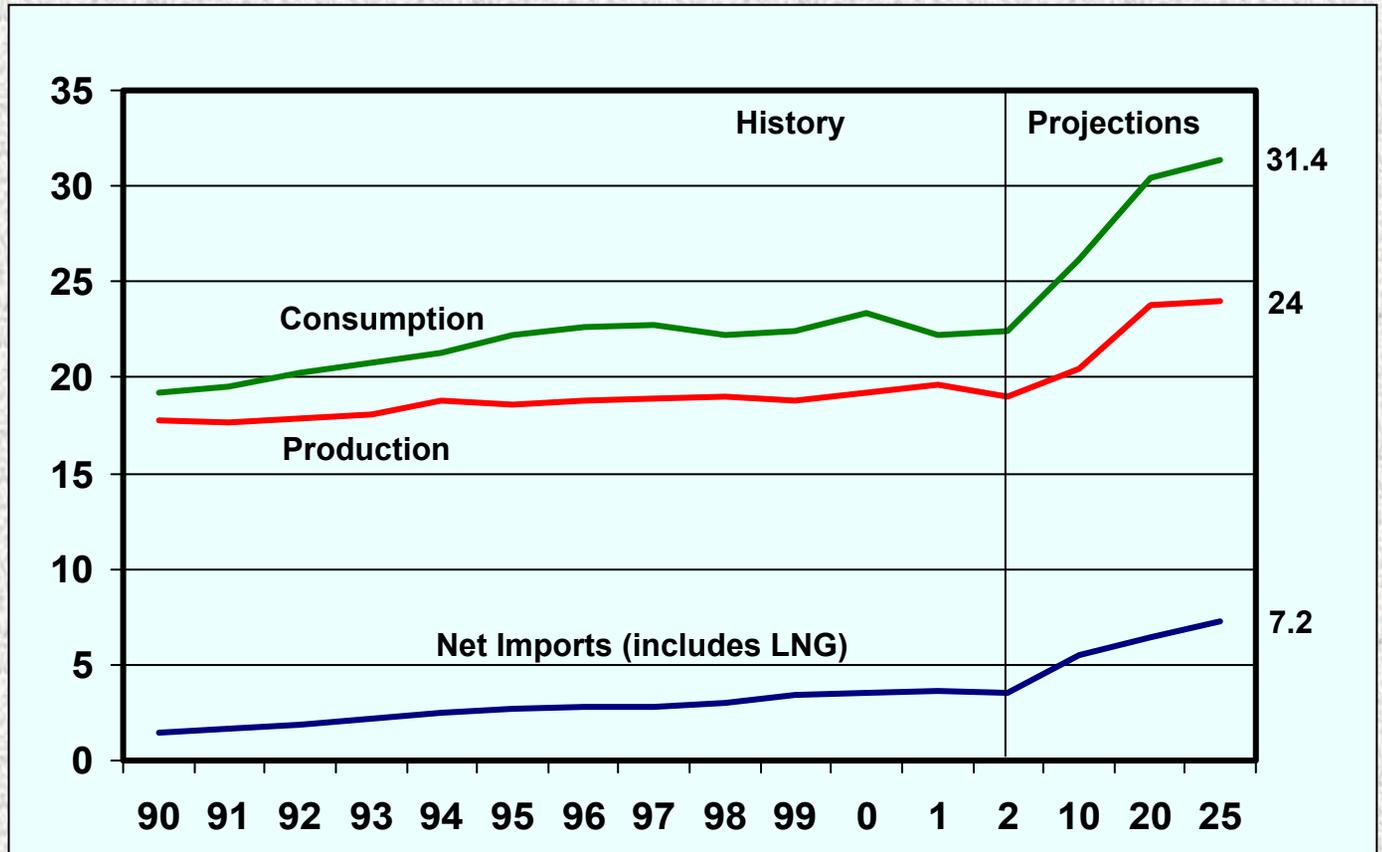
Demand for natural gas is expected to grow 38% over the next 25 years, while production is predicted to grow at a slower rate.



Source: Annual Energy Outlook 2004, Energy Information Administration



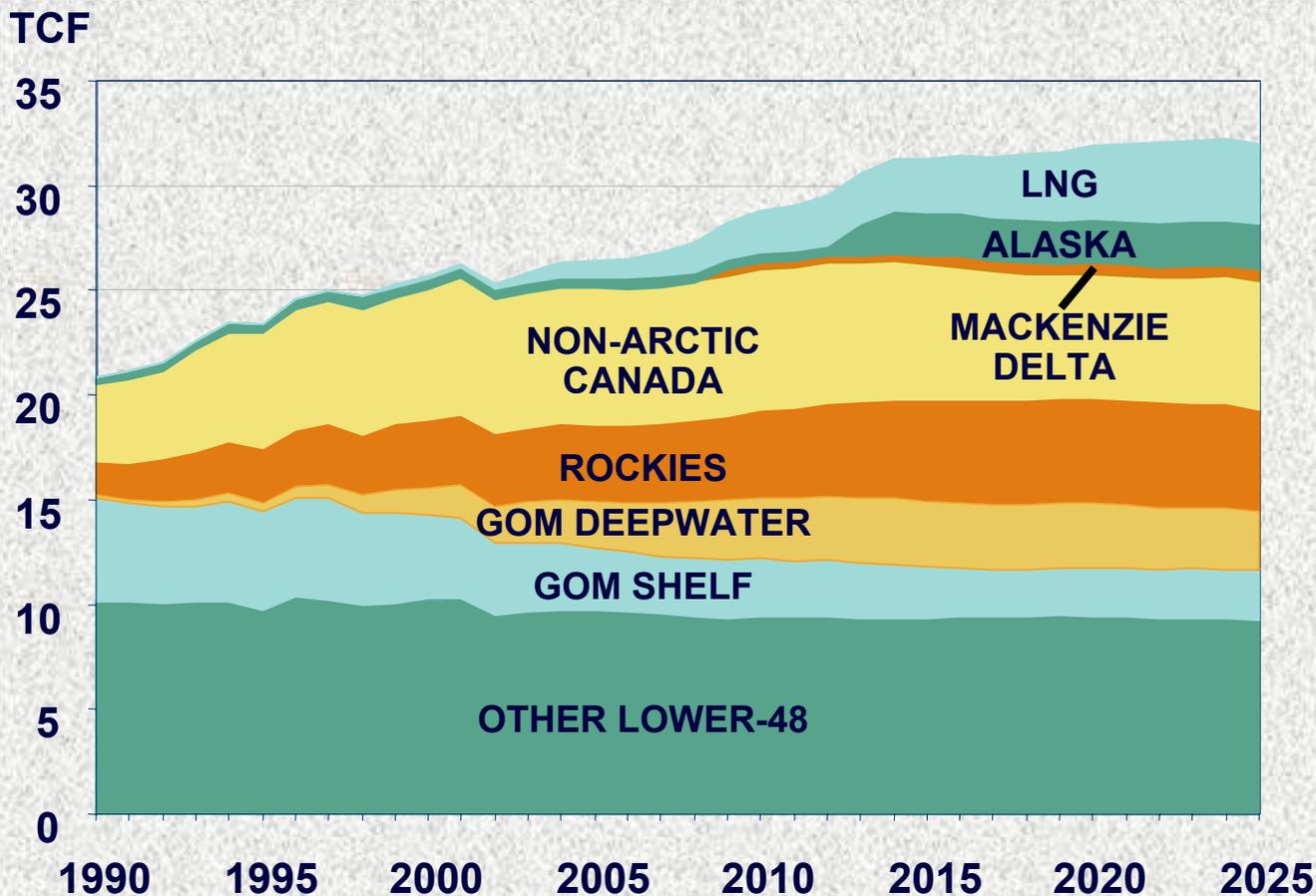
U.S. Natural Gas Production and Consumption (Tcf)



Source: Energy Information Administration, 2004

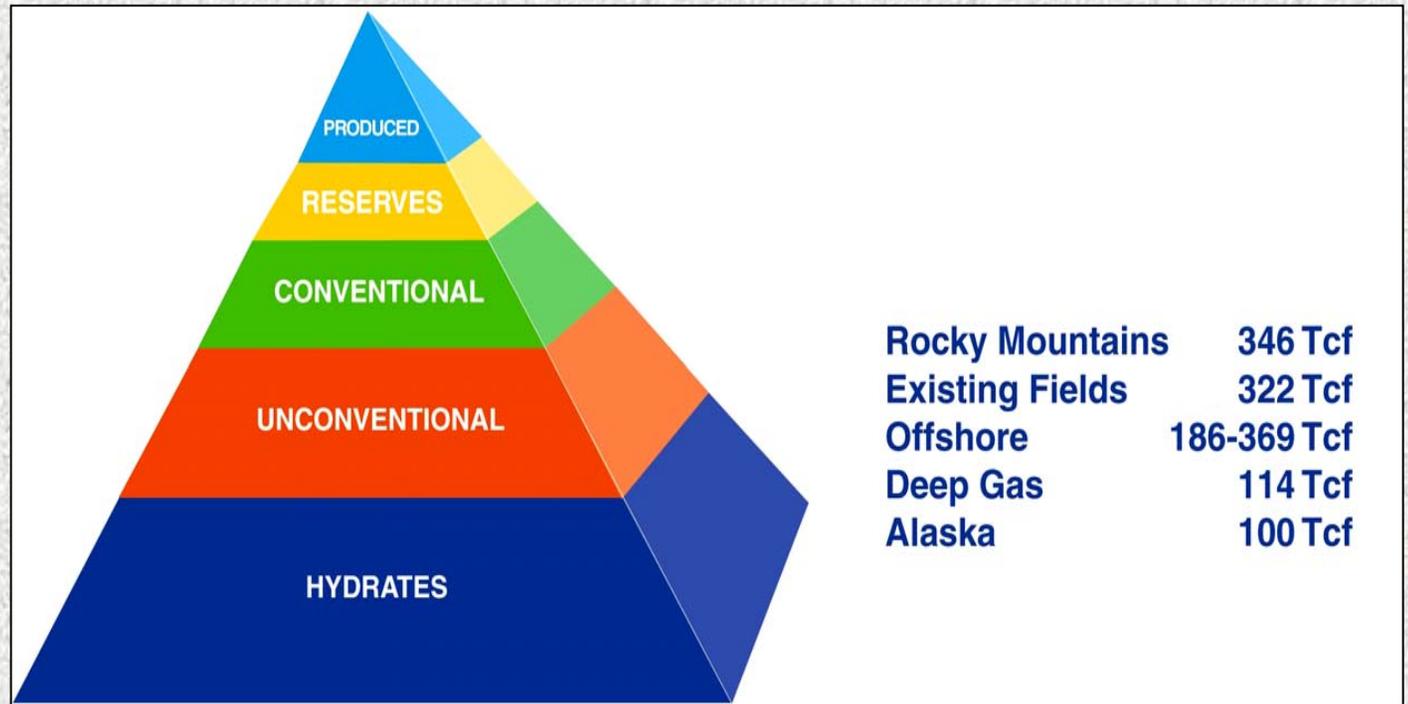


Future Supplies Will Come from Traditional and New Sources



Source: National Petroleum Council, 2003

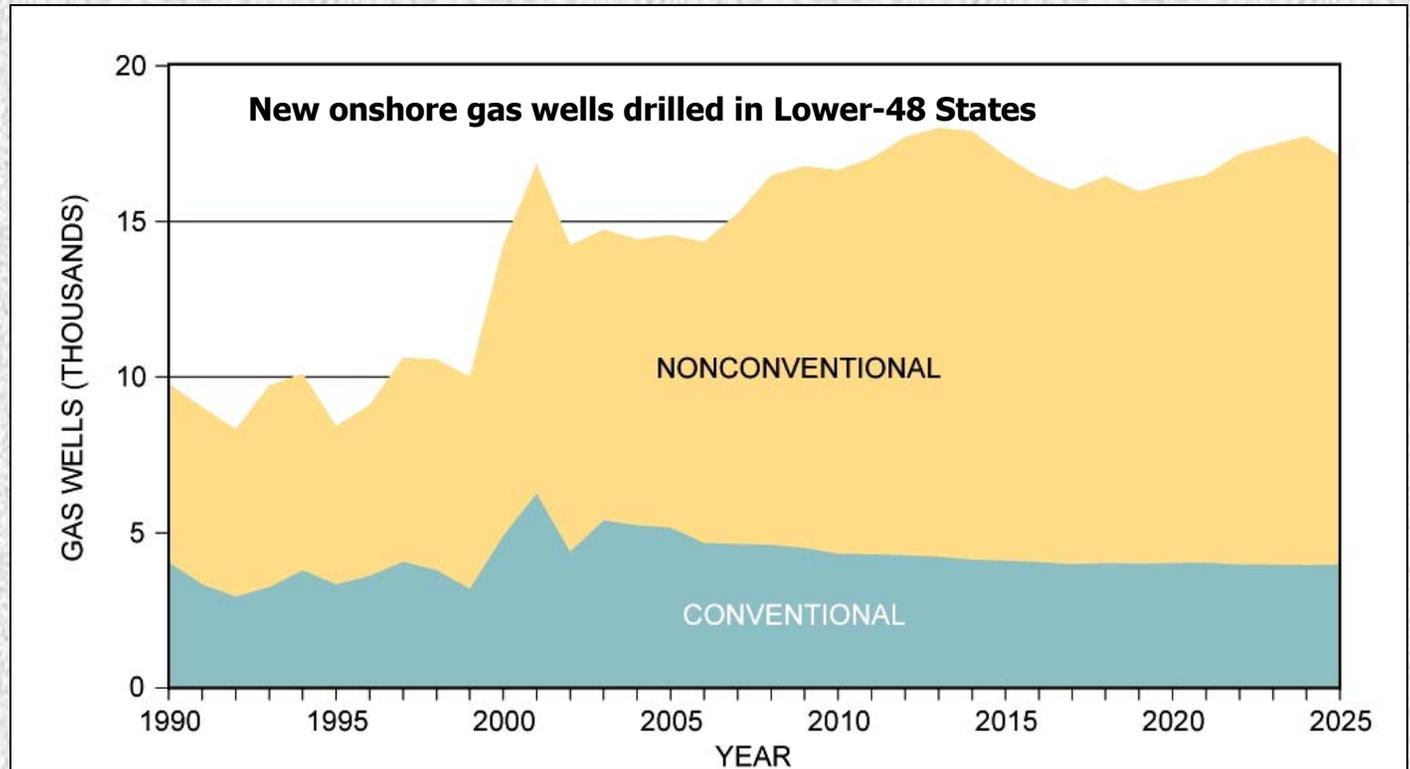
U.S. Natural Gas Resource Base



Source: U.S. Department of Energy, Office of Fossil Energy, 2003

- ◆ **14% future production is attributable to expected advances in technology.**

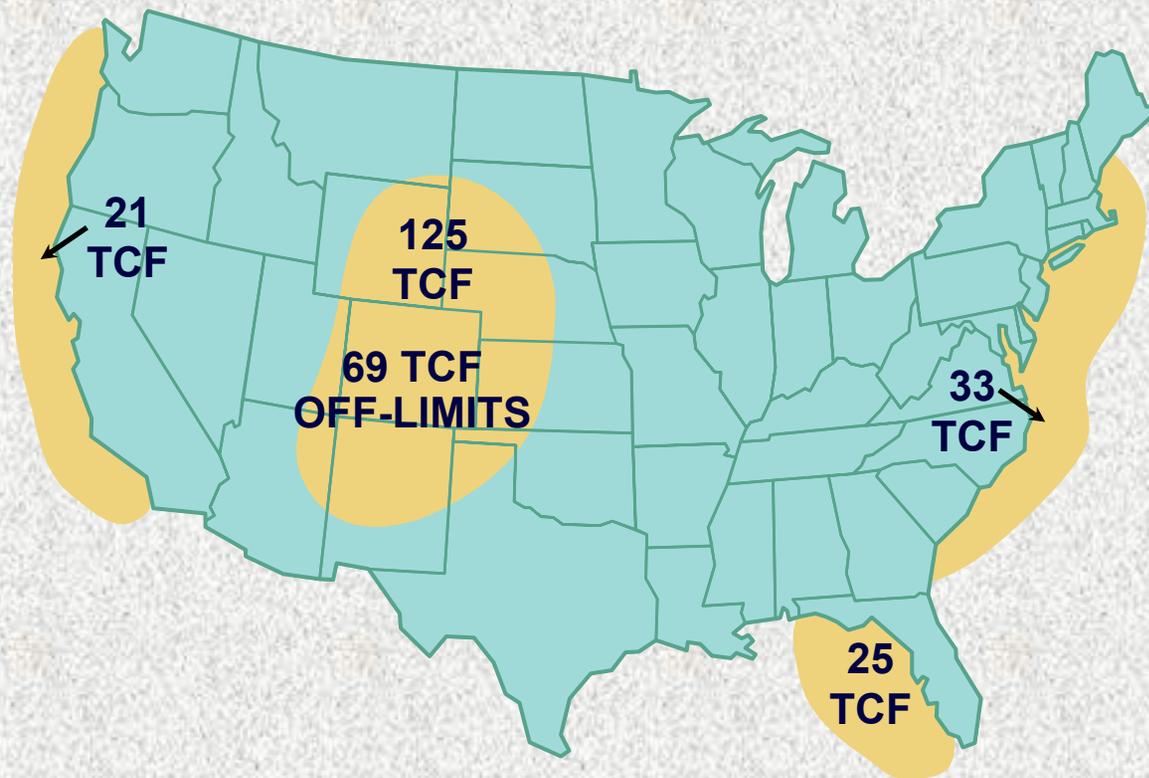
Future Gas Wells



Source: National Petroleum Council, 2003



Domestic Resources Are Not Fully Utilized – Access Restrictions

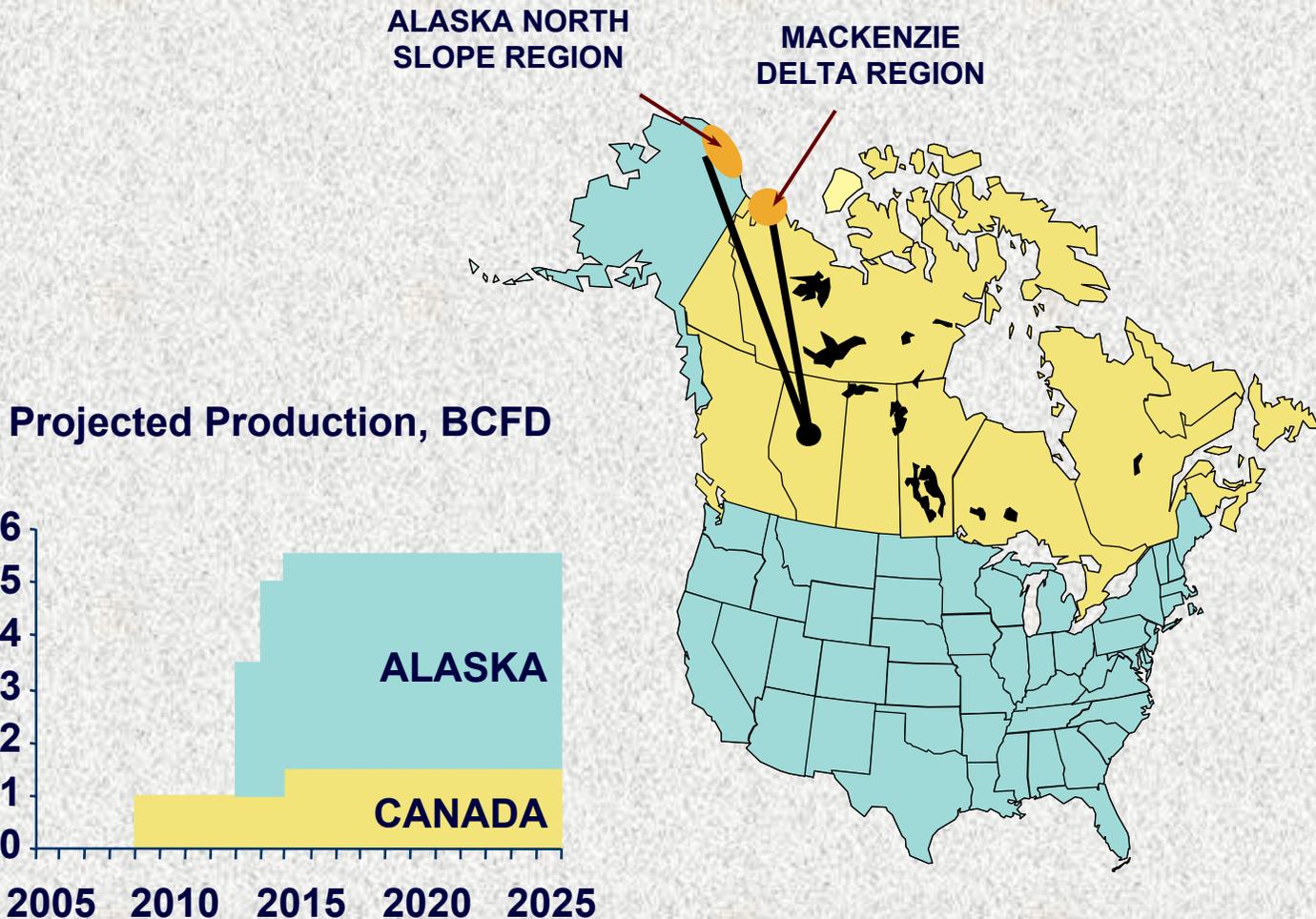


Much of the Nation's oil and gas resource base resides on federal lands. A large portion of this is not open to exploration and development.

Source: National Petroleum Council, 2003



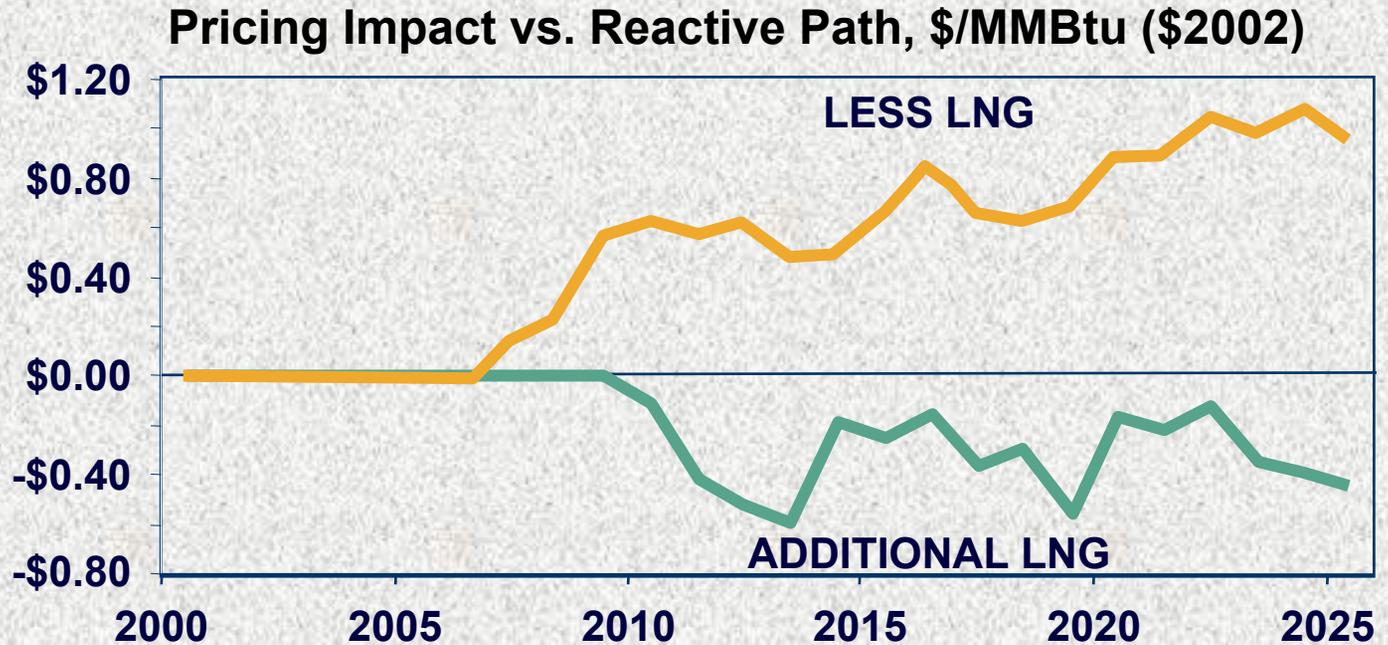
Arctic Pipeline Projects Can Deliver Important New Supplies



Source: National Petroleum Council, 2003



LNG Imports Can Lower Costs to Consumers



Source: National Petroleum Council, 2003

A vertical image on the left side of the slide. The top half shows a close-up of the American flag's stars and stripes. The bottom half shows an oil drilling rig (derrick) in a desert landscape under a blue sky.

DeepTrek

Technology to dramatically decrease cost of drilling below 20,000'

◆ **Issue:**

- Excessive costs to drill deep wells due to low penetration rates, hard rock, high temperatures, and corrosive fluids

◆ **Research focus:**

- Revolutionary technologies to allow breakthrough reductions in deep drilling costs

◆ **Expected benefits by 2015:**

- Drilling time reduced by 33%
- 30 Tcf economically recoverable gas

Methane Hydrates



Program Goals:

- ◆ **2008** - Ensure safety of deepwater oil and gas recovery through or near marine hydrate sediments (Safety & Seafloor Stability)
- ◆ **2010** - Understand impact on global environment (Global Climate Impact)
- ◆ **2015** - Develop knowledge and technology necessary for commercial production with minimal environmental impact (Production Technologies)





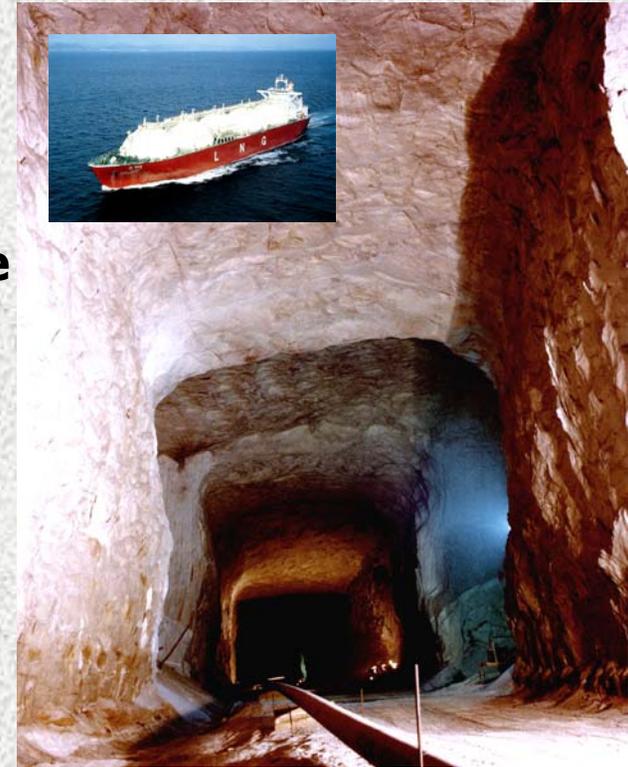
Natural Gas Infrastructure Program

- ◆ **Infrastructure includes: transmission, distribution, and storage**
- ◆ **Infrastructure Program goals are:**
 - Maintain/enhance pipeline system reliability and integrity
 - Improve storage well deliverability reservoir management, advanced storage concepts, gas measurement and metering
 - Reduce environmental impact
 - Enhance interdependencies between gas and electric systems
 - Develop technical foundation for future gas delivery systems and storage facilities
- ◆ **Delivery Reliability Program Areas:**
 - Inspection Technologies
 - Remote Sensing
 - Materials Development
 - Operational Technologies
- ◆ **Storage Program Areas**
 - Advanced Storage Concepts
 - Storage Well Deliverability Enhancement

LNG Storage in Salt Caverns

“The Bishop Process”

- ◆ DOE-funded project with Conversion Gas Imports, LLC
- ◆ Salt caverns are more secure and provide twice the delivery capacity of surface LNG storage tanks
- ◆ Results indicate feasibility of a novel method of unloading and regasifying LNG directly from ocean tankers for storage in underground salt caverns
- ◆ Eliminates the need to build expensive above-ground cryogenic storage tanks





Key Natural Gas Priorities and Challenges

- ◆ **Current supply options:**
 - Rocky Mountains
 - Alaska
 - LNG
- ◆ **Delivering energy to Americans**
- ◆ **Future energy supply**
 - Gas hydrates
 - Long-range, high-risk research

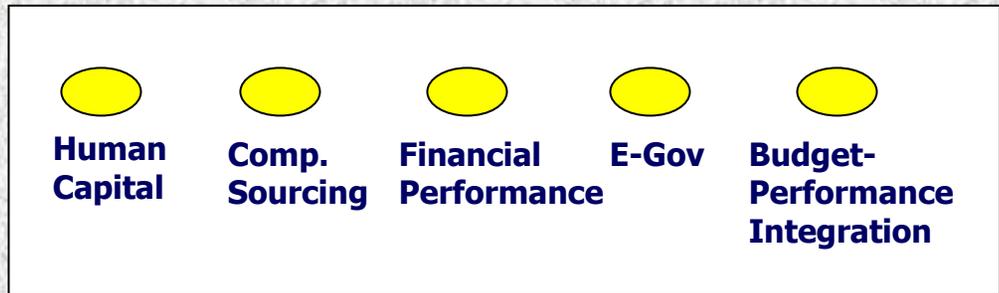


The President's Management Agenda

DOE is one of only two organizations which made the most progress since the launch of the PMA in August 2001.

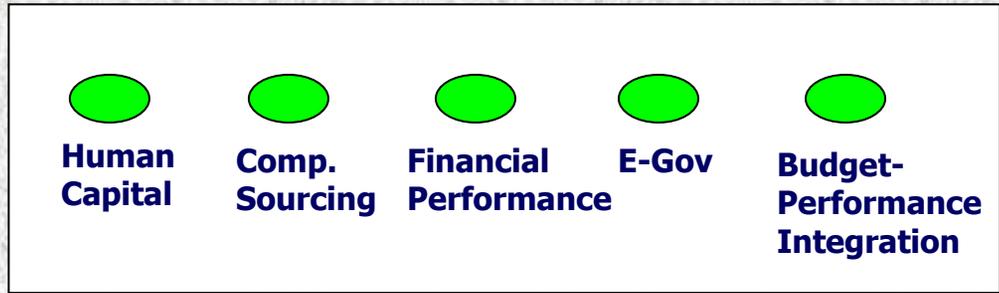
**Status,
December 31, 2003**

(Yellow: Mixed results)



Progress

(Green: Success)



The President's Management Agenda

- ◆ **An aggressive strategy for improving management of the federal government**
- ◆ **Includes five government-wide management reforms:**
- ◆ **Includes criteria for better Federal R&D investment:**
 - **Measures of effectiveness,**
 - **Non-compete with or supplant private investments**
 - **Should not directly benefit corporations that could fund their own R&D projects without Federal assistance**
 - **Focus on benefits to the public (no "corporate welfare")**

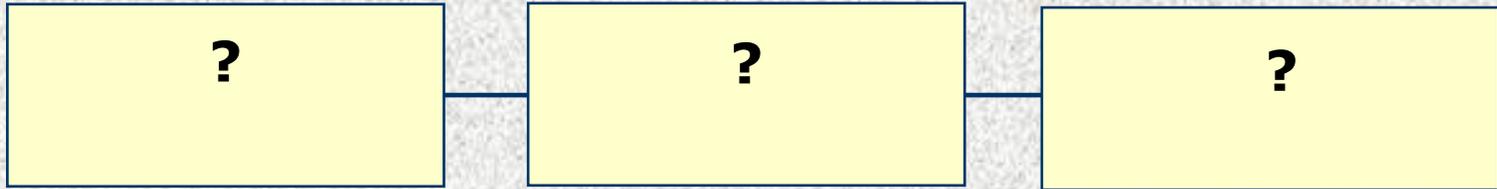


EXECUTIVE OFFICE OF THE PRESIDENT
OFFICE OF MANAGEMENT AND BUDGET

THE PRESIDENT'S MANAGEMENT AGENDA

FISCAL YEAR 2002

New Strategic Directions: Oil and Natural Gas



BENEFITS:

- **Reduced price volatility and energy costs to consumers**
- **Increased public confidence in safety and integrity of oil and natural gas delivery options**
- **Ensure long-term U.S. supplies of oil and gas**
- **Effective carbon management options**
- **Enhanced federal and state revenues (e.g., royalty receipts)**