

# Energy Security Equation

# Energy Industry Overview

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September 22, 2006

# Energy Security In An Interdependent World

- U.S. reliance of oil imports has doubled in 30 years
- Japanese import 100% of petroleum and huge volumes of natural gas, including for power generation
- Indonesia has become net petroleum importer

# Energy Security In An Interdependent World *(Continued)*

- U.K. will be net natural gas importer
- Europe increasingly reliant on Mid-East oil and Russian gas
- All these trends have been decades in the making and will take decades to alter

# Energy Security In An Interdependent World (*Continued*)

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- U.S. energy security can not be achieved by closing our borders to energy imports any more than we can close our doors to other imports and exports
- The globe is interdependent

# Areas of Concern

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- Mid-East: Iran, Iraq, regional stability
- Venezuela
- Nigeria
- Russia

# Petroleum

## Largest U.S. Suppliers ♦ Largest Global Exporters

- Canada
  - Mexico
  - Venezuela
  - Saudi Arabia
  - Nigeria
- Saudi Arabia
  - Russia
  - Norway
  - Nigeria
  - Iran

## World Oil Demand

## OECD North America

2003	79.3	24.5
2004	82.5	25.4
2005	83.6	25.5
2006	84.8	25.6
2007	86.4	26.0

**Source: International Energy Agency**

# Natural Gas

## Exporters

- Russia
- Canada
- Norway
- Algeria
- Netherlands

## Importers

- United States
- Germany
- Japan
- Italy
- Ukraine

# Coal

## Producers

- China
- United States
- India
- Australia
- South Africa

## Importers

- Japan
- Korea
- Taiwan
- United Kingdom
- Germany

# Core Principles

- Diversity of fuel sources
- Economic efficiency
- Accelerated innovation and R&D
- Contingency planning and emergency preparedness
- Balance energy security, economic and environmental objectives

# Most effective way to improve U.S. energy security today is to increase the discovery and production of domestic energy:

- Accelerate the development of innovations and technologies
- Remove financial barriers that may slow investment
- To get the greatest productivity possible from every unit of energy

U.S. energy security cannot be achieved by closing our border to energy imports or by limiting energy exports.

# Geopolitical Actions

- Stabilize the Middle-East
- Continue to embrace China and Russia
- U.S. Technology transfer to developing countries
- Support globalism and WTO
- Expand diplomatic tools including energy related trade

# Domestic Actions

- Efficiency & Conservation
- Increase domestic supply
  - Alaska
  - Outer Continental Shelf
  - Federal Lands in West

# Domestic Actions

## *(Continued)*

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- Diversify Domestic Supply
  - Biofuels
  - Gas to liquids
  - Coal to gas and coal to liquids
  - All Renewables

# Domestic Actions

## *(Continued)*

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- Invest in Technology
  - Renewables
  - Fuels Cells
  - Plug-in Hybrids
  - Oil Shale

# Domestic Infrastructure

- Attacks upon energy systems
  - Where energy infrastructure itself is the primary target*
- Attacks using energy systems
  - Explosions of pipelines, refineries
  - Power plant cooling towers to disperse chemicals
  - Underground conduits to disperse biological agents

# Responses

- Deploy advanced technologies, i.e., sensors, automated valves
- “Islanding”
- Physical security
- Redundancy
- Contingency plans

# Rely on Market Based Decisions

## \*Natural Gas Contracts:

December 2005	\$15.38
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October 2006	\$ 4.89
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## \*\*Gasoline :

August 7, 2006	\$ 3.08
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September 11, 2006	\$ 2.67
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**Source: \* Wall Street Journal**

**\*\* U.S. Energy Information Administration**

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