Southern States Energy Board

The American Energy Security Study: The Case for Domestic Alternative Transportation Fuels

Presented by:
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Secretary
Southern States Energy Board

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Southern States Energy Board

Through innovations in energy and environmental policies, programs and technologies, the Southern States Energy Board enhances economic development and the quality of life in the South.

- SSEB Mission Statement

- **Established 1960, expanded in 1978**
- **16 U.S. States and Two Territories**
- **Each jurisdiction represented by the governor, a legislator from the House and Senate and a governor's alternate**
- **Federal Representative Appointed by U.S. President**

Facts and Figures

- **World Population** = 6.8 billion in 2010; 8.2 billion in 2030
- **World GDP** = $88 trillion in 2010; $154 trillion in 2030
- **World Electricity Demand** = 9,000 billion KWH in 2010; 31,000 billion KWH in 2030
- **World number of Vehicles** = 812 million in 2002; 2.1 billion in 2030
- **Energy Consumption** – will increase 50% in the next 25 years
- **Energy Sources and Increases by 2030**;
  - Coal Production = 74%
  - Oil Production = 43%
  - NG Production = 64%
  - Nuclear Power = 38%
  - Renewables = 61%

Not Smoke and Mirrors!

Significant Global Energy Events

1970

OPEC Sets 55 percent Minimum Tax Rate (1970)

U.S. Institutes Price Controls (1971)

Arab Oil Embargo Against U.S. (1973)

Kissinger Announces "Project Independence" (1974)

EPCA Authorizes Strategic Petroleum Reserve (1975)

Windfall Profits Tax (1980)

Iran/Iraq War – Oil Prices Doubled (1978-1980)

1983

World Oil Glut - *$29 BBL* Oil – U.S. Synfuels Shutdown (1983)

Chernobyl Nuclear Accident (1986)

Alaska's Prudhoe Bay Production Peaks (1988)

Iraq Invades Kuwait – Prices Soar ($36 BBL) (1990)

Clean Air Act – Changes Gasoline & Diesel Fuels (1990)

U.S. Imports More Oil & Refined Product Than It Produces (1993)

Asian Financial Crisis – Oil Prices Plummet (1997-1998)

German Government/Utilities Agree to Phase Out of Nuclear Power (2000)

U.S. Petroleum Consumption – All Time High (19.7 Million BPD) (2001)

2001

Terrorist Attacks on the U.S. (2001)

Photo: Jerry Gay, Seattle Times, 1974

Recent Global Energy Events

2004

Foreign Oil Dependence Rises to 65 percent (2004)

Northeast Blackout Leaves 50 Million People in the Dark

Natural Gas Prices Triple from 1990 Levels

2005

Oil Passes $50/Barrel

Gasoline Exceeds $3/Gallon

Hurricanes Damage Oil/Gas Rigs

Russia Halts Natural Gas to Ukraine

Venezuela Moves to Nationalize Resources

Oil Breaks $75/Barrel

Nigeria Kidnaps Oil Workers

Bolivia Secures Oil Fields

Experts State Oil Production May Have Peaked

Iran Threatens Nuclear Capabilities

Saudis Talk of Propping Up $55 Oil

Chad Orders Chevron to Leave

BP Forced to Repair Pipeline Leaks

China Extends Credit to Oil Nations

Iran, Russia, Others Discuss Gas OPEC

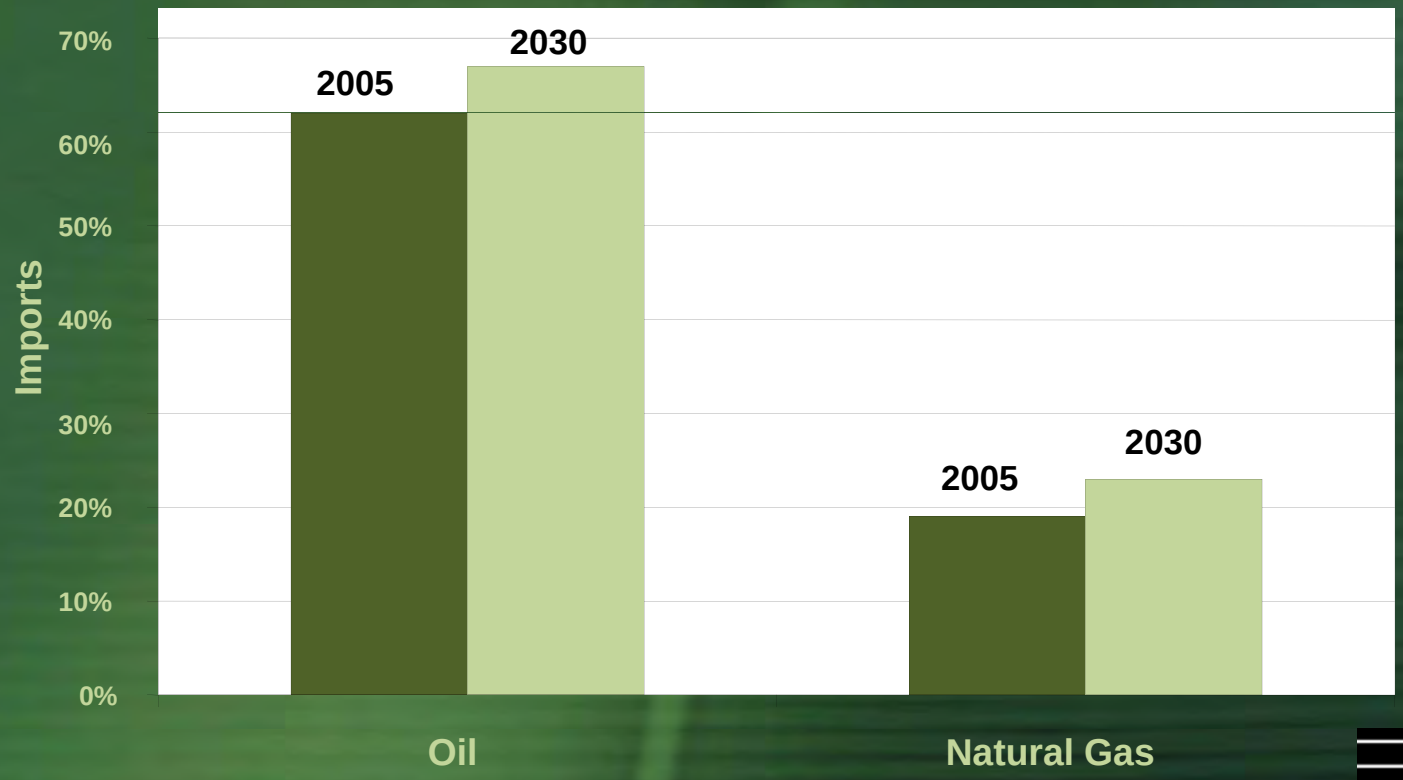
Texas Utilities Cancel 8 of 11 Coal Plants

2007

Oil Breaks $83/Barrel

U.S. ENERGY IMPORTS ARE INCREASING

EIA forecasts that **by 2030 U.S. will be importing 2/3 of its oil and nearly 25% of its natural gas**



Source: EIA, *Annual Energy Outlook 2007*, December 2006

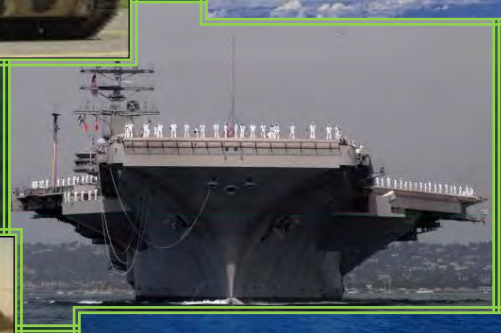
Why the Concern About American Energy Security?

- Crude Oil Production will "Peak"
- Growth and Use of Resources by Other Nations
- Global Competition
- World Oil Demand Exceeds Supply…and Growing
- Excessive Dependence on Imported Oil
- Supply Disruption by Natural Disasters, Terrorism
- Global Warming Threats
- GHG Emissions Dictate Technologies and Risk
- Natural Gas Price Volatility
- Liquid Transportation Fuels Crisis
- Social Injustice of High Priced Energy – Elected Officials Will Pay the Price
- Congressional Inaction

American Energy Security

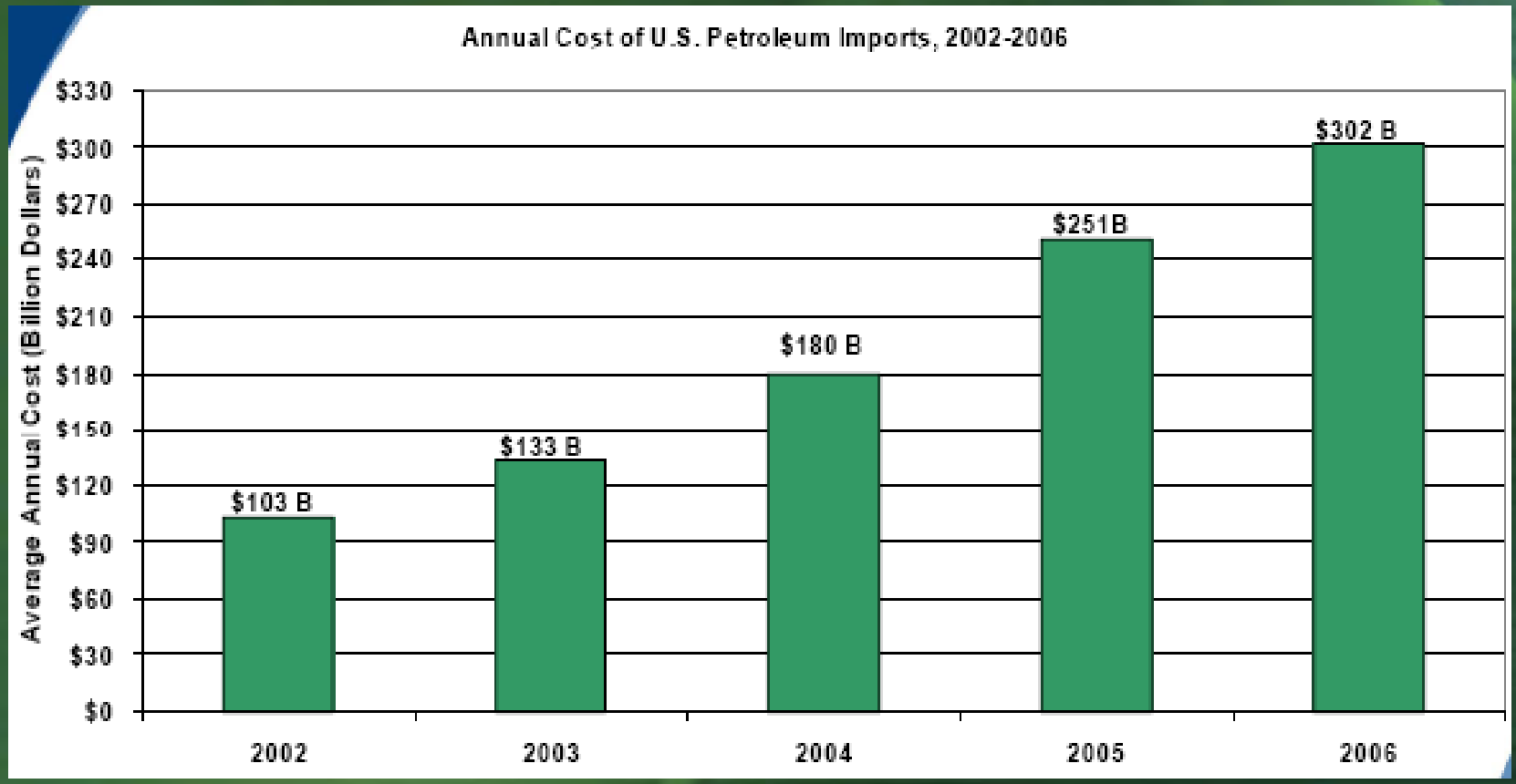
- Military expenditures tied to defending Persian Gulf oil ($100+ billion)
- Lost employment/investment from diversion of financial resources ($160 billion)
- Cost of periodic "oil shocks" ($85 billion)
- Erosion of U.S. industrial base (830,000 jobs lost)
- 2006 Record U.S. Trade Deficit ($764 billion)





The Cost of Dependence

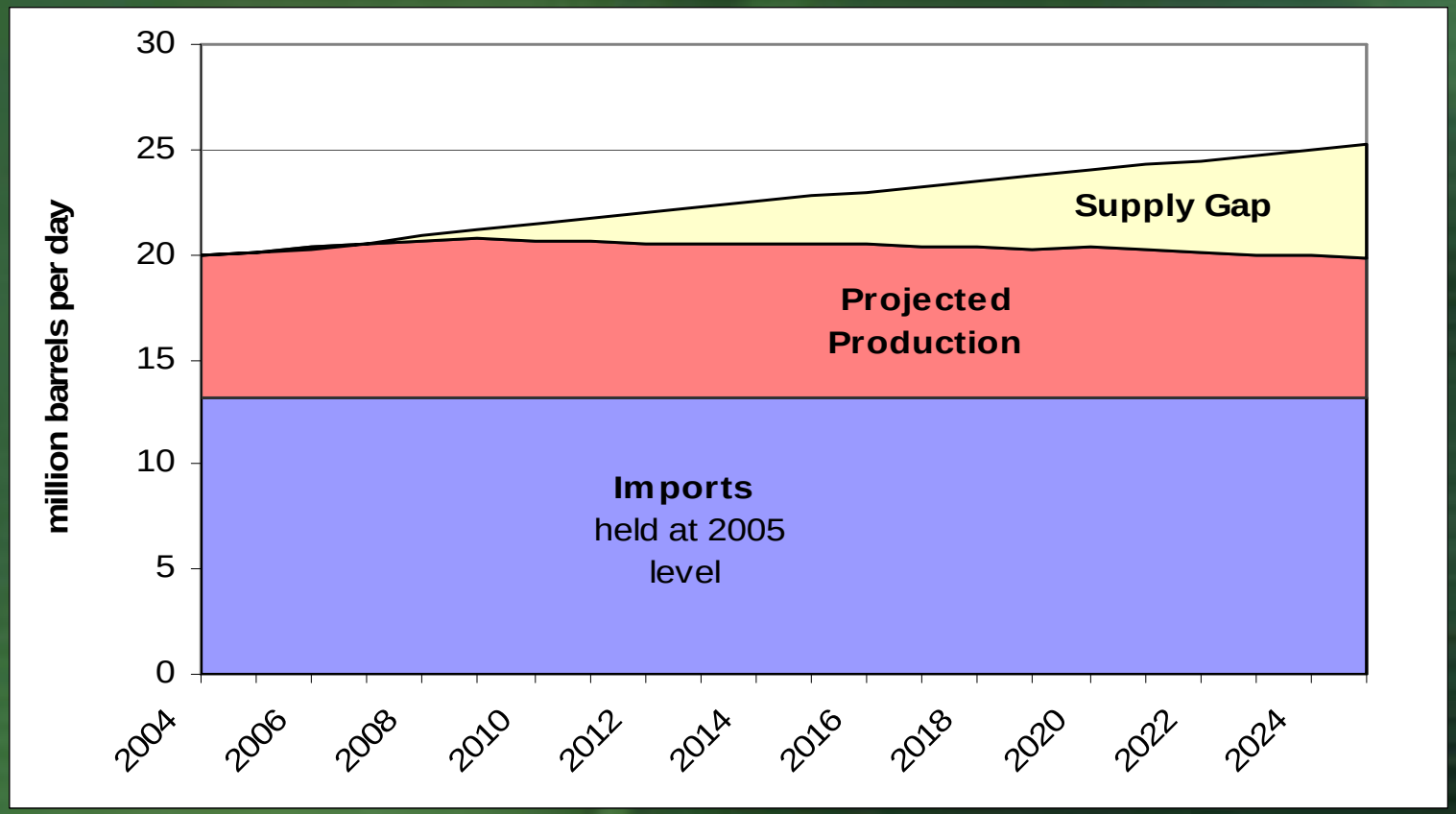
$1 Billion Per Day!



PRES. BUSH: "REDUCE OIL IMPORT DEPENDENCE"

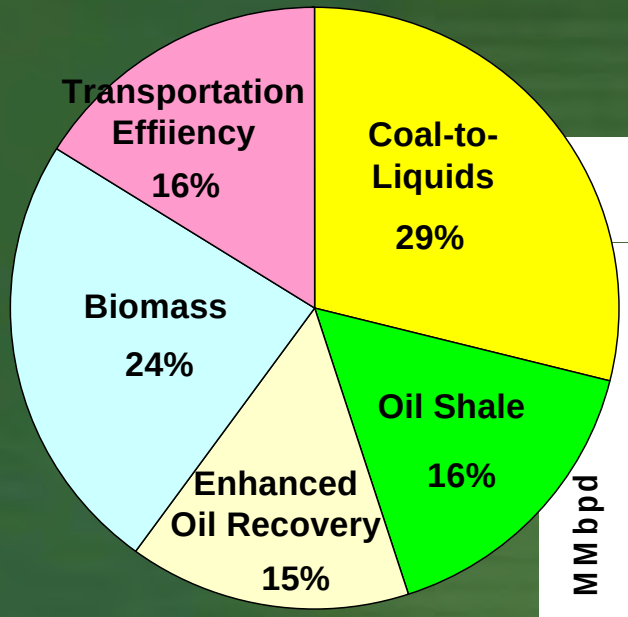
First Thing to do: Stop Digging!

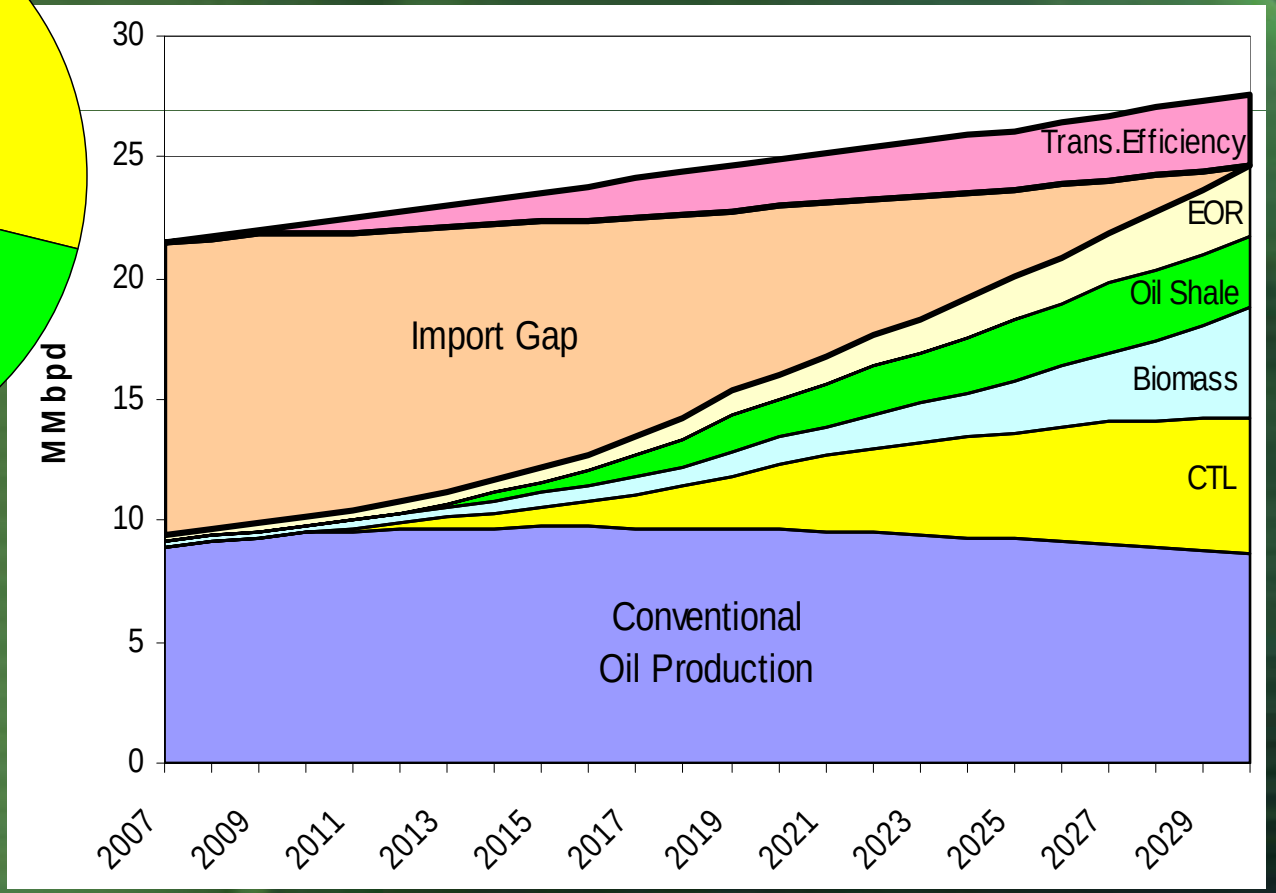
Just to keep oil imports at current level will require an additional 5 MMbpd U.S. production of liquid fuels by 2030



COAL IS KEY TO U.S. ENERGY SECURITY AND INDEPENDENCE

Eliminating U.S. oil imports by 2030 – Southern States Energy Board, 2006





LIQUID FUELS FROM COAL

U.S. Could Be the New Middle East

1.55 Trillion Barrels of Coal Synfuel

Old Middle East

Saudi Arabia:	261.8 Billion Barrels
Iraq:	112.5 Billion Barrels
UAE:	97.8 Billion Barrels
Kuwait:	96.5 Billion Barrels
Iran:	89.7 Billion Barrels
Qatar:	15.2 Billion Barrels
Oman:	5.5 Billion Barrels
Yemen:	4.0 Billion Barrels
Syria:	2.5 Billion Barrels

TOTAL 686 Billion Barrels

U.S. Domestic Coal

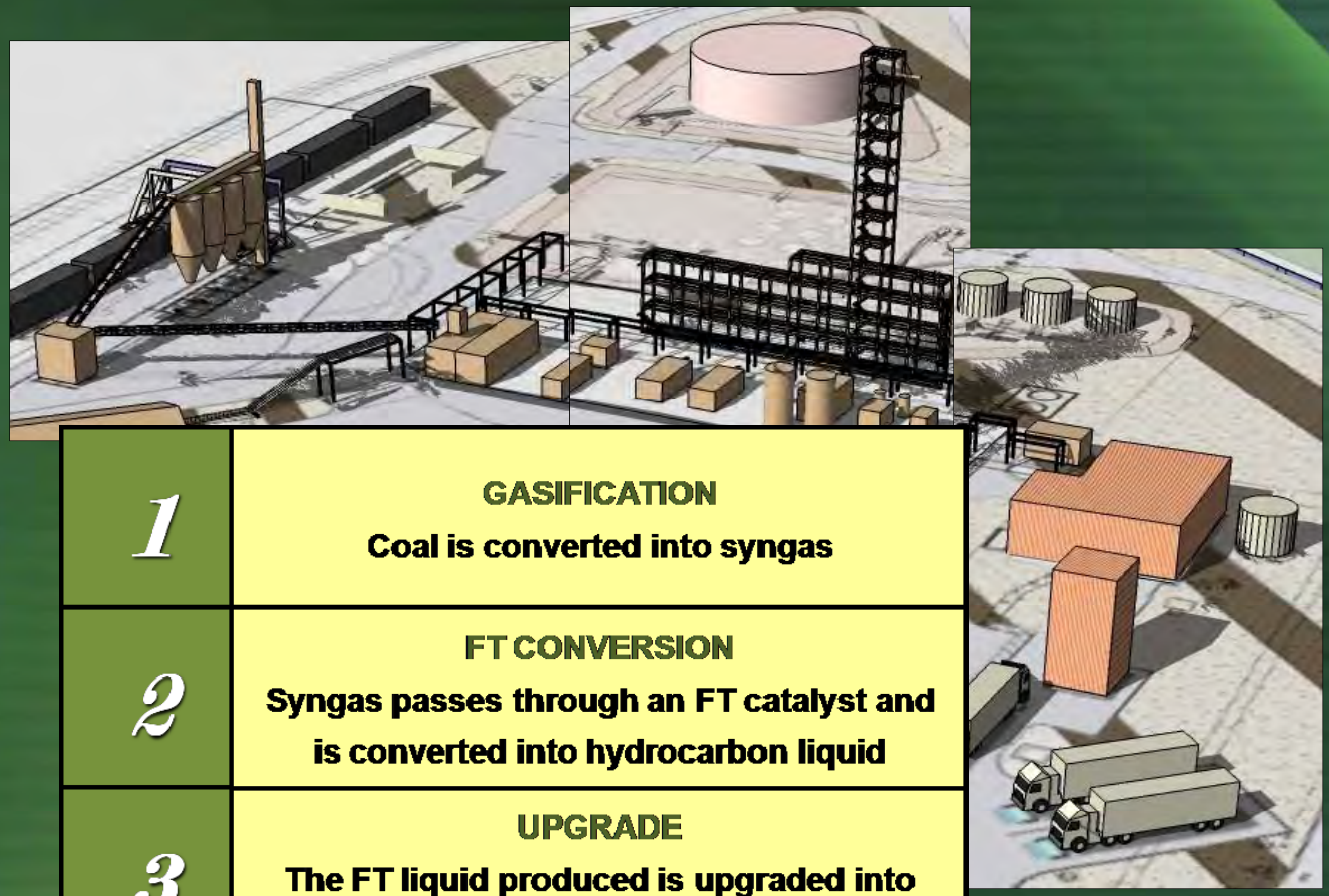
(oil equivalent)

Recoverable reserves 0.55 T Bbls

Demonstrated reserve base 1.0 T Bbls

TOTAL 1.55 T Bbls Equivalent

COAL-TO-LIQUIDS TECHNOLOGY
A Proven Technology Currently in Use World-Wide



1	**GASIFICATION** Coal is converted into syngas
2	**FT CONVERSION** Syngas passes through an FT catalyst and is converted into hydrocarbon liquid
3	**UPGRADE** The FT liquid produced is upgraded into ultra clean synthetic fuels
4	**STORAGE** Long-term storage of FT fuels at Strategic Petroleum Reserve

ESTIMATES OF U.S. CTL POTENTIAL

- SSEB Study (July 2006): ***5.6 MMBPD by 2030***
- USDOE/National Energy Technology Laboratory Study (July 2006): ***5.1 MMBPD by 2027***
- U.S. National Coal Council Study (March 2006): ***2.6 MMBPD by 2025***
- USDOE Unconventional Fuels Task Force (November 2006): ***2.5 MMBPD by 2035***
- ***Bottom Line***: ***All studies indicate huge potential for CTL in the USA***

Is Coal a Low Cost Option?

- Global warming emissions are attributed to coal, oil, gas
- 35% - deforestation, livestock, soils, landfills, waste repositories
- 65% - electricity and heat, industrial processes, transportation, other fuel combustion, fugitive emissions
- NRDC
  - Coal – carbon intensive
  - Double amount of carbon in natural gas
  - 50% more than petroleum
- CTL Plants produce two streams of CO_2
  - Production plant
  - Vehicle exhaust
- Coal/biomass co-firing – carbon neutral event BUT requires mining and water resources

Is Coal a Low Cost Option?

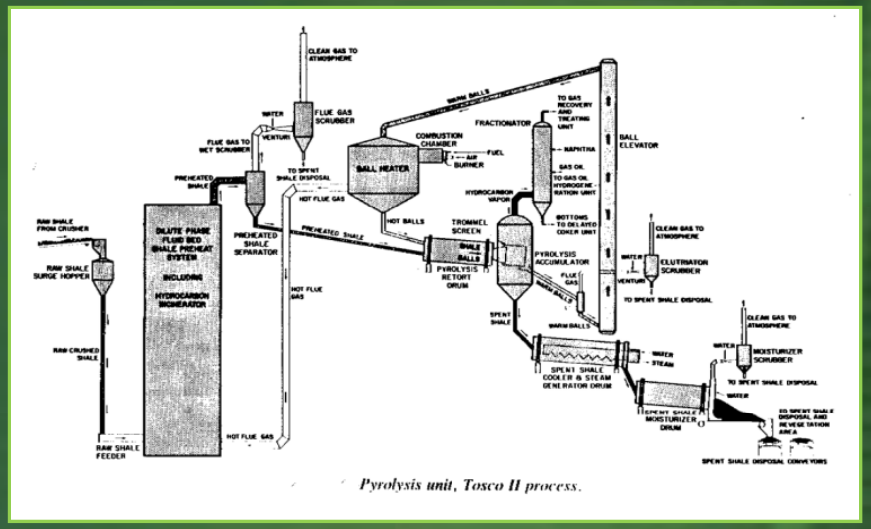
- Carbon sequestration
  - Carbon capture and storage
  - Regional Carbon Sequestration Partnerships
  - Add 20-40% to cost of Plants
  - Add 25% to electricity costs (EPRI test)
  - Carbon “footprint” reduction
- Requiring coal plants to meet new standards will impact “dispatch” of plants in future

Essential Elements for Success

- **National commitment/national will to begin implementation of all initiatives without delay**
- **Federal incentives building upon recent legislation (e.g., Energy Policy Act of 2005)**
  - Enactment of recommendations needed for program startup in 2007
- **State and local incentives that complement federal incentives**
- **Mobilization of private capital required to build the needed facilities and infrastructure**

A Plan to Replace Imported Oil

- Goal of 5% reduction per year for 20 years, beginning in 2010.
- We must start programs now as lead times are long.



Pyrolysis unit, Tosco II process.

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“Peaking” World Oil Production

➢2010 – with NO alternative fuels production programs, U.S. economy will lose (2010-2020):

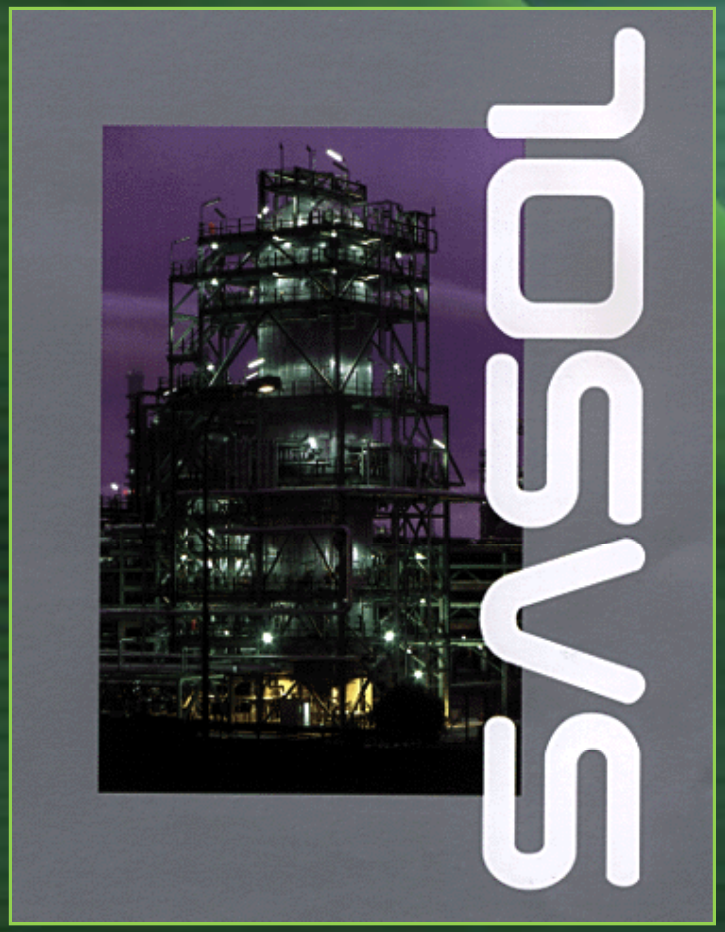
- $4.6 trillion in GDP
- 40 million job years of employment

➢2020 – with NO alternative fuels production programs, U.S. economy will lose (2020-2030):

- $13 trillion in GDP
- 100 million job years of employment
- $4 trillion in federal, state and local tax revenues

roven Technologies Are Available Today

- Commercial Coal-to-liquid fuels
- Biomass derived liquids
- Oil shale: surface retorting/in situ processing
- Large liquid fuels plants
  - Blend coal, biomass, oil shale
  - Gasification to Fischer Tropsch liquids
  - EOR, ECBM, sequestration



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Alternative Energy Farms

- Multi – source energy complexes
- Polygen plants
- Coal – to – liquids/gas/electricity/fertilizers/ chemicals/steam/biomass co firing
- Biomass – to – liquids/gas/electricity/fertilizers/ chemicals/steam
- Oil shale – to – liquids/gas/electricity/chemicals/ steam
- Wind, solar, fuel cell, hydro modules

Policy Recommendations

www.americanenergysecurity.org

- Government policies are necessary
- Market manipulation
- Predatory business practices
- Prevention of alternative fuels development
- To maintain homeland security

Federal Fiscal, Tax, Legislative and Regulatory Recommendations

- Extend the $.50 per gallon Alternative Liquid Fuels Excise Tax Credit
- Provide accelerated cost recovery to alternative fuel plant owners
- Incentivize refining of alternative liquid fuels
- Provide explicit DOE authority and appropriations for loan guarantees
- Fund the Military Alternative Fuels Testing and Development Program
- Authorize and fund military purchases of alternative fuels under long-term contract
- Eliminate the $10 million cap for tax exempt Industrial Development Bonds

Federal Fiscal, Tax, Legislative and Regulatory Recommendations *(continued)*

- Provide regulatory streamlining for the production of alternative liquid fuels and for mine permitting
- Establish a self-sustaining government corporation to provide market risk insurance
- Expand the Strategic Petroleum Reserve (SPR) program to include alternative liquid fuels products
- Provide incentives for existing ethanol plants to convert to coal
- Provide incentives for enhanced oil recovery (EOR), enhanced gas recovery (EGR) and enhanced coalbed methane recovery using CO_2 captured from alternative fuel plants

State Fiscal, Tax, Legislative and Regulatory Recommendations

- **Fund multi-year state/local government purchases of alternative transportation fuels under long-term contract**
- **State loans or grants on matching basis with private industry to assist with preliminary engineering and site qualification**
- **Tax incentives:**
  - Investment tax credits;
  - Corporate tax abatement; and
  - Property tax abatement.

State Fiscal, Tax, Legislative and Regulatory Recommendations *(continued)*

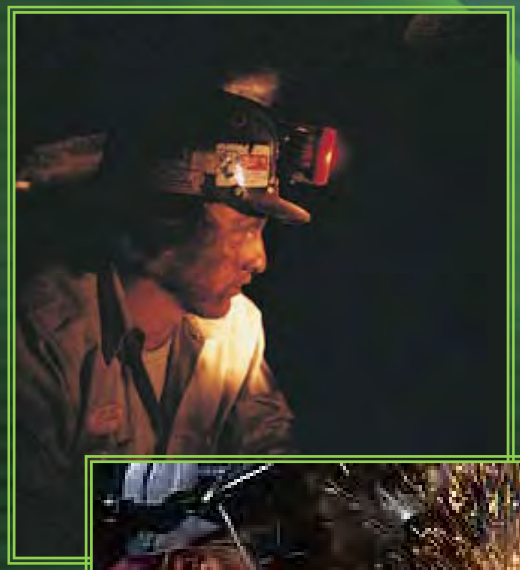
- Incentivize use of CO_2 for carbon capture and storage
- Regulatory streamlining and central state agency coordination of the permitting process for the production of alternative liquid fuels
- Involve state research and development enterprises

chieving Energy Security Through Liquid Fuels Independence

- Reduce risk, lower oil prices and volatility
- Industrial and economic growth
- Job creation
- New technologies
- Eliminate trade and budget deficits
- Strategic fuels for the military
- Stable/reliable domestic energy base

The Energy Workforce of the Future

- **All energy industries face issues**
  - Coal miners are retiring; average age 51
  - Technologies are changing
  - Boilermakers are offshore
  - Nuclear welders do not exist
  - Stigma of a vocational technical education
  - Power generation industry – average age 50
    - Employs 1 million nationwide
    - ½ workforce retirement in 5-10 years
    - 62% of managers are 50 and older
    - 61% of line superintendents are 50 and older
    - 43% of foremen are 50 and older



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he Energy Workforce of the Future

oday's workers want education
pportunity for advancement
ained on latest technologies
ew recruiting tools needed

- Promote CAREER opportunities
- Promote technical education
- Use simulators for training
- Offer skilled craft training
- Offer skilled craft advancement

entucky Coal Academy

- The best of the best
- Strong partners for the mining industry
- Kentucky Junior Coal Academy (KJCA)
- Mine emergency rescue teams?

Doug Klein (left), shows Josh Horn, a senior at Lawrence County High School, how to operate the controls of the Success Xpress' computerized continuous mining machine simulator. Klein is a pre-engineering instructor with the KJCA at the high school. Photo Courtesy of KJCA.

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