ANALYSIS GROUP
ECONOMIC, FINANCIAL and STRATEGY CONSULTANTS

Ending the Energy Stalemate – National Energy Policy for the 20st Century

Susan Tierney

"The Promise of Energy Independence: Examining national policy and regional action"
University of Maine – William S. Cohen Papers Forum
October 5, 2005

Overview of remarks

Looking at national energy policy through three lenses

- **Energy Analyst:**
  What's the context for thinking about energy needs: What are our key national/regional energy issues?
- **Commissioner, Nat'l Commission on Energy Policy:**
  Where Do We Need to Go?
- **Energy Analyst:**
  National Energy Policy Act: Where Does it Take Us?
  Does The Act Get Us Where We Need to Go?
  What's Missing in the Act that's Still Needed?

"….the crux of the energy challenge confronting us revolves around not only recognizing, but reconciling the multiple concerns of environmental quality, economic development and national security."

William Cohen, January 29, 1975

ANALYSIS GROUP
ECONOMIC, FINANCIAL and STRATEGY CONSULTANTS

The U.S. and Regional Energy Context: What are the key energy trends and issues?

"National Energy Policy"
A patchwork quilt, no "grand design,"

Energy "policy" is made by countless decision makers:

- **In Washington – not just Congress & the President**
  - **Cabinet and regulatory agencies**
  - **The courts**
- **In the 50 states:**
  - **Legislatures, Governors, regulatory agencies, the courts**
- **In large and small companies**
  - **Producers, suppliers, utilities, transporters, multinationals**
- **By consumers**
  - **Big businesses, government purchasers, soccer moms**
- **Other forces, e.g.**
  - **interest rates, the economy, OPEC, Venezuela, terrorists, science and technology, the weather and other "Acts of God"**

Shifting and sometimes competing rationales for national energy policy in the 20th Century

Theories of the role of government in energy policy:

- **Energy policy as strategic investment**
  - **E.g., "Atoms for Peace," TVA**
- **Energy as a lever of social change**
  - **E.g., rural electrification in the New Deal**
- **Energy policy as protection against market power**
  - **E.g., breaking up the Trusts, utility regulation**
- **Policy to address external effects of energy production, use**
  - **E.g., Clean Air Act, RGGI**
- **Energy policy as an enabler of markets**
  - **E.g., natural gas deregulation, electric industry restructuring**

Energy politics/politics: highly geopolitical

Globally

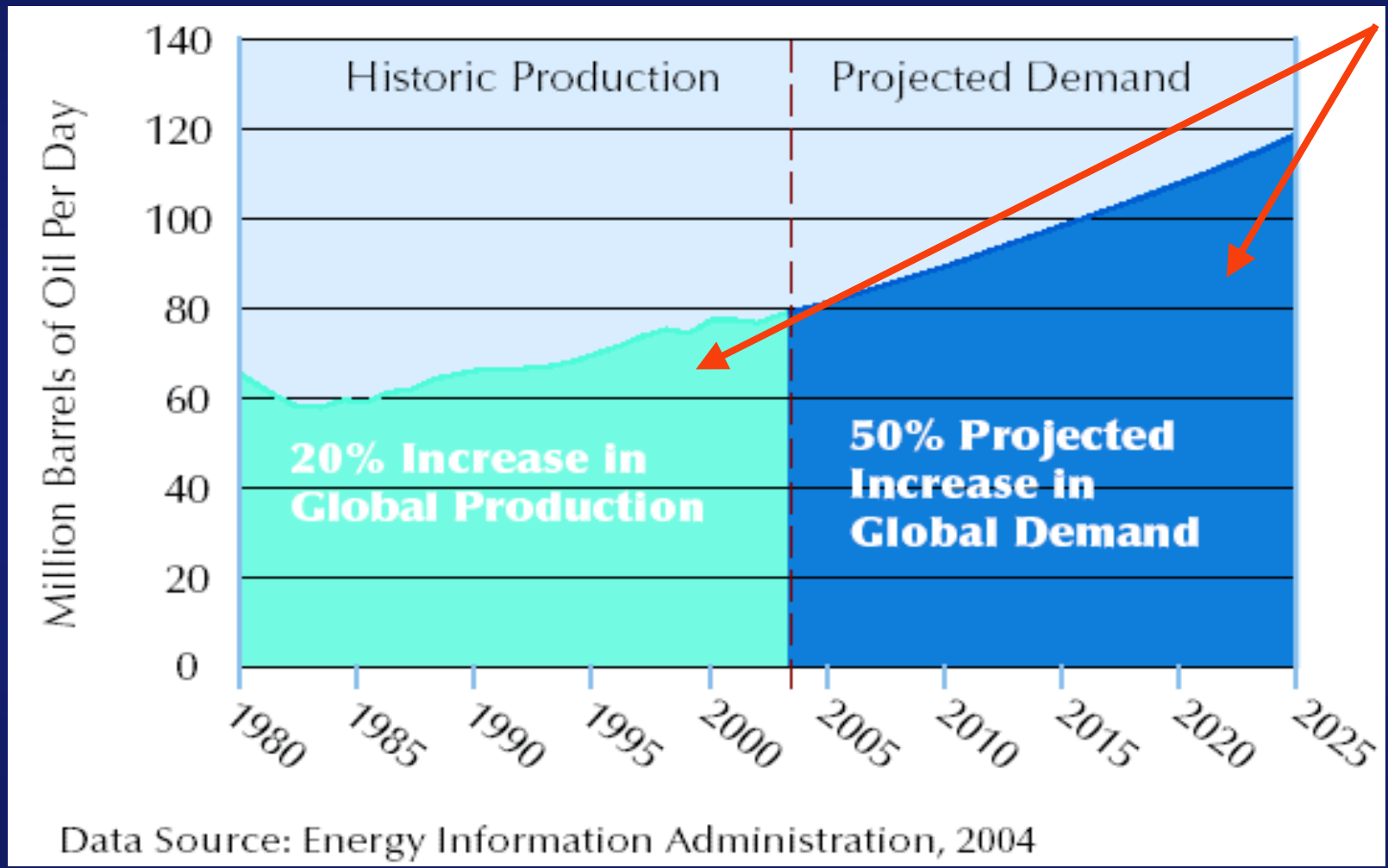
- **Energy prices set in international markets (oil, gas, coal)**
  - **Pressure from growing demand in other countries**
  - **Supplies concentrated in particular regions globally**

Crude Oil Prices: Nominal, Real

EIA, Short-Term Energy Outlook, September 2005

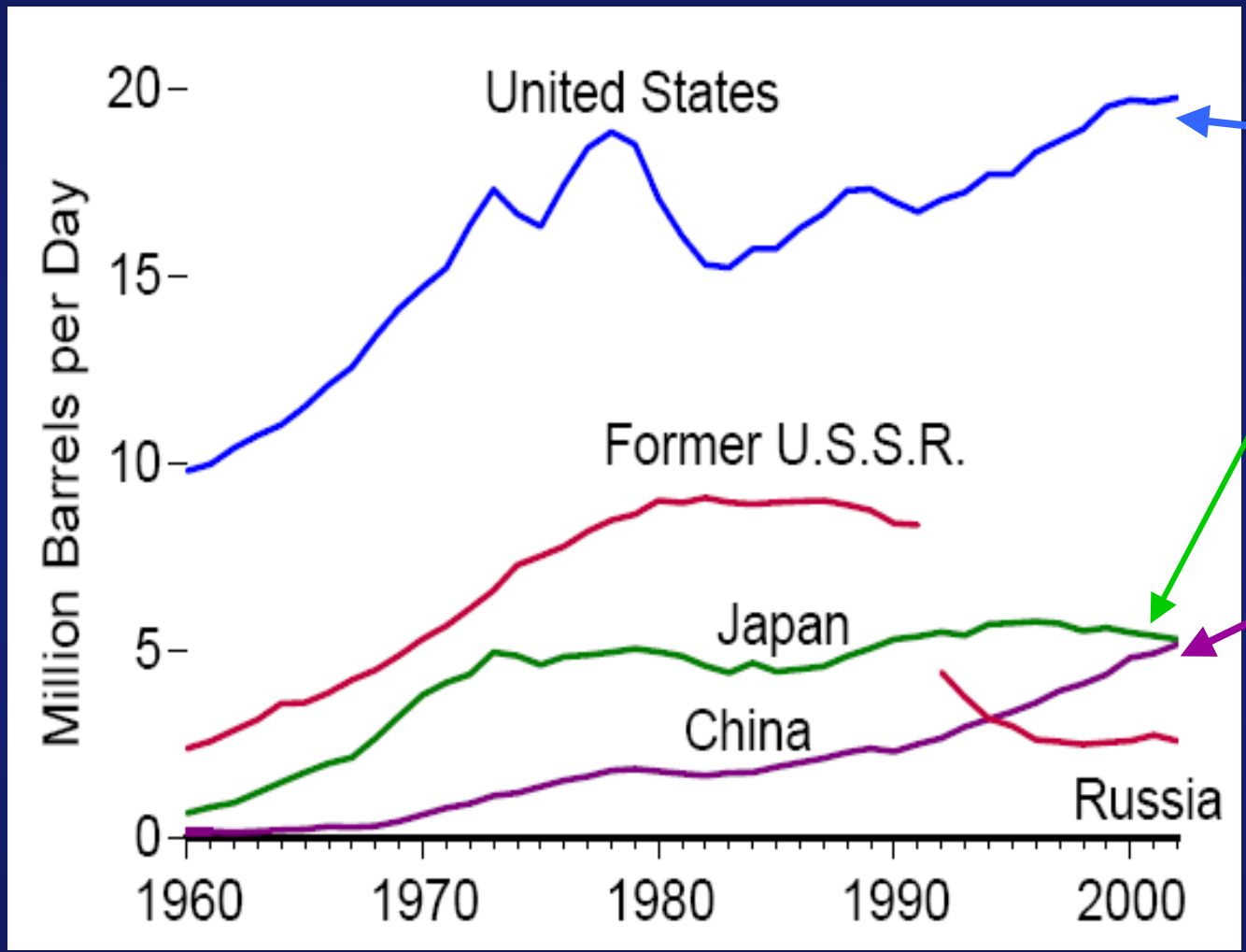
Rising worldwide demand for oil

(especially from motor vehicles)



Data Source: Energy Information Administration, 2004

US remains major oil user, with fast-growing demand from China & India



Δ '90-'00:

U.S. = 13.7 %
(25% of world)

Japan = 3%
(7% of world)

China = 52%
(6% of world)

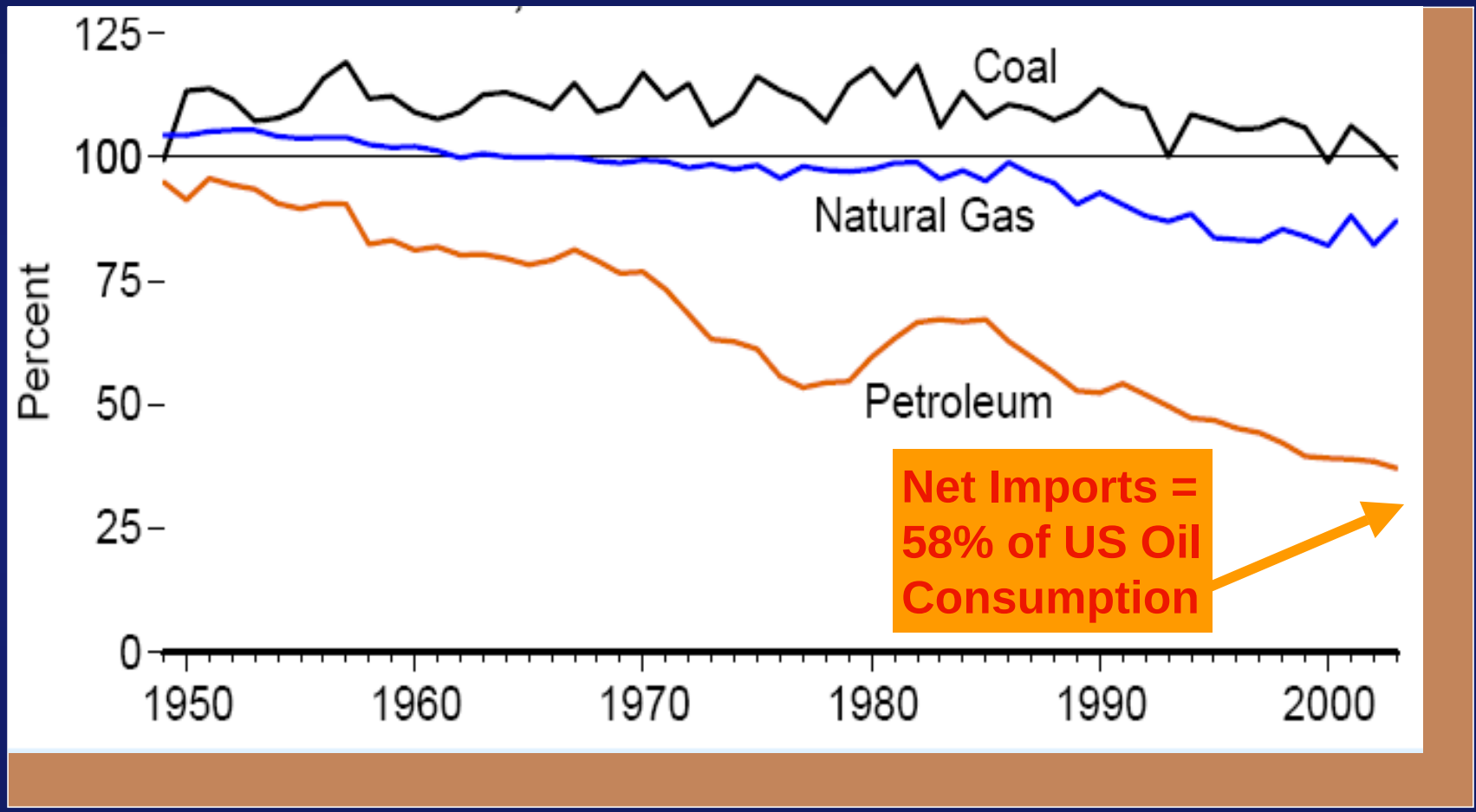
[India = Δ 45%]

[OECD = Δ 13.0%]

[World = Δ 13.4%]

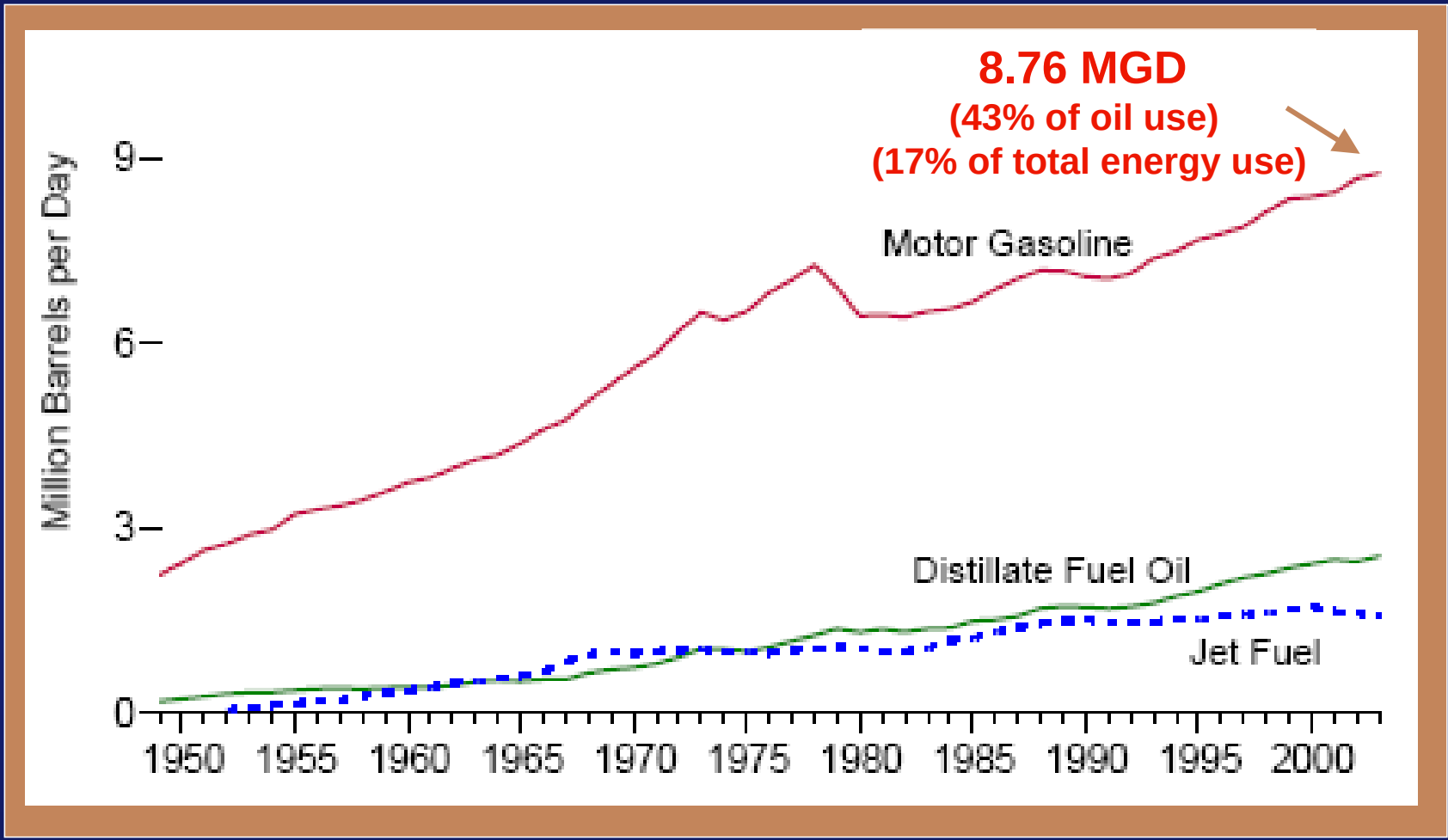
EIA, Annual Review of Energy, 2003, Figure 62, Leading Petroleum Consumers

U.S. Production as % of U.S. Consumption for: Coal, Natural Gas, Petroleum



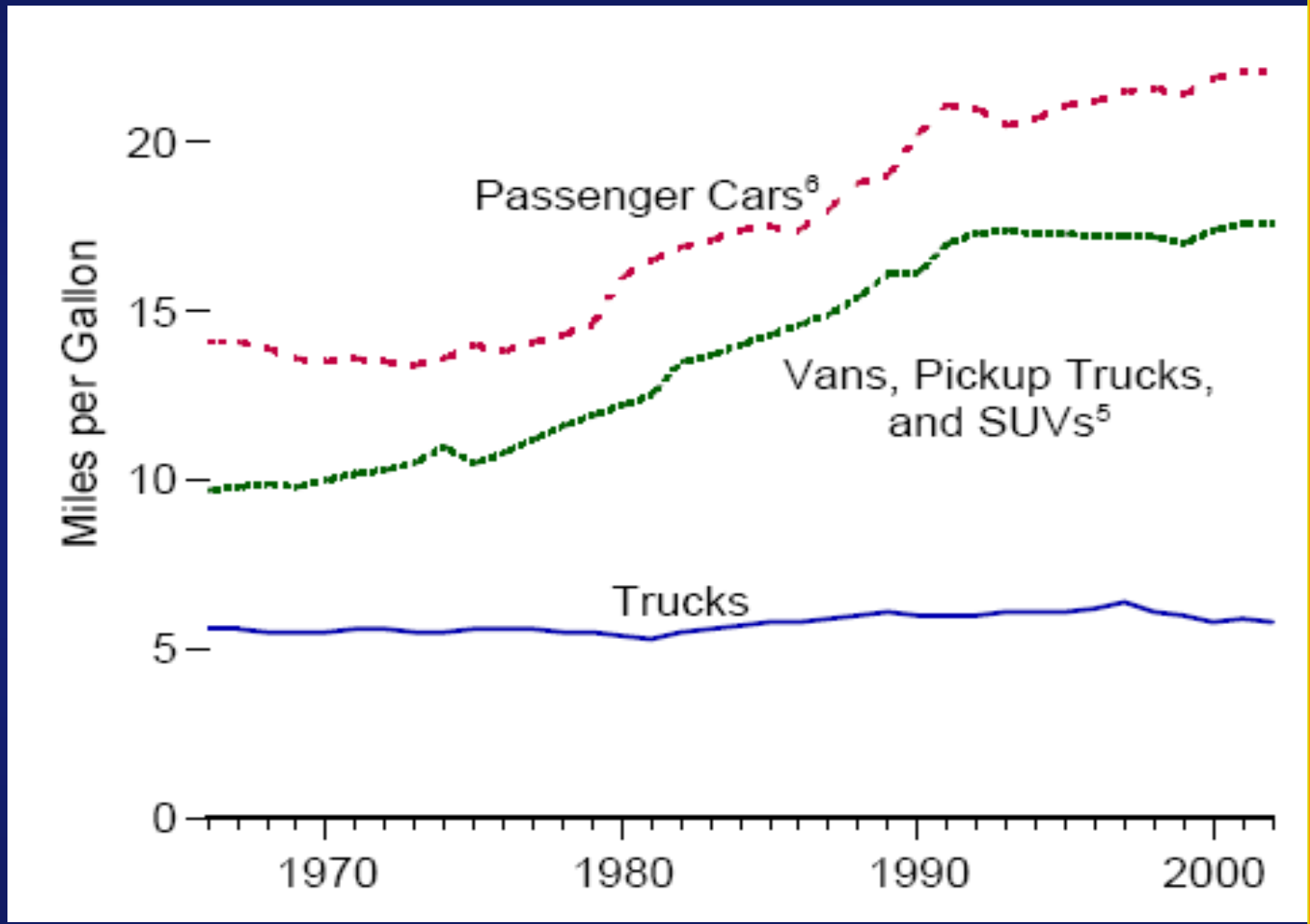
EIA, Annual Review of Energy, 2003, Figure 12. Production as Share of Consumption for Coal, Natural Gas, and Petroleum

Growing Motor Vehicle Consumption of Oil



EIA, Annual Review of Energy, 2003, **Figure 5.13b Estimated Petroleum Consumption by Product by Sector, 1949-2003**

Worsening fuel economy in cars



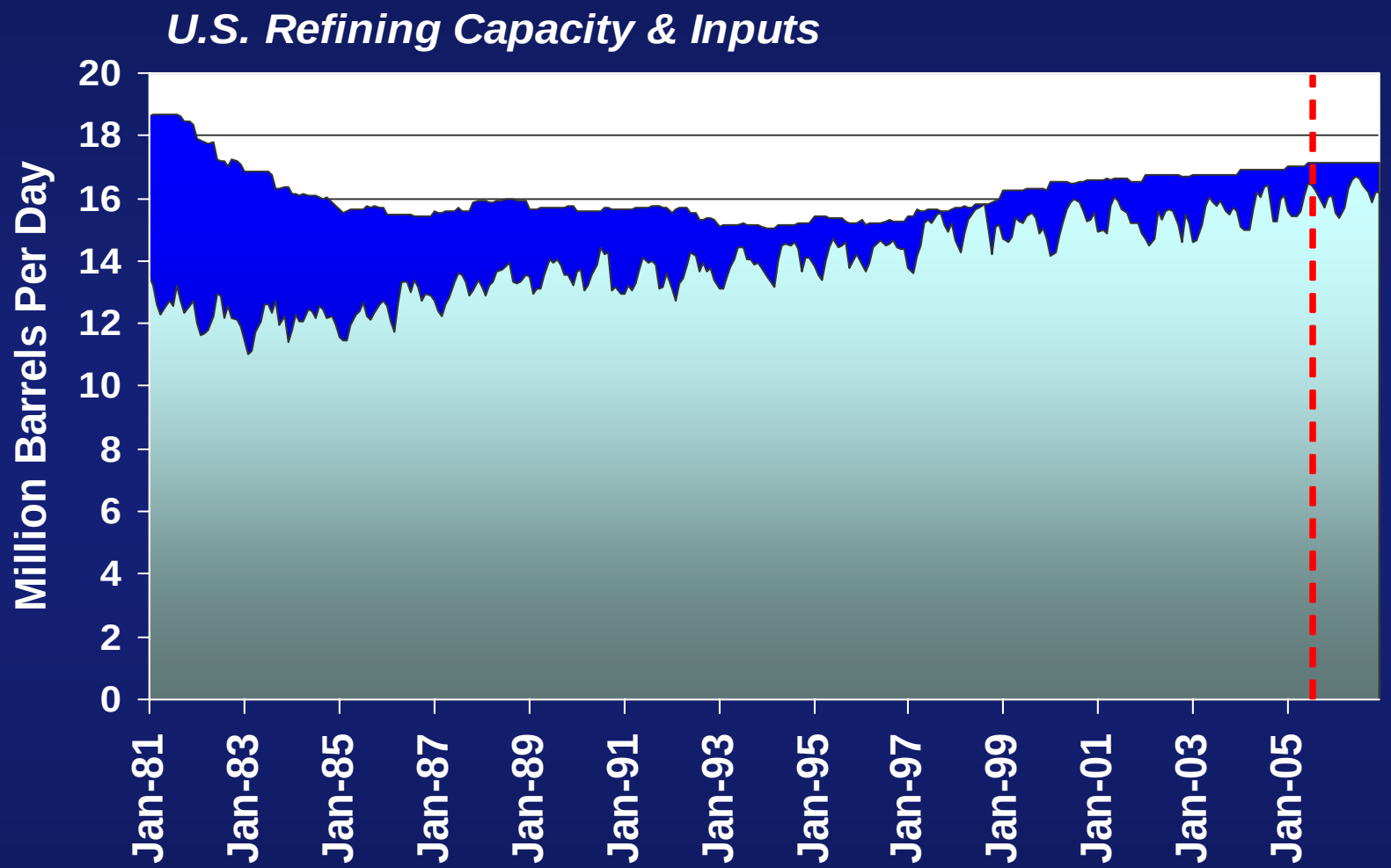
Note: The "Katrina effect" may affect these curves:

September sales of "trucks" including SUVs down 18% from last year, cars sales up.

Last year: Trucks: 58%, now 51%. Cars: 42%, now 49%

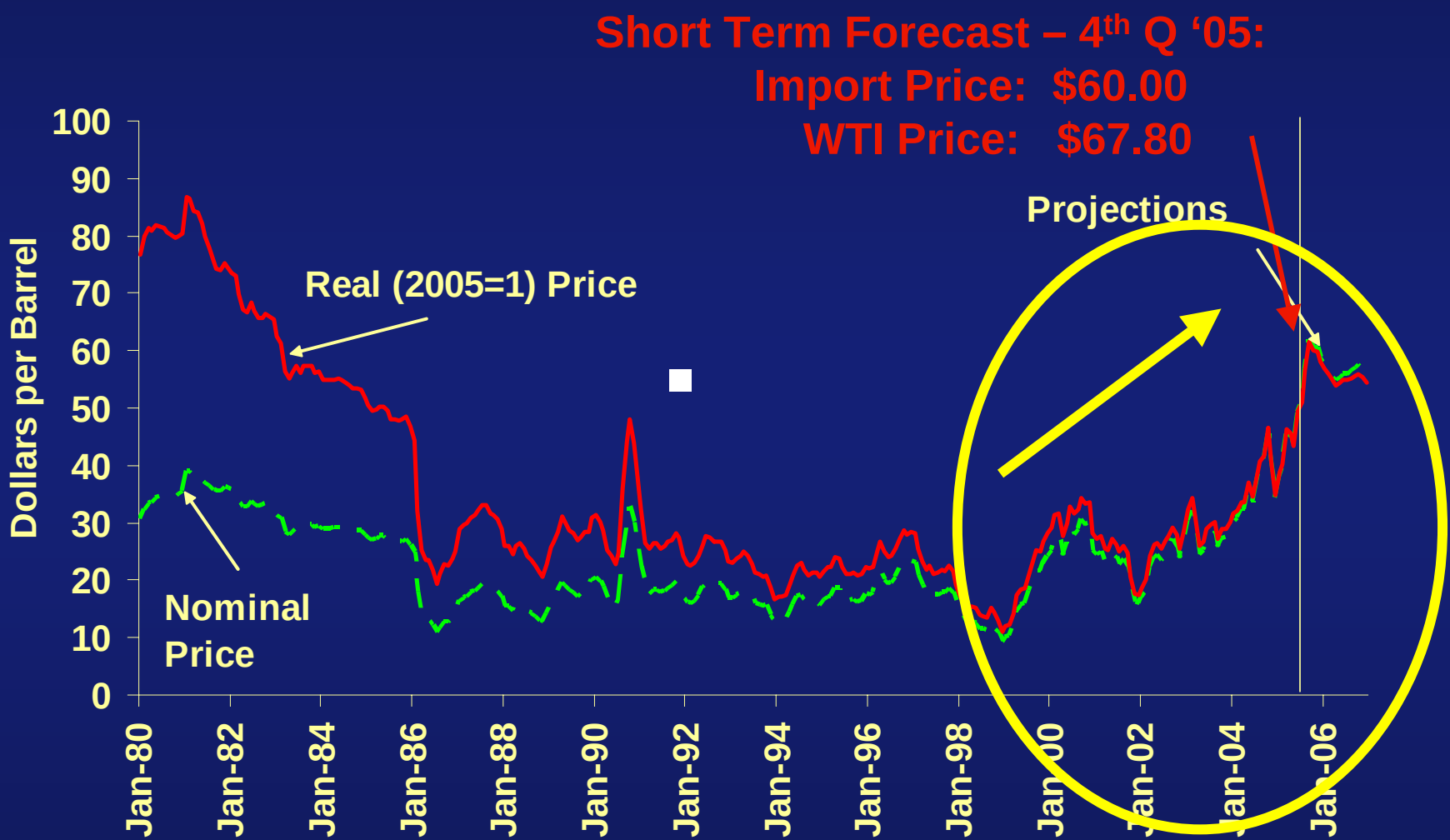
EIA, Annual Energy Review, 2003, Figure 2.8, Motor Vehicle Mileage, Fuel Consumption, and Fuel Rates; USA Today, October 4, 2005, page 2A.

Tightening Domestic Refining Capacity



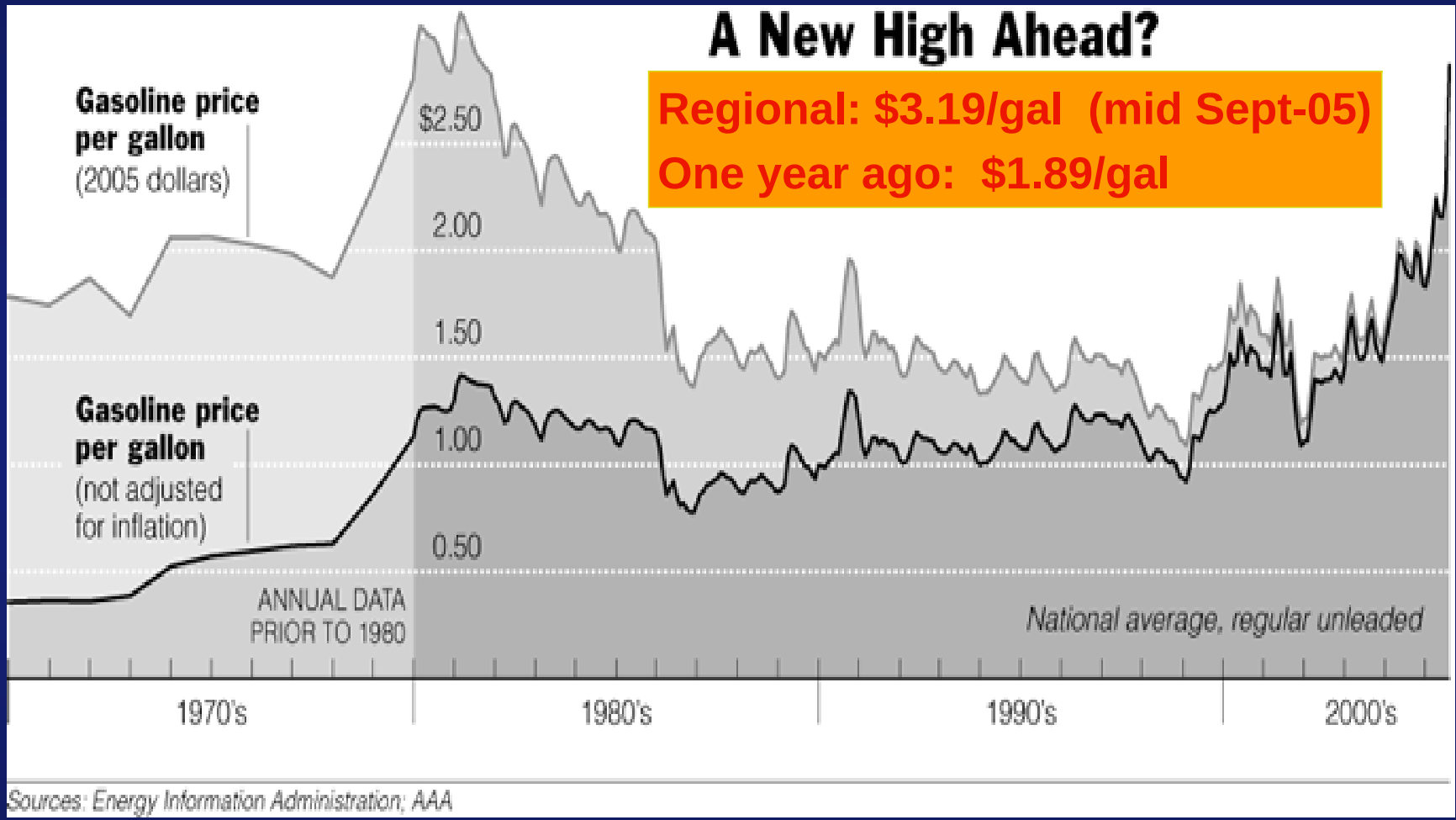
Sources: History: EIA; Projections: Short-Term Energy Outlook, June 2005. History and Outlook for Gasoline Prices Doug MacIntyre/Michael Burdette, Petroleum Division, U.S. Energy Information Administration, July 6, 2005, Owen J. Roberts High School, Pottstown, PA

Imported Crude Oil Prices: Nominal, Real



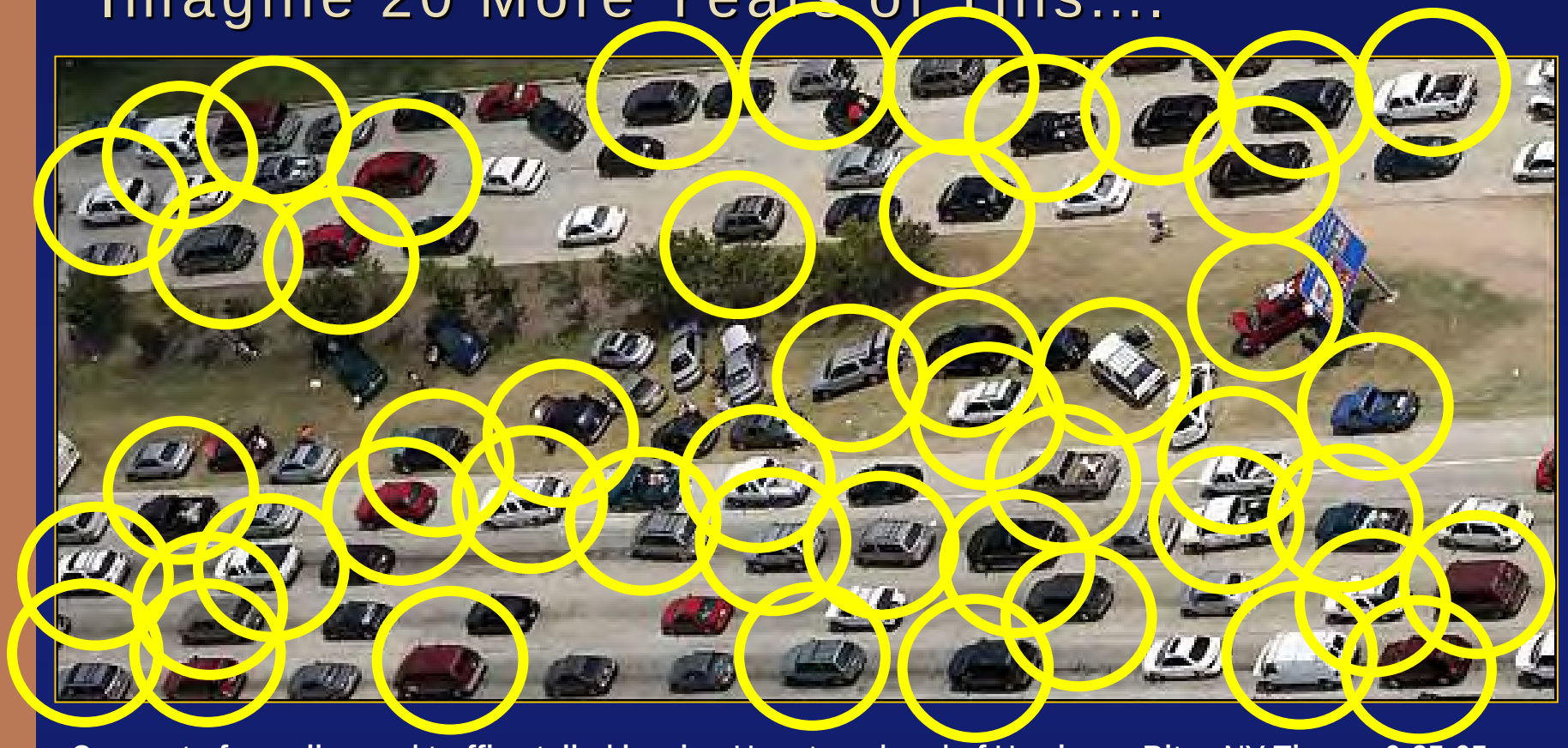
EIA, Short-Term Energy Outlook, September 2005

Rising (Spiking) Gasoline Prices



NY Times, "Katrina's Shock to the System," 9-4-05
http://198.6.95.31/index.asp, and http://198.6.95.31/MAavg.asp

"Imagine 20 More Years of This...."



Cars out of gasoline and traffic stalled leaving Houston ahead of Hurricane Rita. NY Times, 9-25-05

"....America's energy industry - both its oil supplies and refineries - is concentrated along the Gulf of Mexico....[G]as prices will almost always spike each time a hurricane heads for the gulf coast."

Home Heating Oil Prices

MAINE: 17% of energy is heating oil (U.S. = 8%)

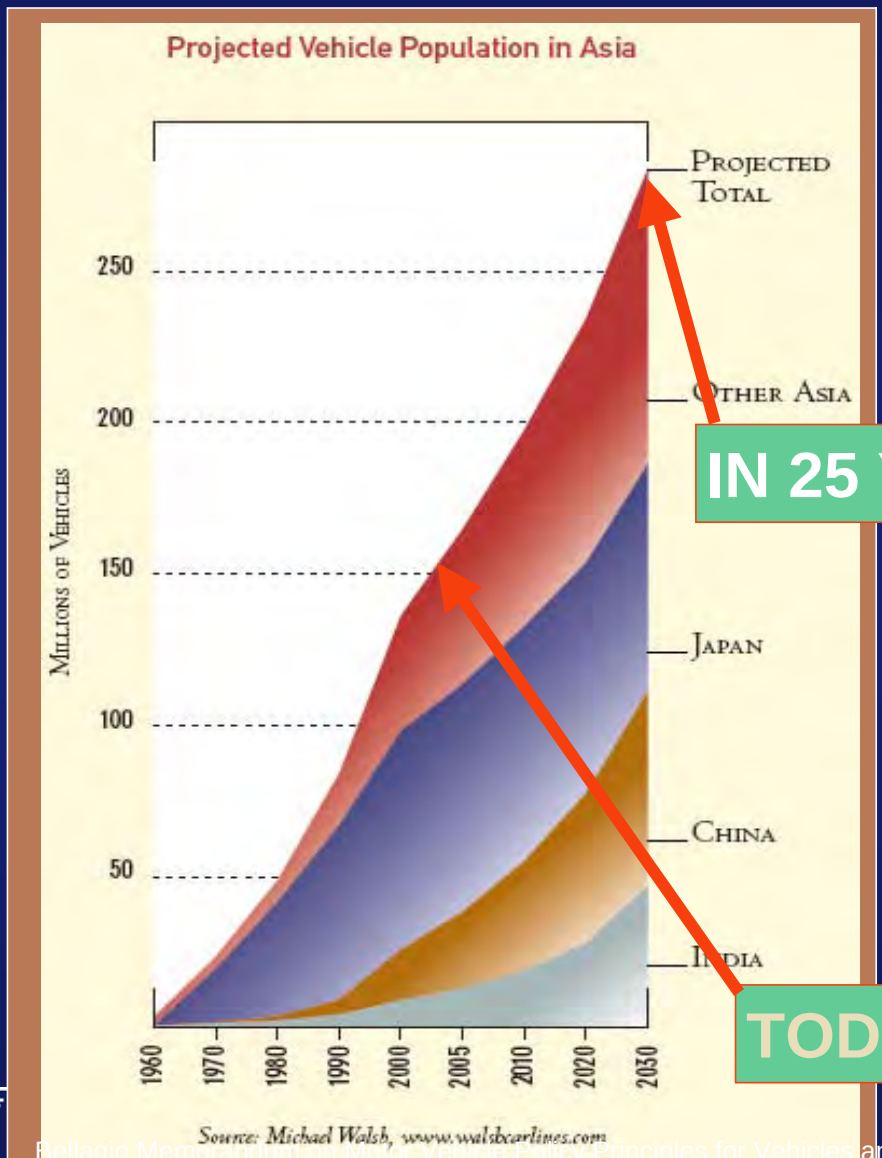
Short-Term Forecast: Retail Home Heating Oil 4th Q ('04 v. '05)

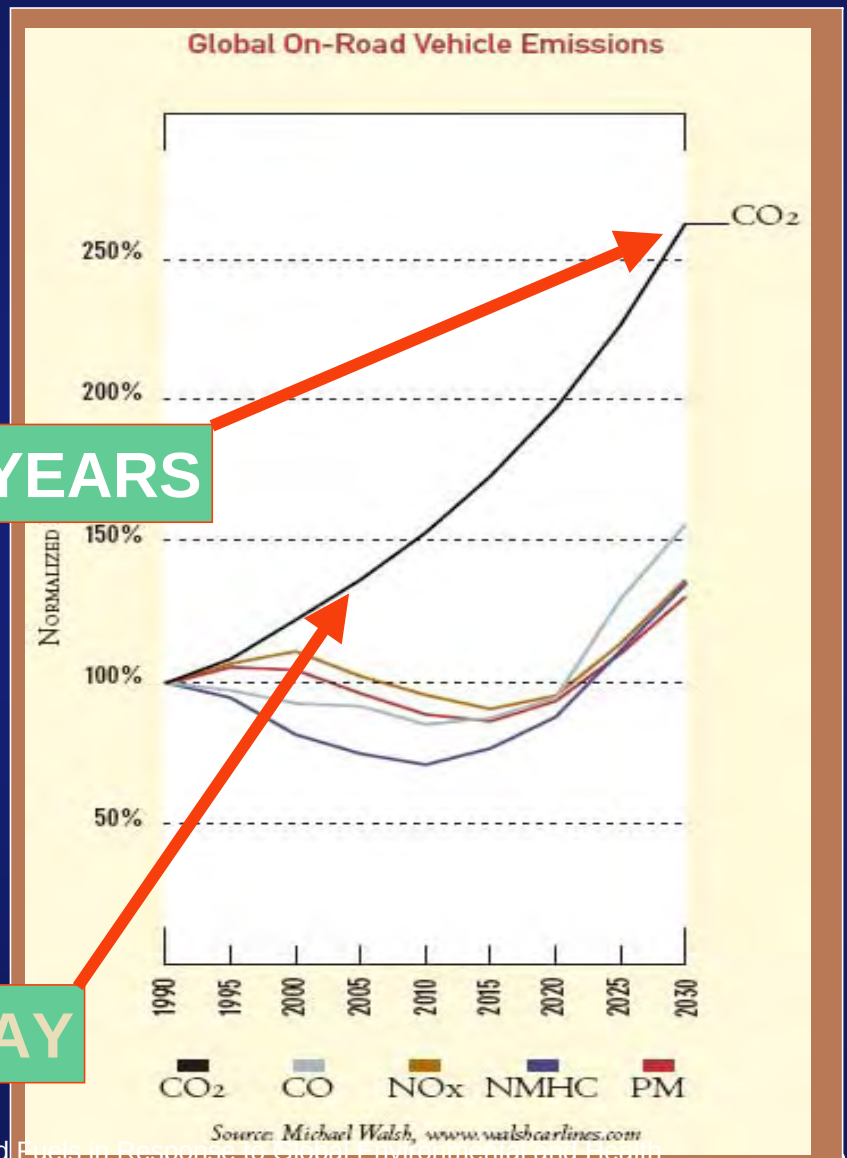
$1.80/gal v. $2.46/gal

www.eia.doe.gov

EIA, Short-Term Energy Outlook, September 2005

Growing vehicle use in Asia, world (↑ oil, ↑ GHG)



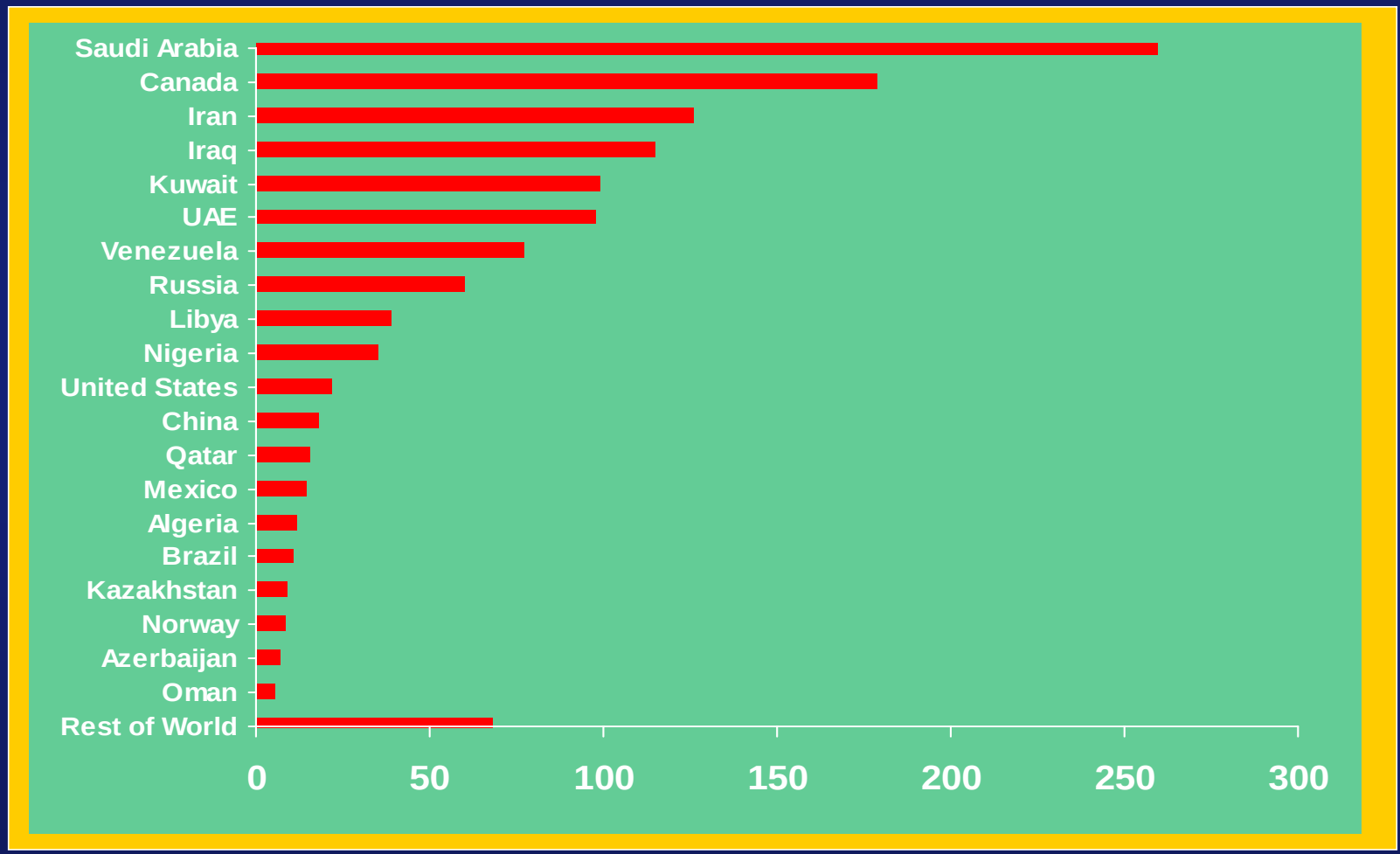


IN 25 YEARS

TODAY

Continuing dependence on Middle East Oil

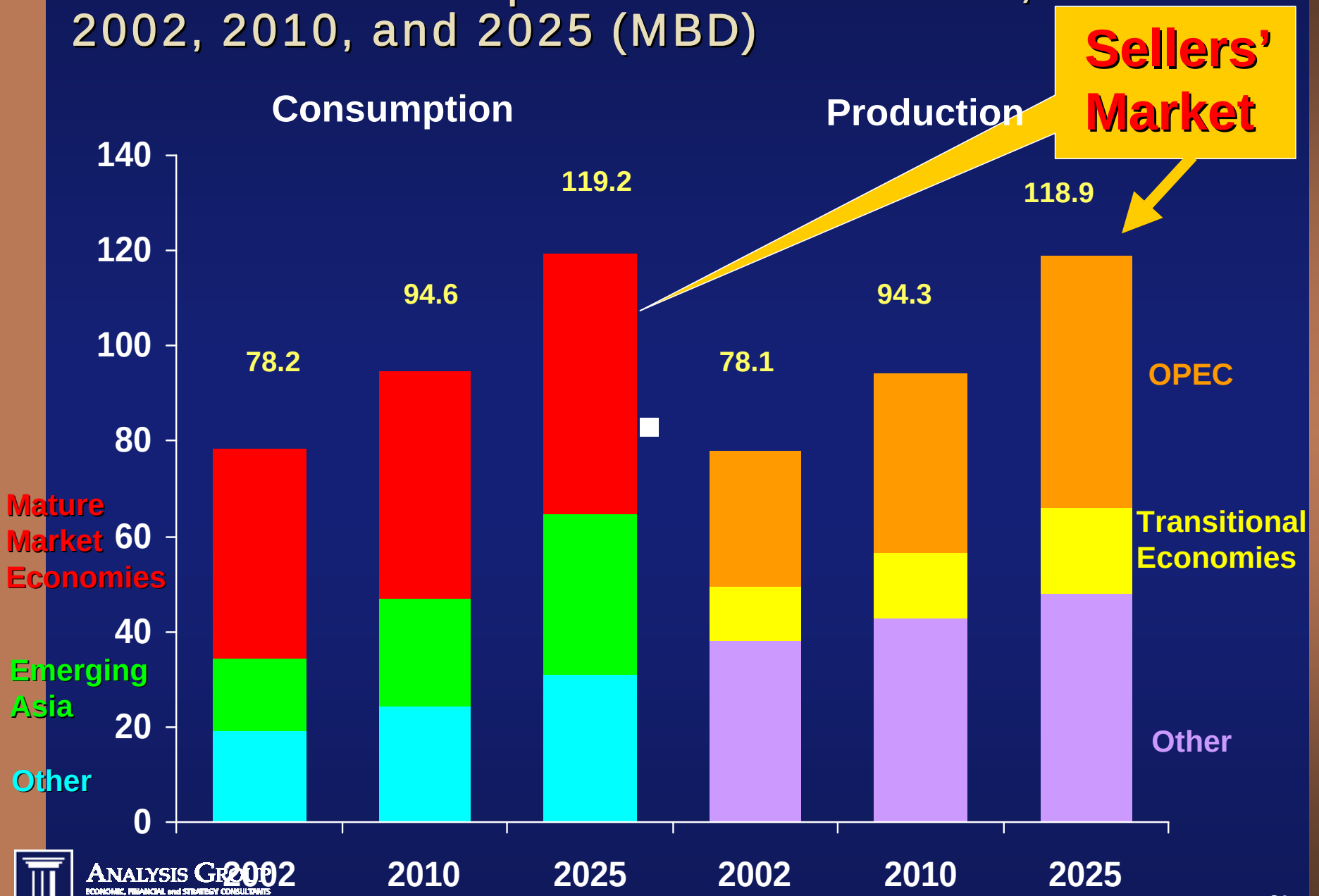
World Oil Reserves by Country, as of January 1, 2005 (b barrels)



ANALYSIS GROUP
ECONOMIC, FINANCIAL and STRATEGY CONSULTANTS

Oil & Gas Journal, "Worldwide Look at Reserves and Production," Vol. 102, No. 47 (December 20, 2004); International Energy Outlook, 2005; both cited in http://www.eia.doe.gov/pejc/speeches/caruso091405.ppt

World Oil Consumption and Production, 2002, 2010, and 2025 (MBD)



ANALYSIS GROUP
ECONOMIC, FINANCIAL and STRATEGY CONSULTANTS

International Energy Outlook 2005; http://www.eia.doe.gov/neic/speeches/caruso091405.ppt

Energy supply – demand balances:

Oil:

- **Worldwide demand/supply ~ 80 MBD**
- **Huge demand pressure (e.g., U.S., China, India)**
- **Production & reserves: inc'l supplies in Saudi Arabia**
- **Refining: extremely tight refining capacity in U.S.**

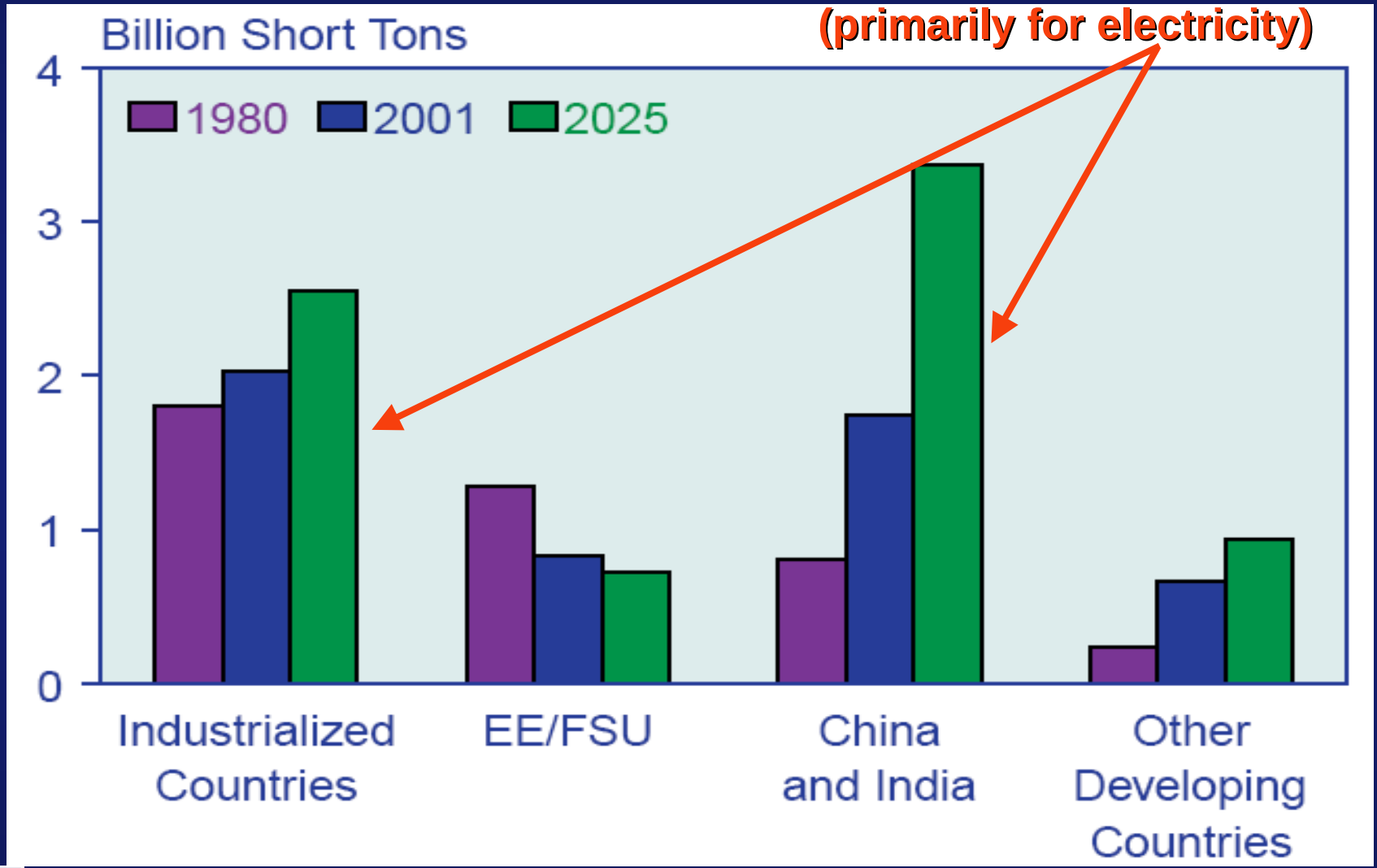
Gas:

- **North American demand pressure (esp. electric power)**
- **Declining North American production**
- **Improving economics of LNG**
- **Pressure for new import/delivery/storage capacity**

Coal:

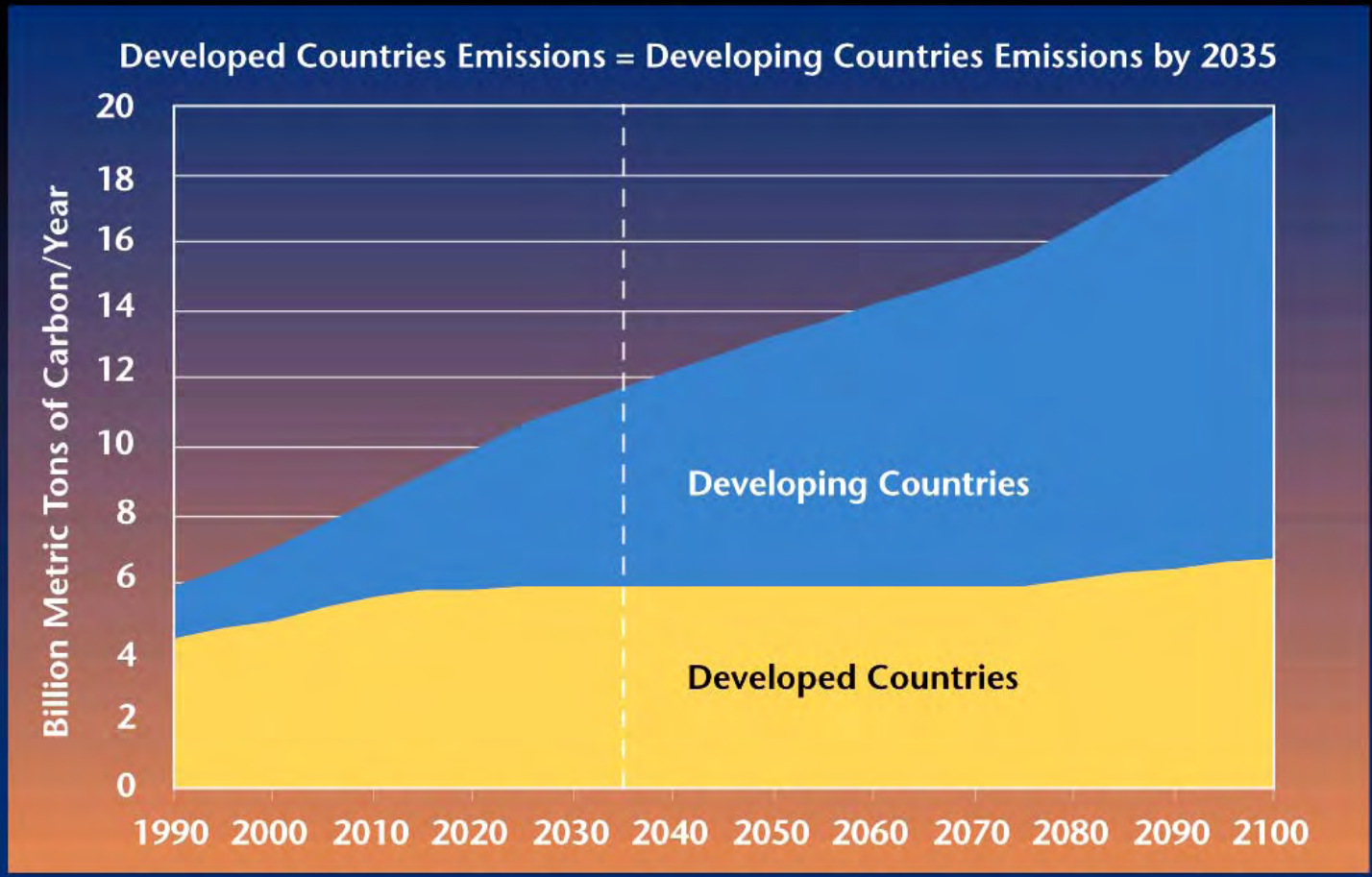
- **Largest domestic fuel resource**
- **Rising demand (esp. China, India)**
- **Rising costs**
- **Significant environmental impacts – especially carbon**

Growing coal use expected worldwide



U.S. Energy Information Administration, *International Energy Outlook* (2004).

Worldwide CO2 emissions: 1990-2100



CO2 Emissions by Country: Total emissions since 1950 (b tons)

Graphic from: Michael Glantz, "What Makes Good Climates Go Bad? … and … "Why Care?" USAEE/IAEE Meeting, 9-19-05.

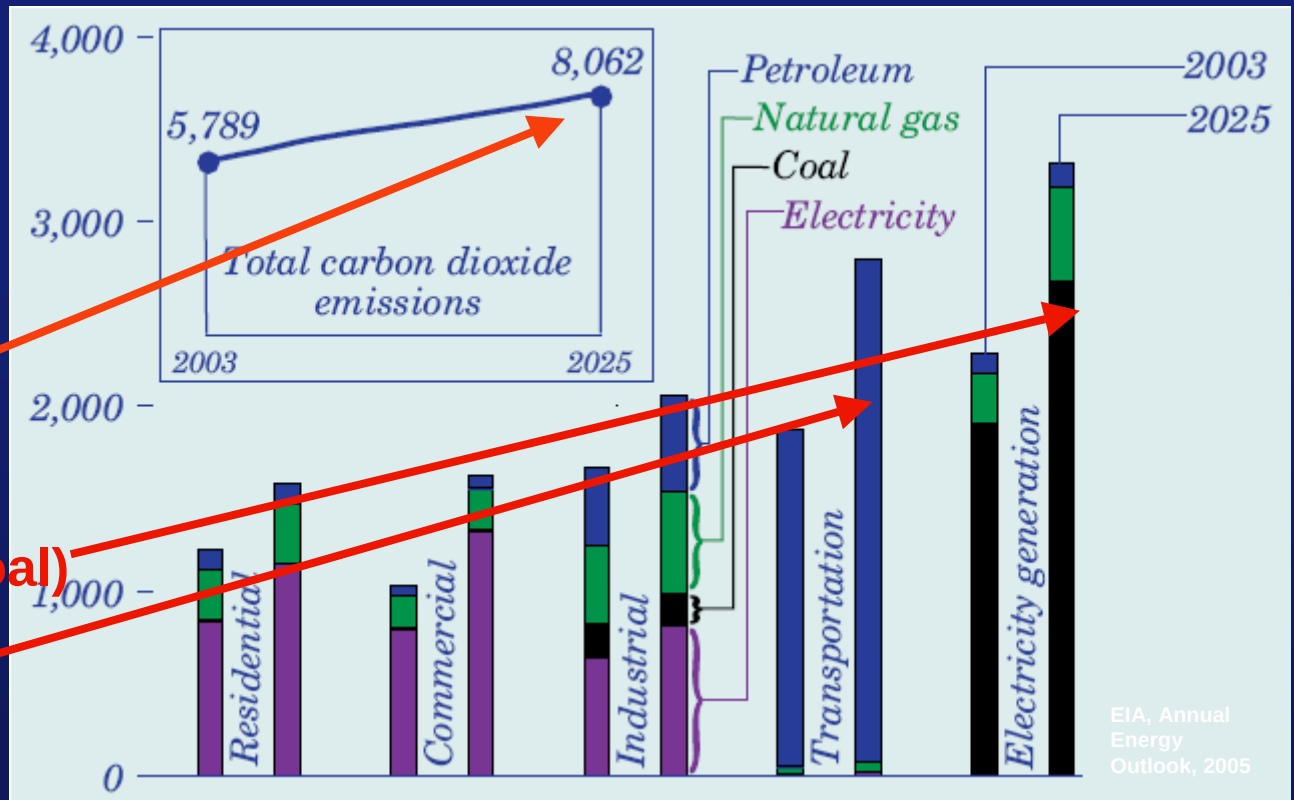
Official U.S. position on Climate Change

The biggest GHG emitter is outside the international treaty

- **Washington not willing to join Kyoto Protocol**
- **Continued resistance to mandatory action**
- **Support voluntary initiatives, R&D, data, analysis**

Continued increases:

- **power plants (coal)**
- **cars, SUVs (oil)**



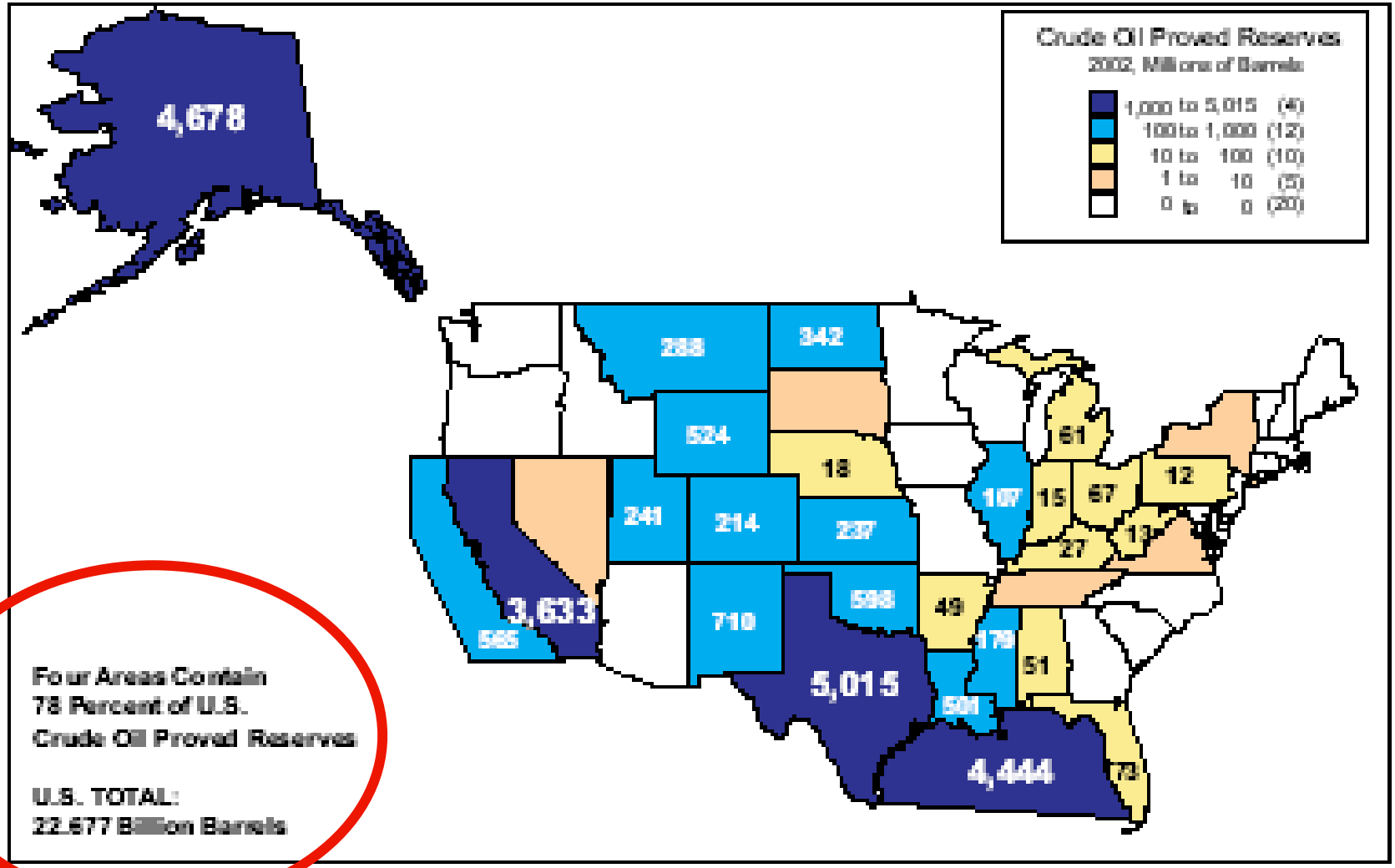
EIA, Annual Energy Outlook, 2005

Energy politics/politics: highly geopolitical

Domestically

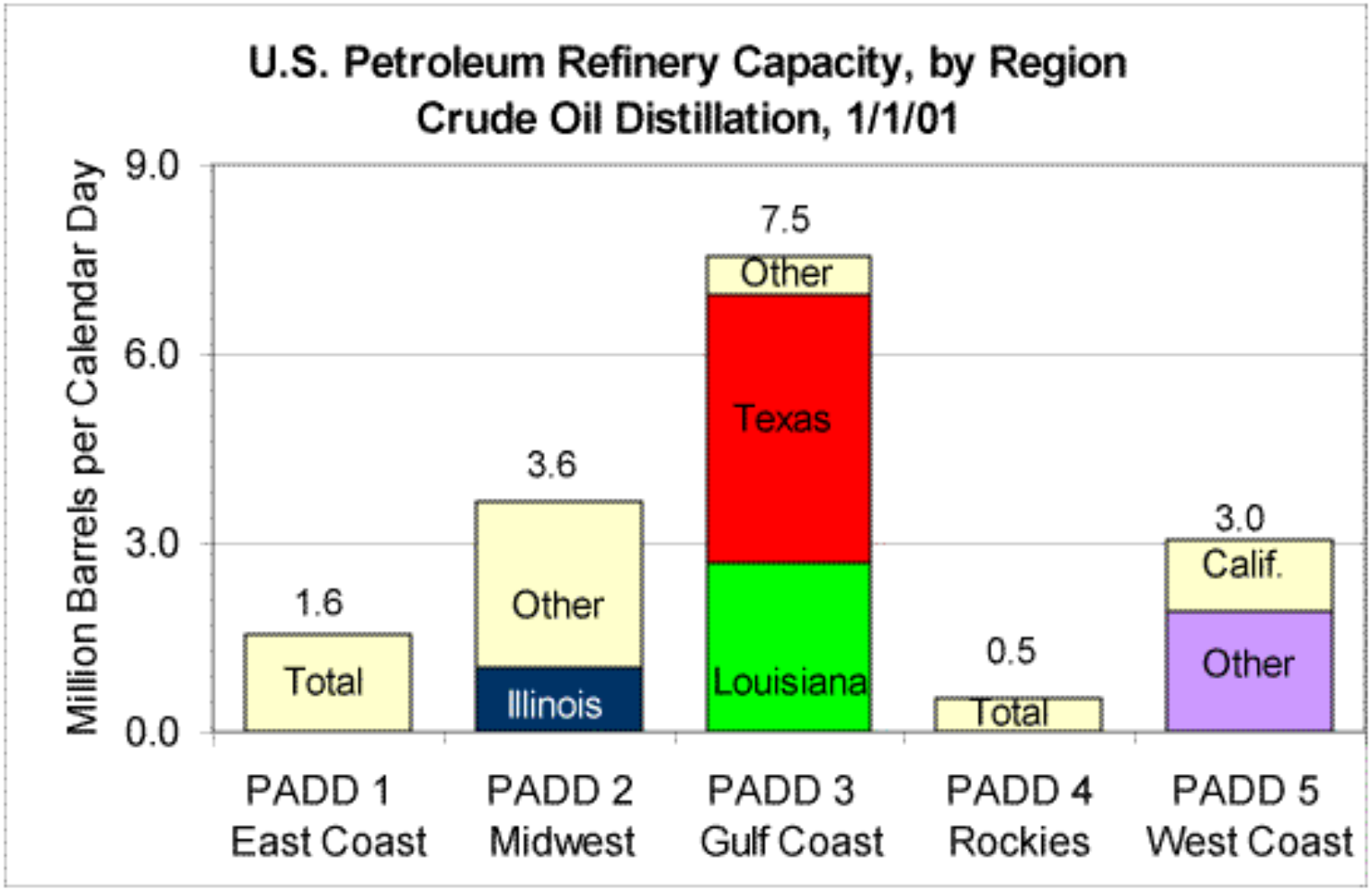
- **Regional disparities in natural resources, energy demand, environmental attitudes, labor attitudes, etc.**
- **Differences often reflected in energy politics – e.g.,**
  - **Producer states v. consumer states**
  - **Low-cost v. high-cost states, "Green states" v. "brown states"**
- **With organized interests: energy policy shaped by benefits and burdens**
  - **Concentrated proponents v. broadly dispersed burdens**
  - **Concentrated opponents v. faceless future beneficiaries**

¾ of U.S. Oil Reserves in Four Areas (2002)



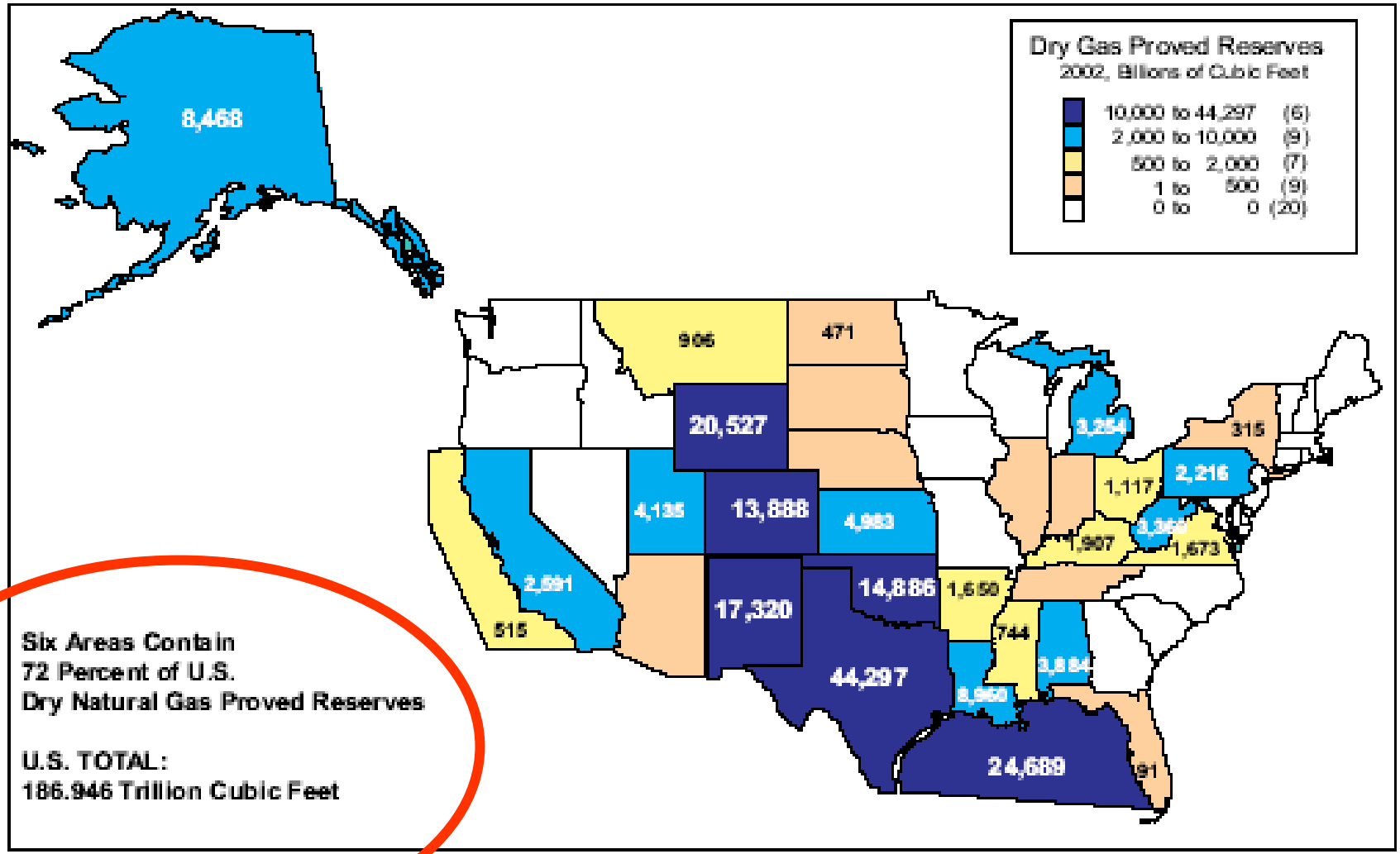
EIA, US Crude Oil, Natural Gas, and Natural Gas Liquid Reserves, December 2003

U.S. Refining Capacity: Regional Concentration



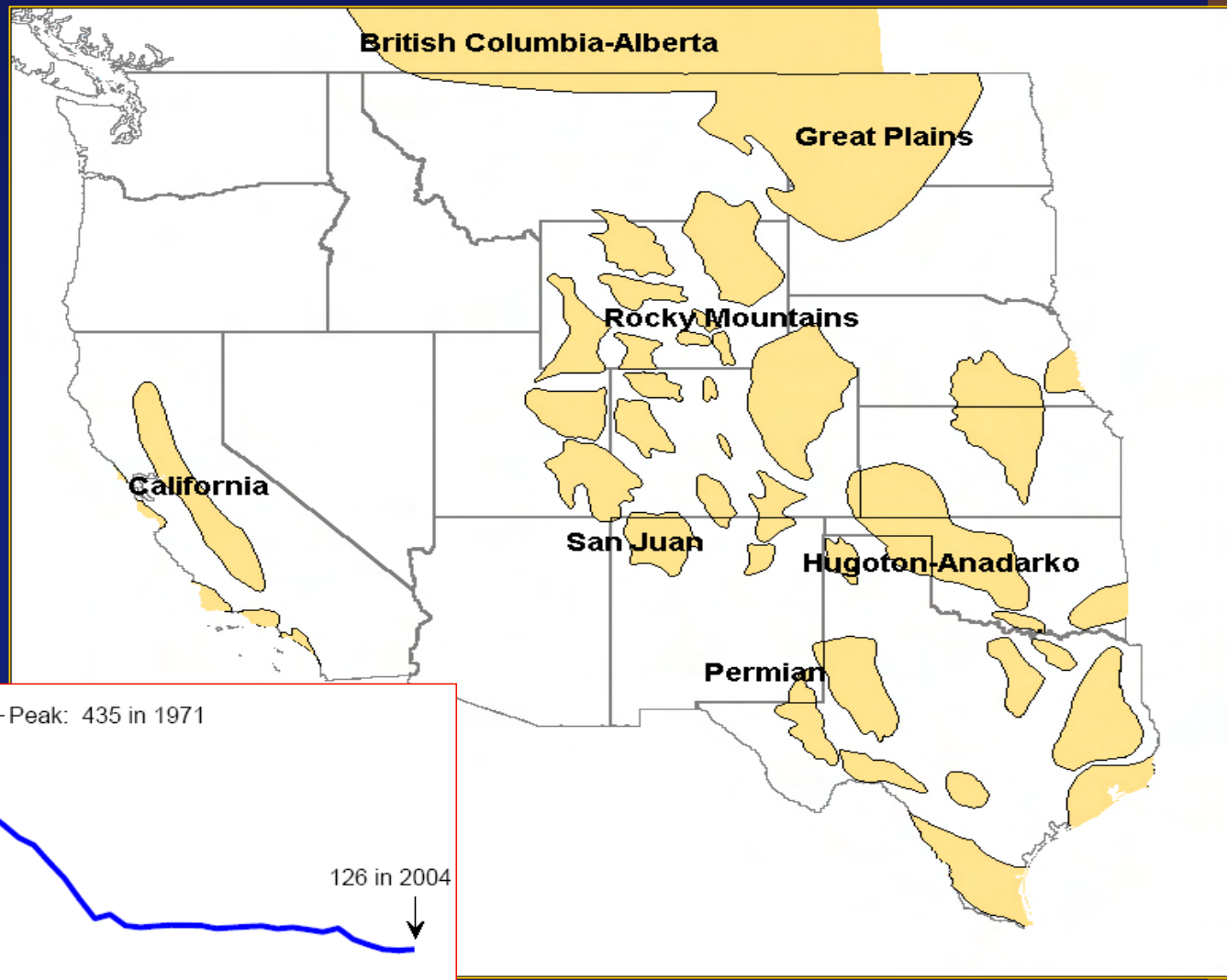
EIA, DOE, Oil Market Basics, http://www.eia.doe.gov/pub/oil_gas/petroleum/analysis_publications/oil_market_basics/Ref_image_USregl_cap.htm; http://www.eia.doe.gov/pub/oil_gas/petroleum/data_publications/petroleum_supply_annual/psa_volume1/current/pdf/volume1_appendix_a.pdf

¾ of U.S. Natural Gas Reserves in 6 Areas (2002)

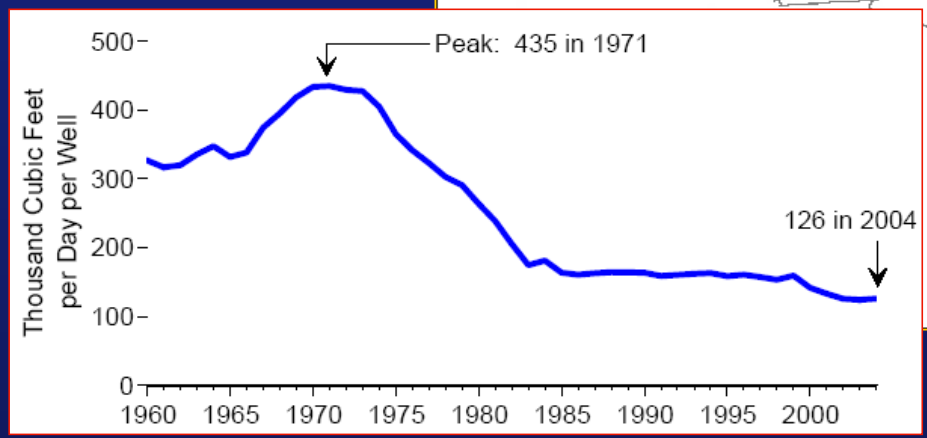


EIA, US Crude Oil, Natural Gas, and Natural Gas Liquid Reserves, December 2003

Western Natural Gas Basins – Declining Production



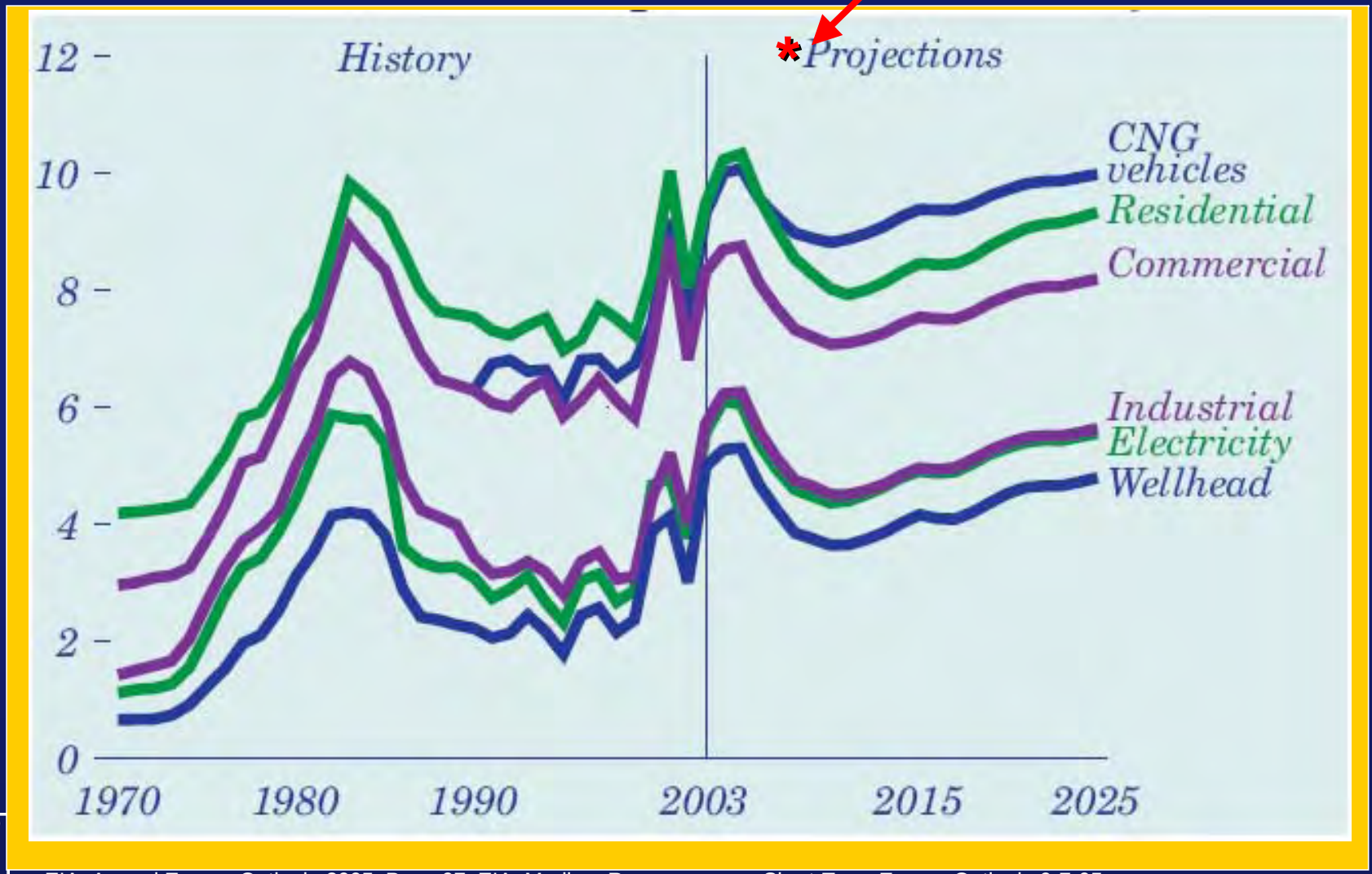
Natural Gas Well Average Productivity



Source: "Western Infrastructure Assessment, Prepared by the Division of Market Development, October 24, 2001 (including data from California Energy Commission, California Energy Outlook, Staff Draft, Sep 2001); Annual Review of Energy, 2004, Figure 35.

Gas Prices Roaring Upward

Latest Spot Prices:
Actual Sept '05: ~$14.00
Forecast Jan '06: ~ $12.00

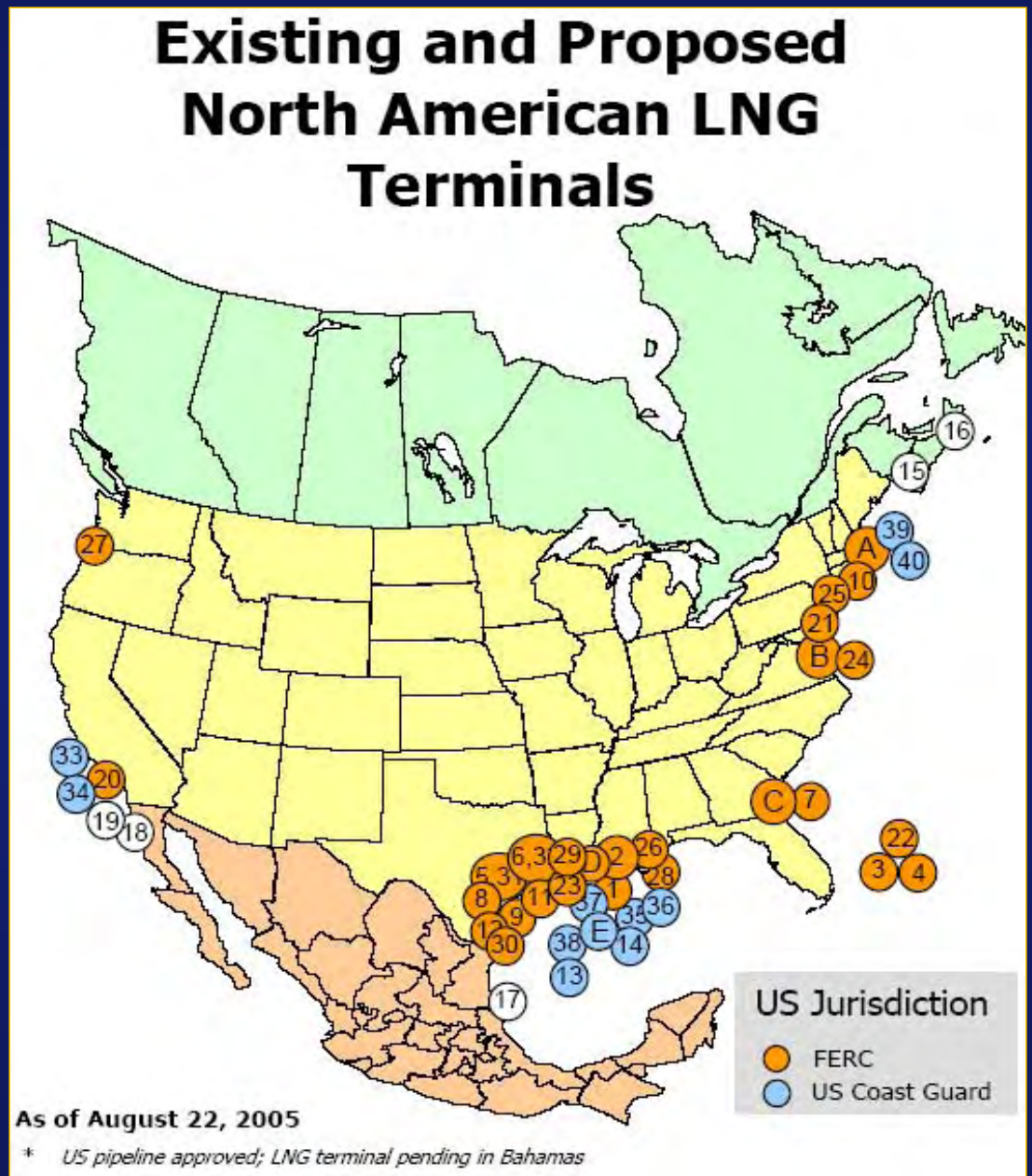


EIA, Annual Energy Outlook, 2005, Page 97; EIA, Medium Recovery case, Short-Term Energy Outlook, 9-7-05

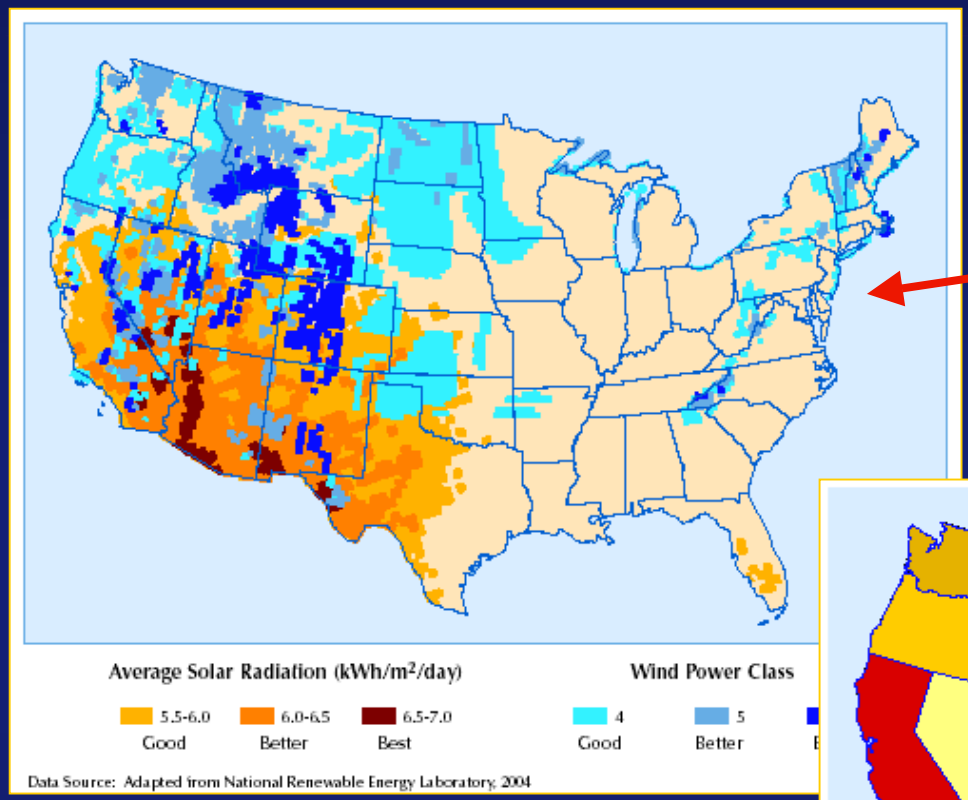
Many proposed new LNG terminals

- FERC
- Coast Guard

http://www.ferc.gov/industries/lng/indus-act/exist-prop-lng.pdf (as of 8-22-05)

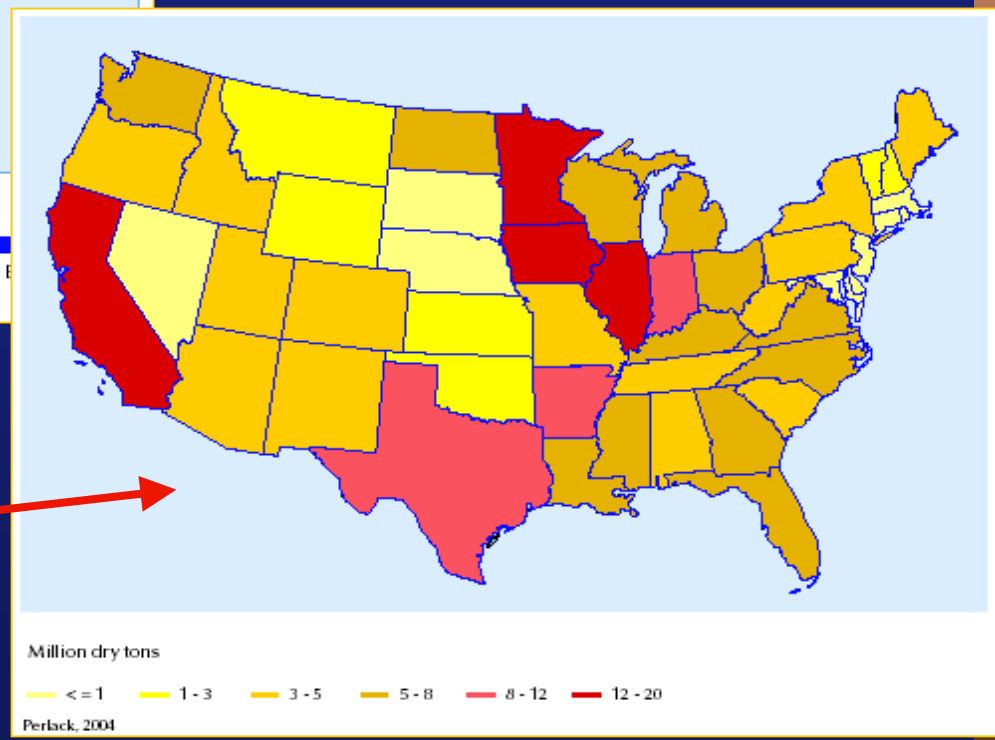


Domestic renewable resources also abundant

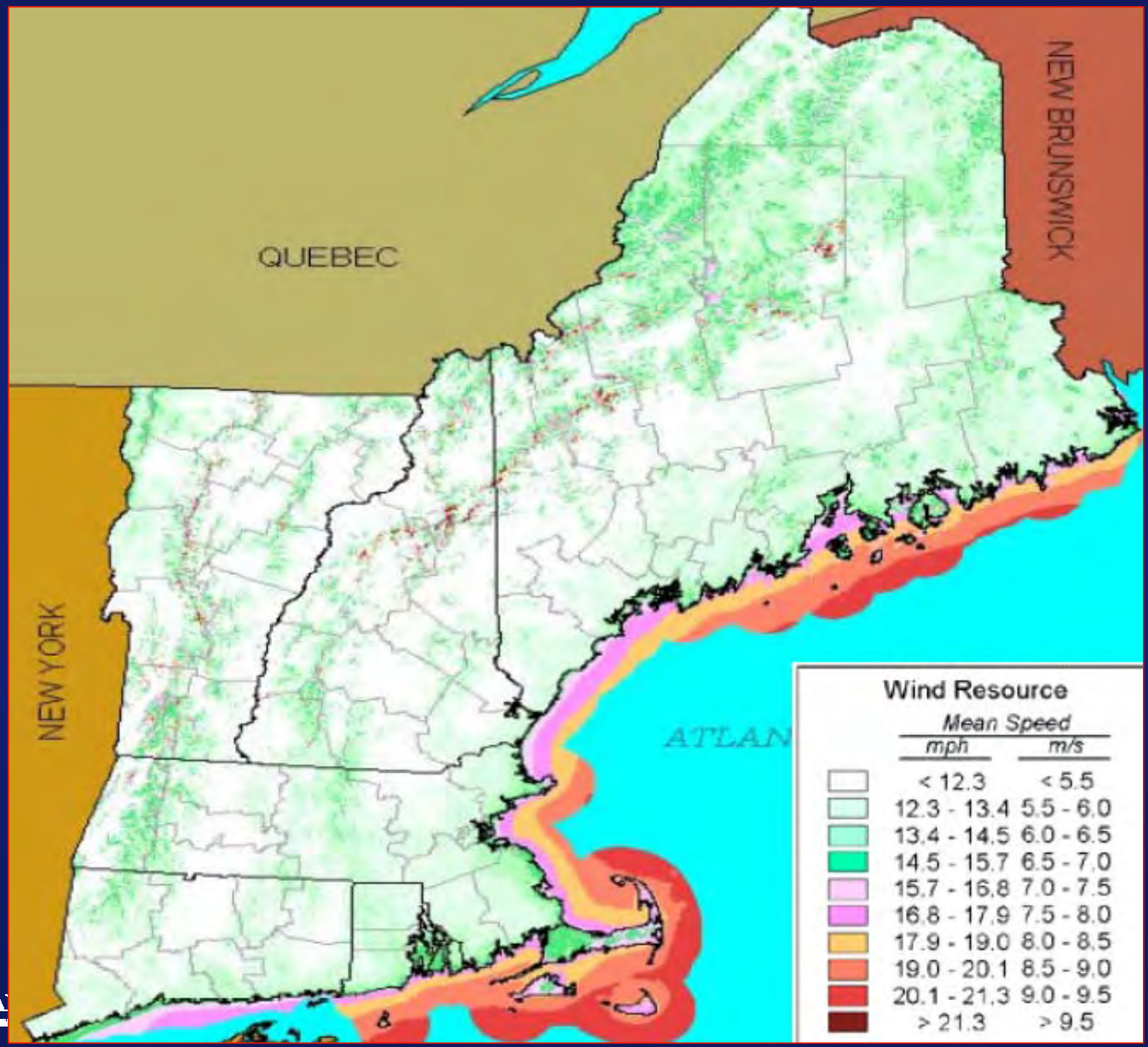


Solar and Wind Resources

Renewable Wastes (Biomass)

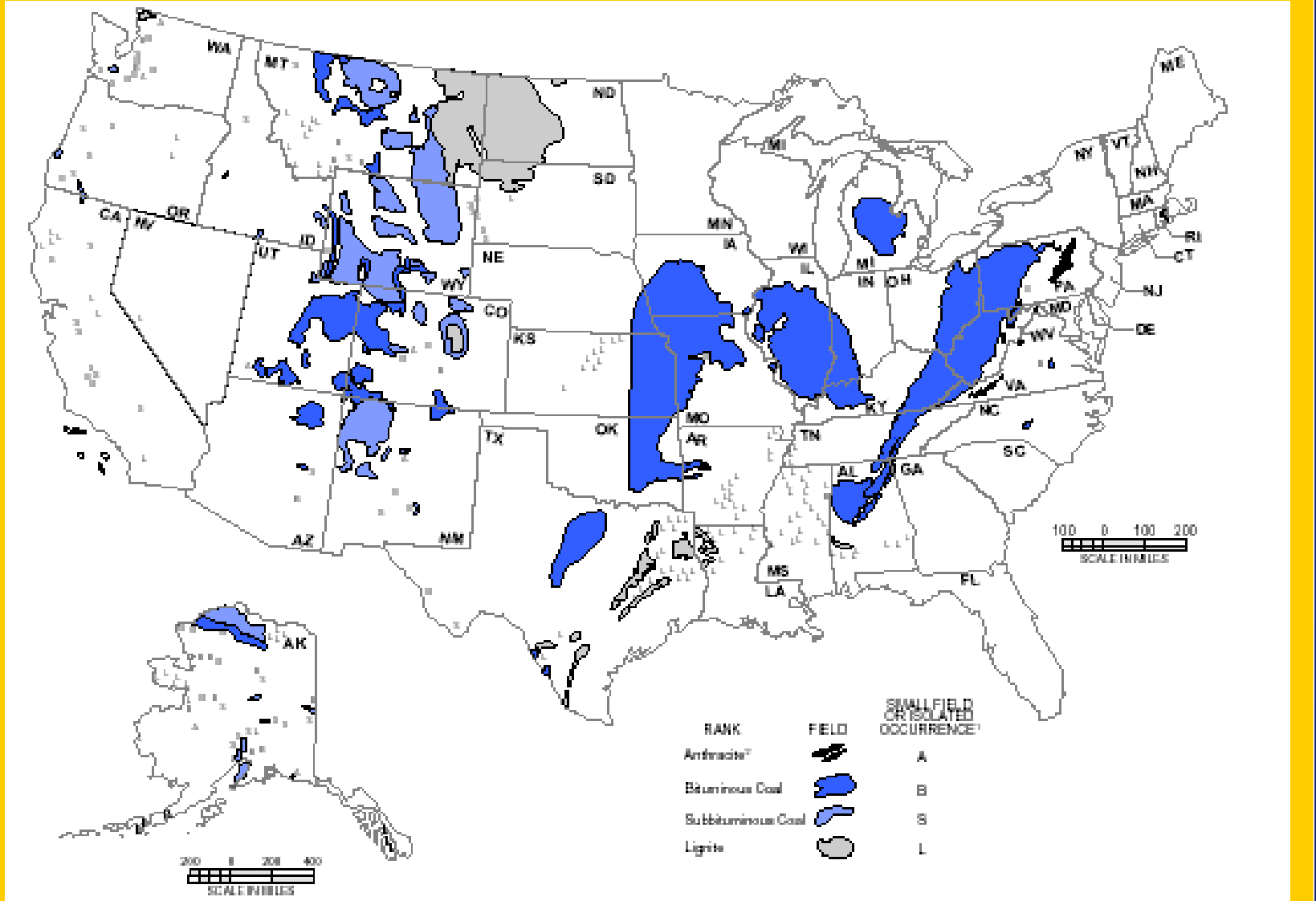


New England wind resources



ISO-NE, RSP05 Appendices

U.S. – Largest Coal Resource Among Nations

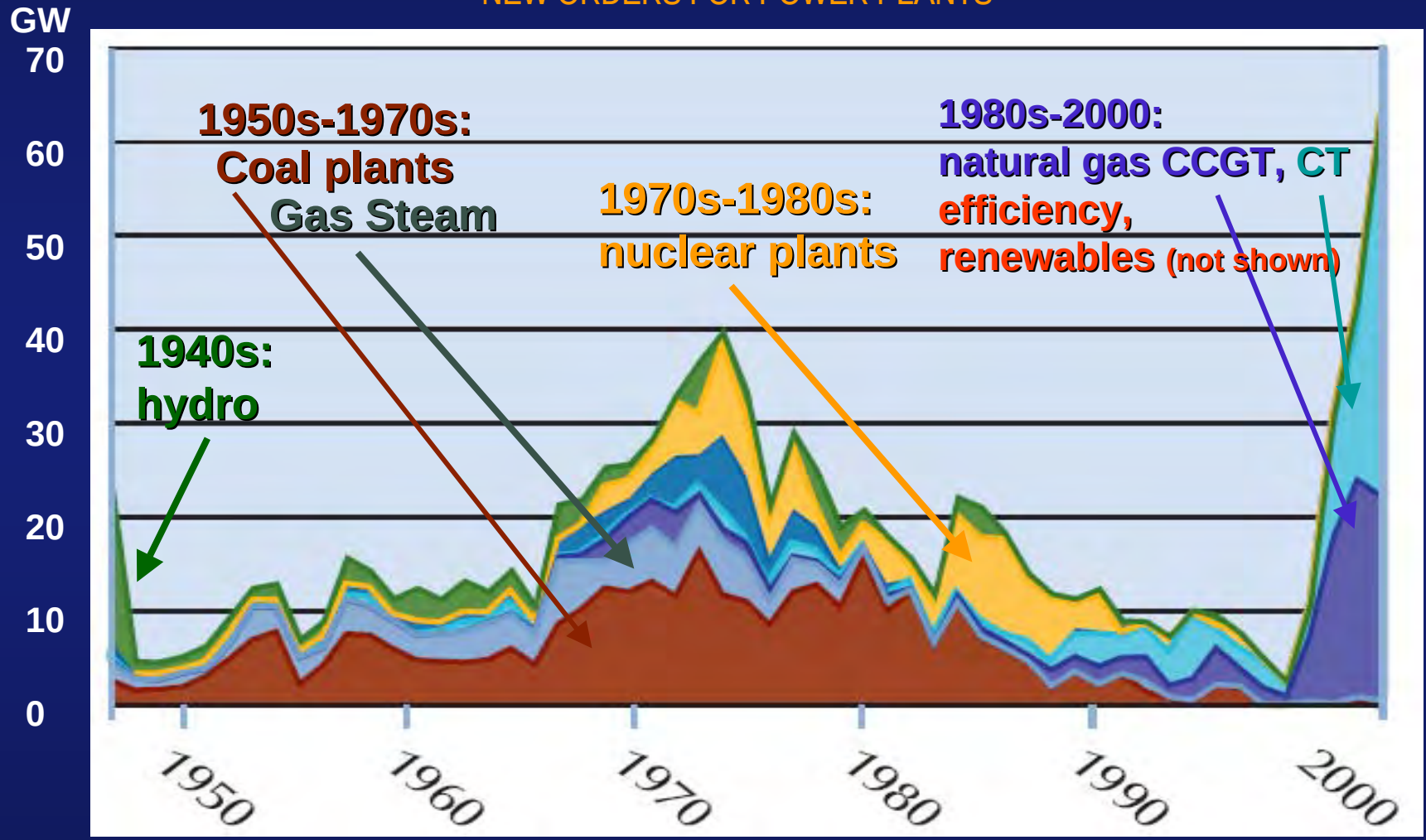


EIA, US Coal Reserves: 1997 Update, 1999

Typical energy trend: "Fuel of the Decade"

E.G.: Fuels going in and out of favor for power generation = f (economics, technology, public policy)

NEW ORDERS FOR POWER PLANTS



ANALYSIS GROUP
ECONOMIC, FINANCIAL and STRATEGY CONSULTANTS

National Commission on Energy Policy, 2004. Ending the Energy Stalemate: A Bipartisan Strategy to Meet America's Energy Challenges, page 44, citing Energy and Environmental Analysis, Inc., 2004.

Current N.E. Power Plants by Vintage & Type

Fuel Type	In-Service Date Prior to 1950		In-Service Date 1951 to 1970		In-Service Date 1971 to 1990		In-Service Date 1991 and After		Total	
	# of Units	MW	# of Units	MW	# of Units	MW	# of Units	MW	MW	Percent
Gas	0	0	0	0	0	0	24	6,378	6,378	20.6%
Dual fuel[(b)]	3	63	4	354	9	336	27	4,805	5,558	18.0%
Oil	7	26	63	2,486	32	4,966	7	60	7,538	24.4%
Nuclear	0	0	0	0	5	4,387	0	0	4,387	14.2%
Coal	0	0	14	2,592	2	256	0	0	2,848	9.2%
Pumped storage	1	29	0	0	3	1,643	0	0	1,672	5.4%
Hydro	65	877	8	316	15	411	49	58	1,663	5.4%
Miscellaneous[(c)]	0	0	0	0	31	656	33	240	896	2.9%
Totals[(d)]	79	996	89	5,748	238	12,655	140	11,540	30,940	100.0%
Percent of Total MW		3.2%		18.6%		41.2%		37.6%		

GAS

COAL, OIL, HYDRO

NUCLEAR and OIL

DSM: +1552 MW

ISO-NE, RSP 05, Table 1.1(as of Summer 2005);
ISO-NE, CELT Report, 2005