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The Lies We've Been Told

or

How Not To Transition to the Fuels of the Future

December 10, 2008
Institute of Economic Studies
University of Iceland
Reykjavik

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Washington, DC
www.eprinc.org

EPRINC

Introduction

Energy Policy Research Foundation Inc. (EPRINC), ***formerly the Petroleum Industry Research Foundation Inc. (PIRINC)***

Founded in NY in 1944

- Moved to Washington from NYC in Feb 2007
- EPRINC brings policy analysis and industry economics to bear on current energy issues

Note: All data in this presentation are from EIA unless otherwise noted. Summary conclusions, comments, etc, are the sole responsibility of EPRINC.

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Fighting Ignorance About Oil Markets Since 1944*

*** It's taking longer than we thought.**

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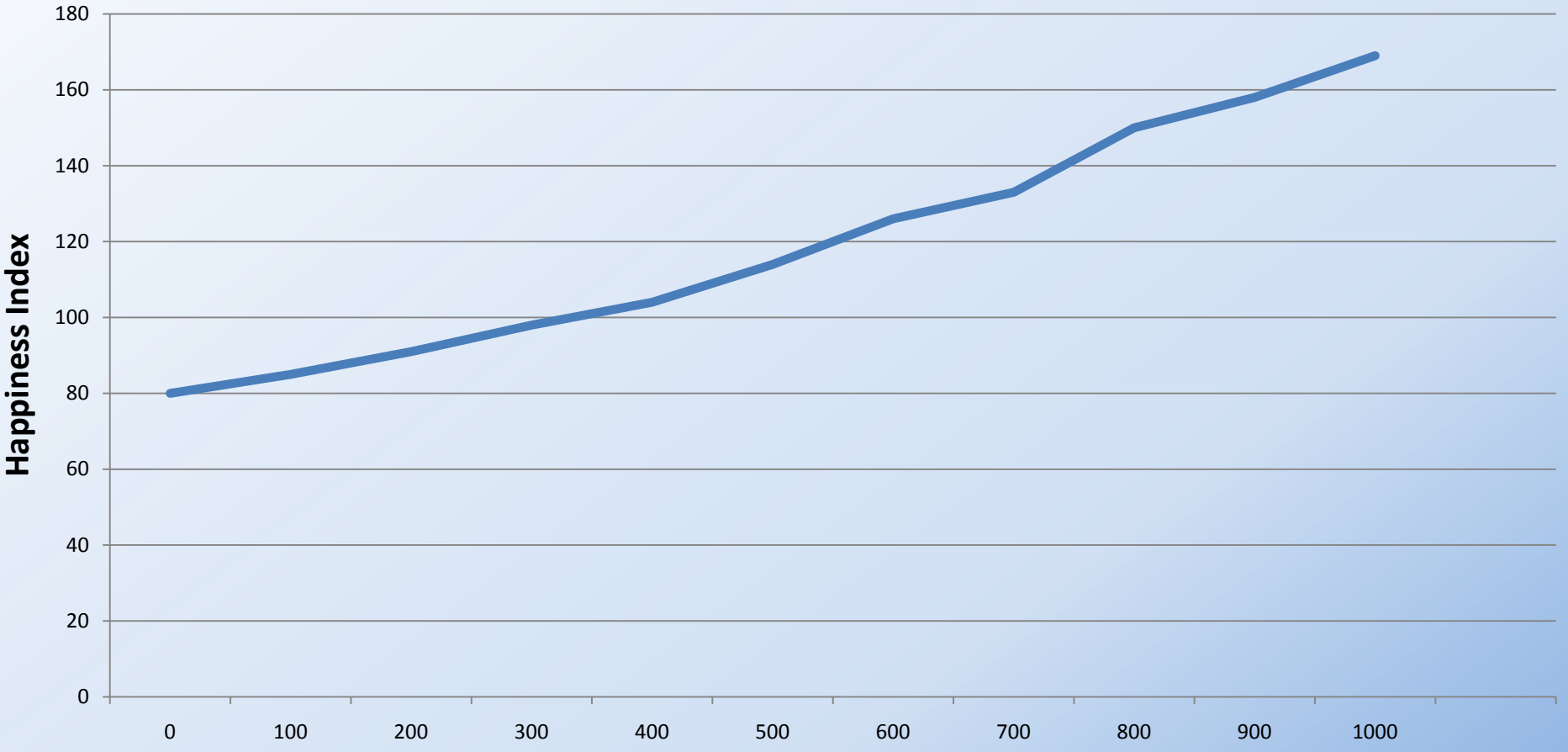
Alternative Titles

- High Cost of Pandering
- “Hey, Am I the Only Person Who was Alive in the 70s?”
- What happens when you ask the wrong questions?
- Where’s the Humility?
- Everything you think you know about the oil market is wrong
- The Black Swan (silent evidence, know-how vs. know-what, turkeys)


Happiness Index
180
160
140
120
100
80
60
40
20
0
0
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200
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400
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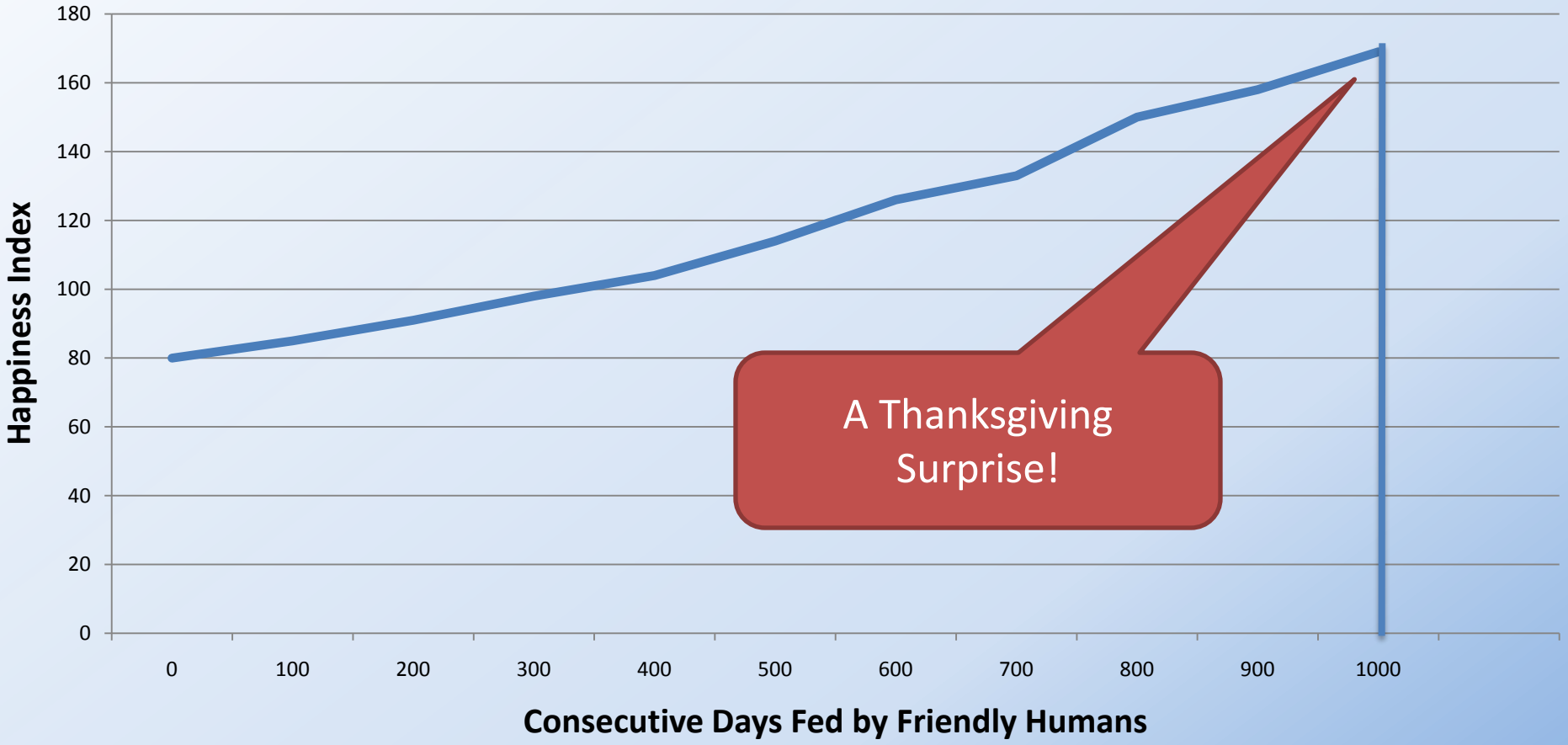
A Turkey Before and After Thanksgiving (Hume's Problem)



THE TAKE AWAYS
or
EPRINC's UNIFIED THEORY

- Expectations Matter **(and sometimes they come true)**
- Recent Run Up in Oil Prices Was A Supply Disruption **(no one saw it because it wasn't in the briefing book)**
- Peak Oil is for Sissies
- What Things Cost are Important **(especially if there are no benefits)**
- Lower Imports Will Not Buy a Lot of Energy Security **(within the likely range)**
- Petroleum Products, i.e., gasoline, diesel, jet fuel are made from Crude Oil **(this is more important than you think)**

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Why Did Oil Prices Climb So High?

1973-1974 Arab Oil Embargo

NOT AN EMBARGO, but instead a

- Structural Shift in Ownership and Control of the Resources of the Middle East

- Fundamental Change in Expectations on Production from Middle East Producers

As an Embargo it was a failure, market was integrated (lesson not yet learned by Chavez)

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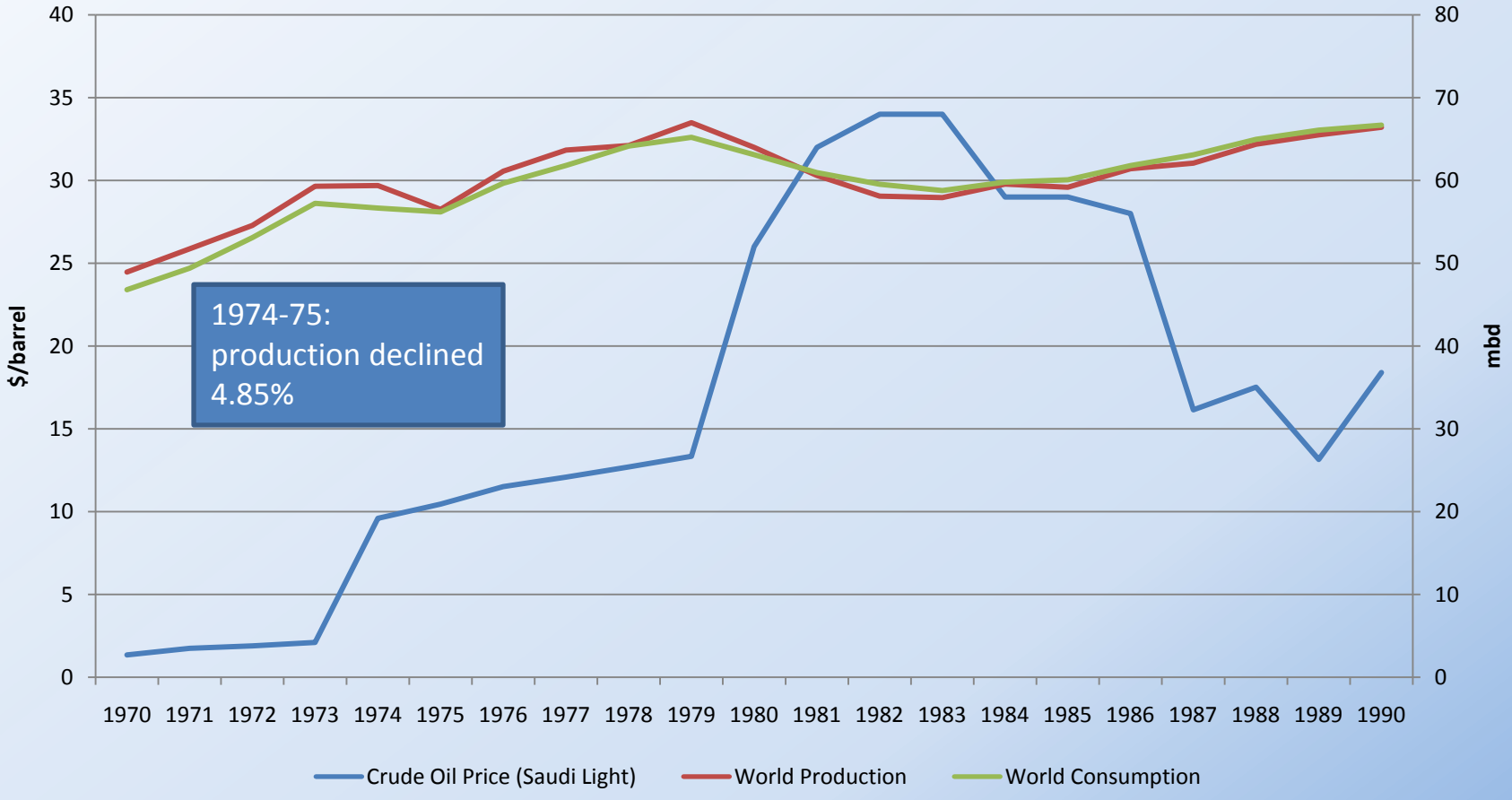
Oil Price, Production, Consumption – 1970 - 1990



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1979 Price Shock

- OIL MARKET WAS NOT FRAGILE, but instead there was a shift in:
  - expectations regarding regional risk; i.e. more risky
  - Prospects for future output from Iran and Iraq were reduced substantially, i.e., access to those reserves would now be delayed

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1986 Price Collapse

- Saudi Arabia abandons role as swing producer at low levels of net demand for SA crude
- Shift in expectations on Saudi decision making within OPEC and as regulator of world oil market
- Sustained reduction in oil use as a percentage of GNP in major Western countries

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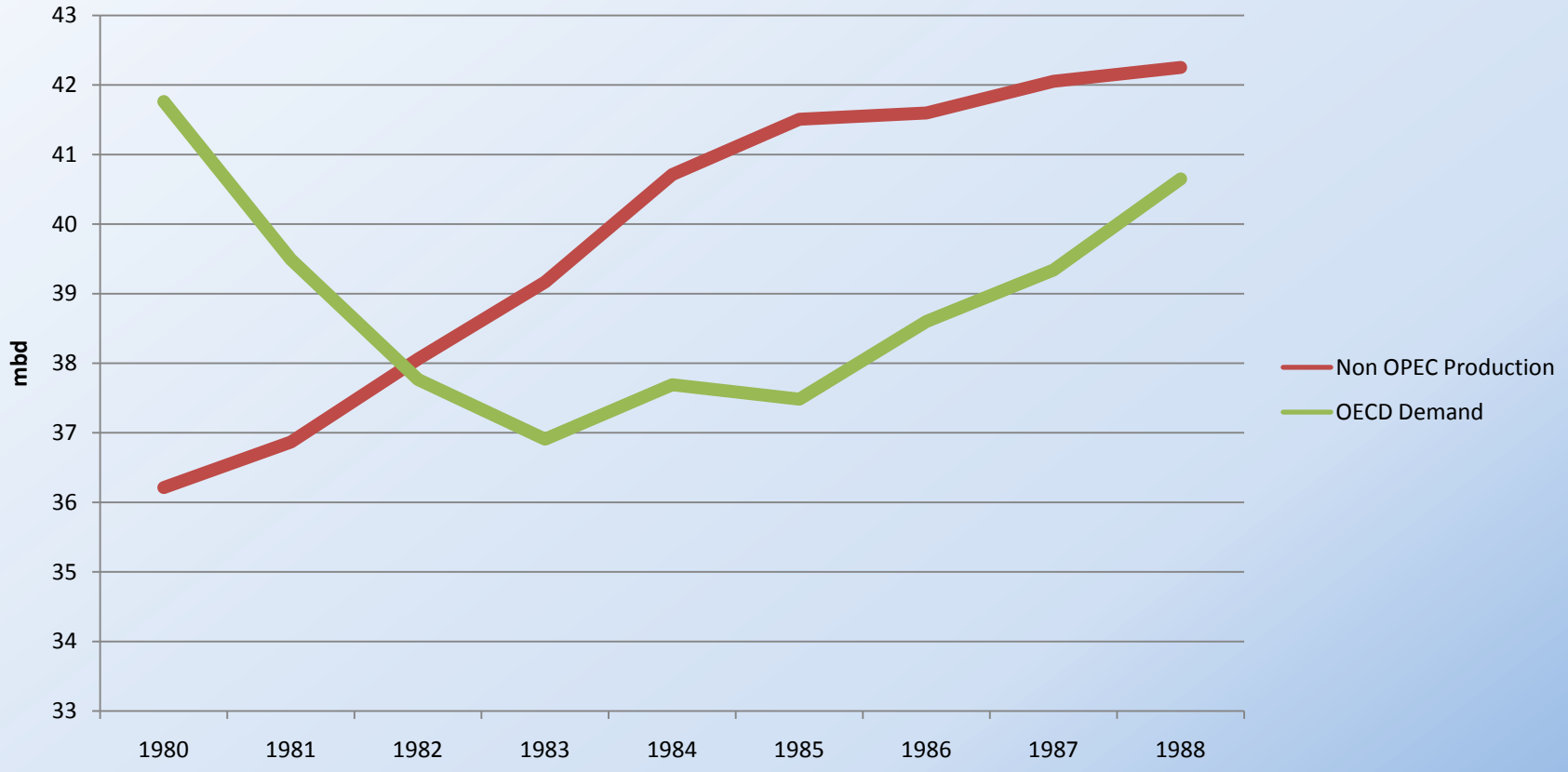
1986 Price Collapse



Source: EIA Data,

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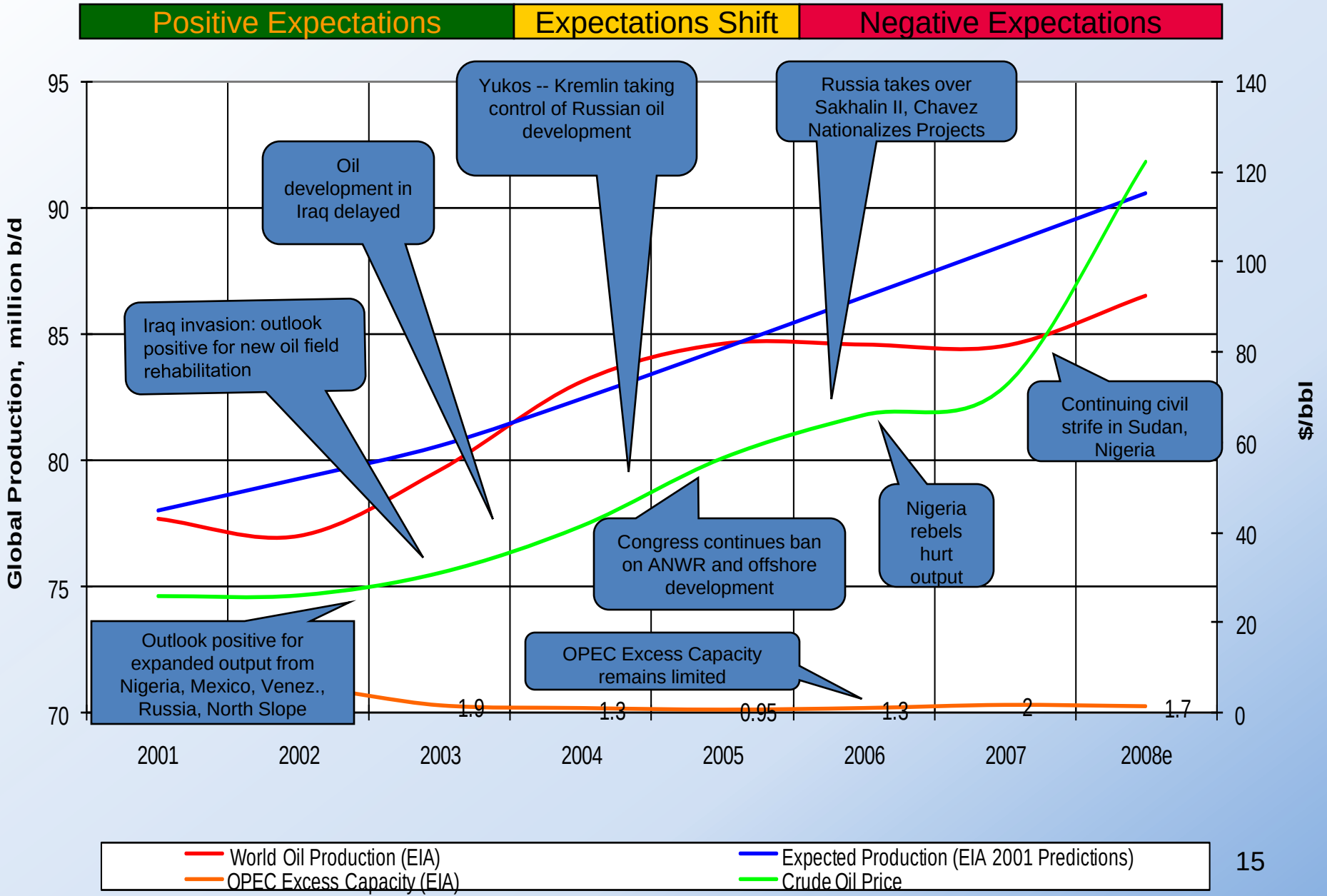
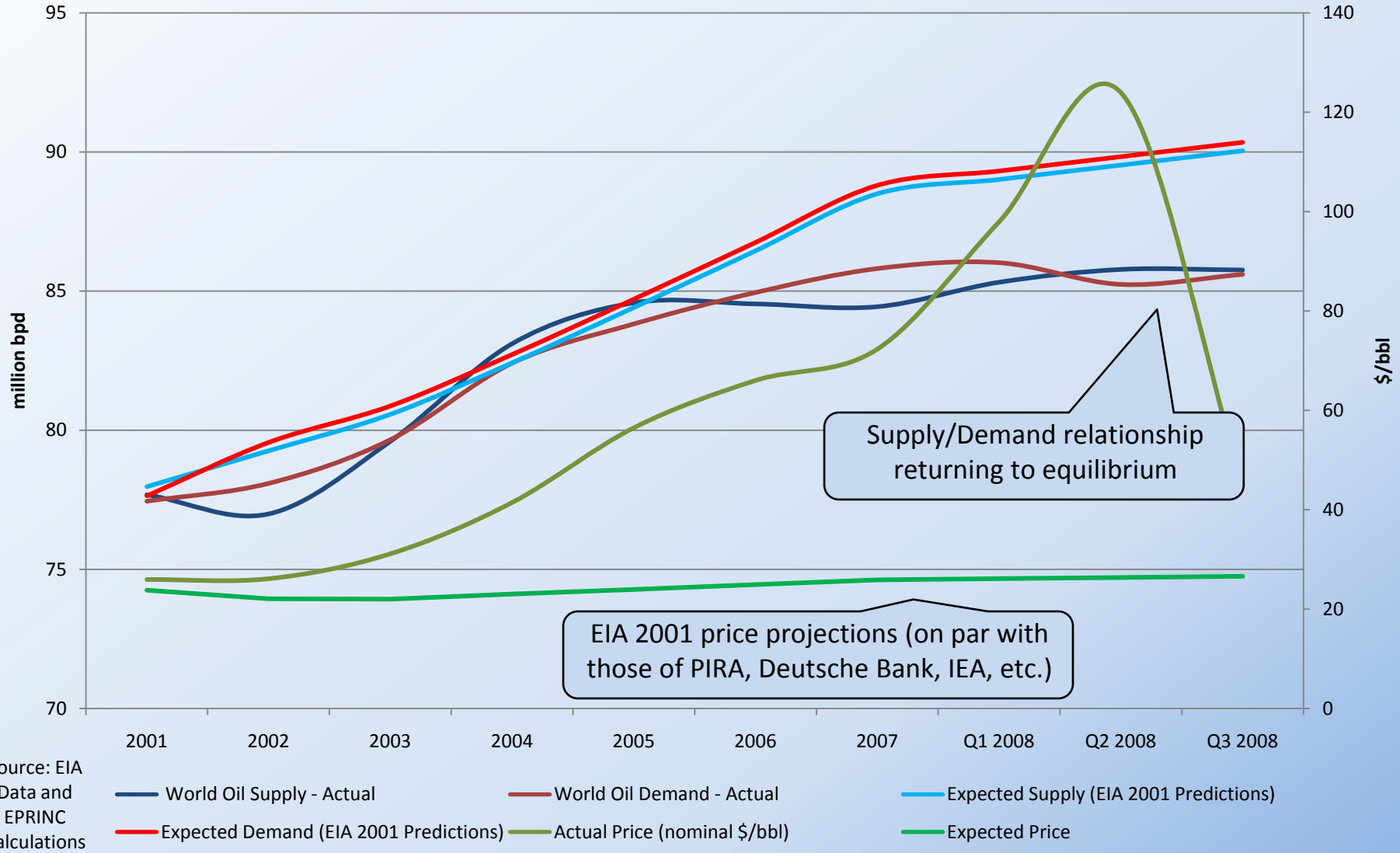
1998 Price Collapse: Six Central Issues

- Asian economic crisis brings a collapse in net demand
- OPEC misreads the oil market
- Warm 1997-98 summers in N. America, Europe, Asia
- Increase in Russian oil exports as Ruble collapses
- Chinese authorities decrease imports in Q4 of 1998
- UN authorizes increase in Iraqi exportation in 1998
- Asian economic crisis brings a collapse in net demand

A Series of Unfortunate Events Leading to New Expectations



Expectations and Reality



Source: EIA Data and EPRINC Calculations

A Series of Unfortunate Events, by country:

Country	Positive Expectations	Negative Events	Lost Production (bpd)
Iraq	Promise of investment in oil sector after war, increased production.	Sustained turmoil drops output below pre-war levels	600,000
Nigeria	4 mbd expected by 2010	Civil strive and attacks on infrastructure, 2005-2007 saw decline to 2.1 mbd	500-700,000
Venezueala	Potential for growth after stagnant production	Nationalization of oil industry, production nosedive	800,000
Russia	Projection seen at 12 mbd by 2010 after privatization of industry brought western influence, $ and new production	Re-nationalization leads to decreased production and investment	200,000
Sudan	Additional proven reserves and access to new fields	Civil strife, attacks on infrastructure, new fields remain inaccessible	200,000-250,000

A Series of Unfortunate Events (cont.)

Argentina	Huge production gains from 1991-2001	Oil industry nationalized in 2004, production and investment dropped	100,000
Kazakhstan	Production from Kashagan was expected to begin in 2005	Technical difficulties with some political disagreements	TBD
US	ANWR was part of Bush's energy policy when he took office in 2000	Currently no access to ANWR or OCS	up to 1,000,000
Canada (Alberta)	Oil sands contain 95% of Canada's 179 billion barrels of reserves	In 2007 new taxes and royalty rates helped to reduce lease sale revenues by 50% compared to 2006	TBD
Mexico	Production expected to reach 4 mbd by 2005	Production in decline since 2004. Cantarell declining and PEMEX needs funding.	500,000 +
Estimated loss of supplies to the world market, 2005-2010:			2.5-4.5 mbd

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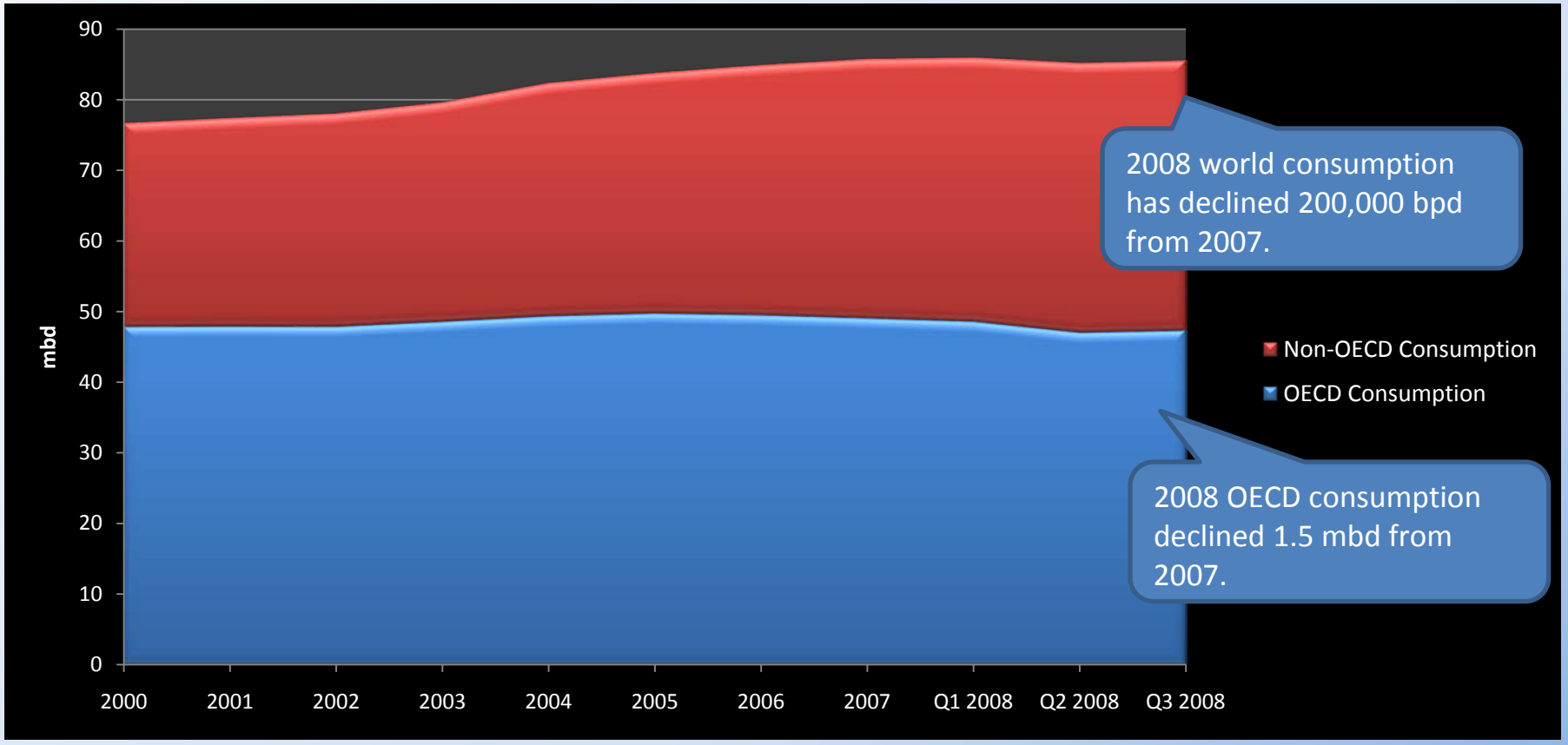
Demand Destruction Worldwide

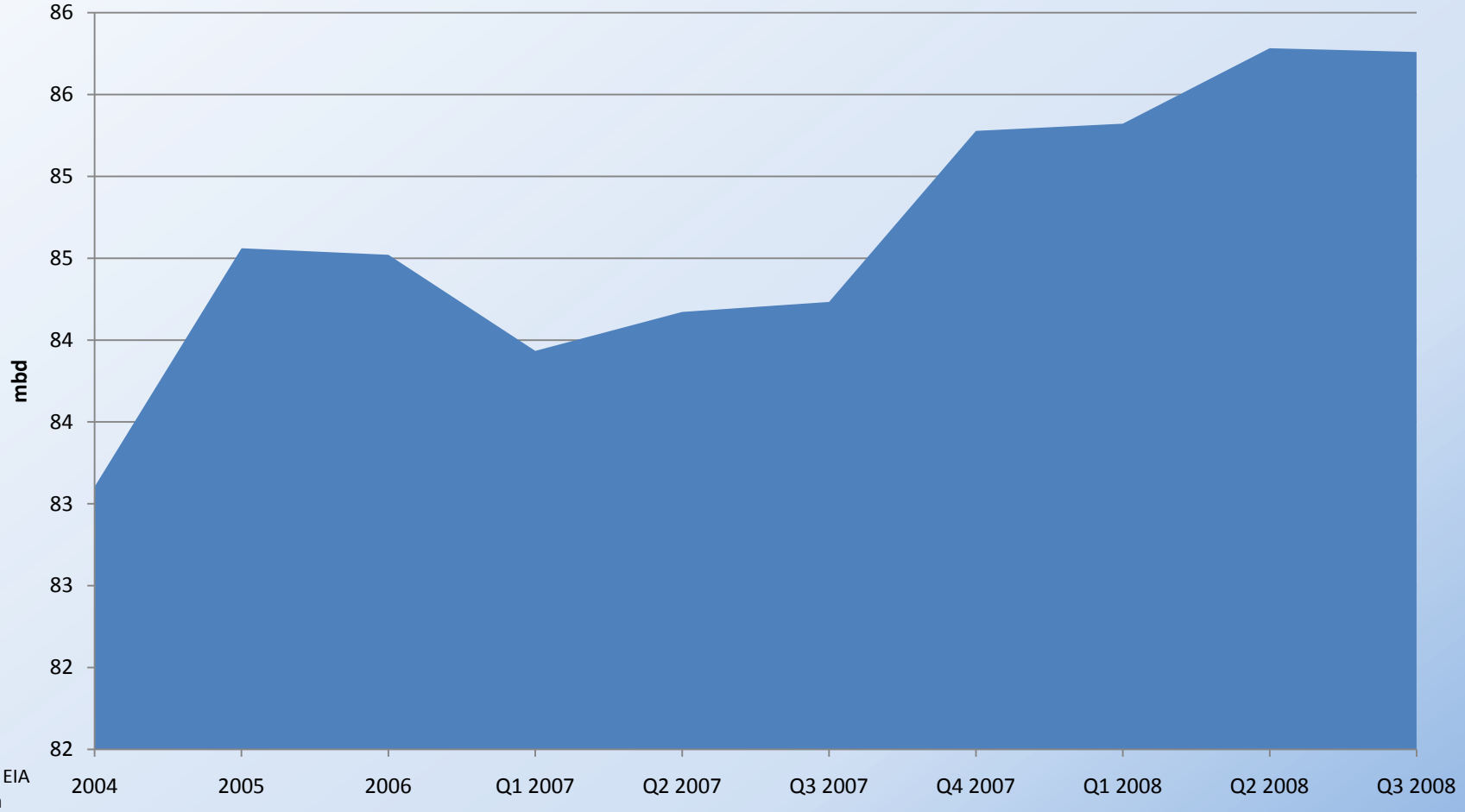
- Global demand down slightly so far this year, OECD decline has been greater than demand growth in non-OECD countries.



Highlights from EIA November STEO

- 2008 consumption to grow by only 100,000 bd
- 2009 consumption to remain flat
  - 2007 – 2009 OECD consumption to drop by 2.2 mbd
  - 2007 – 2009 Non-OECD growth of 2.3 mbd
- Non-OPEC production to grow by 500,000 bd in 2009
  - 450,000 bd growth in the U.S.
- OPEC Surplus Capacity to grow
  - With production cuts and new projects coming online, surplus capacity could reach 4 mbd in 2009 compared to 1.6 mbd in Q2 2008.

World Oil Production - Significant Post-2006 Growth



Source: EIA Data

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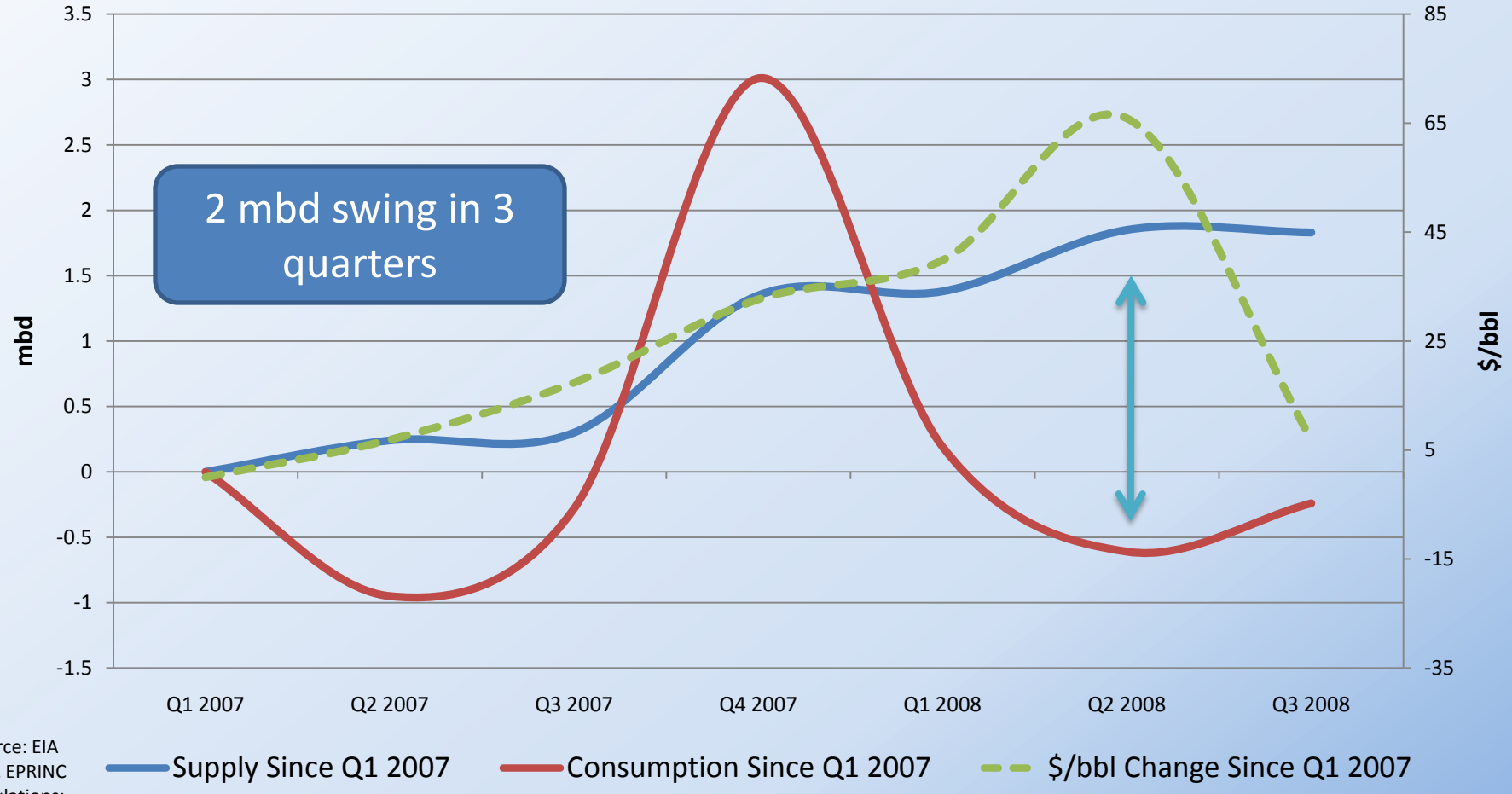
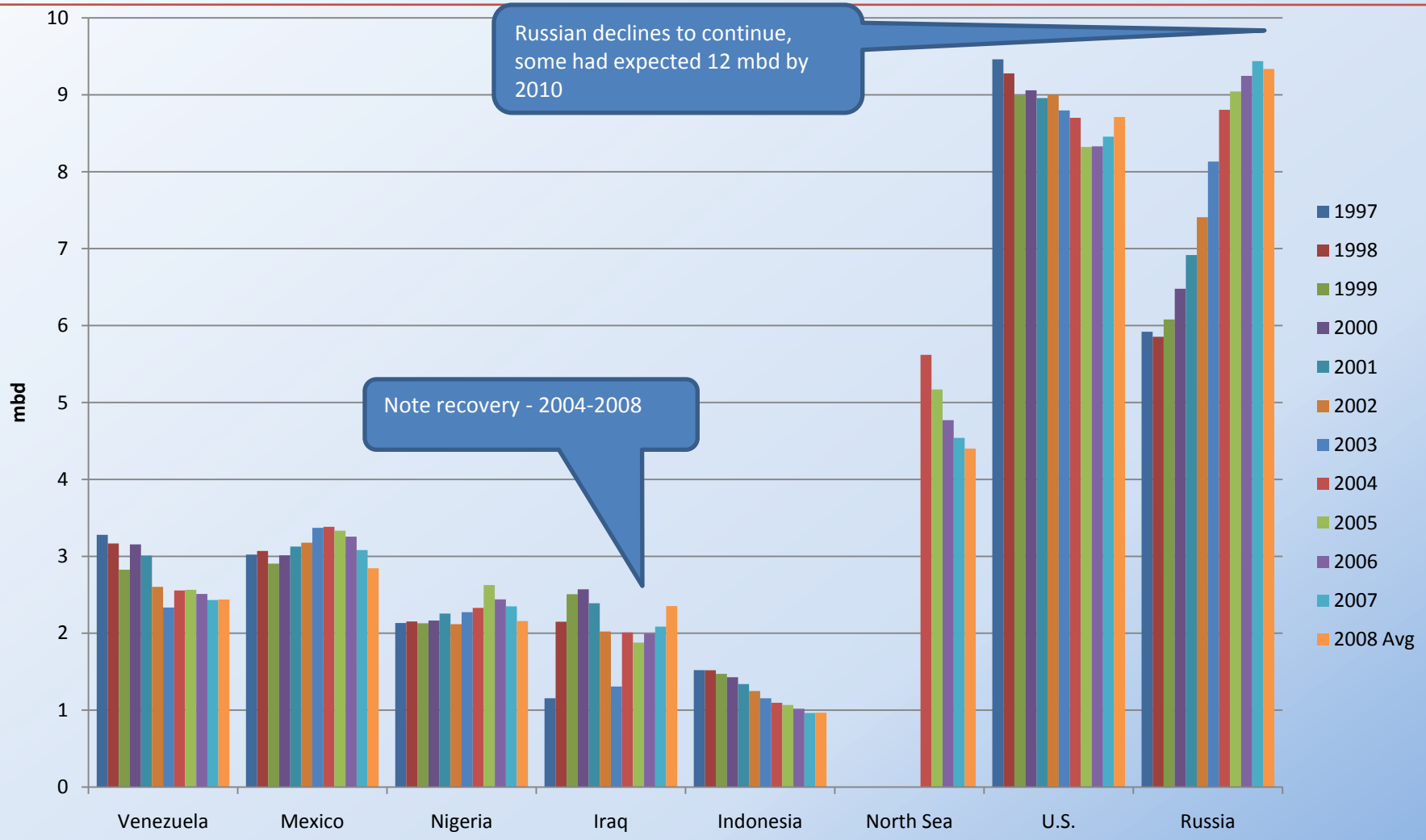
What's Happened Since 2007?

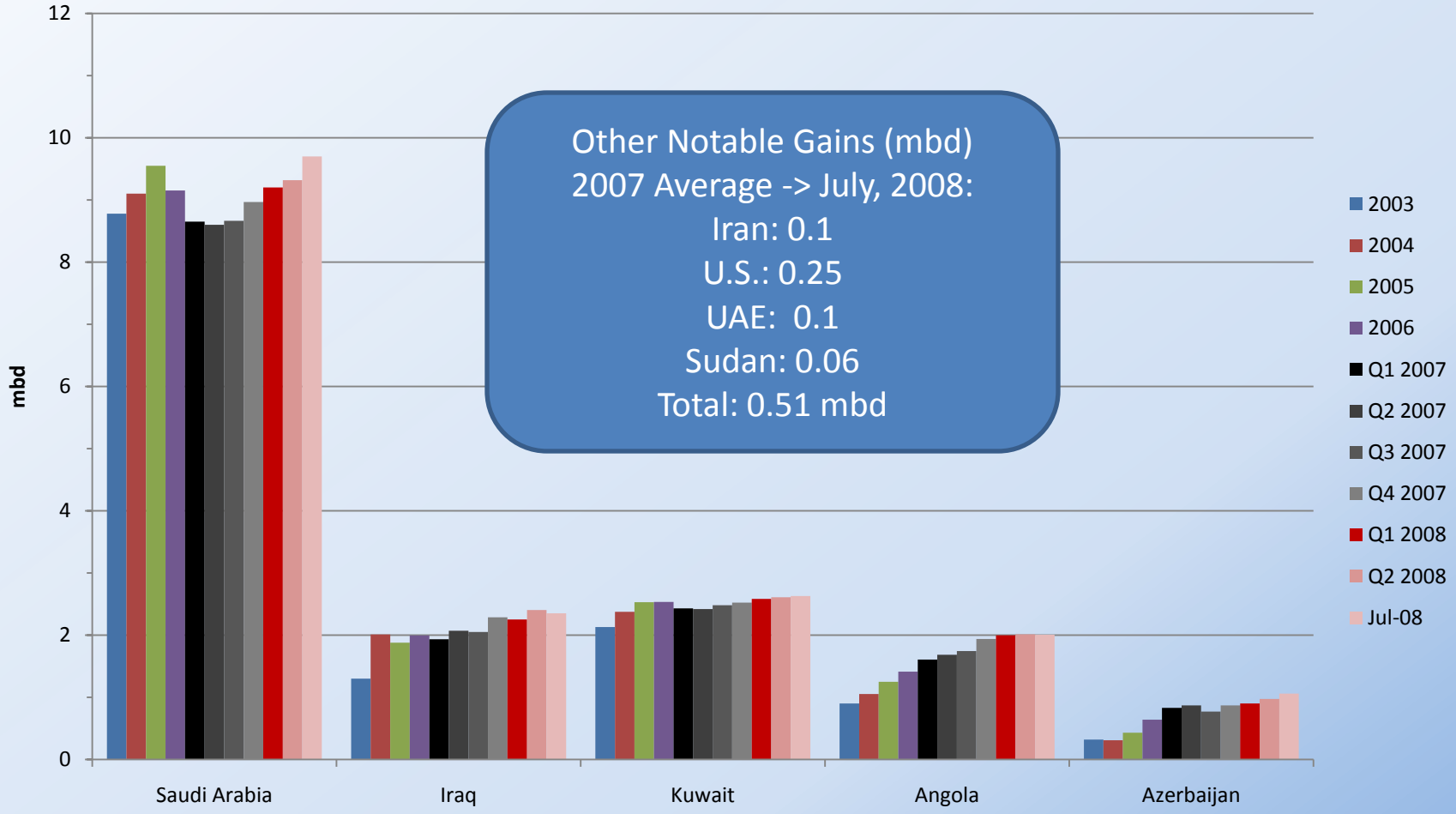


Source: EIA Data, EPRINC Calculations: All Figures Indexed to 2007

Recent Production Declines - 1997-2008



Some Production Bright Spots



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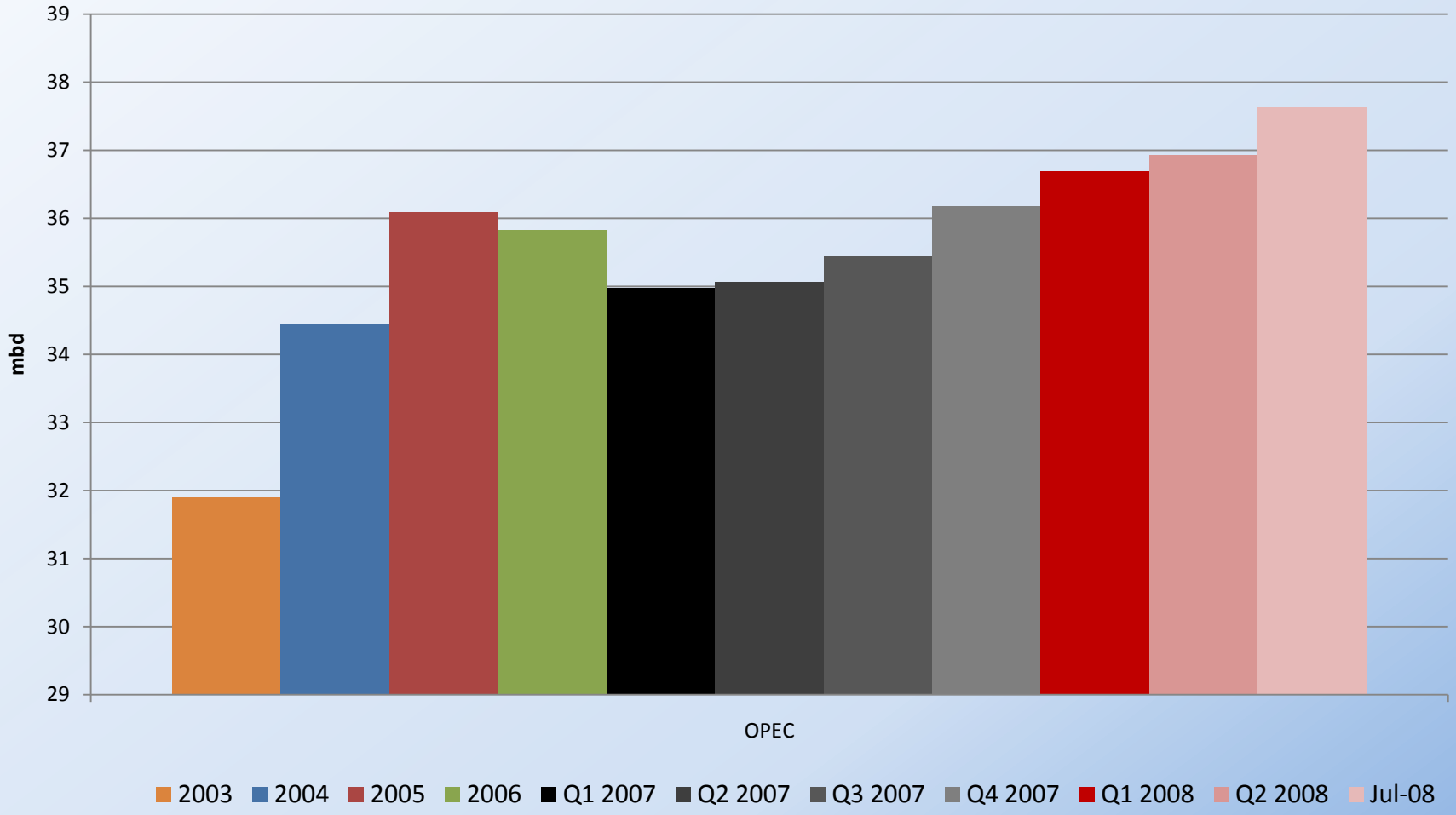
…..Led by OPEC Production



What About Peak Oil

The Wrong Question!!!

The Peak Oil Problem: New Supplies Will Be More Expensive, but We Are Not Running Out of Oil

"One thing is clear: the era of easy oil is over. What we all do next will determine how well we meet the energy needs of the entire world in this century and beyond."

- David J O'Reilly, Chairman & CEO, Chevron Corporation, July 2005

San Joaquin Valley

Testing Hubbard-Method Predictions for Reserves and Production (Billions of Barrels)

	1964	1982	2000
Cumulative Discoveries	7.7	11.8	16.1
Percent Attributable to 1915	49%	69%	76%
Cumulative production as of	8.0-9.5	11.9-12.1	16.1-16.2
Year 2000 production projected in: (mb/d)	44-112	189	597(actual)

Source: EPRINC, October 2006. *Does the Hubbard Method Provide a Reliable Means for Predicting Future Oil Production*, Richard Nehring, October 2006,

Permian Basin

Testing Hubbard-Method Predictions for Reserves and Production (Billions of Barrels)

	1964	1982	2000
Cumulative Discoveries	17.6	27.9	35.2
Percent Attributable to 1950	85%	86%	84%
Cumulative production as of	19-27.5	28.5-30.5	35.8-37.5
Year 2000 production projected in: (mb/d)	162-479	326-479	910(actual)

Source: EPRINC, October 2006. *Does the Hubbard Method Provide a Reliable Means for Predicting Future Oil Production*, Richard Nehring, October 2006,

Real Imported Crude Oil Prices – 1980 - 2008

Source: EIA

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Why You Should Stop Worrying About Peak Oil

- You'll never get the right answer
- Put your effort into something useful, such as the backstop price
- Congress has already decided that any alternative fuel, no matter how expensive, is worth supporting as an alternative to petroleum

ETHANOL

A CAUTIONARY TALE

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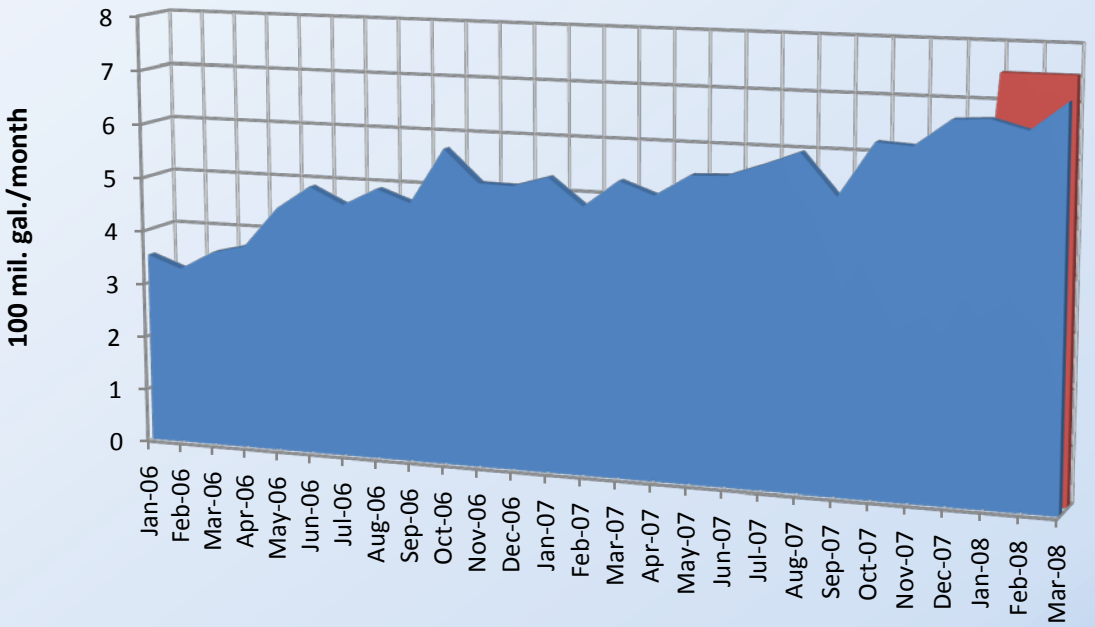
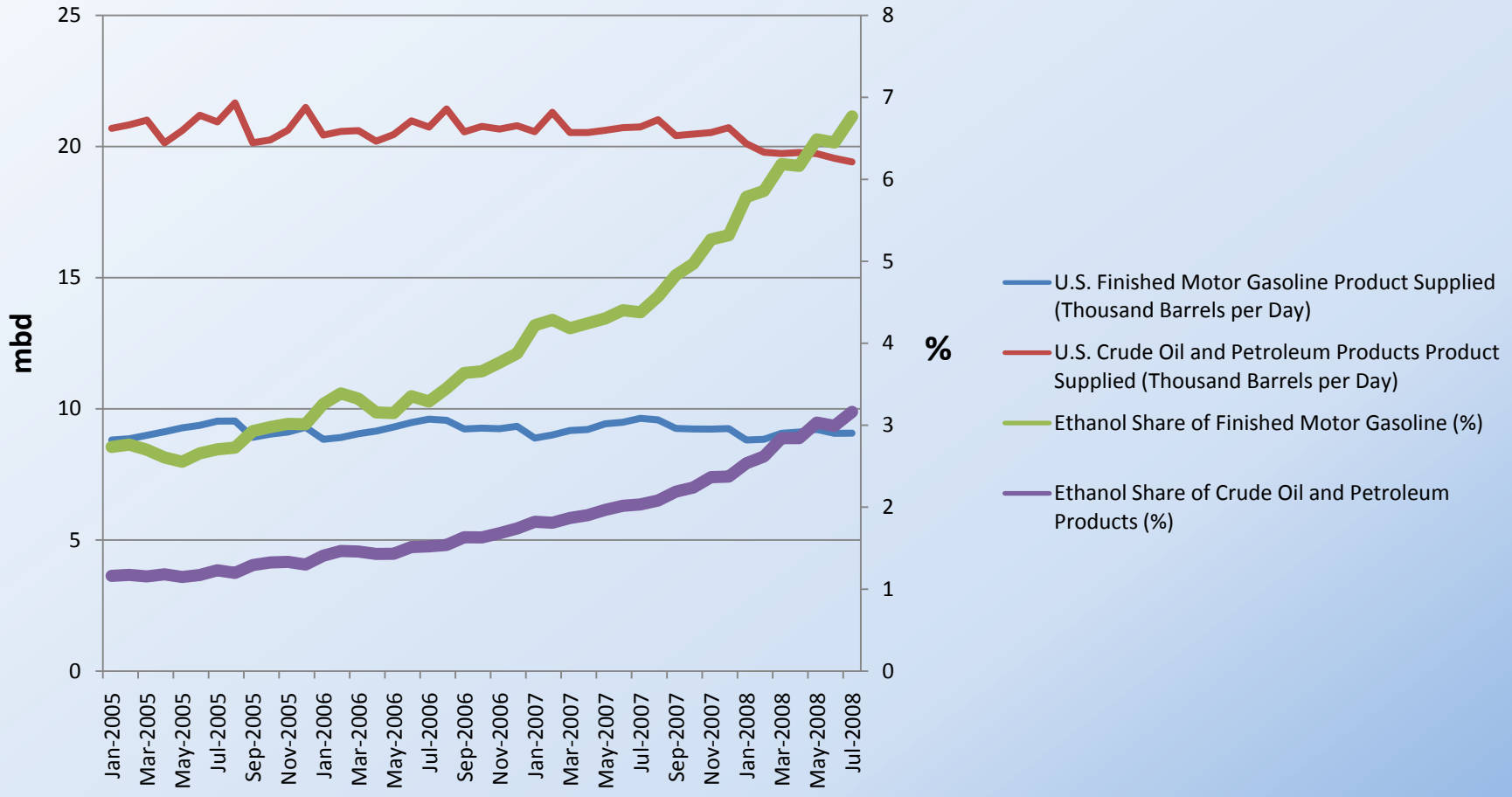
US Ethanol Consumption: 2006 - Present



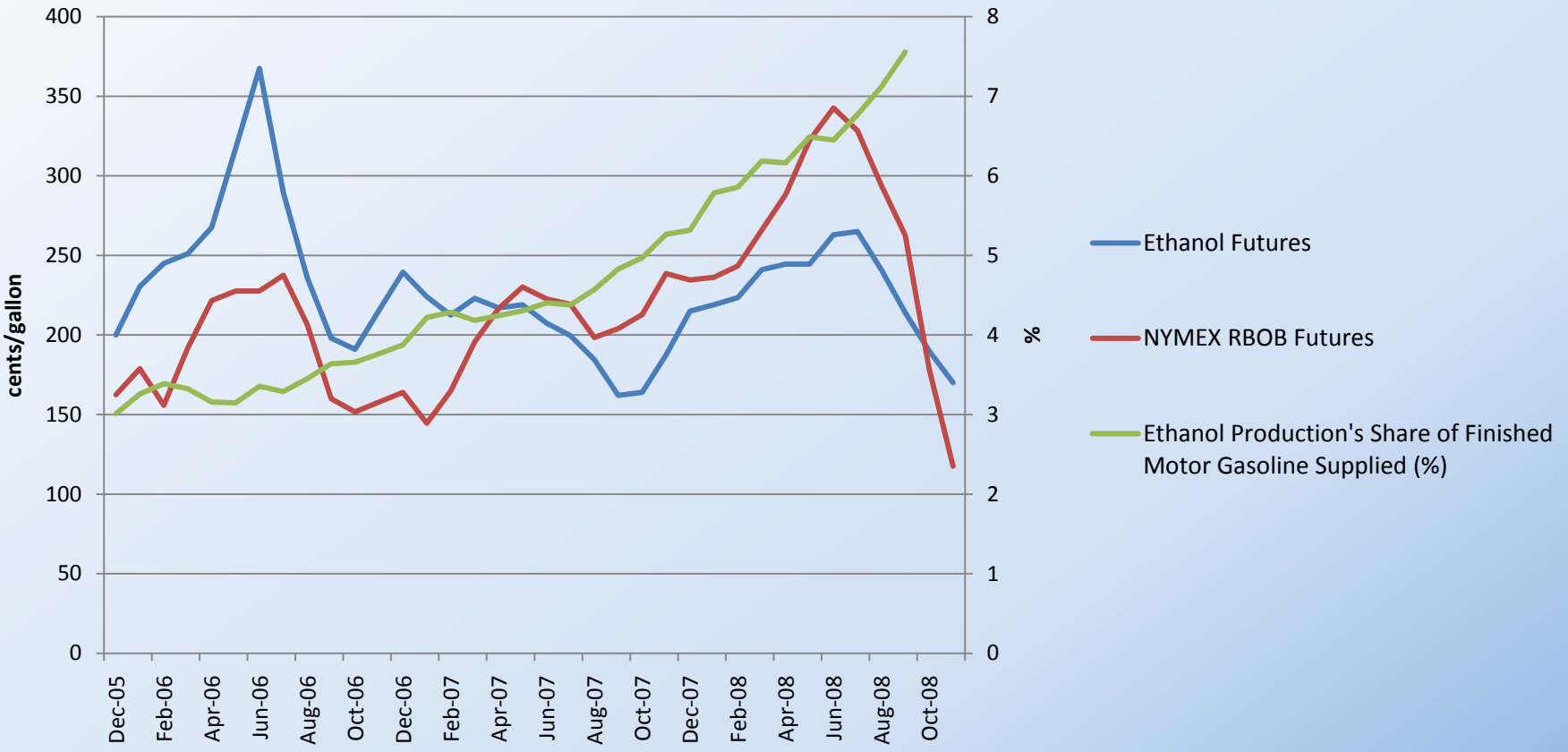
Mandate requirement assumes 750 million gallons per month for 12 months to reach the 9 billion gallon mandate for 2008.

Source: Renewable Fuels Association

Ethanol's Share of Crude Products and Gasoline

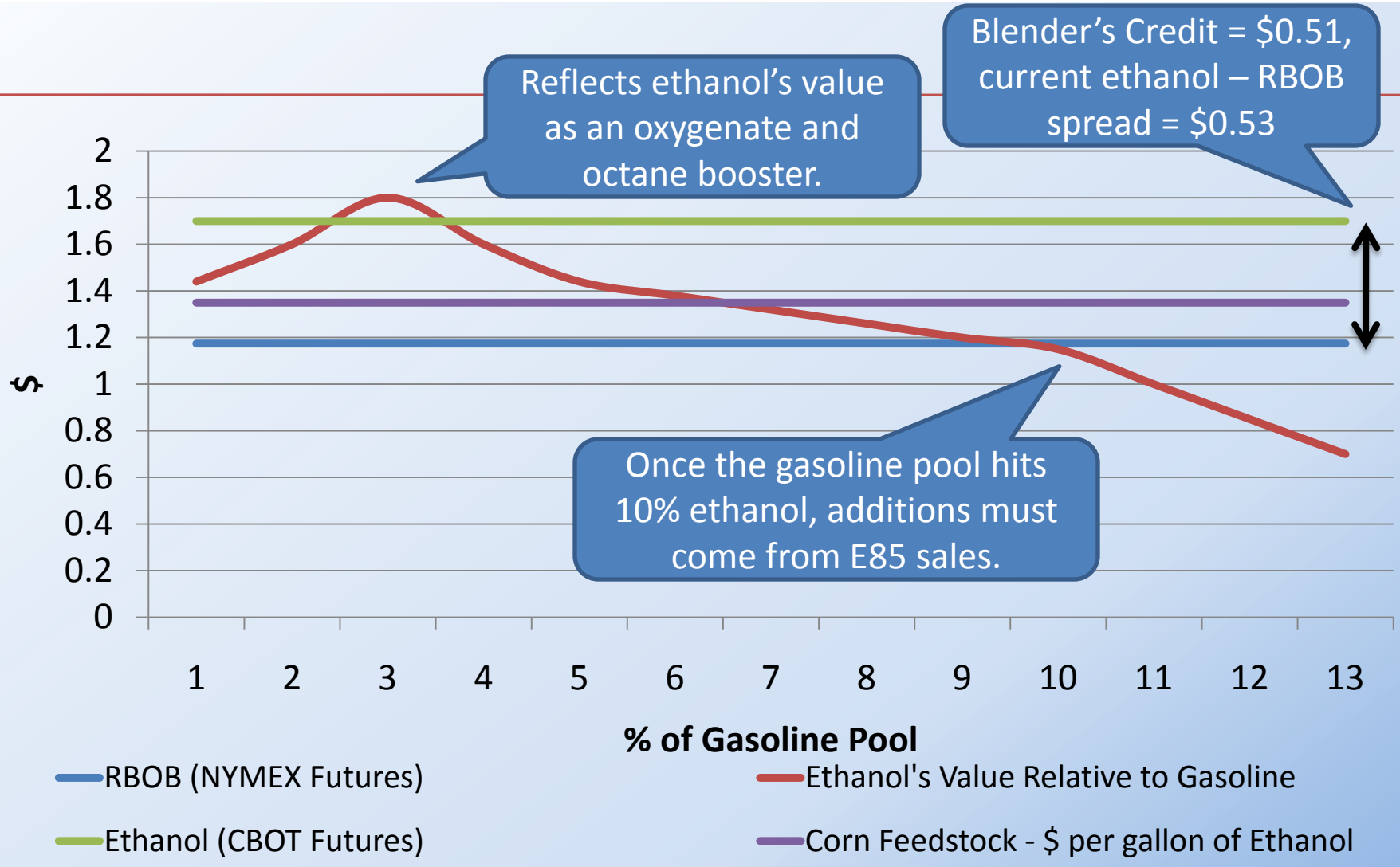


Ethanol and Gasoline



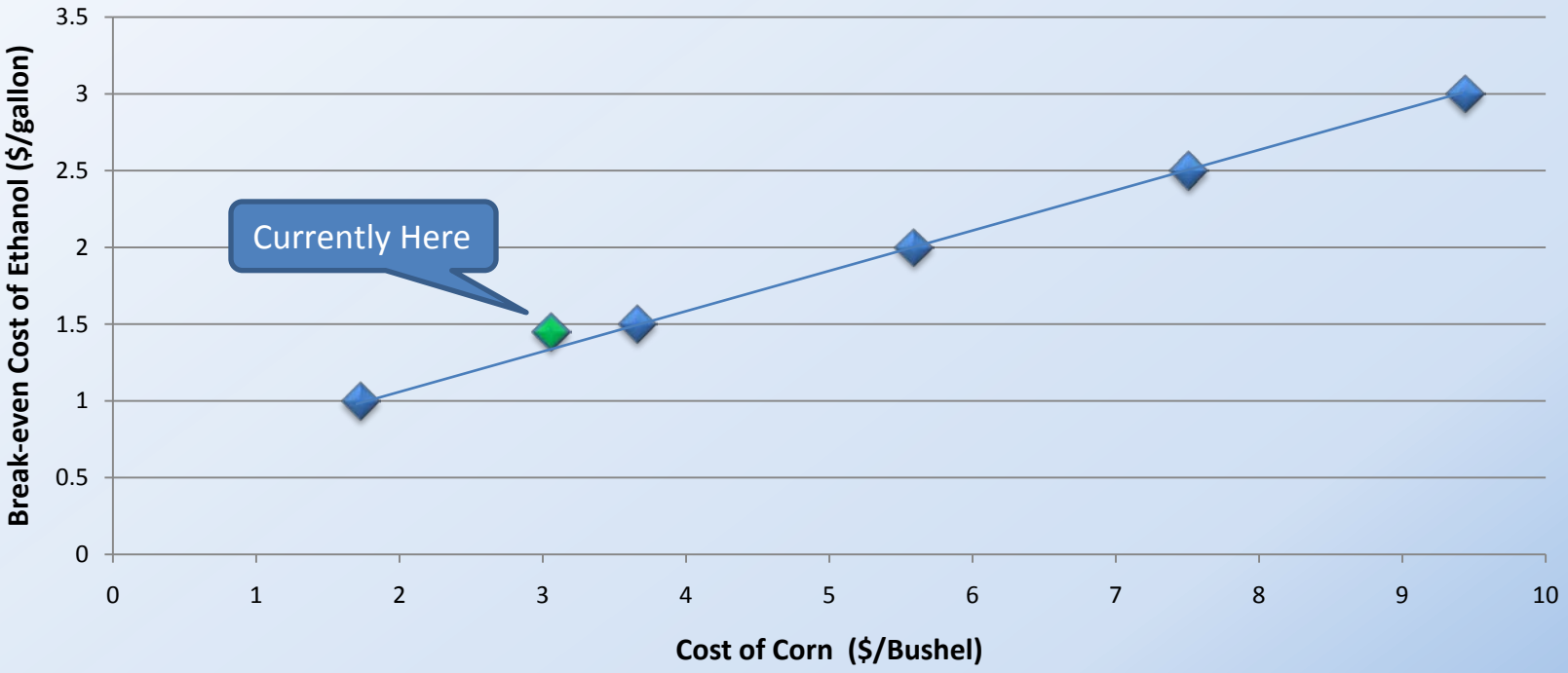
Source: EIA Data, Bloomberg, CME Group, EPRINC Calculations

The Cost of Ethanol and the Gasoline Pool



Source: Bloomberg, CBOT. Futures prices for front month contracts as of November 17, 2008.

Ability of Ethanol Producers to Pay for Corn



Break-even point represents break-even for short-term operating costs, not capital costs.

Source: CBOT, *Iowa Ag Review* – Iowa State

Cost of Ethanol Subsidies

- $7 billion per year (Economist, 2007)
  - About $1.90/gallon.
  - More than 200 types of subsidies
    - $11.2bn+ since 2005 on tax breaks for companies that blend ethanol into petrol (Financial Times)
    - Billions of dollars of subsidies for ethanol producers
  - Tariff on ethanol imports
    - Aimed at preventing imports from Brazil
    - 54 cents/gallon

Source: The Economist, Financial Times

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U.S. Retail Prices: Gasoline vs. Diesel 2006 - 2008

Source: http://tonto.eia.doe.gov/dnav/pet/pet_pri_gnd_dcus_nus_w.htm

Synfuels Corp

- Synthetic Fuels Corp. (SFC) - 1979
  - Use coal to produce 2 mbdoe by 1992
  - New jobs and revenues expected, "The new Office of Coal Commerce in the Illinois Department of Commerce and Community Affairs calculates that every 4 million tons' annual increase in coal output creates 4,013 new jobs, producing a $76 million annual increase in personal income in the state, $6.7 million of which ends up in state and local tax coffers."
  - Cost would be $88 billion over 10 years, partially funded by a windfall profits tax on oil companies.
  - Reagan eventually ended the project in 1986 as oil prices collapsed.

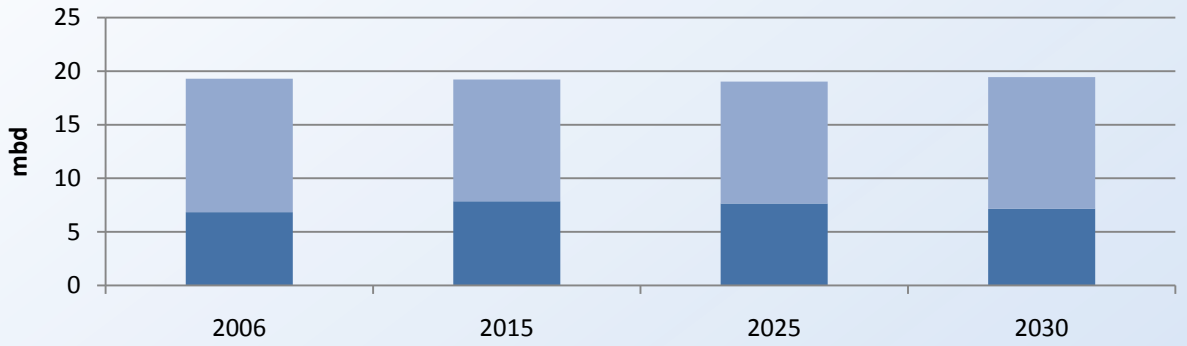
Source: *Illinois Issues,* University of Illinois, 1982.
http://www.lib.niu.edu/1982/ii820420.html

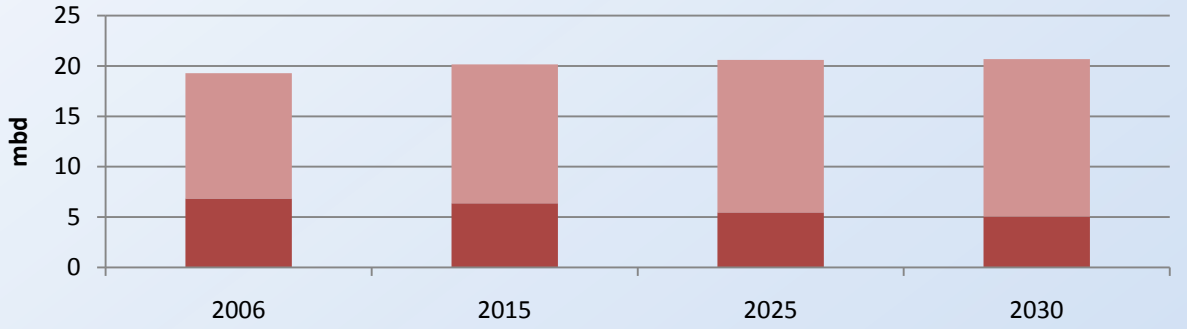
TIME Magazine

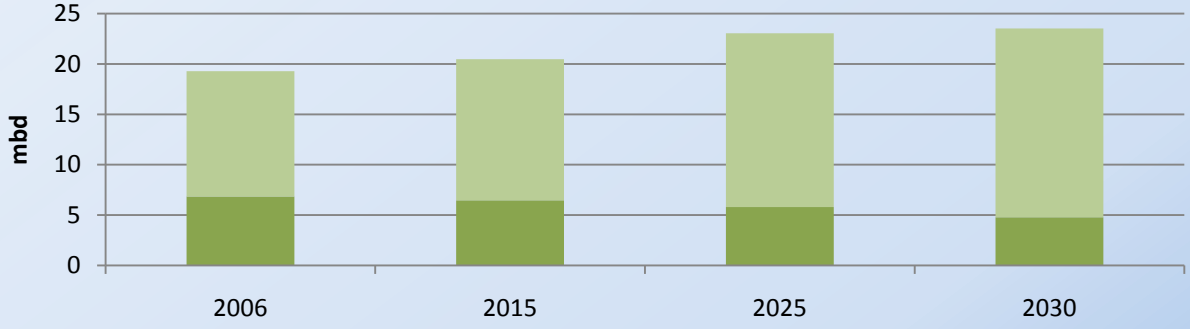
SHOULD WE DRILL FOR OIL*

**AKA, BIG OIL SHOULD USE IT OR LOSE IT*

A Future of Imports…





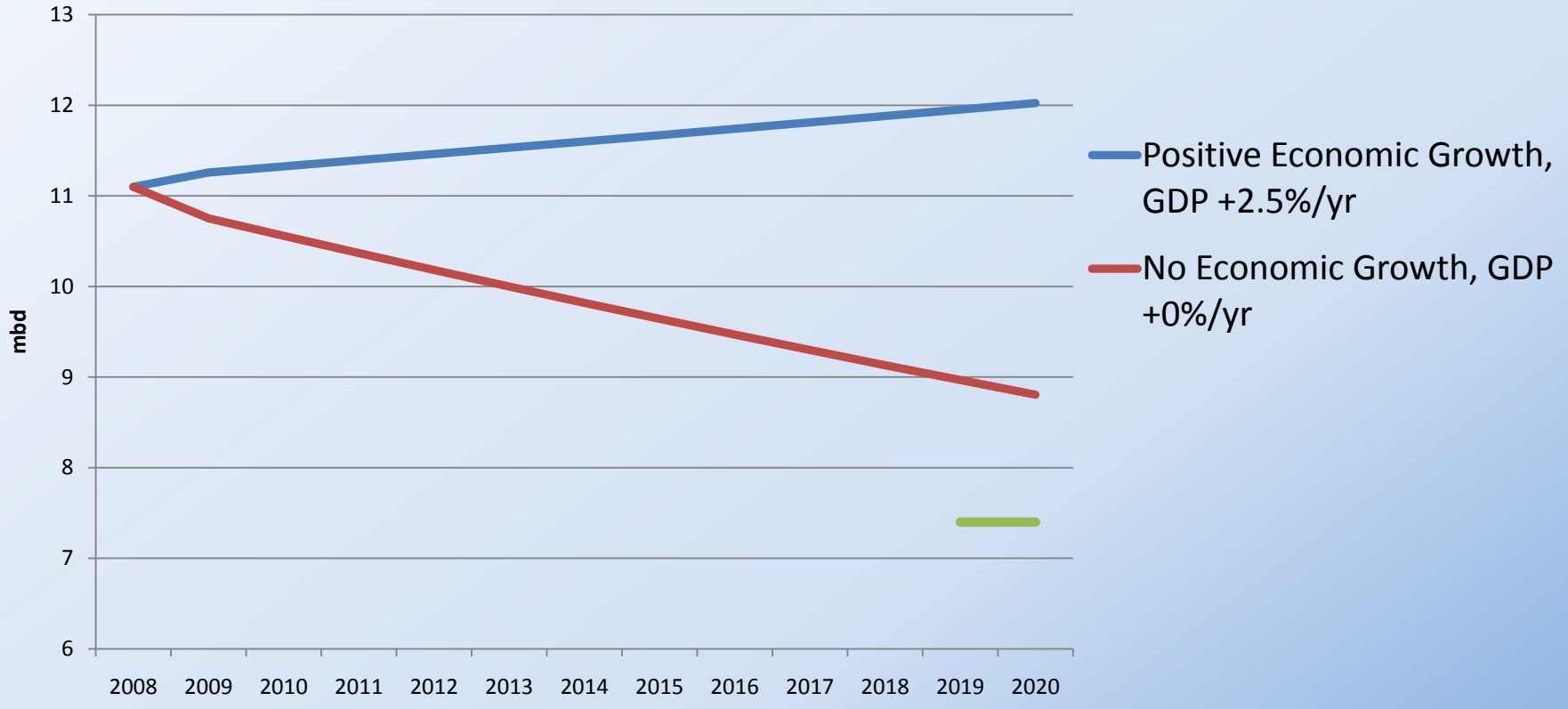


All estimates from the EIA's 2008 Annual Energy Outlook. EIA estimates assume EISA2007 biofuel production levels are met.

U.S. Crude Oil Net Imports

Worst-Case Economic Scenario: 0% Annual GDP Growth Through 2020

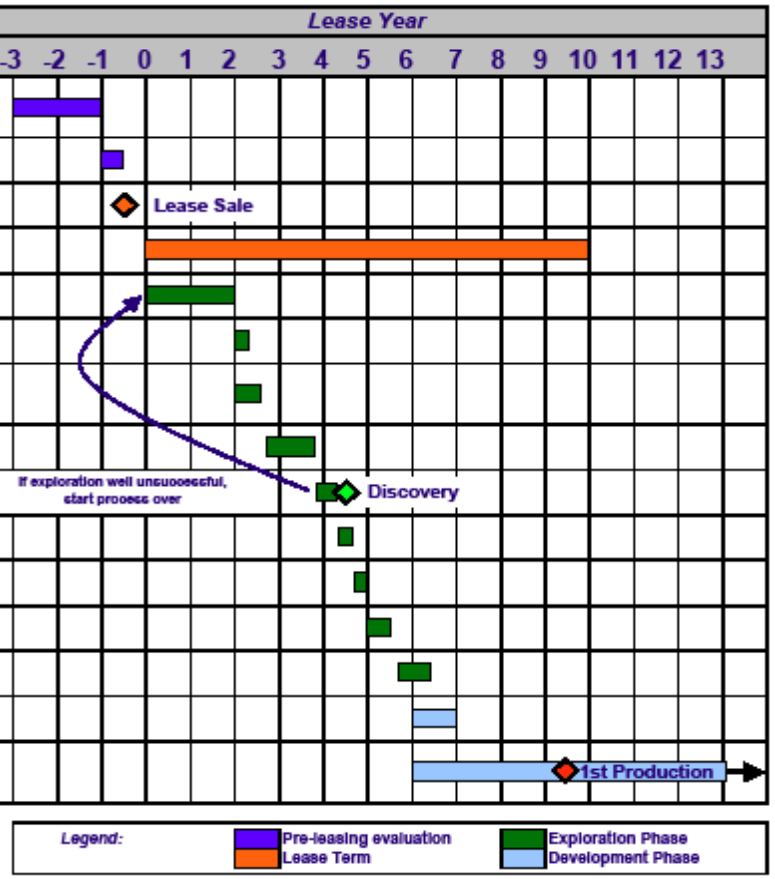
With Crude Oil Prices Rising 3% Annually



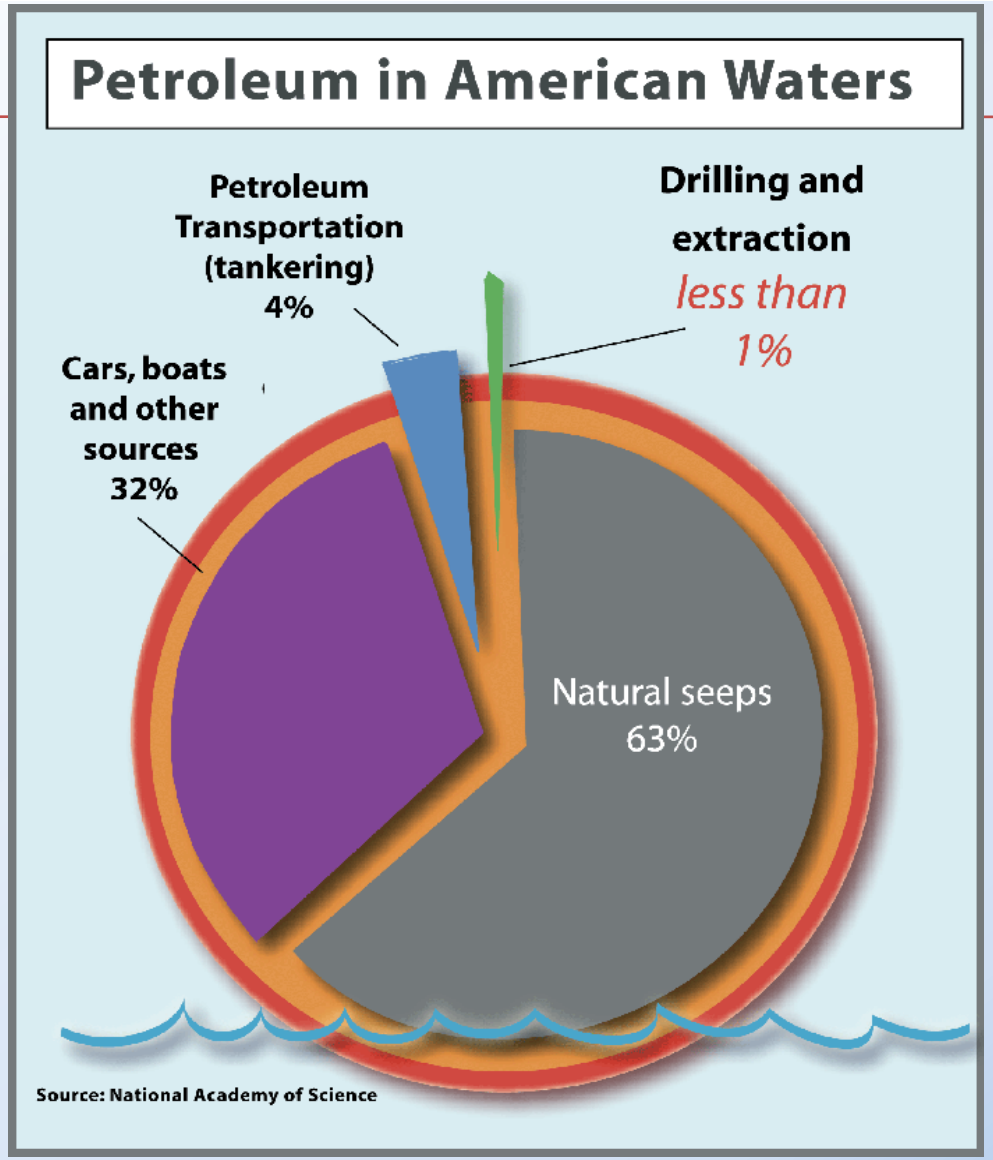
Gulf of Mexico Deepwater Frontier Exploration and Production Timeline

Individual Prospect: 5,000' Water Depth, 30,000' Drilling Depth

Cost (millions)	Cumulative Cost (millions)	Activity
$1-5	$1-5	Acquire 2D and 3D seismic and evaluate geological, geophysical and engineering data to identify leads/drilling ideas.
		Prepare bids for lease sale.
$10-200	$11-205	Lease sale - sealed competitive bidding process.
$1-2	$12-207	High bid leasee awarded (10 year term). Cumulative annual lease rentals.
$5-10	$17-217	Acquire and interpret 3D and other data to turn ideas into drillable prospects.
		Find partners to share costs to drill exploratory well.
		Perform shallow hazard, archeological and other regulatory permitting requirements to obtain Federal approval to drill.
		Contract a rig to drill.
$100-150	$117-367	Drill exploration well.
$40-60	$157-427	Drill sidetrack to exploration well.
		Evaluate results.
$100-300	$257-727	If encouraging, drill appraisal/delineation well(s) and sidetrack(s).
		Evaluate well results, formulate plan of development for discovery.
		Prepare and file permits for development, wait for approvals.
$1,000-5,000	$1,300-5,700	Sanction commerciality, build and install facility, drill and complete producing wells to achieve production.



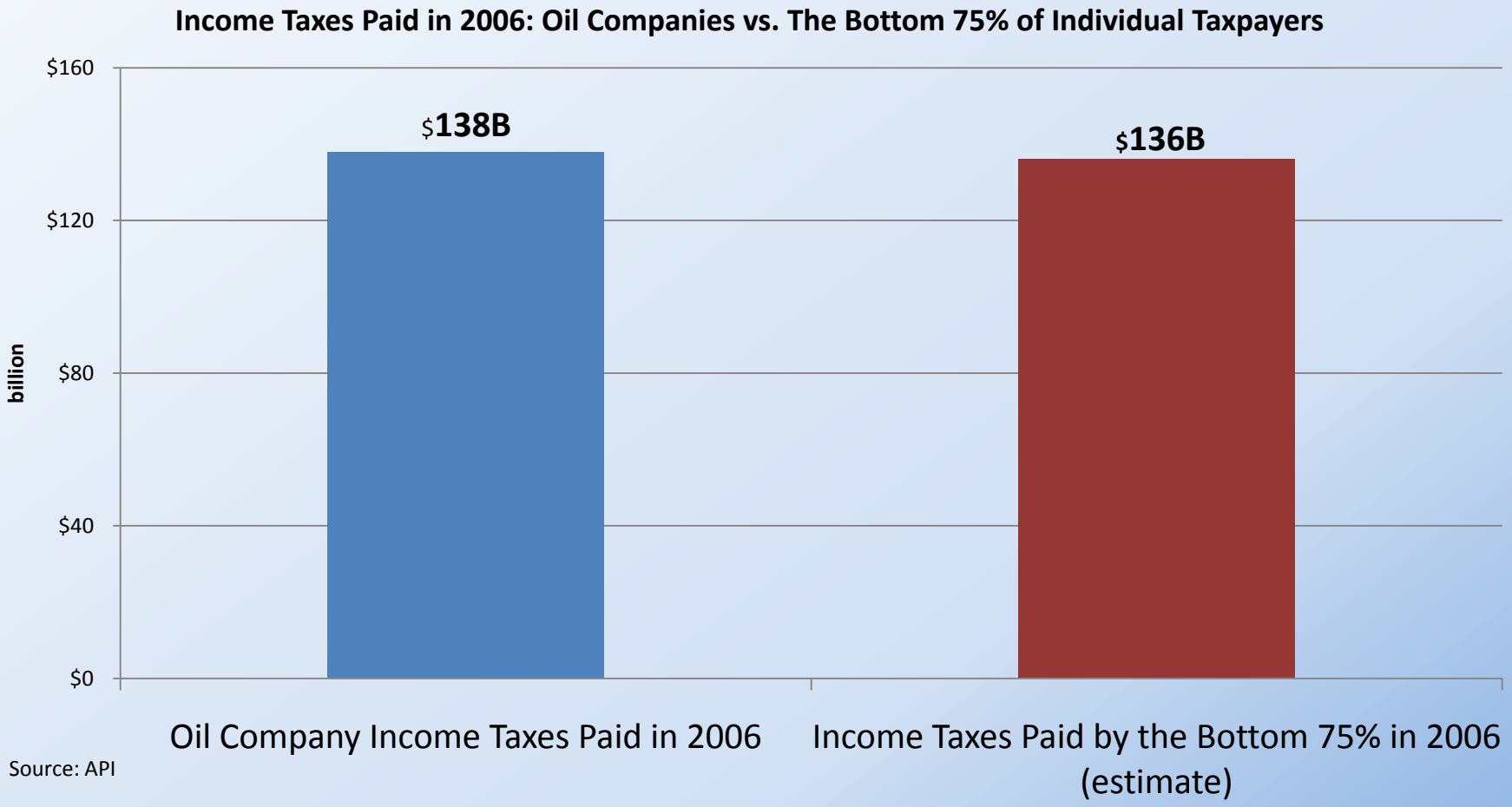
National Academies Study on Oil in the Sea



Highlights from ***Oil in the Sea III (2003)***

- "Operational discharges from vessels in general and tankers in particular have substantially declined over the last 25 years.
- Only 1 percent of the oil discharges in North American waters is related to the extraction of petroleum.
- Although large quantities of VOC (volatile organic compounds) are emitted from tankers and production platforms, these consist of mostly lighter compounds and only small amounts deposit to the sea surface."

Oil's Tax Bill



Source: API

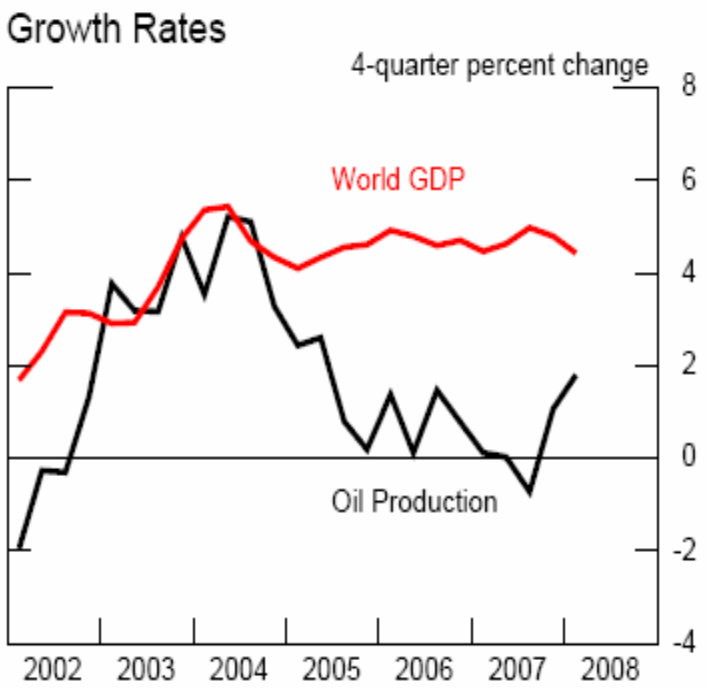
U.S. Gov't Revenues from Leases

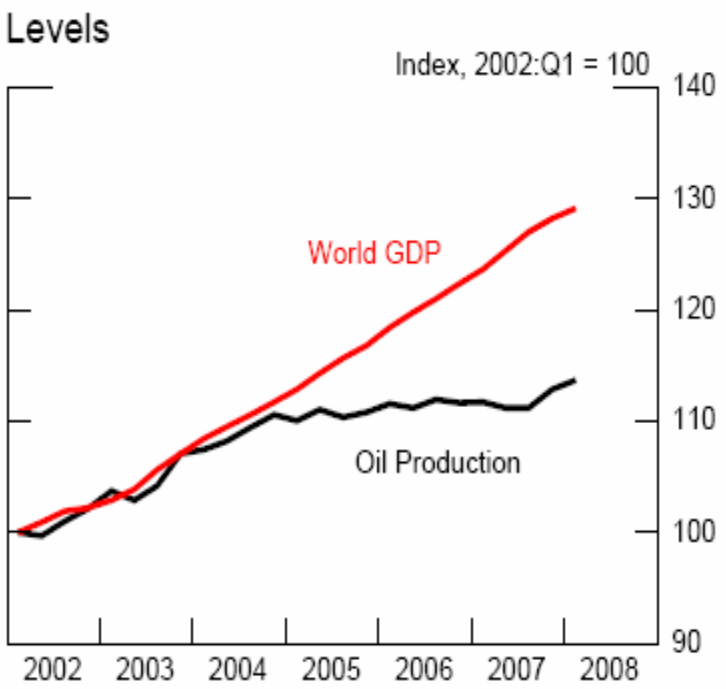
- FY2008 – "Minerals Management Service had distributed a record $23.4 billion to state, American Indian and federal accounts from onshore and offshore energy production"
  - $10 billion from bonus bid payments from lease sales
  - $17.3 billion went to the U.S. Treasury
- 2007 - $11.6 billion
- 2006 - $12.8 billion

Source: MMS, http://www.mms.gov/ooc/press/2008/pressDOI1120.htm

Are We Using Too Much Oil?

World GDP vs. Oil Production

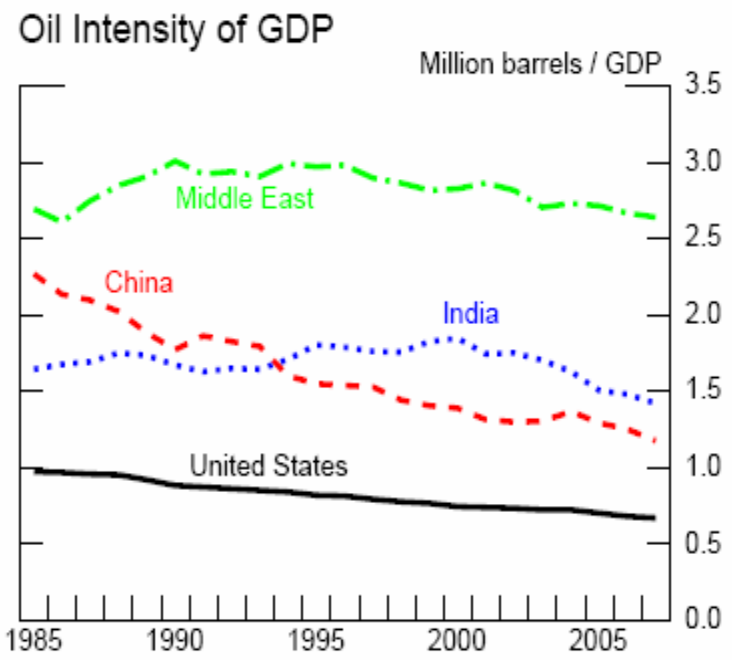


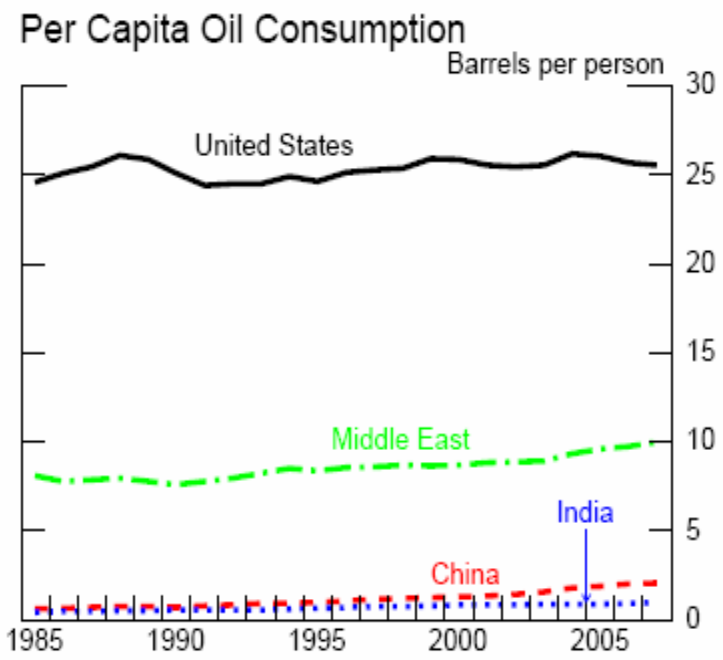


Source: Federal Reserve Board and International Energy Agency. World GDP aggregate weighted by world oil consumption shares.

Source: CFTC Interim Report on Crude Oil, June 2008

Oil Intensity of GDP

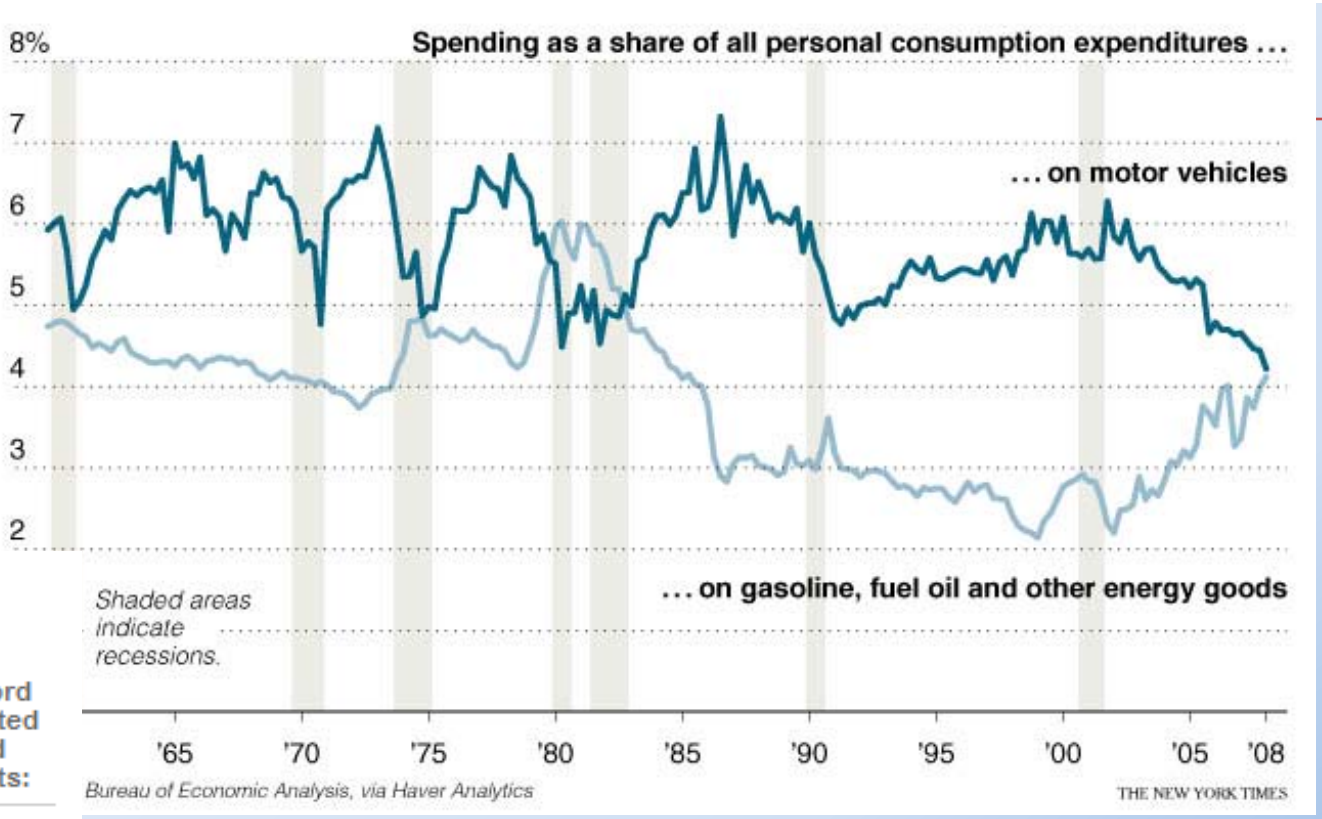




Source: International Monetary Fund and International Energy Agency. GDP is real GDP for each country in billions of 2000 U.S. dollars.

Source: CFTC Interim Report on Crude Oil, June 2008

Cost to consumers…..



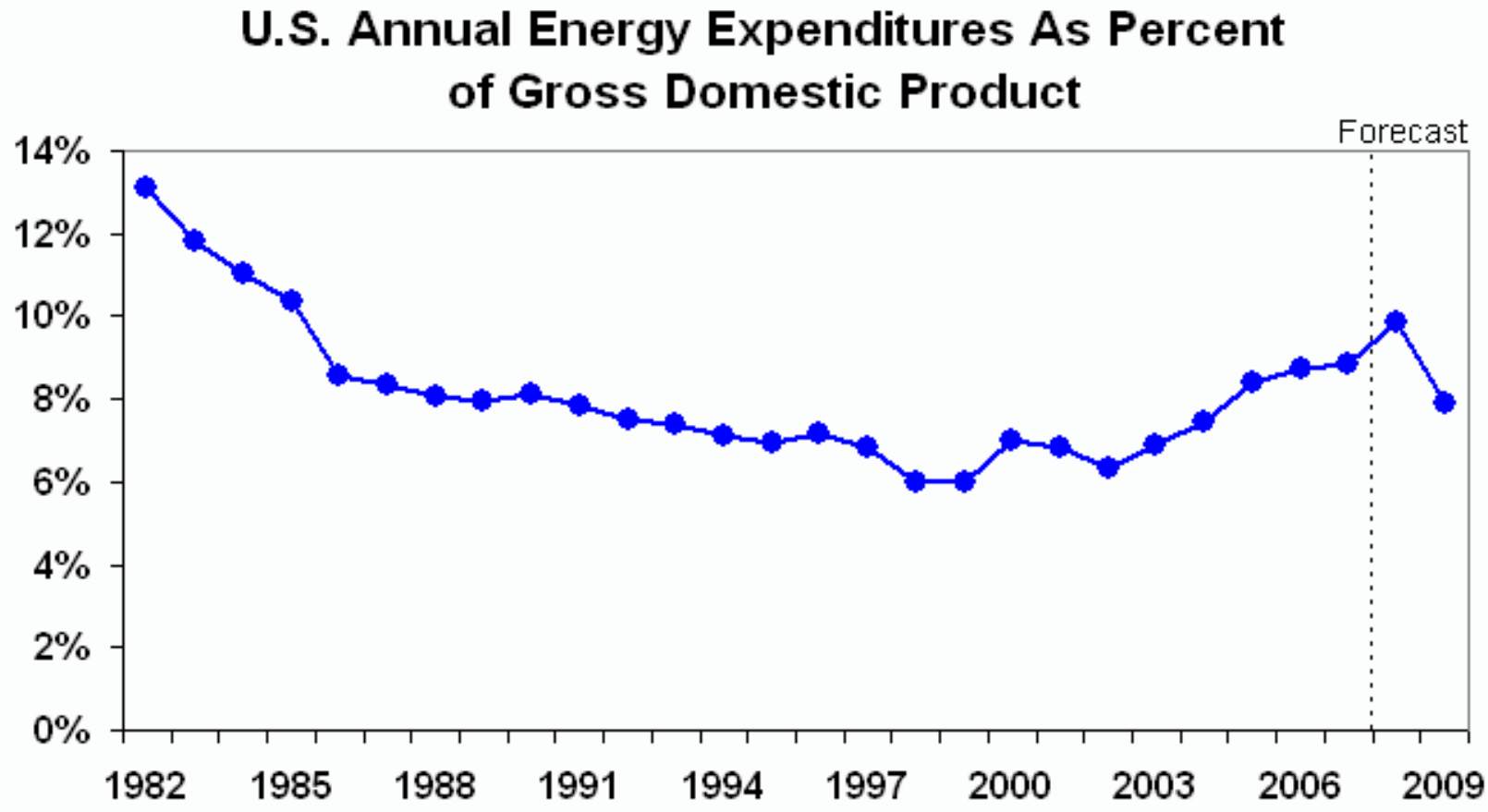
PAYING MORE FOR HEAT

Consumers are expected to pay record prices for heating this winter. Projected average household expenditures and percentage change from 2007-08 costs:

Expenditures	Change
Heating oil $2,644	▲ 36.3%
Natural gas $1,059	▲ 23.8%
Electricity $939	▲ 9.4%

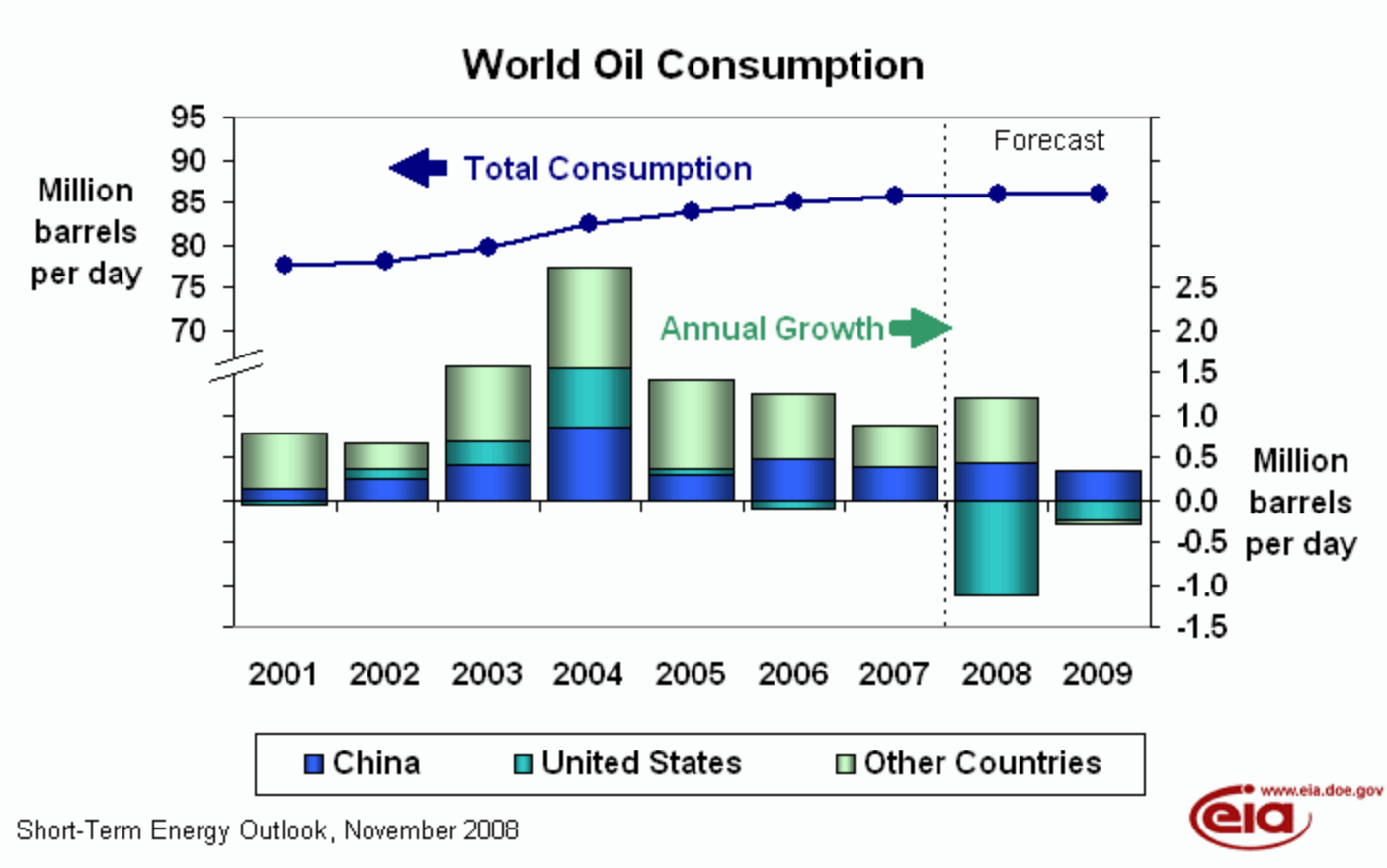
Source: Energy Information Administration

Source: New York Times, USA Today

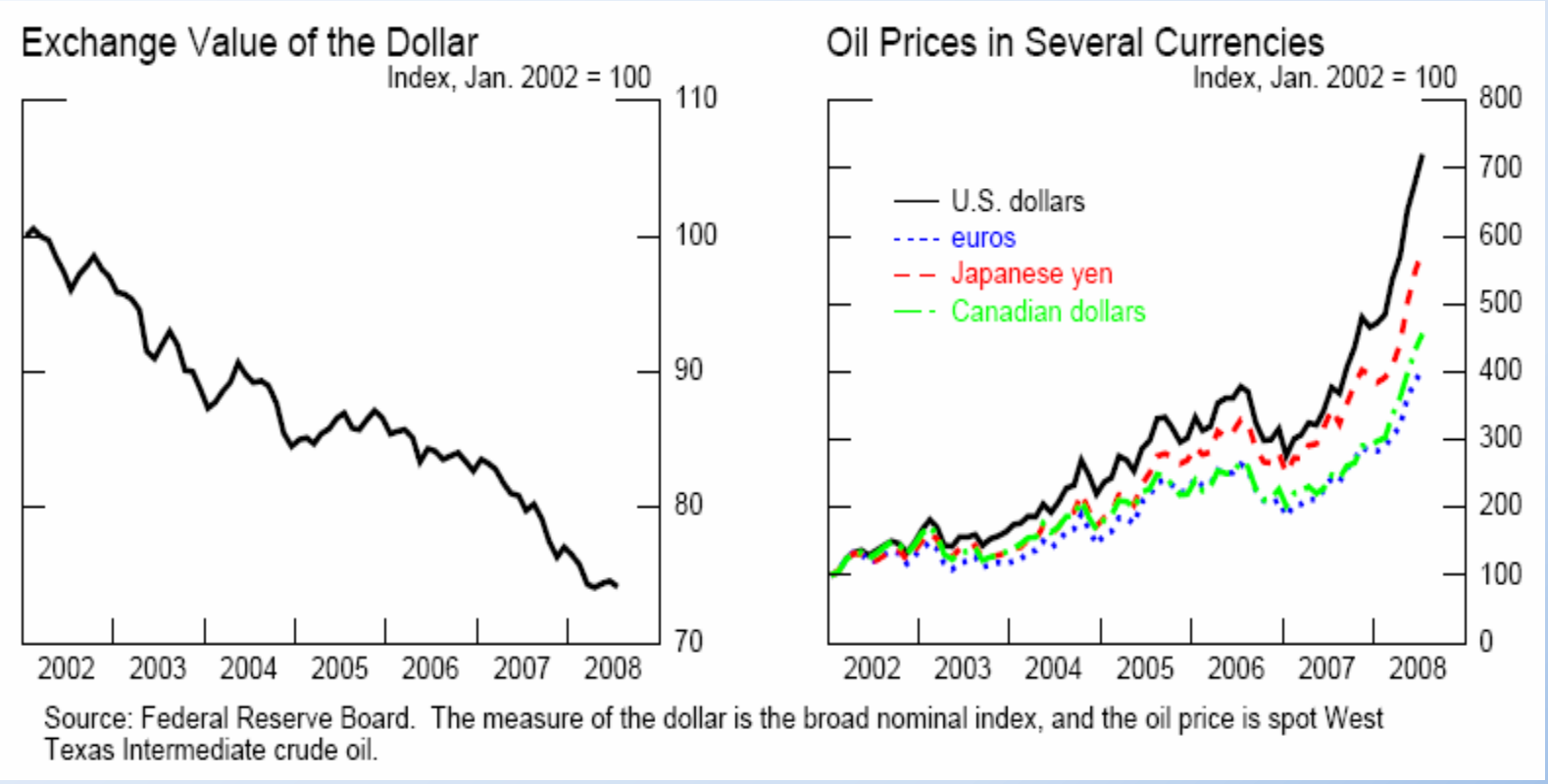

U.S. Annual Energy Expenditures As Percent of Gross Domestic Product
Forecast
14%
12%
10%
8%
6%
4%
2%
0%
1982
1985
1988
1991
1994
1997
2000
2003
2006
2009
Short-Term Energy Outlook, November 2008
www.eia.doe.gov
eia

Some Observations on the Market for Middle Distillates

World Oil Consumption

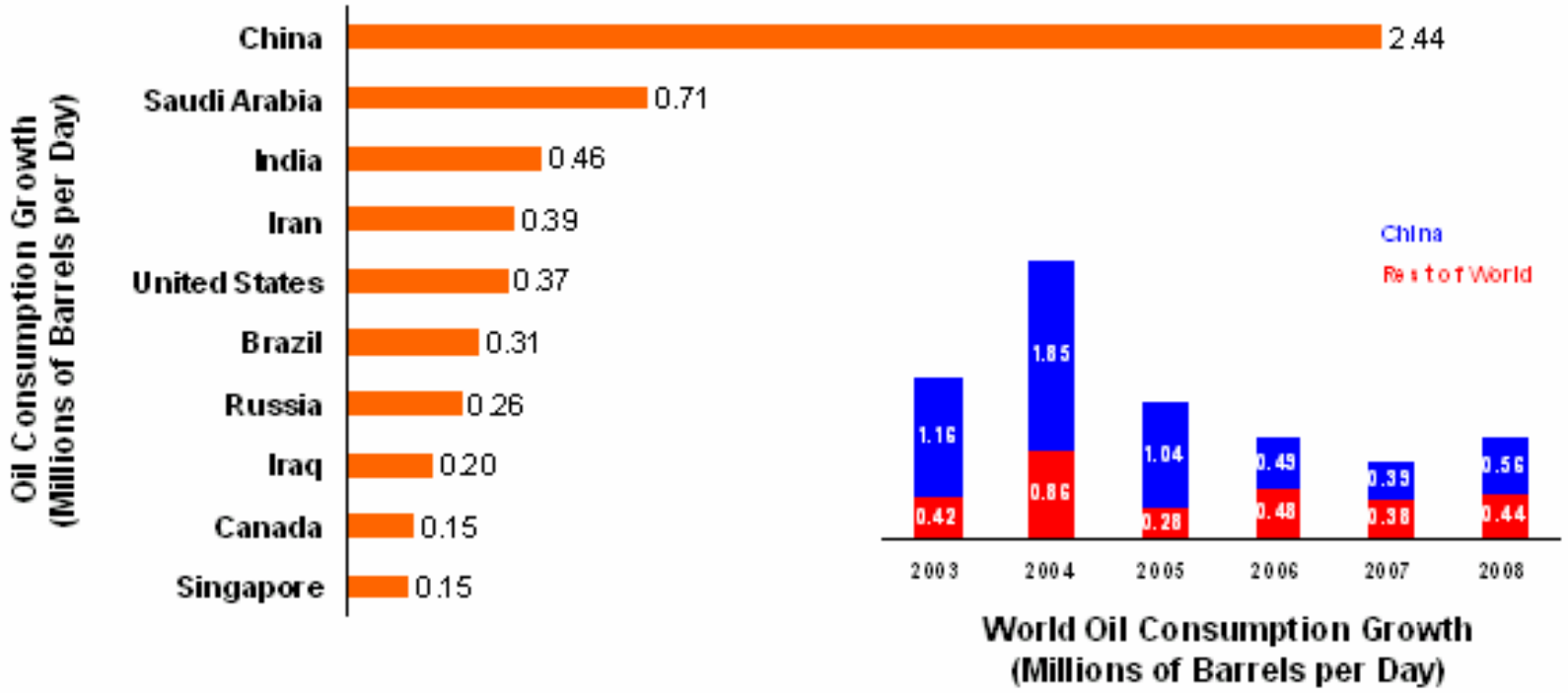


Oil Prices by Currency



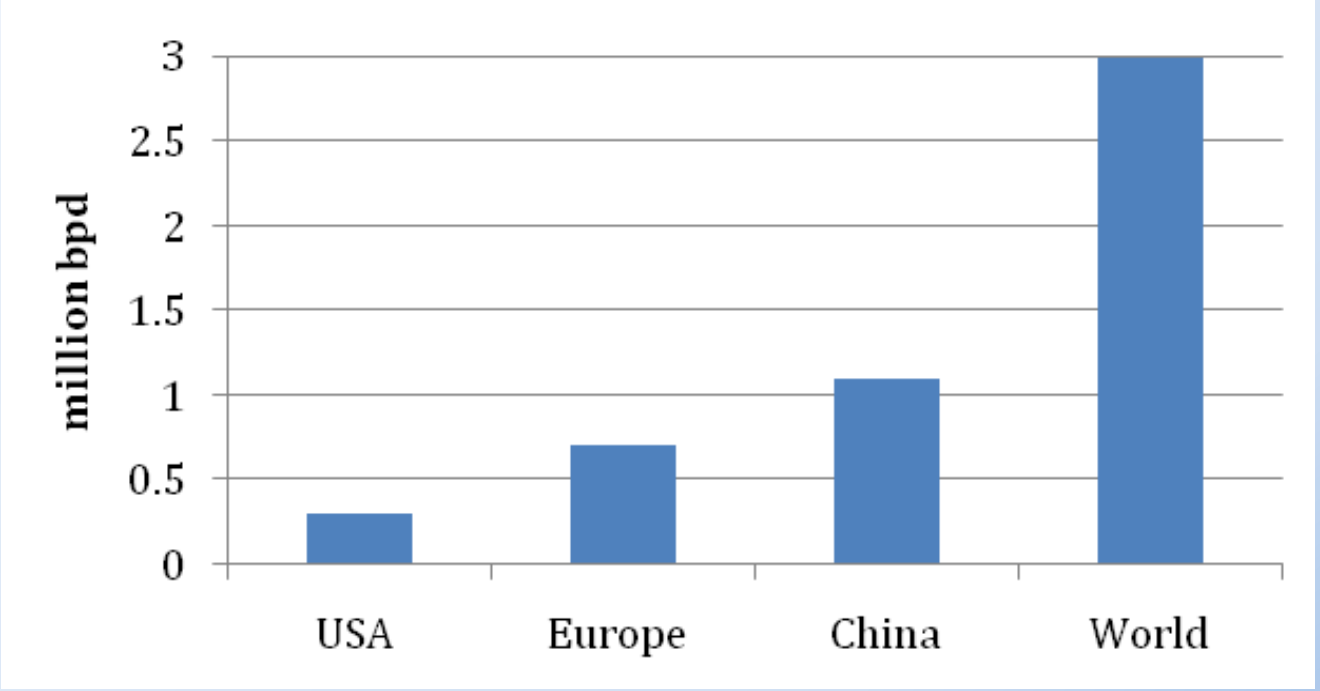
Source: CFTC Interim Report on Crude Oil, June 2008

World Oil Consumption



Source: CFTC Interim Report on Crude Oil, June 2008

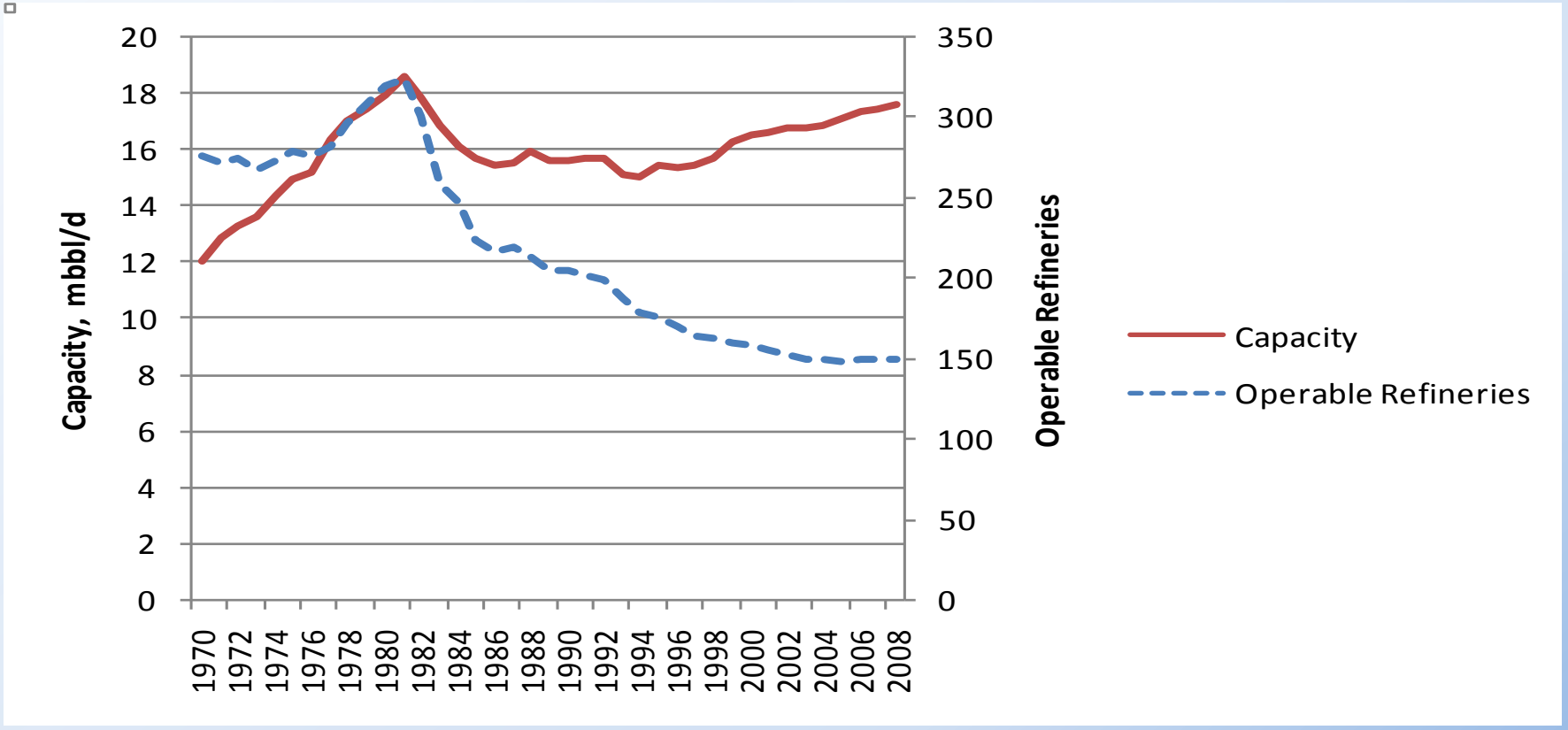
Distillate Consumption Growth: 2003 - 2007



Source: EIA Data

EPRINC

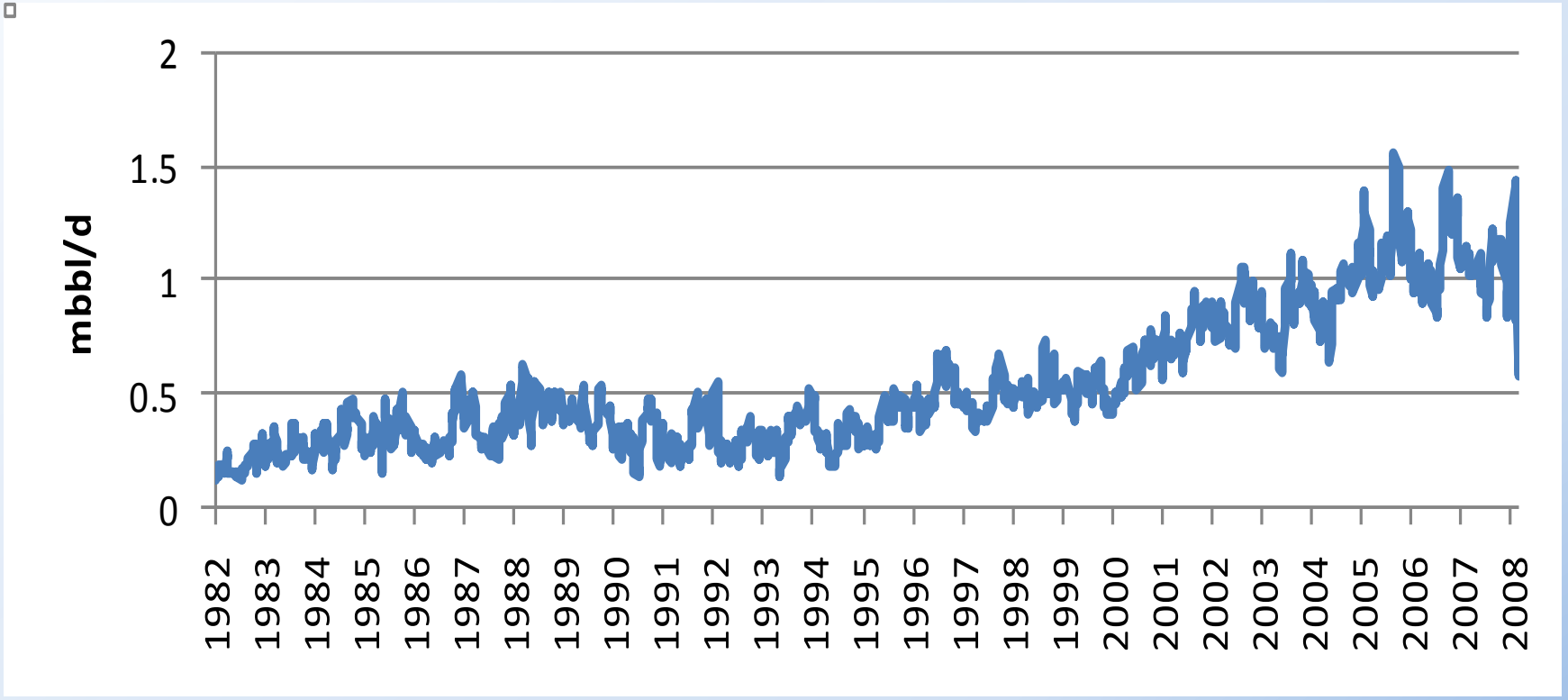
Operable Refiners and Capacity



Source: EIA Data

EPRINC

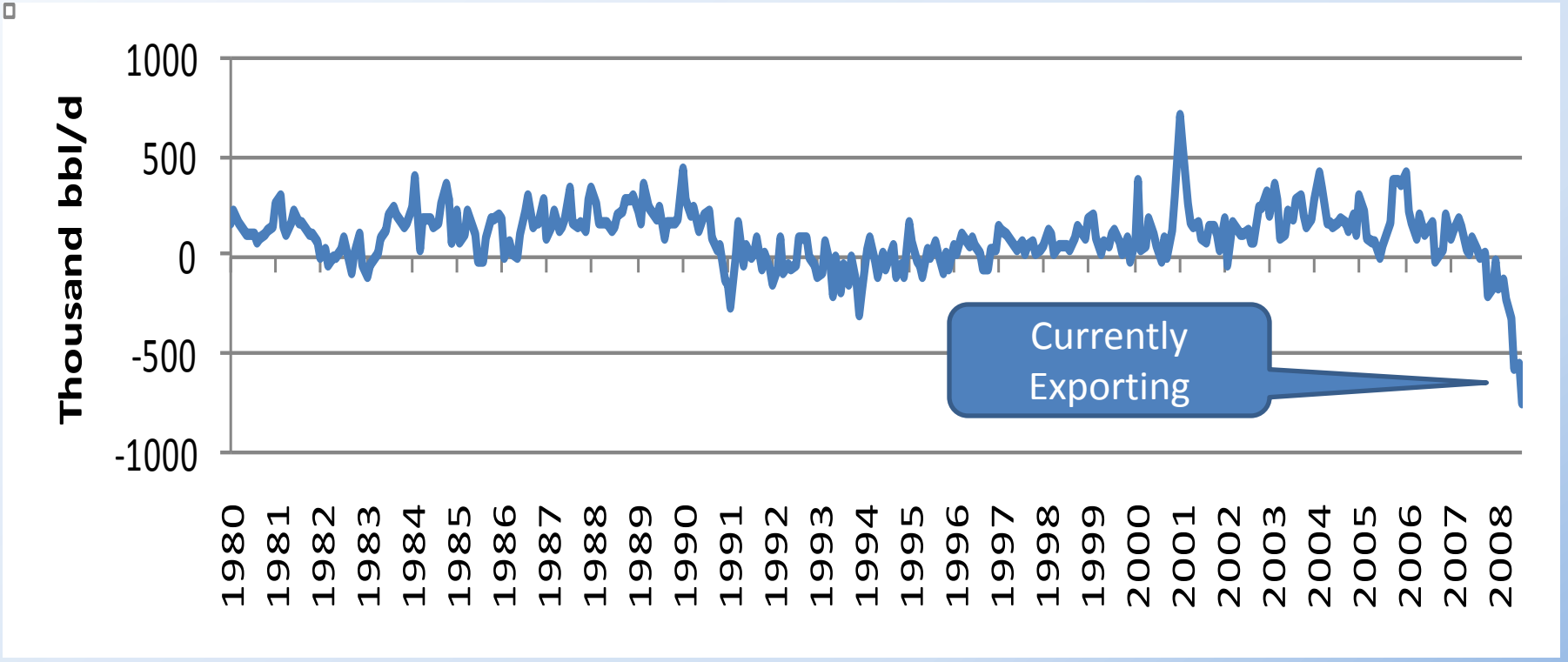
U.S. Total Gasoline Imports



Source: EIA Data

EPRINC

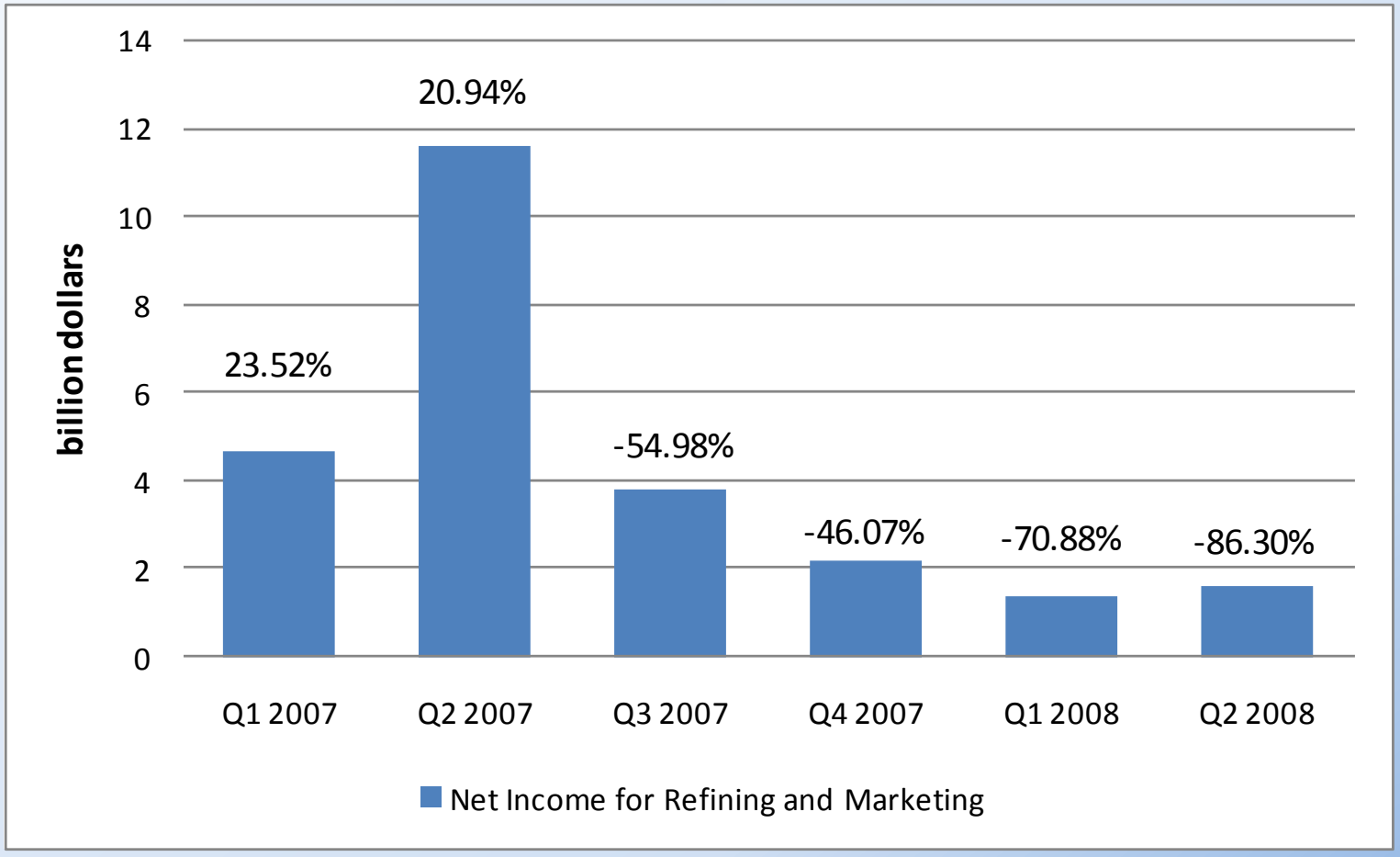
U.S. Distillate Fuel Oil Net Imports



Source: EIA Data

EPRINC

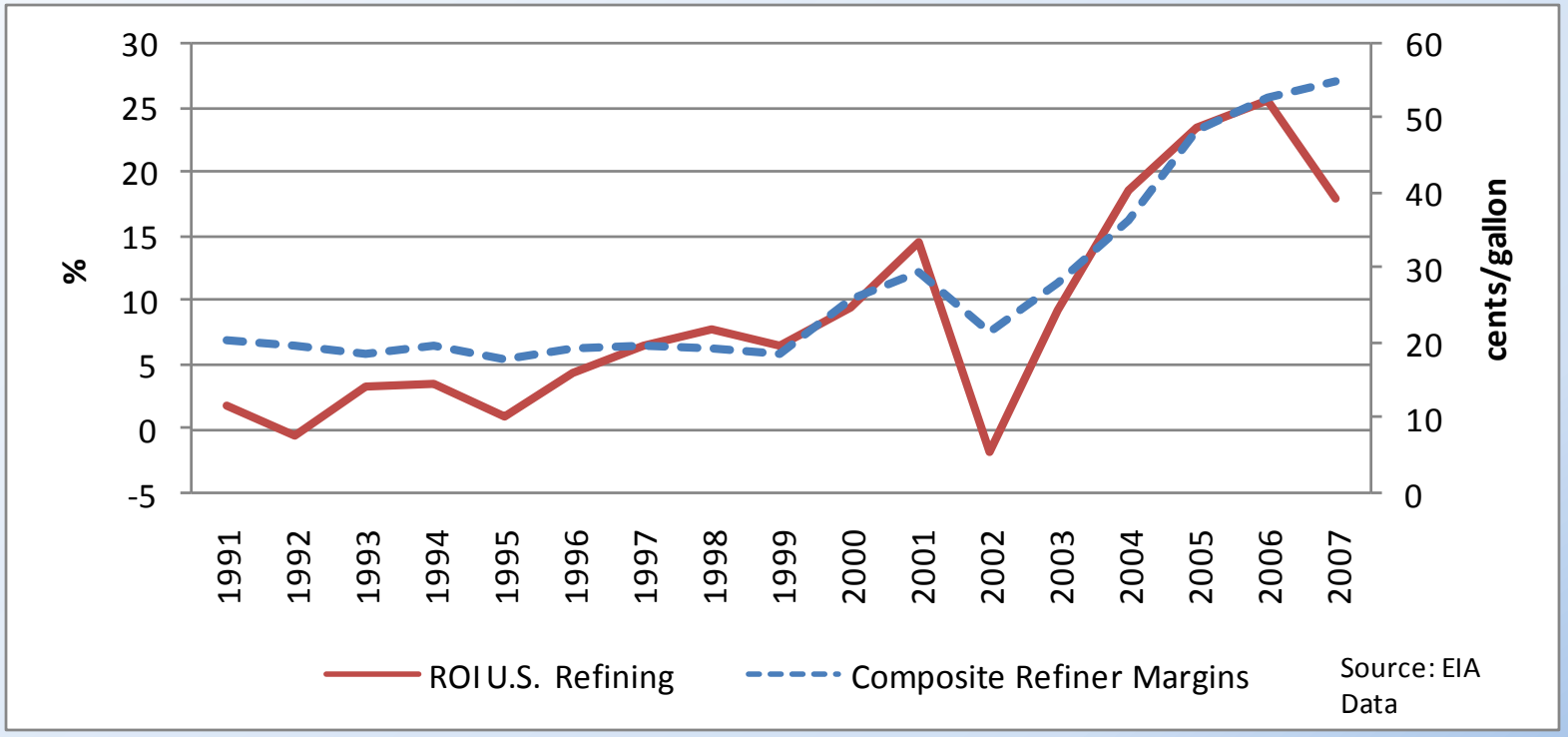
Profitability in Refining and Marketing – 2007-2008
(with year-over-year change)



Source: EIA Data and EPRINC Calculations

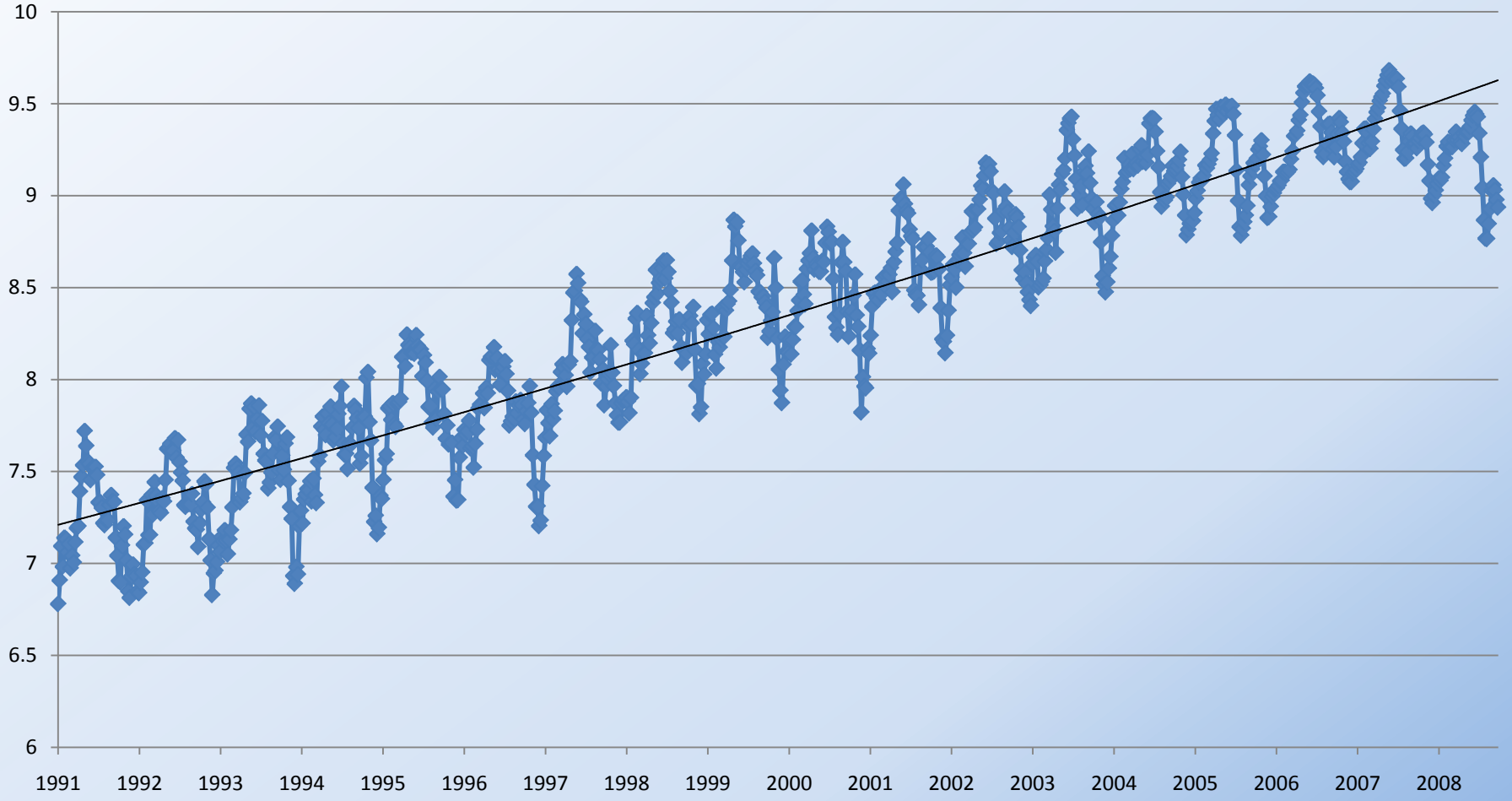
EPRINC

Refiner Margins vs. ROI



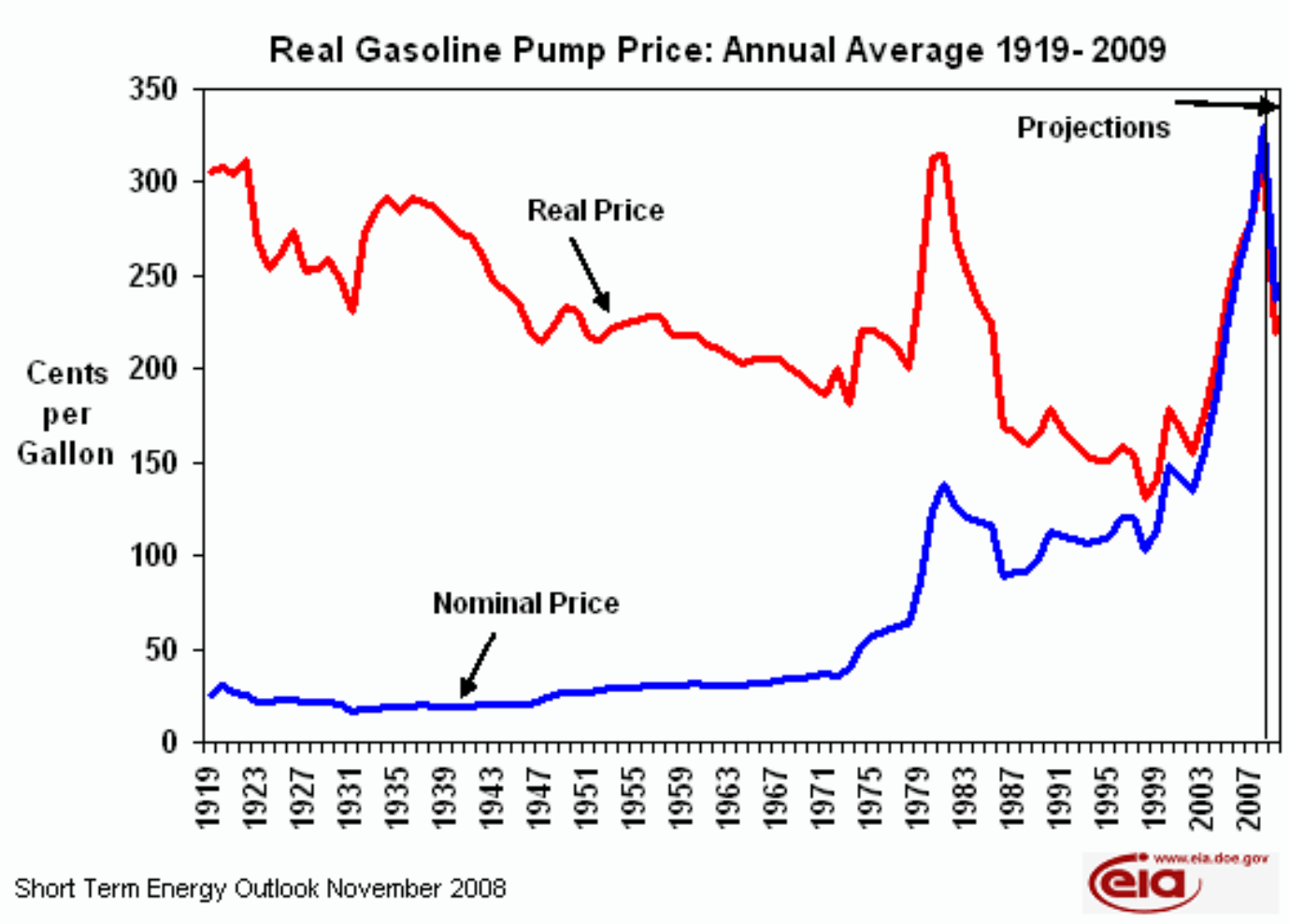
EPRINC

4-Week Average U.S. Finished Motor Gasoline Product Supplied (Thousand Barrels per Day)



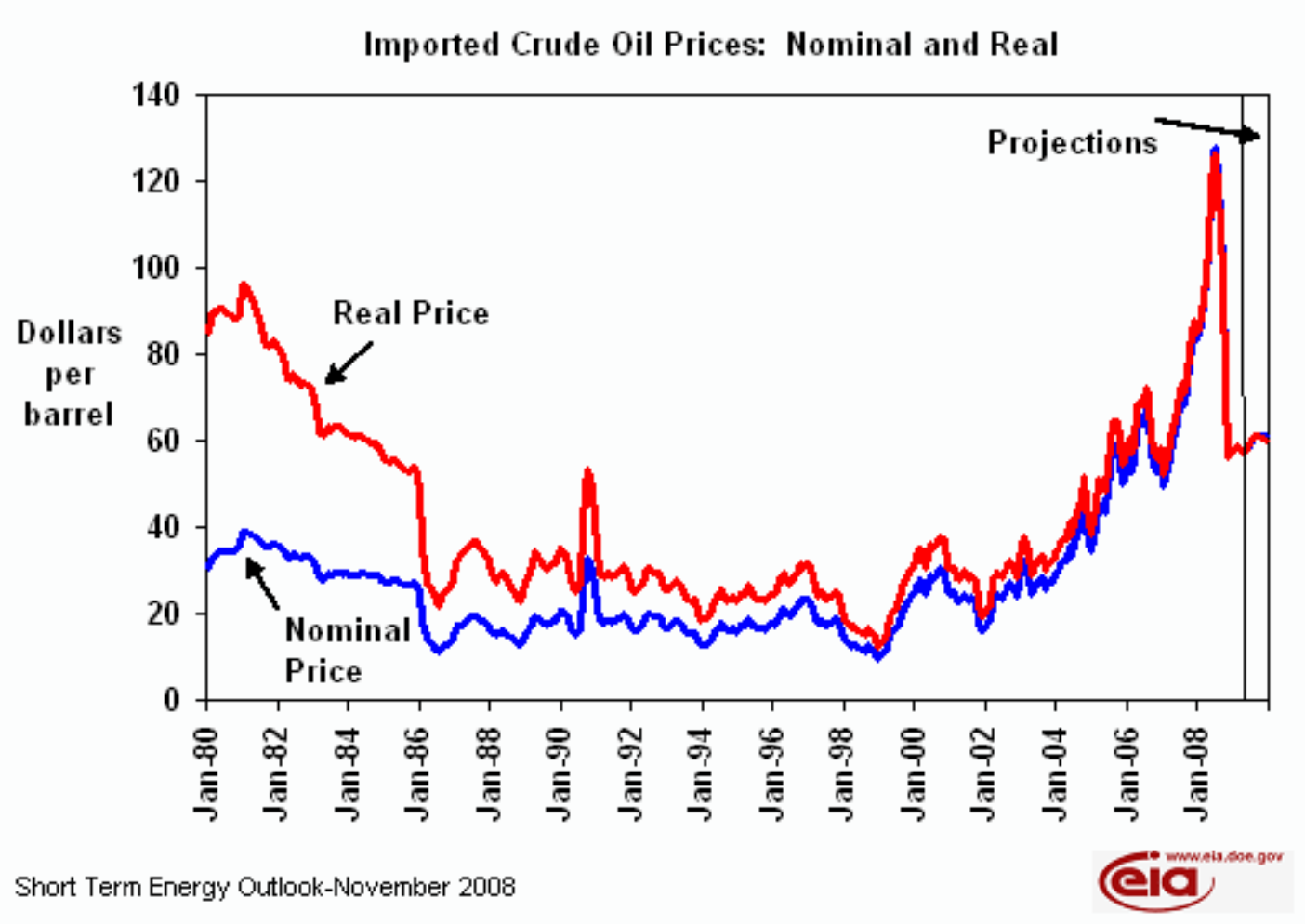
Source: EIA Data

Real Gasoline Prices – 1919 – 2009



Source: EIA

Real Imported Crude Oil Prices – 1980 - 2008



Source: EIA