Energy Independence

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David Bartlett
Carlson School of Management
University of Minnesota

Pilgrim House
Great Decisions
May 1, 2014

Profile of the Global Energy Market

Leading Energy Producers and Consumers, 2010

Top Coal Producers
Thousand Short Tons/Year

# 1	China	3,991,050
# 2	United States	1,016,399
# 3	India	693,592
# 4	Australia	475,872
# 5	Indonesia	452,132
# 6	Russia	387,121
# 7	South Africa	287,650
# 8	Germany	216,375
# 9	Poland	158,428
# 10	Kazakhstan	134,008

Top Oil Producers
Thousand Barrels/Day

# 1	Saudi Arabia	11,726
# 2	United States	11,105
# 3	Russia	10,397
# 4	China	4,372
# 5	Canada	3,856
# 6	Iran	3,589
# 7	UAE	3,213
# 8	Iraq	2,987
# 9	Mexico	2,936
# 10	Brazil	2,652

Top Natural Gas Producers
Billion Cubic Feet/Year

# 1	United States	25,308
# 2	Russia	21,685
# 3	Iran	5,649
# 4	Canada	5,070
# 5	Norway	4,155
# 6	China	3,811
# 7	Qatar	5,523
# 8	Saudi Arabia	3,585
# 9	Netherlands	2,840
# 10	Indonesia	2,559

Top Coal Consumers
Thousand Short Tons/Year

# 1	China	3,976,117
# 2	United States	890,483
# 3	India	801,030
# 4	Russia	275,686
# 5	Germany	262,564
# 6	Japan	203,846
# 7	South Africa	202,410
# 8	Poland	144,114
# 9	Australia	124,740
# 10	South Korea	136,482

Top Oil Consumers
Thousand Barrels/Day

# 1	United States	18,490
# 2	China	10,277
# 3	Japan	4,726
# 4	India	3,622
# 5	Russia	3,196
# 6	Saudi Arabia	2,861
# 7	Brazil	2,807
# 8	Germany	2,388
# 9	South Korea	2,301
# 10	Canada	2,280

Top Natural Gas Consumers
Billion Cubic Feet/Year

# 1	United States	25,533
# 2	Russia	15,437
# 3	China	5,181
# 4	Japan	4,617
# 5	Saudi Arabia	3,585
# 6	Germany	3,080
# 7	Canada	3,057
# 8	Italy	2,646
# 9	United Kingdom	2,641
# 10	UAE	2,235

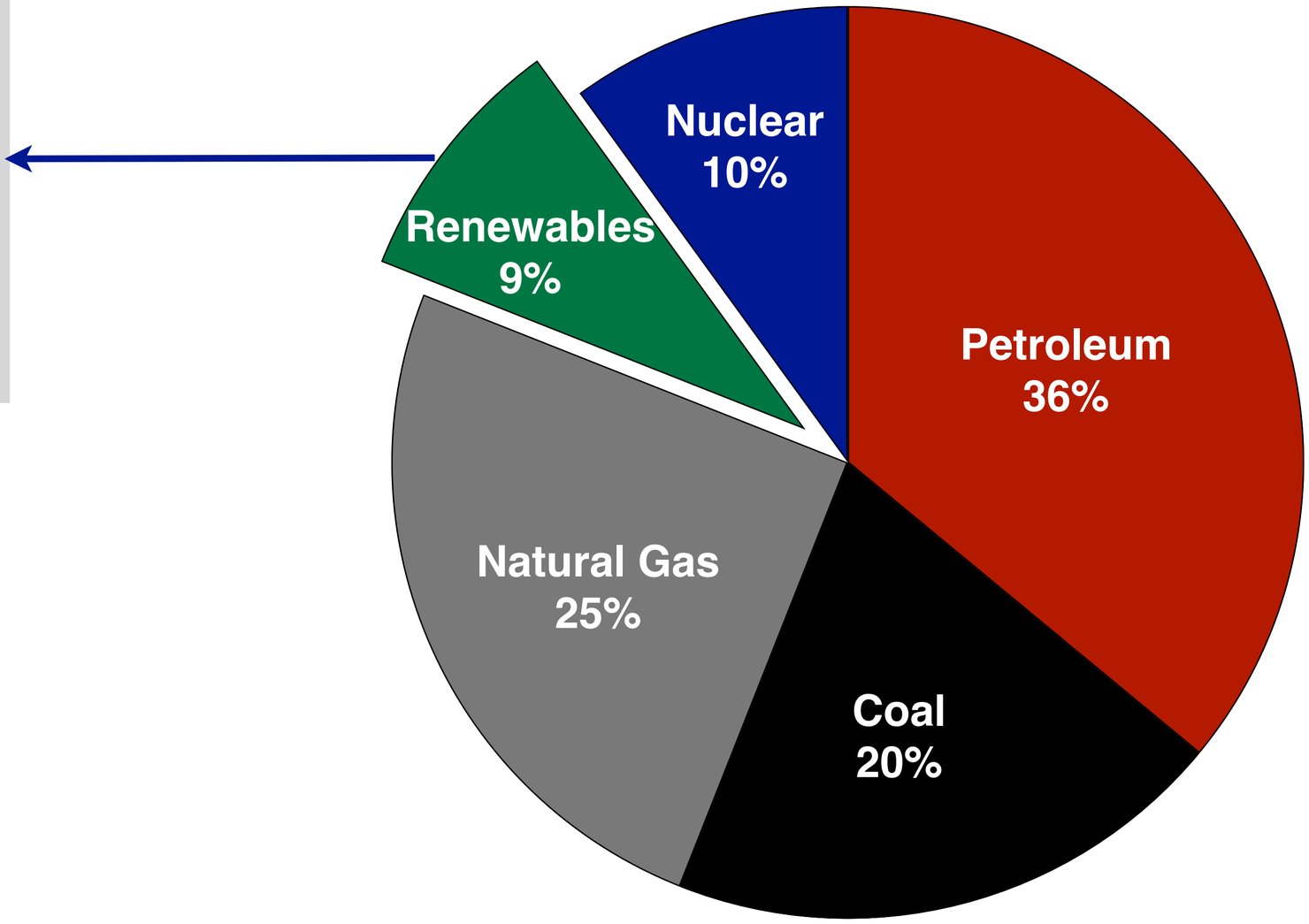
Source: U.S. Energy Information Administration

Energy Mix of the United States

U.S. Energy Consumption by Source, 2011

Composition of Renewables

• Biomass	48%
• Hydropower	35%
• Wind	14%
• Geothermal	2%
• Solar	1%



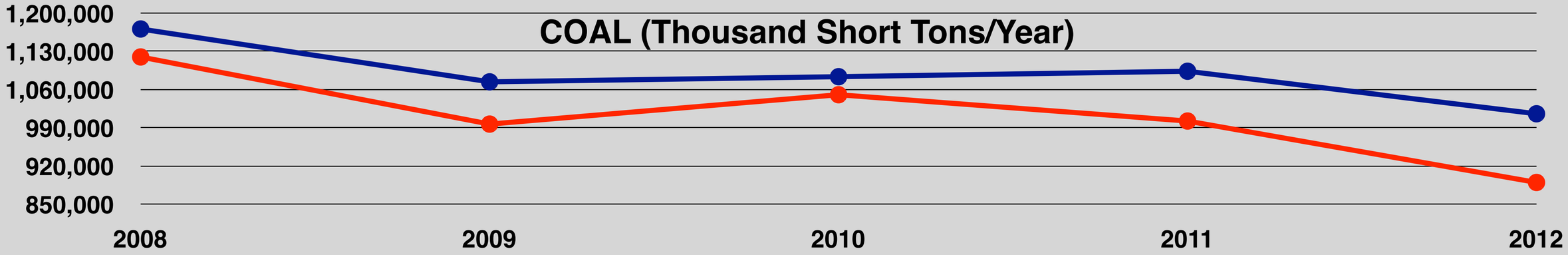
Source: U.S. Energy Information Administration

Hydrocarbons in the United States

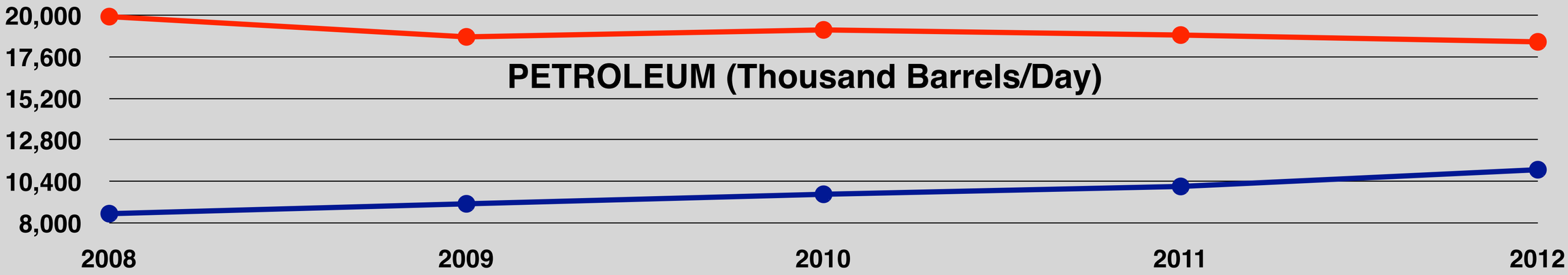
Production and Consumption in the U.S., 2008-12

Production
Consumption

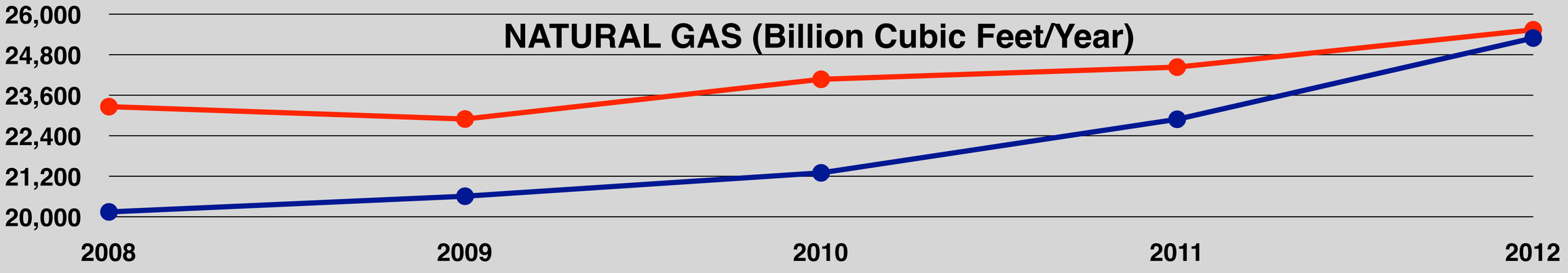
COAL (Thousand Short Tons/Year)



PETROLEUM (Thousand Barrels/Day)



NATURAL GAS (Billion Cubic Feet/Year)



Source: U.S. Energy Information Administration

Oil Reserves in the United States

Proved Oil Reserves, Top Ten States

#7 Wyoming
583 Million Barrels

#10 Montana
343 Million Barrels

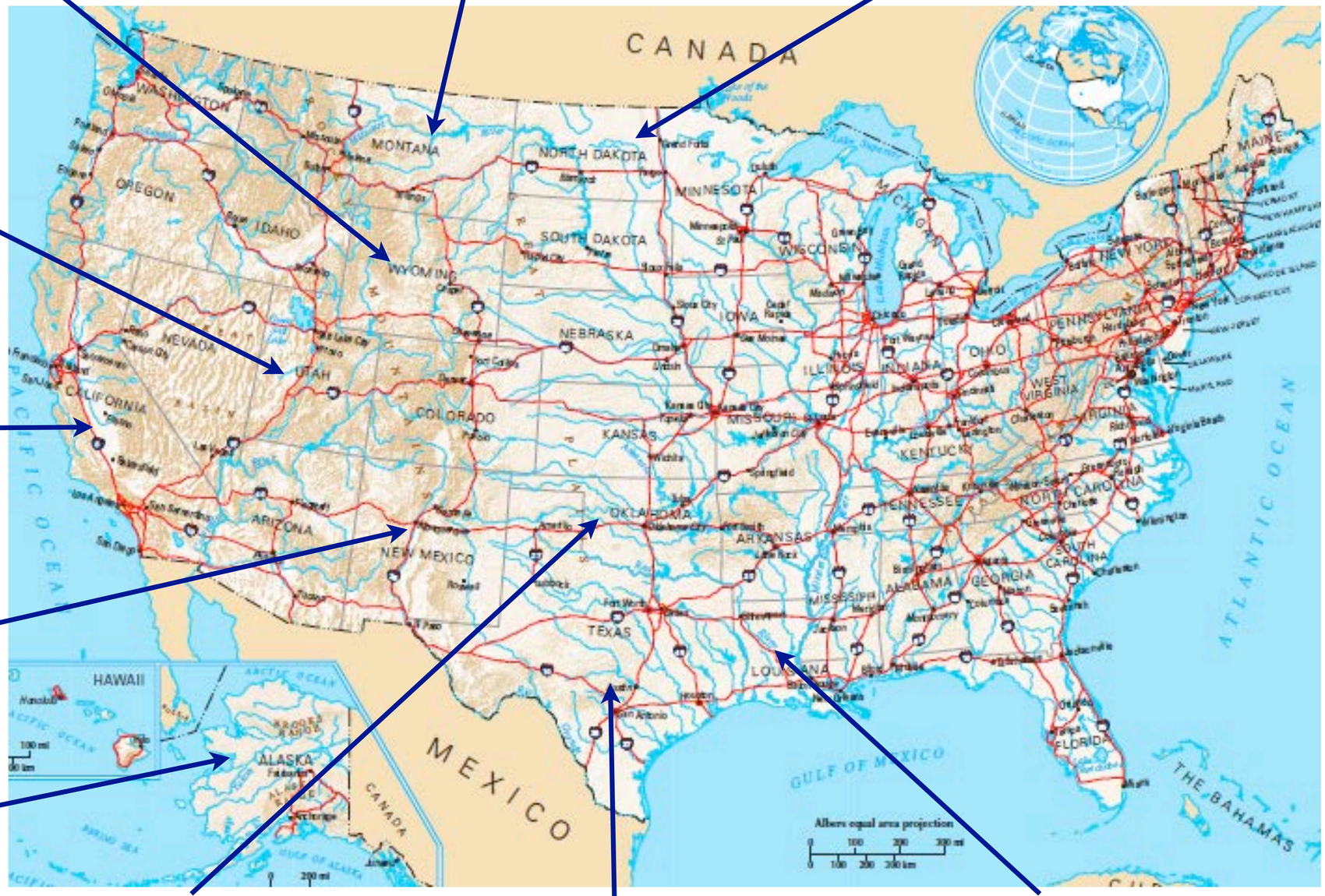
#4 North Dakota
1,046 Million Barrels

#8 Utah
398 Million Barrels

#3 California
2,835 Million Barrels

#5 New Mexico
700 Million Barrels

#2 Alaska
3,566 Million Barrels



#6 Oklahoma
622 Million Barrels

#1 Texas
5,006 Million Barrels

#9 Louisiana
370 Million Barrels

Energy Boom in the United States

Drivers of U.S. Energy Boom
Advances in Recovery Technologies

- Seismic Analysis
- Horizontal Drilling
- Hydraulic Fracturing

Repercussions of U.S. Energy Boom

- Falling Natural Gas Prices
- Decreased Energy Import Dependency
- Increased Competitiveness of Energy-Intensive Manufacturers

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- Diminished Commercial Attractiveness of Renewables
- Potential Environmental Fallout of Hydrocarbon Extraction

Domestic Oil Production
Million Barrels/Day

2008	2011	2020 (est)
5.0	5.7	6.7

Domestic Natural Gas Production
Trillion Cubic Feet, Annual

2006	2011
23.5	28.6

Technically Recoverable Reserves: 2,543 tcf

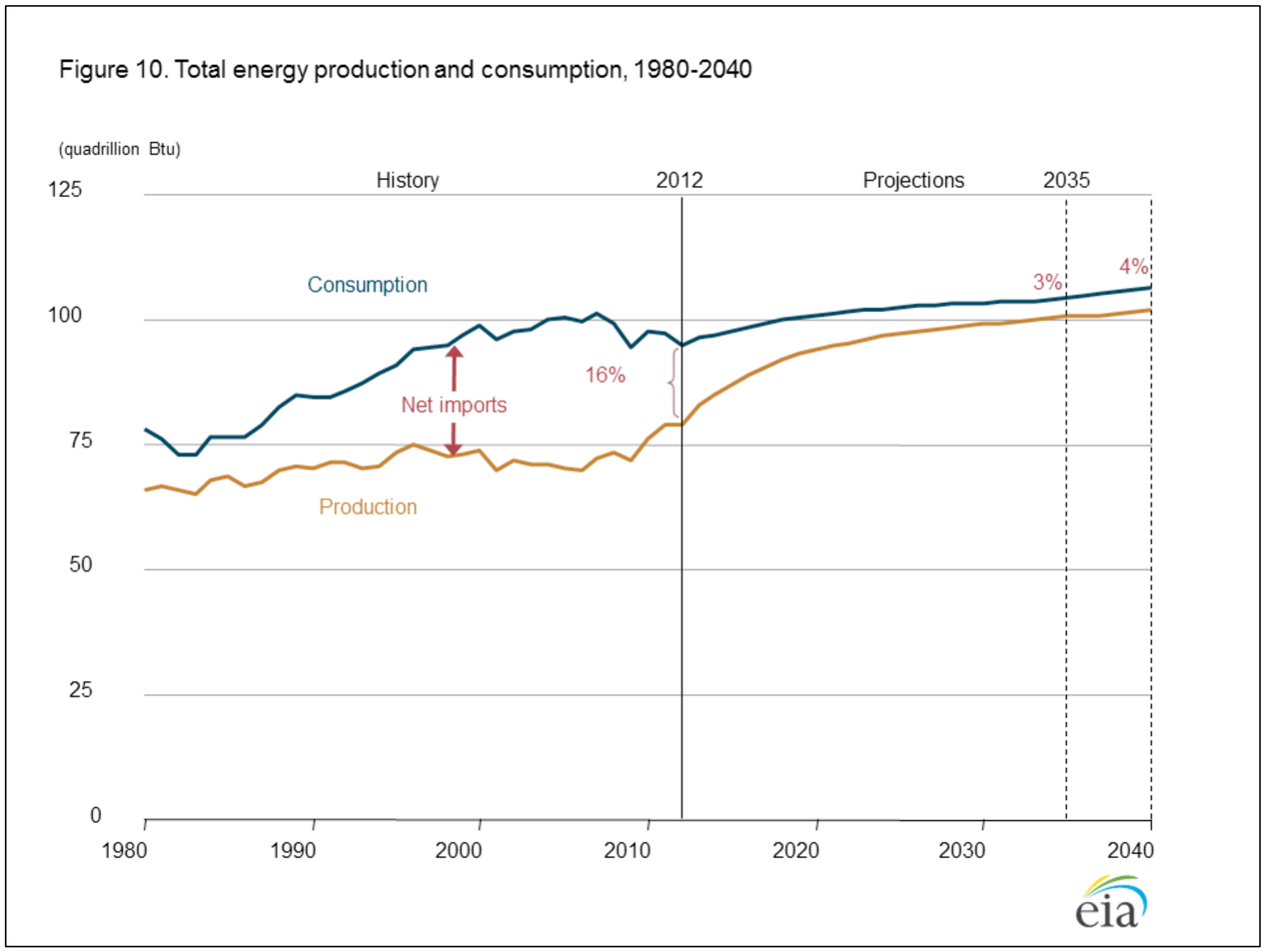
Domestic Energy Production
Share of Total Energy Consumption from Domestic Sources

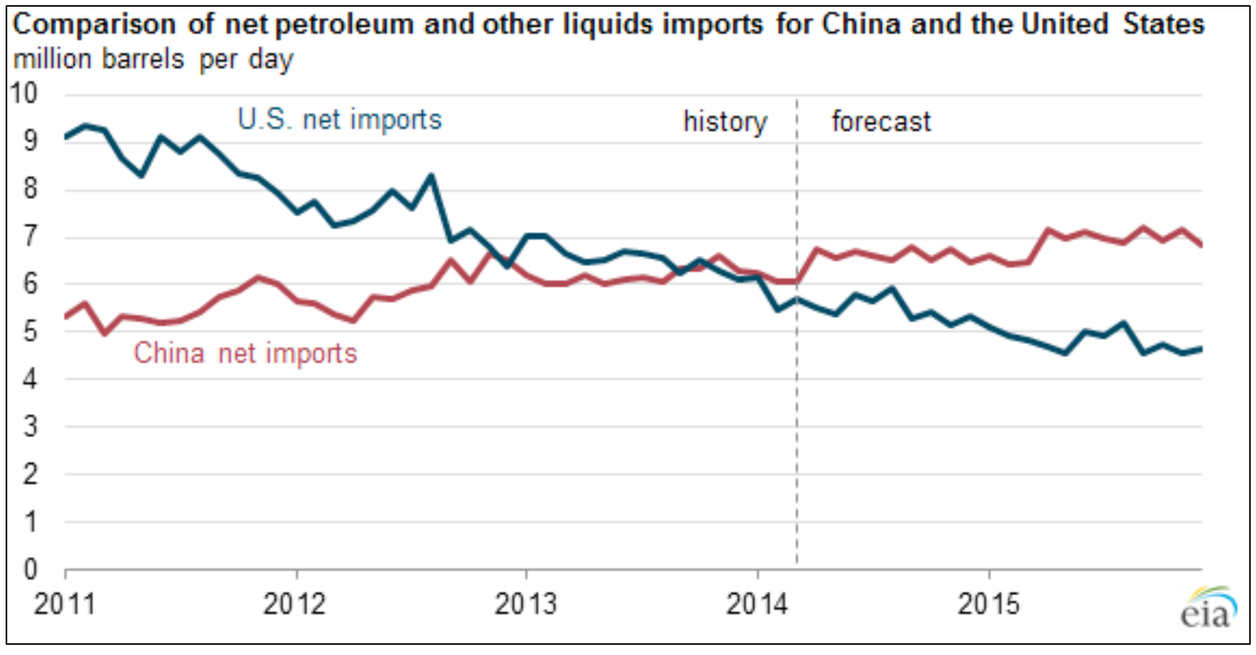
2005	2011
71 %	81 %

Energy Imports
Imports as Share of Domestic Liquid Fuel Consumption

2005	2011
60 %	45 %

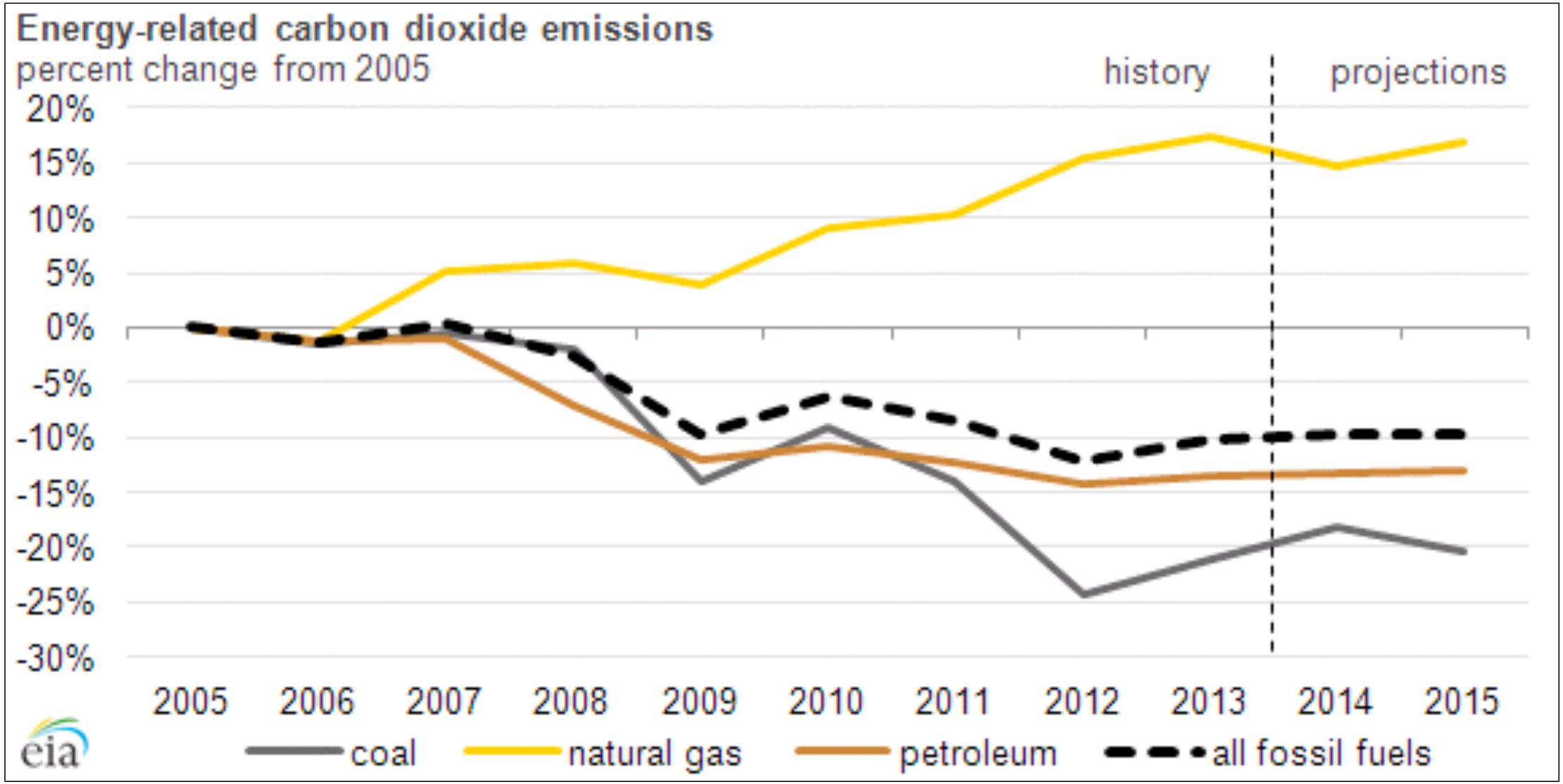
Energy Imports of the United States





Source: U.S. Energy Information Administration

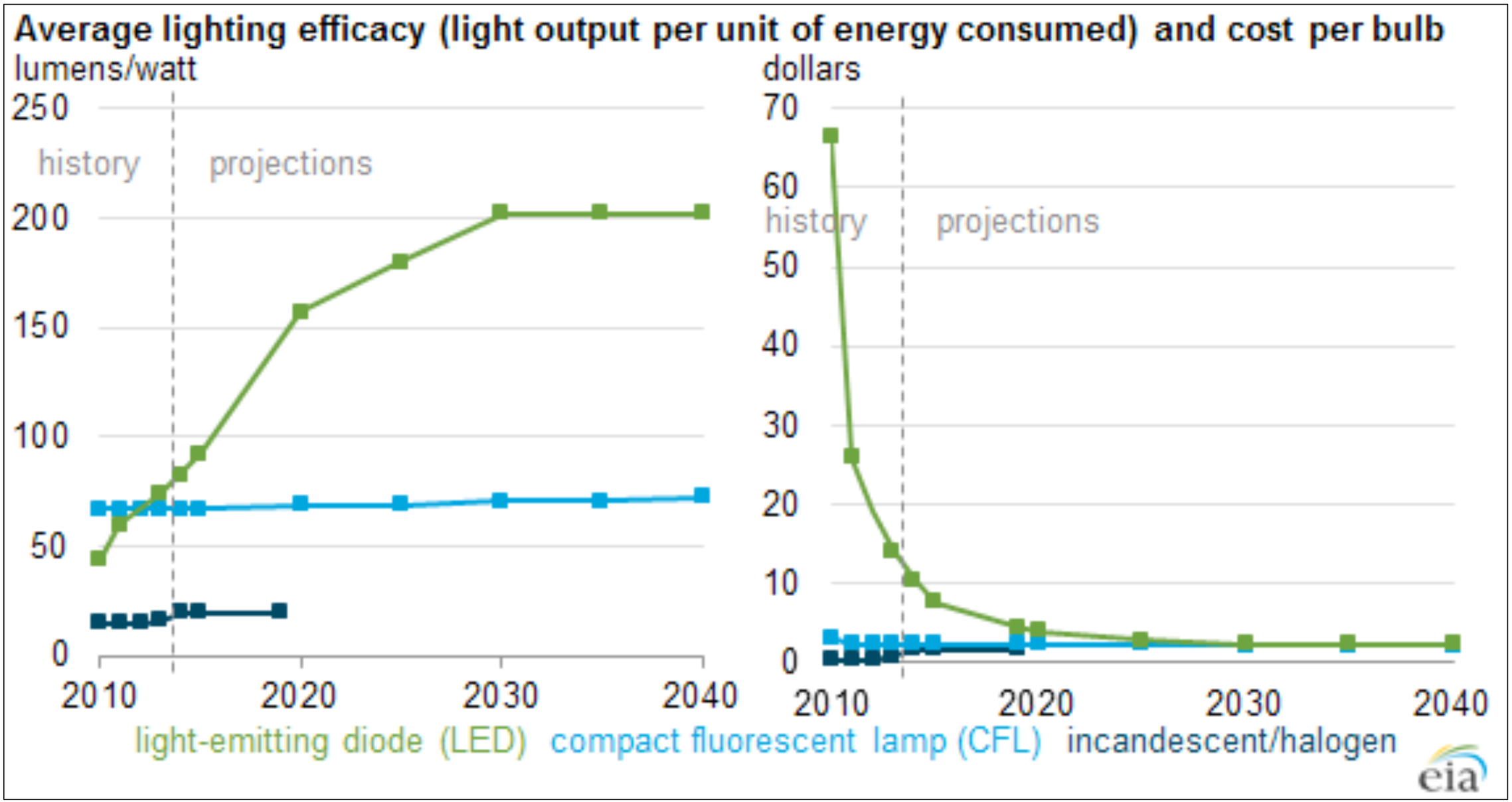
Green House Gas Emissions of the United States



Source: U.S. Energy Information Administration

Energy Conservation in the United States

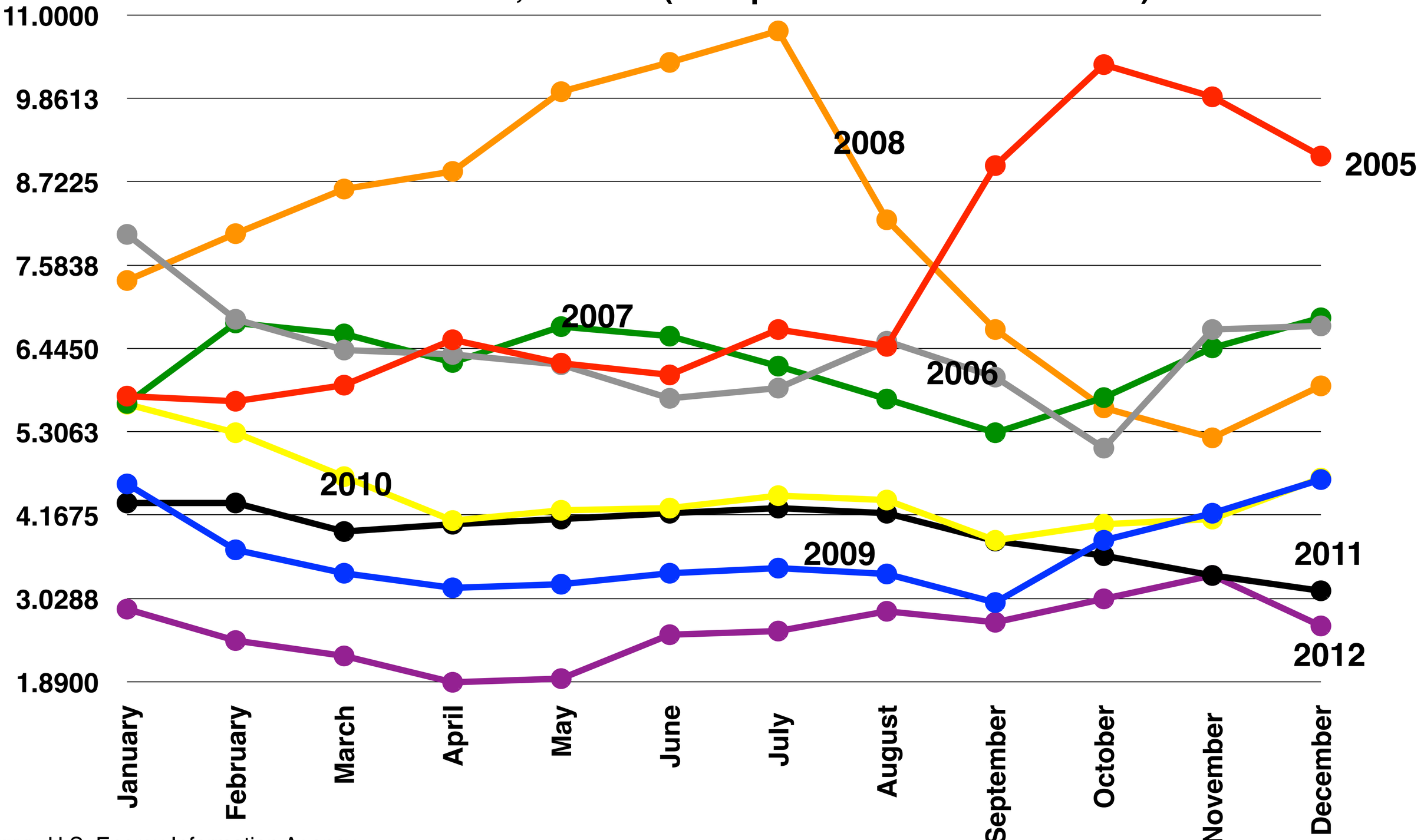
Efficacy and Cost of High-Efficiency Light Bulbs



Source: U.S. Energy Information Administration

Trends in U.S. Natural Gas Prices

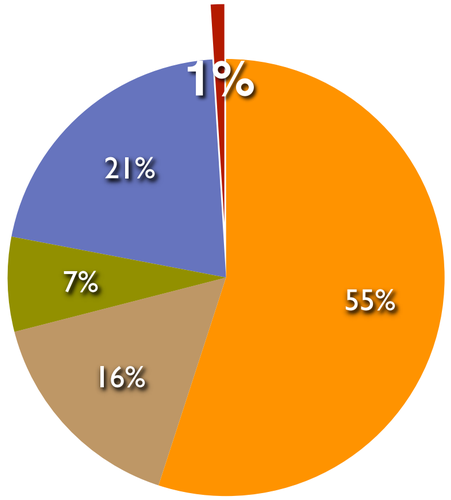
Wellhead Prices, 2005-12 (USD per Thousand Cubic Feet)



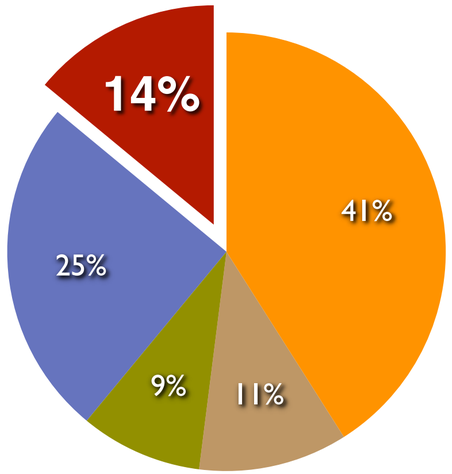
Source: U.S. Energy Information Agency

The Shale Gas Revolution

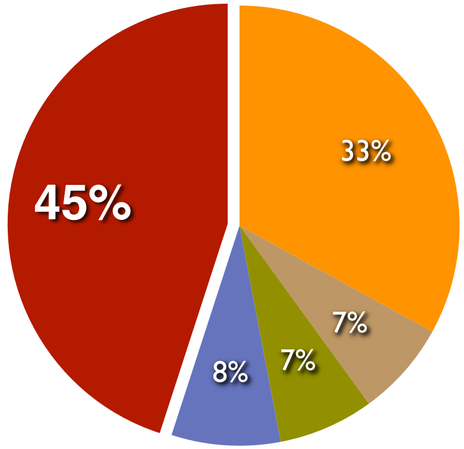
Natural Gas Production in the U.S.



2000



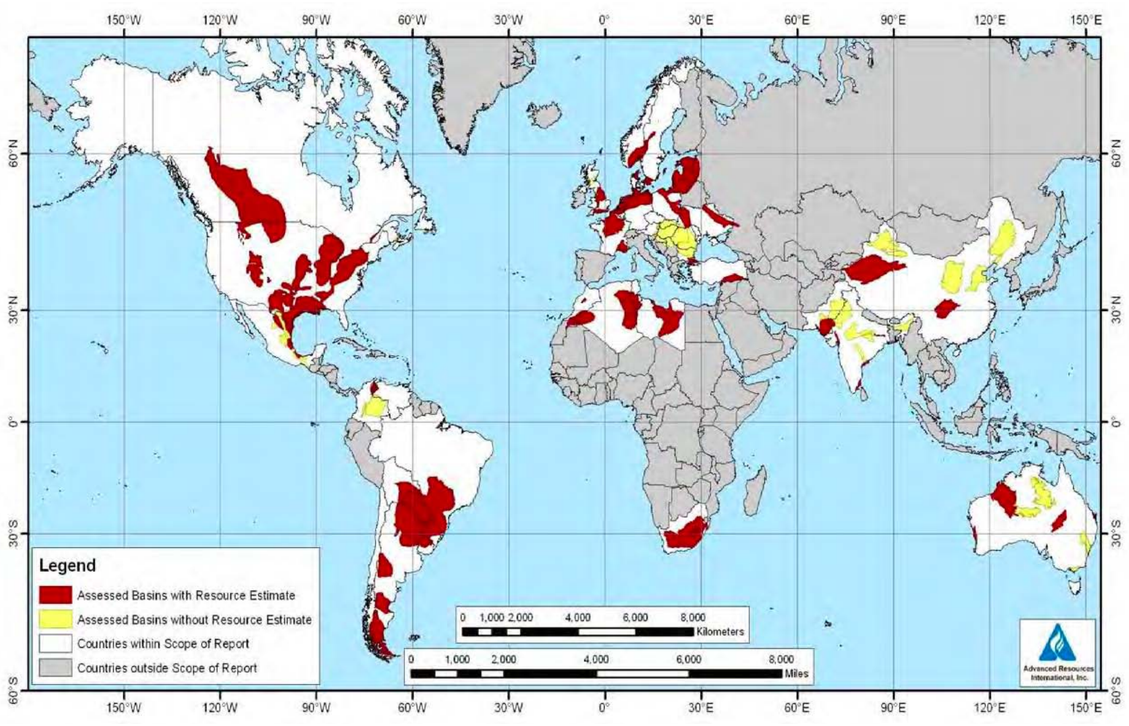
2009



2035 (est)

- Conventional Gas
- Associated Gas
- Coal Bed Methane
- Tight Sands
- Shale Gas

Major Shale Gas Basins



Source: U.S. Energy Administration Agency, World Shale Gas Resources: An Initial Assessment of 14 Regions Outside the United States", April 2011

Source: U.S. Energy Information Administration based on data from various published studies. Canada and Mexico plays from ARI.
Updated: May 9, 2011

The Crisis in Ukraine: Implications for Global Energy

- Impact on U.S.-Russian relations
- Impact on EU-Russian relations
- Options available to U.S./EU
- Role of energy in Ukrainian crisis

The Russian Federation and Energy Dependence

EU Energy Imports from Russia, Selected Countries (Percent of National Energy Imports)

Ireland	1%
Austria	9%
Denmark	10%
Portugal	10%
United Kingdom	13%
Spain	14%
France	17%
Slovenia	24%
Italy	28%
Belgium	30%
Germany	30%
Croatia	34%
Netherlands	34%

Greece	40%
Sweden	46%
Romania	47%
Estonia	69%
Latvia	72%
Czech Republic	73%
Finland	76%
Hungary	86%
Bulgaria	90%
Poland	91%
Lithuania	92%
Slovakia	98%

Source: New York Times

Liquified Natural Gas

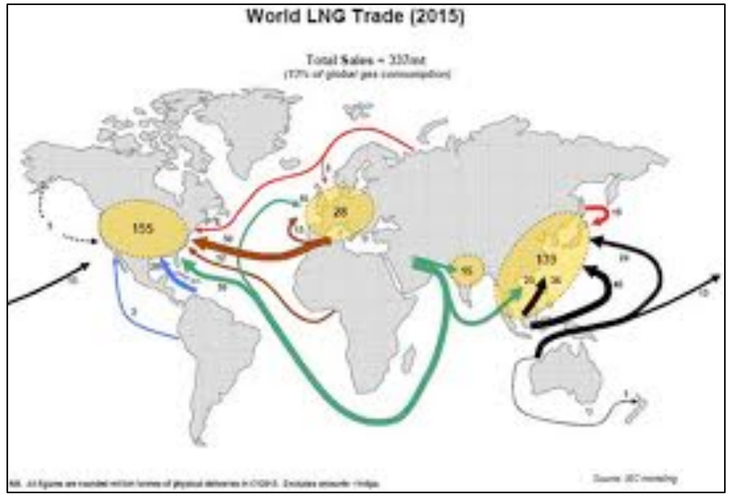
Prospects for LNG Exports from United States to European Union

Figure 78: Liquefaction Plants Investment Cost by Region ($Millions/MMTPA Capacity)

	$Millions/MMTPA	Capital Cost ($/Mcf produced)
Africa	$1,031	$3.05
Canada	$1,145	$3.39
C & S America	$802	$2.37
Europe	$802	$2.37
FSU	$802	$2.37
Middle East	$859	$2.54
Oceania	$1,317	$3.90
Sakhalin	$802	$2.37
Southeast Asia	$1,145	$3.39
U.S.	$544	$1.61

Figure 79: Liquefaction Costs by Region (2012$/Mcf)

	2018	2023	2028	2033	2038
Africa	$3.46	$3.47	$3.50	$3.52	$3.54
Canada	$3.92	$3.98	$4.03	$4.08	$4.23
C & S America	$2.79	$2.81	$2.84	$2.86	$2.89
Europe	$3.65	$3.67	$3.68	$3.68	$3.77
FSU	$3.03	$3.08	$3.13	$3.18	$3.25
Middle East	$2.89	$2.90	$2.91	$2.93	$2.95
Oceania	$4.55	$4.60	$4.64	$4.70	$4.75
Sakhalin	$2.71	$2.73	$2.74	$2.76	$2.78
Southeast Asia	$3.83	$3.85	$3.87	$3.90	$3.93
U.S.	$2.11	$2.16	$2.20	$2.24	$2.38



Source: NERA Economic Consulting

Questions?

David Bartlett
Senior Lecturer
Department of Strategic Management & Entrepreneurship
Carlson School of Management
bartl037@umn.edu