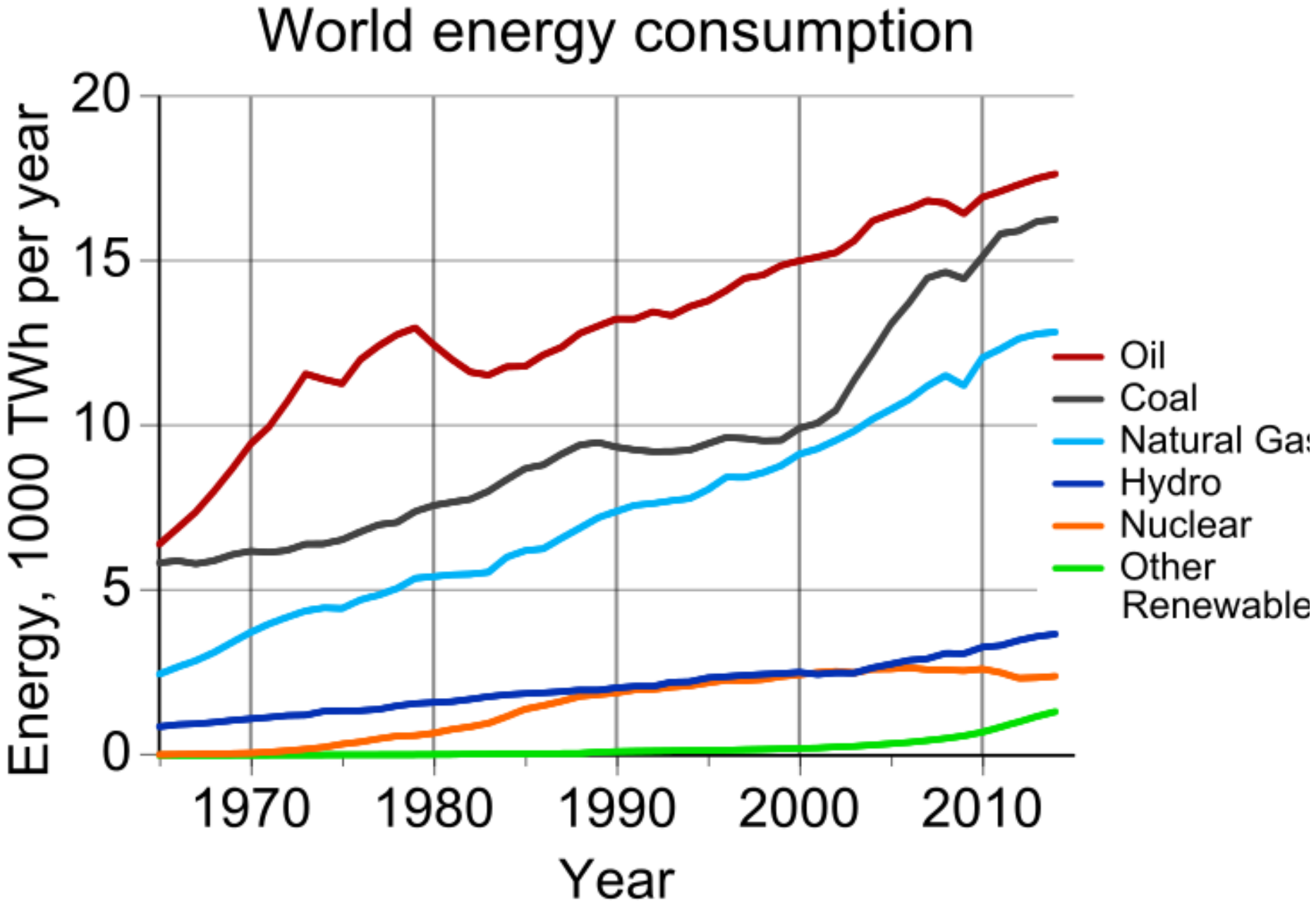
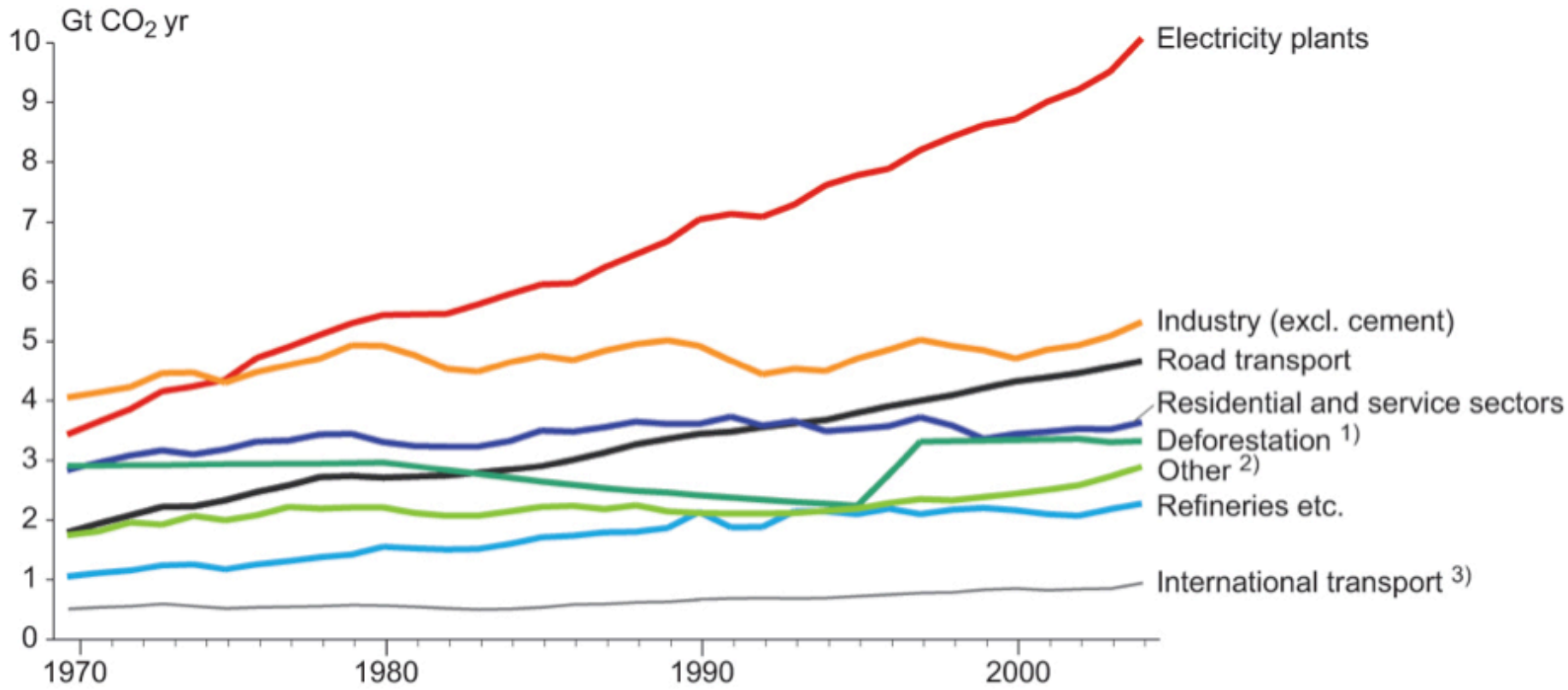


"World energy consumption" by Construct - BP Statistical Review of World Energy 2015

Sources of Global CO_2 Emissions (1970-2004, Direct Emissions by Sector Only)

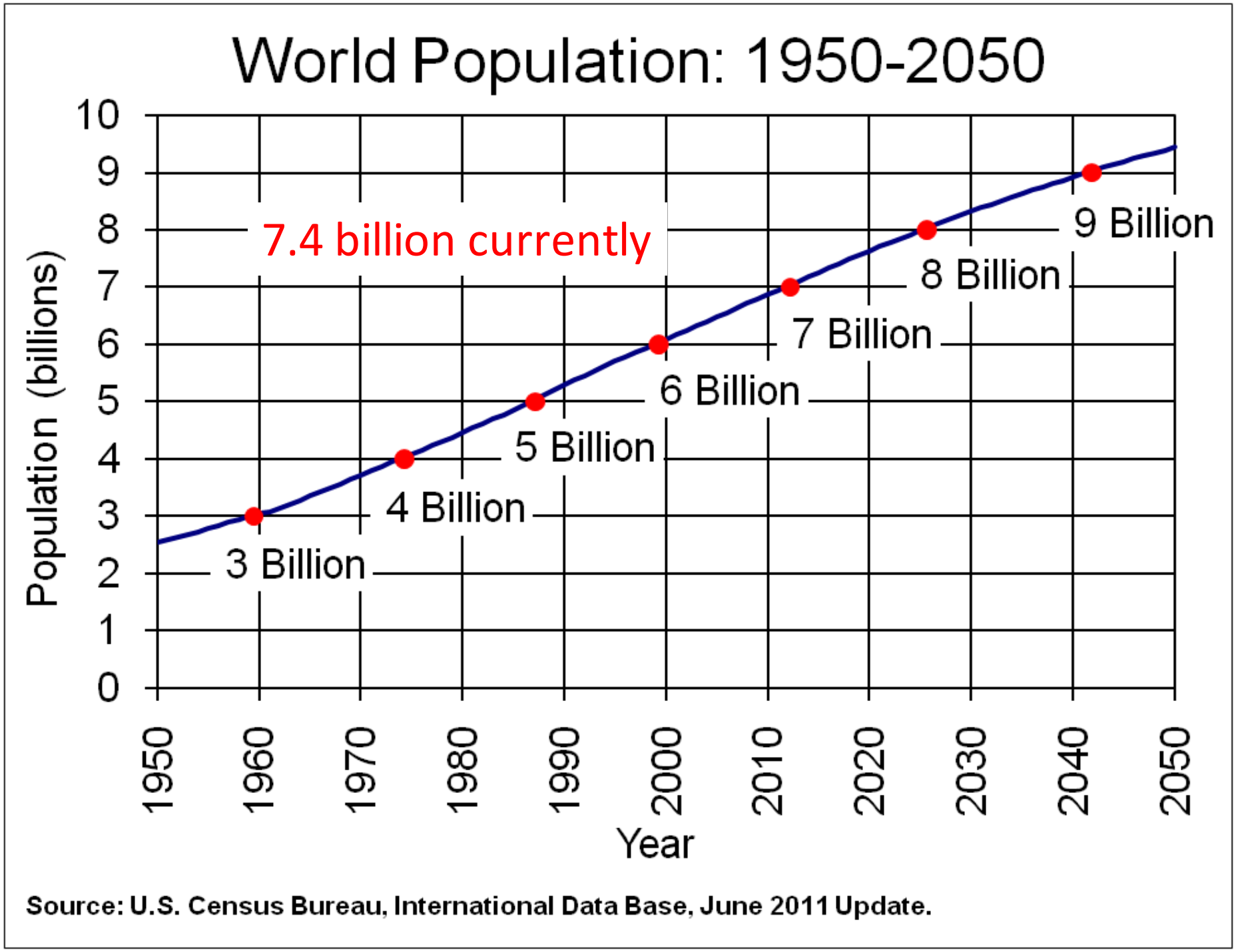


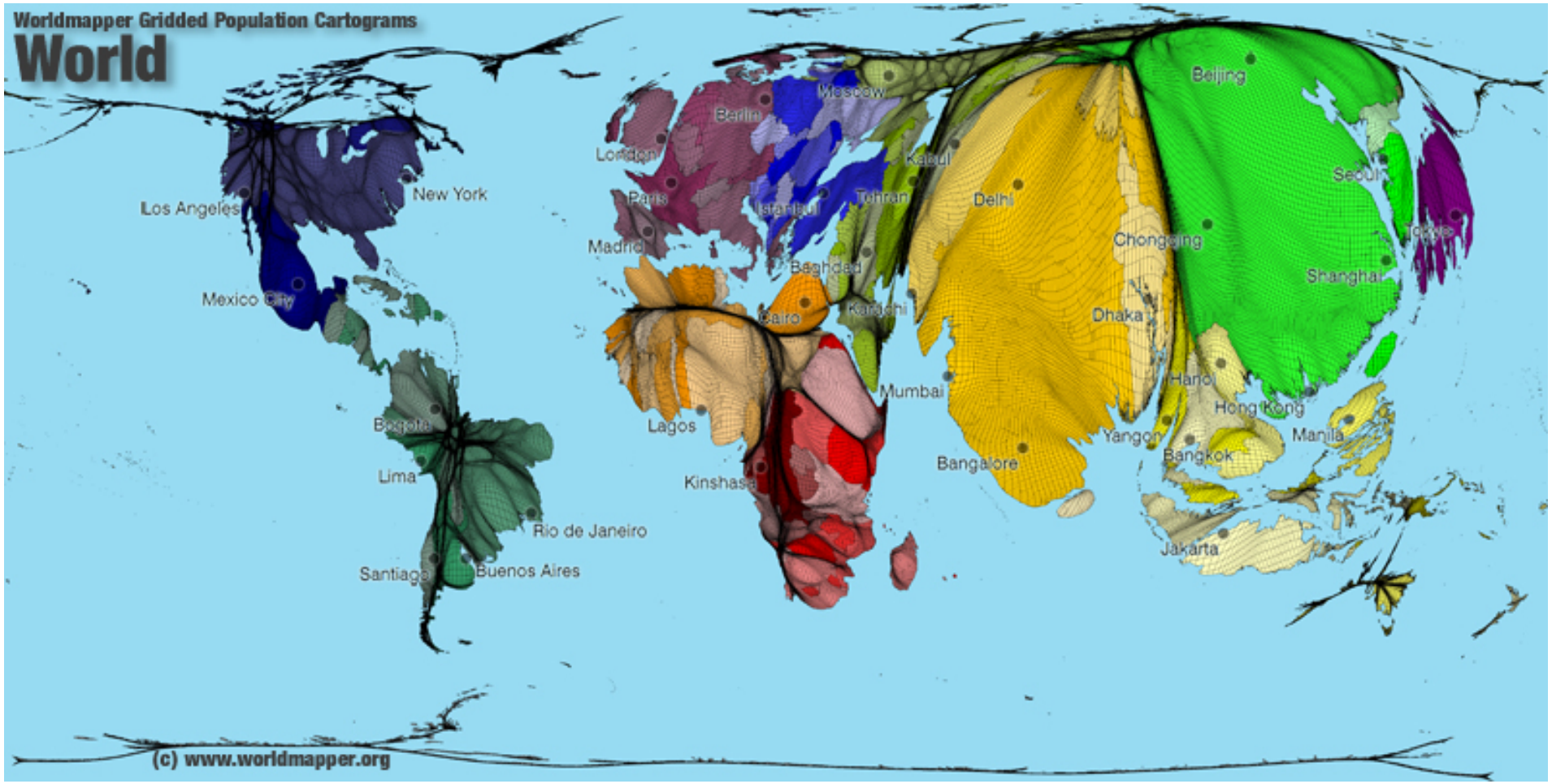
Intergovernmental Panel on Climate Change (IPCC)

2012 World electricity generation by fuels (IEA, 2014)[2]:24

- Coal/Peat (40.4%)
- Natural Gas (22.5%)
- Hydro (16.2%)
- Nuclear (10.9%)
- Oil (5.0%)
- Others (Renew.) (5.0%)

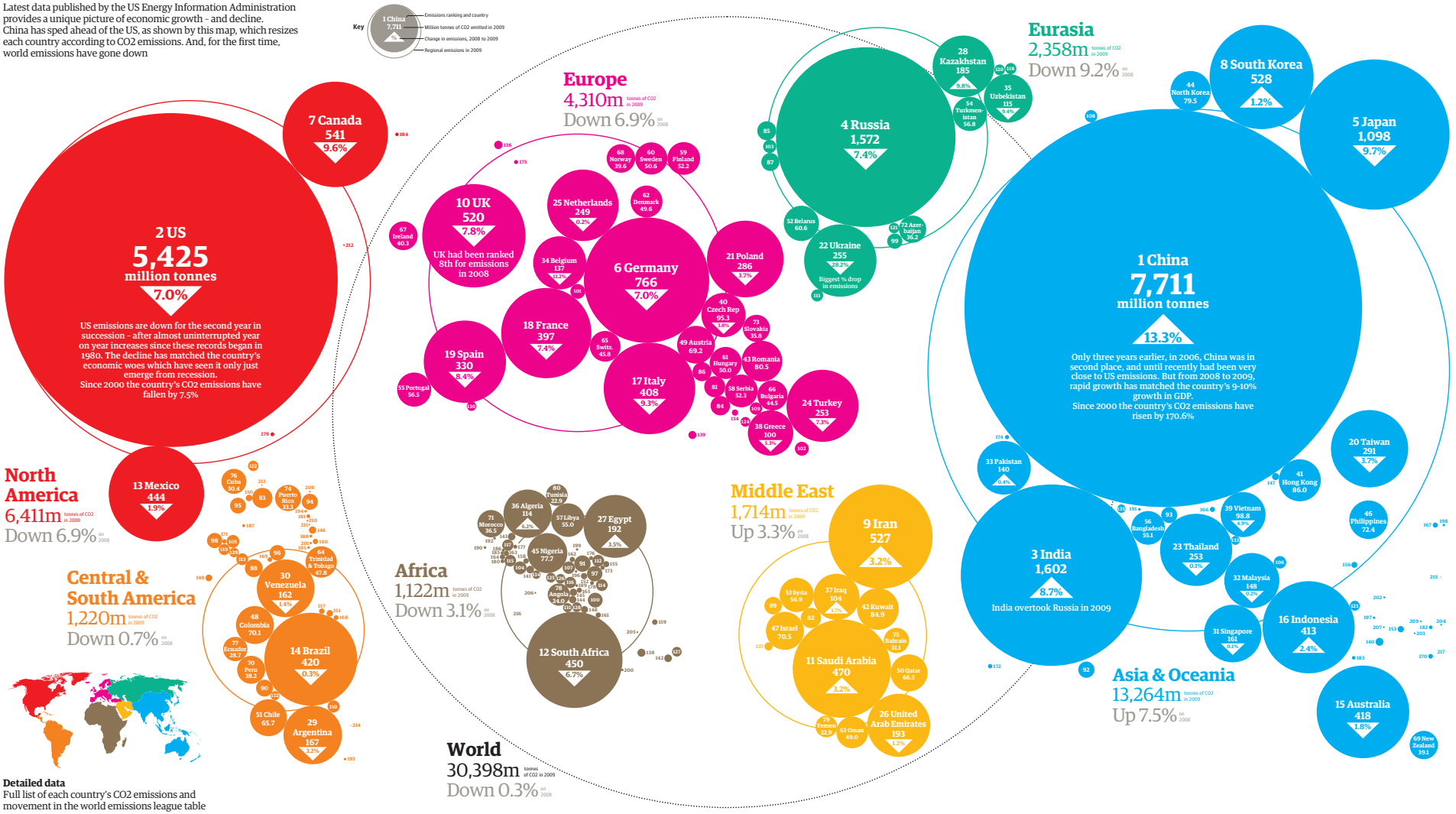
2014 Key World Energy Statistics, IEA


World Population: 1950-2050
Population (billions)
10
9
8
7
6
5
4
3
2
1
0
7.4 billion currently
3 Billion
4 Billion
5 Billion
6 Billion
7 Billion
8 Billion
9 Billion
1950
1960
1970
1980
1990
2000
2010
2020
2030
2040
2050
Year
Source: U.S. Census Bureau, International Data Base, June 2011 Update.


Worldmapper Gridded Population Cartograms
World
Moscow
Berlin
London
Paris
Madrid
Istanbul
Tehran
Kabul
Baghdad
Cairo
Karachi
Delhi
Beijing
Seoul
Tokyo
Chongqing
Shanghai
Dhaka
Hanoi
Hong Kong
Manila
Yangon
Bangkok
Mumbai
Bangalore
Lagos
Kinshasa
Jakarta
Los Angeles
New York
Mexico City
Bogotá
Lima
Rio de Janeiro
Santiago
Buenos Aires
(c) www.worldmapper.org

An atlas of pollution: the world in carbon dioxide emissions

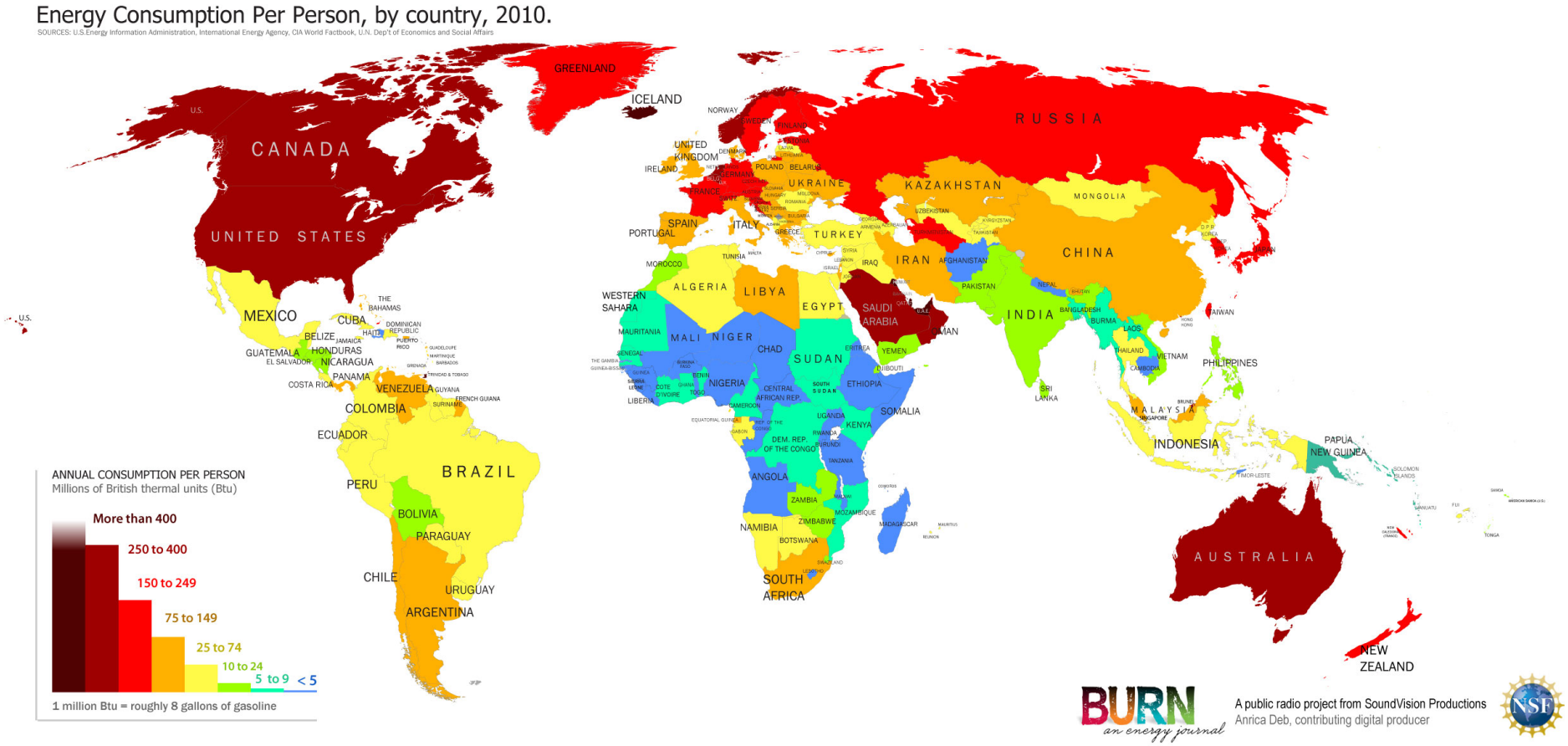
Latest data published by the US Energy Information Administration provides a unique picture of economic growth – and decline. China has sped ahead of the US, as shown by this map, which resizes each country according to CO2 emissions. And, for the first time, world emissions have gone down



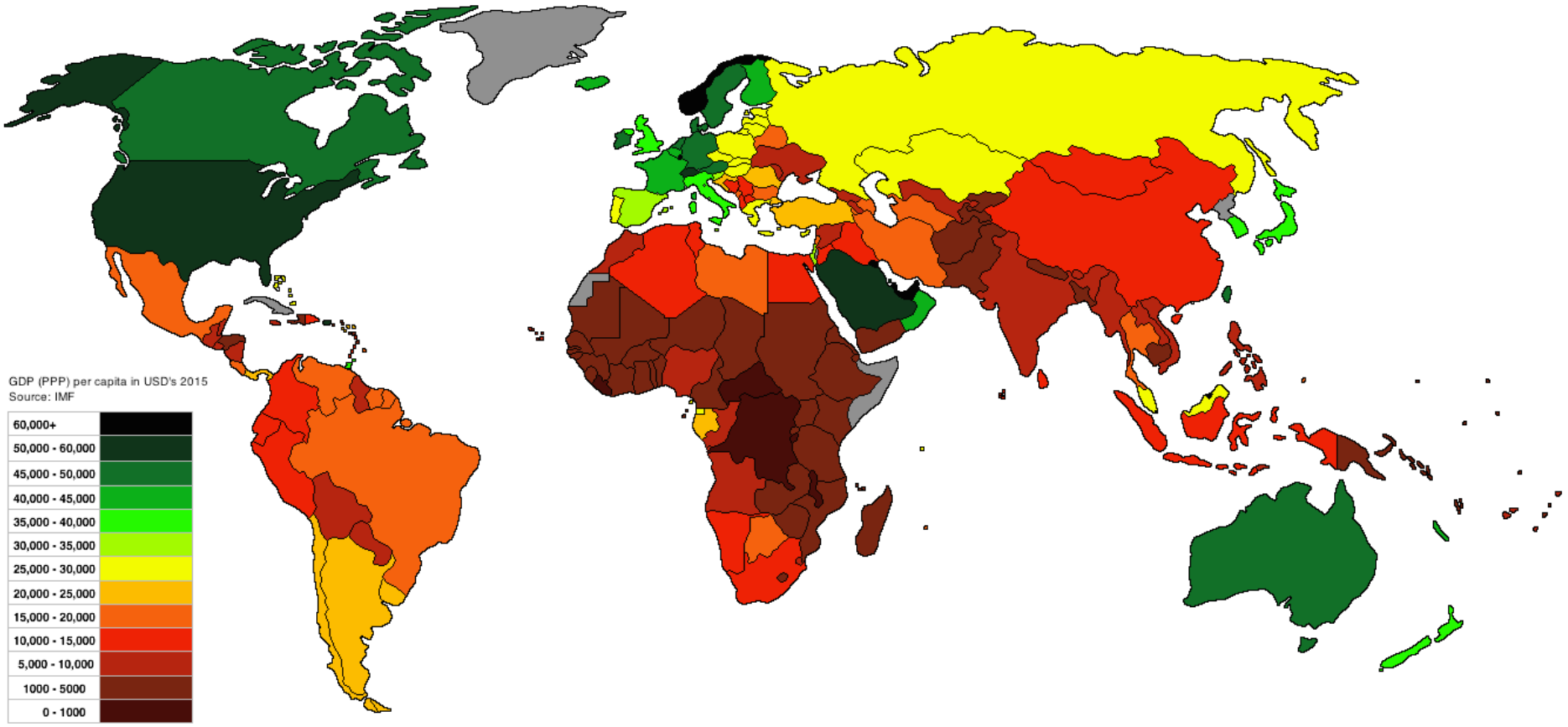
Detailed data
Full list of each country's CO2 emissions and movement in the world emissions league table

Graphic by The Guardian, Data from EIA, looking at 2009 vs 2008 emissions

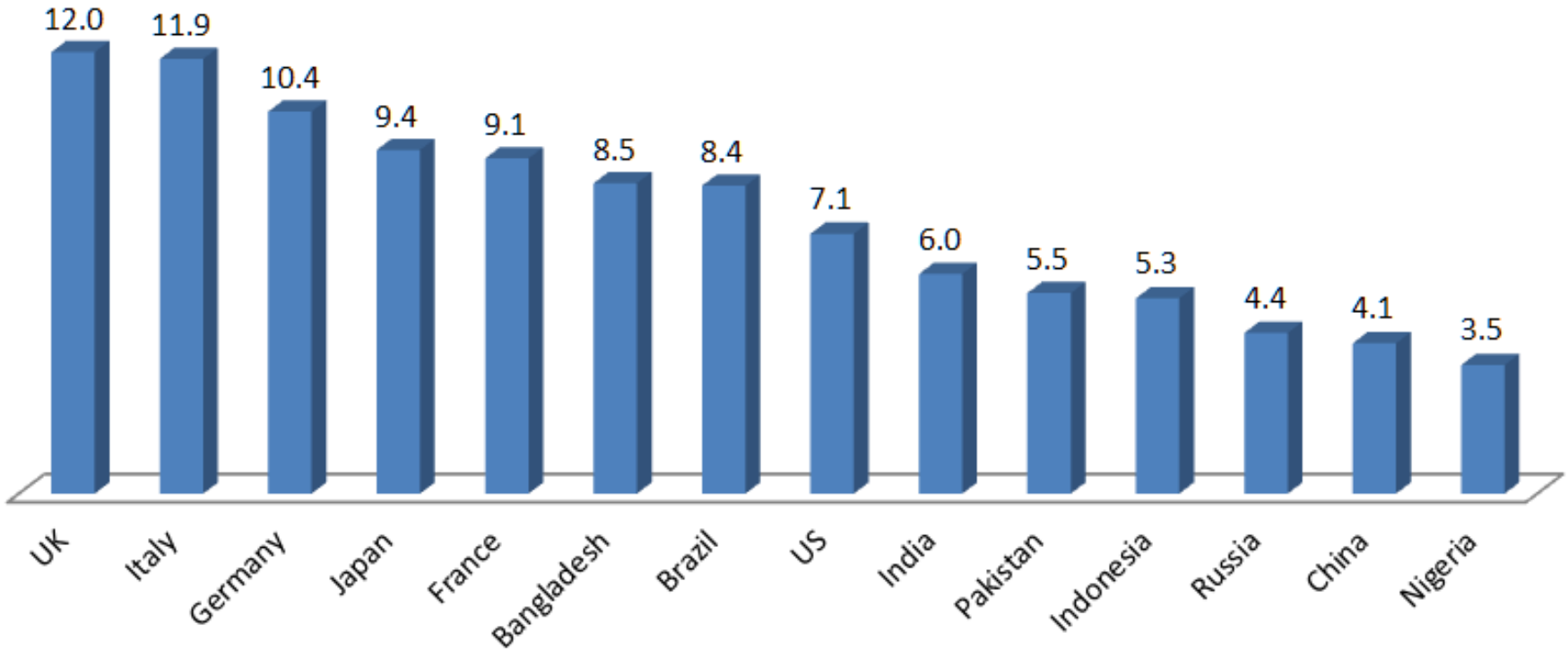
World energy consumption per capita 2010



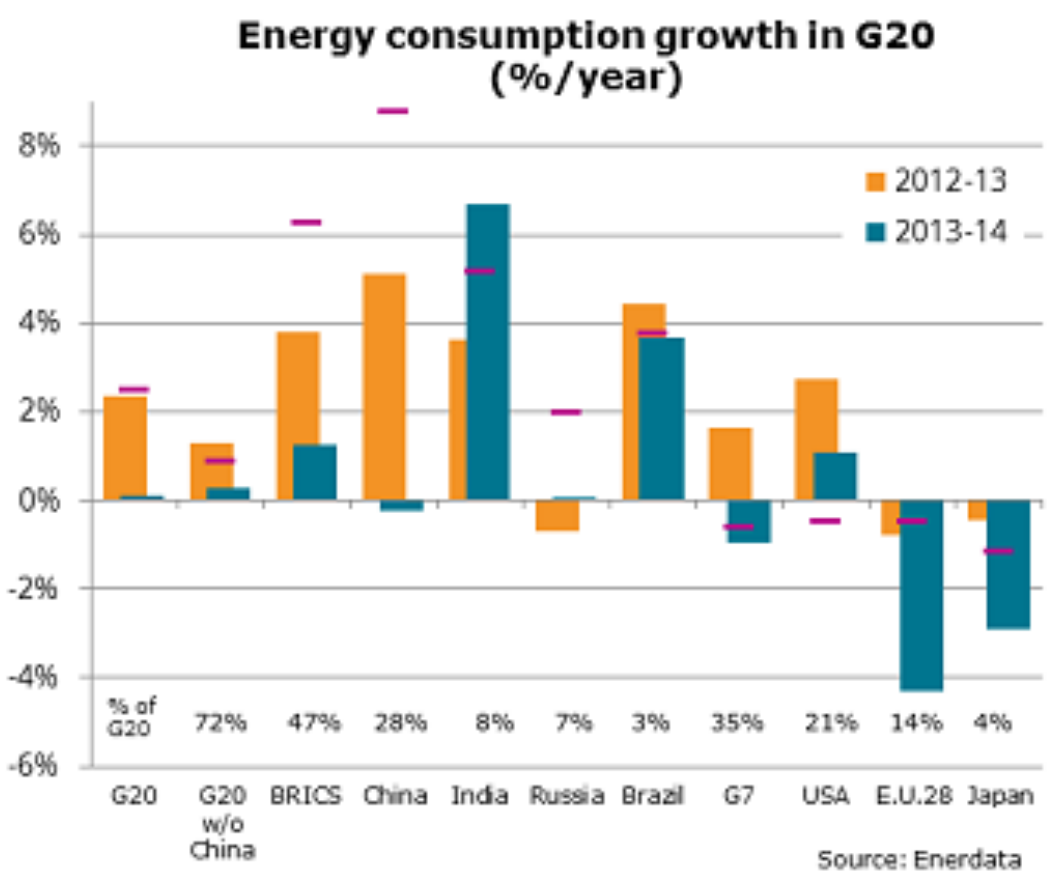
GDP per capita 2010, IMF



GDP per unit of energy use

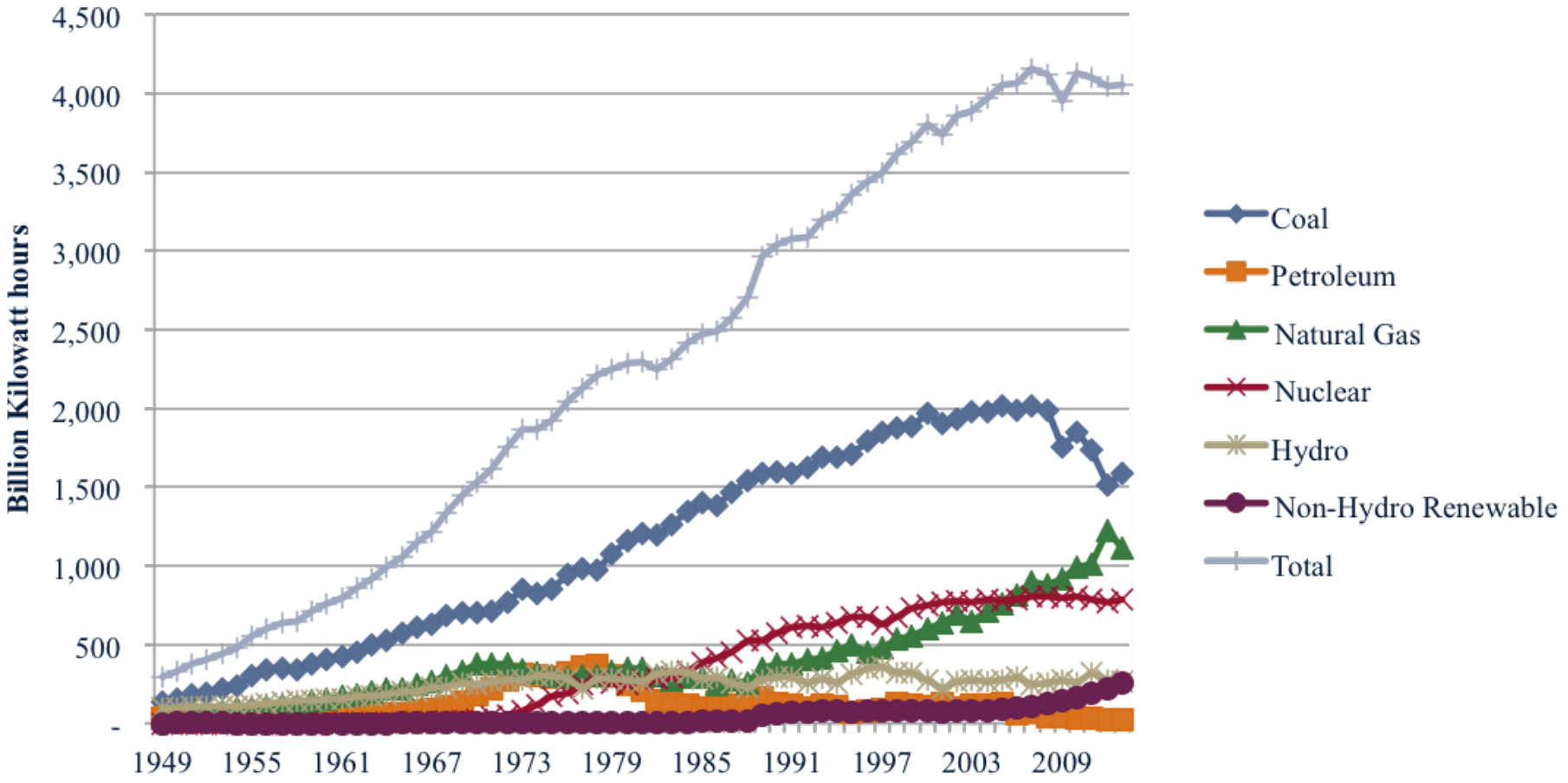


Historical stagnation in energy consumption



- No increase in energy consumption despite economic growth
- China (30% of G20) : stabilisation for the 1st time in 17 years
- Europe: largest fall ever (except during the economic crisis)
- USA: moderate growth
- India: very strong growth
- High impact of climate in Europe and in some Asian countries

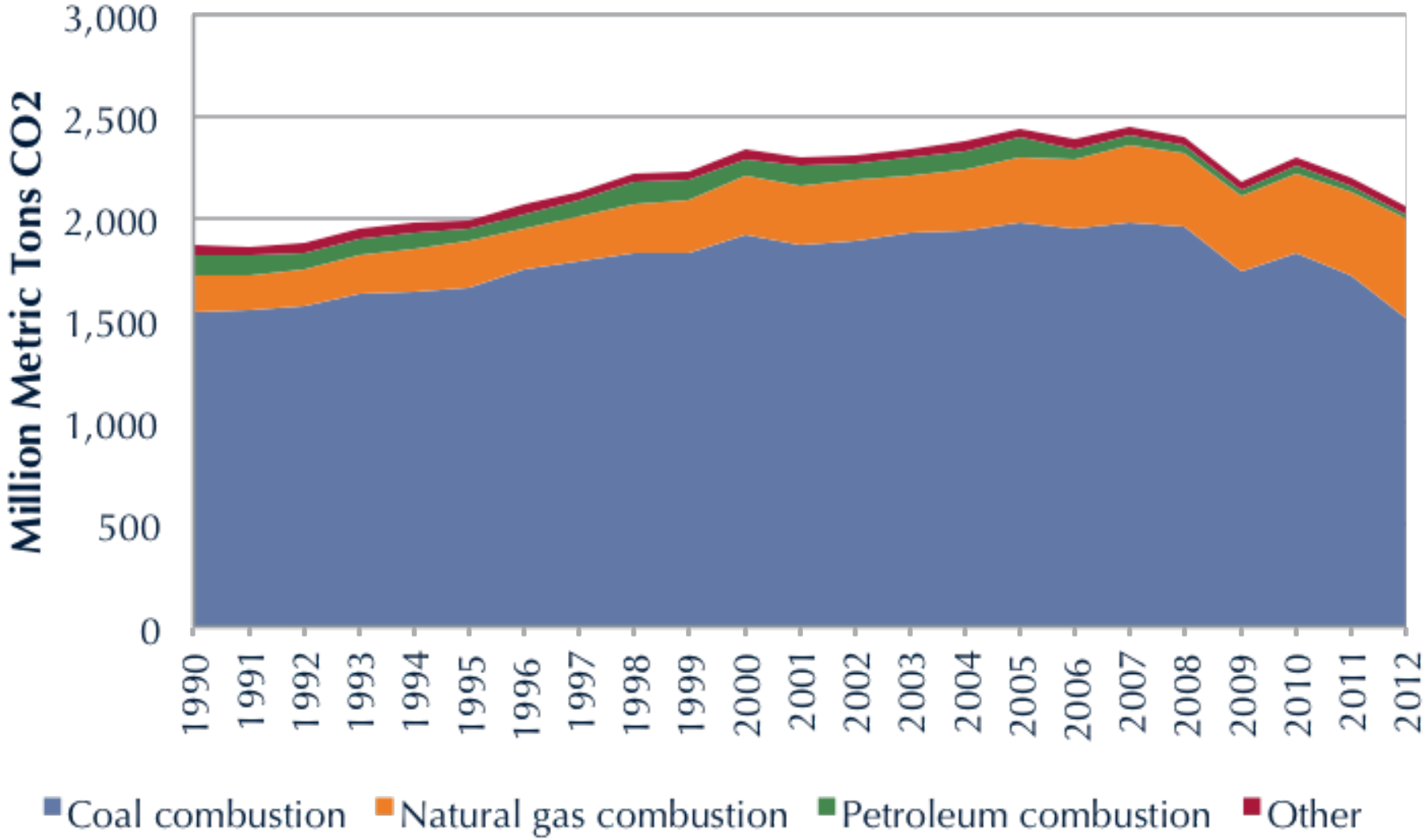
US Net Electricity Generation by Source (1949-2013)



What trends do you see in this graph?

EIA, *Total Energy,* Electricity Net Generation, 2014

US Electricity-related Greenhouse Gas Emissions



EIA, *Total Energy,* Electricity Net Generation, 2014

The Energy "Haves" and "Have Nots"

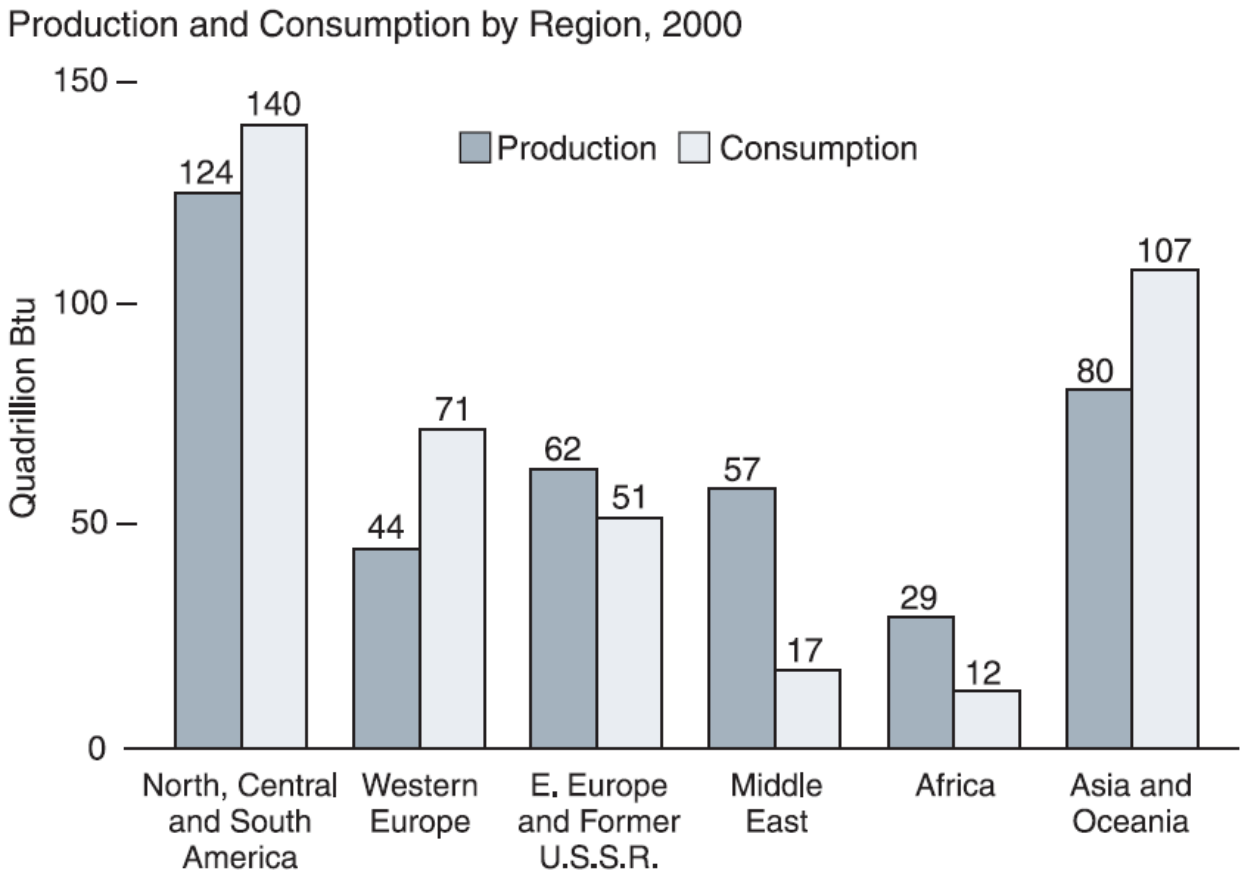


Figure 1.9. Total energy production and consumption in 2000 by region. Source: BP (2001).

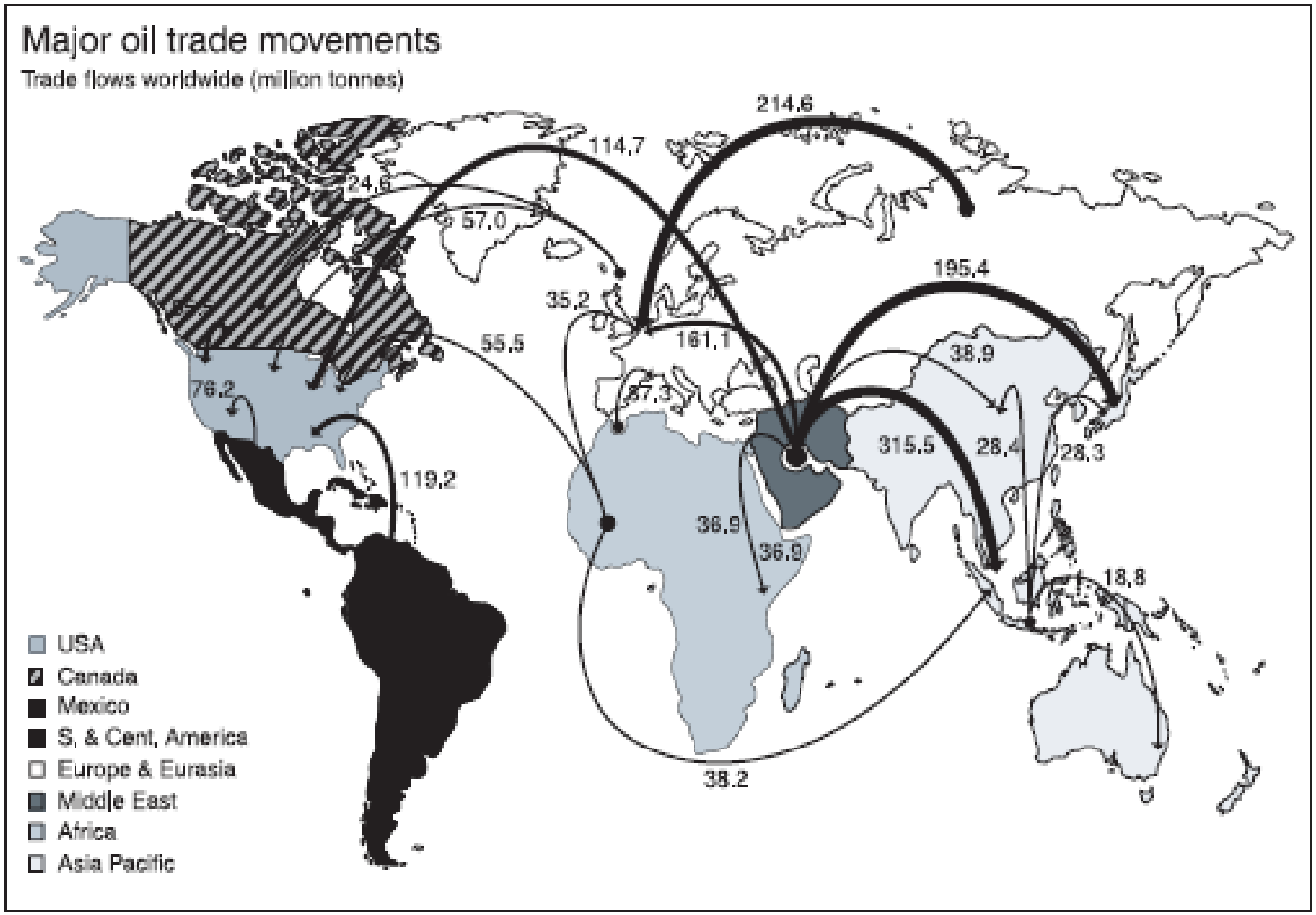
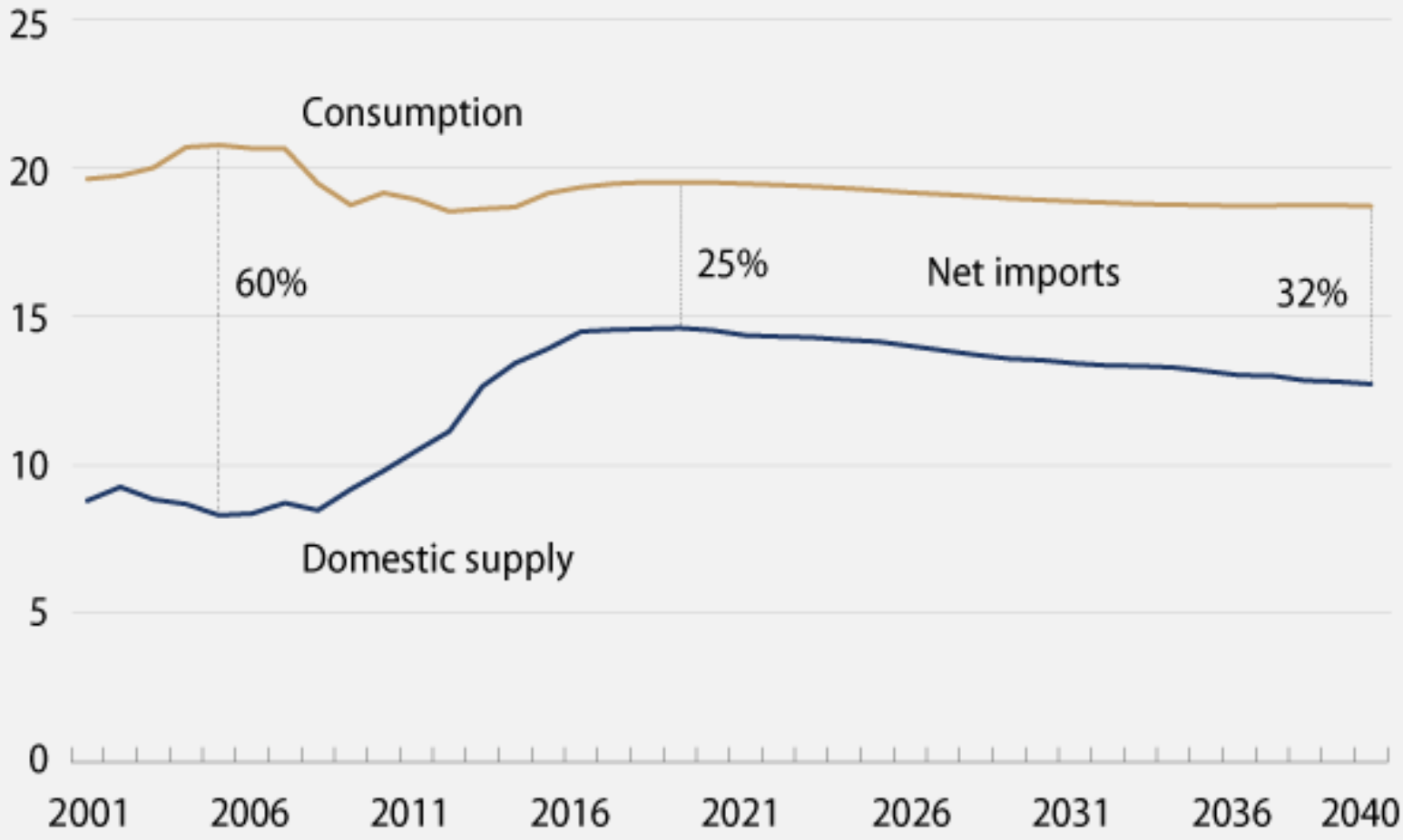


Figure 1.3. Major global trade movements of crude oil in 2002. Source: British Petroleum, (2003): www.bp.com. Reprinted with permission of British Petroleum.

FIGURE 1

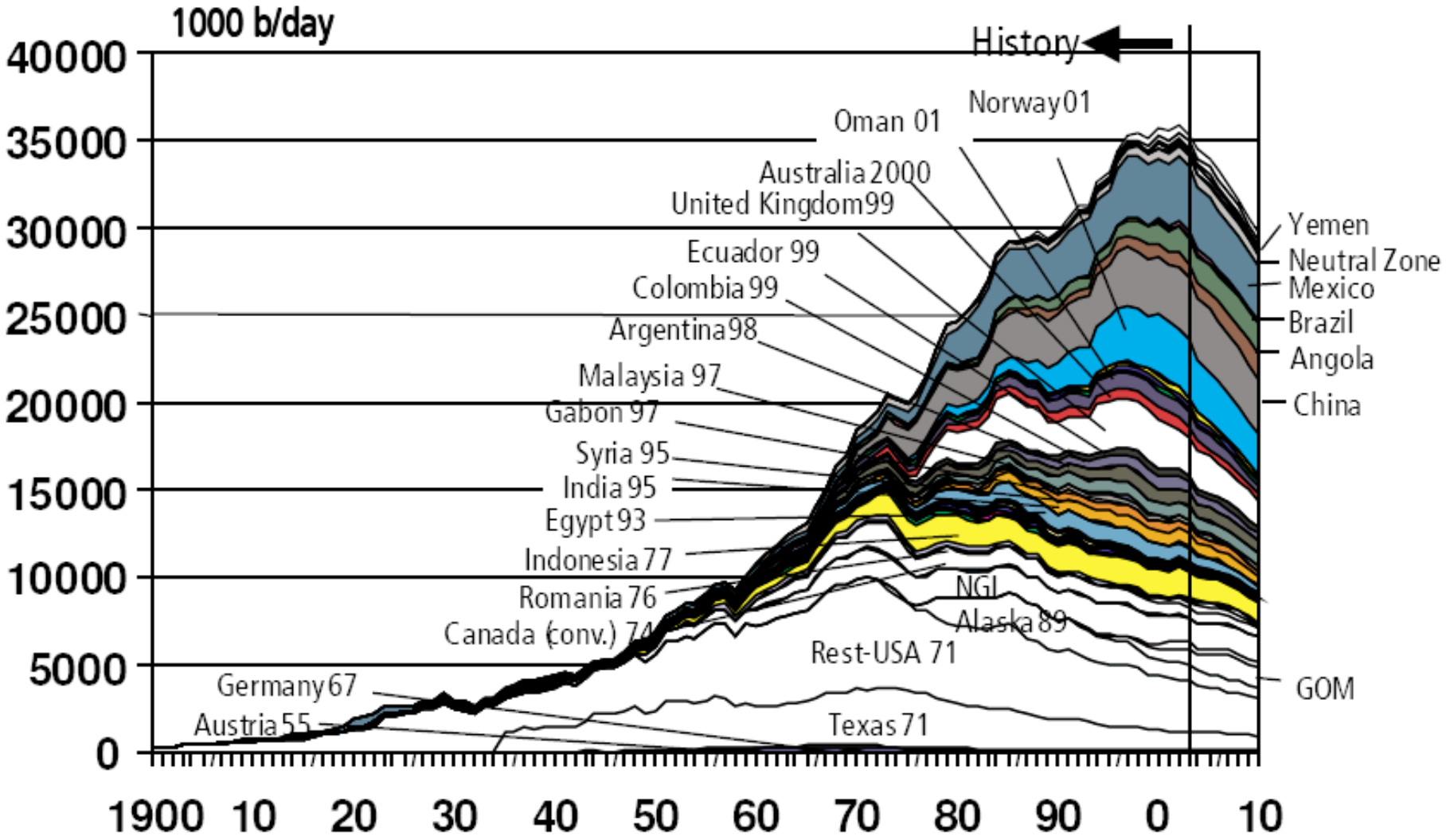
U.S. petroleum and other liquid fuels supply, consumption, and net imports

In millions of barrels per day



Source: Energy Information Administration, AEO2014 Early Release Overview (U.S. Department of Energy, 2014), available at http://www.eia.gov/forecasts/aeo/er/early_production.cfm?src=Petroleum-b2.

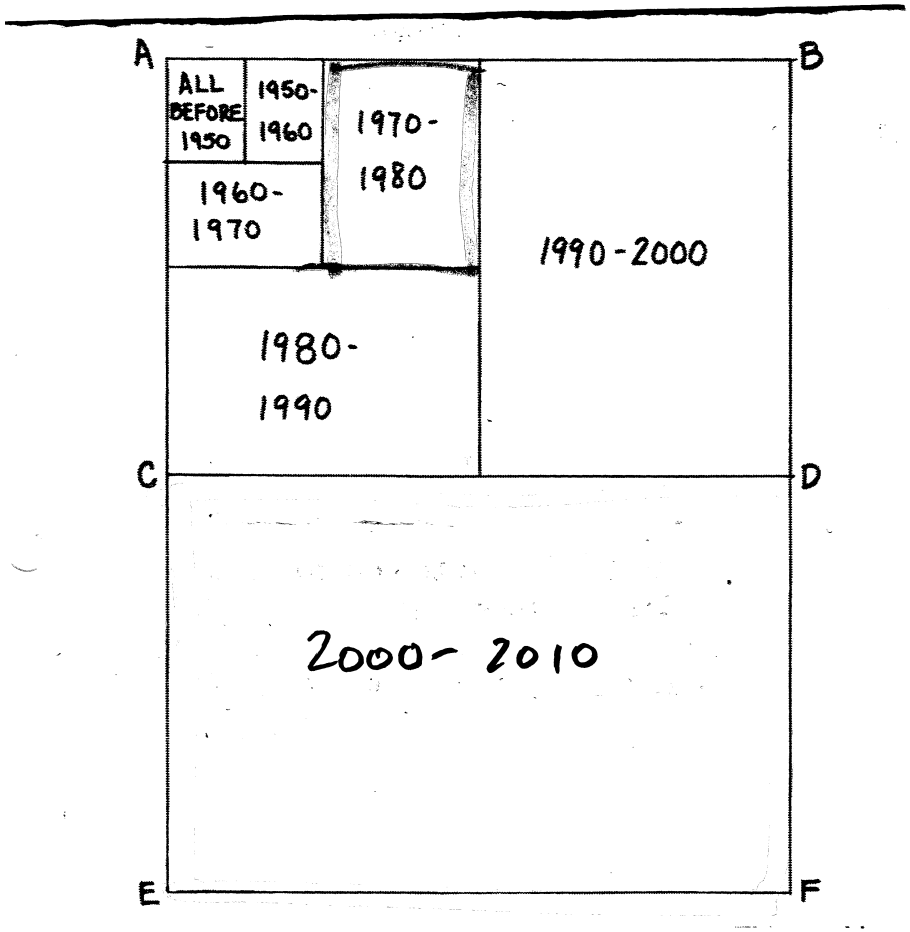
Peak Oil: not “if”, but “when”



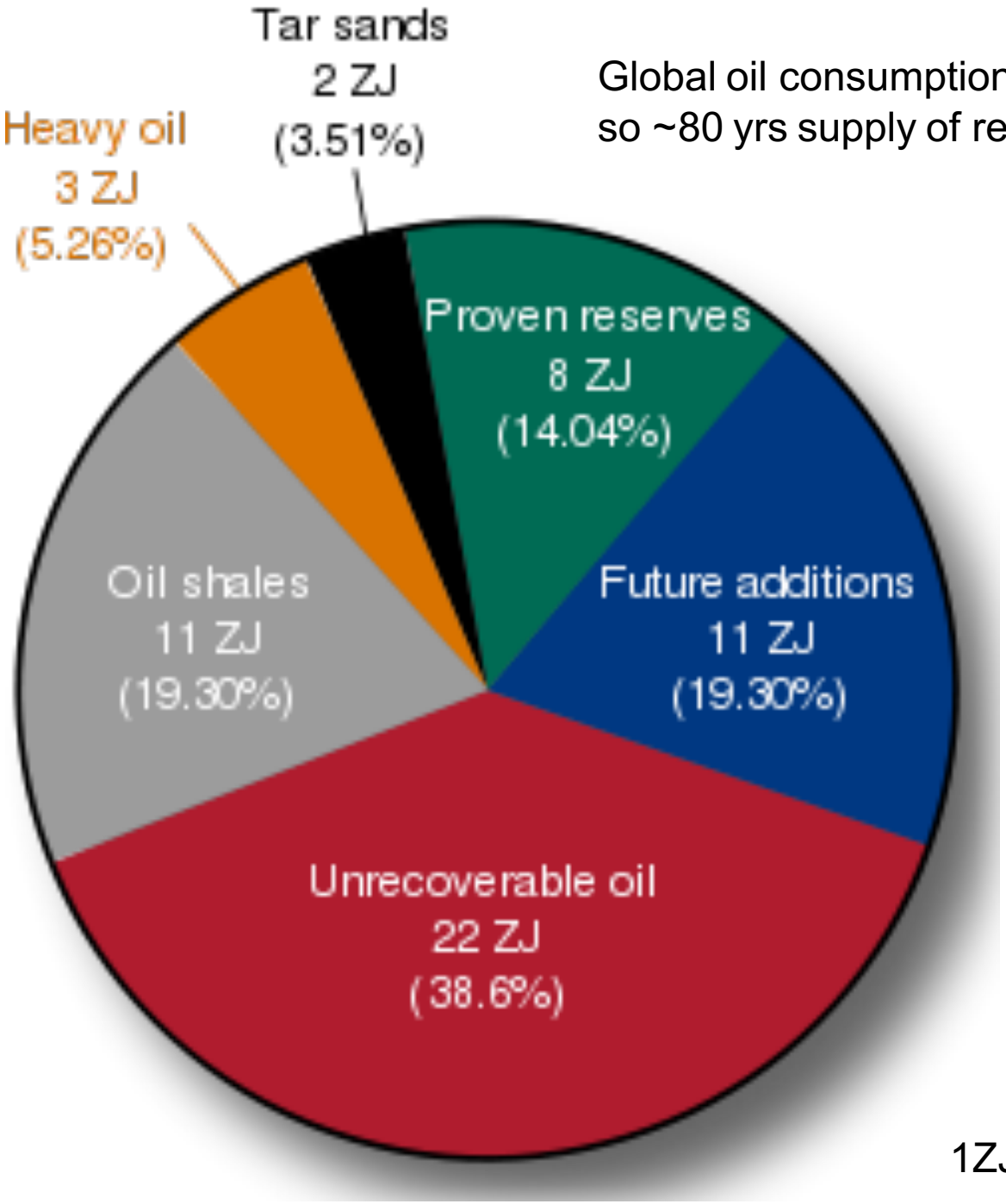
Source: Industry database, 2003 (IHS 2003)
OGJ, 9 Feb 2004 (Jan-Nov 2003)

Oil used since 1950 (R=7)

Recall
$T_2=70/R$



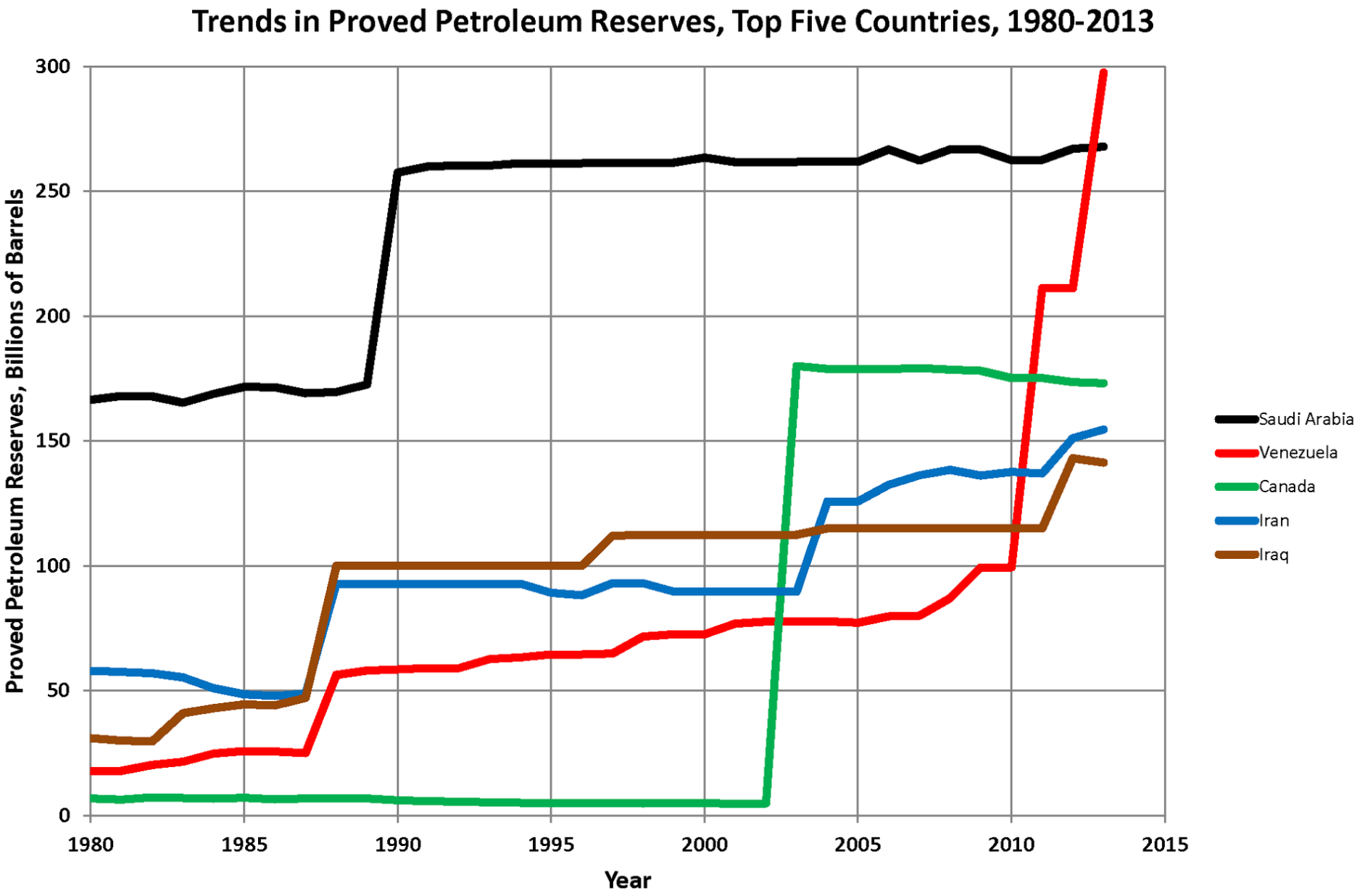
2010 - 2020 ?



Global oil consumption = 0.18 ZJ/yr;
so ~80 yrs supply of reserves

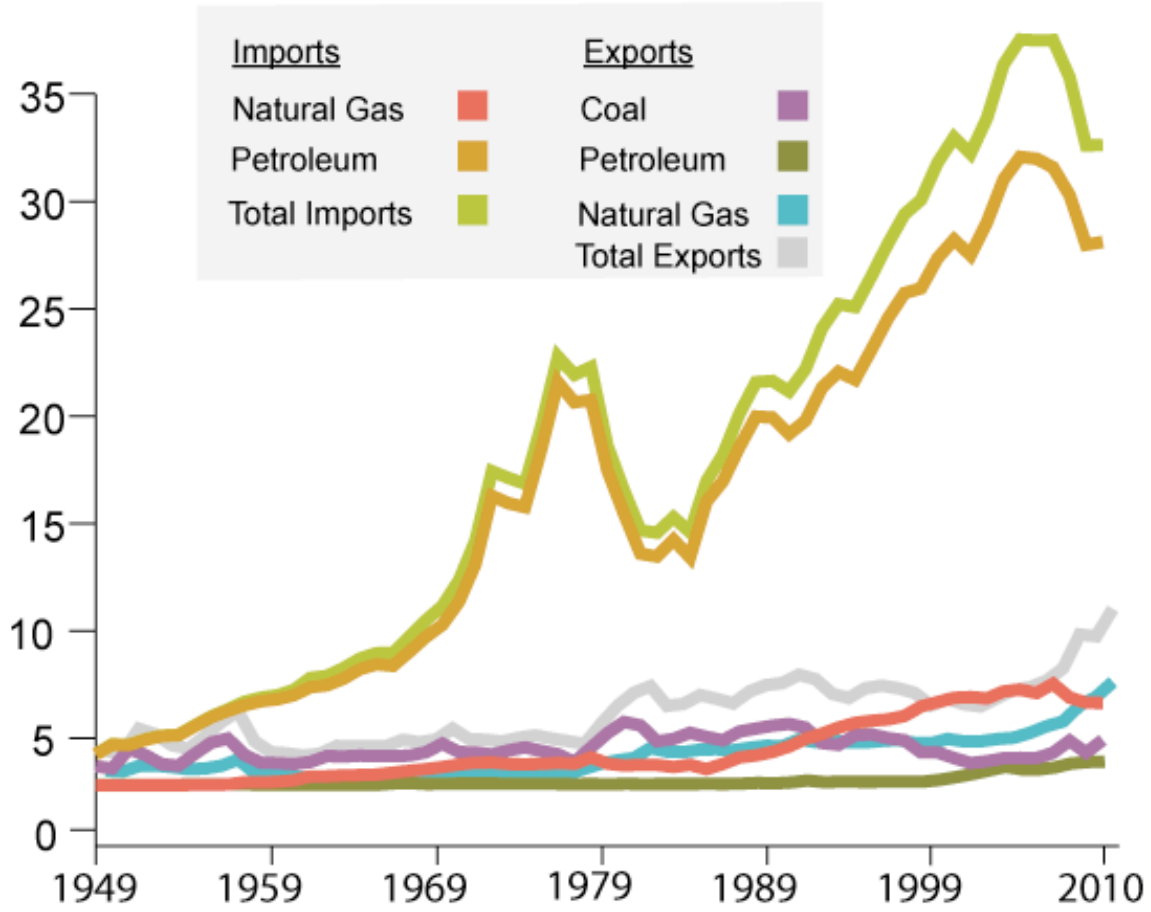
$1ZJ = 10^{20}$ J

Quantifying OPEC oil reserves is a shell game! Nobody knows….



U.S. Primary Energy Imports and Exports

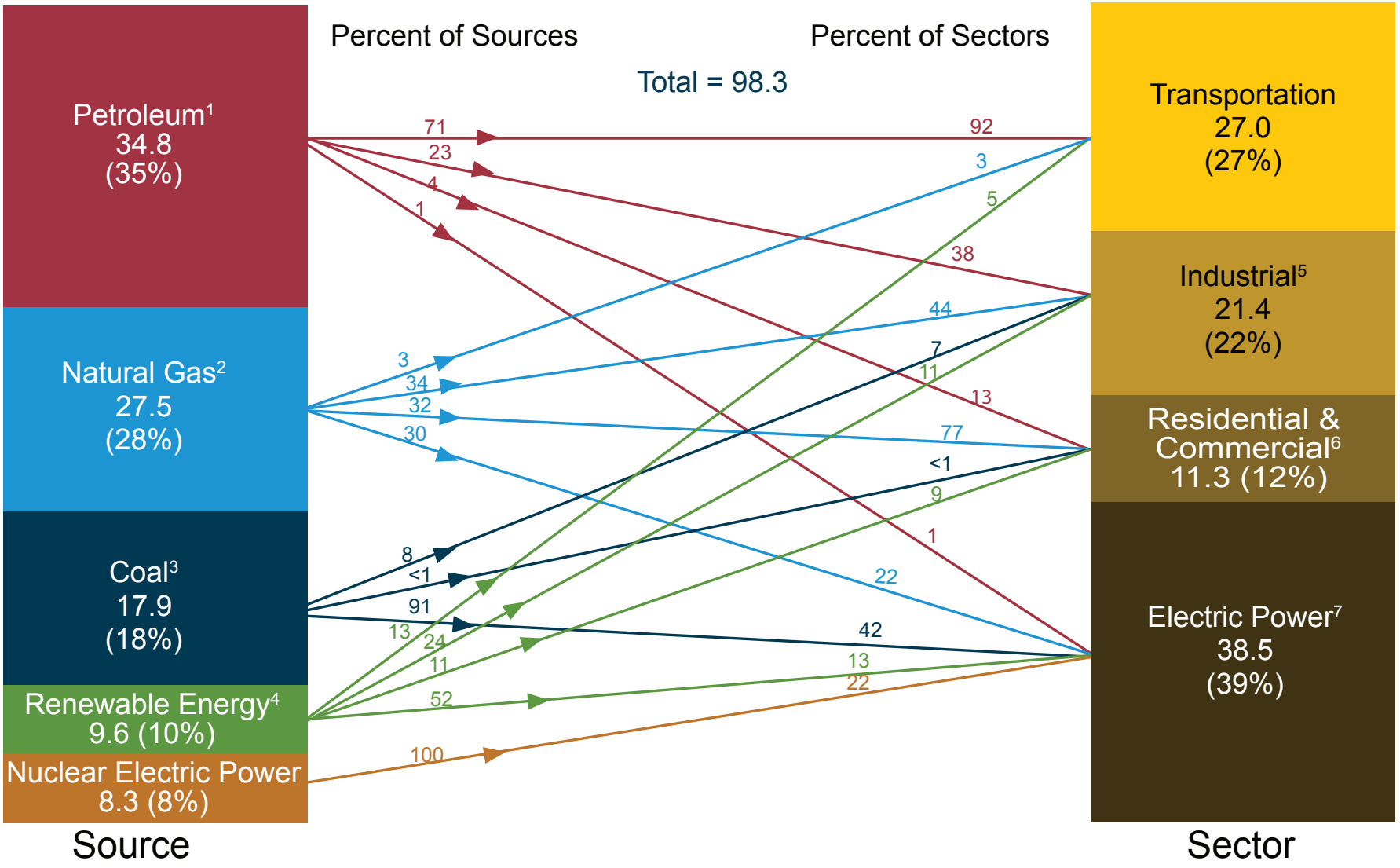
Quadrillion Btu



Source: U.S. Energy Information Administration, *Annual Energy Review,* Table 1.4 (August 2010), and *Monthly Energy Review July 2011*, Tables 1.4.A and 1.4.B.

Primary Energy Consumption by Source and Sector, 2014

(Quadrillion Btu)



http://www.eia.gov/totalenergy/data/monthly/pdf/flow/css_2014_energy.pdf

SHORT-TERM ENERGY OUTLOOK

Release Date: January 12, 2016