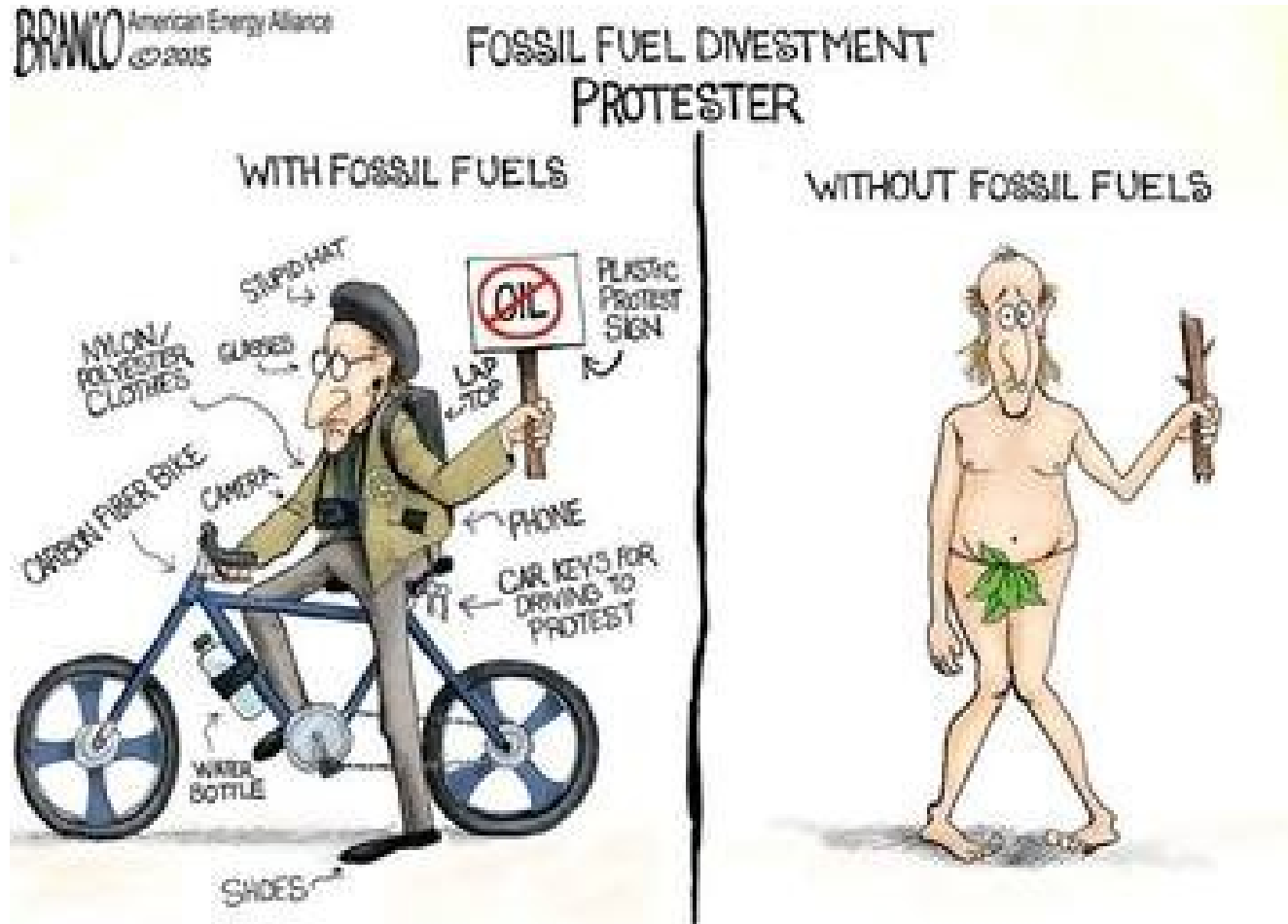


FOSSIL FUELS

from where and for what?

BRANCO American Energy Alliance
© 2015

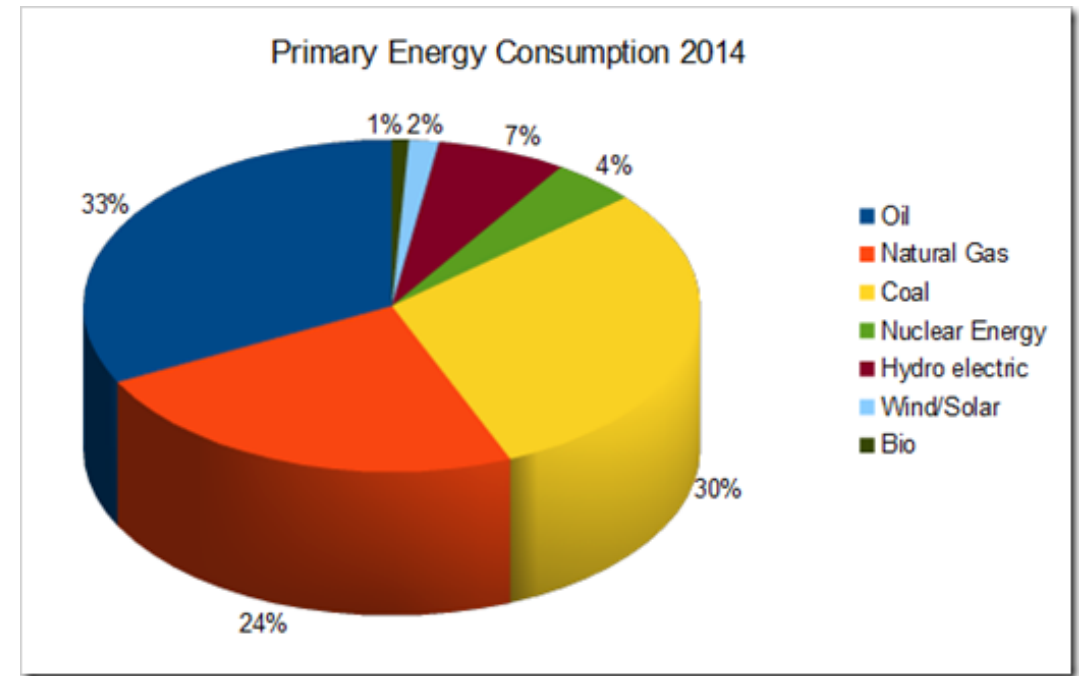


Presented
by

Conghui
& Dewmi

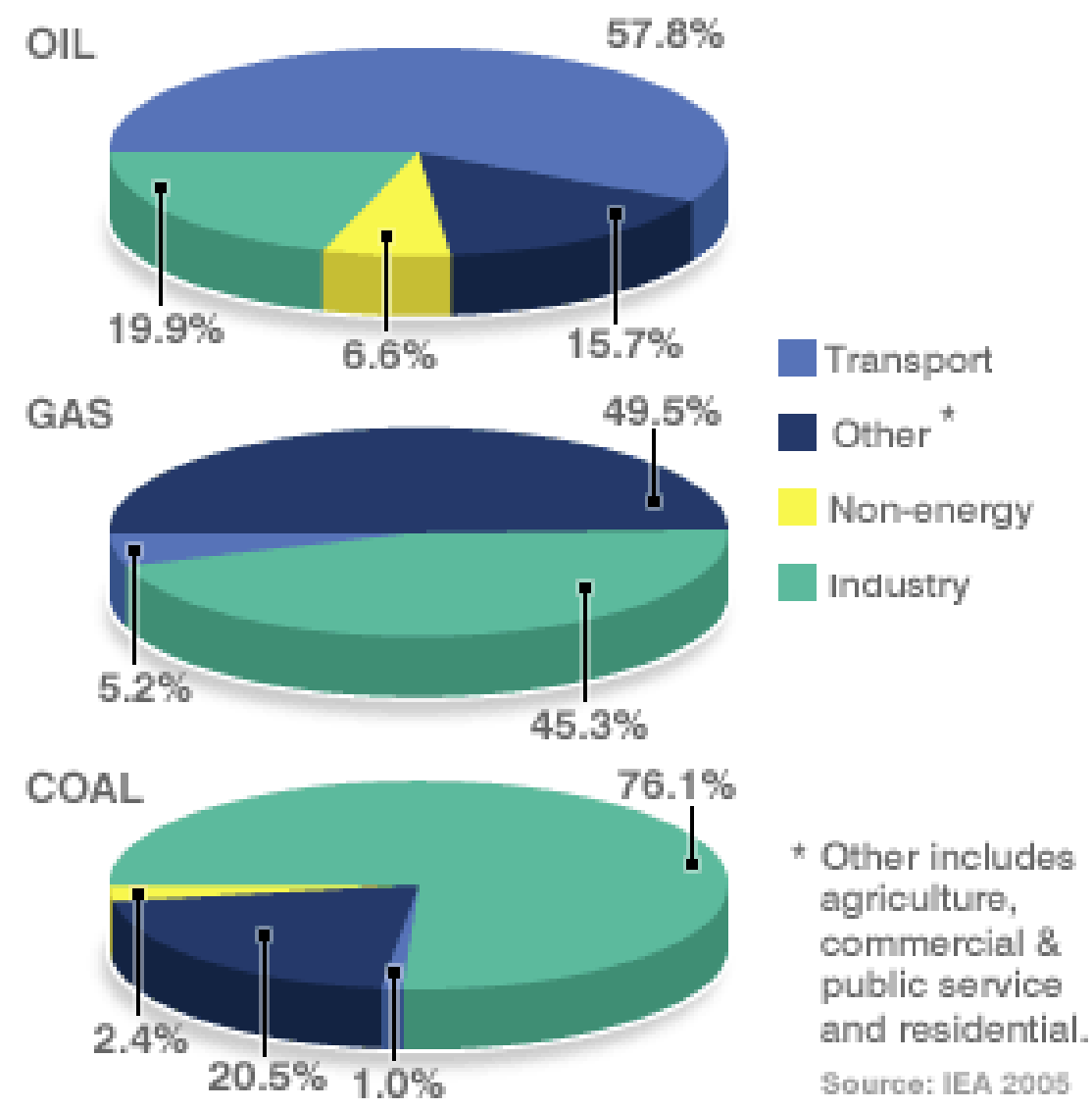
Types of Fossil Fuels

- Natural gas
- Petroleum oil
- Coal

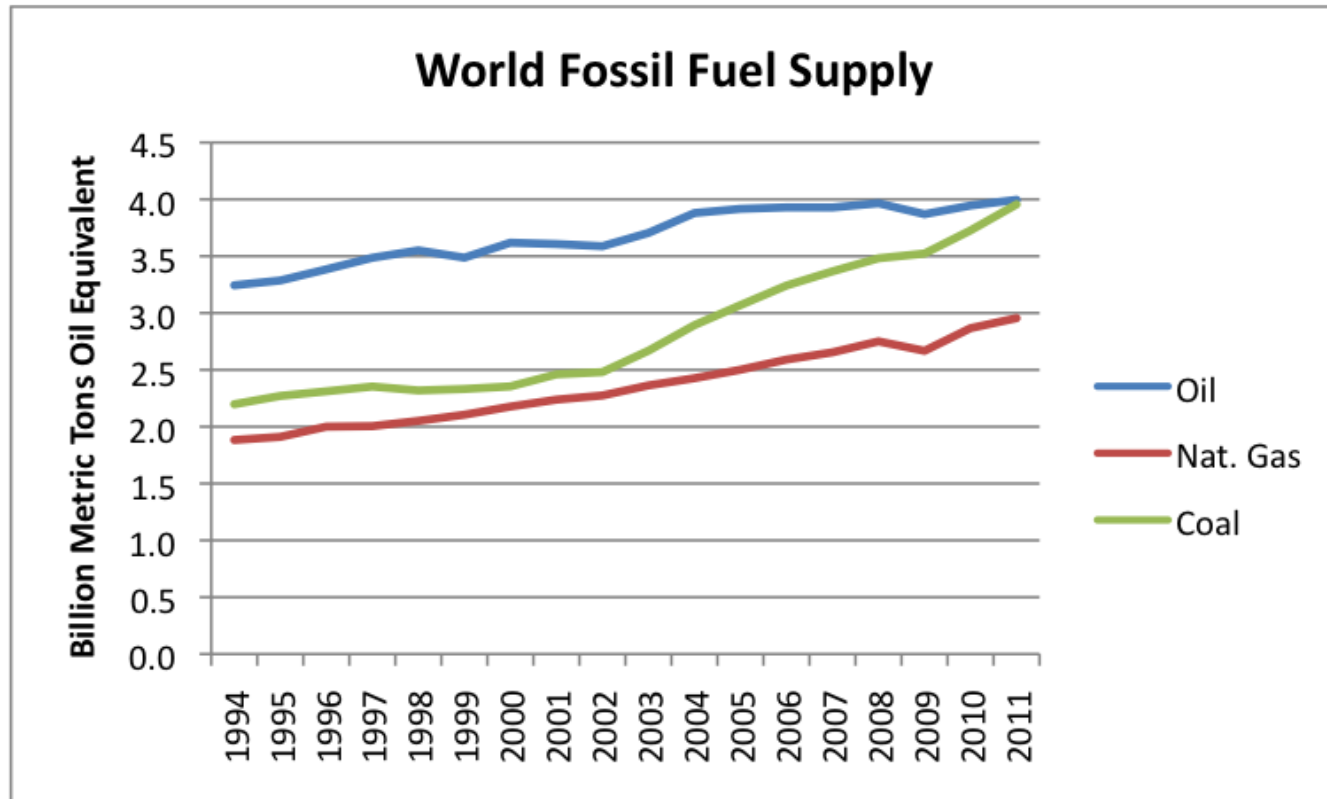


HOW WE USE FOSSIL FUELS

World consumption 2003

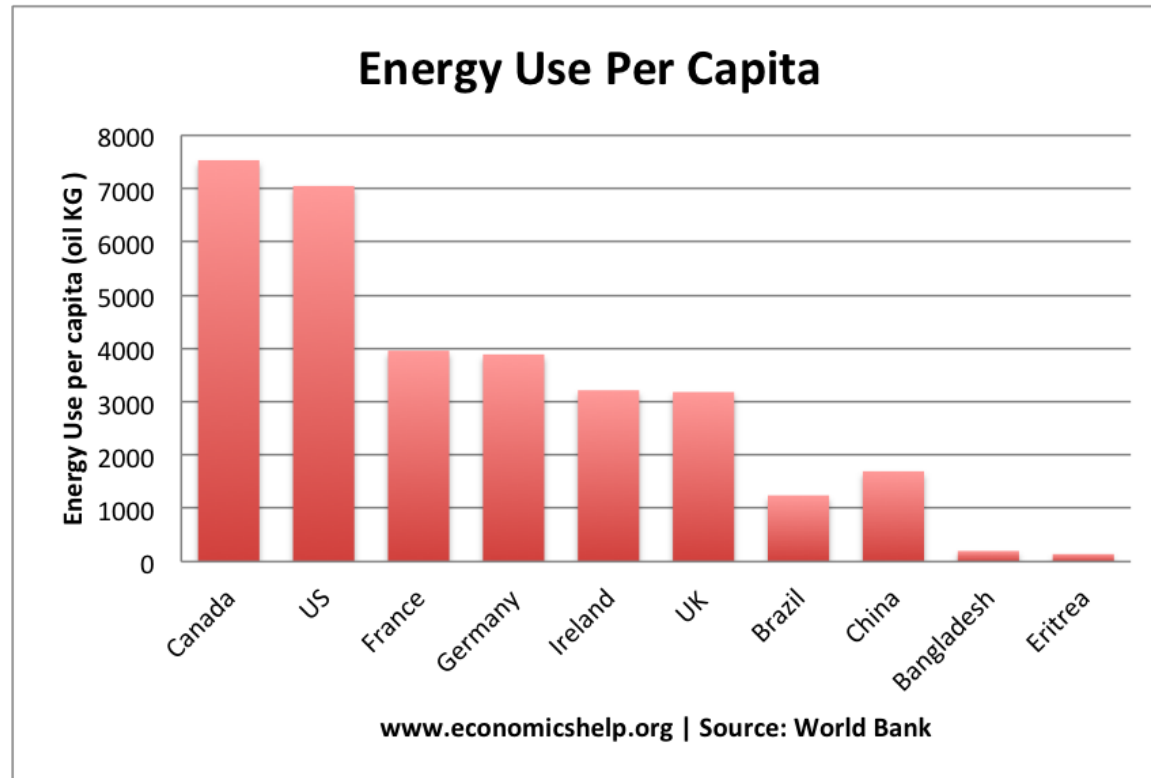


Worldwide fossil fuel supply



- The energy is **required** to make goods and services.
- The mix of types of energy used by a country changes very **gradually** over time, because it is very difficult to substitute one kind of fuel for another without significant investment .
- The supply for the fossil fuel is **still increasing**.

Countries by energy consumption per capita



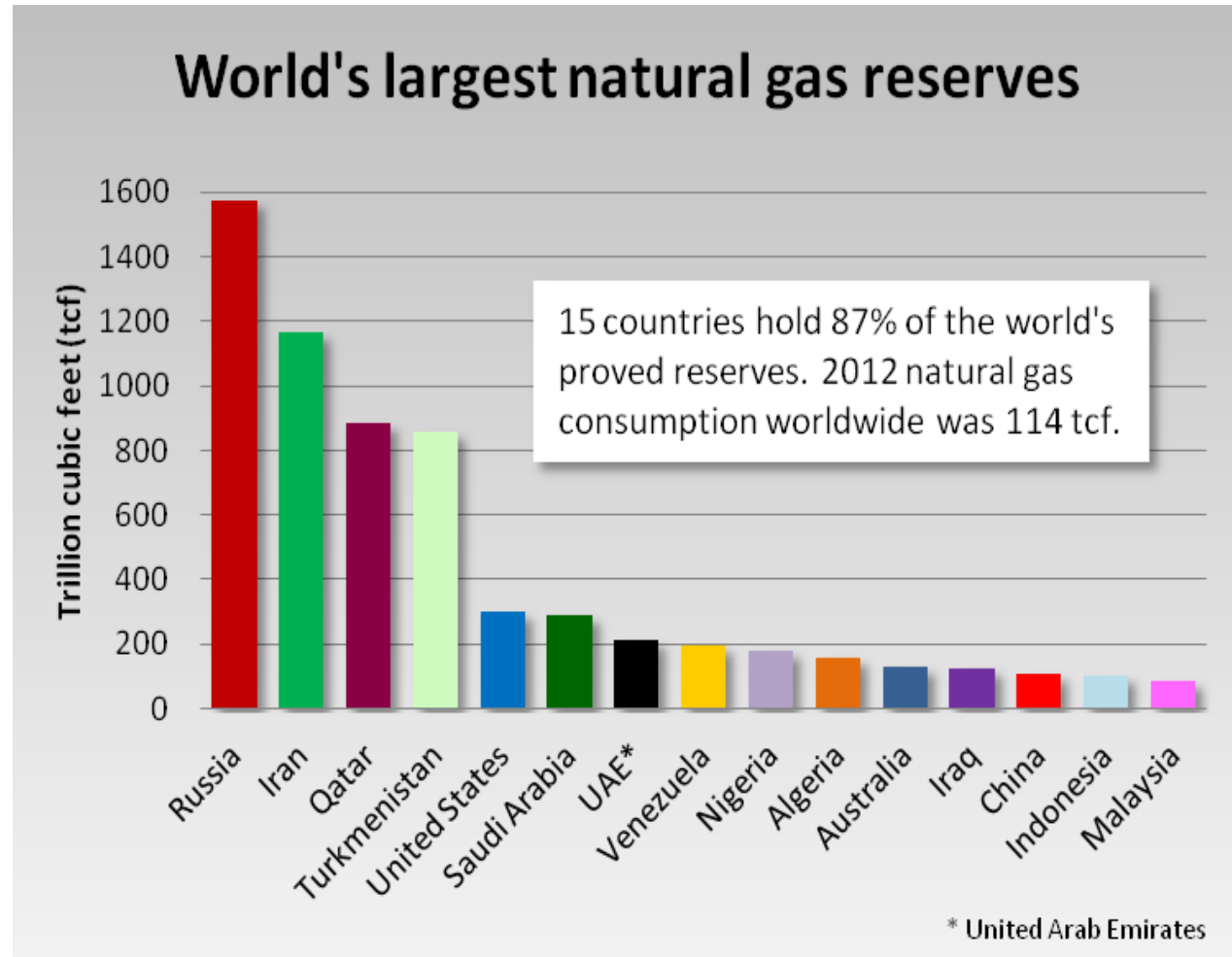
- Energy producers have a high energy use, partly because energy tends to be much cheaper.
- The country with the highest energy use per capita is Iceland. A significant part of Iceland's energy use is thermal energy, which does not involve burning fossil fuels.
- The huge disparity in energy use primarily reflects different income levels throughout the world.

<http://www.economicshelp.org/blog/5988/economics/list-of-countries-energy-use-per-capita/>

NATURAL GAS



Distribution of natural gas reserves

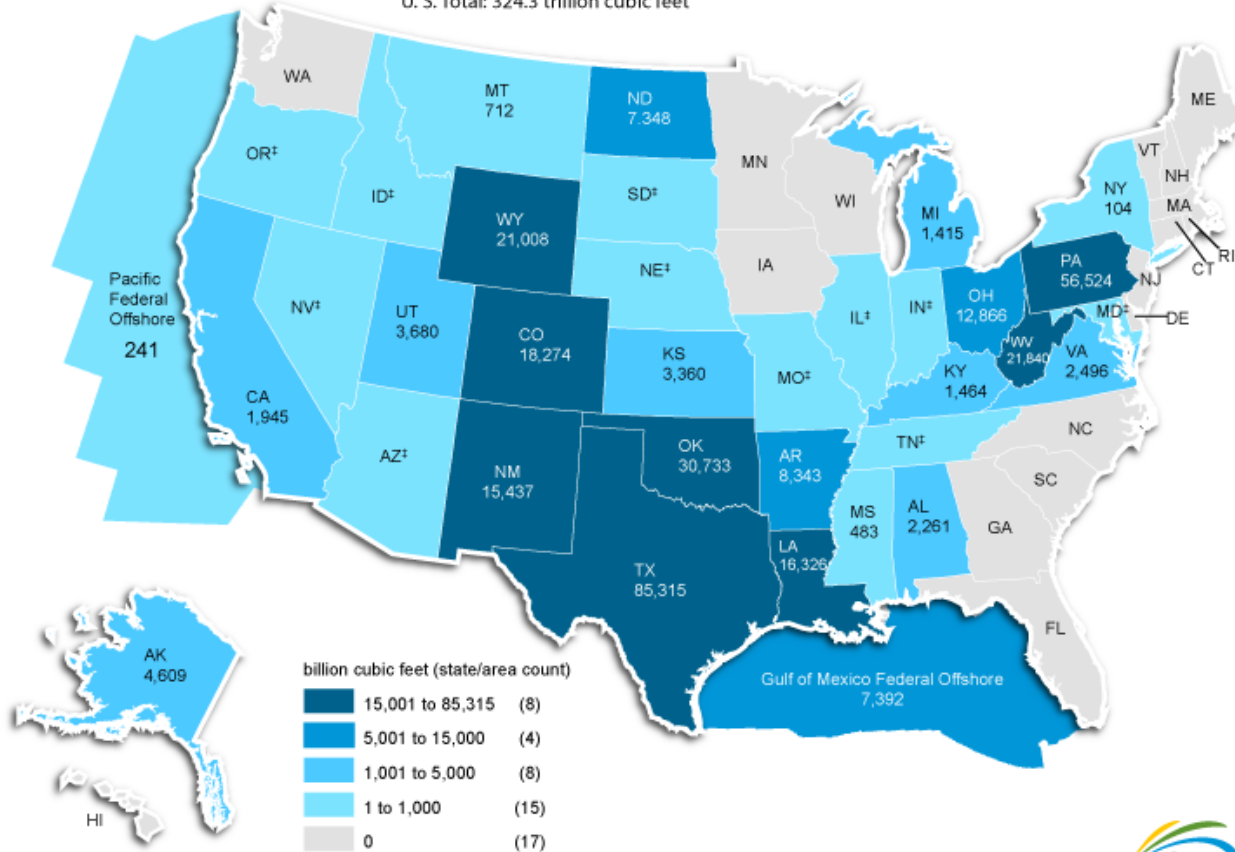


- ❑ Russia holds the largest amount of natural gas reserves in the world, holding about a quarter of world's total gas reserves, followed by Iran and Qatar in the Middle East.
- ❑ Nearly 87% of the world's total proven natural gas reserves are located in 15 countries.

Natural gas reserves in the U.S.

Figure 16. Natural gas proved reserves by state/area, 2015

U. S. Total: 324.3 trillion cubic feet

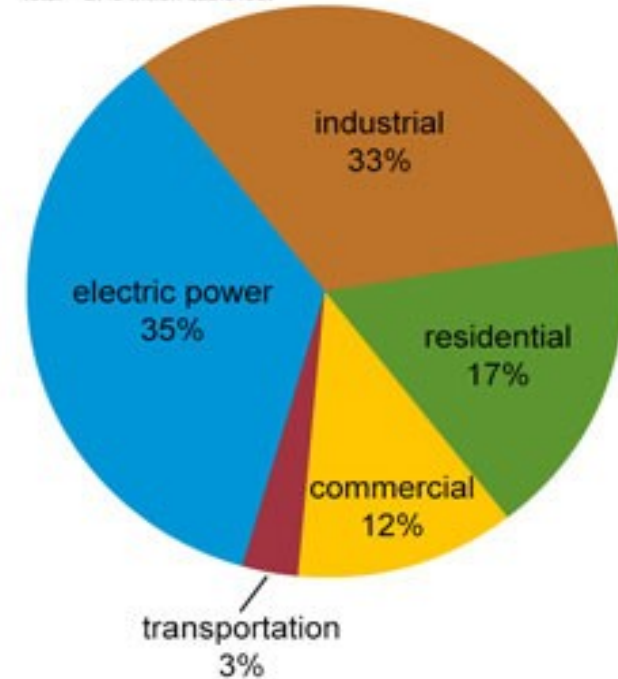


U.S. Consumption of natural gases in 2015

- The **electric power sector** : natural gas was the source of about 26% of U.S. electric power sector energy consumption
- The **industrial sector** : natural gas was the source of about 30% of U.S. industrial sector energy consumption
- The **residential sector**: natural gas was the source of about 23% of U.S. residential sector energy consumption
- The **commercial sector**: natural gas was the source of about 18% of U.S. commercial sector energy consumption.

U.S. natural gas consumption by sector, 2015

Total = 27.5 trillion cubic feet

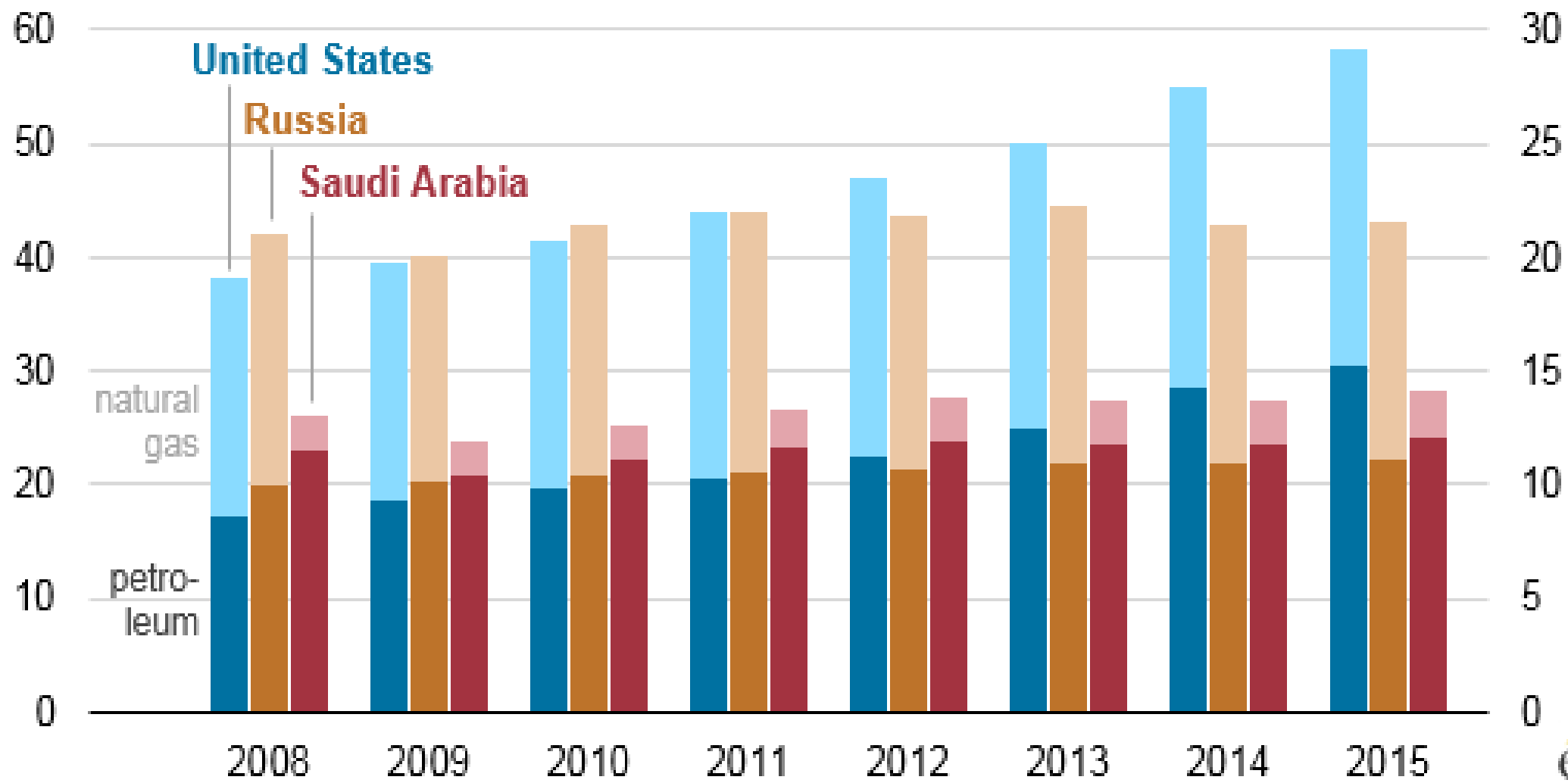


Source: U.S. Energy Information Administration, *Monthly Energy Review*, April 2016, preliminary data



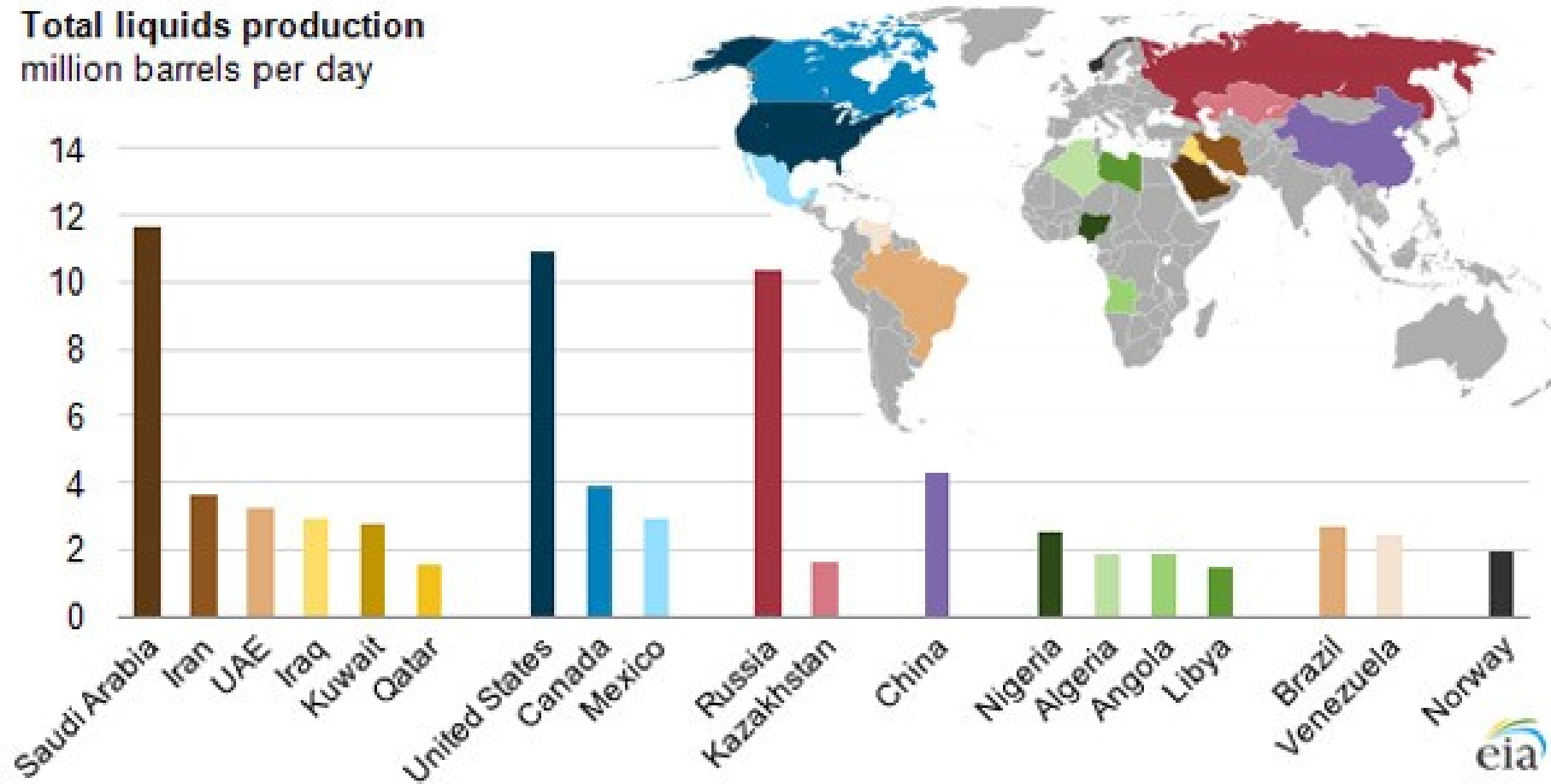
Estimated petroleum and natural gas hydrocarbon production in selected countries

quadrillion British thermal units million barrels per day of oil equivalent



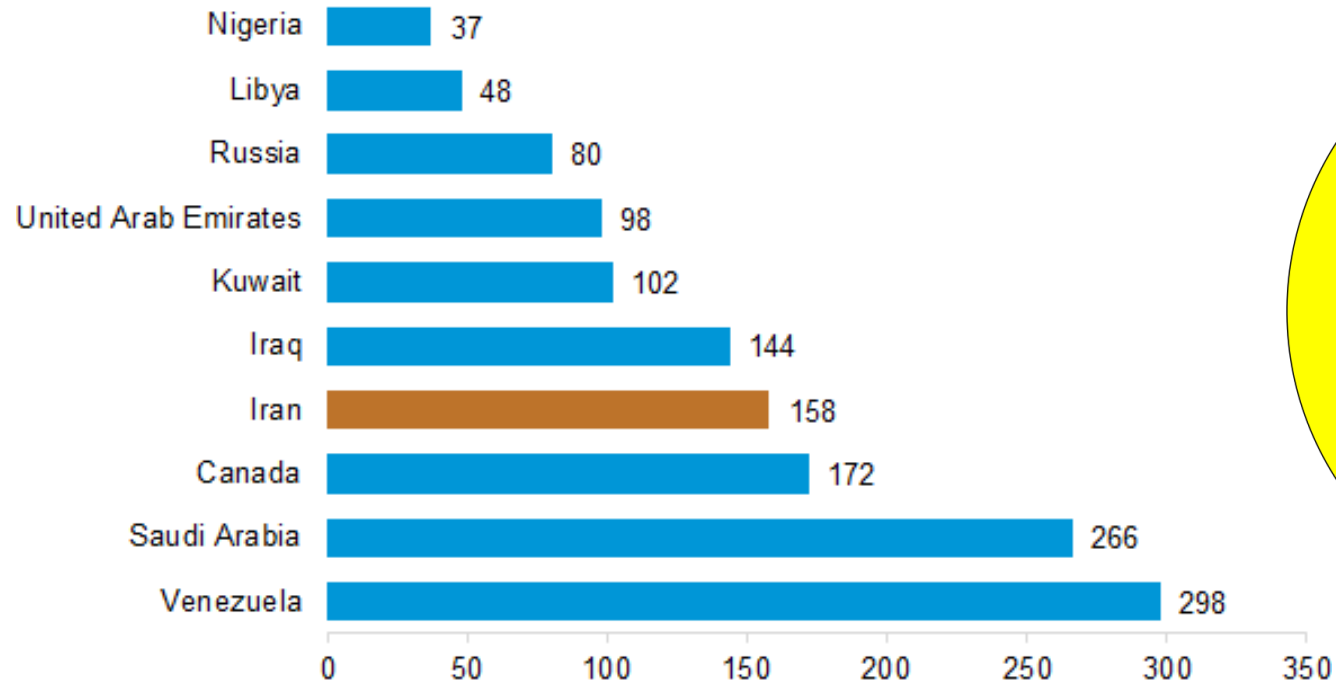
PETROLEUM OIL

Total liquids production
million barrels per day



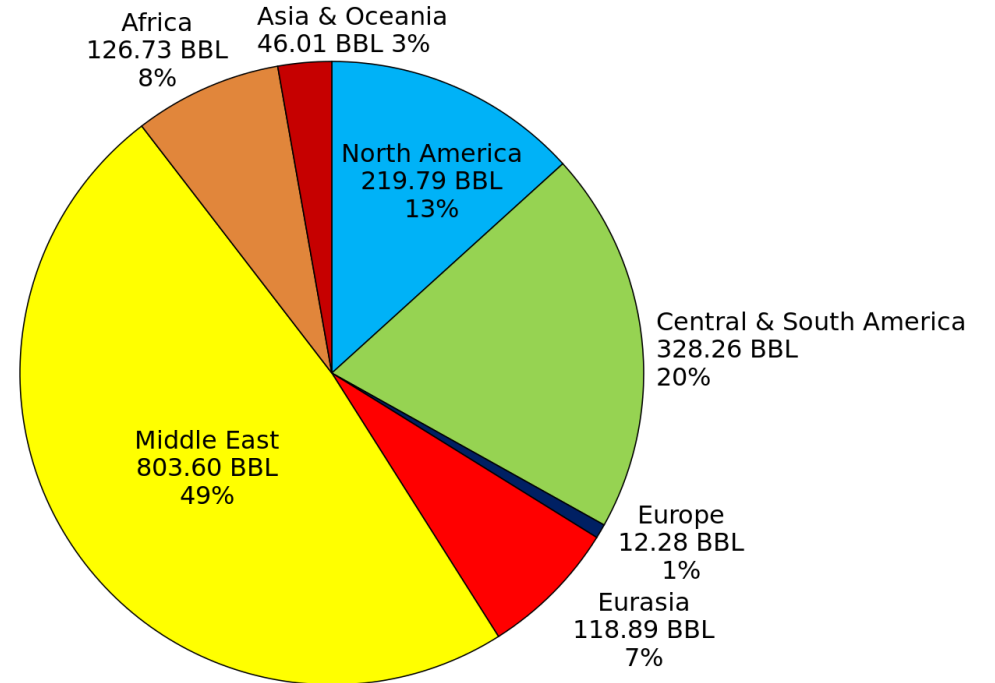
World oil reserves

Largest proved reserve holders of crude oil
billion barrels



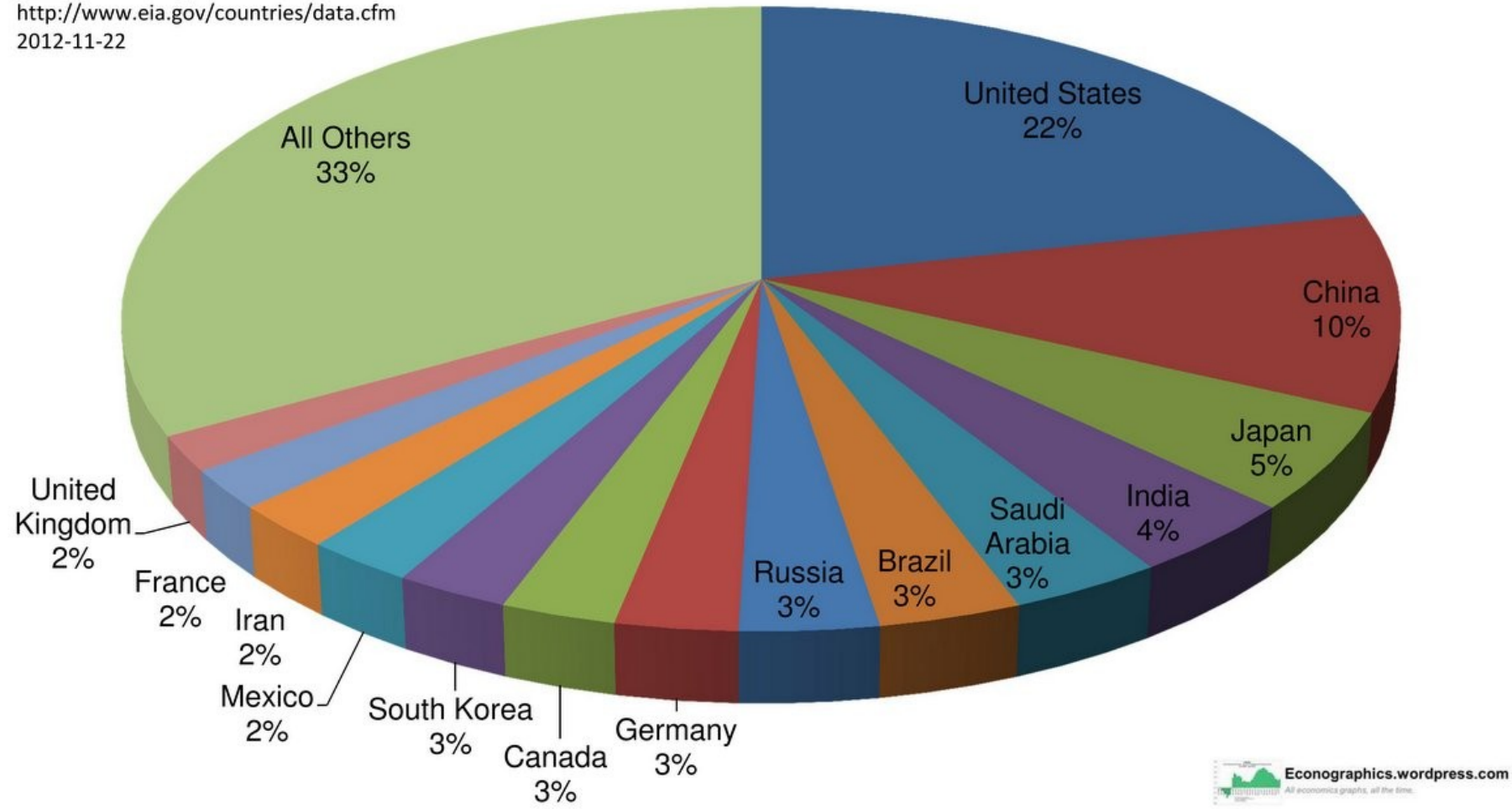
Source: *Oil & Gas Journal*, January 2015.

World Oil Reserves (2014)

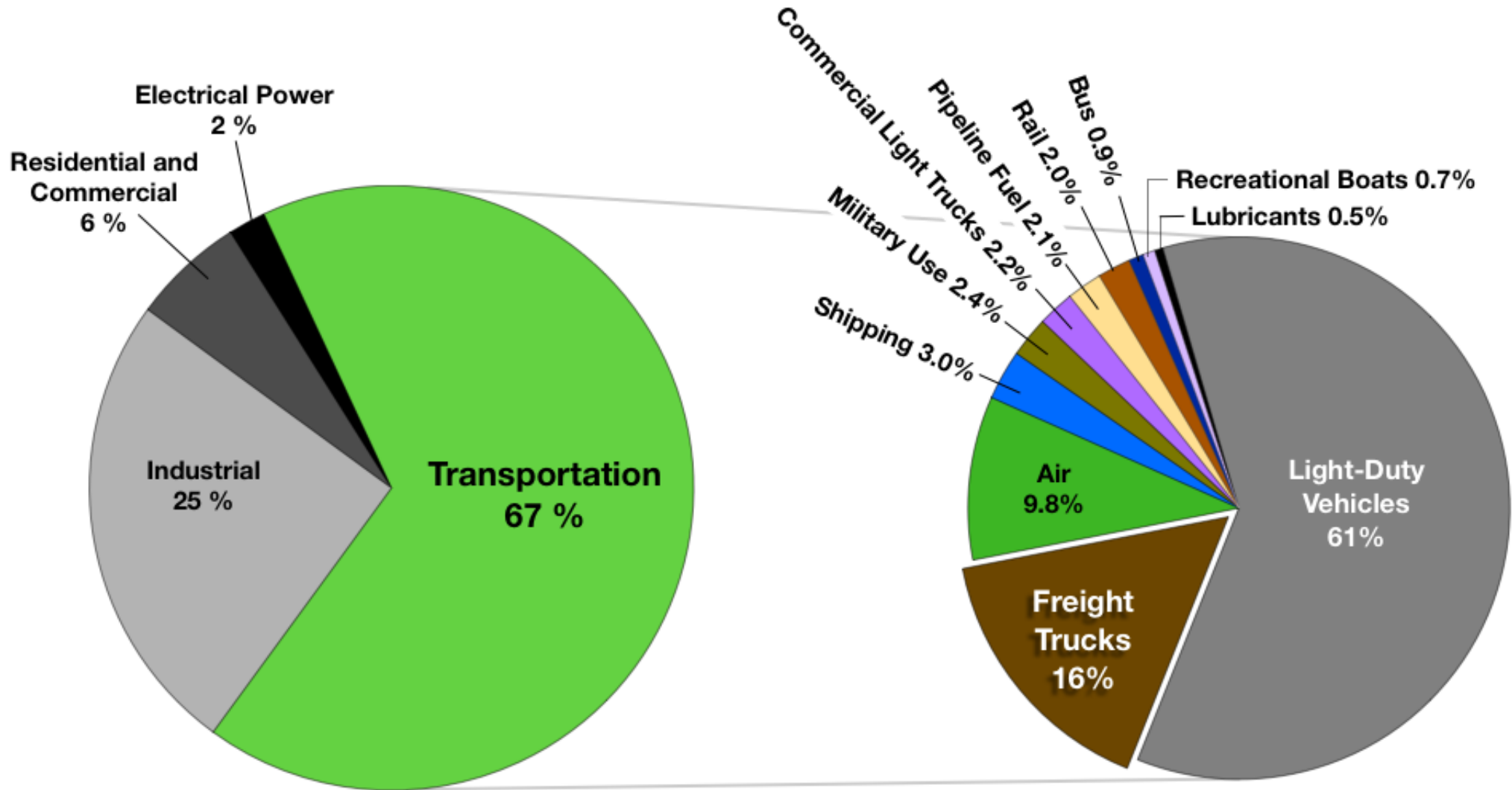


Oil Consumption as Percentage of World Total 2011

Source: U.S. Energy Information Administration
<http://www.eia.gov/countries/data.cfm>
2012-11-22



U.S. Petroleum Consumption by Sector, 2005



Source: EIA. *Annual Energy Outlook 2007 with Projections to 2030*. Tables 2 and 7. Report #:DOE/EIA-0383(2007). <http://www.eia.doe.gov> 8/6/07

Petroleum products have many uses

Petroleum products are central to our lives



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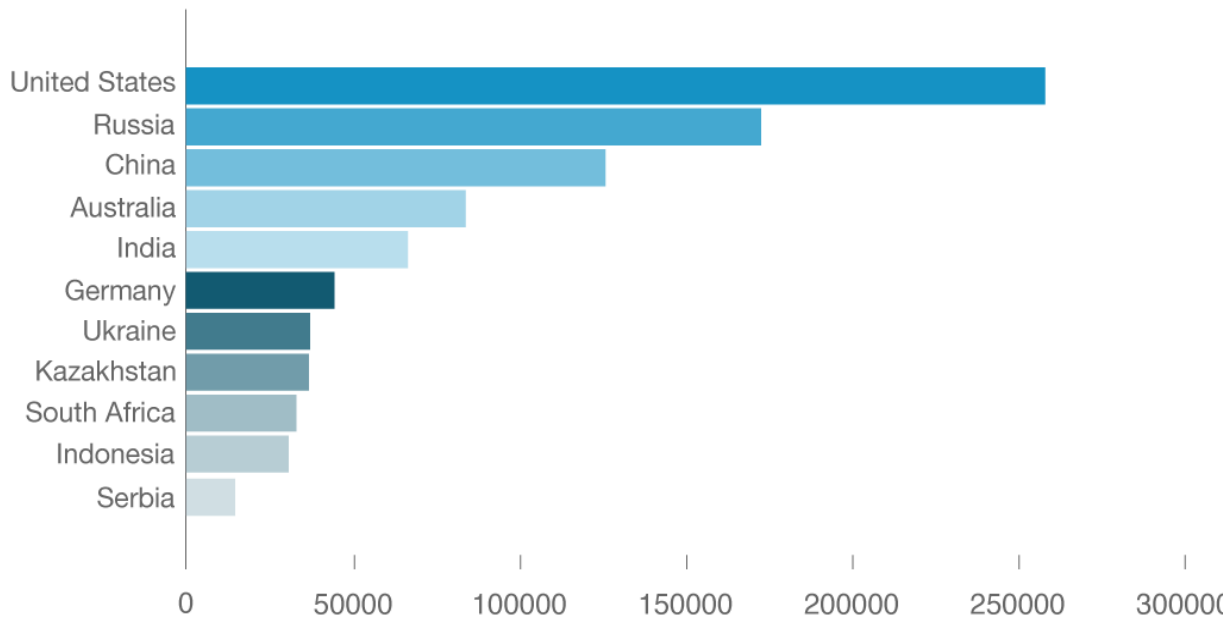
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COAL



COAL

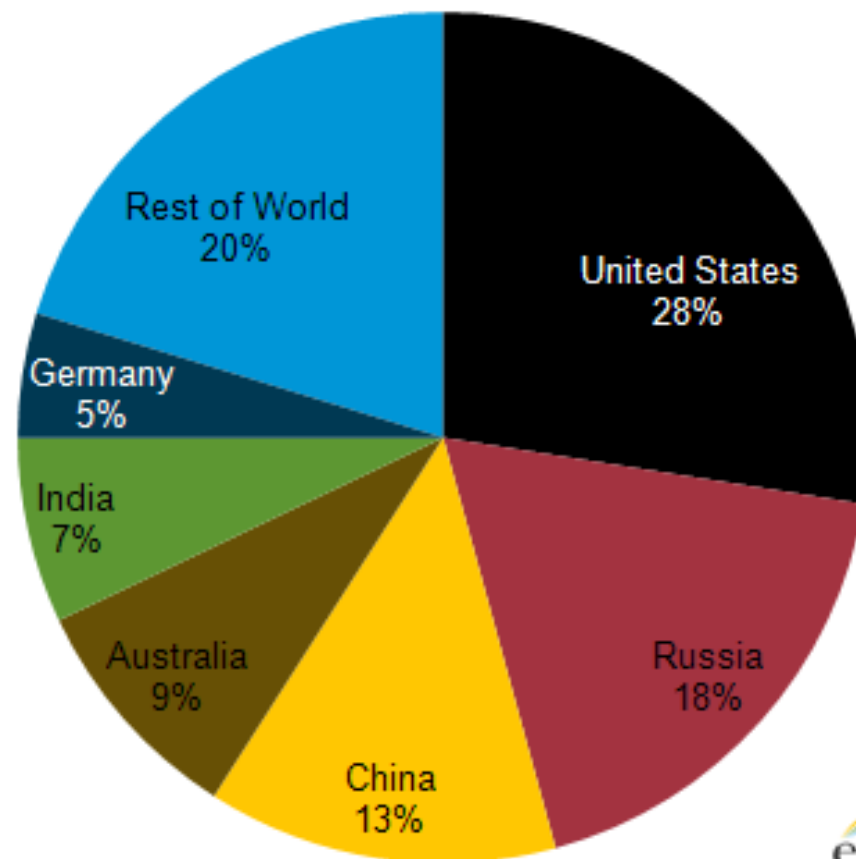
WORLD RECOVERABLE RESERVES



Source: EIA, International Energy Statistics

IER
IN:
EN

Global share of recoverable coal reserves



<http://instituteeforenergyresearch.org/topics/encyclopedia/coal/>

Global Coal Production 2012

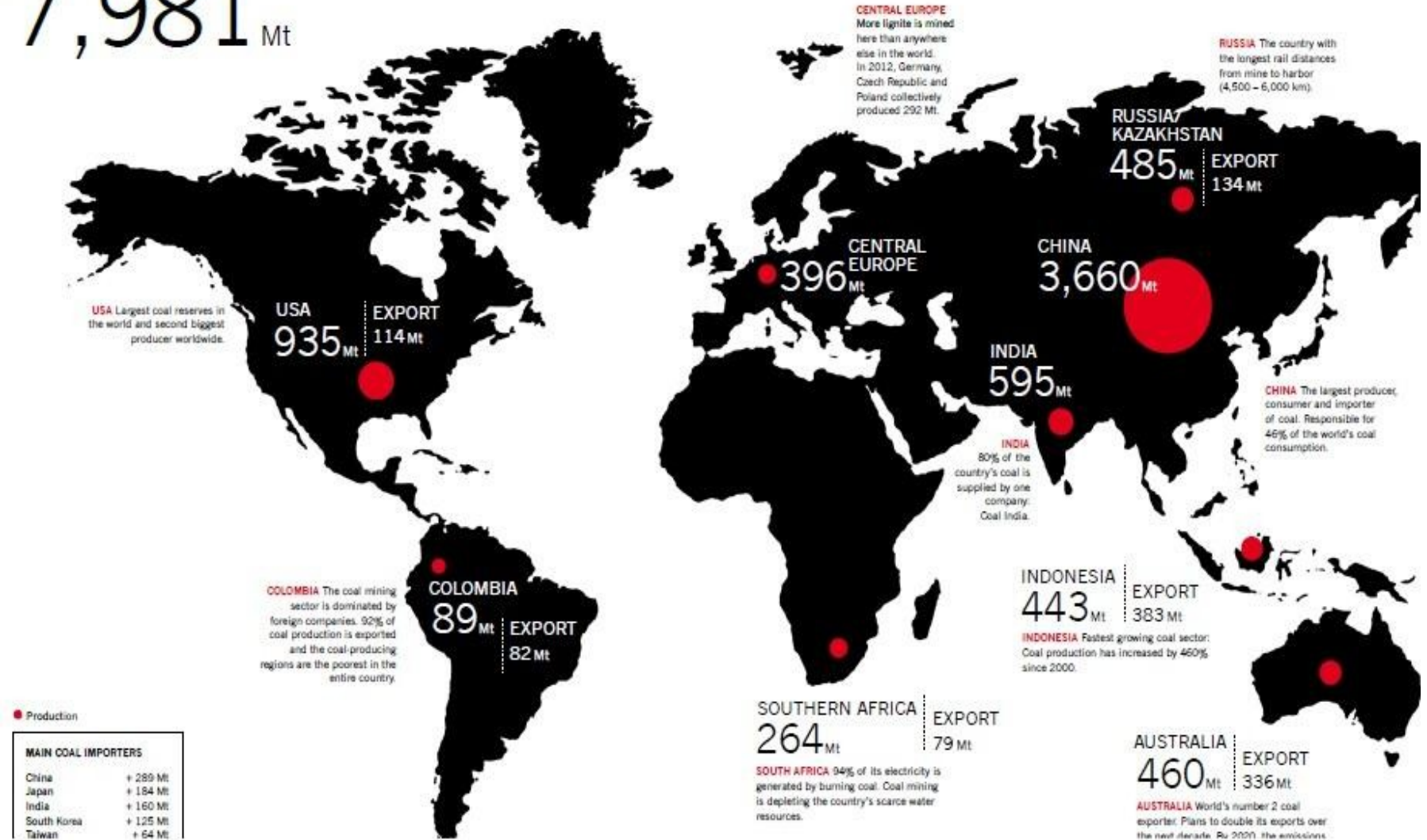
IV. The "Hot Spots"

7,981 Mt

- Top coal producers in 2015 (in Mt)

China 3,650, United States 916, India 668, Australia 491, Indonesia 471, Russia 334, South Africa 253, Germany 187, Poland 137 and Kazakhstan 115.

- In 2015 total coal production was 7,925 Mt.

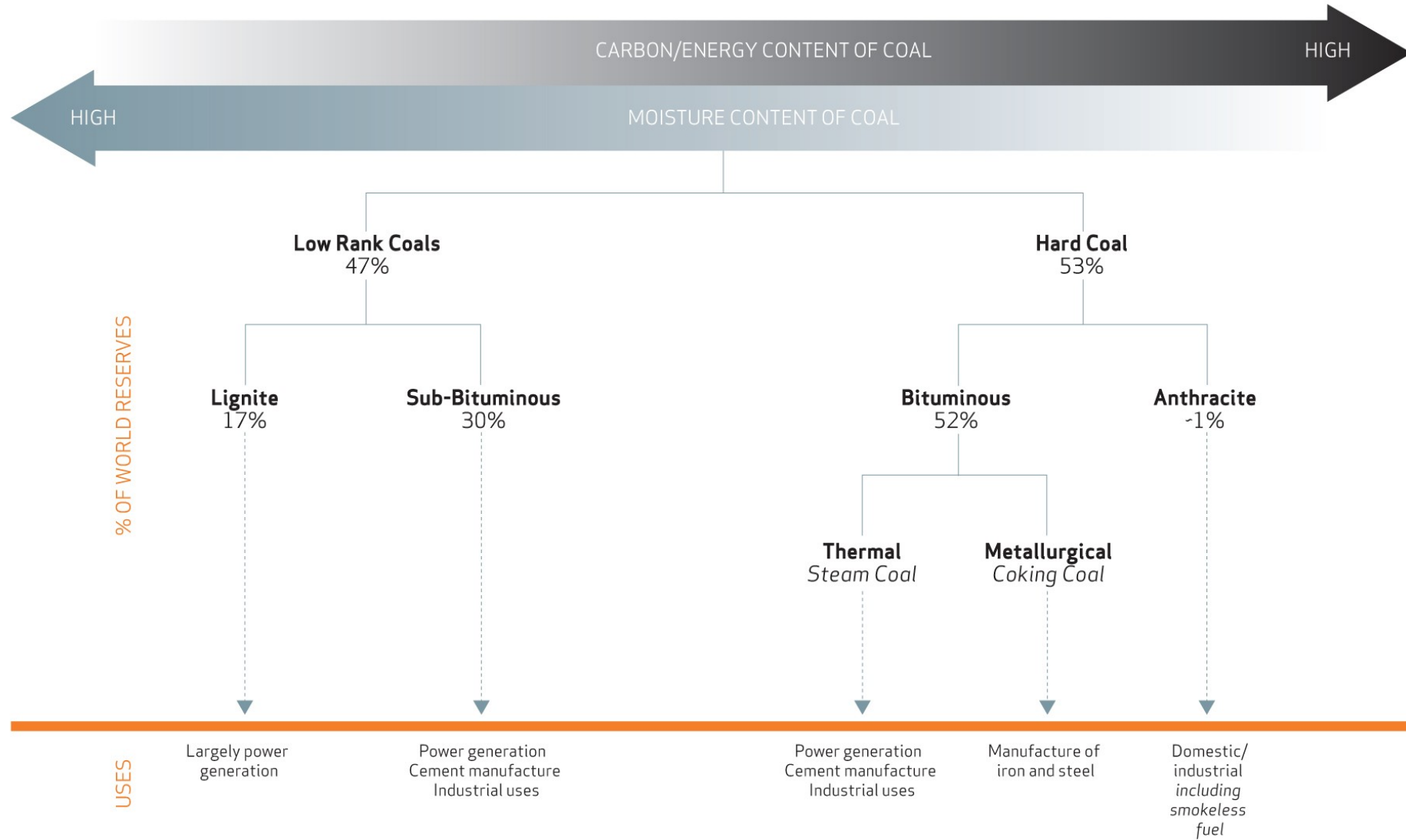


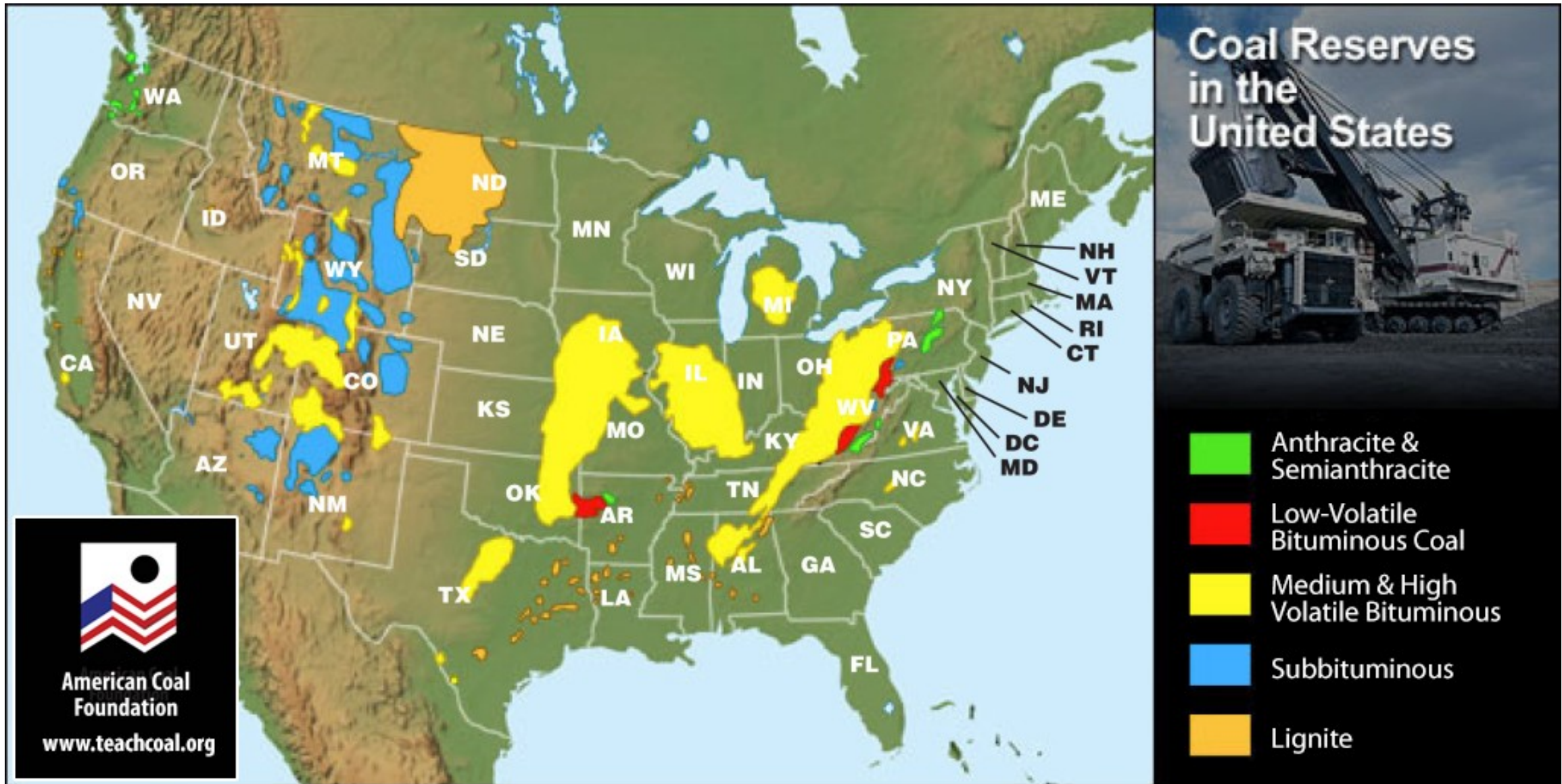
<http://www.postcarbon.org/the-end-of-cheap-coal/>
https://en.wikipedia.org/wiki/Coal_by_country

US Coal reserves

- The United States holds the world's biggest coal reserves. The nation's proved coal reserves as of December 2012 stood at 237.295 billion tones (Bt) comprising more than one quarter of the total proven coal reserves in the world
- The country's reserves are widely distributed across the country's geography with Montana, Wyoming, Illinois, western Kentucky, West Virginia, Pennsylvania, Ohio and Texas hosting most of the reserves. The Peabody Energy-operated North Antelope Rochelle coal mine in the Powder River Basin of Wyoming is the [world's biggest coal mine](#) by reserve
- The US is also the world's second largest producer and consumer of coal. It produced 935 million tonnes (Mt) of coal (approximately 13% of the world's total) in 2012. The country accounted for 11.7% of the world's total coal consumption in the same year. Around 43% of the country's electricity generation is fuelled by coal.

Types of Coal



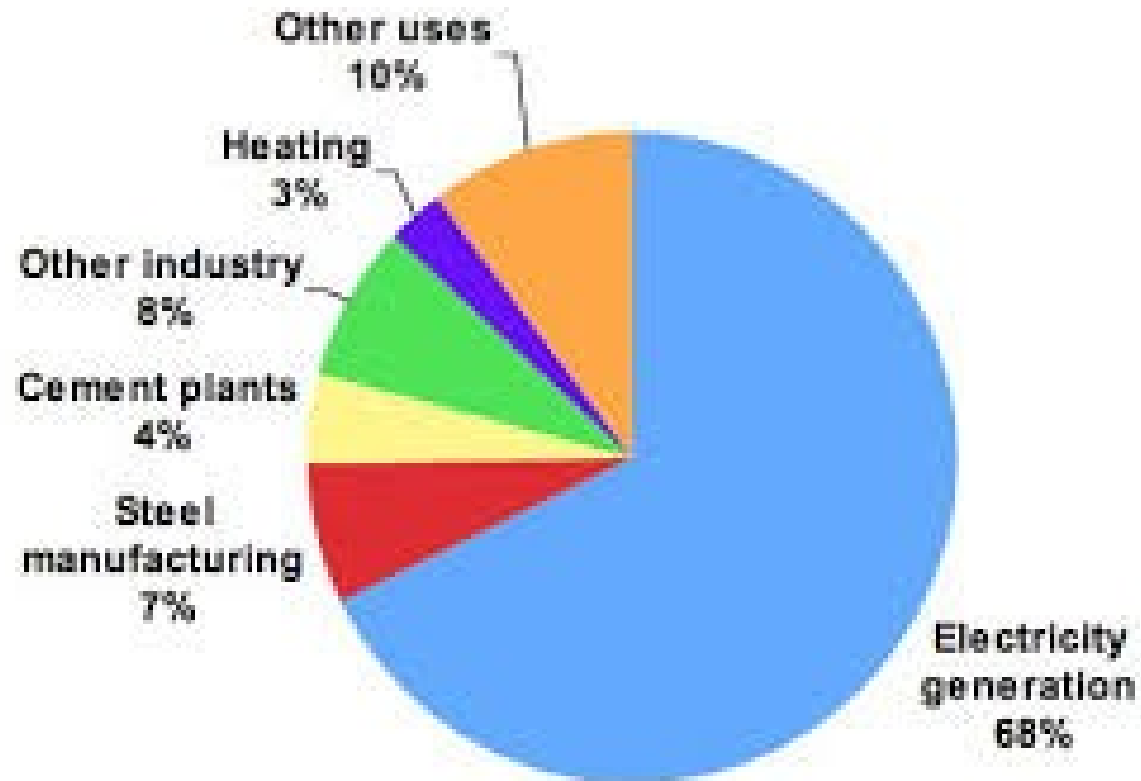


Uses of coal

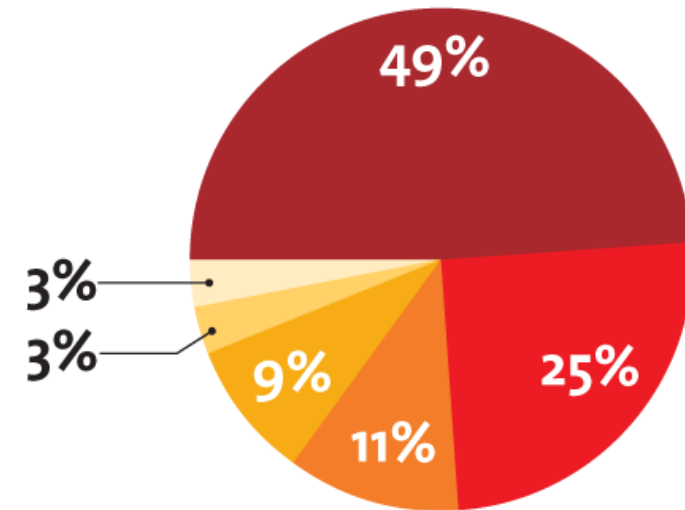
- Steam coal - also known as thermal coal - is mainly used in power generation.
- Coking coal - also known as metallurgical coal - is mainly used in steel production
- Essential ingredient in the production of specialist products
- Activated carbon - used in filters for water and air purification and in kidney dialysis machines.
- Carbon fiber - an extremely strong but light weight reinforcement material used in construction, mountain bikes and tennis rackets.
- Silicon metal - used to produce silicones and silanes, which are in turn used to make lubricants, water repellents, resins, cosmetics, hair shampoos and toothpastes.

- Alumina refineries, paper manufacturers, and the chemical and pharmaceutical industries
- Refined coal tar is used in the manufacture of chemicals
- Creosote oil, naphthalene, phenol, and benzene.
- Ammonia gas recovered from coke ovens is used to manufacture ammonia salts, nitric acid and agricultural fertilizers
- Different products have coal or coal by-products as components: soap, aspirins, solvents, dyes, plastics and fibers, such as rayon and nylon.
- Most significant uses of coal are in electricity generation, steel production, cement manufacturing and as a liquid fuel.

Percentages of the use of coal in the world



Which Countries Use the Most Coal?



Source: US Energy Information Administration



Thank You