The Oil Drum
DISCUSSIONS ABOUT ENERGY AND OUR FUTURE

Getting a Grasp on Oil Production Volumes

Posted by Sam Foucher on October 9, 2007 - 10:30am
Topic: Supply/Production
Tags: cmo, energy units [list all tags]

Oil production numbers are often measured in millions of barrels (1 mb= 10^6 barrels) or billions of barrels (1 Gb= 10^9 barrels). In the January issue of the IEEE Spectrum magazine, I found this little article: Joules, BTUs, Quads—Let's Call the Whole Thing Off. They proposed to measure energy quantities in terms of Cubic Miles of Oil (CMO):

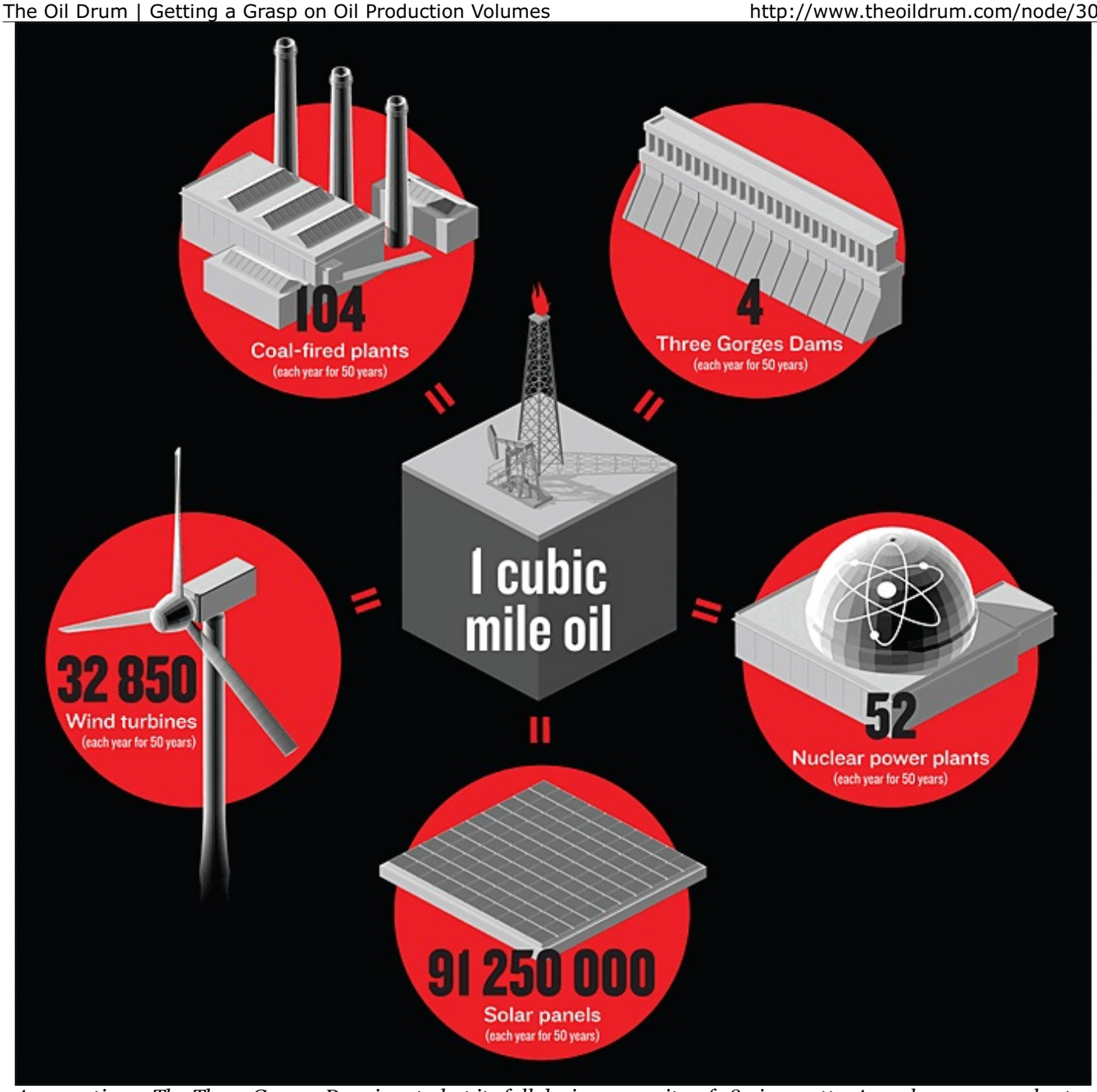
> 1 CMO= 4.17 cubic kilometers= 26.22 Gb (assuming 1 US barrel= 42 gallons)

Last year, the world produced around 26.86 Gb of crude oil + condensate or 1.02 CMO. The figure below gives you an idea of the scale of a CMO compared to the Eiffel tower:

1 Cubic Miles of Oil (CMO) or 26.22 Gb or 71.82 mbpd

The cumulative production for crude oil through 2006 is about 1,000 Gb= 38.13 CMO or enough to fill up one third of Lake Erie (~115 CMO).

The authors (Hewitt Crane and Ed Ed Kinderman from SRI International) proceed to translate the figures of energy from various sources into one CMO unit: *"To obtain in one year the amount of energy contained in one cubic mile of oil, each year for 50 years we would need to have produced the numbers of dams, nuclear power plants, coal plants, windmills, or solar panels"* shown on this amazing representation:



Assumptions: The Three Gorges Dam is rated at its full design capacity of 18 gigawatts. A nuclear power plant is postulated to be the equivalent of a 1.1-GW unit at the Diablo Canyon plant in California. A coal plant is one rated at 500 megawatts. A wind turbine is one with a 100-meter blade span, and rated at 1.65 MW. A solar panel is a 2.1-kilowatt system made for home roofs. In comparing categories, bear in mind that the average amount of time that power is produced varies among them, so that total energy obtained is not a simple function of power rating.
src: Joules, BTUs, Quads—Let's Call the Whole Thing Off, IEEE Spectrum, January 2007
Illustration: bryan christie design

Also check this lecture given by Hewitt Crane:

Second set of considerations about the state of the world's energy supply

This article initially ran on January 18, 2007.