

# ENERGY RESERVES

It is clear so far that the energy requirement is going to increase in the future and also that the U.S. and the rest of the world will depend on fossil fuels. These fossil fuels are non-renewable fuels with a finite life time. So the question is: Would we have enough supply for future energy requirements?

The answer to this question depends on the quantity of fossil fuels we have in the ground. Energy sources that have been discovered but not produced cannot be easily measured. Trapped several feet below the surface, they cannot be measured with precision. There are several terms used to report the estimates of the energy resources. Most commonly used terms are “reserves” and “resources.”

- "Reserves" represent that portion of demonstrated resources that can be recovered economically with the application of extraction technology available currently or in the foreseeable future. Reserves include only recoverable energy.
- “Resources” represent that portion of the energy that is known to exist or even suspected to exist irrespective of technical or economic viability. So reserves are a subset of resources.

Annual consumption and available reserves of different non-renewable energy sources for the United States and the world.

-	U.S. Reserves	U.S. Annual Consumption	World Reserves	World Annual Consumption
<b>Petroleum (billions of barrels)</b> <b>as of Jan 1, 2010</b>	23.3	10.8	1,341.6 <sup>a</sup>	31.84
<b>Natural gas (dry) Trillion Cu. Ft.</b> <b>as of Jan 1, 2010</b>	304.6	33.7	6,289.1 <sup>a</sup> 6,226.6 <sup>b</sup>	112.6
<b>Coal (billions of short tons)</b> <b>as of Jan 1, 2010</b>	258.6	1,17	948	7.99

### How Long Will the Reserves Last?

How long these reserves do last depends on the rate at which we consume these reserves. For example, let's assume that we have 100,000 in the bank (reserves) and if we draw 10,000 dollars every year (consumption) these reserves will last for

10years (100,000/\$10,000 per year). However, in this case, we are assuming that we do not add any money to our deposit and we do not increase our withdrawal.

This is generally not true in the case of life of an energy reserve. We may find new reserves and our energy consumption or production can also increase. In the case of energy reserve, although we know that we might find new resources, we do not know how much we could find. But the consumption can be predicted with some accuracy based on the past rates.

### **Lifetime of current reserves at constant consumption**

We can calculate the life of current petroleum reserves by dividing the current reserves by current consumption.

- At the current rate of consumption, the approximate life time of the world's petroleum, natural gas, and coal reserves is 42 years, 56 years, and 118 years, respectively.
- At the current rate of consumption, the current U. S. petroleum, natural gas and coal reserves will last approximately for 2.2 years, 9 years, and 220 years, respectively.

It is important to note that the entire U.S. petroleum consumption is not coming from the U.S. reserves because we import more than one half of the consumption.

Because we import more than one half of the consumption, the petroleum reserves at the current rate will last about 11 years. If the consumption increases in the future, the life will be less. However, there is also a chance of adding more reserves with more exploration and discoveries. The increase in consumption can change depending on price of petroleum and other alternative fuels.

Therefore, these lifetimes are not carved in stone. It can be debated whether the U.S. reserves will last for 6 years or 10 years or even 20 years, but there is increasing consensus that we must change our lifestyle. We must conserve, innovate (get more with less) or learn to live without these resources.

Source: <https://www.e-education.psu.edu/egee102/node/1932>