# The Resource-Depletion Fallacy

**by Kenneth E. Kogut, P.E., Life Research Institute, August 2003**

The threat of depletion of our natural resources is one of the driving forces some use in striving for easy, legal access to abortion. The concept is that we need to murder babies because additional people will deplete the resources. This paper does not cover all resources, of course, but it does cover the top ten mineral resources that mankind consumes. Then, it gives information on some miscellaneous mineral resources. This paper shows that mankind is not depleting our natural resources enough to warrant any corrective action whatsoever.

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The top ten mineral resources that mankind consumed in 2000 were as follows.[1] (A short ton is 2,000 pounds.)

| Rank | Resource | Millions of Short Tons per Year | Common Uses |
|---|---|---|---|
| 1 | Coal | 4,811 | Fuel, primarily for power plants and industry. |
| 2 | Petroleum | 3,815 | After refining, fuel for vehicles. |
| 3 | Natural Gas | 3,600 | Fuel for home heating, power plants, and industry. |
| 4 | Iron Ore | 1,256 | Iron and steel products. |
| 5 | Salt | 234.1 | To produce other chemicals, especially soda ash and chlorine products. Also to melt snow on roads. |
| 6 | Phosphate (rock) | 155.5 | Fertilizer, primarily nitrogen-phosphorus-potassium fertilizer. |
| 7 | Bauxite | 153.2 | Primarily for aluminum production. |
| 8 | Gypsum | 112.8 | Sheet rock for walls; fertilizer. |
| 9 | Sulfur & Pyrites | 69.9 | Industrial intermediate products and fertilizer. |
| 10 | Potash | 28.3 | Fertilizer |

Following are the results of exhaustive investigations on the Internet and at the nation's third largest library. The results show that, based on 2000 consumption and 2002 reserves, our resources will last indefinitely. (Definitions are at the end of the article. The reference is endnote 2.)

| Rank | Resource | Findings |
|---|---|---|
| 1 | Coal | The amount of recoverable reserves is holding constant. |
| 2 | Petroleum | The quantity in the reserve base is increasing greatly annually. I.e., we find much more oil that we consume. |
| 3 | Natural Gas | At today's consumption rate, we will run out in 25,000 years. |
| 4 | Iron Ore | The quantity in the reserve base is increasing greatly annually. |
| 5 | Salt | There are vast resources on land. Including salt in the sea, mankind could never use all the salt. |
| 6 | Phosphate (rock) | The quantity in the reserve base is increasing greatly annually. |
| 7 | Bauxite | The quantity in the reserve base is increasing greatly annually. |
| 8 | Gypsum | The quantity in the reserve base is holding constant. |

| Rank | Resource | Findings |
|---|---|---|
| 9 | Sulfur & Pyrites | Data on pyrites is not available. The quantity of sulfur in the reserve base is holding constant. |
| 10 | Potash | The quantity in the reserve base is holding constant. |

(Varying terminology--recoverable reserves, reserve base, and resources--was used because that's the way the literature resources used them item by item.)

The conclusion is simple: Although we consume more and more of these resources every year, we always find at least as much of them in the ground to make up for what we use. In four cases we find more than what we use, and in four cases we find as much as we use. **Thus, in the foreseeable future, mankind will not run out of the top ten mineral resources.**

Another literature reference[3] gives the changes in world reserves and cumulative production of selected minerals from 1950 - 1970. The data is old, but that's all the data there is. Five of the 12 minerals listed are the same as listed above. The last column in the following table is most important. For example for iron, the percentage increase in known reserves from 1950 to 1970 is 1,221. This shows we are finding more iron than we are consuming by a fantastic margin.

The units in the table are thousands of metric tons. (One metric ton is 2,205 pounds.)

| Ore | Known reserves in 1950 | Cumulative production 1950 - 1970 [Sum of these 21 years of production] | Known reserves in 1970 | Percentage increase in known reserves 1950 - 1970 |
|---|---|---|---|---|
| Iron | 19,000,000 | 9,355,000 | 251,000,000 | 1,221 |
| Manganese | 500,000 | 194,000 | 635,000 | 27 |
| Chromite | 100,000 | 82,000 | 755,000 | 675 |
| Tungsten | 1,903 | 630[a] | 1,328 | -30 |
| Copper | 100,000 | 80,000 | 279,000 | 179 |
| Lead | 40,000 | 48,000 | 86,000 | 115 |
| Zinc | 70,000 | 70,000 | 113,000 | 61 |
| Tin | 6,000 | 3,800[b] | 6,600 | 10 |
| Bauxite | 1,400,000 | 505,000 | 5,300,000 | 279 |
| Potash | 5,000,000 | 216,000 | 118,000,000 | 2,360 |
| Phosphates | 26,000,000 | 1,011,000 | 1,178,000,000 | 4,430 |
| Oil[c] [Petroleum] | 75,000,000 | 180,727,000 | 455,000,000 | 507 |

Source: National Commission on Supplies and Shortages, *Government and the Nation's Resources*, Report of the National Commission on Supplies and Shortages (Washington, DC, GPO, 1976).

a. Production of tungsten was estimated from production of tungsten concentrates.

b. 1950 - 1952 production estimated from an average of 1953 - 1957 production.

c. Thousands of barrels [instead of thousands of metric tons].

Except for the case of Tungsten, we see again that mankind is finding more minerals than it is using. This is in spite of increasing population and increasing industrial activity.

With respect to all the resources, even those not discussed above, let us not forget the Simon Theory. Concerning possible depletion, according to the Simon Theory, if scarcity arises, scarcity will spur invention and development of new technologies. For example, if the world runs out of oil, cars could operate on natural gas, batteries, or fuel cells.

From time-to-time, doomsdayers have predicted that the world would soon run out of oil. However, they used the wrong figures in their predictions. They used proven reserves but should have used resources or, as shall be shown, more than resources. (Again, these terms are defined at the end of this paper.)

For example, at 2001 production rates of 24.4 billion barrels of oil per year and proven reserves of 1 trillion barrels,[4] oil would be exhausted in 41 years (from 2001), or in the year 2040. However, in 1994 the United States Geologic Survey estimated that there were between 1.4 and 2.1 trillion barrels of oil yet to be produced from resources of between 5.5 and 7.5 trillion barrels.[5]

Instead of dividing 23.7 billion into 1 trillion to show 42 years, dividing it into 2.1 trillion shows that the supplies wouldn't be exhausted for 86 years from 1994. This would be in calendar year 2080.

Yet, for several reasons, even that is pessimistic. The estimates of proven reserves, oil to yet be produced, and resources do not include heavy and extra heavy oil, recoverable bitumen, and shale oil (oil found in shale rock). Nearly 15 trillion barrels of these are available[6] thus extending the exhaustion date from 2080 to 2695 at 100% recovery efficiency of these non-included resources.

In addition coal can be converted to oil and gas. If the usual oil supply would become limited, coal could alleviate the supply problem in two ways: 1) by converting it to oil and 2) by converting it to gas which would replace gasoline (with "natural" gas) in most of our vehicles.

Also, vehicles can be powered by naturally occurring natural gas. According to the second table above, mankind has a 25,000 year supply of that.

Lastly, there are vast quantities of gas hydrates found beneath the oceans and in the Arctic permafrost. Gas hydrates consist of crystallized natural gas and water. The gas from these could minimize the need for oil products. There is more fuel in the form of gas hydrates than all other fossil fuel combined![7] This includes petroleum, coal, and natural gas.

We don't have a problem!

Following are some of the doomsdayers' predictions about oil:

". . . Hurry, before this wonderful product is depleted from Nature's laboratory!" -- an advertisement for "Kier's Rock Oil," 1855.[8]

". . . with no assured source of domestic supply in sight, the United States is confronted with a national crisis of first magnitude." -- U.S. Bureau of Mines, 1916.[9]

". . . there is no hope that new fields, unaccounted in our inventory, may be discovered of sufficient magnitude to modify seriously the estimate." -- Smithsonian Institute, 1918.[9]

". . . it is unsafe to rest in the assurance that plenty of petroleum will be found in the future merely because it has been in the past." -- L. Snider and B. Brooks, *AAPG Bulletin*, 1936.[8]

"The Bureau of Mines estimates the reserves of the United States at about fourteen years' supply, at our present rate of production." -- paraphrasing a 1940 Mines publication, *Minerals Year Book*.[10]

**In conclusion, we can see that it is not necessary for mankind to limit population in order to preserve our mineral resources.**

Definitions:

- Reserve base is that part of an identified resource that meets specified minimum physical and chemical criteria related to current mining and production practices, including those for grade, quality, thickness, and depth. It may encompass those parts of the resources that have a reasonable potential for becoming economically available within planning horizons beyond those that assume proven technology and current economics. That is, it includes quantities that would be producible if more advanced removal technology and better economics were developed.
- Resources in the petroleum industry are amounts of oil one can plausibly speculate exist.
- Proven reserves in the petroleum industry are that portion of total oil resources that have been found and developed and for which production facilities (wells) are in place.

## Endnotes


1. British Geological Survey, *World Mineral Statistics*, 1992 - 2000, many pages.
2. U.S. Bureau of Mines, *Mineral Commodity Summaries*, various years from 1965 - 2002, many pages. Also endnote 3.
3. R. G. Ridker and W. D. Watson, *To Choose a Future*, (Baltimore and London: Johns Hopkins University Press).
4. American Petroleum Institute, *Basic Petroleum Data Book*, Vol. XVIII, No. 1, January 2002, Section II Table 1 and Section IV Table 1.
5. American Petroleum Institute, *Are We Running Out of Oil?*, December 1995, 22.
6. Ibid, 24.
7. Ibid, 25.
8. Ibid, 1.
9. Ibid, 9.
10. H. S. Bell, American Petroleum Refining, (New York: D. Van Nostrand Company, Inc.) 5.



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