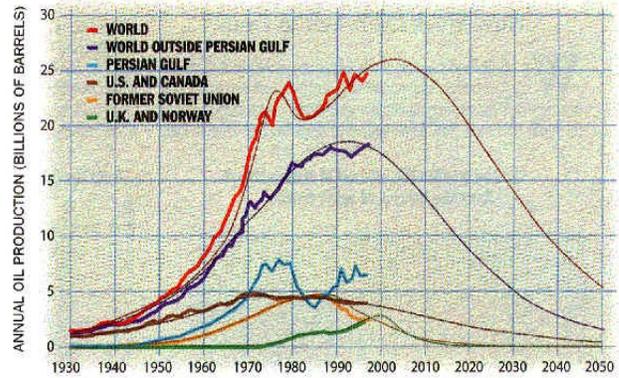


A Time Frame for Systemic Collapse

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A time frame for systemic collapse can be extrapolated easily from a chart of estimated past and future oil production. The production chart shown here is from Campbell and Laherrère's 1998 *Scientific American* article, "The End of Cheap Oil," but most other estimations give a reasonably similar curve.

Roughly speaking, with a 3 percent annual decline, the world's oil production in 2030 will be half that of the peak amount.



Most of the other time frames for collapse -- such as those for electricity, for the general economy, and for population -- will parallel that curve, for the simple reason that everything in modern industrial society is tied to the production of oil (and, to a lesser extent, other fossil fuels).

In "The Olduvai Theory" (*The Social Contract*, Winter 2005-06), Richard C. Duncan says that the failure of electricity will be the first really distinct, "on-off" type of indicator of collapse. His reasoning is that, although fossil fuels are the primary sources of energy in our industrial civilization, we need to keep in mind the importance of "end use."

Electricity wins hands down as our most important end-use energy. To wit: I estimate that 7% of the world's oil is consumed by the electric power sector, 20% of the world's natural gas, 88% of the coal, and 100% each for nuclear and hydroelectric power. The result is that electric power accounts for 43% of the world's end-use energy compared to oil's 35%.

The next parallel can be found in economics, which I suspect will be in two "phases," divided by the point at which money as such is no longer an important means of exchange; past examples occurred with the crash of the USSR, and in Weimar Germany.

Because of famine caused by a failure of agriculture in the absence of fossil fuels, the fall of population will appear as roughly another parallel to the fall in fossil fuels. Some critics have said that the two do not necessarily go together -- or, rather, "fall" together. Yes, of course, it is possible that to some extent humanity will learn to "make do with less." But that remedy can only be stretched so far, for a very simple mathematical reason. In modern industrial society, fossil fuels are the source of more than 90 percent of the energy -- in the strictly scientific sense of the word "energy." If we take away 90 percent of the energy, we necessarily take away most of the population. And we cannot replace that 90 percent of the energy with some "alternative" form, because there isn't enough of any mysterious "alternative energy" to make much difference. Again roughly speaking, a 50 percent decline in oil will be matched by a 50 percent decline in population -- mainly by famine.

Incidentally, a voluntary reduction in population would work. (For that matter, neither would a mandatory reduction in population, and for the same reason.) As stated, oil production will fall about 3 percent annually. Even if every woman on earth stopped having children from this day forward (an utterly impossible situation anyway), birth control in itself would not enable a 3 percent annual

reduction in population. At best, an immediate and universal "No Child Policy" would accomplish very little. Growth rate equals birth rate minus death rate, but the present death rate is only about 1 percent, and even with an aging population it would not get much beyond 2 percent -- not enough, in other words, to match the fall in oil production.

It can be seen, therefore, that the curve of estimated past and future global oil production is not merely one of a myriad of problems with which mankind will have to deal. It is the time scale with which most other problems can be measured, and it is the cause of most other problems.

But if anyone really wants a magic number for a date of systemic collapse, a good choice would be that date of 2030. That's the date at which, with a 3 percent annual decline in oil production, the year's production will be half of that in the peak year. And half of peak oil means roughly half of everything else in human society. A very important "half" will be population, because the rest will have died of famine. And that's the one item that very few people can mentally assimilate.