

Why raising interest rates to reduce inflation may work out very badly

Posted on [July 5, 2022](#) by [Gail Tverberg](#)

Are we headed for very high energy prices? Or, are we headed for a financial system that starts falling apart? The whole economic system may change remarkably. For example, what many people thought was money, or a promised pension plan, may not really be there when the time comes to get value from it. Shelves in stores may be empty when it comes time to make a purchase.

Most people do not understand that the world economy is a physics-based system, powered by energy. If the energy is suddenly much less available, there will be a huge problem. The world economy has been powered by a rapidly growing supply of energy for over 200 years.

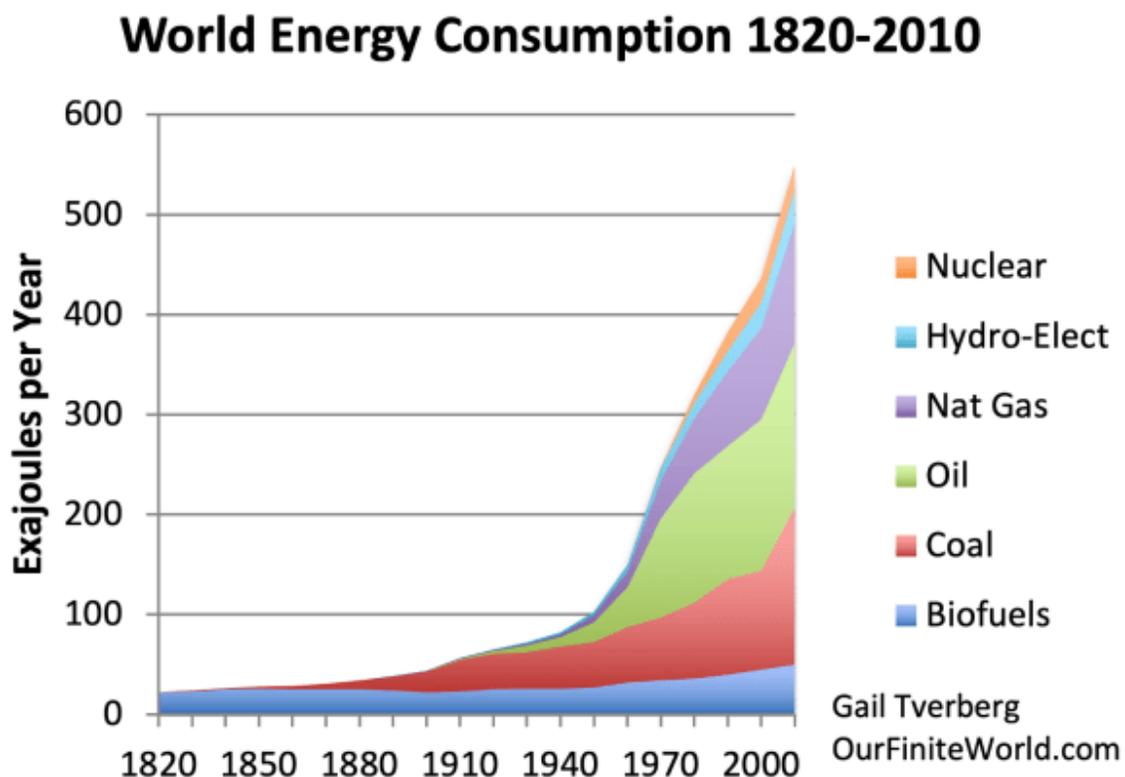


Figure 1. World energy consumption by fuel based on Vaclav Smil's estimates from *Energy Transitions: History, Requirements and Prospects (Appendix)* together with data from BP's *2011 Statistical Review of World Energy* for 1965 and subsequent. Wind and solar are included in Biofuels.

My concern is that the current attempt to bring inflation down will lead to falling energy supply and a world economy that is rapidly changing for the worse.

World Energy Consumption to 2050

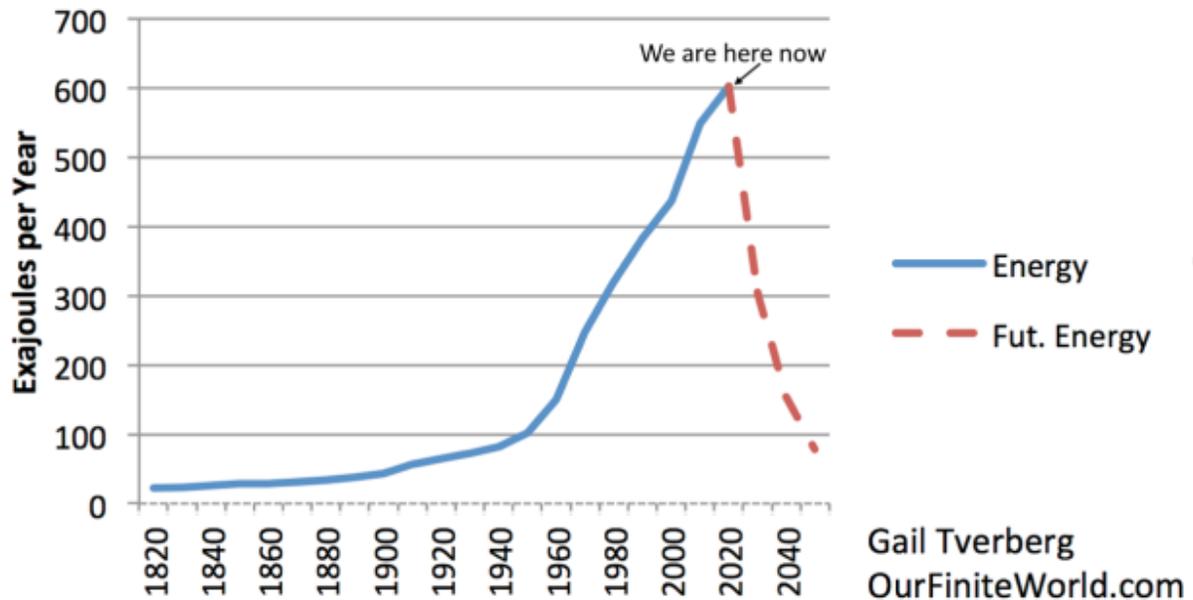


Figure 2. Energy amounts for 2010 and prior equal to those in Figure 1, with a corresponding amount for 2020. Future energy for 2030, 2040 and 2050 are rough estimates based on the observation that the world is now reaching extraction limits for both coal and oil.

Everything I can see says that world leaders are not able to face the possibility that the world is already running seriously short of oil and coal. Future supplies are likely to be much lower, and much more expensive, if they are available at all. Other energy types (including natural gas, nuclear, hydroelectric, wind and solar) are simply add-ons to a system built using coal and oil.

Current world leaders do not realize that the energy situation is very much like the [water level in Lake Mead](#). Looking at it from the top, there still seems to be water there but, in fact, [the required depth is lacking](#). Water for watering crops will soon be exhausted. The world's energy supply is not a whole lot different. The supposedly proven reserves do not tell us anything at all. It is the amount of fossil fuels that can be affordably extracted that is important. We have already exceeded the amount that can be affordably extracted. If central banks cut back future energy supplies using higher interest rates, we can expect to encounter major problems going forward.

In this post, I will try to explain some of the issues involved.

[1] The amount of energy the economy requires depends very much on population. The greater the world population, the more oil is needed for food production and transportation. Non-oil energy is a bit more flexible in quantity than oil, but the total quantity of energy per capita needs to keep rising to prevent very adverse outcomes.

World per Capita Energy Consumption

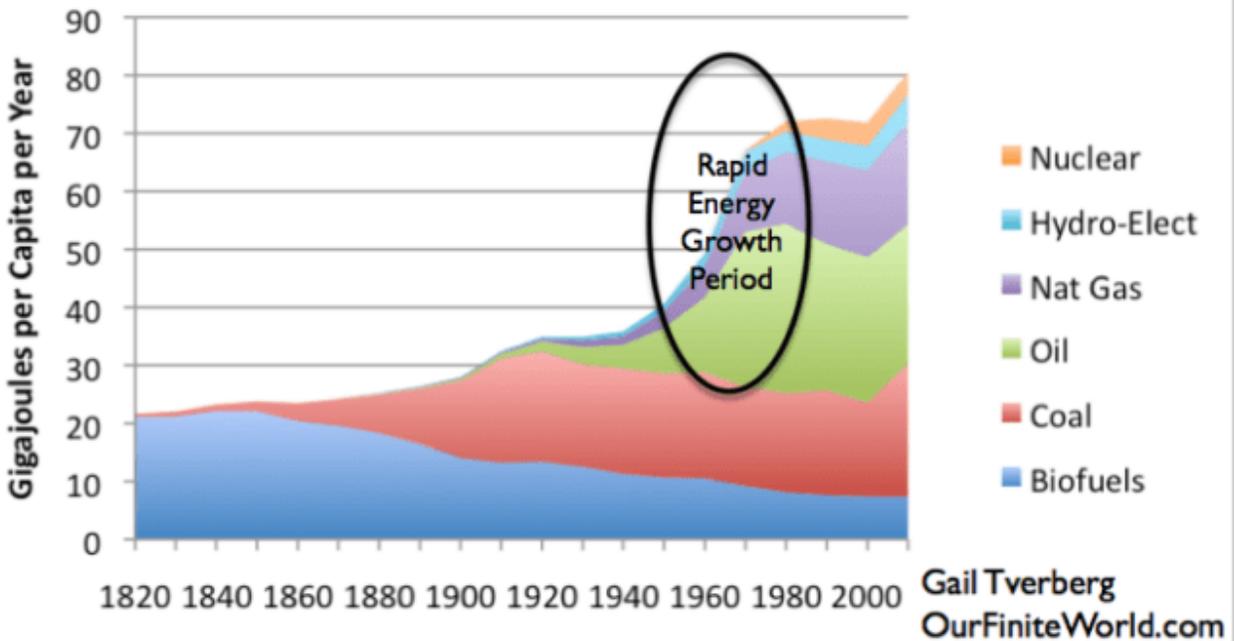


Figure 3. World per capita energy consumption by source, with the 1950-1980 period of rapid growth highlighted. Amounts are equal to those used in Figure 1, divided by population estimates by Angus Maddison.

Figure 3 highlights the fact that the period of Rapid Energy Growth between 1950 and 1980 was a period of unprecedented growth in per capita energy consumption. This was a period when many families could afford their own car for the first time. There were enough employment opportunities that, quite often, both spouses could hold down paying jobs outside the home. It was the growing supply of inexpensive fossil fuels that made these jobs available.

If a person looks closely, it is possible to see that the 1920 to 1940 period was a period of very low growth in energy consumption, relative to population. This was also the period of the Great Depression and the period leading up to World War II. Sluggish energy consumption growth at that time was linked to very undesirable socioeconomic outcomes.

Energy is like food for the economy. If energy of the right kinds is cheaply available, it is possible to build new roads, pipelines and electricity transmission lines. World trade grows. If available energy is inadequate, major wars tend to break out and standards of living are likely to fall. We now seem to be approaching a time of too little energy, relative to population.

[2] Recently published data through 2021 indicates that energy consumption growth is not keeping up with population growth, similar to the situation of the 1930s. This says that the economy is doing poorly. Supply lines are broken; most jobs don't pay well; many goods that normally would be available aren't available.

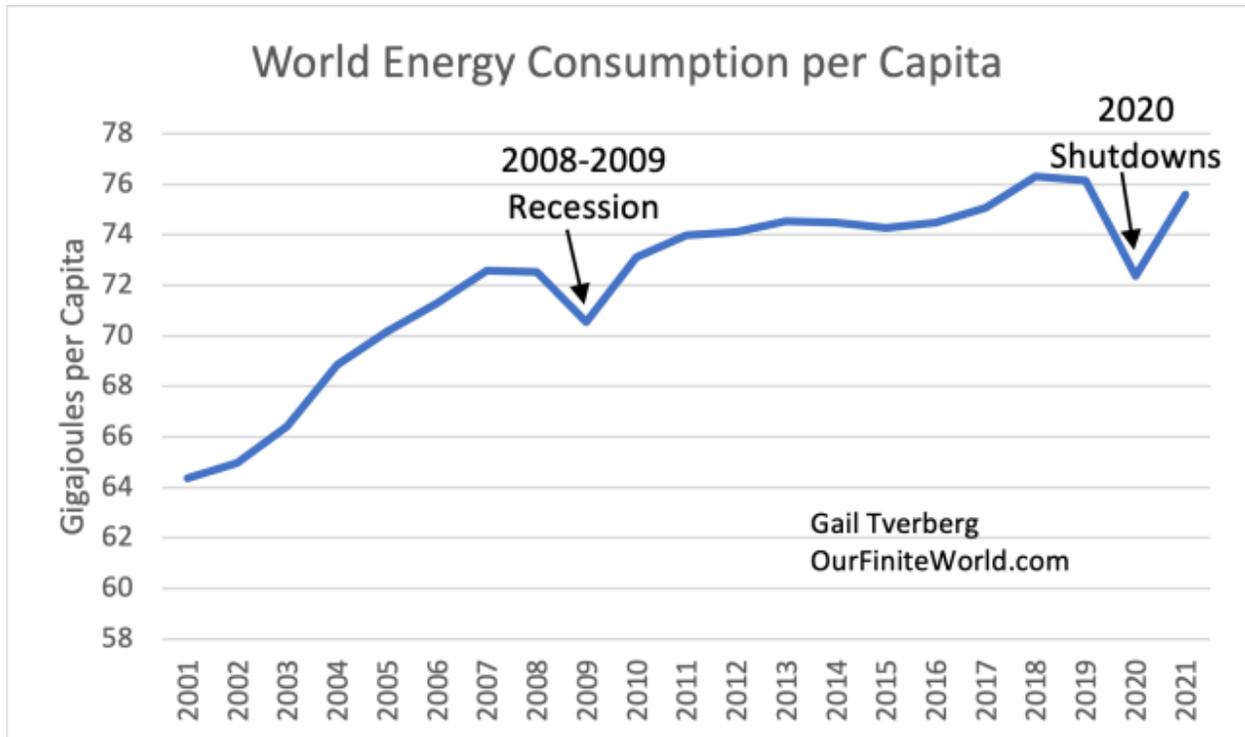


Figure 4. World energy consumption per capita, based on information published in BP's 2022 *Statistical Review of World Energy*.

Figure 4 shows that the year with the highest per capita energy consumption was 2018. This agrees with other information such as automobile sales.

Auto Sales by Country

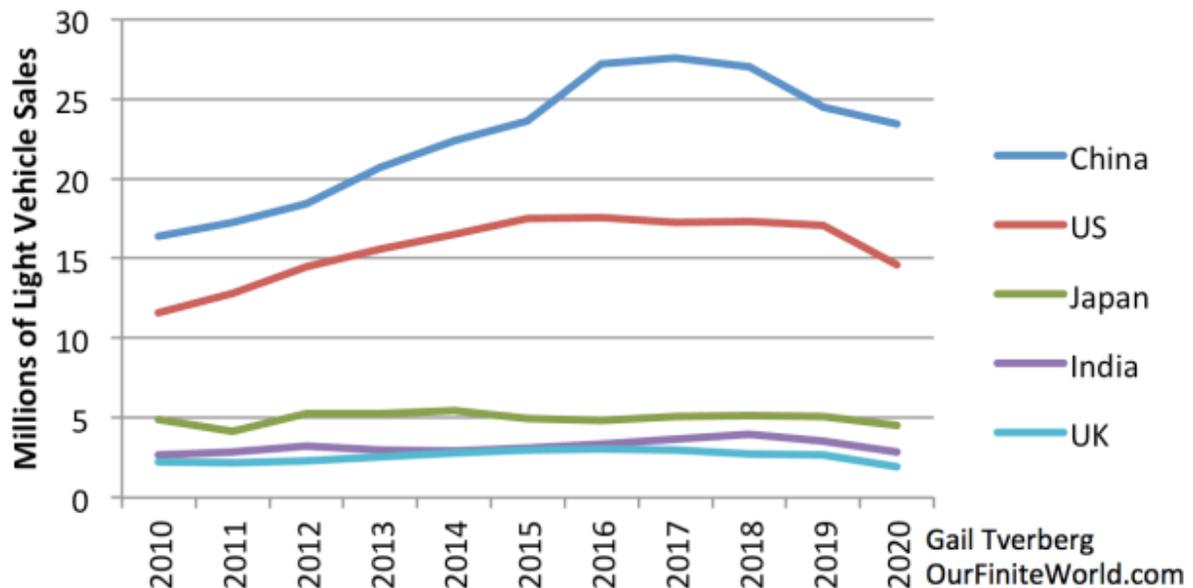


Figure 5. Auto sales by country, based on data of vda.de

For example, the number of automobiles sold seems to have peaked back in the 2018 period. China and India are both reporting fewer automobile sales recently. The economy was already sliding into recession in 2019. The 2020 shutdowns hid the very poor condition the world economy was already in. If people were forced to remain in their homes, they could not take to the streets to protest their poor wages and pension plans. The shutdowns helped give the impression the world economy was doing better than it really was.

Figure 4 shows that even with the bounce back in 2021, total energy consumption per capita is still below the 2018 and 2019 values. This contrasts with the situation that occurred after the 2008-2009 Great Recession. By 2010, per capita energy consumption was back above the 2007 and 2008 values.

[3] We can look back and see how rising interest rates were used to slow the world economy in the 2004 to 2006 period, and how different the economic situation was then compared to now. Even with the rapid growth the economy was making at the time of the interest rates increases, the result was still a deep recession in 2008-2009.

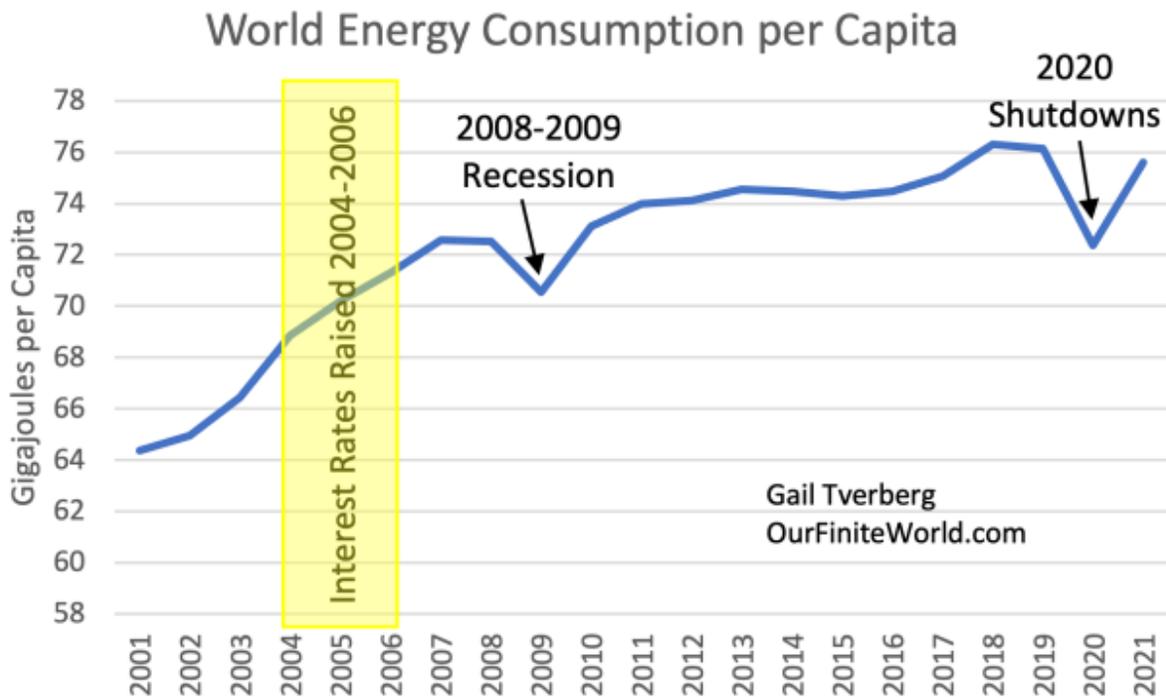


Figure 6. Figure similar to Figure 4 showing world energy consumption per capita, except that notation has been added with respect to the timing of increases in US Federal Reserve Target Interest Rates.

It is clear from Figure 4 and Figure 6 that between 2001 and 2007, the quantity of energy consumed per capita was rising rapidly. This was the period shortly after China was added to the World Trade Organization. Manufacturing was rapidly being moved to China. China's demand for energy products of all kinds was rising rapidly. As a result of this greater demand, oil prices were increasing between 2001 and 2007. To try to reduce inflation, the Federal Reserve [raised target interest rates](#) in the 2004 to 2006 period and gradually brought them down, starting in late 2007.

There are two things that are striking about this earlier situation:

1. The world economy (as shown by rising energy supply) was growing much more rapidly during the 2001 to 2007 period than it is in 2022. All the world economy is trying to do now is get back to where it was before the 2020 shutdowns, in terms of energy consumption per capita.
2. Eventually, there was a bad reaction to the higher interest rates of 2004 to 2006, but this did not come until 2008-2009. This was a much longer lag than most people would expect.

Now, in 2022, we cannot get energy consumption per capita up to the 2018 and 2019 levels. There are many unfinished automobiles, waiting for missing parts. Appliances of many kinds are not available without a long wait. Fertilizer is often not available. Broken supply lines leave

many store shelves empty. It is not that **demand** is unusually high; it is the **supply** of the energy products we need to grow food and to transport many finished goods that is not available.

Raising interest rates is a way to reduce the demand for finished goods and services, such as automobiles and appliances, if the world economy is growing very rapidly, as it was back in the 2001 to 2007 period. If the problem is an inadequate supply of finished goods and services (due to broken supply lines and low wages for workers), then raising interest rates *isentirely the wrong medicine*. It will cause even fewer automobiles and appliances to be made. It will cause many current workers to be laid off. Such an approach, when the world is trying to deal with too few workers, will tend to make the situation worse, rather than better.

[4] The trend in fossil fuel supplies is concerning. Both oil and coal are past peak, on a per capita basis. World coal supply has been lagging population growth since at least 2011. While natural gas production is rising, the price tends to be high and the cost of transport is very high.

Most energy charts are similar to Figure 7, showing energy consumption on a total product supplied basis, without reference to the size of the population using those resources.

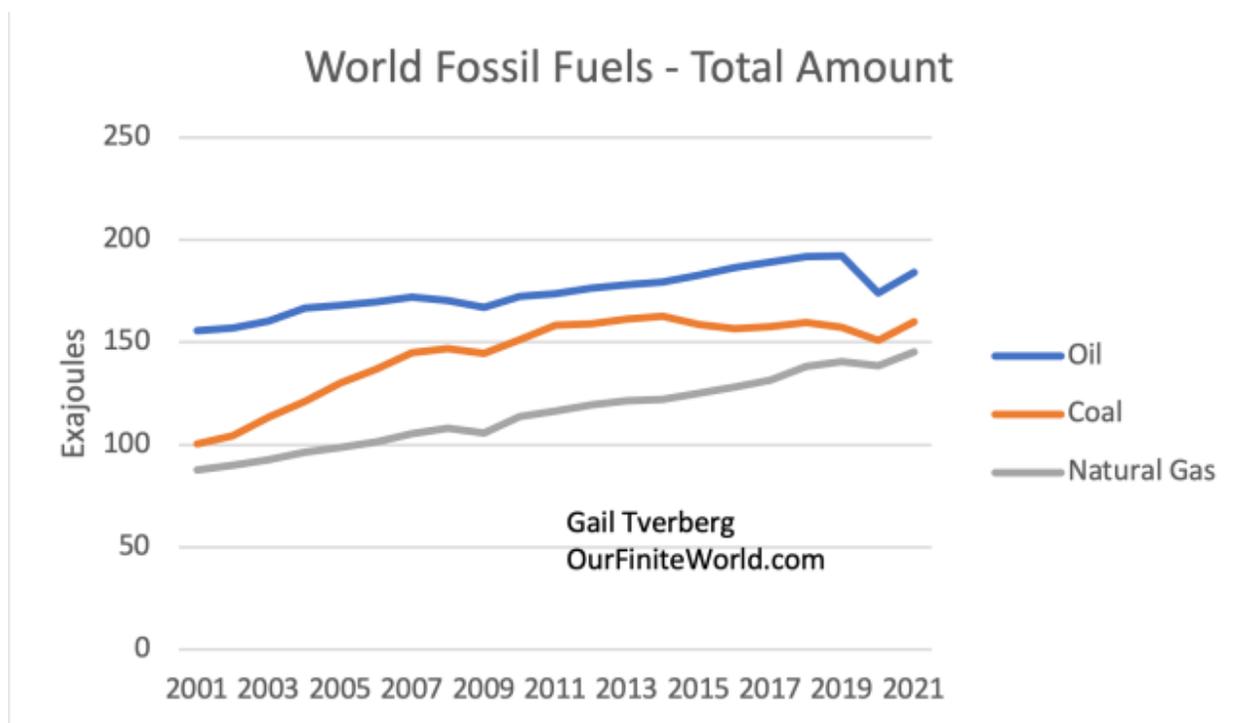


Figure 7. Total quantity of oil, coal and natural gas supplied based on information published in BP's 2022 Statistical Review of World Energy.

Figure 7 indicates that coal supplies are, in some sense, the most troubled of the three types of fossil fuels. In the 2001 to 2007 period, China was able to ramp up its manufacturing using coal, but eventually those supplies ran short. In fact, coal supplies around the world started running short. Instead of telling us about the shortfall in production, we started hearing a story that

sounds a lot like [The Fox and the Grapes](#) of Aesop's Fables: Coal is a horribly polluting fuel which we don't really want anyhow.

To understand how these quantities correspond to the world's rising population, it is helpful to look at consumption divided by population, shown in Figure 8.

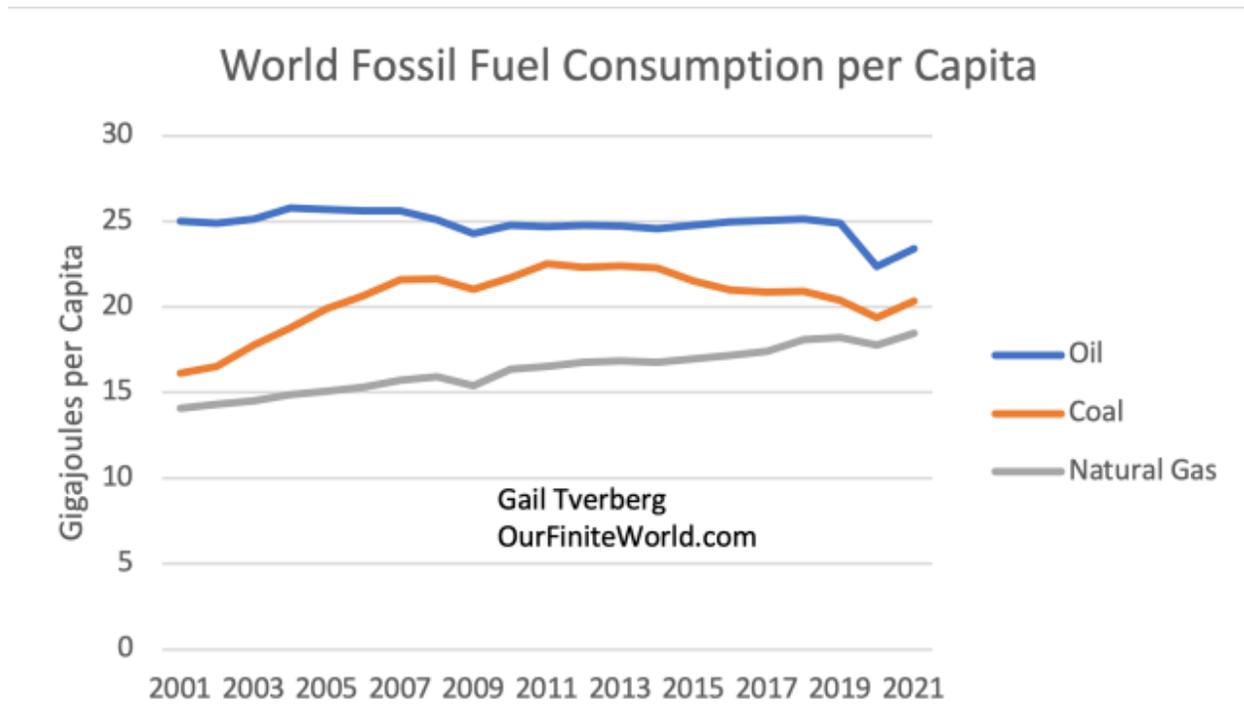


Figure 8. Oil, coal and natural gas energy consumption per capita, based on data in BP's 2022 *Statistical Review of World Energy*.

Figure 8 shows that oil consumption per capita was relatively stable up until 2019. Then, it suddenly dropped in 2020, and it has not been able to fully recover from that drop in 2021. In fact, we know that as oil production has tried to increase in 2022, its price has risen further. Of the years shown, 2004 was the year with the highest oil consumption per capita. That was back at the time that "conventional" oil production peaked.

Figure 8 shows that the peak production of coal, relative to world population, was in the year 2011. Now, in 2022, the least expensive coal to extract has been depleted. World coal consumption has fallen far behind population growth. The big drop-off in coal availability means that countries are increasingly looking to natural gas as a flexible source of electricity generation. But natural gas has many other uses, including its use in making fertilizer and as a feedstock for many herbicides, pesticides, and insecticides. The result is that there is more demand for natural gas than can easily be supplied.

[5] Governments and academic institutions have gone out of their way to avoid telling the world how important energy of the right types and in the right quantities is to the economy.

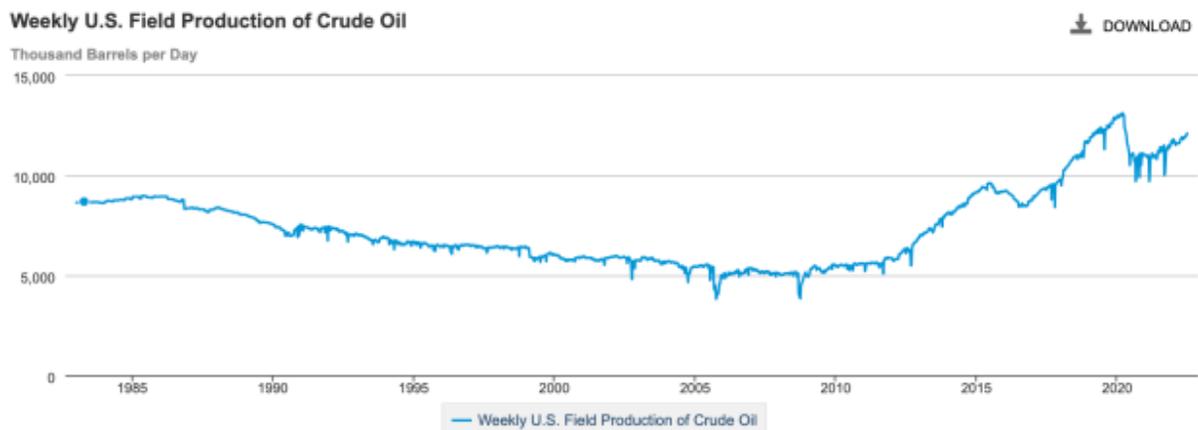
Politicians cannot admit that the world economy cannot get along without the right quantities of energy that match the needs of today’s infrastructure. At most, a small amount of substitution is possible, if all the necessary transition steps are taken. Each transition step requires energy of various kinds. For example, a small amount of intermittent wind can be added to the fossil-fuel generated electricity supply, if care is taken to ramp up fossil-fuel generated electricity to offset the lack of wind when there is a shortfall in supply. Otherwise, battery or other storage is needed for the wind energy until the wind energy is truly needed by the system.

Thus, most people today are convinced that the economy doesn’t need energy. They believe that the world’s biggest problem is climate change. They tend to cheer when they hear that fossil fuel supplies are being shut down. Of course, without energy of the right kinds, jobs disappear. The total quantity of goods and services produced tends to fall very steeply. In this situation, there is likely not enough food for all the people in the world. War is likely to break out over limited resources.

[6] Once the economy starts heading downward, it is not clear that the economy can ever “catch itself” and start back on an upward path again, even for a short while.

Back in 2001, the World Economy was able to get a “bail out” from China’s rapid growth in coal production, but as we have seen, world coal production is no longer growing as fast as population.

Back in about 2010 and 2011, growth in US crude oil from shale formations was able to temporarily bail out world oil supply, but now this is also failing. Also, even the recent “growth” shown is to a significant extent from the completion of “drilled but uncompleted” wells started earlier. Eventually, there are no more “DUCs” to complete.



 Source: U.S. Energy Information Administration

Figure 9. EIA chart showing US Field Production of Crude Oil through June 24, 2022.

In fact, despite all of the supposed high reserves of many kinds around the world, there is little evidence that the Middle East, or anywhere else, can actually raise production much higher.

Once the economy starts shrinking, debt defaults are likely to become a big problem. Banks will find their balance sheets impaired. They may be forced to close. Citizens with deposits may find that only part of their balance is available to spend.

Government programs will necessarily be forced to cut back to match the energy supplies that are available. For example, if road paving material is not available, roads cannot be repaved. If fuel cannot be found for school buses, students may need to learn at home.

Governments at all levels have promised pension plans. In fact, many employers have promised pension plans. Without a growing supply to cheap-to-produce energy, these promises are meaningless. Somehow, governments will find it necessary to cut back on their promises. Perhaps, Social Security and Medicare programs will be handed back to US States to fund, to the extent that the states have funds for these programs. Governments around the world can expect to face similar problems.

With less energy supply available, the whole world economy that we know today seems likely to start falling apart. Fewer goods will be available through international trade. It is cheap energy that has allowed today's economy to function. Once this cheap energy is depleted, the world economy will need to shrink back in many ways, at once.

We don't really know precisely what lies ahead, and perhaps, this lack of knowledge is for the best. We cannot even imagine a world economy changing rapidly for the worse.



About Gail Tverberg

My name is Gail Tverberg. I am an actuary interested in finite world issues - oil depletion, natural gas depletion, water shortages, and climate change. Oil limits look very different from what most expect, with high prices leading to recession, and low prices leading to financial problems for oil producers and for oil exporting countries. We are really dealing with a physics problem that affects many parts of the economy at once, including wages and the financial system. I try to look at the overall problem.

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