The Oil Drum
DISCUSSIONS ABOUT ENERGY AND OUR FUTURE

"Peak Oil" or "Limits to Growth"

Posted by Gail the Actuary on May 1, 2009 - 9:51am
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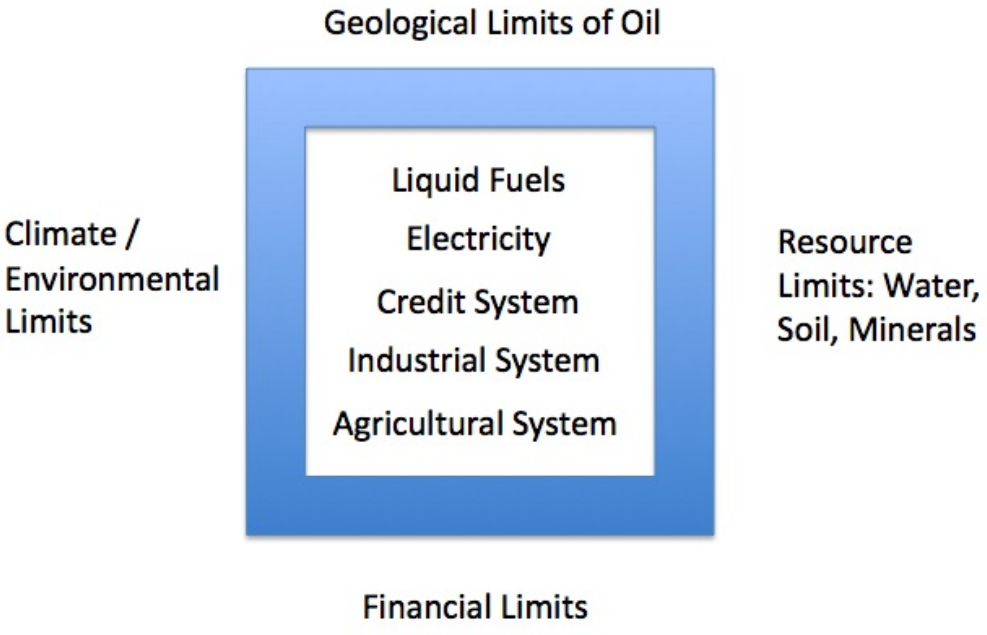

There is a good deal of evidence that we are now a little past "peak oil". Many of us find it doesn't feel quite like we had imagined.

A lot of us had expected that peak oil would be basically a liquids fuels crisis, caused by geological limits. We expected that the solutions of the Department of Energy's Hirsch Report would be sufficient to forestall a crisis, especially if we had started 20 years ago, instead of now. These solutions included things like more oil from tar sands, improving automobile efficiency, and electrification of transport.

Now, when we seem to be at peak oil, we find the current situation feels a lot more like a "box" caused by limits to growth, rather than a liquid fuels crisis. The limits are of many forms--not just geological limits relating to oil--but other resource limits as well, such as fresh water, and concerns about climate change and the environment. The financial system is even behaving strangely.

The fact that the financial system is also in distress is a surprise to many people. There is good theoretical reason to expect that once growth in underlying resources slows, a financial system based on compound growth will run into difficulty. This was predicted by M. King Hubbert and many others. The connection is not easy to see, though, and it is understandable that many would

believe that the financial system would have had problems, even apart from limits to growth.

The fact that so many limits are involved makes it difficult to substitute one resource, such as biofuels, for another, such as petroleum products.

The fact that so many limits are involved also means that it is not just liquid fuels that are being constrained by the limits to growth box. In the diagram above, I show electricity, the credit system, the industrial system, and the agricultural system as being fenced in by limits, in addition to liquid fuels. I could probably have included many other systems as well, such as the international trade system, governmental systems, and long term promises, such as pensions and social security systems.

The world is finite, so it should not come as a great surprise that the various limits are being reached, to varying degrees, simultaneously. Systems such as the electrical system, the credit system, and the agricultural system all depend on availability of finite resources, so are affected as we start reaching limits of various kinds.

Timing

Another thing that some don't think is quite right about the current situation is timing. The peak in liquid fuels production seems to have come and gone, but nothing too terrible has happened. The stores are full of food. The price of gasoline is fairly reasonable, compared to a year ago. Here again, I think if we look at our situation in terms of the limits to growth box, it is not just liquid fuels that are important, but a whole group of networked systems, all of which are affected (to varying degrees) by the constraints of the limits to growth box.

At this point, it seems to me that we are in the lull before the storm. Demand has dropped, because society could not afford high priced petroleum products, but the supply has not yet declined to reflect the lower price level. Stimulus packages have been put in places, but the cost has not yet filtered through the system. People are hopeful for a rebound, and this is reflected in the stock market prices.

To me, the most vulnerable system is the international monetary system. As long as countries trust each other, trade will continue as usual. Once this starts breaking down, it seems likely that countries will need real goods to barter, rather than relying on promises to pay. A breakdown in the international monetary system could cause a major interruption to trade and start a downward spiral. It seems like this could happen at any time.

Whether or not there is a crash, and the timing of such a crash, really depend on how all of the systems work together. Any kind of destabilization, such as new upward price pressures on fossil fuels, could telegraph through the system. Financial disruptions are especially likely.

It is my view that because of this networking, all systems will eventually fail together. A person cannot expect that one system, such as the electrical system, will greatly outlast the other systems. If either the electrical system or the financial system fails, other systems are likely to fail as well.

I see collapse as being stepwise--things may look good for a while, and then there will be a sudden step down. This may happen several times. We are on a step right now.

What Should We Do Now?

It is hard to get any group of people to agree on an answer.

Method of Long Ago

We know one system which more-or-less worked in ages past. People lived in small communities, in very simple homes. Land was tilled by hand or using animal labor. All wastes were returned to the soil, so as to maintain soil fertility. Water was either from hand dug wells or from rainwater catchment systems. People burned whatever was close at hand (dung, peat, wood, coal) to cook their food and heat their homes. Transportation was by foot or using animal power.

Most people don't really want to return to a system such as this. We have 6.7 billion people on earth now. It is not clear that this system could support more than 1.0 billion, even if techniques more advanced than those of our ancestors were used, such as better crop rotation. Life expectancies would likely be very short.

Intermediate Approaches

There are several possible intermediate approaches:

• Find new fuel alternatives--thorium; cold fusion; fourth generation biofuels (Question: Is there time?)

• Build out what we can of alternatives that perhaps aren't running into limits as badly as other things - for example wind turbines, or if one is not concerned about climate change, increased coal generation of electricity; electric trains. (Questions: Will we just run into limits we haven't considered? What do we do when these solutions fail? How many years will these solutions really work?)

• Build out lower tech solutions that have worked in the past--home gardens, small wind mills for farmer, rainwater catchment systems for homeowners, cotton gins, coal fired trains, raising donkeys for labor.

• Build communities of people who want to try to live in more of a sustainable fashion.

One can also work on solving parts of the problem:

• Start teaching skills so that returning to the methods of long ago will not be so problematic.

• Develop open pollinated seeds that will provide a balanced diet for many different climate areas.

• Start encouraging late marriages and one child families.

It seems to me that if limits to growth is really the issue, we should be very cautious about undertaking 20 or more year projects to do anything, unless we believe that the intermediate results will be worthwhile in themselves. There are just too many connections with systems that are likely to fail within the next 20 years.

Instead, it seems like we should concentrate on projects where a more immediate payoff is clear, or that will help us better reach a sustainable long-term situation. This would suggest that we should be starting more at the bottom of the above list of types of actions, rather than at the top.