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Commentary: Redefining "Peak Oil" for the USA

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(Note: Commentaries do not necessarily represent ASPO-USA's positions; they are personal statements and observations by informed commentators.)

Peak Oil's impact on the United States will probably be more severe that what most other countries will feel. This follows from a different way of thinking about the problem – availability vs. production.

The most common definition of Peak Oil – the time when the production of petroleum (however defined) has reached its maximum and will stay steady and then decline in the future – focuses on the production end of the process. While we sometimes speak of local peaks (as was reached in the US in 1970), discussions about the date and magnitude of "Peak Oil" center on asking when will (or did) the world reach its maximum gross level of oil production, and how much is (or was) it.

I would suggest that this is not the most useful way to consider the question. Instead, the Peak Oil debate should pay more attention to what comes out of the pipeline. When it comes to developing responses and policies, the most important question is, when will (or did) the amount of petroleum-equivalent products available to the people of the USA (for instance) reach its maximum? That is the energy challenge that actually confronts us.

This discussion focuses on the US because this is the newsletter of ASPO-USA, but a comparable analysis could be done for any other country or region. Geographic specificity is important. World oil production grew throughout the Twentieth Century, but Germany and Japan faced their own (externally imposed) oil crises around 1940, South Africa during the 1970's, and Cuba since 1991. The fact that oil is plentiful somewhere does not mean it is plentiful everywhere. The US experienced regional peaks (Pennsylvania, California, Oklahoma) before hitting its national peak, and even the national peak was not critical as long as oil could be imported; we consume one-third more petroleum products now than we did when our domestic production peaked back in 1970.

This comprehensive end-user approach can be especially useful because areas where the data and definitions are open to question can be points where the opportunity for creative responses – or, conversely, the risk of conflicts – may be greatest.

The starting point remains gross production of petroleum-equivalent products, but this must be adjusted by the energy used in the production, refining, and distribution process. Net energy is what matters. We can include ethanol and other biofuels, but not double-count both them and the oil used to produce them. To the extent that oil is used to generate electricity (typically two or three percent of total US generation) where an alternative could be used, converting to the new source increases the net supply of oil. Similarly, there may be other feed stocks (including recycling) that would free up petroleum now used for chemicals and plastics.

The next steps involve determining how much of this world net production might be available to the US. (Again, Aussies, Chinese, and others would ask the same questions about their situations.) The US will produce about 5 million barrels of oil per day this year, the lowest level since 1948, and only a quarter of what we want. We have to get the balance from the global export pool. Jeffrey Brown has shown, with his extensive analysis of net exports, that when producing nations try to satisfy their own demand first, export levels drop faster than overall production. Since the rate of oil usage is growing faster in the OPEC countries and Russia than in other parts of the world, the outlook for the export pool is not good.

The "export pool" is not a simple concept, either. The top five sources Americans rely on for oil imports include only one of the top five global exporters. Canada's growth in production is based on

the tar sands, where production costs for new projects far exceed current oil prices. Mexico's production is in sharp decline, and some forecast that the 1.4 million bpd it exports could fall to zero within a few years. Venezuela and Nigeria are both facing major domestic challenges that question their reliability as sources. Saudi Arabia has some excess capacity. However, where are we going to get the oil to replace what we import from Mexico and Venezuela, as well as to supplement our continuing declining production?

Russia, Norway, the UAE, and Iran all have existing relationships and infrastructures sending their oil to Europe, China, Japan, and other destinations. Brazil and West Africa have potential to increase their production, but Brazil has indicated that it may want to keep much of its oil for domestic use.

Further, the US has long consumed about one-fourth of the world's oil, and we act as if we can expect this pattern to continue. There are two reasons to question this assumption. First, of course, the rest of the world – especially the non-OECD nations – wants to grow their usage quickly (or did until the current economic crisis hit), and that will eventually increase their share of the total.

Second, the US has had to borrow extensively to finance its oil imports. When oil is $80 per barrel—twice today's price—and we import 14 million barrels per day, that comes to $1.1 billion per day, or $400 billion per year. Some of that is paid for by our exports, but much has been made possible by foreign purchases of our debt securities. With the massive deficits America is creating to finance the bailouts and recovery packages, who will lend us money in the future? What interest rates, or other security, will they demand? It is reasonable to assume that at some point foreign investors will drastically reduce the investments that fund our imports.

One example of how all of this could play out: if total net world production falls from 80 mbd (out of 86 mbd gross production – assuming a 7% gross-to-net factor, probably low) to 75 (a 6% decline), and the American share drops from 24% to 19%, then American supplies will drop from 19 mbd to 14, a 25% cut, while the rest of the world would continue to share the 61 mbd balance. Our reliance on importing oil with borrowed money could place much of the burden of global Peak Oil on the United States.

From this point there is one additional step we must consider. When the amount of oil available to the US falls far short of the average historical supply, then some process other than price will be used to allocate it. We can be sure that the military will get whatever it needs, and emergency uses including police and ambulances will also get their supplies. Then someone will decide whether to set aside special allotments for agriculture and long-distance trucking (pending the expansion and electrification of our rail network), for school busses and mass transit, and other priorities. If the country decides to take seriously the transition to carbon reduction and a new energy system, oil will be required for the conversion process. These decisions will not be pretty, or easy. However, the "rest of us" will have to share whatever is left. A year or two ago, Tom Whipple projected that ordinary domestic gasoline supplies in the US by 2015 will be about half what they are now. That sounds about right. The distribution of that remainder will be the subject of another paper.

If the world's Peak Oil date, as conventionally defined, is somewhere between 2008 and 2012, then Peak Oil – USA has almost certainly been reached, while Peak Oil – China may still be some years in the future. The changes in finance, economics, trade patterns, and international relations that will emerge from the specifics of local oil availability will shape the coming years. It is not enough any more to focus only on the big picture.

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