Passing the Worldwide Peak in Crude Oil Production: Consequences for Transmission Gully

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Note on Evidence

1. I am a former transport and oil supply issues spokesperson for the Sustainable Energy Forum (2004-2009), a former Convenor of the Sustainable Energy Forum (2007-2009), and a former member of the Vehicle Energy and Renewables Group established by the Minister of Energy in 2008, which operated from 2008-09. Consideration of the oil supply and transport issues caused by the peaking and subsequent decline of world crude oil supply was an important component of all these roles.

2. I do not support the Transmission Gully proposal. However, the evidence presented in this document is factual, based on a number of widely-publicised studies by official agencies and by academics.

3. I have read the expert witness code at [http://www.justice.govt.nz/courts/environment-court/legislation-and-resources/practice-notes/expert-witness.html](http://www.justice.govt.nz/courts/environment-court/legislation-and-resources/practice-notes/expert-witness.html) and ensured that in the evidence I have followed it. In consequence this evidence on peak oil as it affects this proposal:
   
   a. Falls within my expertise. Where I rely on other evidence I clearly identify that.
   
   b. Clearly identifies the data, information, facts, and assumptions considered in forming my opinions
   
   c. States the reasons for the opinions expressed;
   
   d. Does not omit to consider material facts known to me that might alter or detract from the opinions expressed;
   
   e. Specifies any literature or other material used or relied upon in support of the opinions expressed.
World Oil Supply: Crossing the Plateau

4. The International Energy Agency, of which New Zealand is a member, stated in its World Energy Outlook released on 9 November 2010 that the era of cheap oil was over, and that the peak in world crude oil production had in fact occurred in 2006.¹ This admission aligned the International Energy Agency with a number of independent experts who had for some time been predicting such a peak in the first decade of this century. Many of these experts predicted that the peak would result in a production plateau, to be followed by a steep decline.

5. Since 2005, world crude oil production has indeed remained approximately constant. A combination of increased oil production from unconventional sources (such as tar sands), and a downturn in economic activity which was in substantial part brought about by high oil prices caused by the production peak,² has meant that production has remained on an approximate plateau.

6. At some point, the plateau will end, and (following the pattern shown by individual countries' production) world oil production will decline. The decline rate is commonly estimated as 4-8% per annum. There are various estimates of when the plateau will end; in 2010, the US Department of Energy was reported in *Le Monde* as expecting this decline from 2011 onwards.³

7. In addition, the International Monetary Fund released an analysis entitled "Oil Scarcity, Growth, and Global Imbalances" in April 2011 that states:

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8. Global oil markets have entered a period of increased scarcity… a return to abundance is unlikely in the near term.⁴

The New Zealand Situation

9. Official bodies in New Zealand have acknowledged that peak oil presents a problem for New Zealand. In October 2010, the Economics and Industry research team of the New Zealand Parliamentary Library produced a paper on the topic, "The Next Oil Shock?",⁵ which concludes that:

a. The world may be entering an era defined by relatively short periods of economic growth terminating in oil price spikes and recession.

b. New Zealand is not immune to the consequences of this situation. In fact, its dependency on bulk exports and tourism makes New Zealand very vulnerable to oil shocks.

c. A number of alternatives to imported oil have been proposed for New Zealand. These include:

d. Repurposing New Zealand's domestic oil production, whether from existing or potential new fields, to replace imported oil. (Currently, almost all oil produced in and around New Zealand is exported.)

e. Substantially replacing the light vehicle fleet with electric vehicles.

f. Replacing diesel made from imported oil (used primarily in the heavy vehicle fleet e.g. trucks) with biodiesel made from wood waste and from plantations grown on marginal lands, when the technology to convert wood to biodiesel is mature.

g. Replacing diesel made from imported oil with diesel produced by converting Southland's lignite reserves to diesel.

10. Each of these proposals has difficulties:

a. Substantially increasing domestic oil production requires dangerous offshore drilling, including deepwater drilling in conditions more


hazardous than those faced by BP's Deepwater Horizon rig, and most claimed resources are prospective rather than proven.

b. Electric vehicles, although a proven technology for short-range use, are presently expensive, hard to obtain, not suitable for open road driving over long distances (e.g. for SH1 use between cities), and come with their own set of resource constraints, on both battery production and electricity generation.

c. The second-generation technology required to make biodiesel from wood is neither mature nor commercialised.

d. While the basic technology to make lignite from diesel is mature, the process is highly polluting at a local level, causes a high level of greenhouse gas emissions, and is facing increasing political opposition due to both those factors.

11. However, even if one or more of these technologies comes to fruition, its impact will not be immediate. Furthermore, liquid fuels produced by any of these processes will be charged at the world price for such fuels, and they will have a minimal effect on the world supply of liquid fuels. As world oil supplies decline relative to demand, it is expected that liquid fuel prices will rise steeply towards an upper bound that has yet to be determined.

Consequences of oil supply crunches and expensive liquid fuels

12. As the Parliamentary Library report cited above notes, New Zealand is very vulnerable to oil supply crunches:

13. New Zealand would be affected by oil supply crunches both directly and indirectly via the effect on trading partners.

a. Direct effects include higher transport costs and an increased balance of payments deficit due to the increased cost of importing oil.

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6 It might seem that electric vehicles would not be affected by such price pressures. However, some economists argue that the use of electricity for transport will cause the electricity price to rise to meet the liquid fuels price. In any case, electric vehicles can at best only replace the light vehicle fleet, not the heavy vehicle fleet. Even the most optimistic promoters of electric vehicles expect them to be in the minority in the New Zealand light vehicle fleet through at least 2040.
Transport costs constitute a significant expense for exporters, especially exporters of bulk goods like timber, meat, and dairy.

b. Indirect effects would be felt through lower consumer demand in the markets for New Zealand’s export goods, leading to lower prices.

c. The LEaP report [cited in the Parliamentary Library report] details the economic consequences of oil shocks on the $9 billion a year international tourism industry, which it states is “highly dependent on affordable oil”:

d. “Tourism Businesses: face an increase in their operating costs due to higher oil prices and reduced demand in response to oil shocks and price increases.

e. Destinations and communities: face reduced visitation resulting in compromised regional development.

f. Tourists: reduced experience due to higher proportion of holiday budget being spent on transportation.

g. Government: reduced income from tourism as a result of reduced arrivals and reduced expenditure by tourists.”

h. As a country that is reliant on oil imports and heavily dependent on cheap oil for its major sources of income, New Zealand is highly exposed to oil shocks. Domestic oil production is insufficient to meet New Zealand’s oil needs. Equally, increasing domestic oil production would not protect New Zealand from either the direct or indirect effects of price spikes caused by global supply crunches.

14. Economists are now beginning to analyse the effects on New Zealand economic activity of continuing oil supply crunches., and Dr Susan Krumdieck of the University of Canterbury has conducted peak oil risk analyses for the New Zealand context.

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15. The steep rise in oil prices during the middle of last decade was comparatively mild compared to the expected oil price effects of declining world production, but nevertheless, declines in private transport use were reported in Auckland and Wellington during this period. The extent of mode-shifting was constrained by the limited availability of reliable and timely public transport options to those who were considering a switch from private motor vehicle use.

Conclusion

16. The need to reduce greenhouse gas emissions from transport (not addressed in this paper) is widely accepted, including by the present Government. Furthermore, it is now generally accepted by international bodies such as the International Energy Agency that world crude oil production has peaked and is likely to decline in the coming decade, and that alternative sources of transport fuels will not be sufficient to meet the shortfall.

17. Taken separately or together, these factors mean that the business-as-usual projections of increasing transport activity relied on by transport planning bodies such as the New Zealand Transport Agency no longer reflect a credible model of future transport activity. This calls into question the need for such motorway building projects as Transmission Gully, and for the massive expense, and the social and environmental disruption, which they entail. Transport alternatives which make better use of scarce resources, and which enhance resilience when faced with a future of declining transport fuel availability and high transport fuel prices, are preferable to such costly monuments to the age of cheap oil.