



Risky NorthConnex tunnel will not solve congestion problem

Submission by Matt Mushalik

This submission refers to documentation on this website:

http://majorprojects.planning.nsw.gov.au/index.pl?action=view_job&job_id=6136

About the author

I am a retired civil engineer and regional/town planner and now a leading peak oil researcher in Sydney. My first public critique was in 2004 on John Howard's energy white paper. I have designed incremental crude oil graphs which are known all over the world and which have been included in a slide show to the Pentagon by the late Matt Simmons, a Houston based investment banker in the oil and gas industry. I am running my own website with an average of 2-3 articles a month. I have done many slide shows in Universities and for Councils. I personally handed over PO papers to Premier Iemma and Rees, Prime Minister Rudd, Ministers Ferguson, Albanese and Turnbull, among many others.

I participated in Mahla Pearlman's hearing on the F3-M2 Corridor Review in Parramatta Court in 2007 and recommendations of my submission were included in her final report, namely that peak oil should not be forgotten in future planning. This recommendation was not followed up in this EIS.

My track record of submissions on road tunnels is excellent. In 2006 I advised the Brisbane City Council not to build the North South Bypass (now Clem 7) tunnel. My advice was ignored, the tunnel collapsed financially and the matter is now before a court. The same happened with Brisbane's Airportlink.

I have no doubt that the same destiny is waiting for NorthConnex, if it is ever started. It will be a candidate for my "I-told-you-so" menu

Summary

Tunnel not a solution for the congestion problem at hand

The current congestion problem on Pennant Hills Rd is caused by the convergence of 4 distinctive traffic streams in this narrow corridor: (a) trucks on the national highway, (b) long-distance commuting from the Central Coast, (c) inter-regional suburb traffic within Sydney and (d) local traffic. The proposed tunnel would only be a solution for (a) and parts of (b) with destinations in Western Sydney, would offer very little for (c) and nothing for (d). The current proposal would basically move most trucks into the tunnel thereby freeing up capacity on the road, which – however – is quickly filled by growing car traffic – under a BAU scenario, of course. For \$3 bn this is not good enough. Even the EIS has recognised this in Vol 2, page 187: **“it does not fully resolve the congestion problems in the local area in the long term”**

Sustainable solutions will be imposed by external events anyway

From a strategic point of view each traffic stream requires its own sustainable solution:
freight must go by rail (intermodal),

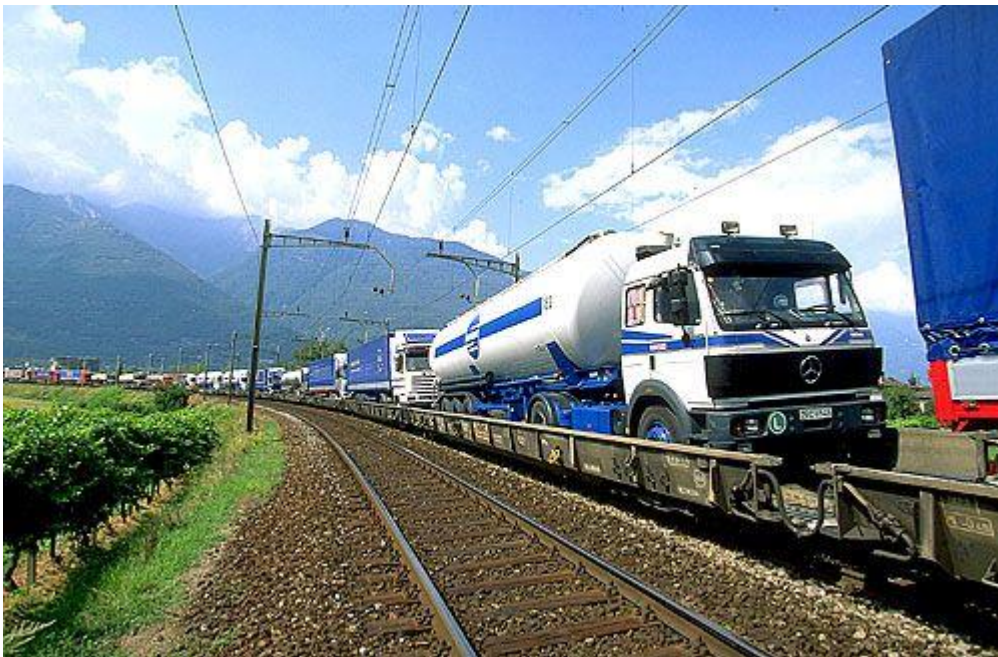


Fig 1 Intermodal train in Switzerland

long distance commuters by carpooling and rail, and regional passenger traffic by buses and car pooling. This has to be done anyway as the easy oil is gone and the CO2 problem accumulates in the atmosphere and the oceans. We do not know whether oil shortages or abrupt climate change come first but these problems hang like a Damocles sword over Sydney. A road tunnel with a life span of decades would only unnecessarily delay this transformation process.

Debt increased and no taxes paid

The 3rd problem is finance and debt. The proponent of NorthConnex, Transurban, sits on A\$ 8 bn of debt which they don't attempt to pay back because the tolls are too low. In this way, almost no tax is being paid. As I have shown in previous research 60% of the Federal deficit since 2008 is caused by a sharp drop in company tax. Finance is proposed to come from a government contribution, new debt and shares. So debt is increased and the government does not get any return from their "investment". It is incomprehensible that governments want to subsidise such a company. It is totally against their own objectives and requirements. Moreover, Transurban's debt situation means that this company is highly vulnerable in the next credit crunch which is only a matter of time. The Lane Cove tunnel went into receivership when debt could not be rolled over.

Oil crisis likely before 2020

Without US shale oil, the world would be in a deep oil crisis and the question of a road tunnel would not have arisen. The International Energy Agency recently published a report which implies that the 2nd – and last- US peak will start in 2016. At the same time, the Russian Finance Ministry has warned that oil production will start to decline also in 2016. 3rdly, a religious war has started on top of Middle East oil fields. It would be naïve to think that this will not impact on oil exports from the region.

Recommendation

State and Federal governments should use their \$800 bn to continue with the ETTT project either between Thornleigh and Hornsby or from Rhodes to West Ryde with an additional rail bridge over the Parramatta River



Fig 2: The missing tracks over the Parramatta River

(1) Traffic forecasts

Traffic forecasts have been done only up to 2029 (10 years of operation after opening) although the concession period goes up to 2048. This is an unacceptable limitation.

The traffic chapter has various tables on AADT, AM/PM peak traffic and AWDT without giving the conversion factors.

Starting point is 80k vehicles per day in 2013 (p 31). Table 3-6 shows that traffic was stagnant near Beecroft Rd for the period 2010-2013 (2009 being an exceptional year). The EIS argues that this is because of capacity limits, although 62K is far lower than 80K

4_EIS Volume 2.pdf - Adobe Reader

Table 3-6 Historical Pennant Hills Road AADT (two-way)

| Location | 2005 | 2009 | 2010 | 2011 | 2012 | 2013 | % p.a. |
|-----------------------|--------|--------|--------|--------|--------|--------|--------|
| near Woodstock Road | - | - | 47,500 | 47,900 | 46,300 | - | - 1% |
| near Copeland Road | - | 73,260 | - | - | - | - | - |
| near Castle Hill Road | 82,700 | - | - | - | - | - | - |
| near Beecroft Road | - | 59,500 | 62,600 | 62,100 | 62,200 | 62,000 | 1% |

(Source: Roads and Maritime, 2013)

Fig 3: Table 3-6

It is not clear why the growth rate is taken at 1%. What's even more astonishing is that in table 8-4 AWDT at Beecroft Rd (North) for 2019 without project is given as 50,200 +46,100=96,300 or a growth rate of $(96,300/80,000-1)/6 = 3.4\%$. No explanation has been brought forward for this high rate. At the same location AWDT for 2029 is 50,000+45,250=95,250. No improvement at all.

Table 8-5 gives a tunnel AWDT of 39,650 for 2029. That would be a total of almost 135K vehicles passing through a cross section above and below ground at Pennant Hills. Nowhere in the EIS documentation has it been made clear that this huge volume of traffic should be expected. Nor is the public made aware that all roads to and from the project area would have to be widened to deal with a 70% increase of traffic by 2029. The author of this submission has put all the AWDT data into the following graph to make it clear what the project entails:

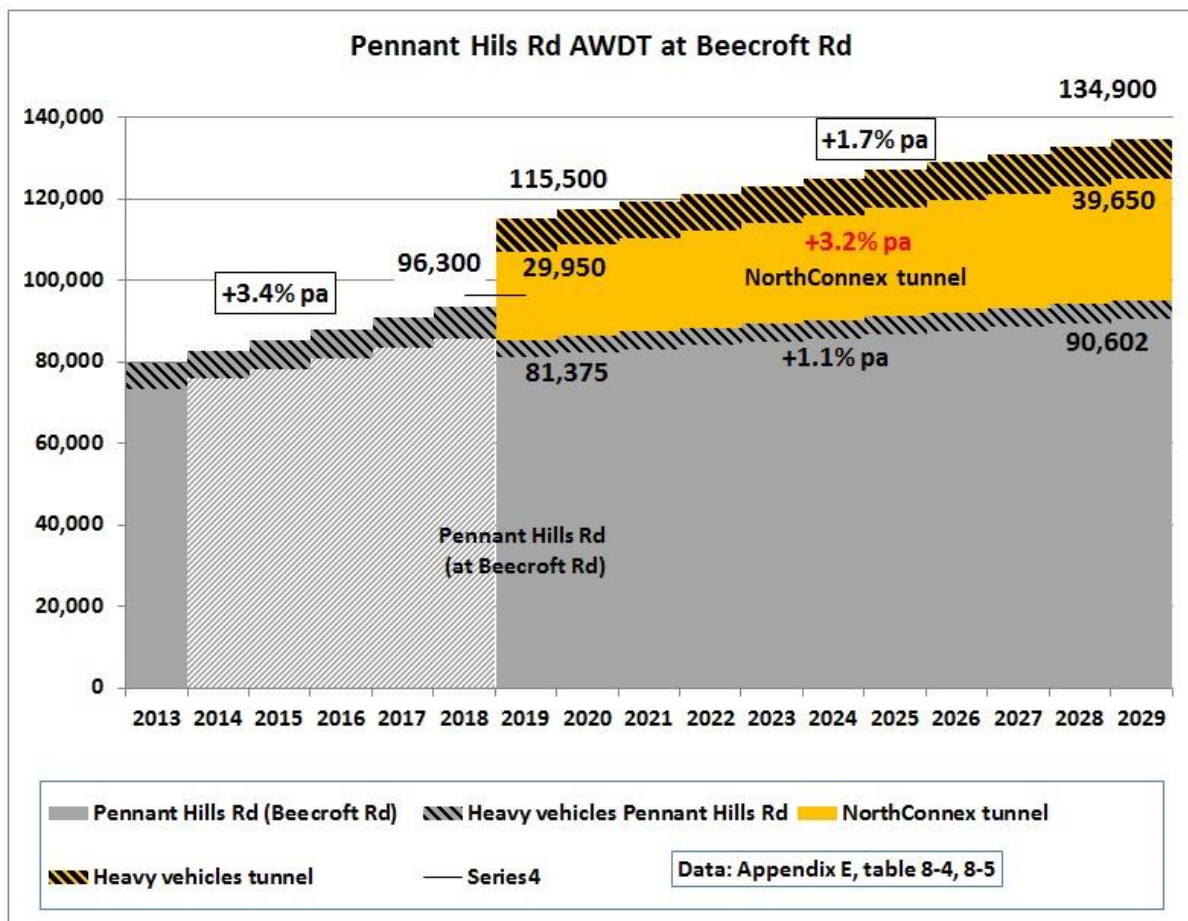


Fig 4: Pennant Hills Rd AWDT for both surface road and tunnel in the period 2013-2029

The grey area represents surface traffic on Pennant Hills Rd, the yellow area traffic in the tunnel, the hatched areas heavy vehicles. The EIS should actually have provided such a graph or similar. There is an obvious lack of transparency here for the average reader of the EIS.

In 2019 there is a huge jump in traffic which is of course unrealistic. The EIS fails to calculate a transition period. Traffic on the Pennant Hills Rd drops in 2019 compared to the “without project” case but is higher than 2013 levels. Moreover, a continuous growth in tunnel traffic of 3.2% pa between 2019 and 2029 is above the normal GDP growth rate. Usually, a traffic forecast should calculate 3 different scenarios: low, reference and high (sensitivity analysis). Nothing of this sort was done.

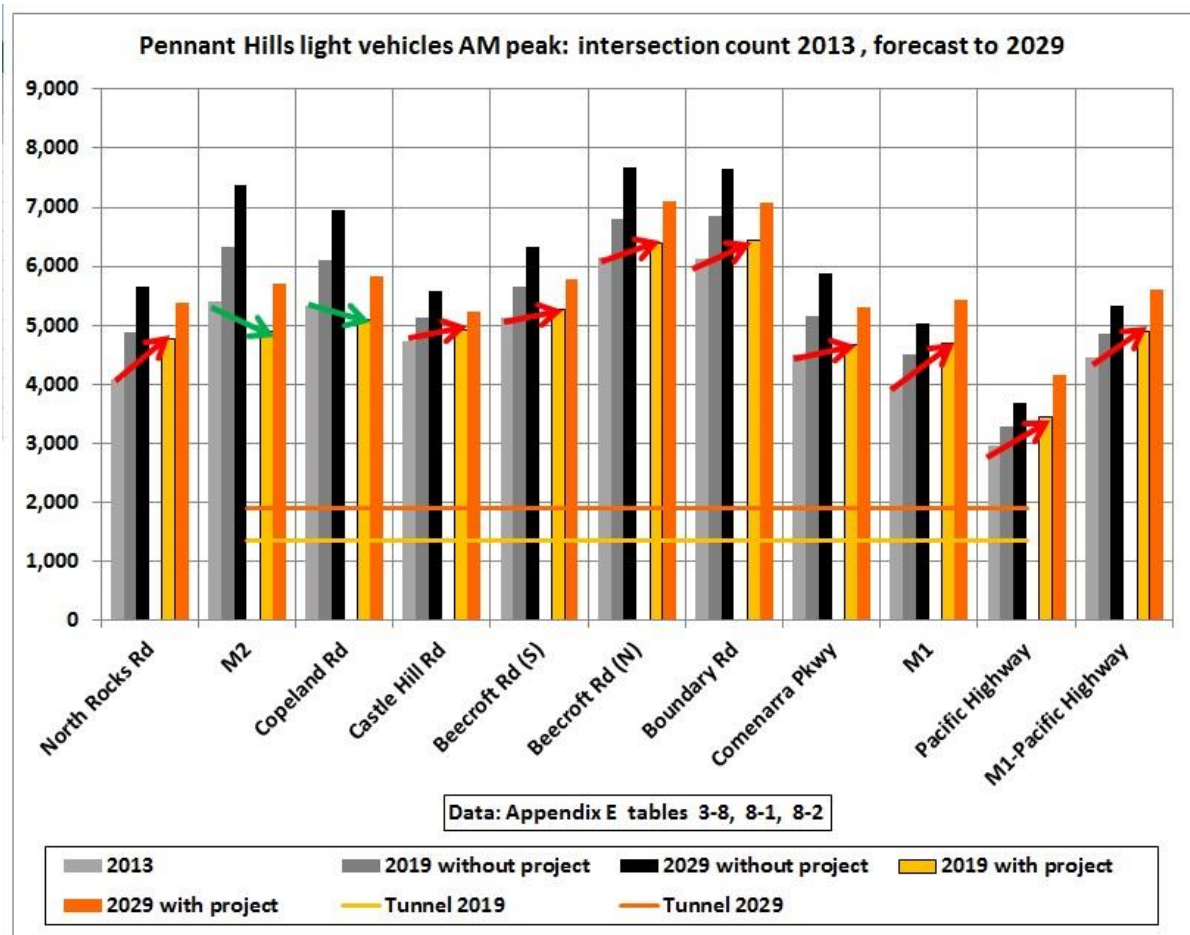


Fig 5: Pennant Hills Rd AM peak hr traffic for the years 2013, 2019 and 2029 at various intersections

The graph starts in the South (left) and ends in the North (right). Grey columns denote traffic without the project and orange columns traffic with the project. The horizontal lines show traffic in the tunnel. It can be seen that except for the section between the M2 and Copeland Rd (green arrows) light vehicle traffic is higher than in 2013 (red arrows).

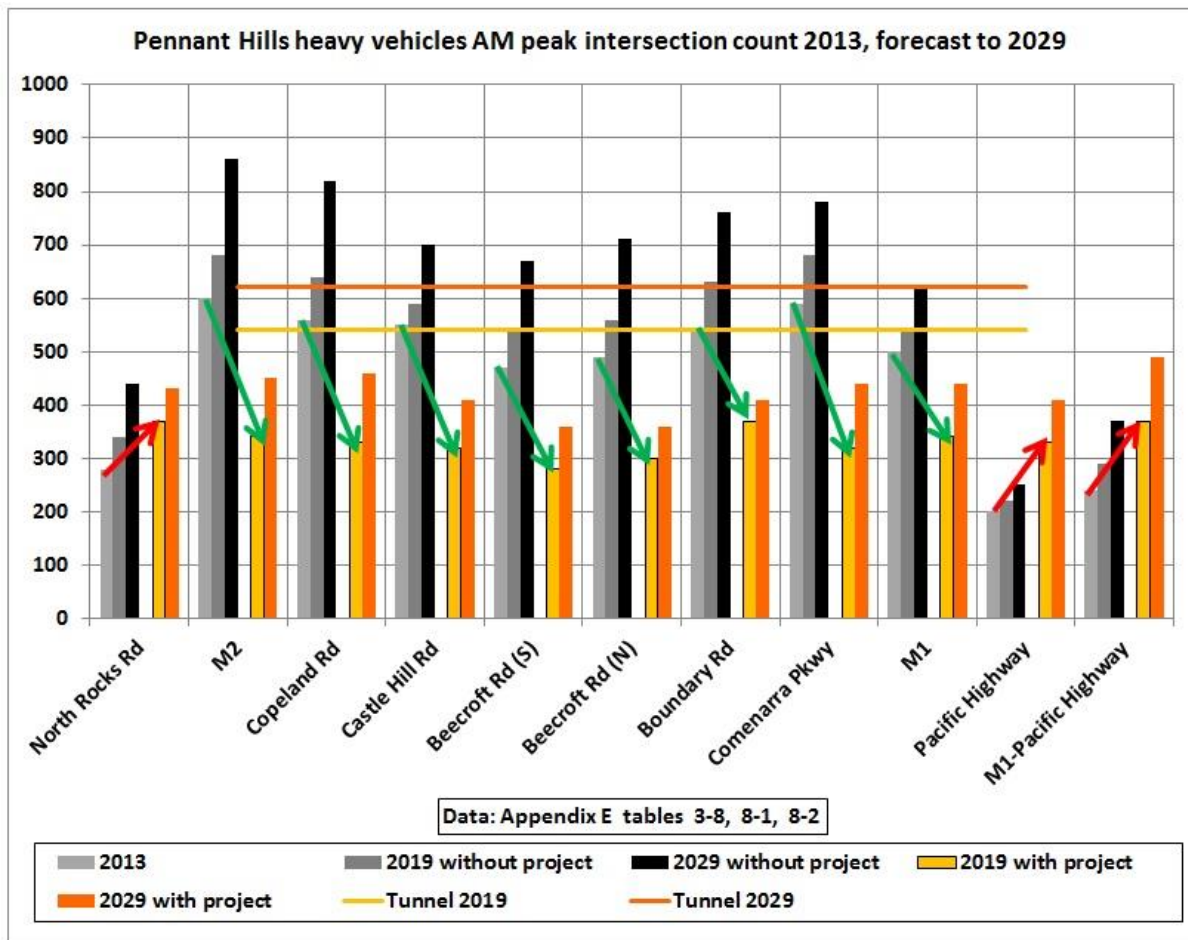


Fig 6: Pennant Hills Rd heavy vehicles intersection count 2013 and forecast 2019, 2029; tunnel in 2019-29

Heavy vehicle traffic drops at all locations except at the tunnel exits. This means basically that above ground heavy vehicle traffic is moved into the tunnel, making room for more light vehicles on the surface.

A huge problem would develop at the Southern end. According to table 8-4 AWDT between the M2 and North Rocks Rd would be 27,900+33,800 (no saving from the “without project” AWDT of 27,850+32,000). But then an additional 17,791 vehicles would be dumped on the Pennant Hills Rd South of the M2, increasing traffic by a whopping 29%, already in 2019

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Table 8-5 Origin and destination of 2019 and 2029 tunnel AWDT volumes

| NorthConnex Tunnel | Two-way AWDT 2019 (vehicles per day) | Two-way AWDT 2029 (vehicles per day) |
|---|---|---|
| West (M2, west of Pennant Hills Road) | 9,991 | 14,547 |
| South (Pennant Hills Road, south of M2) | 17,791 | 21,087 |
| East (M2, east of Pennant Hills Road) | 2,173 | 4,013 |

(Source: Strategic transport model, 2014)

Fig 7: AWDT at the Southern Exit. Similar data for the Northern exit have not been provided

It is doubtful whether the level of service E (already downgraded from D) between M2 and North Rocks Rd has been properly calculated (table 8.6), given that Pennant Hills Rd South of the North Rocks intersection continues with 2 lanes only up to Carlingford Court.



Fig 8: Pennant Hills Rd (Cumberland Highway) south of North Rocks intersection near Woodstock Rd

If this section is clogged up, traffic will back up North into the tunnel. This detail alone will make the tunnel unusable during the AM peak. It should also be noted that 300 flats are under construction along Carlingford Rd opposite the Carlingford Court shopping centre.



Fig 9: 300 flats along Carlingford Rd near Pennant Hills Rd

Additional local traffic from this development will reduce the level of service of the Pennant Hills Rd/Carlingford Rd intersection. 10 times as many flats are planned for the Epping precinct, which will dump even more traffic on Carlingford Rd. The whole Metropolitan plan is unsustainable as already submitted here:

Metropolitan Strategy

http://crudeoilpeak.info/wp-content/uploads/2013/06/Submission_Draft_MetroStrategy_June_2013_by_Matt_Mushalik.pdf

http://strategies.planning.nsw.gov.au/Portals/0/Documents/Submissions4/dms_2013_Matt_Mushalik.pdf

<http://strategies.planning.nsw.gov.au/MetropolitanStrategyforSydney/Submissions.aspx>

(2) EIS to be revised

It has been reported that tolls on other connecting toll-ways like the M2 and M7 will be increased to pay for the NorthConnex tunnel.

M7 tolls to go on for 11 more years to help pay for NorthConnex — and more roads could follow

<http://www.dailytelegraph.com.au/newslocal/west/m7-tolls-to-go-on-for-11-more-years-to-help-pay-for-northconnex-and-more-roads-could-follow/story-fngr8i5s-1226965478458>

That will change traffic demand for the NorthConnex, especially by trucks which will face a double whammy on both the NorthConnex and the M7, for example, something which was not considered in the current EIS. Insofar this EIS is outdated and invalid. It needs to be revised and re-submitted.

A completely hypothetical extension of the concession period (oil supplies, global warming in 30 years?) will not have any effect on cash flows in, say, the first 10 years of the project life or during the next credit crunch.

(3) Subsidies

Both State and Federal governments have indicated they want to contribute \$405 million each to the NorthConnex project. This subsidy alone shows that the project on its own is not commercially viable. It is also completely against the current budget objectives of the Federal government.

Transurban pays just \$3 million tax, despite collecting \$1 billion in tolls

5/8/2014

<http://www.smh.com.au/business/transurban-pays-just-3-million-tax-despite-collecting-1-billion-in-tolls-20140805-100le8.html>

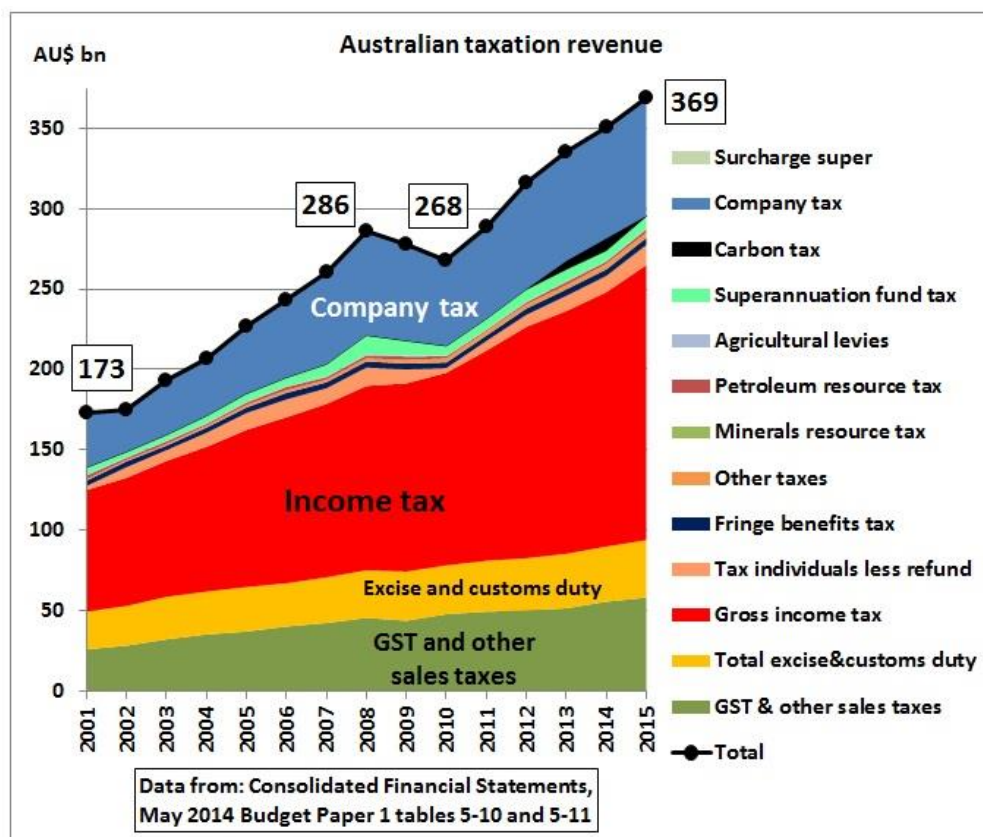


Fig 10: Federal taxation revenue took a hit in 2008

More details can be found in this article:

28/5/2014 Australian budget hit by global financial crisis and high oil prices (part 1)

<http://crudeoilpeak.info/australian-budget-hit-by-gfc-and-high-oil-prices-part-1>

(4) Debt

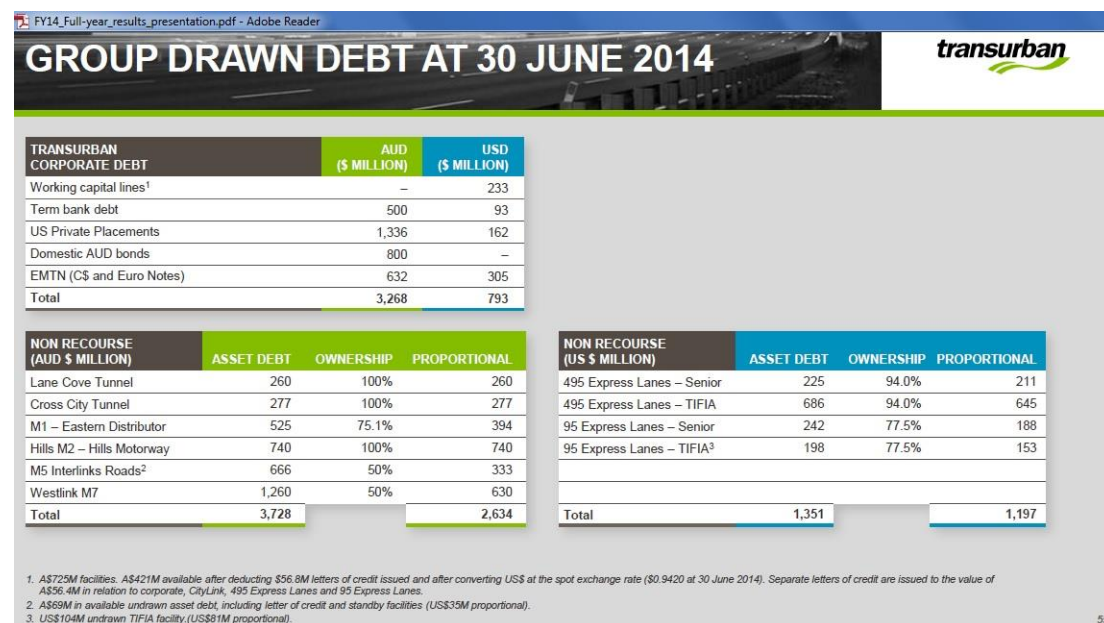


Fig 11: Transurban debt is around \$A 8 bn

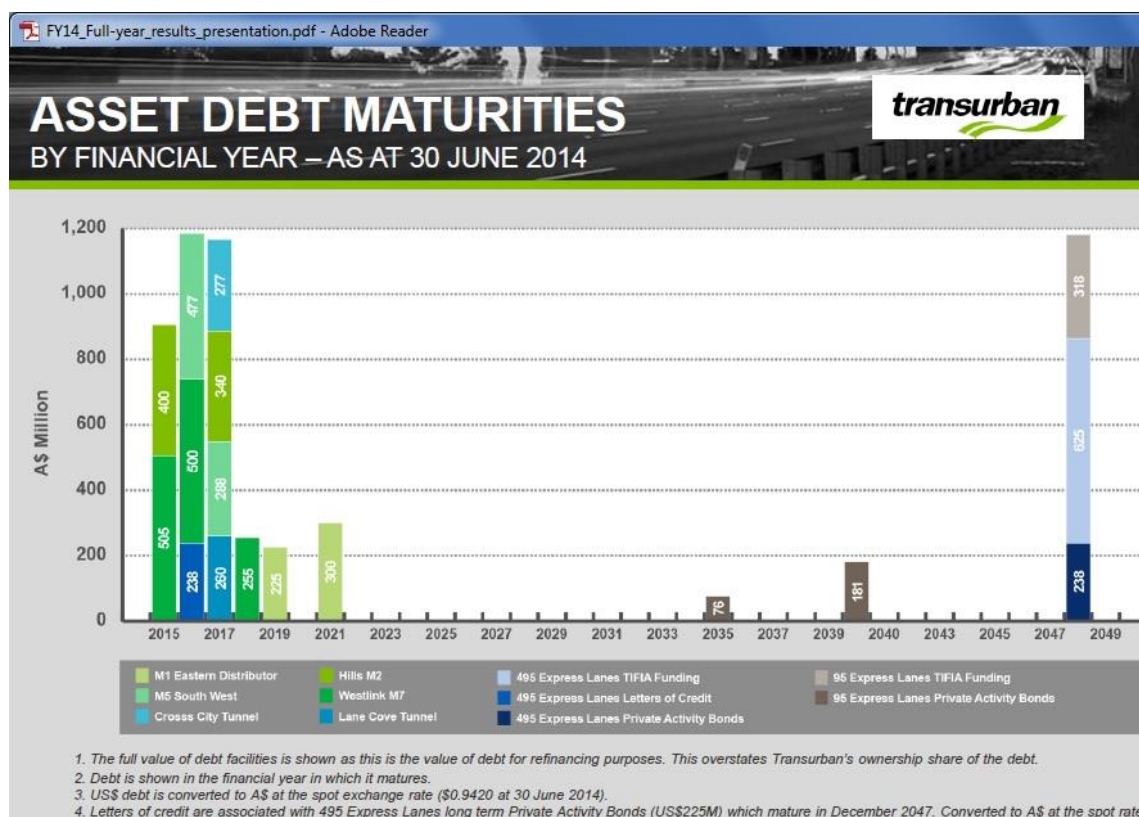


Fig 12: Transurban's asset debt maturities are mainly due before 2020

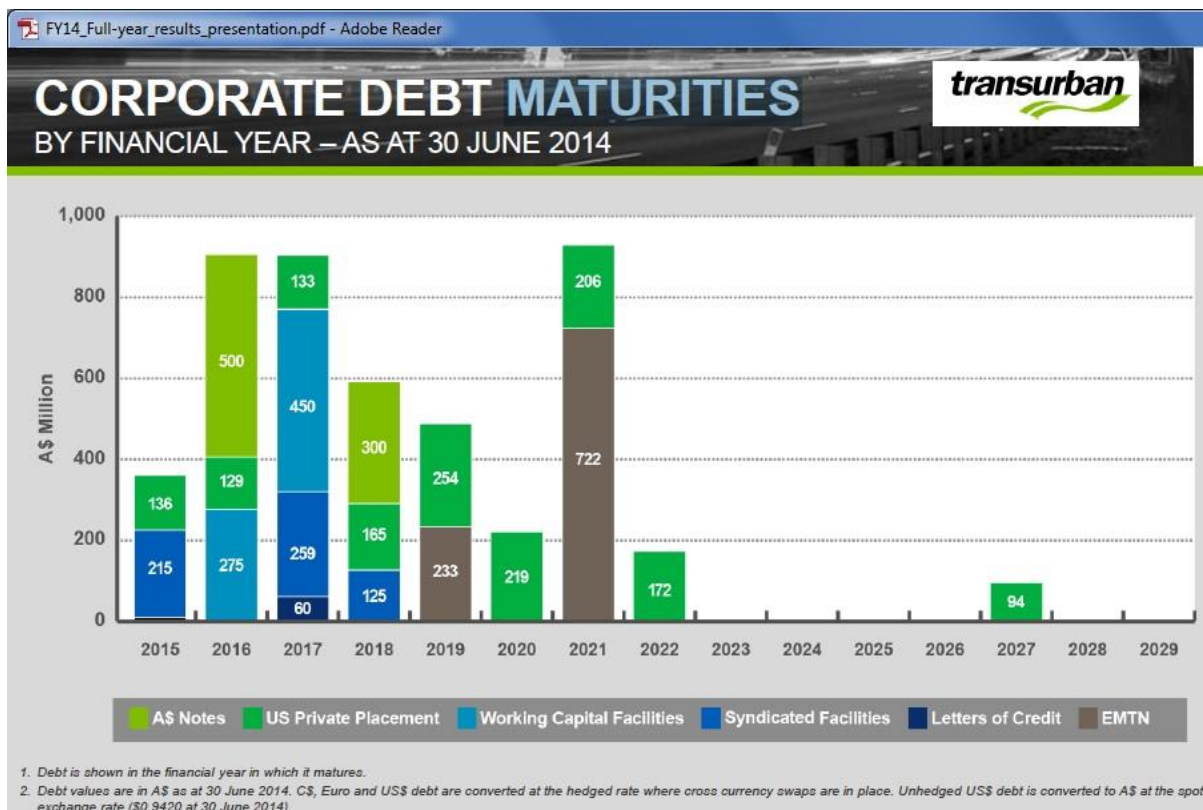


Fig 13 Transurban's Corporate debt maturities

We see that Transurban is continuously under pressure to roll over debt. One day that will become a big problem. Will the government impose a condition that asset debt in relation to NorthConnex will be paid back within the traffic forecast period to 2029?

(5) Conflict of interest

It is strange that the proponent prepares his own EIS. Is that part of the government's policy "open for business"? Why does RMS expose itself to future legal challenges? Who will be financially responsible for peak oil ignorant traffic projections? Will the well paid directors of Transurban deposit a bond to guarantee the accuracy of traffic assumptions?

(6) Peak oil in EIS

Peak oil is mentioned in chapter 8.3 which is a strange mixture of issues on resources and waste. This alone reveals the mindset of the authors of this chapter. It is an afterthought inserted somewhere in the document WITHOUT any meaningful connection or as an input into the traffic chapter, for example. Excerpts from p 1022:

Peak oil

"Roads and Maritime are taking the view that it is prudent to consider that oil production may peak and then decline. This could increase the cost and reduce the availability of transport fuels

and construction materials derived from oil. For transport, the solutions to the problem of “peak oil” are similar to those for climate change.”

Fine. But no number crunching is included. Here it is:

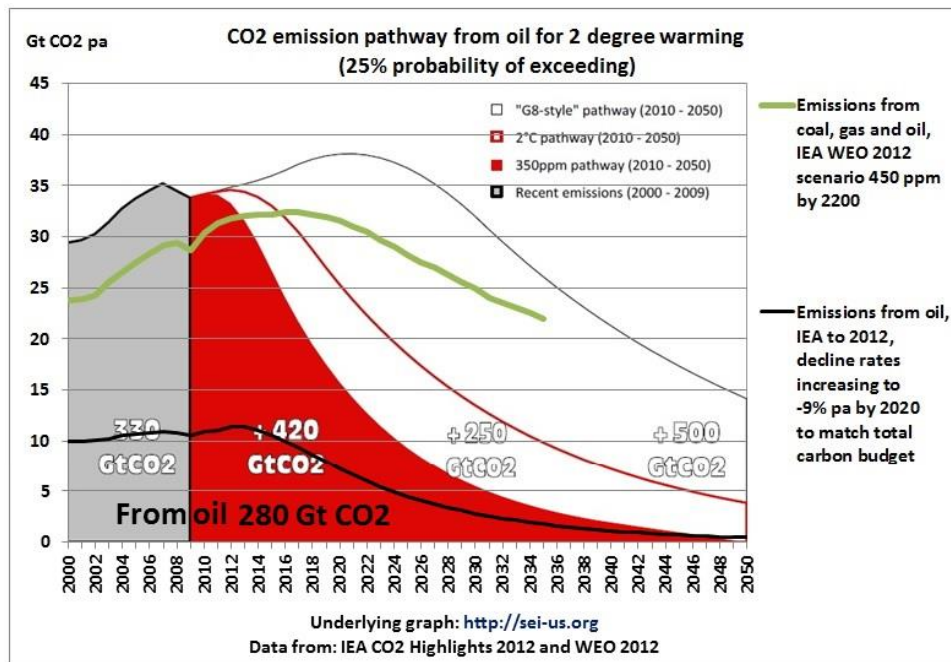


Fig 14: Oil consumption decline curve to stay within 2 degree warming

The graph shows that globally oil production and therefore consumption would need to decline by 6% pa and achieving 9% pa by 2020 in order to stay within 2 degrees warming. In the GHG chapter the EIS has calculated that emissions from construction alone may just be offset by 2027. Clearly, the authors of chapter 8.3 have no idea what the CO2 targets are and how tight the timeline is. More details can be found on my website in this article:

16/5/2013 Half of oil burnable in 2000-2050 to keep us within 2 degrees warming has been used up as we hit 400 ppm

<http://crudeoilpeak.info/half-of-oil-burnable-in-2000-2050-to-keep-us-within-2-degrees-warming-has-been-used-up-as-we-hit-400-ppm>

Extract:

“Alternatives to fossil fuels need to be found and transport must become more energy efficient. There are moves to establish alternatives to oil as a fuel for transport and to improve energy efficiency. This would enable the economic benefits provided by road transport to continue to be delivered with a reduced need for fossil fuels. Similar action is being taken, through recycling and investigation of alternative materials, to reduce the need for construction products derived from fossil fuels.”

Well one first has to find and develop them in sufficient quantities and at acceptable prices and then more roads of the 21st century can be built but not the other way round. You don't build a space ship to another planet if you haven't already developed and tested a fuel for the rocket.

The authority on biomass is Barney Foran:

Powerful Choices: transition to a biofuel economy in Australia

<http://lwa.gov.au/products/pn30178>

50 million ha of deep-rooted forest would be needed which would hopefully survive the many bushfires under global warming conditions. Good luck

On electric cars the IEA has calculated that there might be 24 million of EVs by 2020. That is 2.4% of the global fleet

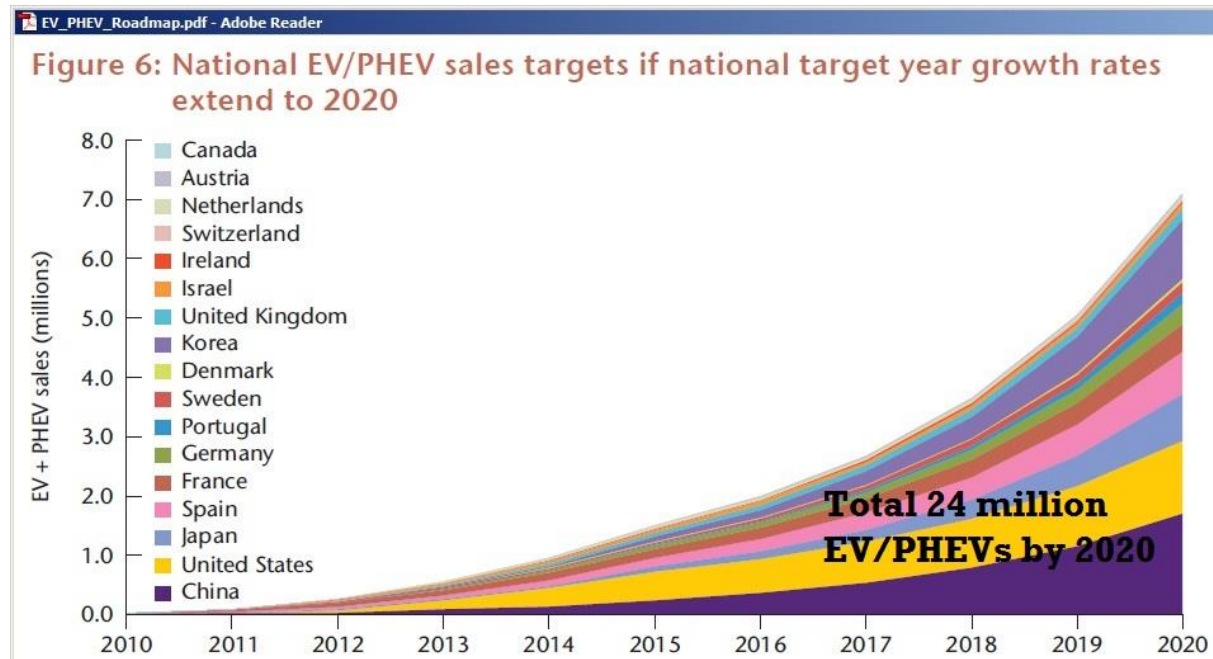


Fig 15: 24 million EVs by 2020

More details can be found in this article:

31/8/2011 1 billion vehicles in year #7 of peak oil

<http://crudeoilpeak.info/1-billion-vehicles-in-year-7-of-peak-oil>

And this is the reality:

27 May 2013 World car production grows 3 times faster than global oil supplies

<http://crudeoilpeak.info/world-car-production-grows-3-times-faster-than-global-oil-supplies>

One alternative transport fuel (although still fossil fuel based) is natural gas, but this is exported in huge quantities. The equivalent of 5.5 LNG trains would be needed to replace all Australian petroleum based liquids. More details can be found here:

13/10/2011 NSW gas as transport fuel. Where are the plans?

<http://crudeoilpeak.info/nsw-gas-as-transport-fuel-where-are-the-plans>

9/5/2012 Queensland plans to export more than 10 times the gas NSW needs (part 3)

<http://crudeoilpeak.info/queensland-plans-to-export-more-than-10-times-the-gas-nsw-needs-part-3>

Les jeux sont faits. By the time the public wakes up, the gas is gone, for good

Extract:

“Roads and Maritime is also participating with Austroads and industry in research and trials with the goal of developing more sustainable road construction materials and practices and reducing reliance on products derived from oil. As road transport is a significant and necessary element of the NSW economy, that also provides many social benefits, Roads and Maritime will continue to ensure that all potential impacts on this system, such as peak oil, are identified and action is taken to manage these risks.”

If this is at the research and trial stage it is too late. It was already too late 10 years ago. Obviously, the authors of chapter 8.3 did not watch this Catalyst oil crunch story In April 2011

<http://www.abc.net.au/catalyst/stories/3201781.htm>

in which the IEA’s chief economist Fatih Birol gave the warning that we must get away from oil before oil gets away from us. Catalyst: “how urgent is that?” Answer: “We should have started 10 years ago.

Conclusion: building oil dependent road tunnels is definitely not a strategy to get away from oil. Only electric c rail is.

Extract:

“With reference to the project, traffic modelling across the Sydney network indicated that the proposed project would result in increased travel speeds and shorter distance of the tunnel compared to the surface roads. This would result in an overall reduction in the quantity of fuel consumed by private and freight vehicles and a subsequent reduction in the quantity of emissions produced. As noted in Section 8.4 (Greenhouse gas and climate change), it is estimated that by 2027, savings in operational road use emissions would be greater than the estimated emissions generated during construction of the project. Furthermore, it is estimated that operational emission savings from road use of around 68,600 Mt CO₂-e would be achieved by 2029 when compared against the ‘do nothing’ scenario.”

As calculated above, these savings are all marginal. This sentence conforms that the authors don’t know the targets. These are already known since 2008:

Target atmospheric CO₂: Where should humanity aim?

Hansen et al. 2008

Paleoclimate data show that climate sensitivity is ~3°C for doubled CO₂, including only fast feedback processes. Equilibrium sensitivity, including slower surface albedo feedbacks, is ~6°C for doubled CO₂ for the range of climate states between glacial conditions and ice-free Antarctica. Decreasing CO₂ was the main cause of a cooling trend that began 50 million years ago, the planet being nearly ice-free until CO₂ fell to 450±100 ppm; barring prompt policy changes, that critical level will be passed,

in the opposite direction, within decades. If humanity wishes to preserve a planet similar to that on which civilization developed and to which life on Earth is adapted, paleoclimate evidence and ongoing climate change suggest that CO₂ will need to be reduced from its current 385 ppm to at most 350 ppm, but likely less than that. The largest uncertainty in the target arises from possible changes of non-CO₂ forcings. An initial 350 ppm CO₂ target may be achievable by phasing out coal use except where CO₂ is captured and adopting agricultural and forestry practices that sequester carbon. If the present overshoot of this target CO₂ is not brief, there is a possibility of seeding irreversible catastrophic effects.

<http://pubs.giss.nasa.gov/abs/ha00410c.html>

NASA climatologist James Hansen did this lecture at Sydney Uni

8/3/2010

NASA climatologist James Hansen at Sydney Uni: "Australia doesn't agree now that they got to stop their coal, but they are going to agree. I can guarantee you that within a decade or so because the climate change will become so strongly apparent that's going to become imperative"



Fig 16: James Hansen holding a lecture AT Sydney Uni

20 seconds clip:

<http://www.youtube.com/watch?v=qMD2sdolPeg>

Full lecture:

<http://www.youtube.com/watch?v=5E5EdbiB4HU>

>From here:

http://www.usyd.edu.au/sydney_ideas/lectures/2010/professor_james_hansen.shtml

It is incomprehensible that professional experts in AEMO do not know this.

(7) The real story of peak oil

7.1 Peaking as process

Peak oil is to be seen as a process rather than an event in the year of maximum production. Global crude oil started to peak in 2005 as can be seen on the following graph. We have peaking in fields, provinces, countries, regions and finally in the world. We are now at a stage where peak oil spreads from one country to the next, like a cancer. I warned Howard in 2006, that problems will already start BEFORE the global peak.

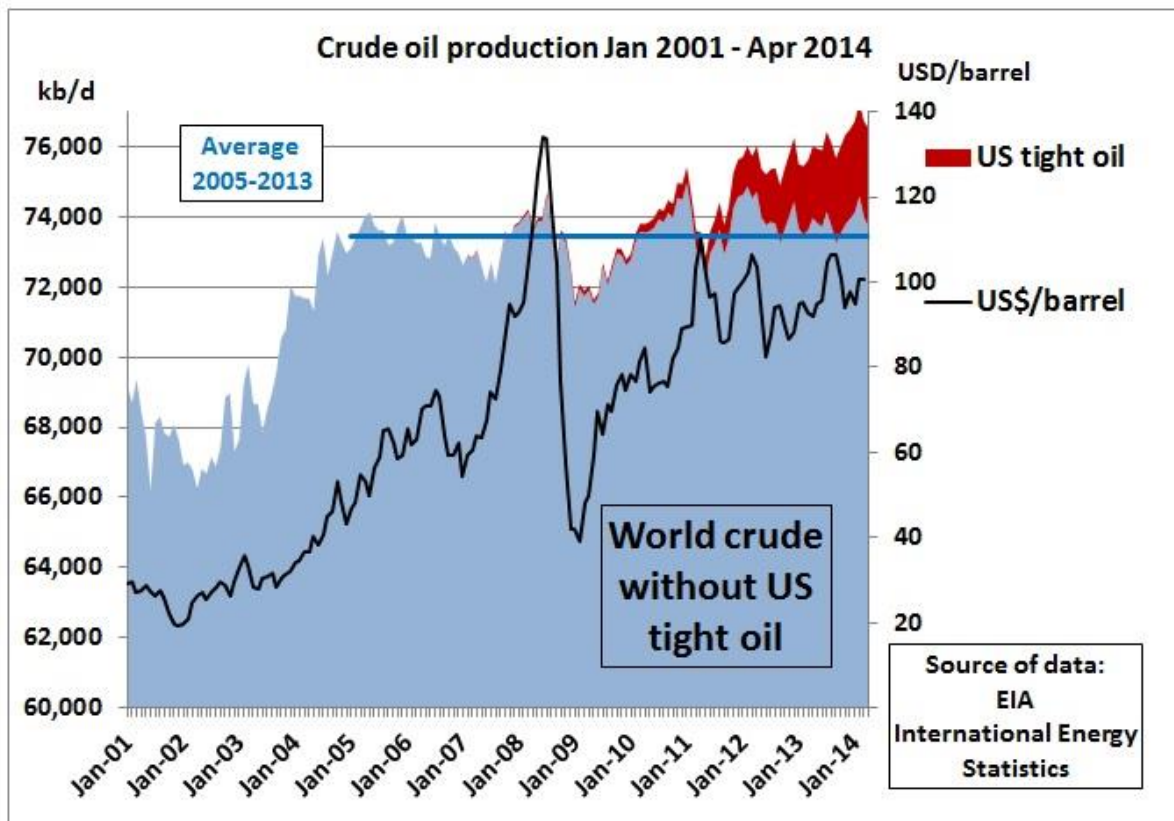


Fig 17: US shale oil sits on top of a bumpy production plateau in the rest of the world

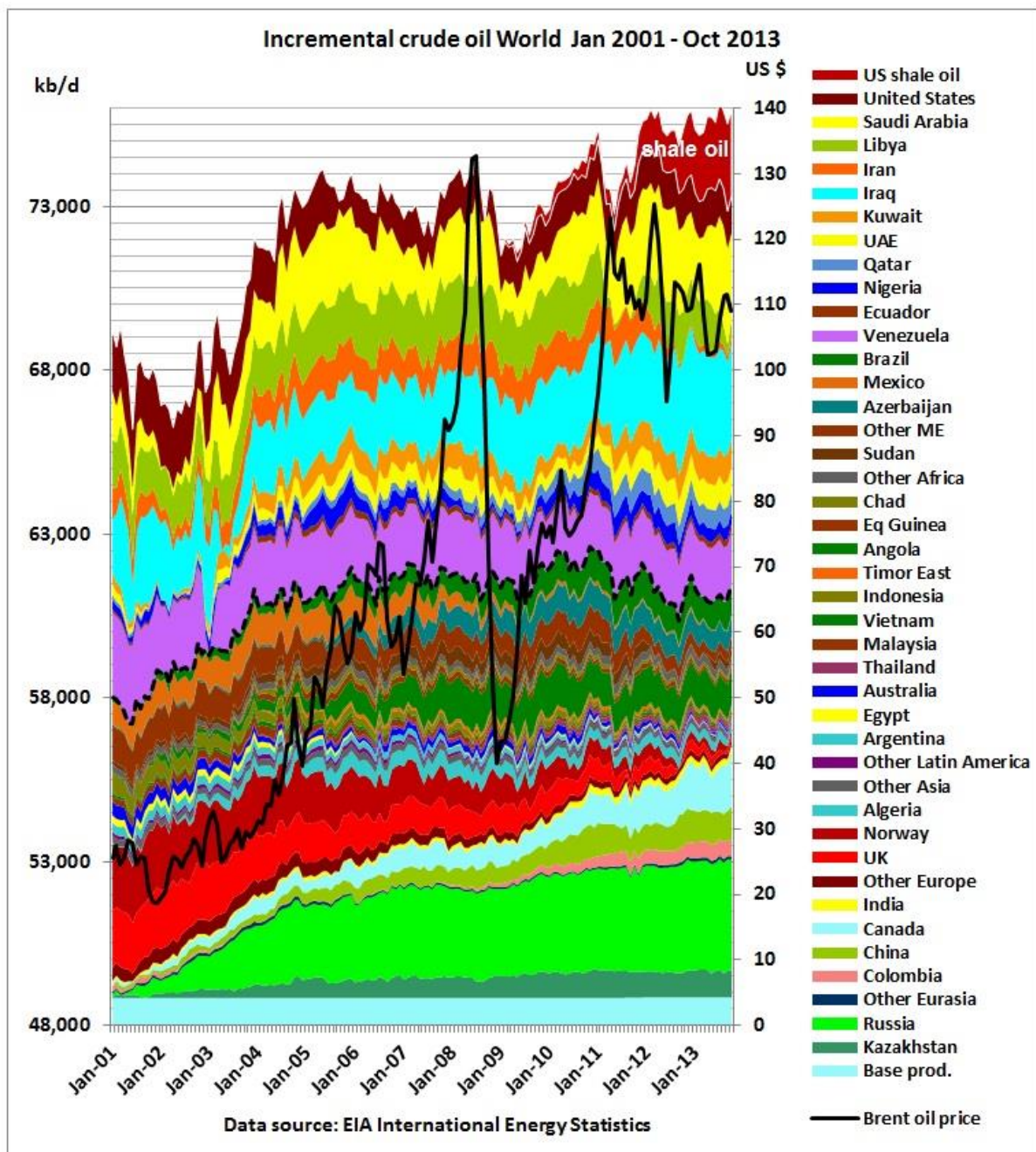


Fig 18: Incremental crude oil graph. Russia will soon peak

More details are here:

13/3/2014 World crude production 2013 without shale oil is back to 2005 levels

<http://crudeoilpeak.info/world-crude-production-2013-without-shale-oil-is-back-to-2005-levels>

7.2 Peak oil and financial crisis

The 1st phase of the financial crisis was triggered by the convergence of accumulating debt and an oil price spike in 2008. Crude oil production declined between 2005 and 2007, [causing a recession in the US in late 2007](#) (supply shock). In 2008 there was a demand shock caused by China's Olympic Games.

It is important to understand the following 3 classical articles because the media are still not connecting the dots.

(1) Causes and Consequences of the Oil Shock of 2007–08

James D. Hamilton

Spring 2009

*“Whereas historical oil price shocks were primarily caused by physical disruptions of supply, **the price run-up of 2007-08 was caused by strong demand confronting stagnating world production**. Although the causes were different, the consequences for the economy appear to have been very similar to those observed in earlier episodes, with significant effects on overall consumption spending and purchases of domestic automobiles in particular. In the absence of those declines, it is unlikely that we would have characterized the period 2007:Q4 to 2008:Q3 as one of economic recession for the U.S. The experience of 2007-08 should thus be added to the list of recessions to which oil prices appear to have made a material contribution.”*

http://muse.jhu.edu/journals/brookings_papers_on_economic_activity/v2009/2009.1.hamilton.html

See Fig 2 above and the author’s article on the Oildrum blog in October 2007

<http://www.theoildrum.com/node/3052>

(2) The Global Financial Crisis:

Causes and Consequences

Nov 2009

Warwick J McKibbin and Andrew Stoeckel

*“Rising demands from China (and, to some extent, India), plus a booming world economy saw commodity prices rise across oil, minerals and food from late 2004 to late 2007. The shock to the global economy from this **commodity price boom was as big as the first oil shock in the 1970s**”*

http://melbourneinstitute.com/downloads/conferences/mcKibbin_stoeckel_session_5.pdf

(3) Financial Crisis of 2007–2010

Winston W. Chang

Department of Economics

SUNY at Buffalo, NY 14260

September 24, 2010, Revised: June 30, 2011

*“Following the collapse of the housing bubble the global commodity market entered its own bubble. From early 2007 to mid-2008 oil prices skyrocketed from \$50 to \$140 a barrel then plunged to \$30 by the end of 2008. The bubble has been attributed to the flight of capital from the housing market, pure speculation, **increasing concern over the limited supply of natural resources** and increased demand from growing, resource-hungry economies in Asia. With more money flowing to oil producing nations, economic growth in the rest of the world suffered under the increased cost burden.”*

http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1738486

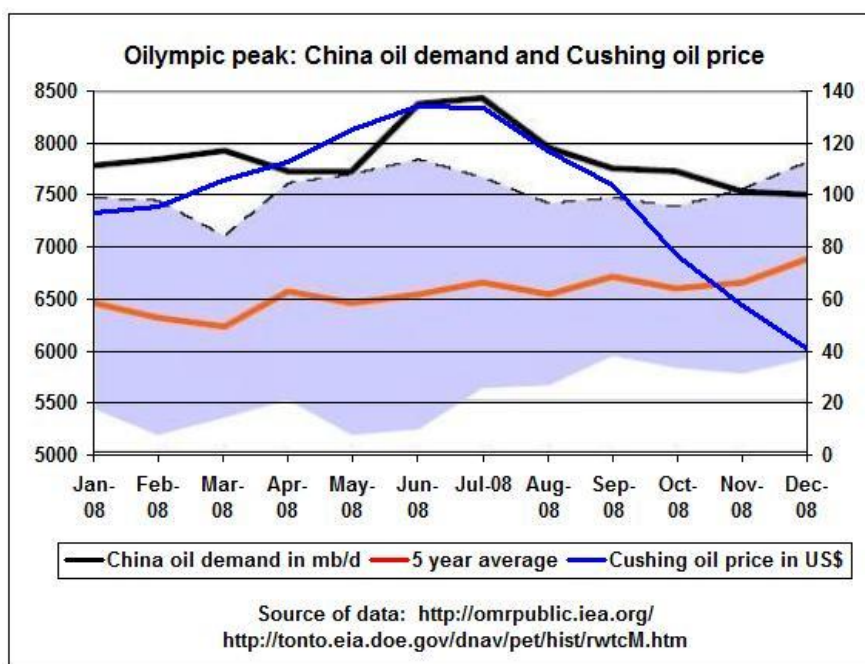


Fig 19: China's oil demand ahead of the Olympic Games

Demand shock in mid 2008: China went on the oil market with an additional 800 kb/d in preparation for the Olympic Games. The supply was forthcoming at a record price, mainly from Saudi Arabia which increased production from 9.2 mb/d in Jan 2008 to 9.7 mb/d in July 2008, just short of a theoretical maximum capacity of 10.9 mb/d. The new AFK field project was not fully operational at that time and Saudi production immediately dropped by 1.2 mb/d once demand eased, to avoid overproducing fields. In fact, Matthew Simmons' 2005 warning in his book "Twilight in the desert, the coming Saudi oil shock and the world economy" had materialized in 2008. Saudi Arabia's inability to produce oil quickly enough hit a financial system with a pre-condition of accumulated debt.

7.3 Global supply system

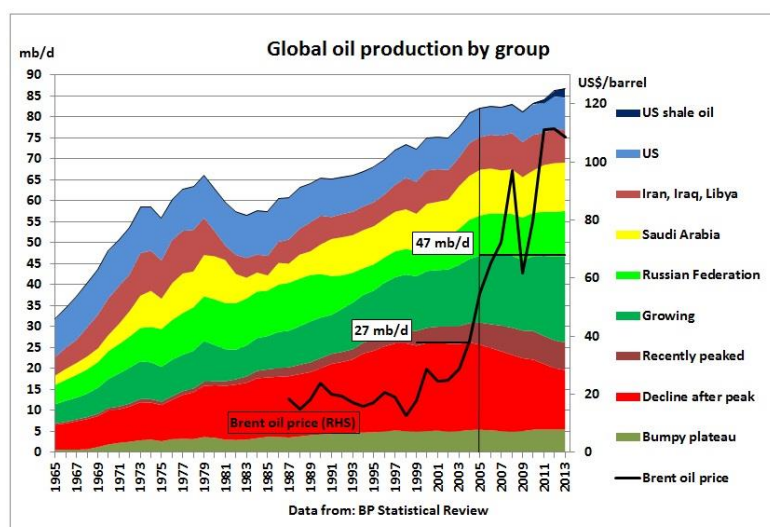


Fig 20: Oil production stacked by group and Brent oil price

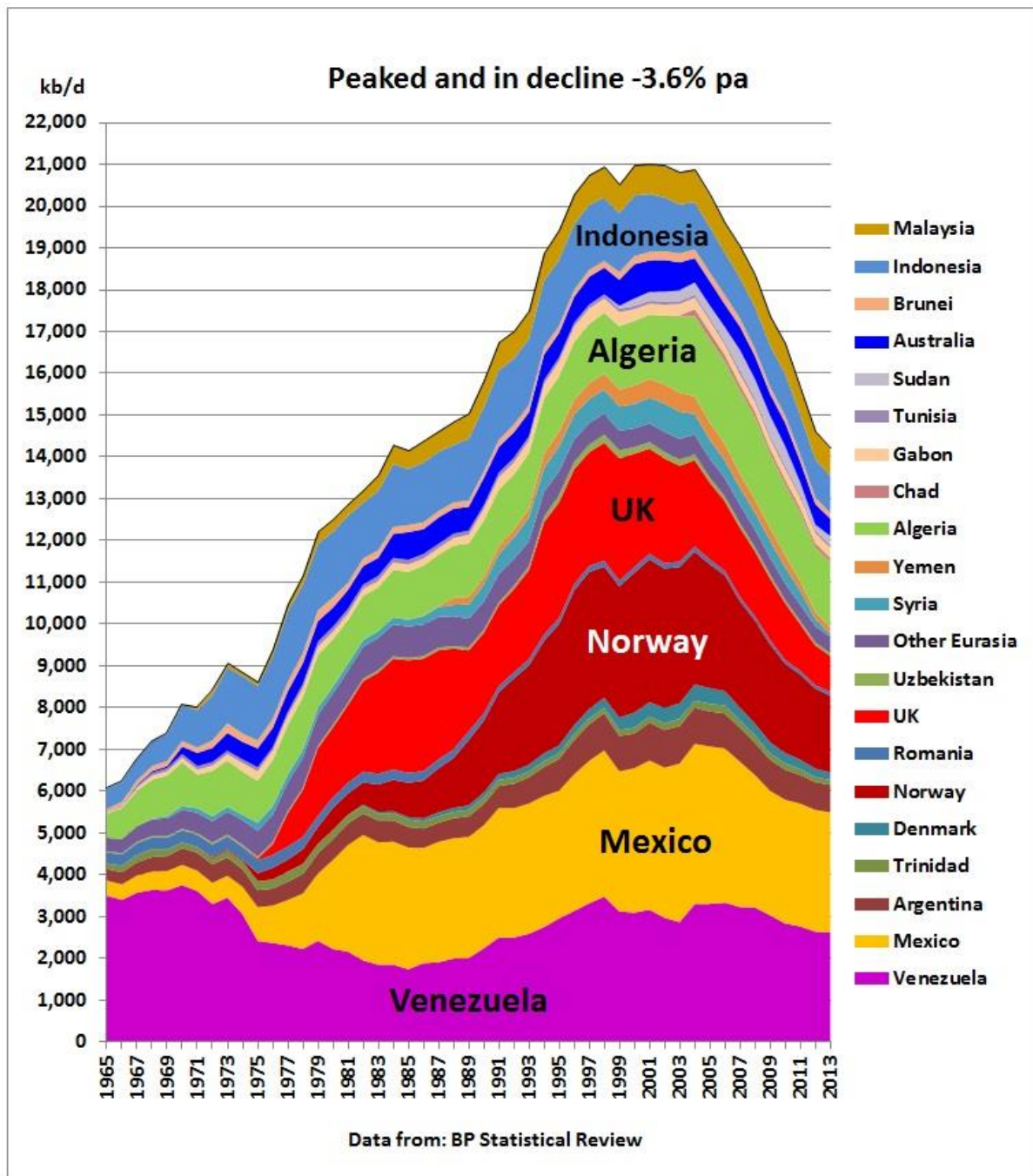


Fig 21 No quote marks around peak oil for this group of countries, including Australia. Debate is over.

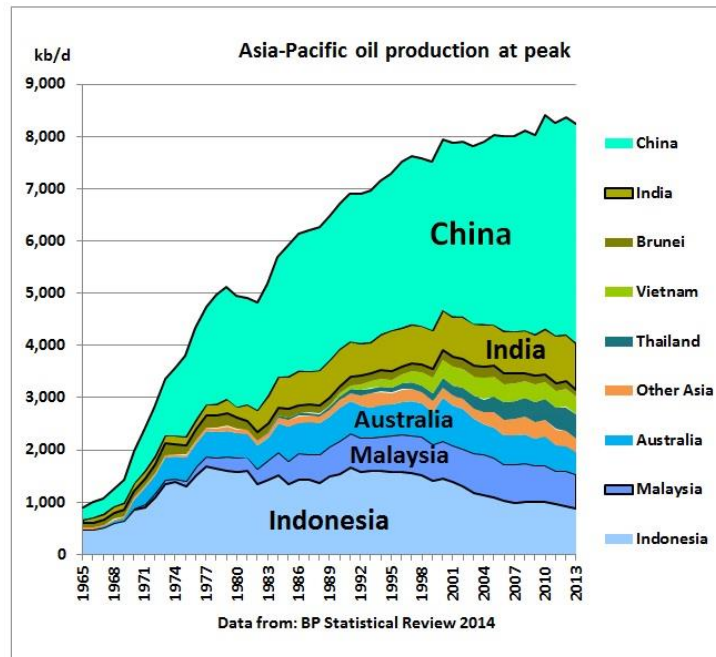


Fig 22: Asian century will last only as long as oil can be imported from the Middle East

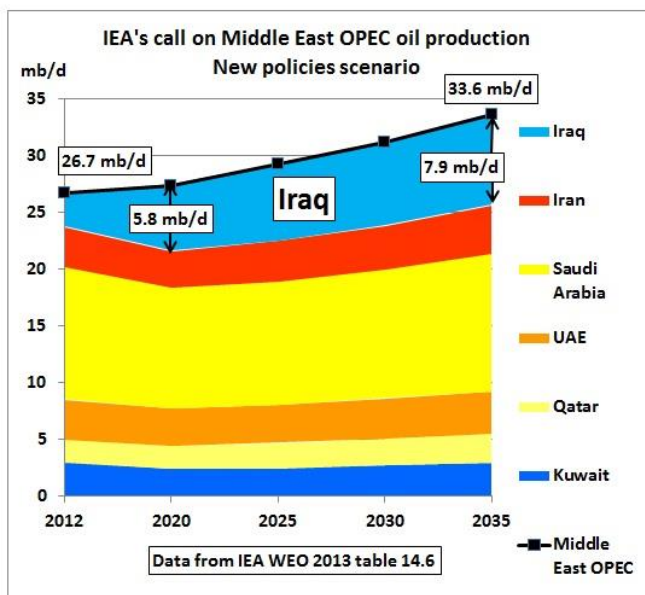
More details in this article:

25/6/2014 Analysis BP Statistical Review 2014: Oil prices started to skyrocket when 1/4 of global supplies went into irreversible decline

<http://crudeoilpeak.info/oil-prices-started-to-skyrocket-when-one-quarter-of-global-supplies-went-into-irreversible-decline>

7.4 How many mb/d of Iraqi oil by 2020?

NorthConnex proponent must prove Iraq will produce 6 mb/d by 2020 because the IEA has included this in their calculations (WEO Nov 2013)



<<< Fig 23: Middle East oil

More details are here

15/6/2014 World's untested assumption on 6 mb/d of Iraqi oil by 2020

<http://crudeoilpeak.info/worlds-unttested-assumption-on-6-mbd-iraqi-oil-by-2020>

7.5 OPEC's paper barrels

There is also the problem of OPEC's paper barrels. <http://crudeoilpeak.info/opec-paper-barrels>

Read this:

Saudi Aramco CEO: Oil industry 'needs timely investments'

26/8/2014

Speaking at the Offshore Northern Seas Conference in Stavanger, Norway, on Monday, Khalid A. Al-Falih said: "We must put our money where our mouth is, by making prudent and timely investments; balancing long-term objectives and short-term interests; and meeting the energy needs of the future while providing attractive investment options and delivering value to shareholders.

"At Saudi Aramco, as we solidify our upstream leadership while also diversifying our business portfolio, our investments will exceed \$40 billion a year during the next decade. Although our investments will span the value chain, the bulk will be in upstream, **and increasingly from offshore**, with the aim of maintaining our maximum sustained oil production capacity at 12 million bpd, while also doubling our gas production.

<http://www.arabnews.com/economy/news/620836>

Saudi Arabia's official **proven reserves** are 260 Gb. This means they should know where that oil is exactly. But obviously they don't. Maybe they mean offshore like Manifa? Colin Campbell, that Irish peak oil guru advised 10 years ago that Saudi's reserves are their original reserves, not remaining reserves, so cumulative production would have to be deducted. This time bomb will explode one day, possibly at an inconvenient time.

7.6 Peak oil in dictatorships

When oil peaks in dictatorships, dictators are running out of money to keep their population happy. The 1st Iranian peak in the mid 70s under the Shah triggered the Iranian revolution and the 2nd oil crisis in 1979. <http://crudeoilpeak.info/iran-peak>

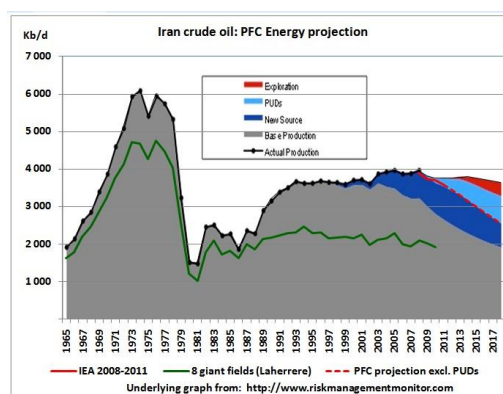


Fig 24: 1st Iranian peak in the mid 1970s

Latest example is Syria and desertification from global warming plays a role, too

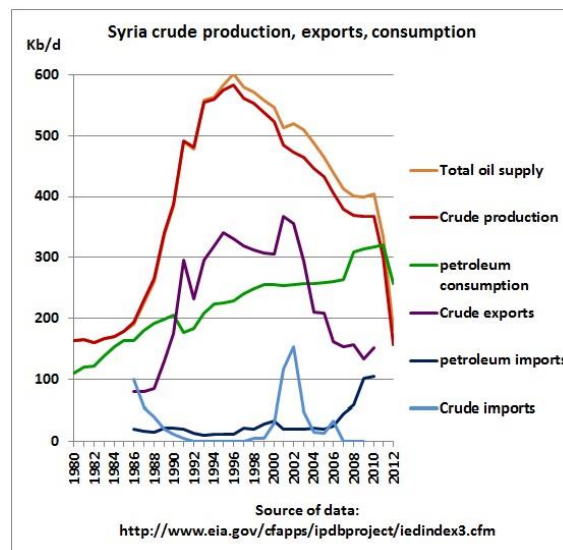


Fig 25: <http://crudeoilpeak.info/syria>

Peak oil, climate change and pipeline geopolitics driving Syria conflict

<http://www.theguardian.com/environment/earth-insight/2013/may/13/1>

Egypt (transit of 3.5 mb/d Suez canal and Sumed pipeline)

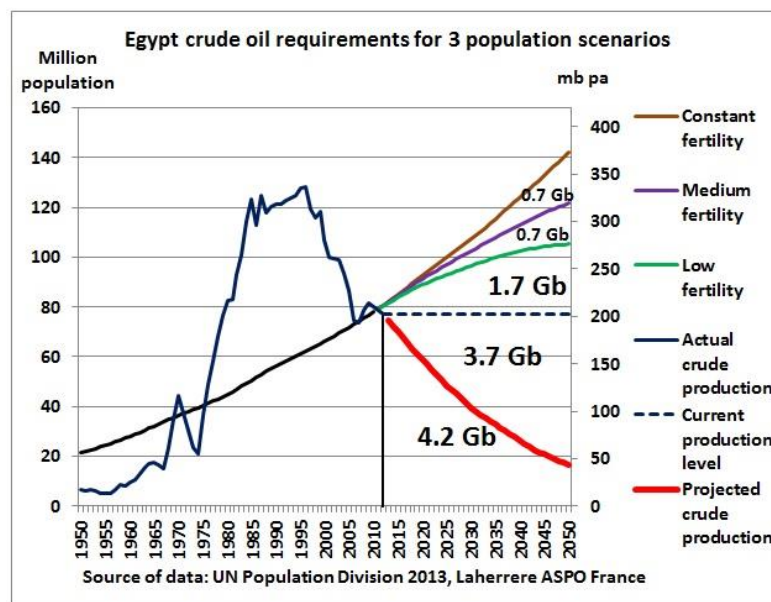


Fig 26: Egypt's oil import requirements

6/7/2013 Egypt's future crude oil import requirements for 3 population scenarios

<http://crudeoilpeak.info/egypts-future-crude-oil-import-requirements-for-3-population-scenarios>

4/7/2013 2/3 of Egypt's oil is gone 20 years after its peak

<http://crudeoilpeak.info/23-of-egypt%E2%80%99s-oil-is-gone-20-years-after-its-peak>

What's the impact on Asia? It is in the interest of all GCC countries (and the world) to support Egypt with discounted oil (so that it does not become a failed State like Sudan, Libya and Yemen). It already happens:

Saudi Arabia to gift \$3 billion worth of fuel to Egypt government

11/5/2014

<http://english.al-akhbar.com/node/19726>

Not only is the cost of that gift included in Saudi oil prices but that oil can't be exported to Asia.

So what will be Egypt's oil import requirement by 2029?

Still want to put quotes around peak oil? Still want to build road tunnels?

7.7 Closer to home

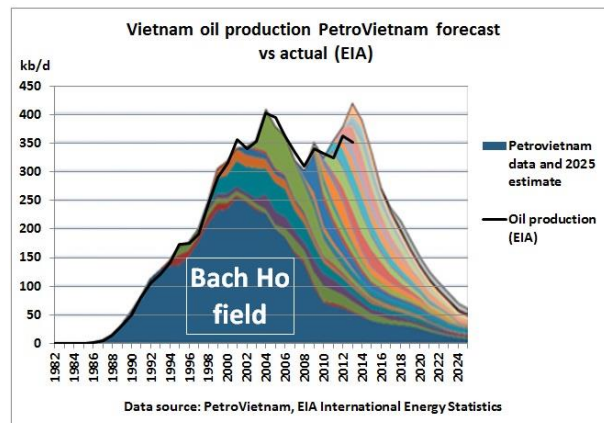


Fig 27 That explains the clashes with China. More to come

7.8 Why Australian refineries are closing

Oil industry doesn't tell the truth

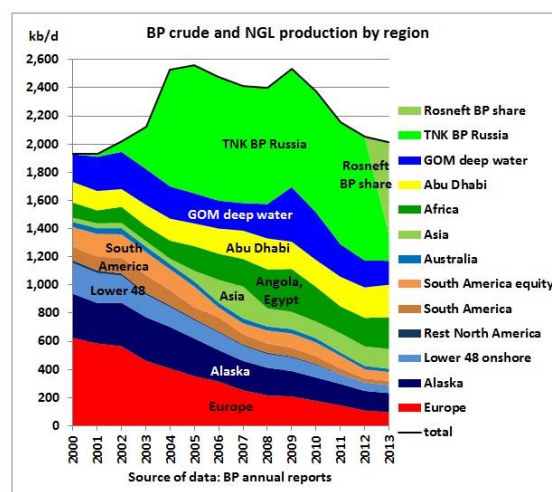


Fig 28 BP, peak oil here, too

9/4/2014 Why the closure of BP's Brisbane Bulwer refinery reduces Australia's energy security
<http://crudeoilpeak.info/why-the-closure-of-bps-brisbane-bulwer-refinery-reduces-australias-energy-security>

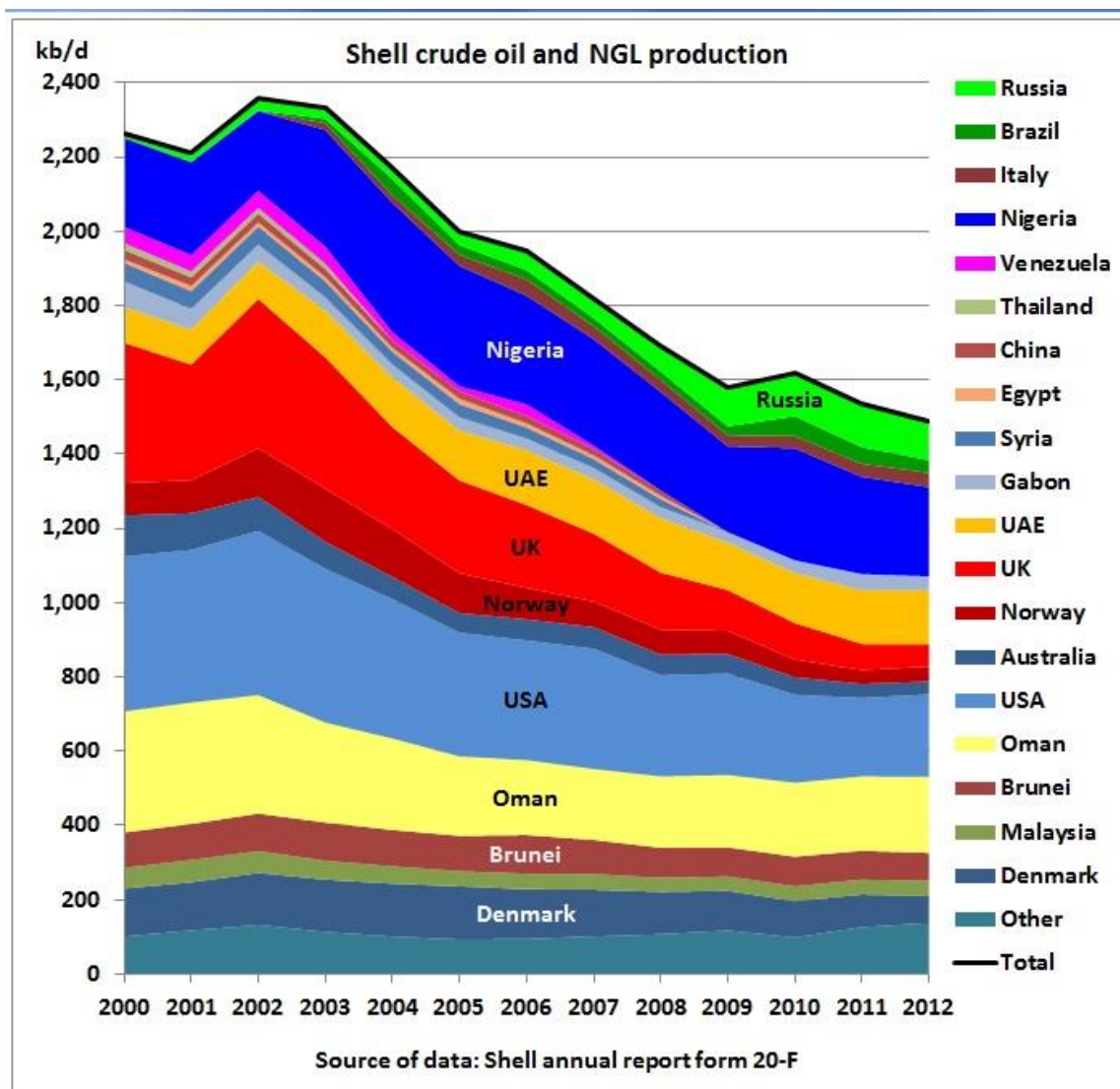


Fig 29: Shell production profile

23/2/2014 Geelong refinery sold as Shell's oil production continues to decline
<http://crudeoilpeak.info/geelong-refinery-sold-as-shells-oil-production-continues-to-decline>

28/8/2013 Chevron's oil production, sales decline by 5%
<http://crudeoilpeak.info/chevrans-oil-production-sales-decline-5>

7.9 US 2nd peak

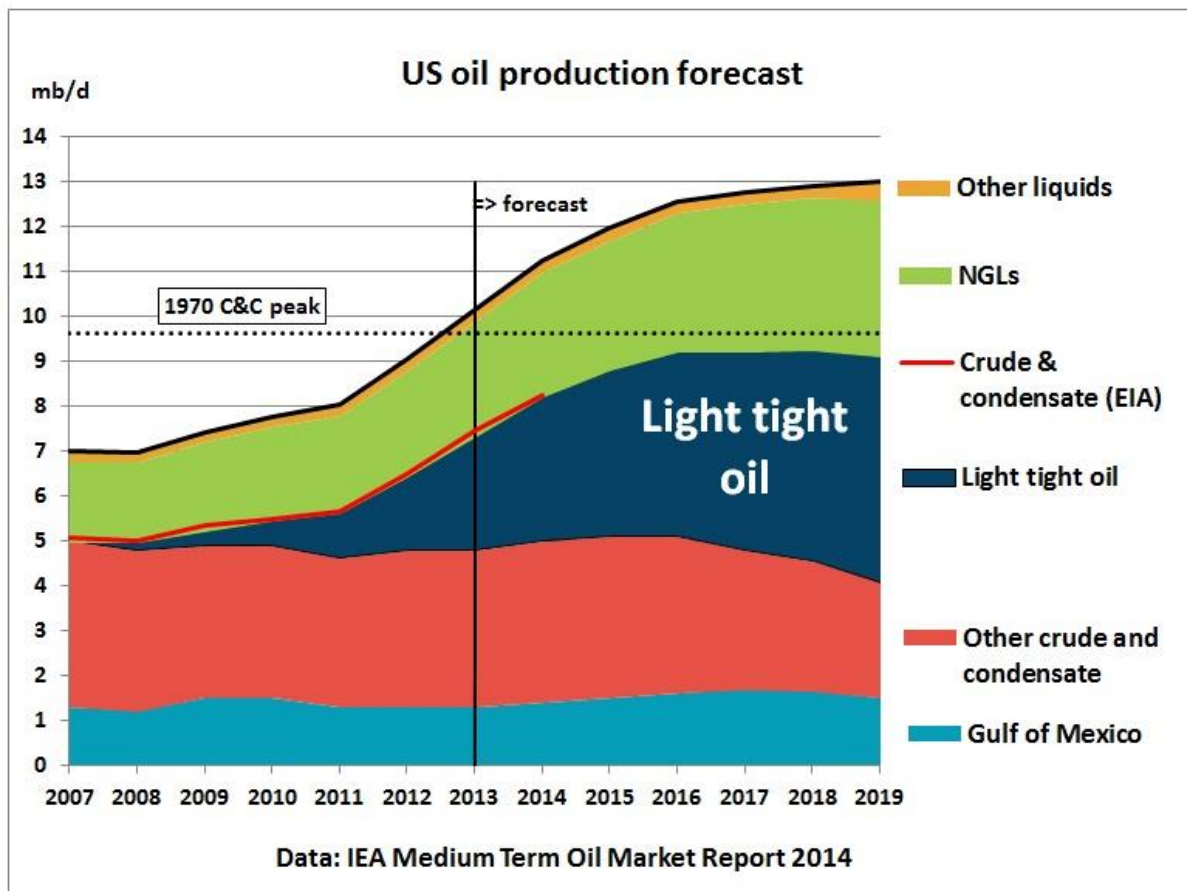


Fig 30: US 2nd crude peak starts in 2016

This shale oil (also called tight oil) is short lived – not an energy revolution - as decline rates in wells are very high. That is why US crude oil production will peak in the next years. The international energy agencies IEA and EIA know this although there are uncertainties about the exact timing. At the same time, Russia approaches peak production. And when looking at the disintegration of the Middle East it becomes obvious that there will be an oil crisis before 2020, just about when the NorthConnex tunnel is planned to open to traffic.

Once the public learns about this, there will be a confidence crisis. That will impact on the credit worthiness of all oil dependent infrastructure.

7.10 Russia

MOSCOW, July 7 (UPI) --An anticipated drop in oil production by 2016 is expected to hurt the Russian economy, the Russian Finance Ministry said Monday.

http://www.upi.com/Business_News/Energy-Resources/2014/07/07/Russian-oil-production-expected-to-drop/4391404741593/#ixzz38Fy4lGgX

Figure 3.24 – Oil and NGL production in the Russian Federation by reserve type, Baseline Scenario and Other Asia Scenario

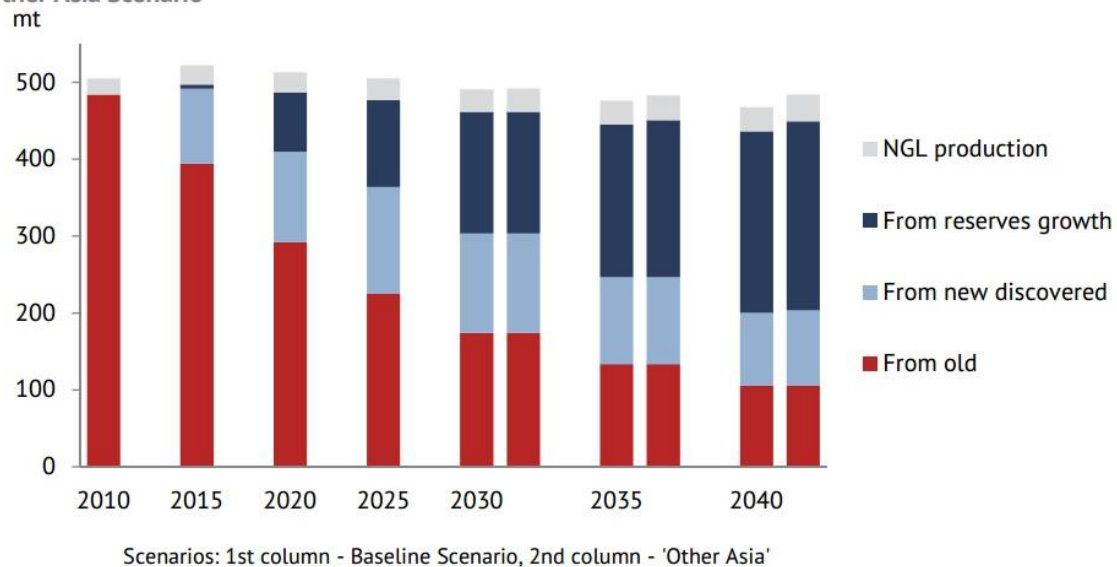


Fig 31 Sanctions will impact on green field developments

Putin is getting nervous but the West is sleeping and still wants to build new road tunnels.

What the Russian oil peak means geopolitically we can see in Ukraine.

29/7/2014 The Ukraine conflict, peak cheap gas and the MH17 tragedy

<http://crudeoilpeak.info/the-ukraine-conflict-peak-cheap-gas-and-the-mh17-tragedy>

(8) What should have been done in the EIS

What should have been done – **before starting work on the EIS** - was a proper energy resource analysis for the operation of vehicles using the tunnel **for the entire concession period (up to 2048!)**. This analysis would need to include peaking crude oil production, power supplies under global warming conditions and alternative fuels. As the tunnel is supposed to take mainly trucks, a diesel supply forecast - including an updated risk analysis - was necessary, especially as Australian refineries are closing (because oil production of IOCs is declining)

At least this peak oil analysis should have been included in the Appendix E on traffic forecasts (“oil” only contained in “spoil” and “soil”) because oil supplies and the cost of fuels will determine traffic volumes. If planners had done this it would have dawned on them how academic their traffic forecasts are.

Prepared by Matt Mushalik 12/9/2014