Submission on Targets and Progress Report Oct 2013

Contents

Prepared by Matt Mushalik

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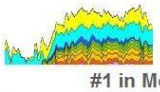


http://crudeoilpeak.info

Crude Oil Peak

#1 in Monitoring the Global Crude Oil Peak

(1) Global emission budget

Quote: “Keeping within a global emissions budget of 1,700,000 million tonnes of carbon dioxide equivalent (Mt CO2 -e) between 2000 and 2050 is estimated to give a 67 per cent chance of staying below 2 degrees – emitting less would improve these odds; emitting more would reduce them. “

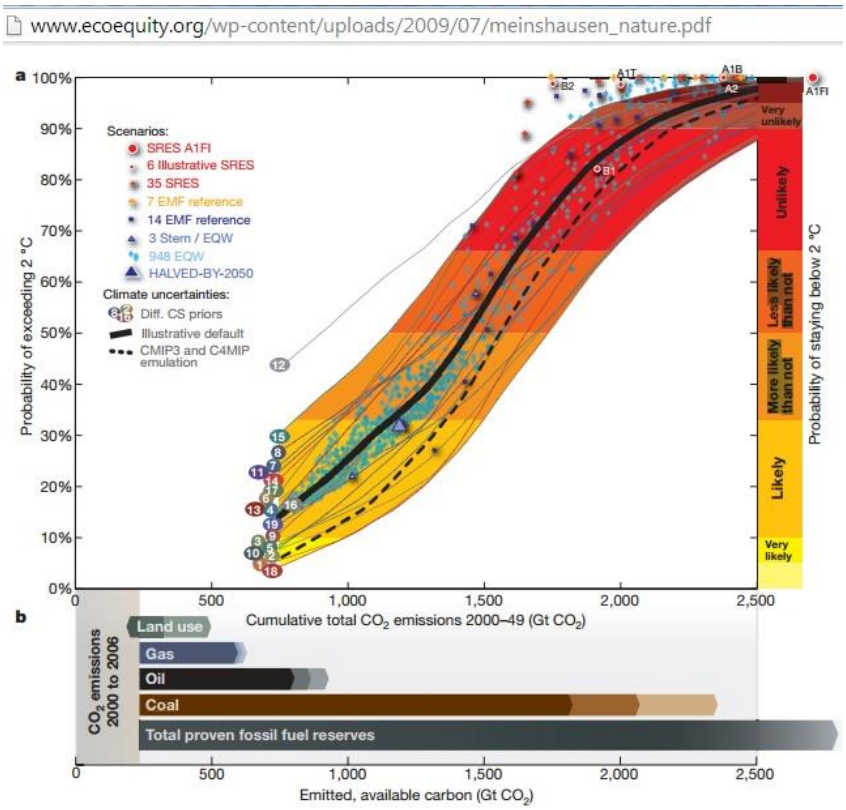
Comment:

This statement gives a false sense of probability and certainty by using the “illustrative default case”. The Potsdam Institute for Climate Impact Research – quoted in chapter 3.3 - had calculated:

www.ecoequity.org/wp-content/uploads/2009/07/meinshausen_nature.pdf

Table 1 | Probabilities of exceeding 2 °C

Indicator	Emissions	Probability of exceeding 2 °C*	
		Range	Illustrative default case‡
Cumulative total CO_2 emission 2000–49	886 Gt CO_2	8–37%	20%
	1,000 Gt CO_2	10–42%	25%
	1,158 Gt CO_2	16–51%	33%
	1,437 Gt CO_2	29–70%	50%
Cumulative Kyoto-gas emissions 2000–49	1,356 Gt CO_2 equiv.	8–37%	20%
	1,500 Gt CO_2 equiv.	10–43%	26%
	1,678 Gt CO_2 equiv.	15–51%	33%
	2,000 Gt CO_2 equiv.	29–70%	50%



http://www.ecoequity.org/wp-content/uploads/2009/07/meinshausen_nature.pdf

So the wording should have been: “a carbon budget of 1,700 Gt CO2e has the probability between 15% and 51% of exceeding 2 C warming”

One may wonder whether the CCA authors would ever consider climbing into a car, bus, train or plane with even a 15% probability of crashing, not to mention 51%.

What’s worse, NASA climatologist James Hansen recently argued that a 2 C limit is too high:

HOUSE OF COMMONS

ORAL EVIDENCE

TAKEN BEFORE THE

ENVIRONMENTAL AUDIT COMMITTEE

PROGRESS ON CARBON BUDGETS

THURSDAY 16 MAY 2013

PROFESSOR JAMES HANSEN AND PROFESSOR MARK JACCARD

16/5/2013

Q1 Chair: ……We are undertaking an inquiry looking at the UK’s carbon budget regime, intermediate targets on the path to the UK’s statutory target to cut emissions by 80% by 2050. That UK carbon budget regime is based on the objective of limiting global temperature rises to 2°C. Is that still the right objective?
Professor Hansen: Well, 2°C is the limit. The community has agreed that 2°C is an upper boundary that we should avoid penetrating. I argue that the limit should be lower than that. We know that the last time the world was 2°C warmer was 120,000 years ago in the Eemian Period, and things were rather different then. The sea level was at least six metres higher. From the earth’s history we know that, as the temperature has changed, the sea level has gone along with it, because ice melts when the planet gets warmer, and so the eventual response to 2°C warming is probably going to be a situation that is rather unacceptable. There is no evidence that would indicate that that target is too ambitious. If anything, it is too weak.

http://www.publications.parliament.uk/pa/cm201314/cmselect/cmenvaud/uc60-i/uc6001.htm

(2) Australia's fair share of emissions budget

Quote: "The Authority's view is that distant past emissions should not be included as these occurred when their harmful effects could not be foreseen."

Comment: So the question has to be answered since which "distant" year these harmful effects could have been foreseen. In chapter 9.4 emissions from 2000 – 2012 are removed from calculations so the year implied to have been chosen is 2012, an arbitrary year, conveniently late. However, already the 4th IPCC report of 2007 stated:

> "Most of the observed increase in global average temperatures since the mid-20th century is very likely [90 percent confidence] due to the observed increase in anthropogenic greenhouse gas concentrations http://www.ipcc.ch/publications_and_data/ar4/wg1/en/spmsspm-understanding-and.html

Looking into the future, when global warming will morph into genocide, it will be courts who will decide on this knowledge threshold as astronomical compensation claims will be forwarded by countries which lose land, crops, livestock and human population.

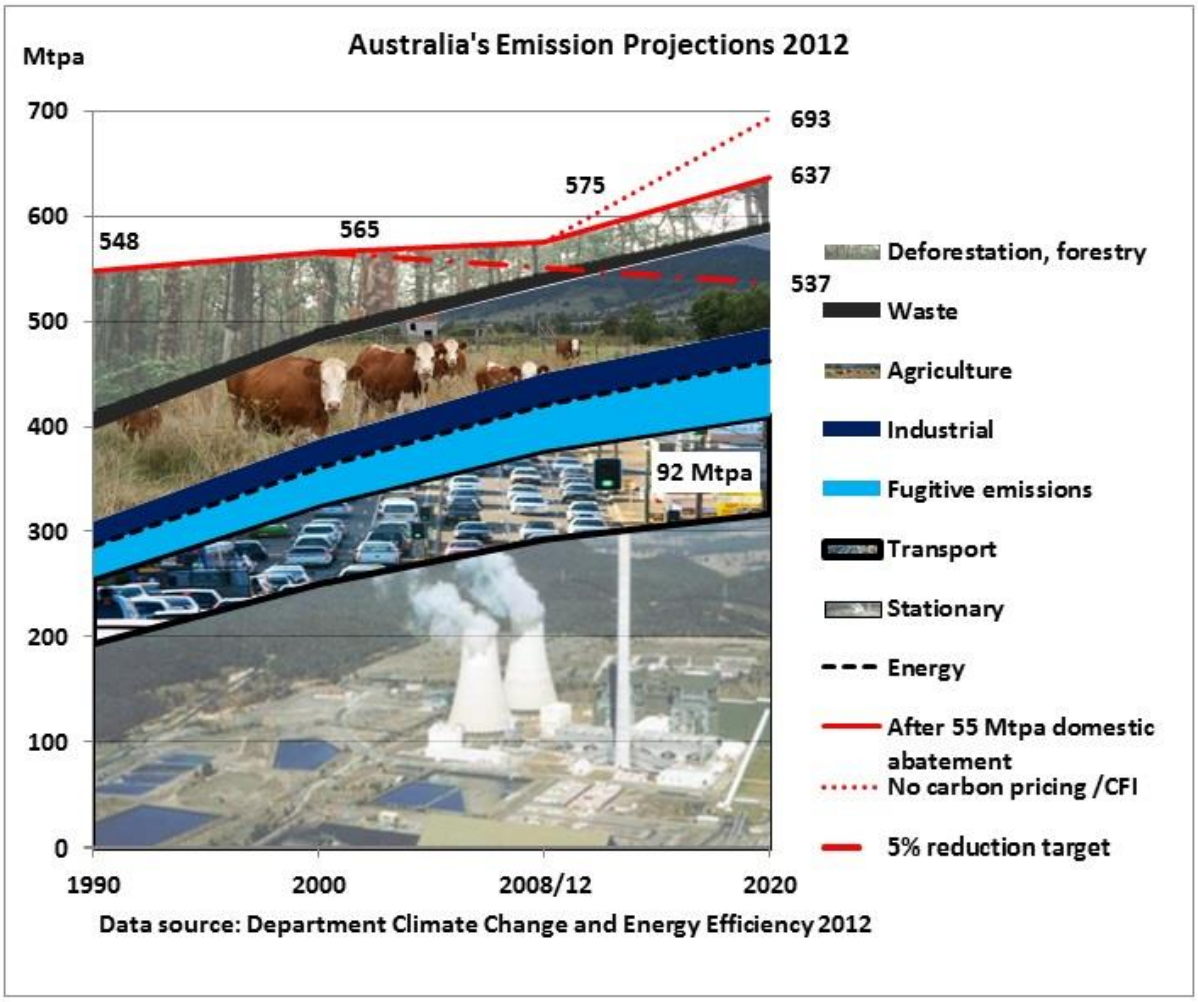
> ***Attorney Christina Barroga is exploring how to raise the recent cyclonic event at the International Criminal Court.***
> ***You see, for us this a crime - a climate crime - and we will be seeking climate justice. With this catastrophic reality, human beings here in the Philippines have now become an endangered species.***
> ***Rodne Galicha is a district manager in the Philippines for The Climate Reality Project, overseen in Asia by the Australian Conservation Foundation. He is currently based at a disaster relief centre on Romblon, one of the smaller Philippine islands devastated by typhoon Haiyan which tore through the region a week ago.***
> http://www.smh.com.au/comment/typhoon-haiyan-this-is-a-climate-crime-20131115-2xkif.html

Completely omitted in chapter 9 are Australia's oil, gas and coal exports. It is likely that courts will allocate blame according to the benefits obtained from producers and user of these fossil fuels. As a minimum it can be expected that the government will use all royalties, taxes and other revenues directly or indirectly obtained from the production of fossil fuel to reduce emissions elsewhere in the economy. This potential amount must be added to a fair emissions budget.

Also forgotten have been emissions embedded in imports.

So Australia's proposed fair share budget of 10.1 Gt CO2e has to be re-calculated.

(3) What a 5% reduction means



Data source: Table 1 in:
http://www.climatechange.gov.au/sites/climatechange/files/files/climate-change/projections/aep-summary.pdf (captured 18/11/2013)

We can see that annual emissions have grown from 548 Mtpa in 1990 to 575 Mtpa in the Kyoto period 2008-2012. This comparatively modest growth of 5% over 20 years (fulfilling the Kyoto Protocol limits of +8%) was only achieved by forestry management, not a reduction in fossil fuel use.

But for the period to 2020 this one-off reduction in deforestation can no longer be continued and total emissions would grow to 693 Mtpa in 2020 or 20.5% over 10 years.

The previous (Rudd/Gillard) government introduced carbon pricing and together with a carbon Farming Initiative (CFI) emissions were calculated to be reduced domestically to 637 Mtpa by 2020.

A target of 5% reduction on 2000 levels by 2020 would be 95% x 565 Mtpa = 537 Mtpa, 100 Mtpa lower than what is supposed to be domestically achievable. An international carbon pricing mechanism was thought to bring in this 100 Mtpa from overseas abatements.

Note that the emission reduction job compared to business as usual growth is 1-537/693=22.5%. Compared to current levels of 575 Mtpa the 5% target actually means a reduction of 1-537/575=6.6%. By now, there are only 7 years remaining to achieve this. Annual monitoring is needed to measure how far we are away from that 537 Mtpa target.

As an integration into e.g. the European ETS has been abandoned by the Abbott government, who will now buy 100 Mtpa CO2 abatement from overseas?

(4) The Infrastructure Prime Minister will not even achieve 5% in transport sector

Let's see whether the "roads for the 21st century" can bring down emissions:

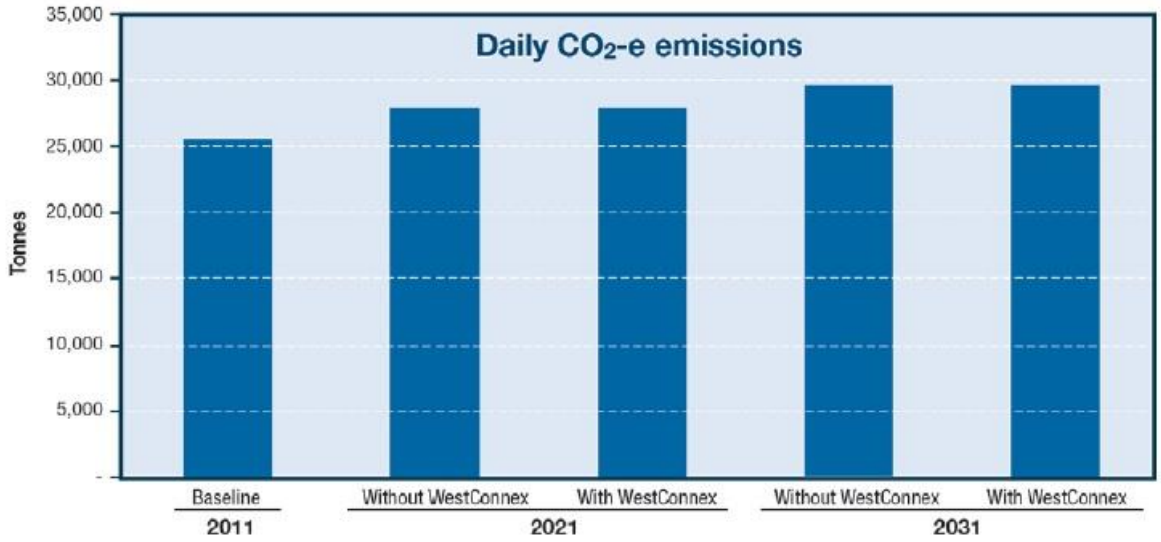


Figure 6-8 Estimate GHG emission forecasts for traffic

Source pers. comm. RMS (March 2013)

From: http://www.westconnex.com.au/internal-pages/about/index.html

Compared to 2011, Sydney's traffic emissions in 2021 go up by 8.4% while actually they should go down 6.6%, **a difference of 15% in the wrong direction**.

The Federal government wants to subsidize Westconnex with $1.5 bn i.e. 5 times the ERF budget of $ 300 million for the 1st year. It does NOT reduce emissions compared to the do-nothing case. It is therefore not a useful project. Direct action makes no sense if the government finances projects in a sector which increases CO2 emissions

The introduction of HOV (high occupancy vehicle) lanes could change that. Care must be taken when designing the number of lanes and ramps to ensure that total VKT does not increase as a result of a road project.

Proposal: instead of wasting $1.5 bn (plus $1.8 bn from the State government) for Westconnex, NSW RMS should calculate which CO2 abatement can be achieved by making T2 and T3 lanes more attractive and maybe compensate motorists for their use.

T3 lane on Victoria Rd not used to capacity.

Governance arrangement:

Infrastructure Australia and INSW should update research which was already done, e.g. by ITLS in Sydney, see item 4 in this table:

Table 1: Emissions savings (from forecast) from further reduction measures to achieve a 20 percent reduction on 2000 levels by 2020: three options

Measure	Target	2007	Option A			Option B	Option C
			2020	Emissions saved (Mt)	Share of savings	2020	2020
1. Fewer/shorter urban car trips	Less car kms	-	10%	3.5	9.2%	20%	25%
2. Shift urban car to walking/cycling	Active transport mode share (urban)	16%	26%	4.4	11.6%	34%	39%
3. Increase urban public transport mode share	PT mode share (all urban trips)	7.5%	15%*	2.6	7.0%	20%	21%
4. Increase urban car occupancy	Passengers/car	1.4	1.6	3.0	8.0%	1.8	1.9
5. Freight efficiency	Less fuel than forecast	-	30%	11.7	30.9%	30%	30%
6. Car Emissions intensity	Less than 2007	-	30%	8.2	21.8%	18%	13%
Truck emissions intensity	Less than 2007		18%	4.4	11.5%	13%	8%

Note: * The 15 percent mode share is 15 percent of all trips, which is equivalent to 20 percent of motorised trips.

http://sydney.edu.au/business/__data/assets/pdf_file/0003/36282/itls-wp-09-21.pdf

Monitoring, verification and compliance
Continuing traffic counts are needed to measure the impact of HOV lanes

Auction arrangements
Capital cities have to compete by proposing their HOV projects with the highest reduction in CO2.

Design and operation
Moneys provided by the Emissions Reduction Fund will be used to establish the HOV lanes, mostly line markings, modifications of signage, traffic lights and installation of monitoring equipment. In case license plate recognition can be done, one may even consider to pay motorists for car pooling, a negative toll.

Tollways: tollway operators are interested in maximising traffic to increase their revenue. Car pooling will reduce their income. Therefore, this is a business without future in a carbon constrained world. Tolling per passenger must be introduced to compensate for car-pooling revenue losses .

Fuel prices: higher fuel prices have resulted from the conventional oil peak in 2006/07 and higher production cost of non-conventional oil. The impact from this increase is similar to that from a carbon tax, with the difference that this "tax" is paid to the oil & gas industry, not to the government.

Emission projections by BITRE (from 2009, no further abatement measures)

www.bitre.gov.au/publications/2009/files/wp_073.pdf

Table ES1 Emission projections for energy end use by Australian domestic civil transport, BITRE Base Case 2007

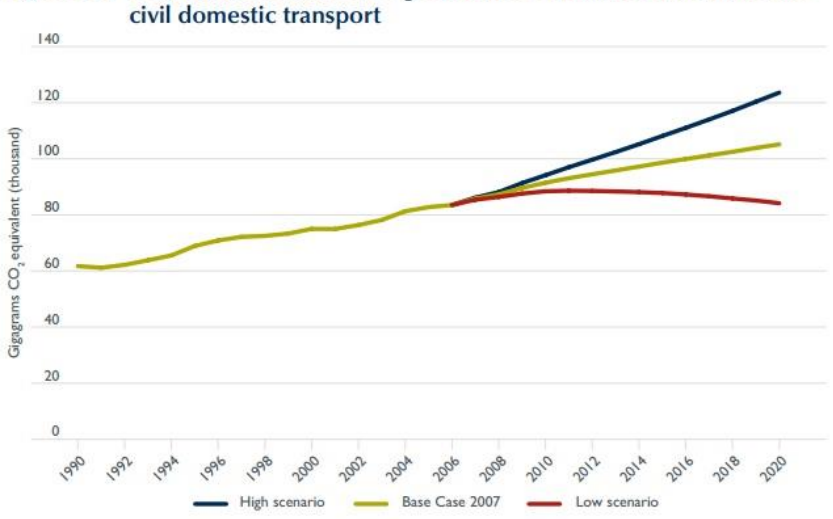
Year ending June 30	*Cars*	*Other road vehicles*	*Air*	*Rail*	*Marine*	*Other*	*Total*	*Per cent change in total from 1990*
			(Gigagrams of direct CO_2 equivalent)					
1990	34 805	19 926	2 833	1 733	2 387	60	61 743	–
2007 (preliminary estimates)	44 503	29 970	6 867	2 413	2 176	94	85 803	39
2010 base case (BAU)	46 869	32 320	7 517	2 739	2 377	97	91 466	48
2020 base case (BAU)	49 750	41 251	8 894	3 343	2 537	107	105 151	70
2020 low scenario (combined sensitivity test)	39 954	32 517	7 263	2 959	2 244	89	84 153	36
2020 high scenario (combined sensitivity test)	57 875	49 232	10 364	3 858	2 866	121	123 598	100

Notes: CO_2 equivalent emission values include only contribution of direct greenhouse gases (CO_2, CH_4 and N_2O).
Gigagrams = 10^9 grams, equivalent to thousand tonnes.
BAU business-as-usual.

BITRE's civil transport emissions in 1990, 61.7 Mtpa, are the same as in table 1 of the Climate Change Department's document referred to above, but the BITRE base case (105.1 Mtpa) is 5% higher than the unabated projection of DCCEE (92x694/637=100 Mtpa).

www.bitre.gov.au/publications/2009/files/wp_073.pdf

Figure ES1 Projections to 2020 of CO_2 equivalent emissions from Australian civil domestic transport

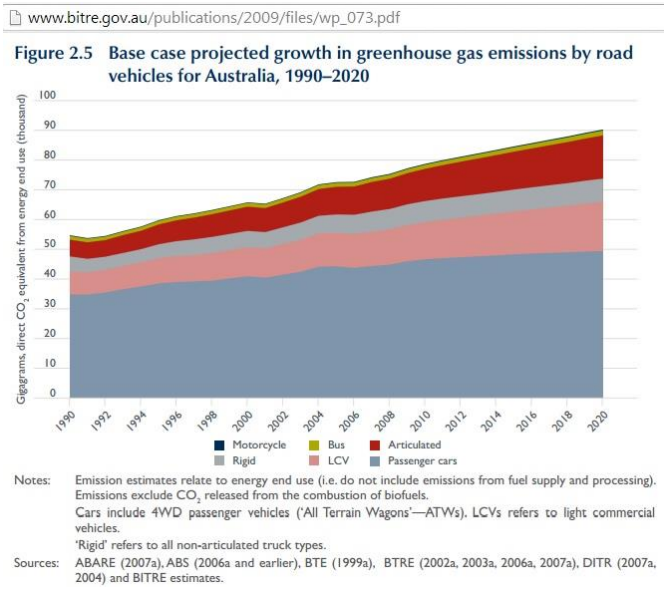


Notes: Emissions relate to energy end use, and include only direct greenhouse gases. Emission estimates exclude CO_2 released from the combustion of biofuels.

It is interesting to see which assumptions went into the low emissions scenario:

*The Low combination scenario is the result of running the BITRE emission models using the combination of deviations from each of the preceding sensitivity scenarios that yields the lowest level of aggregate transport emissions (**including the effects of low economic growth, low population growth, a higher rate of fuel intensity improvements than the base case, high oil prices and low urban congestion response**). The low combination settings gave total 2010*

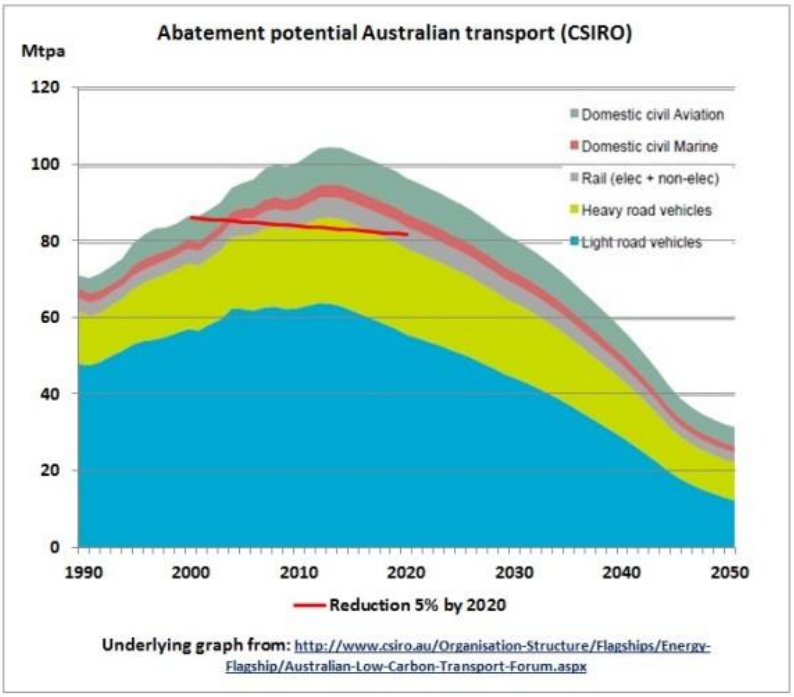
emission levels of around 3.3 per cent below the base case, with total 2020 emission levels around 20.0 per cent lower than the base case.
http://www.bitre.gov.au/publications/2009/files/wp_073.pdf



The BITRE base case is business-as-usual

CSIRO report
Sep 2012
GHG abatement potential of the Australian transport sector
http://www.csiro.au/Organisation-Structure/Flagships/Energy-Flagship/Australian-Low-Carbon-Transport-Forum.aspx

This scenario includes measures to introduce EVs, fuel intensity reductions, biofuels, traffic management, mode shift, urban PT priority, improved logistics, eco-driving, telecommuting, high speed rail (which has now been abandoned by the Abbott government – yet another mistake) i.a. We insert in figure 21, p 39, the 5% reduction curve

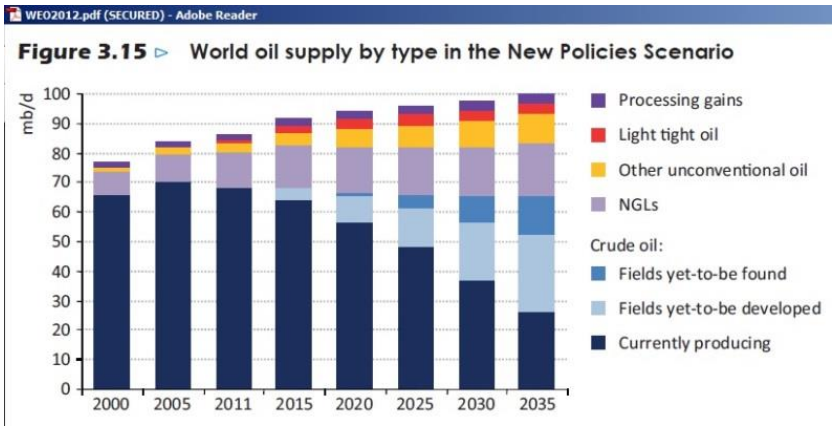


We can see that much more has to be done than what the CSIRO proposes.

(5) Cumulative CO2 emission scenarios from oil

Let's do some simplified calculations using following scenarios:

(5.1) IEA's New Policies Scenario



<< In this scenario of the WEO 2012, tight oil and other unconventional oil allow for growth of around 0.7% pa

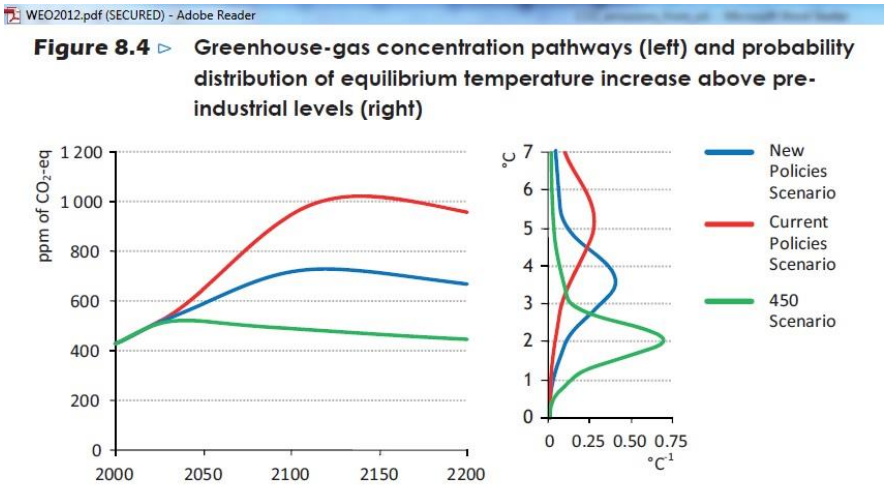
Note the decline in currently producing fields, the enormous gap to be filled (fields yet-to-be developed and found) and the increasing role of less versatile natural gas liquids.
http://www.worldenergyoutlook.org/publications/weo-2012/#d.en.26099

(5.2) Oil production flat

This is for illustrative purposes only.

(5.3) IEA's 450 ppm scenario

In this scenario, according to table 3.4 of IEA's WEO 2012, world oil supply will first increase from 86.6 mb/d in 2011 to 90.5 mb/d in 2020 and then drop to 79 mb/d. It is assumed in the calculations of this article that emissions are proportional to these supply assumptions.



Notes: The median of the temperature distribution in the three scenarios is aligned with the respective greenhouse-gas concentration levels in 2200, where levels are almost stabilised. The probability distribution function for the temperature range was derived based on the equilibrium climate sensitivity distribution given in Rogelj, Meinshausen and Knutti (2012). PPM = parts per million.

Sources: IEA analysis using the MAGICC (version 5.3v2) and OECD ENV-Linkages models.

Note that 450 ppm will only be achieved in the year 2200 and that CO2 concentrations will even go up to 500 ppm. This is definitely not a scenario which will keep temperature increases to 2 degrees.

(5.4) Oil shock scenario

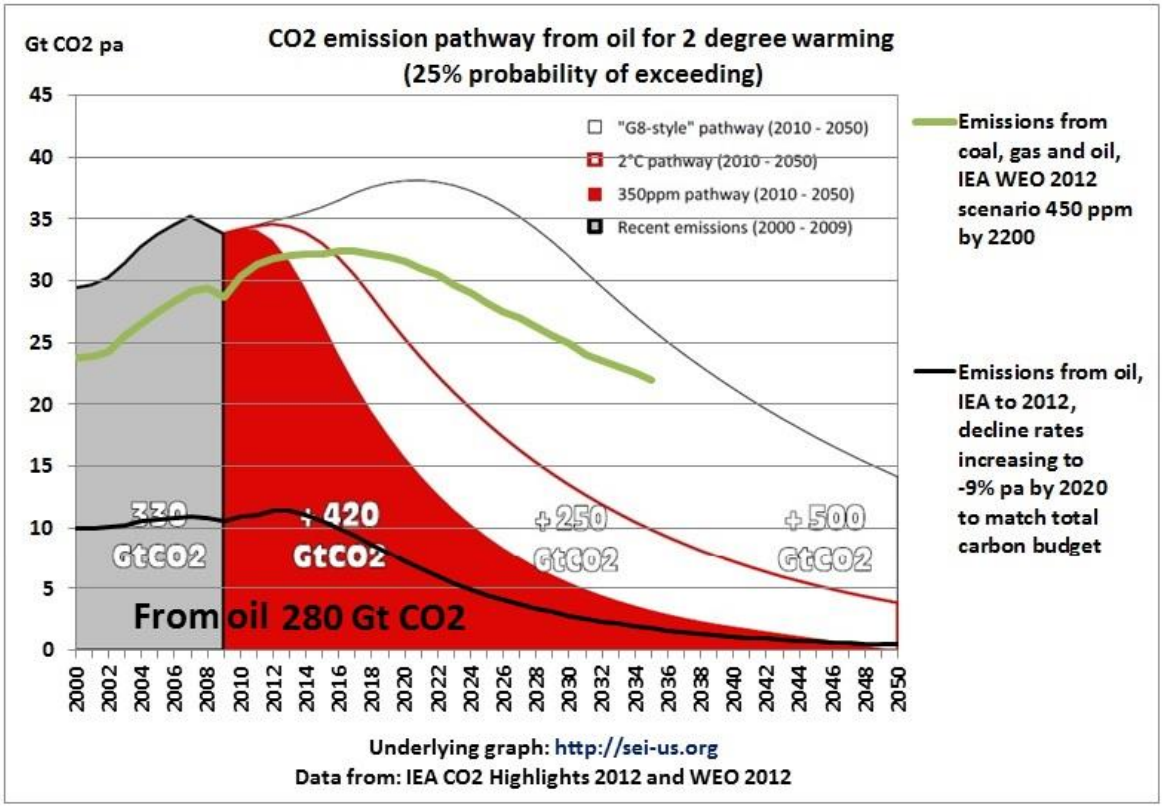
In this scenario, 17 mb/d of oil through the Strait of Hormuz is blocked in an oil war in 2014, for an indefinite period. As a result, the financial system goes to its knees and funds dry up to find and develop new oil fields (light blue crude oil columns in Fig 3.15 above). Furthermore, it is assumed that only half of tight oil and unconventional oil is developed due to a continuing recession (red and yellow columns) which leads to an additional reduction of 2 % pa.

World transit choke points
http://www.eia.gov/countries/regions-topics.cfm?fips=wotc&trk=p3

(5.5) Limiting global warming to 2 degrees C (25% probability of exceeding)

Total carbon budget 2000 – 2050 is 1,000 Gt CO2
http://sei-us.org/Publications_PDF/SEI-350ppmPathway-09.pdf

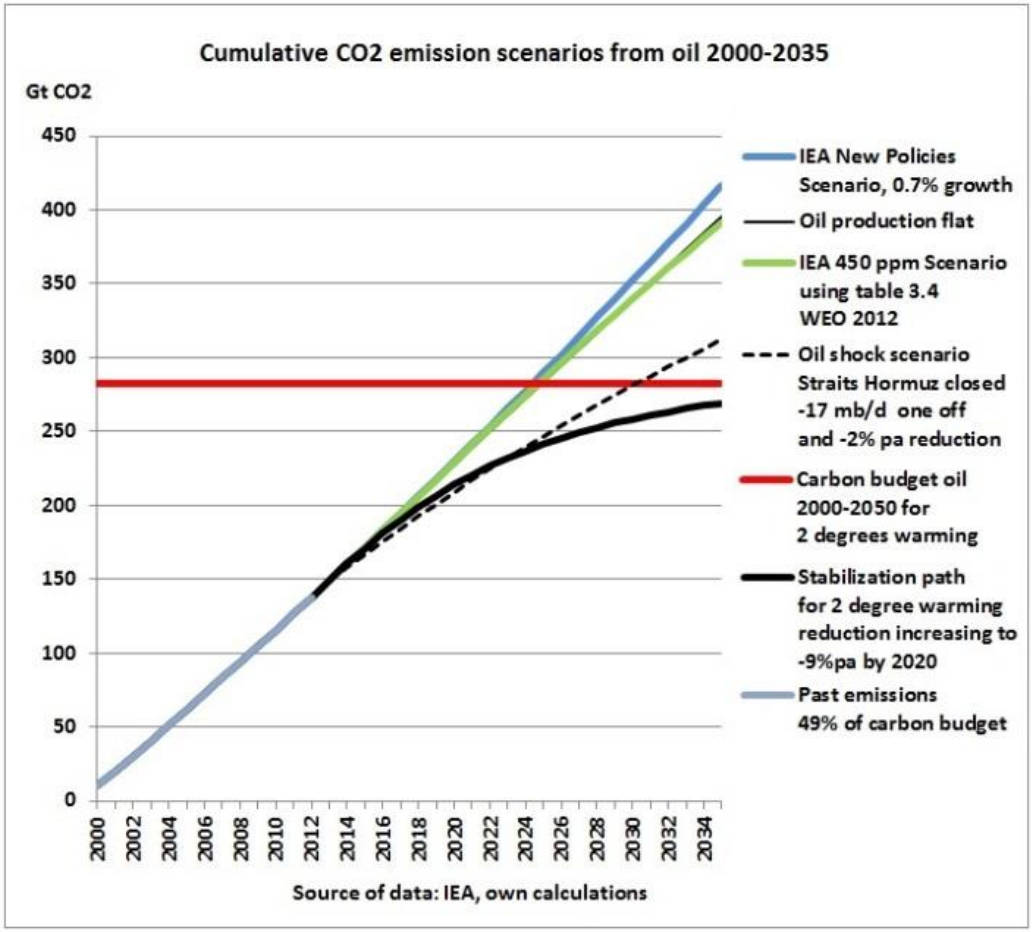
Let's put the IEA CO2 emission curves from fuels into the key graph of this publication:



IEA's emissions from fossil fuels are around 78 % of the total. Assuming a continuing percentage of 36% of oil in the fuel mix (no signs of coal phase out yet) we get 280 Gt of CO2 budget for oil in the period 2000-2050. The decline rates for oil after 2013 are adjusted to arrive at the total as follows: linearly increasing to -9% pa by 2020 and then a continuing, progressive decline by -9% pa.

(5.6) Scenarios summary

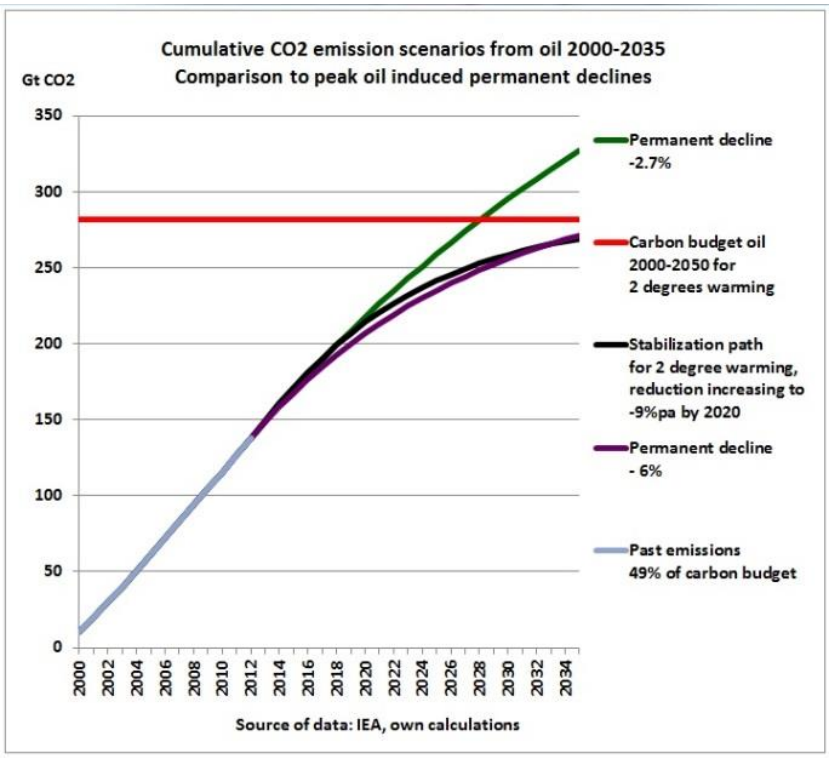
We can now put all the scenarios in one graph:



Most importantly, 49% of the carbon budget 2000-2050 has already been consumed in just 12 years! We also see that the IEA's so-called 450 ppm scenario is in fact a business-as-usual case in which cumulative emissions increase as if production continued flat. The "New Policies" scenario is even worse (what's new then?). A stabilization path which observes a 2 degree warming limit is fundamentally different as it would bend asymptotically towards the carbon budget limit. The graph also shows that even an oil shock scenario in which the Strait of Hormuz is closed (immediate loss of 17 mb/d), followed by a -2% pa decline brings us into overshoot mode, provided of course the world economy still continues to function, something which is unlikely and would probably mean the end of our carbon based consumer society with a totally different emissions outcome.

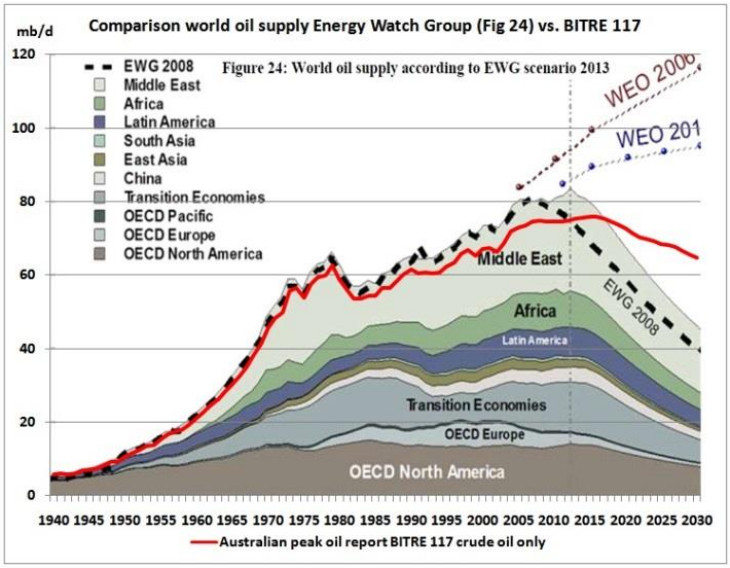
(5.7) Peak oil emission scenarios

Which hypothetical, permanent decline rate after an assumed peak oil year 2012 would satisfy the boundary condition of 2 degrees warming?



The graph shows it's around -6% pa. There is no peak oil scenario around with such steep decline rates. The latest research of the Energy Watch Group (EWG) has a decline rate of -2.7% pa to 2030.

Fossil and Nuclear Fuels – the supply outlook
http://www.energywatchgroup.org/fileadmin/global/pdf/EWG-update2013_long_18_03_2013.pdf



This graph shows the March 2013 update of the EWG. The Australian peak oil report BITRE 117 (crude oil only, red line) has even lower decline rates.

In this respect, global warming is more critical than peak oil, a point Monbiot made last year in an article in the Guardian when he summed it up: "There's enough oil to fry us all" http://www.guardian.co.uk/commentisfree/2012/jul/02/peak-oil-we-we-wrong

However, we were not wrong on peak oil, which is a process having started in 2005. The response to triple digit oil prices was (and is) a massive quantitative easing (QE) program worldwide. In the most oil addicted country of the world, the US, this allowed to develop shale oil (tight oil), now hyped as a new energy revolution. The latest EIA Annual Energy Outlook estimates that a total of 25.3 Gb of tight oil may be produced to 2040, equivalent to just 10 months of current global oil demand. http://www.eia.gov/forecasts/aeo/pdf/0383(2013).pdf (page 82). This would generate another 9 Gt of CO2, or 3% of the carbon budget.

Conclusion: We have a race between peak oil, debt, global warming and the disintegration of the Middle East. Symptoms of these complex processes pop up every now and then. US tight oil will peak in this decade as decline rates are very steep (6% per month). So far most of the peak oil related events like oil wars, refinery & car factory closures and fuel shortages - even in oil producing countries - are regional. But this will change as the problem will spread through the system. On the global warming front of our war with nature an increasing frequency of extreme weather events points to what global warming means and how many lives and money this will cost.

Unfortunately, peak oil with high oil prices is now impacting on the financial system and the fiscal position of governments in a way which slows down efforts to reduce emissions. Oh, and by the way, would decision makers in governments like to work in a building with a 25% probability of collapsing by 2050?

Prepared by Matt Mushalik
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