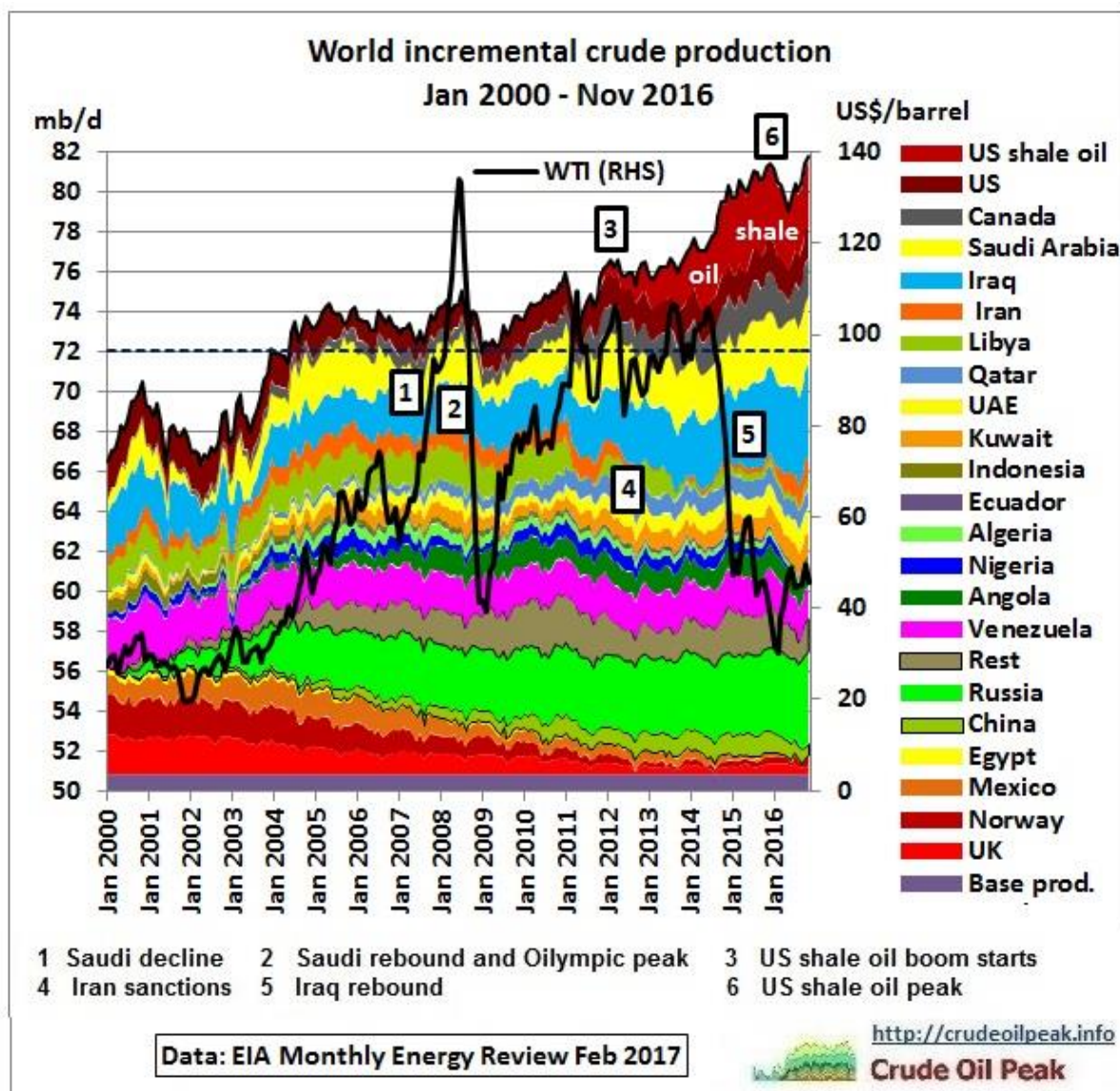


Peaking oil production – where are we?
 February 2017

Global peak



1st phase of peak oil

The peaking started in 2005, as predicted. But oil prices went up earlier after the Iraq war and as the North Sea and Mexico peaked.

(1) 2005/07 Saudi decline of 1 mb/d led to oil prices of \$75 by mid 2007. In the US \$3 a gallon, up from \$1.1 in late 2001. That caused the US recession end 2007 (Hamilton study)

(2) Mid 2008: additional oil demand of 800 kb/d for the Olympic Games in China plus the usual Saudi fuel burn for summer air conditioning. Saudi rebound in production was not sufficient. Oil prices spiked at \$ 140 a barrel and petrol prices at \$ 4.1 a gallon. That hit car dependent US suburbia which had optimistically over-invested in housing, driven by peak oil ignorant banks. Plus petro dollar debt accumulated since the Nixon shock 1971 (after US

crude production had peaked, requiring ever increasing oil imports paid in US\$). So all this together triggered the financial crisis.

2nd phase of peak oil

(3) The response to the peaking of conventional oil production in 2007 was to set interest rates artificially low (the opposite of what happened in the 1970s oil crises) and then Quantitative Easing which allowed the economy to afford high oil prices. The cheap money was also used to produce unconventional shale oil and tar sands in Canada. But contrary to economic theory, more oil did not bring down oil prices. The impact of shale oil (much of it is actually condensate) on the global oil market was limited to around 2 mb/d of US import substitution of similarly light oil.

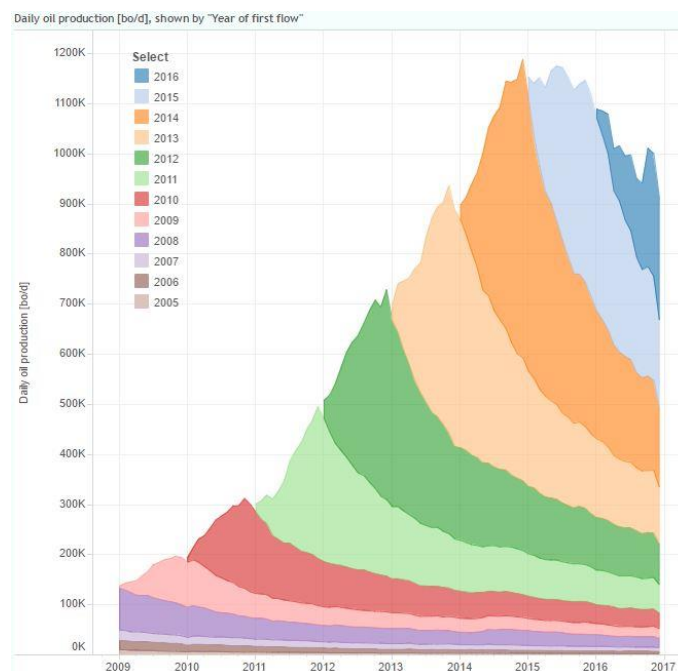
(4) Iran sanctions helped to keep oil prices up

3rd phase of peak oil

High oil prices since 2004 had finally killed the golden goose 10 years later. \$100 dollar oil is unaffordable. Remember Geoff Dixon saying Qantas can't make money at \$120 a barrel. China's customers of consumer products had spent their money for petrol. Australia experienced the problem as a drop in iron ore and coal prices. The oil price drop in 2014 coincided with the Fed's announcement that QE3 will be ended.

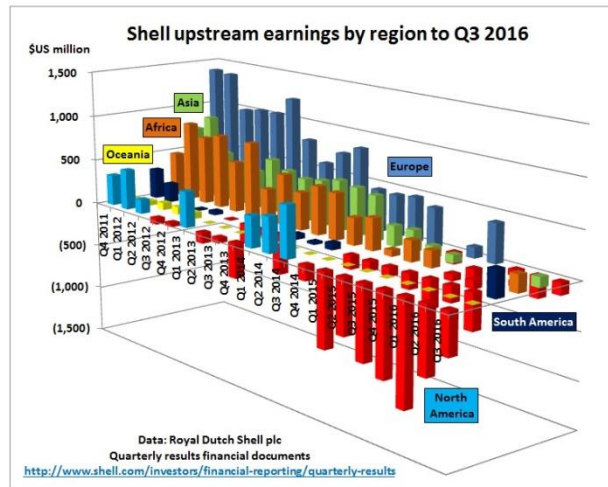
(5) Finally oil production in Iraq is coming off the ground

(6) US shale oil peak. After the potential for import substitution was exhausted, the US refineries must deal with all the problems of accommodating extra light shale oil in their distillation towers which were never designed for light oil. Lifting the ban on crude exports did not help much. Shale oil is only exported in small quantities as blending component, not as a bulk refinery feedstock. This problem is not well understood in the media. US shale oil can never compete with Arab Light, for example. In an analysis of EIA data with a Houston based oil geologist we found that US crude inventories are much higher than the balance of crude imports, exports, production and refinery intake implies. An exchange of emails with the Deputy Administrator could not clarify the discrepancies. We suspect US tanks are filled with unaccounted-for, hard-to-sell shale oil.



Bakken production profile showing step declines of legacy wells

The main problem for the economy now is debt incurred during the high oil price period and budget deficits (80% of Australian budget deficit is caused by lower company tax after the GFC). Oil companies are not able to earn sufficient upstream money due to low oil prices.



This reduces the ability to invest in new oil fields or expand/upgrade existing fields.



CAPEX in many companies will be reduced for the 3rd year in a row, compared to 2014

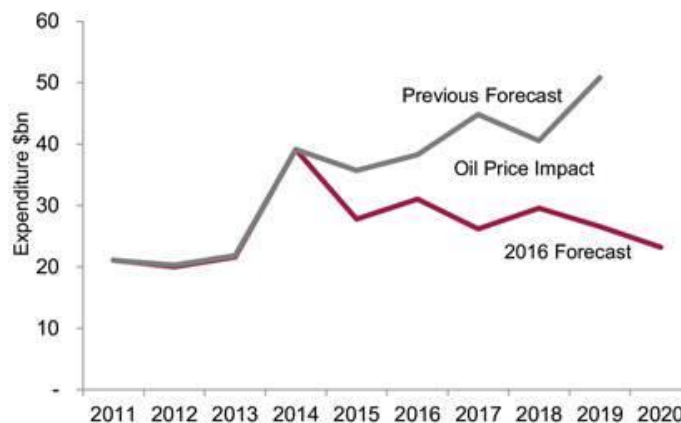
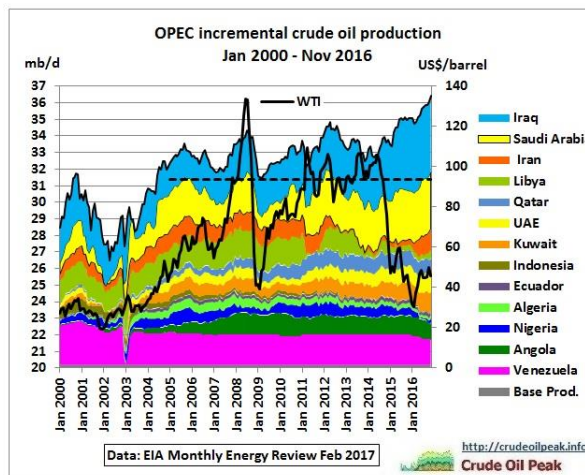
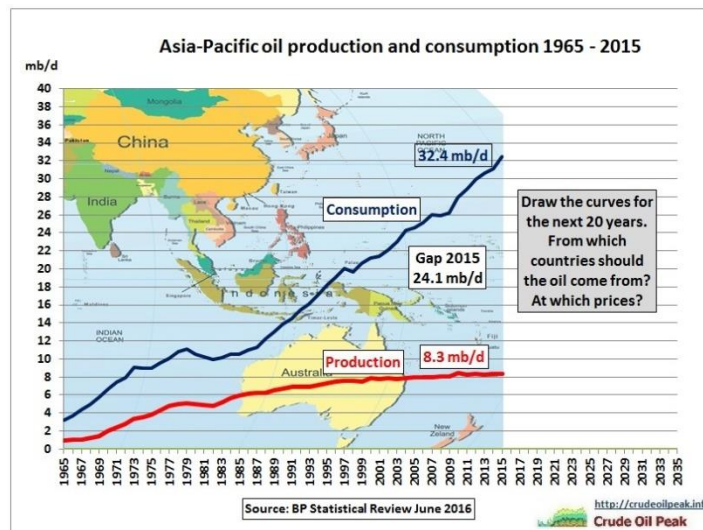
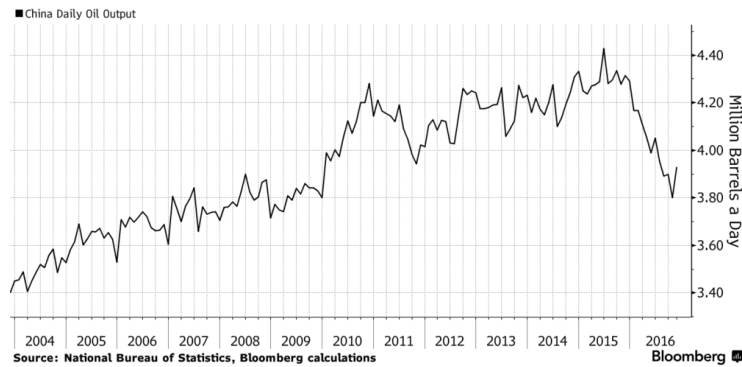


Figure 2: Global Deepwater Capex 2015 Vs. 2016 – Oil Price Impact
Source: Douglas-Westwood, World Deepwater Market Forecast 2016-2020

This means: once the portfolio of projects which were sanctioned and started during the high oil price period has been commissioned, less projects will be in the pipeline to replace

declining oil production in old fields. The resulting production drop (around 2020 or before) will surprise the world. And China has peaked. That will change history.

Further to Go?
China output forecast to extend slide in 2017



OPEC excluding Iraq did not produce more oil in 2016 than in 2005.

Apart from the global peak there are many other country peaks which have derailed the Middle East: Egypt, Syria, Yemen, Sudan, even Libya. Venezuela is another candidate for collapse. It could well be that “voluntary” production cuts by OPEC cover up their own production peak. So peak oil (as a process, not a one-off event) is alive and well. But governments don’t want to look at it through their ideological glasses.