

Oil Production Decline

Australian oil production decline

Australia has been shielded from past oil shocks by our domestic oil production from Bass Strait. Hence, as a nation we have not learnt as much about oil conservation and transport planning as European countries, especially the Netherlands which radically changed its transport planning policy to reduce its oil dependence after the 1973 oil crisis.

However, Bass Strait production has been declining since 1985 and until now other fields have filled the production gap. Reliable recent predictions by Geoscience Australia and Woodside indicate that Australia's oil and condensate production will fall substantially in the next decade (Akehurst (2002), APPEA (2004)).

Figure 2. Oil and condensate production profiles of individual Australian fields, and the forecast cumulative production at 50% probability derived from industry data, Powell (2001), Akehurst (2002). BI denotes Barrow Island; GF denotes giant Gippsland Basin Fields.

The dominance of a few large fields, shown in Figure 2, is typical of oil regions. The giant fields are normally found first. An increasing discovery rate of usually progressively smaller fields is needed to keep production relatively constant as the giant fields decline. Then inability to keep finding adequate volumes in ever-smaller fields leads to an overall decline. s becoming increasingly vulnerable to serious oil shortages, in the short term (within a year), in the medium term (within 5 years) and in the long term (within one or at most two decades). Self-sufficiency is expected to decline from an average of 80-90% over the past decade to about 20% by 2020 (APPEA (2004))

World oil production decline predictions

A world-renowned US Geological Survey petroleum geologist, Les Magoon, visited Australia in November 2001 as the Distinguished Visiting Lecturer of the Petroleum Exploration Society of Australia. He gave talks around Australia entitled "Are We Running Out of Oil". As reported (Australian Energy News (2001), Magoon (2001)), he describes the "Big Rollover" as the change from the current world oil buyers'-market to a world sellers'-market when global production starts to decline. Various forecasts have put the "Big Rollover" date at sometime around 2003, 2007, 2010 or by 2020 (Andrews and Udall (2003)).

"At BP, our best estimate of when global oil shortages will begin to bite deeply is between 20 and 40 years", Greg Bourne, Regional President of BP Australasia, told the 5th Energy in WA conference in Perth in March 2003.

Figure 3a: Current forecast of future world oil production, including non-conventional oil. (ASPO (2002)). Scale is in gigabarrels of oil-equivalent per year. The peak of the curve is the "Big Rollover";

Figure 3b: Current forecast of future world oil and gas production, (ASPO (2002)). The inclusion of gas does not change the shape of the global hydrocarbon depletion curve substantially.

Prof. Pierre-René Bauquis of the French Institute of Petroleum told a combined meeting of the Society of Petroleum Engineers and the Petroleum Exploration Society of Australia in Perth that he expected global oil production to start its terminal decline in about 16 years (Bauquis (2004)). He does not see any significant renewable energy substitutes for petroleum over the next 20-50 years. He was also dismissive of hydrogen as a transport energy carrier and foresaw the use of nuclear energy to help manufacture synthetic hydrocarbon fuels

As can be seen in Figure 1, there are some considerably more optimistic forecasts of future oil supplies. The most optimistic ones are driven by economic and political perspectives, rather than by geology and engineering constraints, for example see Lynch (2002). There are very considerable grounds on which to doubt the forecasts published by the International Energy Agency. The IEA takes without question the oil reserve data provided by all the national governments. Many of these estimates are clearly misleading as they either increase dramatically without any matching exploration success, or they remain constant for years in spite of substantial production which must reduce the actual oil reserves. Conflicting definitions and national and political priorities make the IEA figures as dubious, for example, as similar audited and glowing accounts of the financial strength of HIH and Enron just before their catastrophic corporate crashes.

Shell has recently revised its "proven reserves" downward by 23%, showing that oil-company reserve claims are subject to uncertainties and mistakes. The scope for analogous errors and misrepresentation at the national level is very substantial. Mexico has twice halved its claimed reserves since the mid 1990s. Recent presentations by Matthew Simmons (Simmons (2004), (2004a)) cast considerable doubt on the reliability of the claimed Saudi oil reserve figures. Similar doubts about OPEC's overall reserves are also raised by Salameh (2004)

In the case of Saudi Arabia, any substantial errors in reported reserve estimates are of very serious global significance. There is of course the complementary but lower probability that some reserves may have been understated, but most concern has been expressed about over-optimism.