The peak is nigh

Oil production is peaking and the world must rethink its energy-supply strategy, says Kjell Aleklett, president of the Association for the Study of Peak Oil and Gas. Interview by Tom Nicholls

THE International Energy Agency's (IEA) statistics are routinely trotted out at energy conferences in support of various theories and arguments, the authority of its forecasts and data assumed and unquestioned. So it's disorienting to hear the august number-crunching body described as "dream factory number one".

But, says Kjell Aleklett, president of Aspo, the IEA's methodology for forecasting oil supply is based on wishful thinking – on the oil the world would theoretically need to maintain a certain rate of economic growth, rather than on what is physically possible to extract. "You can write down any demand figure you like, but if you can't fill it with real production it doesn't help you," he says.

According to Aspo – a network of scientists concerned about what it sees as a precipitous decline in oil production and the lack of alternative sources of energy – oil production will probably peak between 2011 and 2012, at between 90m barrels a day (b/d) and 94m b/d. Even that range might prove unreachable: output may plateau at 84m b/d in the next five to seven years, it says. Perhaps, if demand grows more moderately than expected, the peak might be delayed until 2018 or so. But even at the optimistic end of Aspo's forecasts, there would be an alarming shortage of oil within two decades. By 2030, says Aspo, oil output is likely to be 50m-60m b/d – catastrophically short of the 101m b/d of oil consumption that would be implied by an annual average GDP growth rate of 3% over the next 22 years.

Some in the industry – the chief executives of ExxonMobil and Saudi Aramco, for instance (*PE* 12/07 p2) – flatly dispute Aspo's hypothesis, claiming that the availability of liquids is simply not a constraint. But some – making more cautious assumptions about geology, geopolitics and the effects of climate policy – see lower limits to growth. Last year, for example, Christophe de Margerie, Total's chief executive, described 100m b/d as an "optimistic" target for world oil supply. Shokri Ghanem, chairman of Libya's National Oil Company, and ConocoPhillips' chief executive Jim Mulva (see p15) have also identified 100m b/d as a probable limit.

Output predictions fall short

These predictions are all significantly short of the 116m b/d of consumption that the IEA's *World Energy Outlook 2007* pencils in for 2030 under its business-as-usual forecast – a figure Aspo claims is hopelessly unrealistic.

Aleklett claims the world would need reserves of 0.96 trillion barrels to attain crude production of 105.2m b/d – assuming a 4% global average rate for oil depletion, the fraction of reserves that can be produced every year. Given that crude consumption – at present around 81m b/d – between now and 2030 will amount to something in the order of 0.747 trillion barrels and that crude reserves, according to Aspo, stand at 0.800 trillion barrels at present, another 0.907 trillion barrels of oil would have to be discovered in the next 22 years to push the net reserves total up to 0.967 trillion barrels by 2030. That implies a discovery rate of 41bn barrels a year – a similar rate to that achieved in the 1960s when most of the world's largest fields were found, says Aleklett. "It is hard for me to believe this will happen."

There is, unsurprisingly, considerable disagreement over the rate at which fields are declining. Forecasts supplied by Cambridge Energy Research Associates (Cera), a consultancy, have become the industry's antidote to Aspo's grim warnings, painting a relatively rosy picture of future oil supply (*PE* 2/08 P26). But, complains Aleklett, Cera doesn't consider project delays – a very real prospect given the tightness in the contracting market – and is too trusting in industry predictions, schedules and timetables.

And don't be fooled by creative accounting, he says. With many companies' proved reserves-replacement rates ticking along at around 100% on a yearly basis, the casual observer could be forgiven for assuming that exploration efforts have remained consistently successful over the years. But that is misleading, says Aleklett: the big discoveries were made in the 1960s and increases to proved reserves since have depended to a large extent on proving up already discovered reserves from the probable category.

Beware too the oil-equivalent reserves number – which some oil companies are favouring instead of separate figures for oil and natural gas – he says. The non-oil component of the oil-equivalent number, such as gas, can't necessarily be turned into a practical replacement for barrels of liquid oil, he points out, and certainly not at the scale required to offset declining oil production and meet incremental demand. The potential for gas-to-liquids, for example, is limited because gas is needed for other purposes. To make 4m b/d of coal-to-liquids (CTL) – the amount, says Aspo, by which production from existing oilfields is declining every year – would require 60% of China's coal production if the coal were being converted into liquid fuels with the efficiency that has been achieved in South Africa's CTL industry. Neither do the energy-intensive Canadian oil sands have the capacity to have much more than a fringe effect: production might rise to something like 3.6m b/d by 2018, he says – a marginal figure in the context of world oil consumption.

"You can talk about oil-equivalent instead of oil and it sounds great and you play around with the words, but the hard-core truth is that something must come out of the ground at some time and that's physics. For some reason economists believe they can make everything with money."

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This all adds up to a problem that goes far beyond high oil prices and is more frightening than climate change, he says. "You can always accept a warmer climate. But energy is reality: it's having money or not."

Head of Aspo since 2003, Aleklett is an engaging mixture of dispassionate scientist and passionate sociologist. Neither a sandwich-board doom-merchant nor anyone's stooge, his academic credentials, as a professor of nuclear physics at Sweden's Uppsala University, are impeccable. In addition, like other members of the organisation, he receives no payment for the work he does for Aspo.

So what does motivate him? He is driven by a duty to discover the truth – "part of being a university professor". But underpinning his work for Aspo is a deep-seated concern about how civilisation would adapt to what would be – if the organisation's fears prove founded – an energy shock of gigantic proportions. "I'm very worried about the world's future," he says. "And if people really understand the problem with energy, they should put in more effort to try to solve that problem, because it has to be solved."

If he's right – and here the sociologist takes over from the scientist – nothing less than a change in society's structure is needed. "What human beings do when they are not eating or sleeping is killing time," he says. "Today, we do a lot of things that use a lot of energy to kill the time in between." The question for economists and politicians is how to kill time using less energy, but continuing to generate wealth.

He doesn't offer a vision of how this might be achieved – "I'm not an economist" – although he does make a few suggestions of measures that might help, such as the immediate banning of managerial bonus schemes that force companies to focus on short-term profitability. At the same time, however, he resists the temptation to offer a vision of the apocalypse, instead expressing confidence that human ingenuity will find a solution. "The beauty of us as human beings is we can adjust to different situations. We have always been able to do that." ■