The Oil Drum
DISCUSSIONS ABOUT ENERGY AND OUR FUTURE

# The ASPO Conference -First Morning

Posted by Heading Out on September 17, 2007 - 9:00pm
Topic: Supply/Production
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Cork, so the Deputy Lord Mayor told us, is the port that the Titanic sailed from. It is also the place that took delivery of 57 Steinways for its new school of music, and so it was appropriate that we were entertained with song and dance this evening. It should have been a celebration.

As Dr. James Schlesinger, the first Secretary of Energy, said in his Opening Address, the battle is over, Peak Oil is now accepted as inevitable, and the debate only becomes as to when. We have "won" and need to learn to take Yes! as an answer. He spoke mainly of three things – the arrival of the Peak and the recognition that is starting to grow, and to mean that we are no longer lone voices crying in the Wilderness. Trade and government publications are already acceding with back-door concessions that we are facing a moment of truth. He paid tribute to Colin Campbell's dictum that "before you produce it, you have to develop it", and reminded us of the gap in matching discoveries as the old fields die out. Having been there, he told of the oil industry laughing when President Carter discussed renewable energy back in 1979. Back then "conservation was not the American way, production was the American way." But now, to sustain production we need to find 4 or 5 fields the size of all those in Saudi Arabia. It is not going to happen, but before we celebrate, remember that there are political and technical realities. And, as the day wore on, the mercilessness of the numbers began to be apparent.

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This was his second theme, that people do not want to admit they were wrong. That we who were right are being shown to be so, but must be magnanimous in our victory lest we worsen the situation. Remember that the presence of the Peak does not drive action, and that action can only

come through the acts of politicians. Politicians work for a public that expects that becoming independent of oil will lower the fuel and power bills. In the US there was a pledge made by President Nixon in 1973, that the country would be oil independent by 1980. By then oil imports were up 60%, and today they are three times the 1973 numbers. The first rule of a politician is to get elected, and the second rule is to get re-elected. (Cassandra's and those asking for sacrifice rarely succeed at task 2). Putting this all together was the clear implication that, while we weren't standing on the deck of an aircraft carrier, that the job was not over, but rather must now move to a different phase.

This, his third theme, will require patience as we decide what to do. International fleets of cars cannot be replaced overnight and provide a necessary support leg to existing society. The internal combustion engine needs liquid fuel, and because memories of the last time we had a problem have faded, we need to hit the public over the head with a metaphorical 2X4 to get them to sense the size of the problem. While human ingenuity cannot be dismissed, it is very time consuming and some 15 -20 years will be required to get us where we need to be. While dismissing corn ethanol, he did seem impressed by cellulosic ethanol (and could have been influenced by Khosla on this). Yet at the moment this is all still a political game (if it were serious there would be no $0.50 duty on Brazilian ethanol). He sees the fight over Global Warming as a passion in Europe, but a transient phase in the US (partially because of the futility of action given Chinese coal use). And he pointed to Senator Reid as a reason that more immediate steps to mitigate the crisis are not being taken. He did see the next Congress passing "cap and trade" legislation, though with enough loopholes (as in Europe) to give it little value.
And he worries about the vulnerability of the oil supplies that travel on the high seas.

Ray Leonard was next, and talked mainly about the FSU in the context of the 2006 Hedberg Conference. The rule for that is that you are only invited if you present, it is invitation only, and attendees cover the waterfront. With that background he was not kind to the USGS survey reports on remaining reserves. In contrast to such rosy predictions he suggested (from that conf), that the real numbers would be on the order of Western Siberia 8 billion barrels (bbo), relative to USGS 55 bbo; Niger Delta 18 bbo, relative to 40 USGS; S.W. Africa 15 vs 30; Caspian 10 vs 20; Gulf of Mexico 18 vs 42 bbo; Brazil 7 vs 39, and KSA 60 rather than 136 bbo. The revised total was 250 bbo waiting discovery, rather than 700 bbo.

Looking at Western Siberia he noted that the first 100 fields discovered averaged 100 bbo; the second 100 averaged 40 bbo; the third 100 averaged 10; the fourth 4; and the fifth 2 bbo. Optimistic claims to reverse this trend lack credibility. The change to FSU from SU allowed a recalculation of reserves, but that bite of the apple can only be taken once. Some reserve growth is legitimate and he felt that particularly for the FSU and ME there will be more growth (to a total of 490 bbo) if the money is properly spent.

Technology to enhance production depends on how much it costs. For example if the baseline is 1, then discovery costs are 1.2 times that base, to optimize production (infield drilling etc) will be at 1.8 times the base cost, and EOR and tertiary recovery will run 4.7 times base cost. So that if deep offshore is at $20 boe base cost, then tertiary recovery will cost $95 a barrel, and we ain't there yet. He thinks that tertiary will add 10% to field production (for Siberia moving it from 35% to 45%). It is this type of gain that makes him predict that Russia will sustain current production for at least another decade.

He was deeply cynical about unconventional oil (Venezuelan heavy crude and the Canadian oil sands). He anticipates only around 2.5 mdb from Canada by 2015, with lots of unexpected costs and issues (though many have been discussed here and in TOD Canada). Venezuela might hold

current Orinoco production (at around 800,000 bd) but won't have the political ability and will to increase this. Putting this all together he thinks that the world will run at capacity for some 1 to 5 years, and that this will be at a plateau of 95 to 100 mbdoe. It will occur, however, in a very high price environment. To date we are only in a high price environment.

He was followed by Mike Rogers of PFC Energy, who have recently completed a supply forecast. It has three messages:

Oil prices will remain high, or higher.
There will be little to no growth in exports, outside of the FSU.
There will be 3 barrels produced for every barrel found.

Basically by 2010 he feels that non-OPEC will have peaked, and be starting to decline, and that the only growth in OPEC will be from heavy oil and NGL. For this he sees OPEC giving 33-36 mbdoe in 2010; 37-55 in the 2015 timeframe; 50 mbd by 2020.

Looking at production data the records seem to indicate that when fields are around 54% depleted then production begins to significantly decline (though there is a range). On average for non-OPEC, non-FSU the combined producing countries are seeing a decline of around 5-7% that will start to have a significant impact after 2009.

In the former Soviet Union there is a possibility to achieve 13 – 16 mbdoe by 2015. However depletion is growing and though there are 11 new fields to come on stream in Russia the peak there may be reached in 2012 when, if all goes well, the country might achieve 11 mbdoe. But then it falls off. Azerbaijan may get up to 1.2 mbdo, and Khazakstan may reach 2.1 mbdoe, though dates are slipping and production may have a number of complications. Combining the three gives the FSU peak in 2015 but it is expected to decline significantly thereafter.

He was more optimistic that Ray on Unconventional, thinking that the Canadians might be able to get up to 4.8 mbdoe in Alberta by 2015, with an ultimate peak of 7.5 mbdoe.

Turning to OPEC Qatar has lots of NGL but is imposing a moratorium until they can decide how to spend the money. Outside of that there has been a disappointing history of exploration, with the result that many fields are getting up to 60% produced, so that the region combined may reach there in a couple of decades.

When all this comes together his feeling was that the OOPS moment will come in 2014 at less than 100 mbdoe.

After a break Pierre-Rene Bauquis talked on the role of nuclear and gas (he was initially going to talk about natural gas supplies). He sees a non-OPEC peak of 60 mbdoe and possibly an OPEC peak of 40 mbdoe, though he thinks the latter unlikely. Oil companies have largely backed out of nuclear, although it has potential not only for general use, but also for specific field uses. Particularly he saw this role for helping with heavy oil. It will also help in production of hydrogen, which will become more viable closer to 2020, as oil prices head over $200. Its use will probably, however, be chemical rather than as a transport fuel, since there will still be more viable alternatives. By 2100 the energy for transportation will come 30% from oil and gas, 60% from nuclear power, and 10% from other renewables.

The first presenters were then joined by 3 more panelists for a discussion. Jim Buckee gave an operator's perspective and felt that the commentators were too optimistic given the shortage of labor, skilled engineers and equipment. He already faces decline problems every day in his work,

but while it is now controlled, when it reaches 7% then there will be another OOPS moment. Oil wells decline exponentially, gas wells go faster, but for many fields post peak, this can reach over 11% pa.

Chris Skrebowski noted that this has been the longest period that world production has effectively sat on a plateau, across a range of possible producers. For the next 6.5 years the die is already close to being cast on production schedules and thus in his Megaprojects lists he can predict production out to 2014. He used 4% for depletion (the industry used to be able to hold 3%) Working these numbers, and allocating for internal consumption, he sees that we have two good years left, then by 2011 we will be post peak and OOPS.

Eddie Walshe noted that 40% of hydrocarbon fuels are natural gas, which still has lots of reserves, but in Russia, Iran and Qatar. With this constricted supply prudence would suggest that alternate sources be developed, but it should be remembered that power companies such as Centrica don't have the resources for a nuclear or coal fired power plant.

Finally in the morning session Gareth Roberts, who does gas-injection EOR felt that the 35-45% increase that had been mentioned is too low, and with proper EOR it can add 20% to field production. However the time frame for this to have an effect will be post-peak. Part of the problem is that the industry is still costing projects anticipating $40 oil, and thus killing projects that are viable at today's $80 figures. It gives an EROI of 4-5:1 in fields that may be down to 3:1 EROI with conventional production. Orinoco uses 12% of produced energy for production, while SAGD requires 25-30%.

Natural gas is harder to predict since it can move through rock faster, but the panel thought that a peak 10 years after that for oil was the right ballpark.

It was then time for lunch (and so a break since I will now head bedwards).

To be continued.

(Apologies to the speakers for inaccuracies and faults in transcription, this is only meant to give a flavor of the contents of the talks, and I would recommend getting the CD, when it comes out. )