



Investment in Oil Exploration and Production -- An "Above Ground" Factor

Posted by [Dave Cohen](#) on November 24, 2006 - 7:11pm

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On November 7th, the International Energy Agency (IEA) released its [World Energy Outlook 2006](#). At a [press conference](#) announcing the new report, the agency's Executive Director was quoted as follows:

"The key word is urgency," IEA director Claude Mandil told a press conference in London following release of the study. "Urgency for immediate policies and measures to promote energy efficiency and facilitate technology development ...

"On current trends, we are on course for an expensive and dirty energy system that will go from crisis to crisis. It can mean more supply disruptions, meteorological disasters or both. *This energy future is not only unsustainable, but it is doomed to failure.*

"Governments can either accept such a future, or they can decide to come together to change course."

Had the IEA changed its tune? A closer look at the report's conclusions sends a mixed message.

What are the "Above Ground" Considerations?

CERA's peak oil [Decision Brief](#) identifies "aboveground" risks as the limiting factor in expanding the world's oil production to meet projected rising demand for oil.

Aboveground risks may limit upstream investments. An apparent peak in world oil production could appear if aboveground issues--such as war and political changes, or intractability in decision making by governments--limit upstream investment and activity. But such an outcome would not be rooted in a belowground geological constraint in the next few decades. An apparent peak could also be triggered by technological change that substitutes for oil in transportation, capping demand.

It's a safe bet that we can dismiss the possibility of some miraculous *technological change* that would cap conventional oil demand and make our liquid fuel & climate change problems just magically disappear — something akin to [fusion at home](#) powering a global fleet of [electric cars](#).

CERA's underlying assumption, shared by the IEA, is that above ground factors curtailing upstream investments supporting new E&P activity will be the real cause of a peak in global

conventional oil production flows. This argument is tantamount to saying that were it not for those nasty human political realities, you could throw enough money at the peak oil problem — a problem explicitly acknowledged by both CERA and the IEA but posed differently — and all would be well, at least out to *circa* 2030. About this faith-based free market approach, Ken Duffeyes said that *The economists all think that if you show up at the cashier's cage with enough currency, God will put more oil in ground*. Ken neglected to add that *God* put a lot of that existing recoverable oil in some pretty geopolitically & geographically inconvenient places as far as the OECD consumers represented by the IEA are concerned, which is, one supposes, their main point.

Let's take a brief look at the IEA's findings about the current level of oil E&P investment and some factors affecting it. Finfacts presents a [more detailed](#) media story on the IEA's conclusions.

Oil E&P Investment Levels

On November 8th, a Wall Street Journal article [Investment by Oil Industry Stalls](#) reported on the investment problem.

Data compiled by the International Energy Agency show that investment in the oil-and-gas industry was \$340 billion in 2005, up 70% from 2000. *But cost inflation for goods and services used by the industry accounted for almost all of that increase*, according to the IEA, the energy club of 26 of the world's major industrial nations. *Adjusted for inflation, the oil industry's investment increased by 5% between 2000 and 2005*, the IEA, based in Paris, said...

"That's almost nothing; it's inadequate," said Fatih Birol, the IEA's chief economist and principal author of the agency's latest annual World Economic Outlook...

Mr. Birol, the IEA economist, said in an interview that *he expects the oil industry's production capacity will slightly outstrip demand through the end of this decade -- or by 1.3 million barrels a day [mbd] -- "if all the projects see the light of day."*

Even then, when added to current spare oil-production capacity of roughly two million barrels a day, the total reserve of 3.3 million barrels a day still would be well short of the five million barrels a day needed to put the world into the comfort zone, he said.

Figure 1 shows the investment pattern since 2000 and what is projected to 2010.

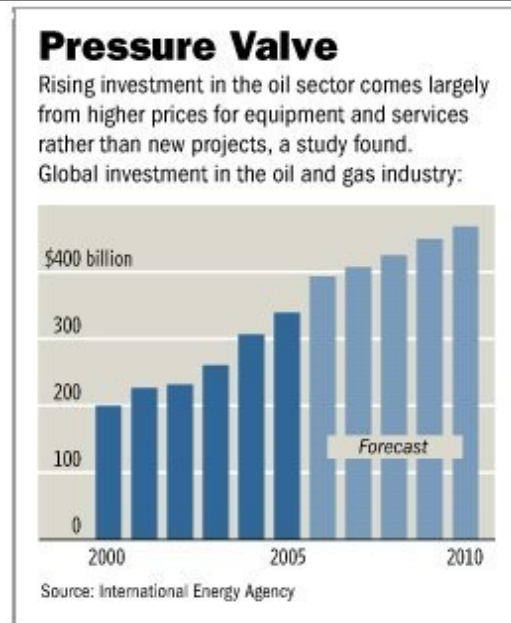


Figure 1

Needless to say, it seems safe to assume that not *all projects will see the light of day* because, outside of real above ground concerns, now customary delays are likewise due to geological, technological, environmental and inflation-driven economic constraints on new conventional oil production which extend normally long lead times. So much for that 1.3 mbd of additional spare capacity *vis-a-vis* increased demand projections. If you're seeking CERA's cap on demand, the ceiling on available supply is where *peakists* recommend you look.

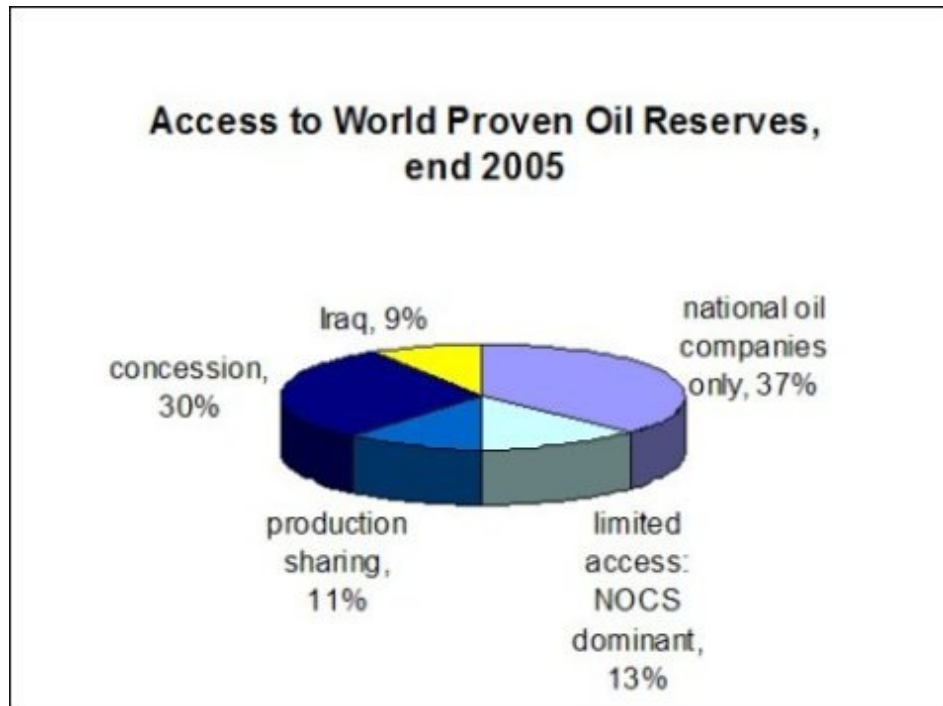
As to the cited current *spare productive capacity* \cong 2.0 mbd, we are still looking for it but perhaps we should stop searching, just as there is no longer any reason to look for *weapons of mass destruction* in Iraq. If only we had a geopolitical [magic can opener](#), perhaps social justice, an end to ideological conflict, redistribution of the oil wealth and suppression of greedy human impulses could restore [lost production](#) in Nigeria, and resurrect that [now useless pipeline](#) running from Kirkuk to Turkey in Northern Iraq. One should never discount the power of above ground disruptions to the oil supply but reality dictates that all of us, including the IEA & CERA, must learn to live with it.

On the other hand, the assumed global decline rate of \cong 5% in existing conventional oil production would not seem to be solvable even by historically unprecedented political readjustments followed by massive capital expenditures.

Factors Weighing on Investment

The IEA states that inflation costs for goods & services have mostly swallowed up increased [expenditures for conventional oil E&P](#)—this includes, but is certainly not limited to, licenses for oil exploration blocks, [bribes](#), seismic survey and test well costs, direct equipment costs (pipes, valves and fittings), oil services, leased drilling infrastructure (scarce rigs), operating costs (*eg.* consumables like fuels, energy lubricants, chemicals) and so forth.

A commonly heard argument is that new E&P is held back because the International Oil Companies (IOCs) such as ExxonMobil, BP, Royal Dutch Shell, et. al. are increasingly prohibited from operating in what the IEA and others would consider prospective areas in the OPEC countries or elsewhere, as in Russia. Look at *Figure 2*, based on IEA's WEO 2006 data.



*Based on a total proven reserves estimate of 1.293 billion barrels
The estimate apparently includes OPEC reserves calculations as
revised upward in the 1980's — Figure 2*

Only in the case of *concessions*, as in countries like the Nigeria or Kazakhstan — where no national oil company (state-owned NOC) exists— are the IOCs able to operate freely after they are awarded the E&P lease blocks following the bidding phase. *Figure 2* indicates that 37% of countries exercise complete control on access (eg. KSA/Saudi Aramco, Mexico) and 13% allow limited access where there are dominant NOCs (eg. Russia). Countries like Iran, Algeria and Qatar use *production sharing* or *buy-back* arrangements, whereby control over the oil remains with the NOCs there. [The Oil Investment Climate](#) by Vahan Zanoian (June, 2004) provides a detailed analysis of the investment issues.

The not-so-subtle, often overt, message of the IEA is that the NOCs are either incompetent, hamstrung by restrictive government policies, or otherwise not motivated to provide the necessary levels of investment to produce more oil in order to satisfy growing demand in the OECD nations or the "Asian Tigers" —China & India. If only the IOCs were able to operate freely all over the world, the peak oil crisis would be solved. While this narrative contains elements of truth, it is by no means the whole story regarding development of new conventional oil, as The Oil Drum has [repeatedly pointed out](#).

Indeed, the trend is not favorable. Russia is now [harassing Shell](#) at Sakhalin II. Bolivia [nationalized](#) all of its upstream oil & gas assets. Venezuela [pressured IOCs](#) operating there and, according to the IEA, effectively re-nationalized 0.565 mbd of oil production.

Tense relations between private firms and Mr. Chávez's government escalated last week when the government seized fields operated by two European oil giants - France's Total and Italy's ENI - after the two companies snubbed government demands to convert their contracts to joint ventures with the state by April 1.

"This country does not allow itself to be blackmailed," says energy minister Rafael

Ramirez. "These two multinational companies resist adjusting to our law. Our sovereignty isn't under negotiation."

Sixteen companies - including Chevron and Shell - did agree to new terms giving state oil company PDVSA at least a 60 percent state stake, a success which analysts say could embolden Venezuela to demand a majority stake in more valuable projects in the country's Orinoco heavy-oil belt...

"Chávez is in the driver's seat because he has what everybody wants," says Roger Tissot, energy analyst at PFC Energy consulting firm, about Venezuela's heavy oil. "It's not any kind of oil. It's the oil of the future."

Finally, it almost goes without saying that investment in Iraq or Iran is a tad risky at this point for reasons that [all too obvious](#).

Conclusions about Investment

The IEA's investment argument contradicts the position that petroleum geologists have left no stone unturned looking for oil all over the world. Surely it is the case that some onshore oil remains to be discovered —*how much* oil is really the question. Outer continental shelf exploration in the Gulf of Mexico, West Africa, Brazil, Malaysia etc. has proceeded apace. The melting Arctic is the final frontier. On the whole, oil discoveries peaked in the 1960's. This fact alone hardly inspires confidence that there will ever be another renaissance of new conventional oil discoveries that supplements continuing reserves growth in existing fields.

Above ground issues play an important role in current and future oil supply but they are not paramount. When the peak of oil production arrives sometime before 2015, so-called *peakists* will say "I told you so". The IEA or CERA will say it was due to lack of investment — this is their fall back position as some commenters have pointed out here at The Oil Drum —a [CYA](#) stance meant to preemptively deflect future blame. But, does it matter who is right in the end? No, not after the keen hindsight we get from seeing the peak in the rear view mirror. However, it still matters now as we struggle to get the world to pay attention to a crisis which may still be down the road.

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