



Worldwide Oil Discoveries by Decade

Depletion and Peak Oil A Serious Issue Or An Over Exaggerated Fear?

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Presented by:
Matthew R. Simmons

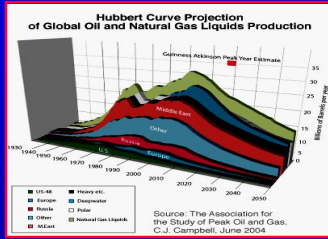
Peak Oil and Depletion Are Foggy Issues

- Debate has been mute.
- Optimists heap scorn on scientists.
- Scientists are dealing with fuzzy data.
- Key debate group >500 people.
- Group size has tripled in last 3 years.
- Most key issues are misunderstood.

Key To Understanding Issues Is Properly Defining Terms



- Production decline: A downward slope in output.



- Peak output: The maximum point, degree or volume produced.



- Proven reserves: The estimated amount of currently recoverable oil given existing technology and current economy.



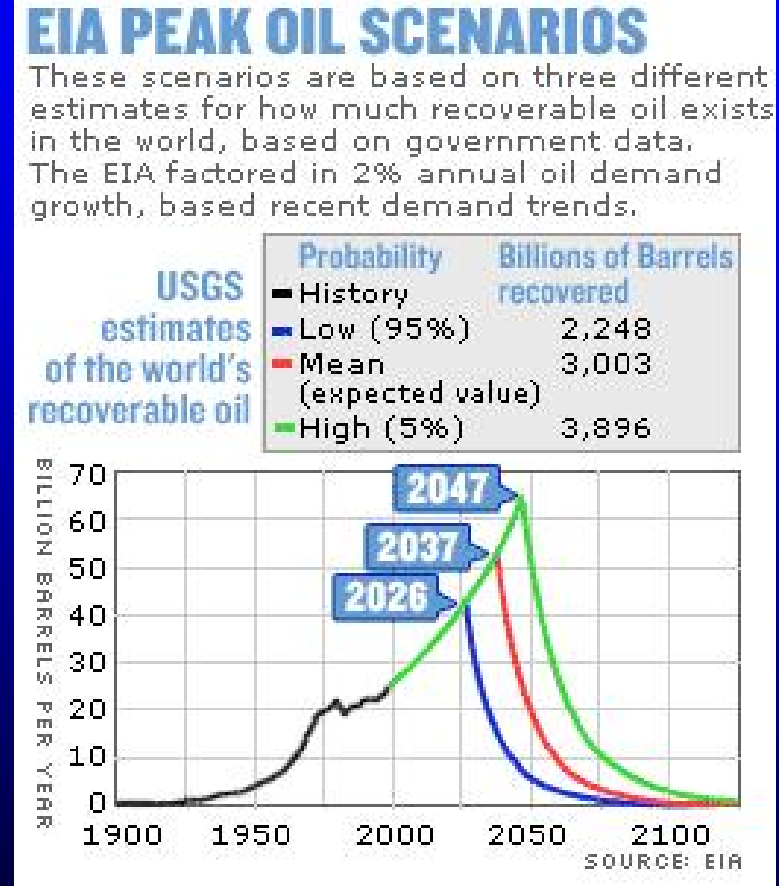
- Ultimate recoverable reserves: Percentage of oil in place that will likely be recovered over time.

- Barrel of oil: 42 gallons (336 pints) of crude petroleum of varying quality.



What Peak Oil Does and Does Not Mean

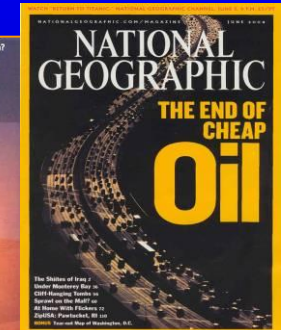
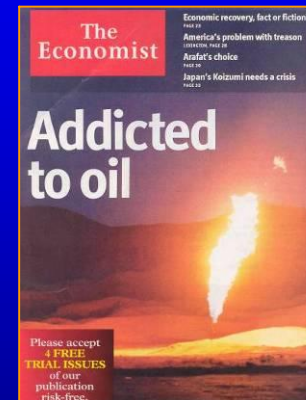
- It does not mean oil is running out.
- Peaking happens to all individual oil wells, oil fields, then oil basins and finally global supply.
- Peaking means growth is over.
- Peaking is usually followed by production decline.
- Since world uses ≈ 85 million barrels per day, declines can occur over years while still producing vast quantities of oil.
- Peaking will happen.



Peaking Is Not A Static Event

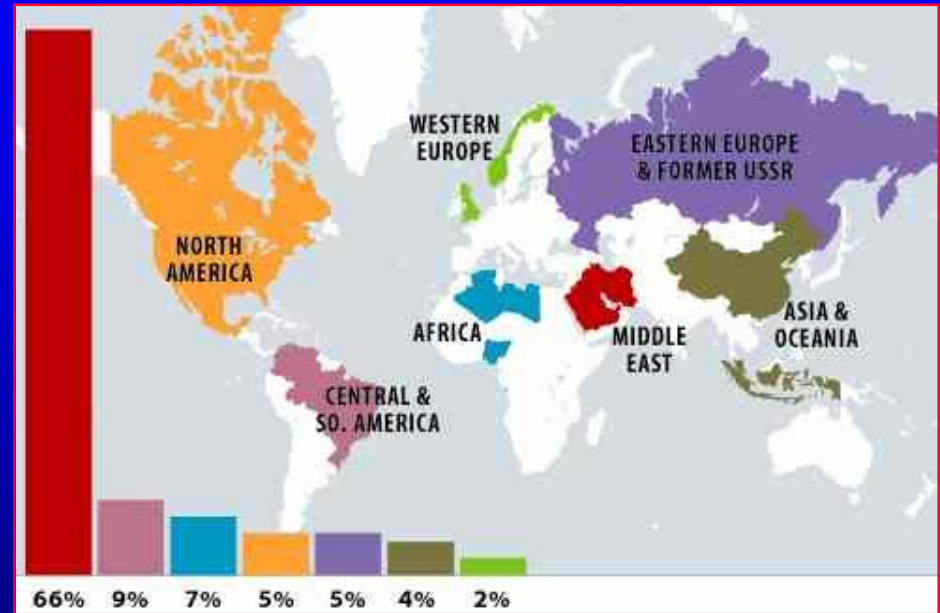
- The higher oil demand grows, the faster Peak Oil is reached.
- World's oil use is now at record high.
- Today's use is not peak demand:
 - 15% of world (OECD) uses 50 million b/d (per capita use 18.4 bbl/yr)
 - 85% of world (Rest) uses 35 million b/d (Per capita use 2.3 bbl/yr)
- Past growth is likely to continue until it hits peak supply:

1975	55 mmb/d
1985	65 mmb/d
1995	70 mmb/d
2005	85 mmb/d



World's Best Knowledge About Oil Resources

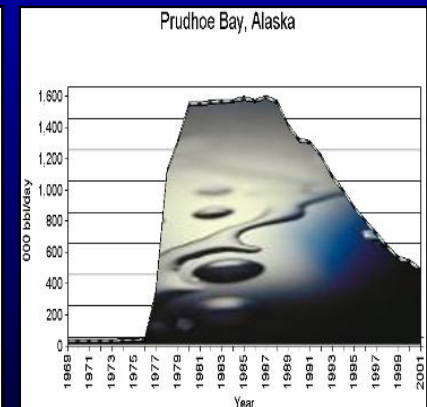
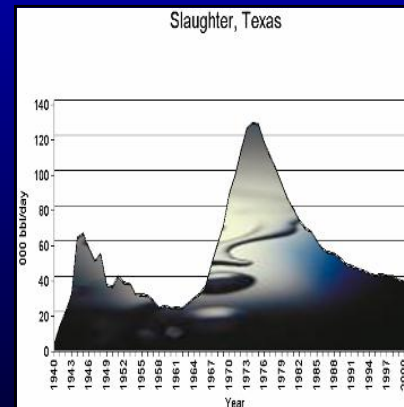
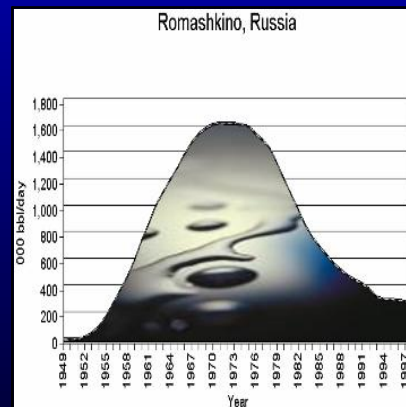
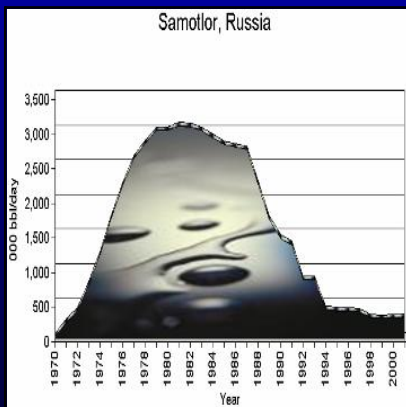
- Global “proven reserves” total 1,190 trillion barrels.
- 890 billion = OPEC proven oil reserves.
 - 733 billion = OPEC Middle East reserves.
 - 263 billion = Saudi Arabia’s oil reserves.
- 300 billion = Rest of the world.
- 90% of these proven reserves are unaudited.
- There is no demarcation of quality:
 - Super light free flowing sweet oil
 - Sour oils
 - Heavy and unconventional oil
- A barrel of high quality oil is not “a commodity”.



All put in the same data bin

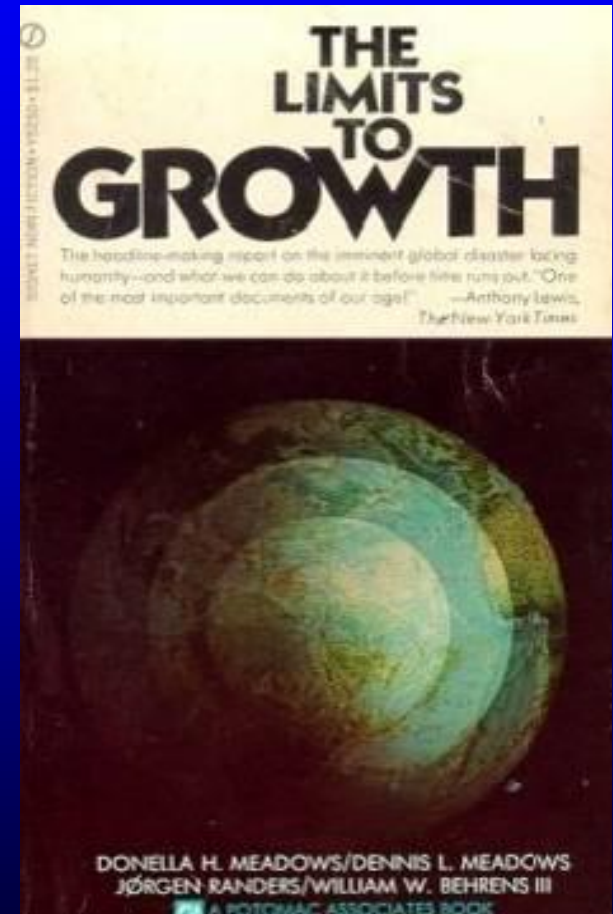
All Oil Fields Ultimately Decline

- Sooner or later, individual oil fields peak.
- When declines start, they tend to be irreversible.
- Rapid expansion of producing wells can mitigate declines.
- When high reservoir pressures wane, water and gas encroachment crowds out oil (normal aging process)
- Tracking field-by-field production data allows analysis on probable future oil supply.



The Global Oil Data System Is Blind

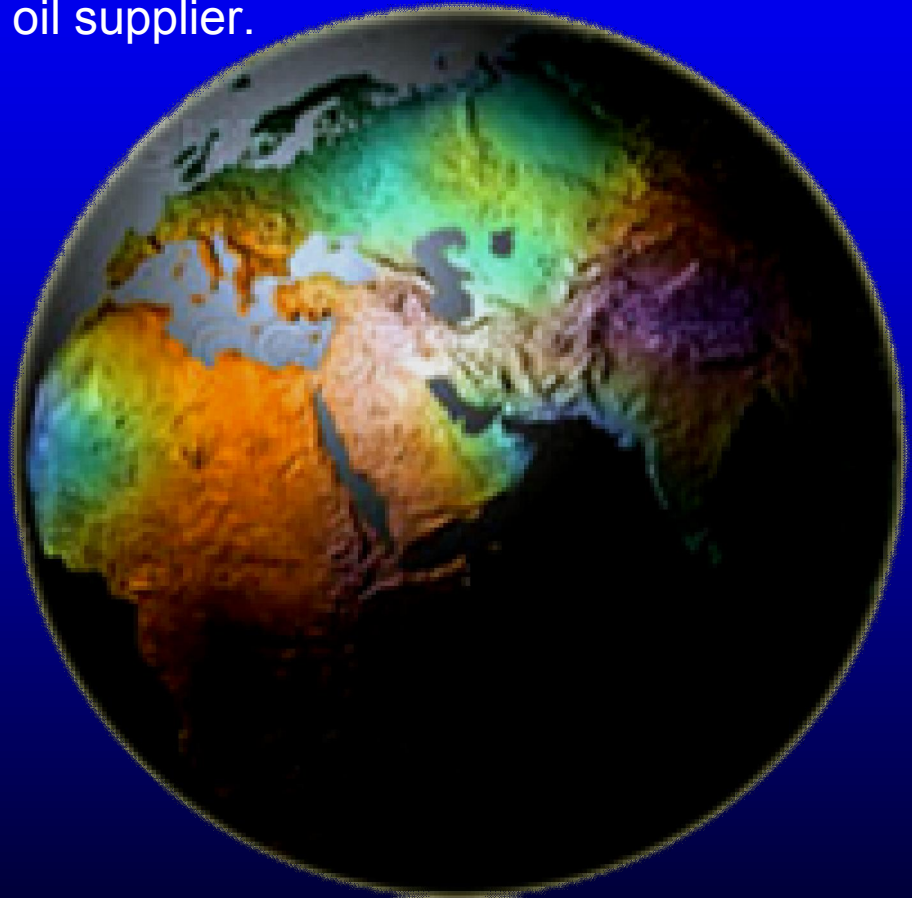
- No audits for any proven reserves.
- Almost no timely field-by-field production reports.
- Many country-by-country production estimates are third party “guesses”.
- No production well data to allow analysts to estimate field-by-field or regional decline rates.
- The entire system is based simply on a series of guesses.



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Saudi Arabia's Oil Resources: A Case Study In Fuzzy Data

- Saudi Arabia is worlds most important oil supplier.
- The world assumes Saudi Arabia can increase its oil output by 2-3 times by 2025 – 2030.
- Some say these numbers are conservative.
- Proven reserves grew 2.8 times in a decade of no new exploration success (no proof this number is accurate).
- No field-by-field production reports post-1981.
- Mystery on how many producing wells creating Saudi's oil flow.
- Even estimated 2003-2005 production is questionable.



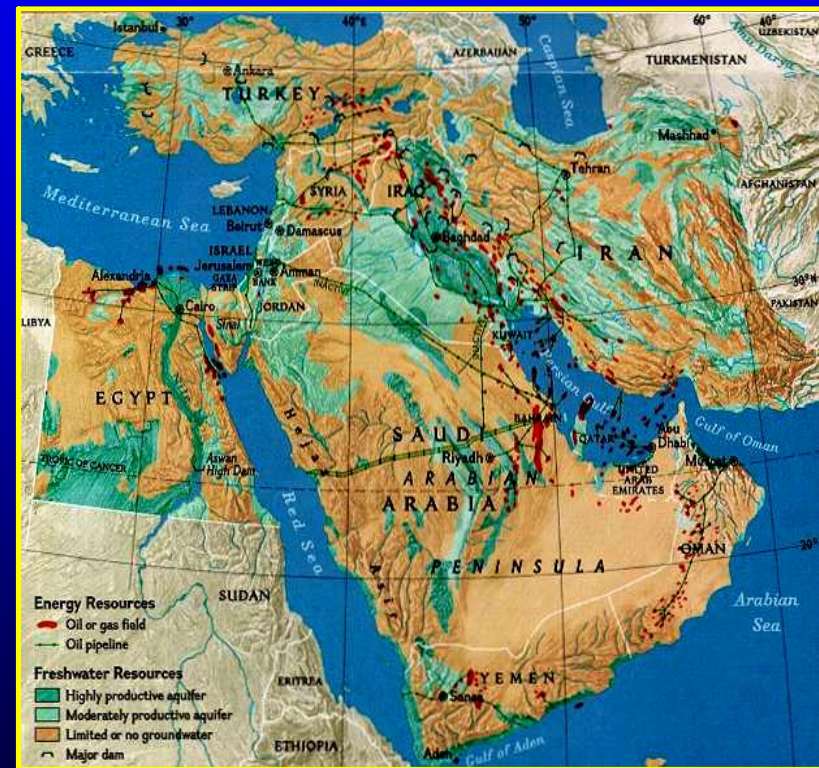
The Risk Saudi's Oil Output Faces: Their Oil Base Is Highly Concentrated In Old Fields

- 7 key oilfields have made up $\approx 90\%$ of total supply

Current Output
(estimated)

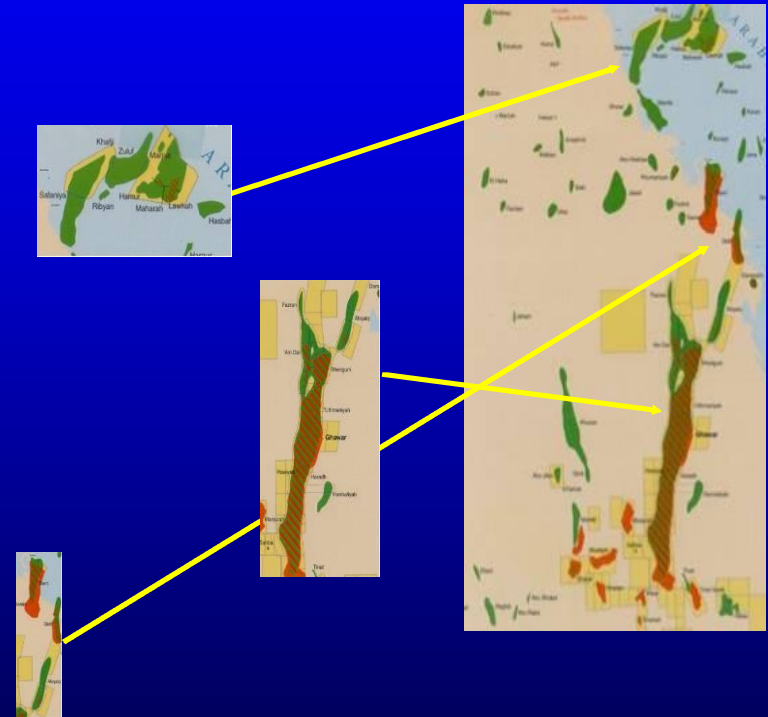
Million Barrels/Day

Ghawar	4.5 - 5.0
Safaniya	0.5 - 0.7
Abqaiq	0.4 - 0.6
Berri	0.3 - 0.5
Shaybah	0.5 - 0.6
Zuluf	0.5 - 0.7
Qatif	0.5 - 0.5
Others	<u>1.3</u> - <u>0.9</u>
Total	<u>8.5</u> <u>9.5</u>



Each Key Producing Field Faces Risk of Production Decline

- All key fields are extremely “mature”.
- All maintain high oil flows from small number of producing wells.
- Intense water injection has kept reservoir pressures artificially high.
- When reservoir pressures finally drop, oil output will plummet.
- There is now no way to gauge or monitor extent of timing of the risk.



Saudi Arabia's Oil Future Might Not Work As Planned

- Most long-term supply models assume Saudi Arabia will produce 20 to 30 million barrels per day by 2025 – 2030.
- 35 years of exploration found only small amounts of new oil.
- String of “new oil projects” occur in old oilfields with problematic production in 1970s.
- Many internal Saudi experts doubt Saudi oil output could safely exceed 12 million b/d.
- My worry is risk of production collapse from current levels.

‘The West is deluded to rely on Saudi oil’

Matthew Simmons doesn't look like a contrarian. He comes across as what he is: an oil-industry magnate. Over the past 20 years, the Texas-based investment bank he founded – Simmons & Co International – has guided countless blue-chip clients through oil deals worth \$60bn (£3.3bn), writes Liam Halligan.

Despite these credentials, Simmons holds controversial views that pit him against almost the entire Western oil establishment. In his London offices last week, he told me he is “deeply concerned” that Saudi Arabia's oil will run out.

“For decades, Saudi has been the most important producer on earth,” he says. “They have been the only country able to pump extra crude when the West needs it, and everyone just assumes that spare capacity will last.”

With oil prices above \$50 a barrel, having risen by 80 per cent this year, the West is indeed relying on yet more Saudi crude. “This is delusion,” says Simmons. “Saudi oil output may soon start declining – imminently, in my view, in the next six to 36 months.”

Simmons' warning is based on “a very close study of hundreds of technical reports” produced by the Desert Kingdom's own engineers. Saudi's oil capacity is “dangerously concentrated,” he says. “Six fields have yielded 95 per cent of all Saudi oil ever produced, with a single field – Ghawar – pumping 60 per cent. But the Saudis have pushed these fields hard. And when you push big fields, reservoir pressures fall.”

His analysis, if correct, is scary. It would exert severe

upward pressure on already sky-high oil prices – with devastating implications for financial markets and economic growth worldwide.

“But the conventional wisdom,” Simmons says, “that we can rely on Saudi oil indefinitely is driven only by ‘groupthink’ and vested interests.”

The Energy Information Administration, part of the US government, forecasts global oil demand of 120m barrels daily by 2025 – up 50 per cent on the current consumption of 80m. Over the same period, the EIA says, Saudi production will rise from 9m bpd to 22m. Put simply, in 20 years' time the world will rely on Saudi for 19 per cent of all oil production – a dramatic increase on the country's current 11 per cent share.

Having served on vice president Dick Cheney's energy task force, Simmons knows these forecasts well. “The EIA numbers are the global economy's energy roadmap,” he says. “But while their demand estimates are real, they basically invent the future production numbers as they go along.”

So what of US government claims that Saudi will pump 22m bpd in 2025? “If, by some miracle, they find some huge fields that have defied discovery for 50 years,” Simmons says, “it might happen. Then again, I could be living on the moon in 2025.”

“I would say the probability of me living on the moon is higher than Saudi reaching 22m barrels.”

Officially, the Saudis dismiss Simmons' analysis. “That is talking rubbish,” oil minister Ali Al-Naimi has said. So when I went from Sim-



Al-Husseini: forecast concerns

mons' office to meet Sadad Al-Husseini, I expected him to trot out the same line.

After all, until March, Al-Husseini was head of exploration and production at Aramco, the state-owned oil monolith which accounts for 97 per cent of Saudi's crude output. Yet, astonishingly, Al-Husseini lent some credence to Simmons' views.

“The question isn't ‘can we can pump 15m or 20m barrels daily?’,” he says. “The question is, how long it can be sustained? We could only manage 22m bpd for a very short time – maybe 10 years. And that would mean an awful lot of depletion, which isn't in the best interests of the global economy.”

What does Al-Husseini make of US estimates of future Saudi production? “These are US numbers, not ours,” he says. “The American production outlook is much too high.”

When I ask Al-Husseini where the EIA is going wrong, he echoes Simmons: “The EIA focuses only on demand. That

is why they overestimate not only future Middle East supplies but non-Opec and Russian supplies too.”

We agree the production outlook for the Middle East as a whole – which the EIA predicts will almost double, from 21m bpd today to 40m in 2025 – depends crucially on Iraq.

“The country does have substantial reserves,” says Al-Husseini. “But after years of neglect, it will take a long time for Iraq's oil infrastructure to make a significant contribution to global supplies.” How long? “I doubt they can exceed 3m barrels a day by the end of this decade.”

Al-Husseini refutes Simmons' claims that the Saudis have partly squandered capacity by pumping too quickly in the past. “The Kingdom's oil is managed in a highly professional manner,” he says. “But Simmons' concerns over US output forecasts are legitimate concerns.”

Where do these two very different oilmen think prices are going next? Simmons thinks prices are unlikely to ease. “This winter, global demand will considerably exceed supply,” he says. “So it is conceivable prices could fall by much.”

Again, Al-Husseini's view is similar. “I suspect prices around \$50 will be with us for a while,” he says. And then he issues his own Saudi-related warning. “The excess capacity is no longer there. That will mean more of the volatility and price surges. And the financial markets have yet to wake up to that.”

● Liam Halligan is Economics Correspondent at Channel 4 News

Source: The Sunday Telegraph, ‘The West Is Deluded To Rely On Saudi Oil’, October 31, 2004

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Many Recent Reports Assume Rosy Global Oil Outlook

- Unconventional oil reserves are believed to be supply panacea.
- CERA report assumes 16.4 million b/d new supply by 2010 (net of depletion?)
- Other optimistic reports assume high oil prices will create new supply.
- Others believe “ingenuity and technology” will add boundless new oil supplies.
- There is no solid data to support these optimistic beliefs.

Oil & Liquids Capacity to Outstrip Demand Until At Least 2010



Despite current fears that oil will soon “run out,” global oil production capacity is actually set to increase dramatically over the rest of this decade, according to a new report. As a result, supply could exceed demand by as much as 6 to 7.5 million barrels per day (mbd) later in the decade, a marked contrast to the razor-sharp balance between strong demand growth and tight supply that is currently reflected in high oil prices hovering around \$60 a barrel.

Press Release

June 21, 2005 | Press Release


Source: CERA

What Optimists Ignore

- Unconventional oil cannot easily replace high flowing oil:
 - high energy intensity to convert into useable oil;
 - flow rate/well small.
- Most “detailed” future supply reports:
 - assume all named projects work perfectly;
 - ignore declines of current production base;
 - Ignore rapid peaking of most new supplies.
- “New technologies” all occurred in last 30 years.
- Future technology blackboard is bare.

Urgency Of Energy Data Reform

- Important recent effort underway to mandate new era of data reform:
 - IEA; G-8; UN; IMF; all back this reform.
 - Data reform could be mandated immediately if all stakeholders said “yes.”




APERC/EUROSTAT/OECD-IEA/OLADE/OPEC/UN
JOINT OIL DATA EXERCISE

Country _____
Month _____ Unit _____

	Crude Oil		Petroleum Products					
			LPG	Gasoline	Kerosene	Gas/Diesel Oil	Fuel Oil	Total Oil
Production	0	Refinery Output	0	0	0	0	0	0
Imports	0	Imports	0	0	0	0	0	0
Exports	0	Exports	0	0	0	0	0	0
Stocks	Closing	Stocks	Closing	0	0	0	0	0
	Change		Change	0	0	0	0	0
Refinery Intake	0	Demand	0	0	0	0	0	0

- Timely field-by-field oil production data, well bore data and proven reserves by field (audited) would create solid supply data.
- The data would answer the risk/probability of approaching or passing sustained Peak Oil.
- Key oil supplies unwilling to adopt data reform need to be labeled “unreliable supplier”.

Peak Oil Risk Is Real And Serious

- Peak Oil could be at hand.
 - When it happens, world needs to go to “Energy War Footing”:
 - Transportation use of oil needs to be reduced within 5 to 7 year time span.
 - Energy cooperation framework needed.
 - Burst of energy R&D to invent new sources of energy.
 - If Peak Oil occurs and is ignored, it could create global tipping point.
- 

Passing Peak Oil Is A Major Event

THE STORY BOOK OF OIL



“Oil has become more and more necessary to everyone. At first it was used for medicine, for lamps, and for lubrication. Now, if the supply of oil were cut off, our manner of living would change completely until something to take its place was found.”

Foto S. Ballard

(Written in 1935 by Maud and Miska Petersham
when the world used 3.5 million barrels of oil each day)

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