

Energy In 2006: A Rough Ride Ahead

2006 New Zealand Petroleum
Conference

Auckland, New Zealand
March 6, 2006

by
Matthew R. Simmons
Chairman

Simmons & Company International

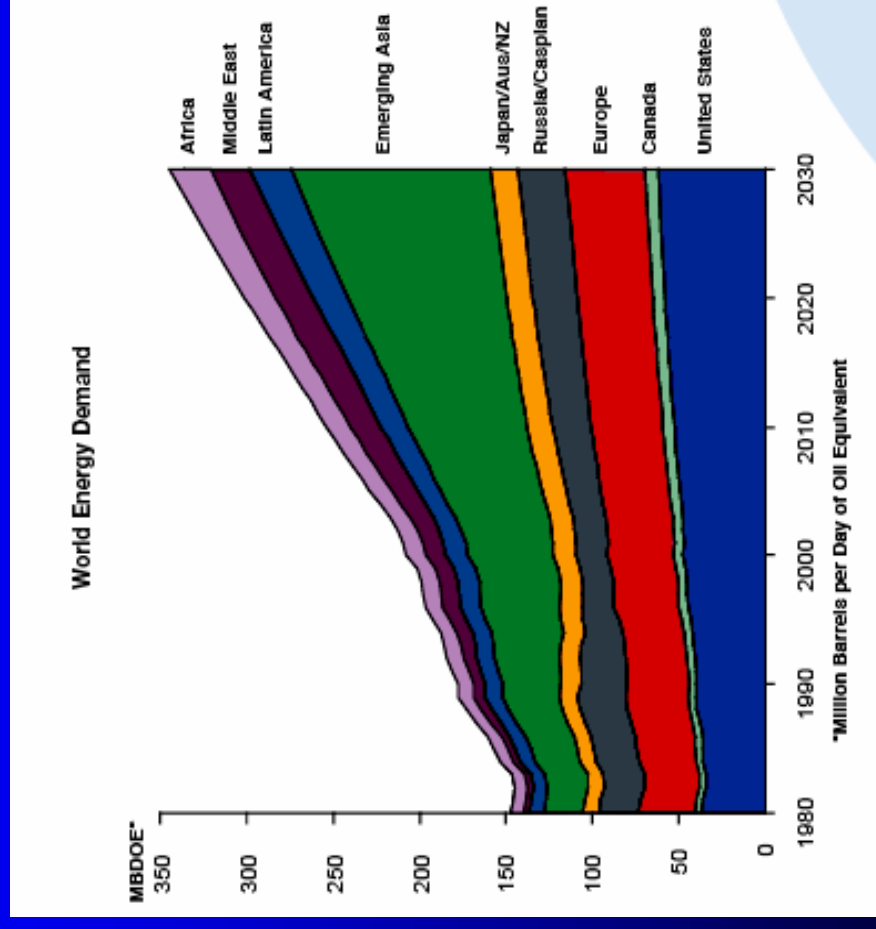
Danger Of Sailing Into A Uncharted Sea

- “Fasten your seat belts:
A Rough Ride Ahead.”
- “We are now where we
have never been.”
- “Houston, we have a
problem.”
- All are truism anecdotes
for Energy 2006.
- “Can you explain
“Uncharted Sea?”
(East China Normal University,
January 2004)



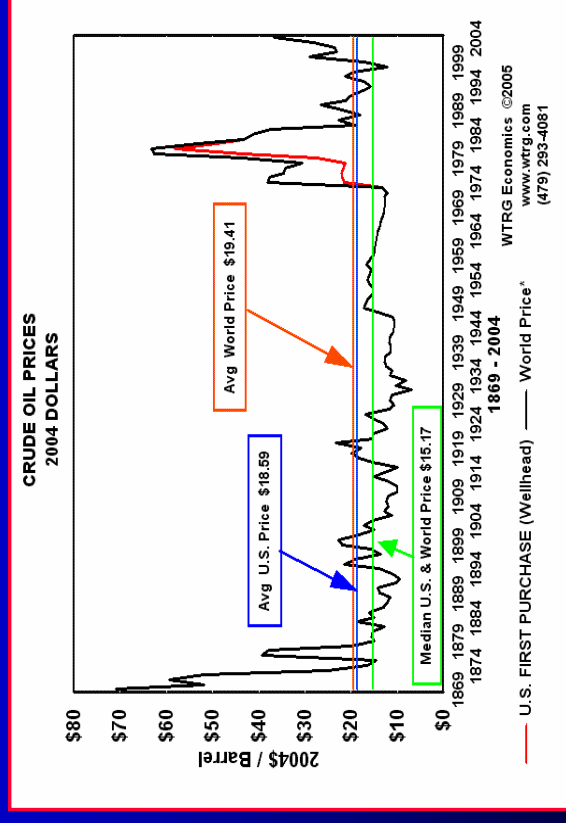
Energy In 2006: An Uncharted Sea

- Energy demand at record high.
- No signs of demand slowing down.
- Energy supply growth is slowing down.
- We have no spare/shut-in supply.
- Every drilling rig is at work.
- People assets are in decline.
- This is new territory: “An Uncharted Sea.”



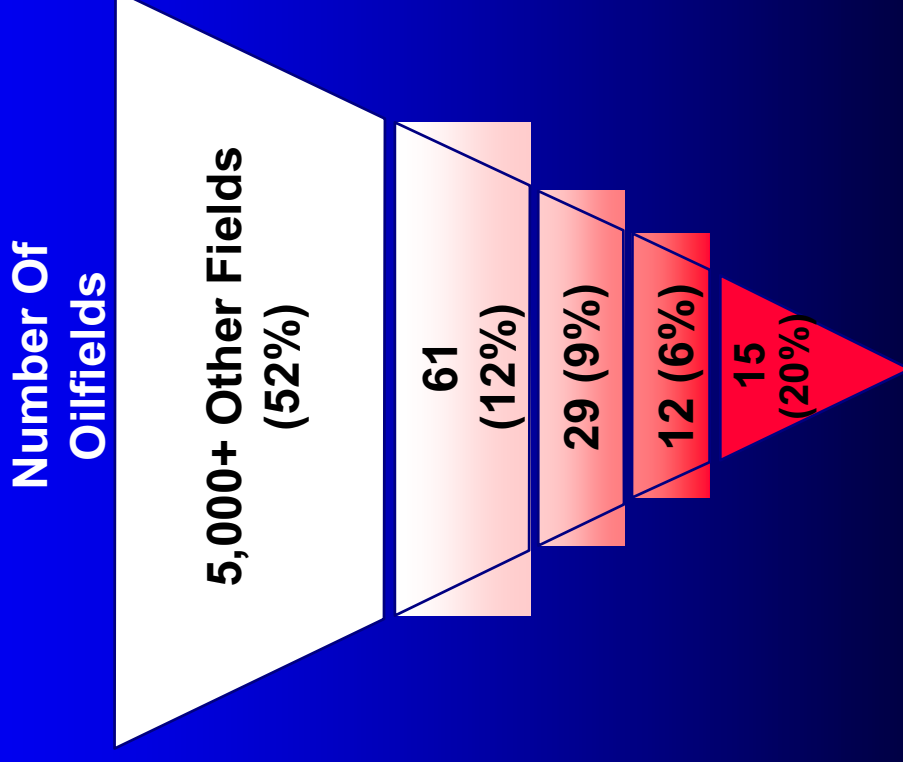
It Is Not Like 1973 Or 1979

- Both years saw shortages and enormous price spikes.
- Shortage were artificially induced (and correctable).
- Panic hoarding exacerbated the crisis.
- Major supply additions were “at hand”:
 - Western Siberian oil and gas
 - Alaska’s North Slope
 - North Sea
 - Massive nuclear plan construction boom
 - Plentiful coal
- There was no need to panic.



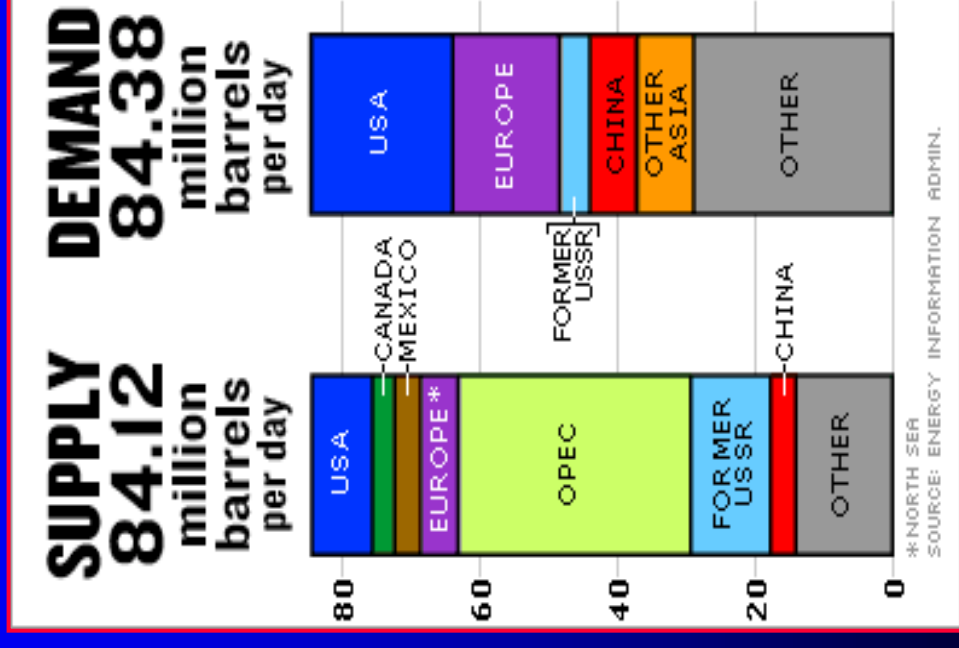
2006 Problem “A Clash Of Ages”

- Demand is still “young” and growing fast:
 - 80% of world just starting to use oil, gas and electricity
 - Prosperous world also using more energy
- Supply is “too old” and starting to decline:
 - 20% of world’s oil comes from 15 very old oil fields
 - 30% comes from 2,100 oil fields, average age is 20 – 30 years
 - 60% of natural gas supply in decline
 - Average decline rates ≈ 5% to 10% per annum
 - High quality black coal in decline



Energy's Insurance Policy Just Lapsed

- Having energy supply cushion (excess capacity) is "insurance."
- Spare capacity should be "1/4 of a tank's supply."
- Backlog of new projects is also important.
- There is no gauge for when demand needs to slow.
- There is no gauge for oil and gas inventories.
- There is no decline rate information.
- Other than SPR's, we have no insurance policy.

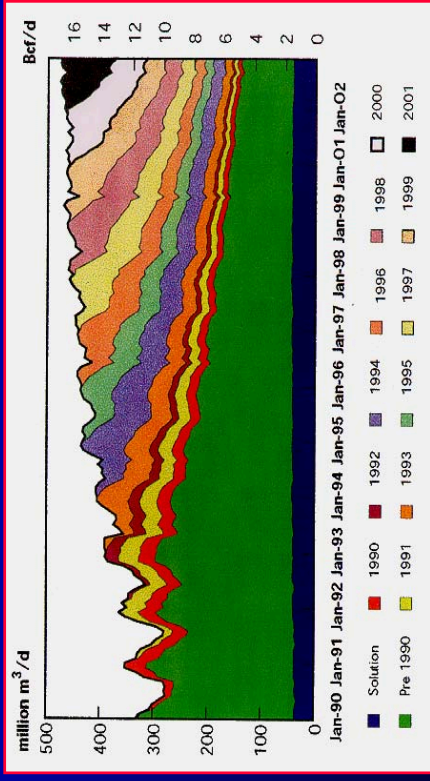
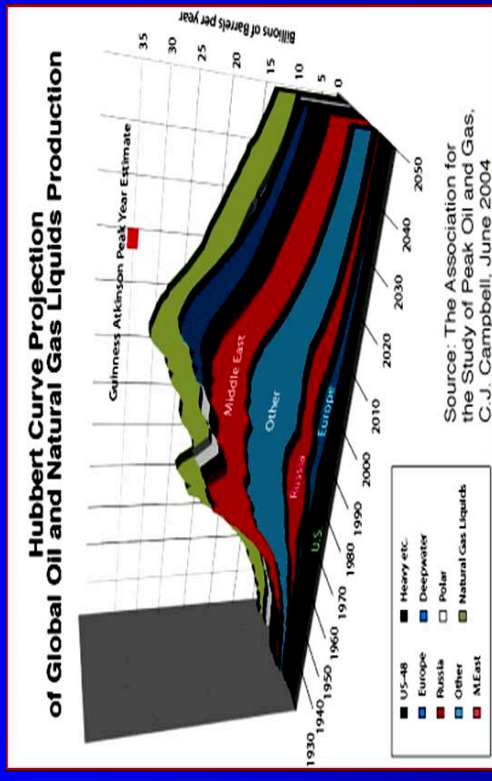


Too Much Oil and Gas Comes From Danger Zones

- Stable sources of oil and gas in decline:
 - USA – Mexico – Kuwait
 - Canada – China – Oman
 - North Sea – India – Syria
 - Australia – Argentina – Yemen
 - Indonesia – Columbia
- Future supply areas are in “danger zones”:
 - Iran – Nigeria – Libya
 - Iraq – Venezuela – Algeria
 - Saudi Arabia – Egypt

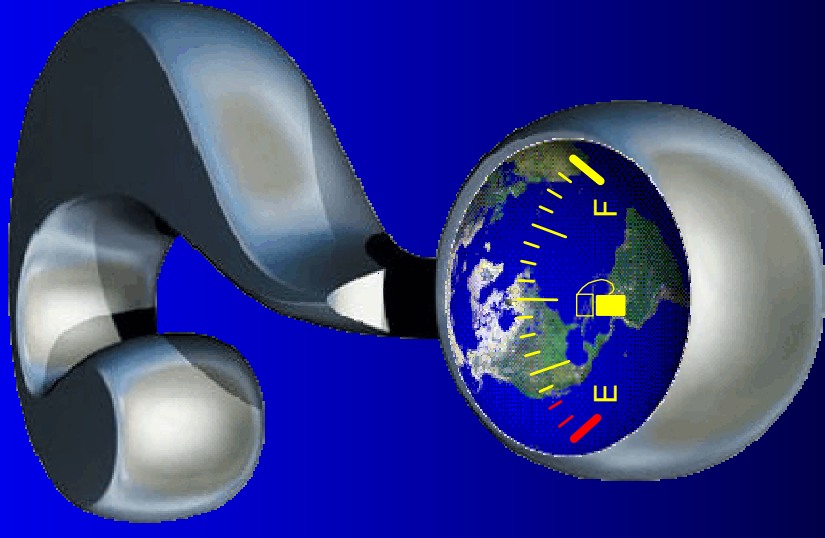
Quality Of Energy Supplies Is Depleting

- Light sweet crude oil is in decline.
- High quality methane (natural gas) is in decline.
- High BTU black coal is in decline.
- Replacing these sources are:
 - Heavy and sour crude
 - Sour gas
 - Bitumen/tar sands
 - Tight gas/coal bed methane
 - Brown coal and rocks



Scarcity Popping Up Everywhere

- Scarcity is emerging across energy's value chain:
 - Promising new exploration frontiers
 - Large new reservoirs to tap quickly
 - Drilling rigs and oil service assets
 - Expandable pipeline capacity
 - Refineries to handle deteriorating crude qualities
 - Tankers
 - Skilled people
 - Tires and railroads to ship tar sands and coal
- Scarcity will get far worse before it gets better.
- Is “getting better” a realistic possibility?



Time Is Now An Enemy

- Over time, all bottlenecks might get fixed.
- Over time, current supply gets increasingly older.
- Replacing 3,000 old drilling rigs will take decades.
- Over time, current average decline rates will accelerate.
- 70% - 80% of skilled energy employees will retire in the next 15 to 20 years.
- Training skilled energy employees take decades.
- “Has the clock” become a ticking time bomb?



The Rich/Poor Gap Equals Energy Instability



- Too much of global population is too poor.
- OPEC population is 1% rich/99% poor.
- 2 billion people's prime energy source is dung and charcoal.
- Emerging economies are creating inexhaustible energy demand.
- The poor now want to share in energy riches:
 - The oil curse issue
 - Movement to emancipate the Niger Delta is “poster child” of rich/poor issues

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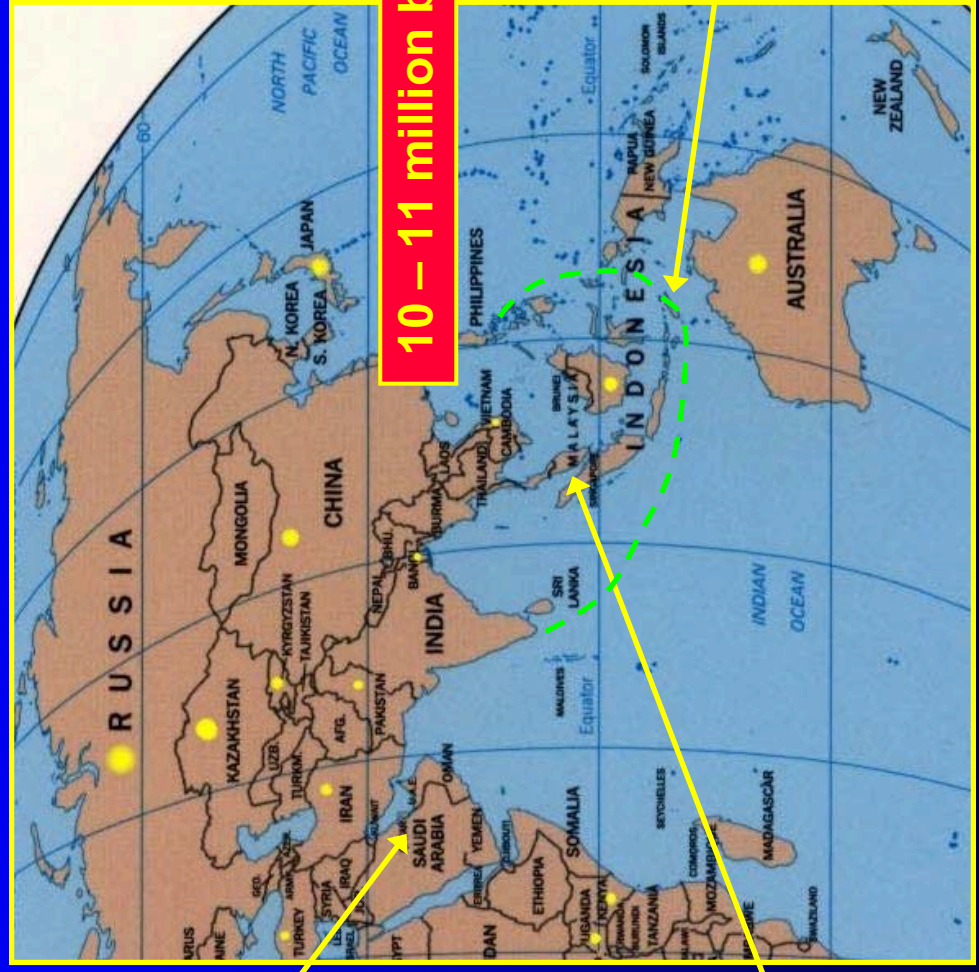
The Two Critical Global Flash Points

1. Abqaiq Oil Processing Plant

6 million barrels oil per day

10 – 11 million barrels oil per day

Alternate route add 7 to 12 days transportation



2. Strait of Malacca

Money Is No Object

- Rising energy prices have created enormous energy wealth:
 - Key oil producing regions no longer need “Big Oil”
 - “Big Oil” is coining free cash
 - Oil service inflation is creating real oil service free cash
- Money does not easily translate into more energy supply.
- All realistic energy source are now “economical.”



Simmons And Company's Peek Into Oil Supply

- Rumors abound that new oil supplies will soar over the next 3 to 4 years.
- These rumors are now over a decade old.
- Adding up real score cards casts doubts on this pending glut.

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FRIDAY, FEBRUARY 3, 2006

We're not running out of oil says record-breaking Shell

BY CHRISTOPHER HOPE
INDUSTRY EDITOR

ROYAL Dutch Shell yesterday suggested it is confident the US president George W Bush's administration will not force that America should lose its addiction to oil, adding that it is not planning to start looking to running out of black gold.

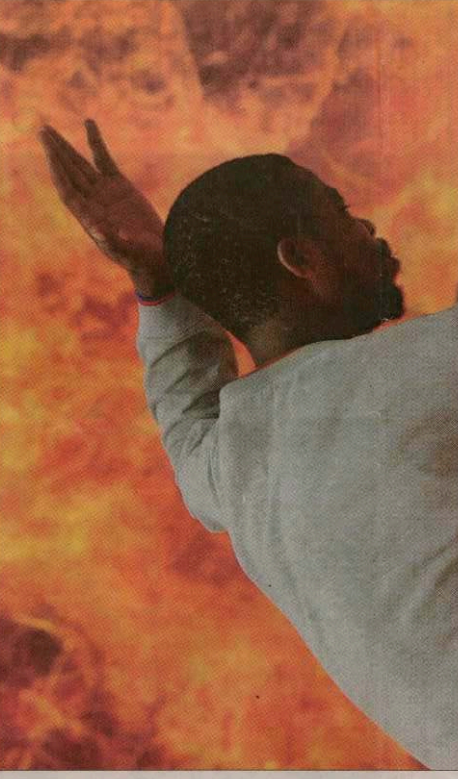
The news came as Shell, the world's third biggest oil and gas company, reported a record profit for a British-listed company of \$22.9-billion (€16.1bn) on its first day of trading on the London stock exchange, after a year of strong refining margins. This is likely to be the \$21.7-billion forecast by analysts.

Jeroen van der Veer, Shell's chief, said: "President Bush has to run Shell's business and we have to run his. It is a huge energy challenge in the world. We have plenty of oil reserves, but we have to be about proved resources."

Shell was feeling "very good" about its reserves, finding plenty of oil and gas by developing oil fields in the Gulf of Mexico and gas production was nowhere near peaking because of the potential of shale gas. He said: "There is the theory of peak oil, but the big worry is that we will run out of oil. We don't know where the peak will come with oil sands. With shale gas, the peak has not started. There will be many peaks in many time frames."

Shell's production last year peaked at 3.5m bpd (billion barrels per day) in the Gulf of Mexico knocked out some plants in Texas. Production last year peaked at 3.65m bpd in 2006, it added.

DOUG COLEMAN



Fire-ups a man checks the flames at Uruoguan station near Warri on the Niger delta. Unrest in Nigeria cost Shell more than 1m barrels of oil last month although Shell is suggesting it only replaced six or seven of them. The company's refining capacity is 1.5 million barrels a day. A lingering concern was local unrest affecting the company's interests in Nigeria. It struck a target of seven million barrels of oil production in 2004. Despite a "big cut" prospects - containing more than 100m barrels of oil and gas - were not as bright as they once were. Shell is increasing capital drill between 15 and 20 sites. UK petrol pumps. In UK tax: podcast@telegraph.co.uk

Merrill wins adviser role at Guardian

BY ROBERT MILLER
CLASPAIN Media Group
publisher of the bookmaking
Guardian and Observer

newspapers, has appointed
Lynch to advise on strategic
options. This could lead to a
£1.3-billion sale of the
company, which includes the
flagship Auto Trader title.

Chief executive who is to
stand down in July, said:
"This assistance, which will
run for the next few months,
will focus on potential opportunities for
future development. Daily
Telegraph revealed that GMG
was considering the possible
sale of the Observer and
Division, which owns 70 titles
including Auto Trader, Bike
Trader and Truck Trader.

£1.5-billion on which it might
secure a better return. The
company is looking to sell titles
which are not profitable in
Scotland and several jazz FM
licenses, could also be sold.
Guardian directors, Merrill
Lynch will consult the
trustees of the Scott Trust, the
trust, founded in 1936, has
one task - "to secure the
continued existence of the
Guardian in perpetuity."

The latest financial results
showed the company's
Media arm rose 50p to
£365m last year while
operating profits before tax
rose to £117m. The Guardian is
looking to raise money following last
year's £1.1-billion sale of the
British format and a similar
rework of the Observer last
month. Losses at GMG's
last year deepened to £48.3m
from £9.2m in 2004, as the

Business Comment B2
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Major OPEC Projects

OPEC Production Decline Rate Sensitivity Table (mb/d)						
Decline	2006	2007	2008	2009	2010	2010
2.5%	31.7	32.6	33.4	34.9	36.3	36.3
5.0%	30.9	31.1	31.1	31.9	32.6	32.6
7.5%	30.1	29.6	29.0	29.1	29.2	29.2
10.0%	29.3	28.1	26.9	26.5	26.2	26.2

■ OPEC has 60 major projects over the next 5+ years yielding approximately 2 million barrels per day.

■ An average managed decline rate of 6.6% would completely offset all production gains.

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Country	Project	Major OPEC Projects	Start/US	Peak/Output	API
Iran	South Pars al Layer (Khavaz)	New development	2006	300	Light
Saudi Arabia	Haradh - 3	NIOC	2006	300	Medium
Iran	Rag & Saif/Bangestan	New development	2006	200	Light
Nigeria	Eria	New development	2006	150	Light
UAE	Bu Hesa, Sahil	ExxonMobil	2006	150	Light
Iran	South Pars P 6 and B	ADNOC	2006	120	Medium/Light
Iran	Darrehun, Masjed, Suleiman	Statoil	2006	110	Light
UAE	NEB Phase 1	ENI	2006	110	Light
UAE	NEB Phase 2	ExxonMobil	2006	110	Medium
UAE	Dolphin, Al Khatij	ADNOC	2006	100	Light
UAE	ENI/US Korean Co.	New development	2006	100	Light
UAE	Asab	ENI/US	2006	100	Light
Algeria	In Amenas	ADNOC	2006	50	Light
Nigeria	BP/Statoil	Shell	2006	50	Light
EA	Ureca	Unocal	2006	30	Light
Indonesia	West Seno # 2		2006	30	Light
Total 2006				1,980	
Saudi Arabia	AFK	Saudi Aramco	2007	500	Medium
Saudi Arabia	Khurayyah NGLs	Saudi Aramco	2007	300	NGL
Iran	Salmeh, Fozcozan, Daroud	New development	2007	150	Light
Algeria	Block 208	Total, Petro Iran	2007	125	Medium
Qatar	Iddi al Shargi North & South Dome	New development	2007	100	Light
Kuwait	Sabriya	Occidental	2007	50	Light
Qatar	Ras Gas	KOC	2007	45	Light
Algeria	Berkine Block 405a	ExxonMobil	2007	40	Light
Qatar	Al Rayyan	Burjigan	2007	30	Light
UAE	Hawala	CP, OGC/Minerals	2007	30	Medium/Light
UAE	B140 / B150	KPC	2007	30	Medium
Total 2007				1,380	
Saudi Arabia	Shaybah	Saudi Aramco	2008	500	Extra/Light
Saudi Arabia	Hawiyah (NGLs, Ethane)	Saudi Aramco	2008	370	NGL
Nigeria	Agbani	New development	2008	250	Light
Qatar	Ras Gas	CHX	2008	150	Light
Saudi Arabia	Al-Rafiq	ExxonMobil	2008	100	Light
Saudi Arabia	Al-Rafiq	New development	2008	100	Light
Qatar	Al-Rafiq	SAIPAM	2008	100	Light
Qatar	AKG other phases	Saudi Aramco	2008	80	Light
Qatar	QatarGas II	New development	2008	80	Light
Indonesia	Jenuk	ExxonMobil	2008	50	Light
Indonesia	Offshore Kalimantan	Santos	2008	50	Light
Qatar	Al Rayyan	JV	2008	50	Light
Qatar	Al Rayyan	Andariko	2008	50	Heavy
Qatar	Al Rayyan	CP, Total	2008	15	Light
Qatar	Al Rayyan	First Catagary	2008	15	Light
Total 2008				1,910	
Saudi Arabia	Khurais	Saudi Aramco	2009	1,200	Light
Qatar	Kusk-Hosseinih	NIOC	2009	300	Heavy
Qatar	Al-Shaheen	Upgrading	2009	225	Medium
Nigeria	Akpo	Manerik	2009	220	Light
UAE	Zakum, UMM	Total	2009	200	Light
Iran	Asadegan (south)	ExxonMobil, ADCO	2009	150	Light
Iran	Asadegan (north)	ExxonMobil, ADCO	2009	150	Heavy
Algeria	Rhoude El Baquel	ENI	2009	100	Light
Algeria	Algeria	Upgrading	2009	100	Light
Iran	South Pars P 6 to 10	Sonatrach	2009	80	Light
Indonesia	Java Sea	New development	2009	50	Light
Algeria	Gassi El Agreb	JV	2009	15	Light
Total 2009				2,660	
Saudi Arabia	Manifa	Saudi Aramco	2010+	600	Heavy
Qatar	Prudhoe	KPC	2010+	450	Medium
Iran	Yadavaran	NIOC/JV	2011	300	Medium
Nigeria	Copp	New development	2010	170	Light
Indonesia	Likot/Usan/Togo	ExxonMobil	2010	150	Light
Nigeria	Bonga SW	Total	2010	125	Light
Iran	Azadegan (north) phase II	Shell	2012	110	Light
Indonesia	Jenuk-2	New development	2010	100	Heavy
Algeria	Zarzaitine	Santos	2010	75	Light
Algeria	Zarzaitine	Upgrading	2010	15	Light
Total 2010+				1,920	

Saudi Production Projects

Saudi Arabia Major Projects

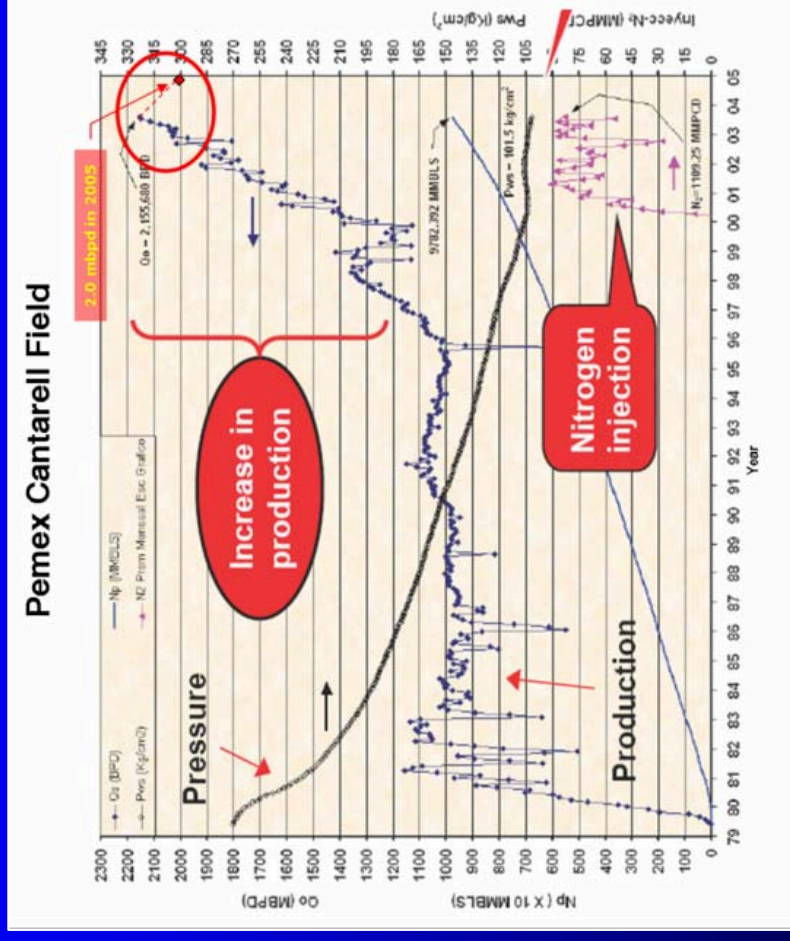
Country	Project	Type	Start-Up	Peak Output
Saudi Arabia	Harath - 3	Upgrading	2006	300
Saudi Arabia	Abu Hadriya, Al Fadhilli, Khursaniyah (f	Upgrading	2007	500
Saudi Arabia	Khursaniyah NGLs	New development	2007	300
Saudi Arabia	Shaybah	Upgrading	2008	250-500
Saudi Arabia	Hawaiyah (NGLs, Ethane)	New development	2008	370
Saudi Arabia	Nuayyim	Upgrading	2008/2009	100
Saudi Arabia	Khurais	Upgrading	2009	1200
Saudi Arabia	Manifa	New development	2010+	300-600

Saudi Production Decline Rate Sensitivity Table (mbr/d)					
Decline	2006	2007	2008	2009	2010
0.0%	10.0	10.5	11.4	12.5	13.3
2.5%	9.7	10.0	10.7	11.5	12.0
5.0%	9.5	9.5	10.0	10.5	10.9
7.5%	9.2	9.1	9.3	9.7	9.8
10.0%	9.0	8.6	8.7	8.9	8.8

- Saudi Arabia hopes to expand production capacity by ~2 to 12.5 million barrels per day by 2009.
- Saudi drilling activity doubled over the past year (90 working rigs) and is expected to reach 120 rigs during 2H'06.
- Saudi's announced major projects include about 3.0 to 3.3 million barrels per day of incremental gross production.
- 2/3 of incremental production is upgrading existing fields 1/3 from new development.
- Assuming Saudi Arabia's current production of 9.5 million barrels per day, spare capacity of 1 million barrels per day new capacity adds of 3.2 million barrels per day through 2009, a base decline rate of 2.5% would allow Saudi Arabia to meet its target of 12.5 million barrels per day.
- Differing views on Saudi Arabia's base decline rate, range from 5% to 12%.
- A managed decline rate higher than 2.5% would result in Saudi Arabia missing it's target.

Mexico: Cantarell Field (#2)

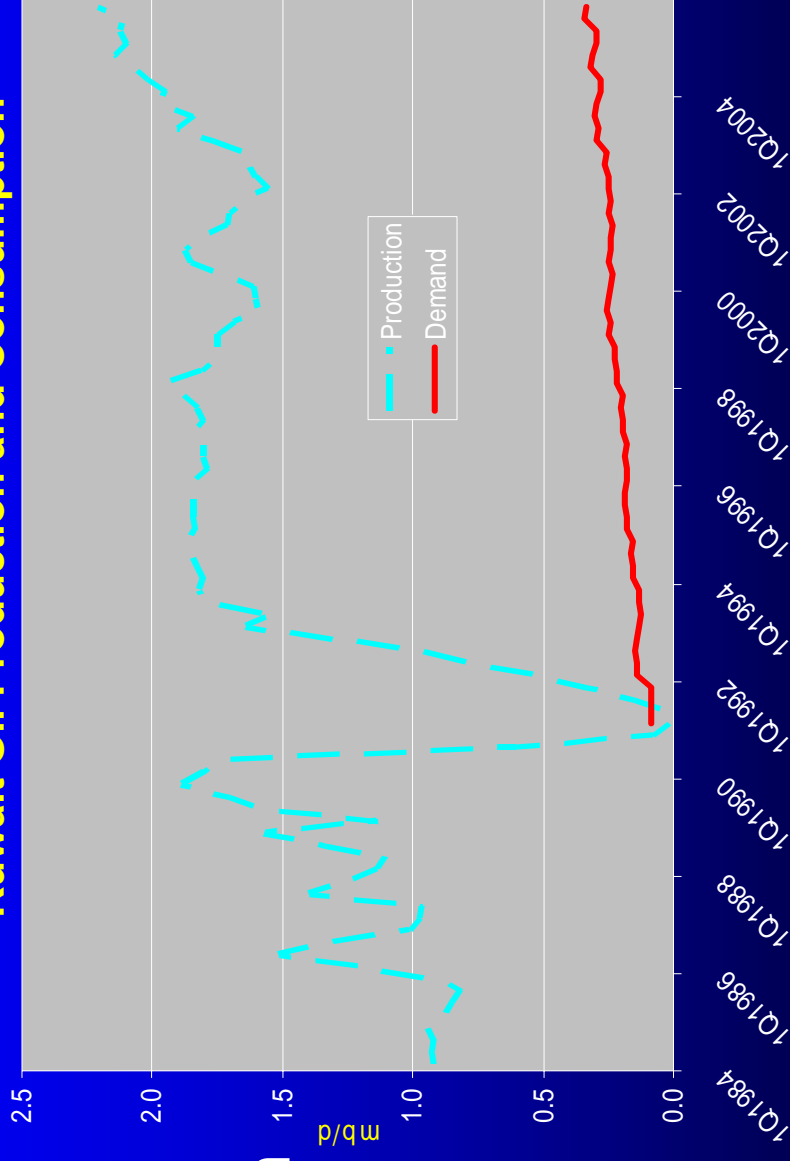
- World's second largest oil producing field (discovered 1976).
- Produced ~1 million barrels per day from 1980 to 2000.
- Tertiary recovery accelerated production, which peaked in 2004 at 2.2 million barrels per day.
- Pemex is expecting a decline rate of about 15% (~200-300 kb/d per year).



Kuwait: Burgan Oil Field (#3)

- World's third largest producing oil field (discovered 1938).
- Production peaked in 2005 (2.0 million barrels per day) Expected to decline going forward.
- Represents 68% of Kuwait's current production, 63% of proven reserves and 42% of probable and possible reserves.

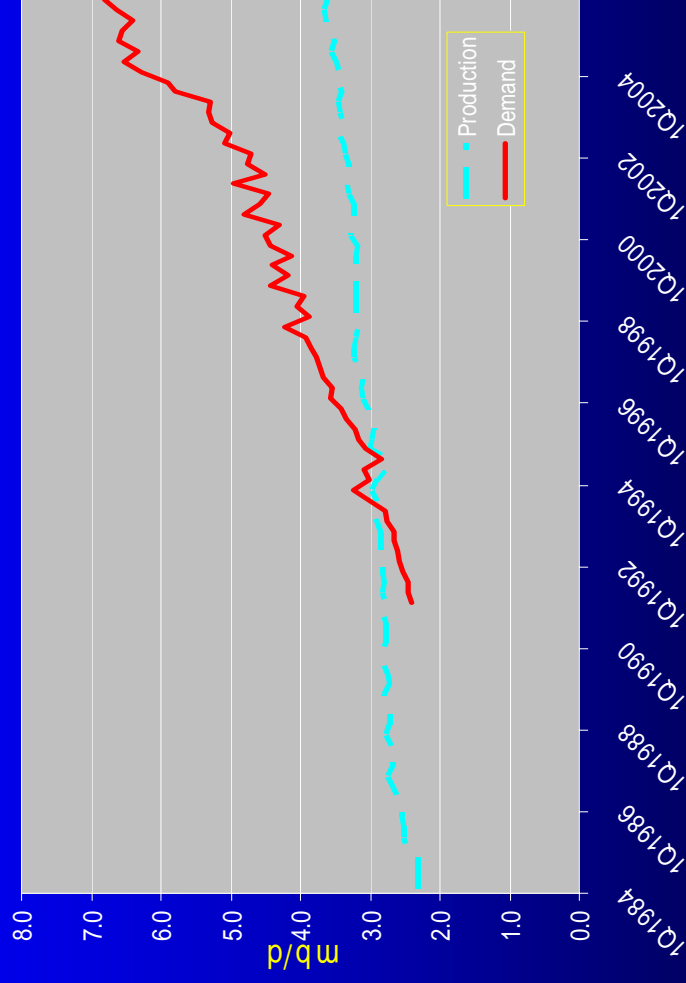
Kuwait Oil Production and Consumption



China: Daqing Oil Field (#4)

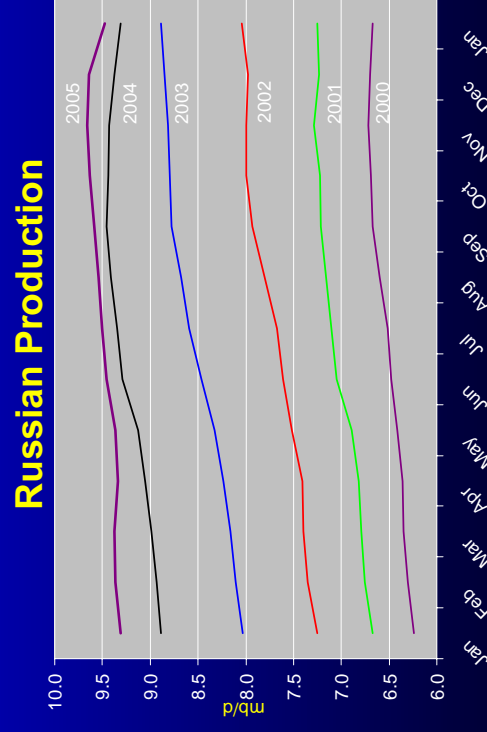
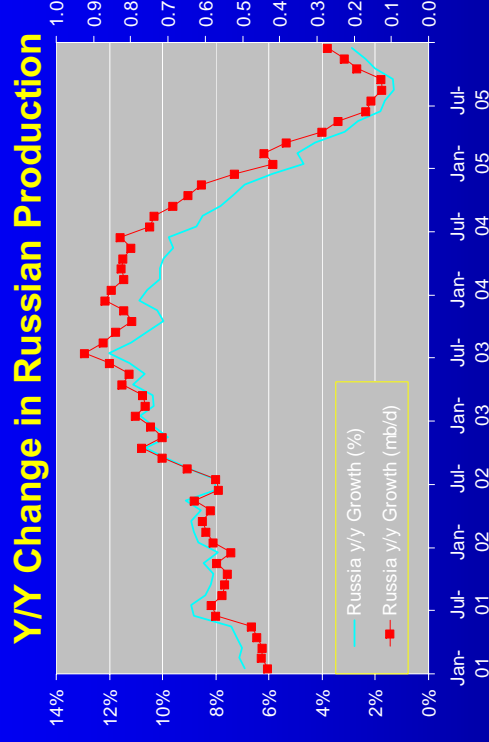
- World's fourth largest producing oil field (discovered 1959).
- Peak production exceeded 2 million barrels per day.
- Production was >1mb/d for 27 years prior to 2003.
- Production declined 8% in 2004 (902 kb/d-25% of China's total production), followed by a 7% fall in 2005 (850 kb/d).
- China projecting 840 kb/d through 2010 and 800 kb/d through 2020 (optimistic?).

China Oil Production and Consumption



Russian Production Profile

- Russian production growth, the only secular oil growth over the 1999 – 2004 slowed markedly from 12% in mid-2003 to less than 3% currently.
- 2005 output was up 2.7% y/y. Estimate for 2006 calls for 250 – 300 kb/d (~2.5%) growth.
- Putin's renationalizing of the Russian oil industry, as well as a punitive tax regime and uncertain regulatory environment, are limiting the attractiveness of upstream investments in Russia.
- XOM's Sakhalin project hopes to reach capacity of 250 kbd by end of 2006.



Africa Oil Supply

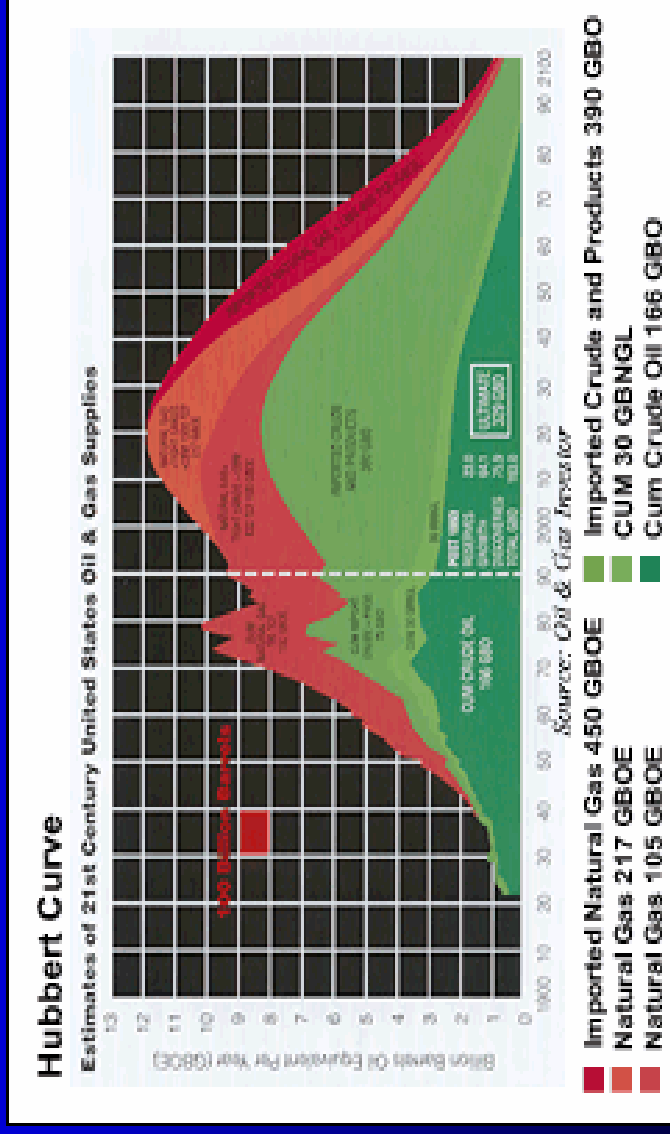
- An important area of growth in '06
 - 421 kbd non-OPEC Africa (54% of 780 kbd ww total)
 - 240 kbd Angola (57% of non-OPEC Africa)
 - 143 kbp in Nigeria
- Future project delays are likely:
 - Since 2001, 11 major West Africa projects delayed
 - Average delay: 3.6 years
 - Average development time: 9.2 years
- Existing field “managed” decline rates are significant:
 - 6.8% per annum in Angola
 - 8.9% per annum in Nigeria

Country	Project	Discovery		Targeted		Capacity kbd
		Year	Startup	Year	Startup	
Nigeria	Bonga	1996	2005	2005	200	
Angola	Kizomba B	1997	2005	2005	250	
Angola	Sanha-Bomboco	<1998	2005	2005	100	
Angola	BBTL	1998	2005-06	2005-06	200	
Nigeria	Eirha	1999	2005-06	2005-06	150	
Mauritania	Chinguetti	2001	2006	2006	75	
Angola	Dalla	1997	2006	2006	240	
Angola	Greater Plutonio	1999	2007	2007	200	
Angola	Kizomba C	2000	2007	2007	250	
Angola	Rosa	1998	2007	2007	65	
Nigeria	Agbami	1999	2008	2008	250	
Nigeria	Akpo	2000	2008	2008	225	
Nigeria	Bonga SW	2001	2008	2008	125	
Angola	Landana Tombua	1998	2008	2008	150	
Congo	Moho-Bilondo	1995	2008	2008	90	
Angola	Negage	2002	2008	2008	75	
Nigeria	Bosi	1996	2009	2009	120	
Angola	Kizomba D	2000	2009	2009	125	
Angola	Lirio	1998	2010	2010	65	
Angola	Perpetua-Zinia-Acacia	2000	2010	2010	125	
Angola	Plutao-Saturno	2002	2010	2010	200	
Nigeria	Usan	2002	2010	2010	150	
						3,430

kbd	SCJ Forecast										Change ('06 vs. '05)			
	2004	1Q'05	2Q'05	3Q'05	4Q'05	2005	1Q'06	2Q'06	3Q'06	4Q'06	2006	SCI	IEA	Diff
Angola	988	1,123	1,145	1,336	1,352	1,240	1,444	1,444	1,460	1,572	1,480	240	234	6
Sudan	300	310	330	340	392	343	490	522	545	570	532	189	189	(0)
Mauritania	0	0	0	0	0	0	0	0	20	40	15	15	52	(37)
Other	2,116	2,089	2,094	2,141	2,126	2,113	2,111	2,096	2,082	2,067	2,089	(24)	54	(78)
Non-OPEC Africa	3,404	3,522	3,569	3,817	3,870	3,696	4,045	4,062	4,107	4,249	4,116	421	529	(108)
Nigeria	2,513	2,551	2,622	2,652	2,649	2,619	2,711	2,725	2,803	2,808	2,762	143		

Oil Supplies Are Now Peaking

- USA's oil peak is Case Lesson 1.
- North Sea peaking Case Lesson 2.
- Many other peak supply cases got ignored:
 - Kuwait
 - Australia
 - Iran
 - Egypt
 - Iraq
 - Oman
 - Argentina
 - Syria
 - Columbia
 - Etc., etc.
- Best medicine to fight depletion is drilling more wells.
- Rig shortage used up this “fix.”



Natural Gas Is Now Peaking

- Conventional natural gas production is entering decline:
 - USA case lesson: Peaking happened in 1973
 - Siberian case lesson: Uruguay peaked in 1987
 - UK case lesson: Gas production entering a tail spin
- Most “stranded gas” has never been discovered:
 - Vast gas resources are still “unexplored”
 - Vast gas frontiers are “Edge of Envelope” experience
 - Orem Lange
 - Shtokman
 - North Field/South Pars

The Crisis Is Simply “The Gap”

- Peaking of oil and gas does not mean we “ran out.”
- It does mean “no more growth.”
- Demand needs to grow:
 - 2025 global oil demand needs to exceed 115 to 125 million barrels per day
 - Demand for natural gas and electricity needs to rise faster
 - Assumptions underpinning demand are too conservative
- Use of energy cannot exceed supply.
- The Gap is the crisis.

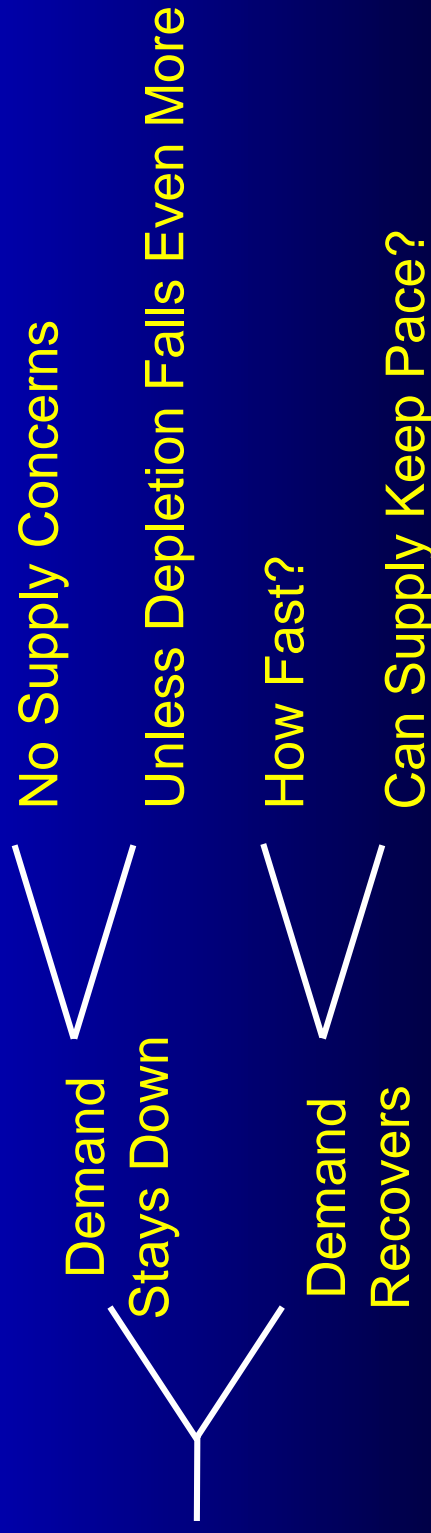
Prioritizing Flash Points

- It is hard to list “the top ten” supply problems.
- List changes by the week:
 - Iran’s nuclear desire and their oil card
 - Russia’s Ukrainian/Georgia/Italy gas crisis
 - MEND in Nigeria
 - Terrorists at Saudi’s Abqaiq Oil Processing Plant
 - Bad weather in the Black Sea
 - Chavez and PdUSA
 - Mexico’s Cantarell Field



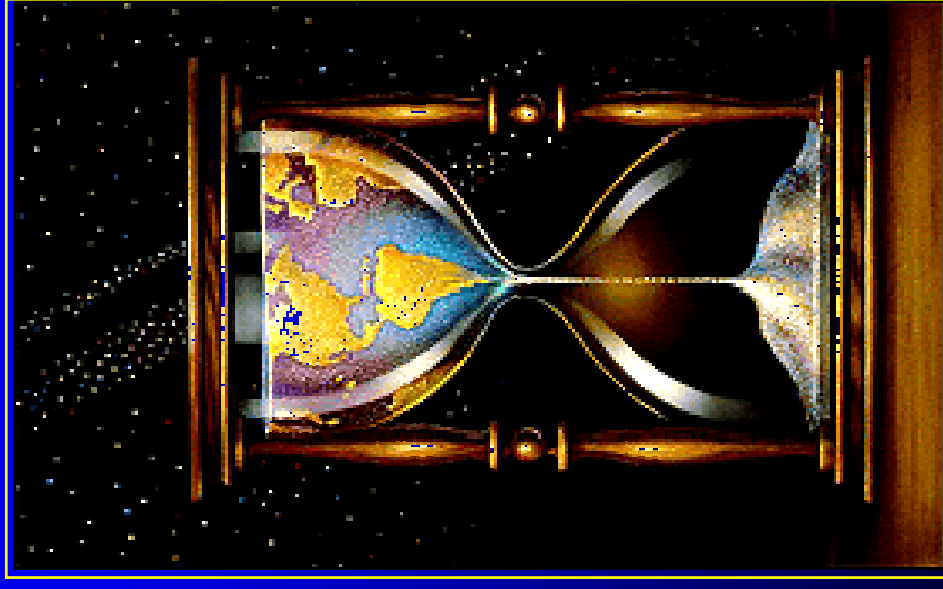
These Problems Were Predictable

- In October 1998, I spoke in Perth at SPE Asia/Pacific Conference.
- \$10 oil was deemed to be a new ceiling for oil.
- My comments:



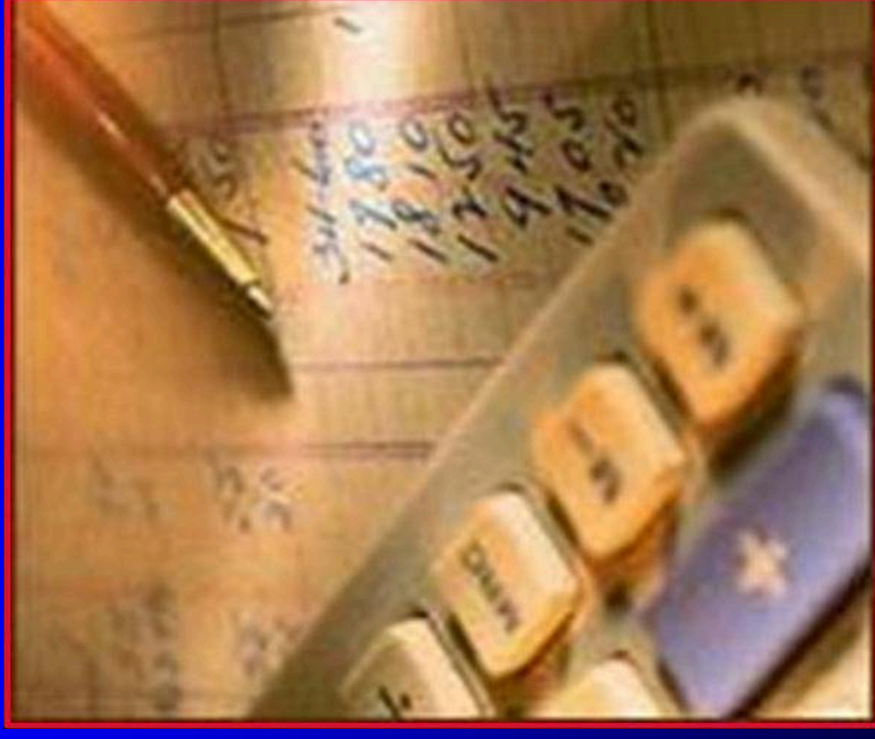
Have We Run Out Of Time?

- Time is the enemy.
- Denial could create a terminal crisis.
- The world can cope with Peak Oil if we want too.
- “We” might not be able to cope with Peak Gas.
- The race: Waking up in time vs. denial (creating “Peace in Our Time” mentality).



Energy Data Reform Is First Step To A Fry

- Urgent need to create quarterly reports for all heavy oil and gas fields:
 - Average quarterly production
 - Number of producing wellbores
 - Average production per well trend analysis
 - Proven reserves by field
- This data is equivalent of MRI/cat scan/biopsy for cancer patient.



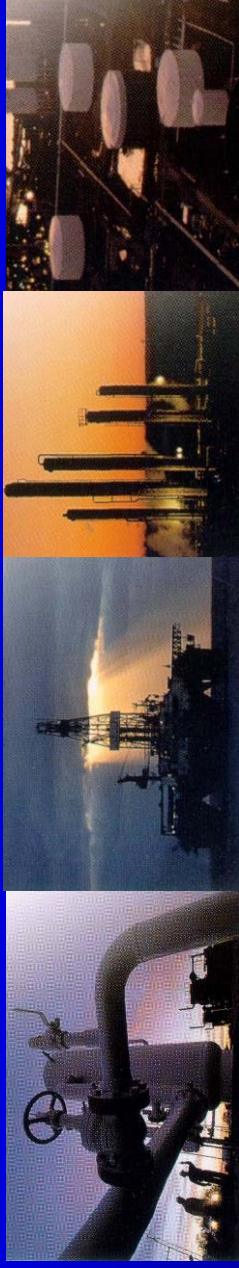
Without Data Energy Debate Rages On

- So far, Peak Oil debate growing in intensity and passing.
 - The optimists have faith in optimism, technology, hard work and market efficiencies
 - The pessimists struggle to interpret fuzzy and often bad data
- The debate has become “I believe” (theological).
- Peak Oil is likely to overtake climate change is world’s biggest debate.

After Twilight Comes Darkness And Hopefully A New Dawn

- Twilight is approaching for fossil fuel era.
- Twilight creates illusion of best light of the day.
- Suddenly twilight fades into darkness.
- It is always darkest before the dawn.
- If the world solves our energy crisis, 21st century will have a new dawn.
- If crisis is ignored, we will enter a dark age.

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