Oil & Money 2007

Shifting Power in the Global Oil Industry

Long-Term Oil Supply Outlook: Constraints on Increasing Production Capacity

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INTERNATIONAL Herald Tribune THE WORLD'S DAILY NEWSPAPER | iht.com

Energy Intelligence

A Detailed Assessment of Global Oil Capacity and Prices Through 2030

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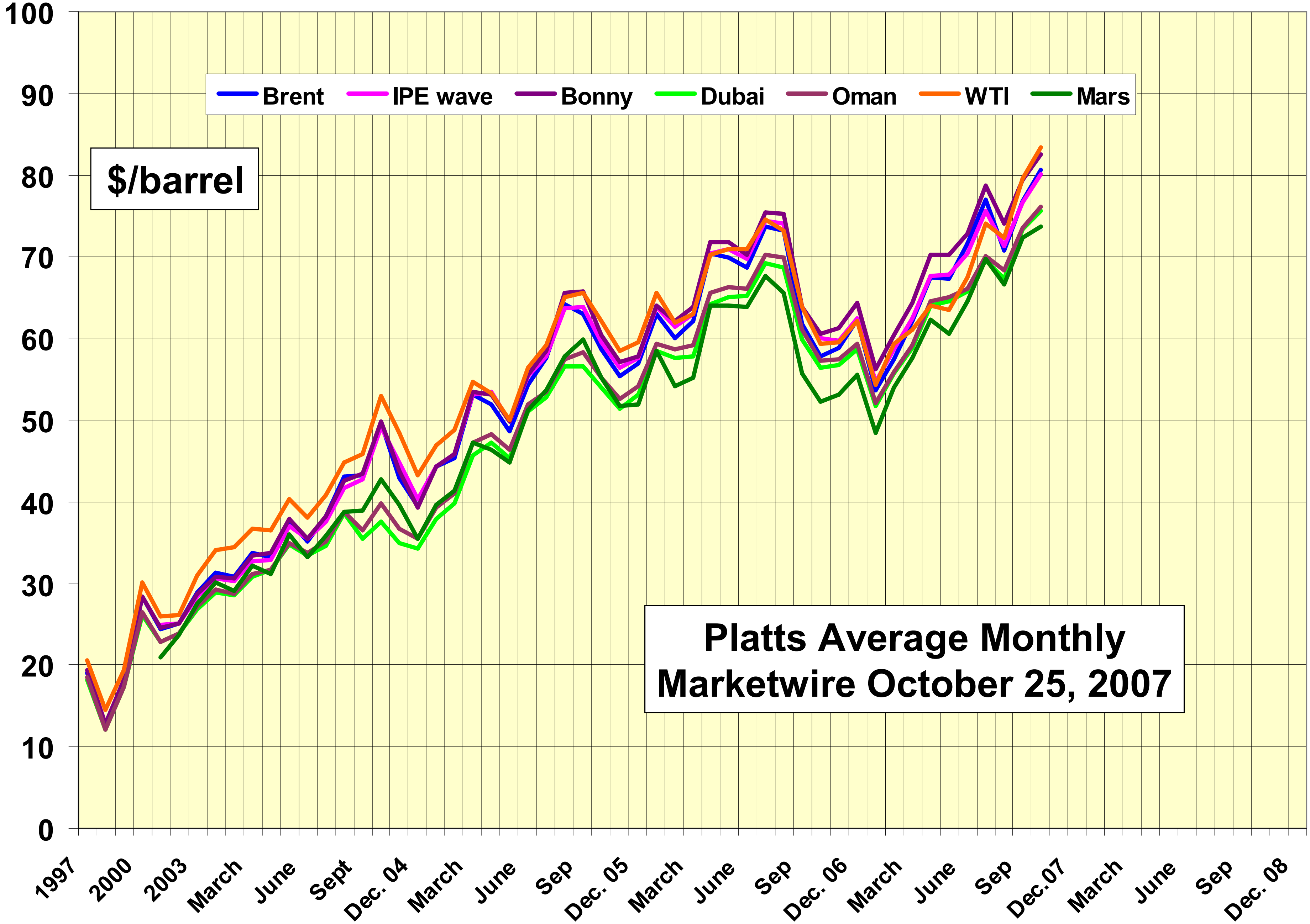
Oil and Money Conference
London
October 30, 2007

Oil prices continue to rise in spite of OPEC capacity announcements



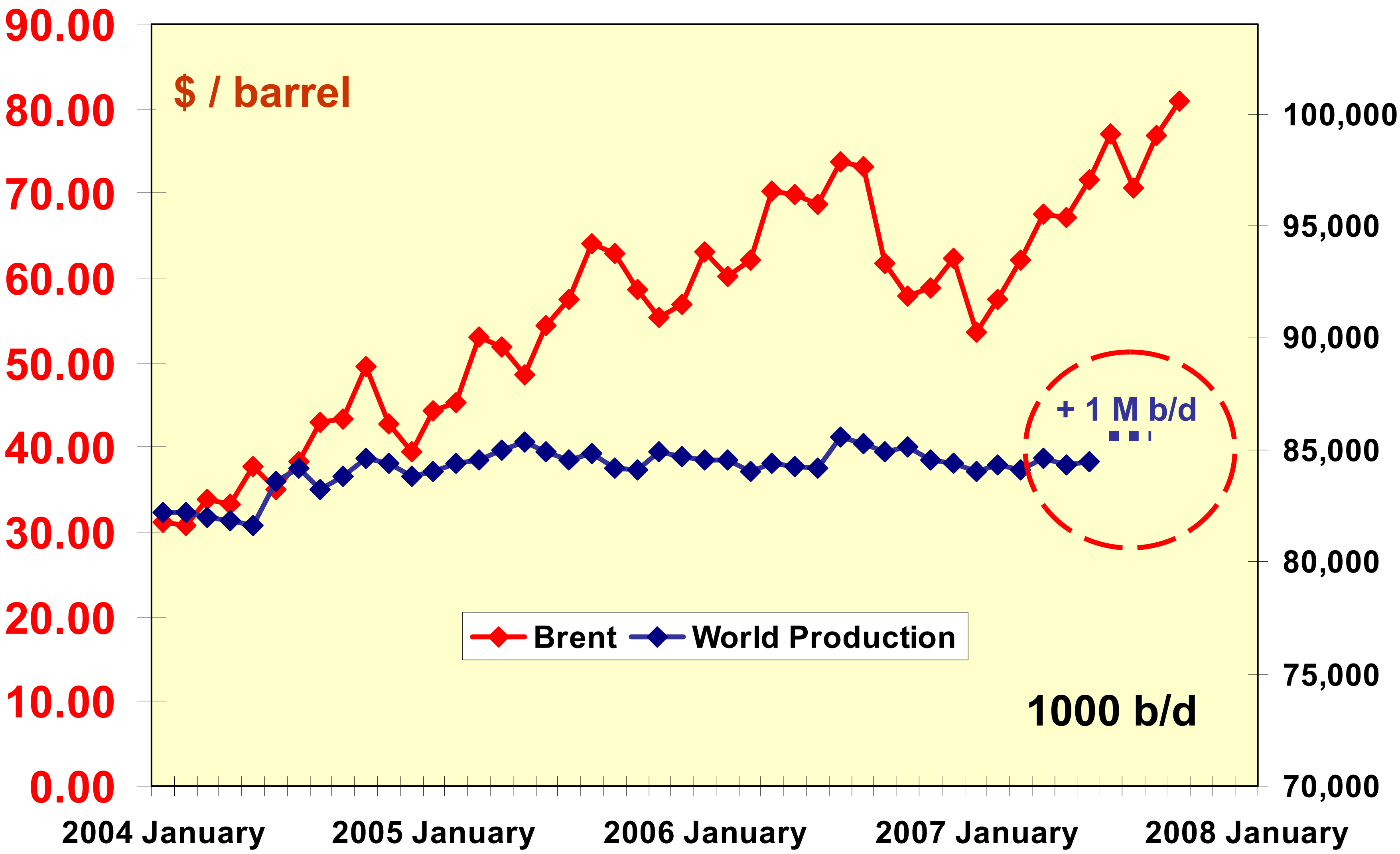
New projects are attempting to mitigate prices, e.g. Saudi Arabia

Oil Facilities	Capacity	O/S Date	Value ($)
Qatif	500 k b/d	2005	3 B
Abu Safa	150 k b/d	2005	1 B
Haradh – 3	300 k b/d	2006	2 B
Hawiyah / Haradh Gas	125 k b/d NGL	2007/8	4 B
Khursaniya (AFK)	500 k b/d	2007/8	5 B
	80 k b/d NGL	2007/8	
Shaybah	250 k b/d	2008	2 B
Nuaim	100 k b/d	2008	1 B
Khurais	1,200 k b/d	2009/10	8 B
Manifa	900 k b/d	2011/12	9 B
Other Support Projects			19 B
Total Projects	4,105 k b/d		54 B

And the Arabian Gulf countries are proposing 15 refinery projects 6 of which are in Saudi Arabia

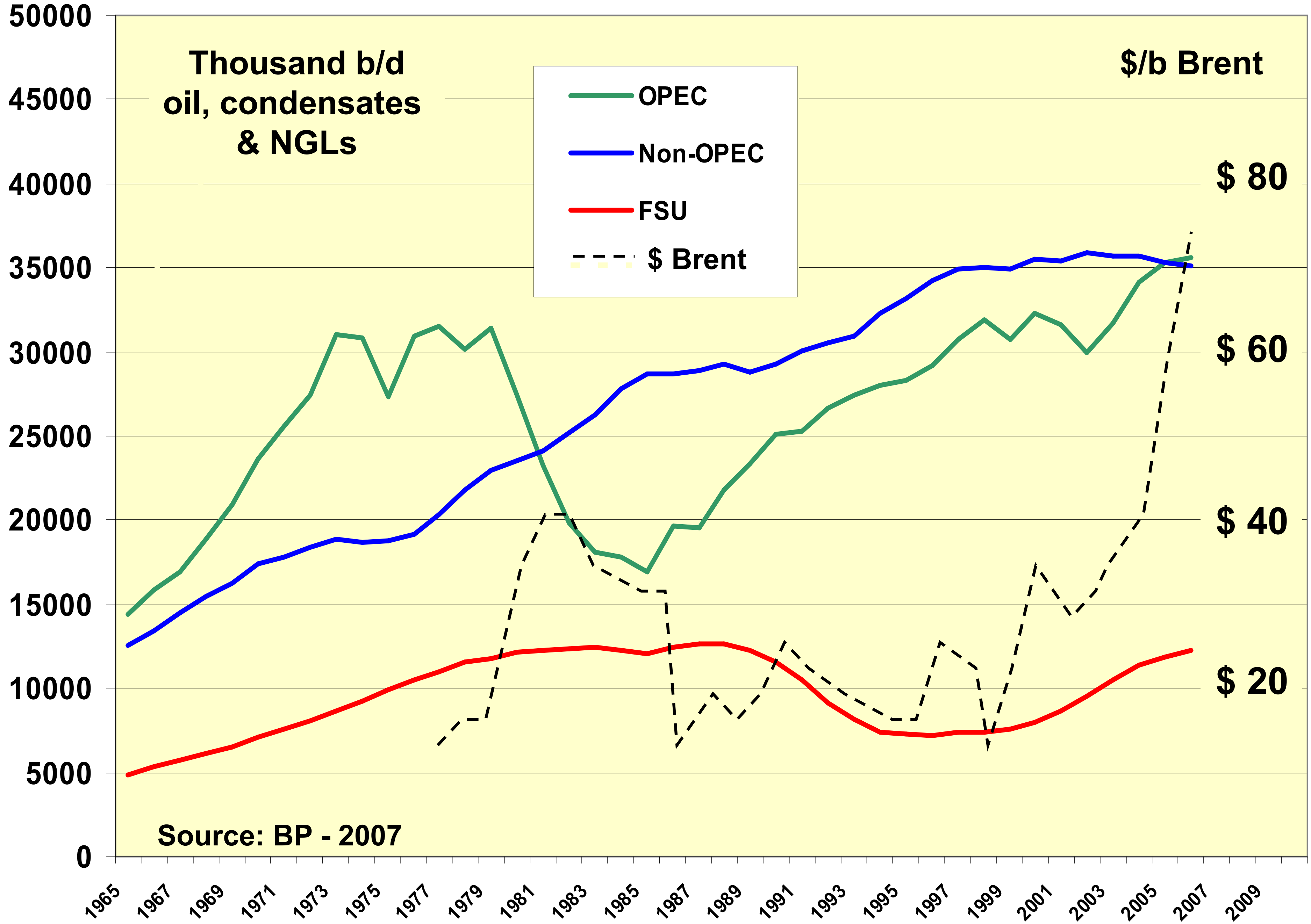
	Location	Capacity, b/d	Start-up
Saudi Arabia	East & West Coast topping refs.	400,000	2012
	Jubail - Total	400,000	2012
	Yanbu - Conoco	400,000	2013
	Ras Tanura/Dow Chemicals	175,000 +	2012
	Jizan	200,000 - 400,000	2012
Kuwait	Al-Zawr	615,000	2012
UAE	Fujairah - Conoco	400,000	2012/2013
	Ruwais	300,000	?
Oman	Duqum	300,000	2012/2013
Qatar	Shaheen	250,000	2011
	Ras Laffan Condensate	140,000	2008
Iran	Arak	100,000	2009
	Qeshm	160,000	2012
	Condensate Splitters	360,000	2010-2011
Total		4,400,000	

However actual production has not increased and even 1 million bd would have a minimal impact. . .



Platts average monthly marketwire,
EIA monthly global oil production

And no “idle” OPEC capacity remains to be tapped



> 400 billion barrels of reserves replacements and growth have materialized in 10 years !

	1986	1996	2006
North America	101.6	89.3	59.9
S. & Cent. America	64.6	90.8	103.5
Europe & Eurasia	76.8	84.6	144.4
Middle East	536.7	672.2	742.7
Africa	58.0	74.9	117.2
Asia Pacific	39.7	39.2	40.5
TOTAL WORLD	877.4	1049.0	1208.2

BP Statistical Review, 2007

These developments raise key issues

Why are oil, condensates and NGL capacities not responding to increased oil prices?

Are there actual political, economic or physical impediments to increasing oil capacities?

Given the "abundance" of reserves, what is the long term outlook for oil supplies and prices?

“Reserves” are inflated with >300 B bbls of “resources”

		Statistical reliability	Production Outlook	Technical basis
1.1 Trillion	Depleted			
Actual Reserves : 0.9 Trillion	Proven > 90%	Proven oil In Place – high confidence Developed – clear recovery factor Undeveloped – good. recov. est.	Growth thru actual reservoir mgmt. & performance	Improved Oil recovery thru existing technology
	Probable > 50%	Probable oil in place – confident Developed - prelim. recovery factor Undeveloped – est. fair recovery	Growth thru delineation, testing & development	Clear opportunity with existing technology
Contingent Resources: 1.1 Trillion	Potential > 5%	Potential oil in place – low confiden. Drilled – v. low recovery factor Undrilled – recovery likely poor	Growth thru pricing, delineation or IOR/EOR technology	Indicative data & potential opportunity
	Resource: Uneconomic volume & commerciality	Likely presence but undelineated OIP or GIP	Profitability or Technology currently inadequate	Available access but lacks good reservoir and fluids data
Prospective & Speculative Resources: 2.0 Trillion	Oil, Gas, Shales, EHC & to be discovered <u>resources</u> (speculative outlook)	Technically present but physically inaccessible hydrocarbons	Future resolution thru exploration & relevant technology	General geological, seismic and/or physical indications
		Conceptually Possible Hydrocarbons, incl. EHCs		

Some capacity is from very mature reservoirs – e.g. 75% of Iran's production

Depletion Status	2005 M b/d	2010 M b/d	2015 M b/d
00 – 29%	0.450	0.850	1.117
29 – 49%	0.470	0.818	0.838
50 – 69%	2.363	1.955	1.627
70 – 97%	0.555	0.326	0.217
Est. Capacity	3.838	3.949	3.799

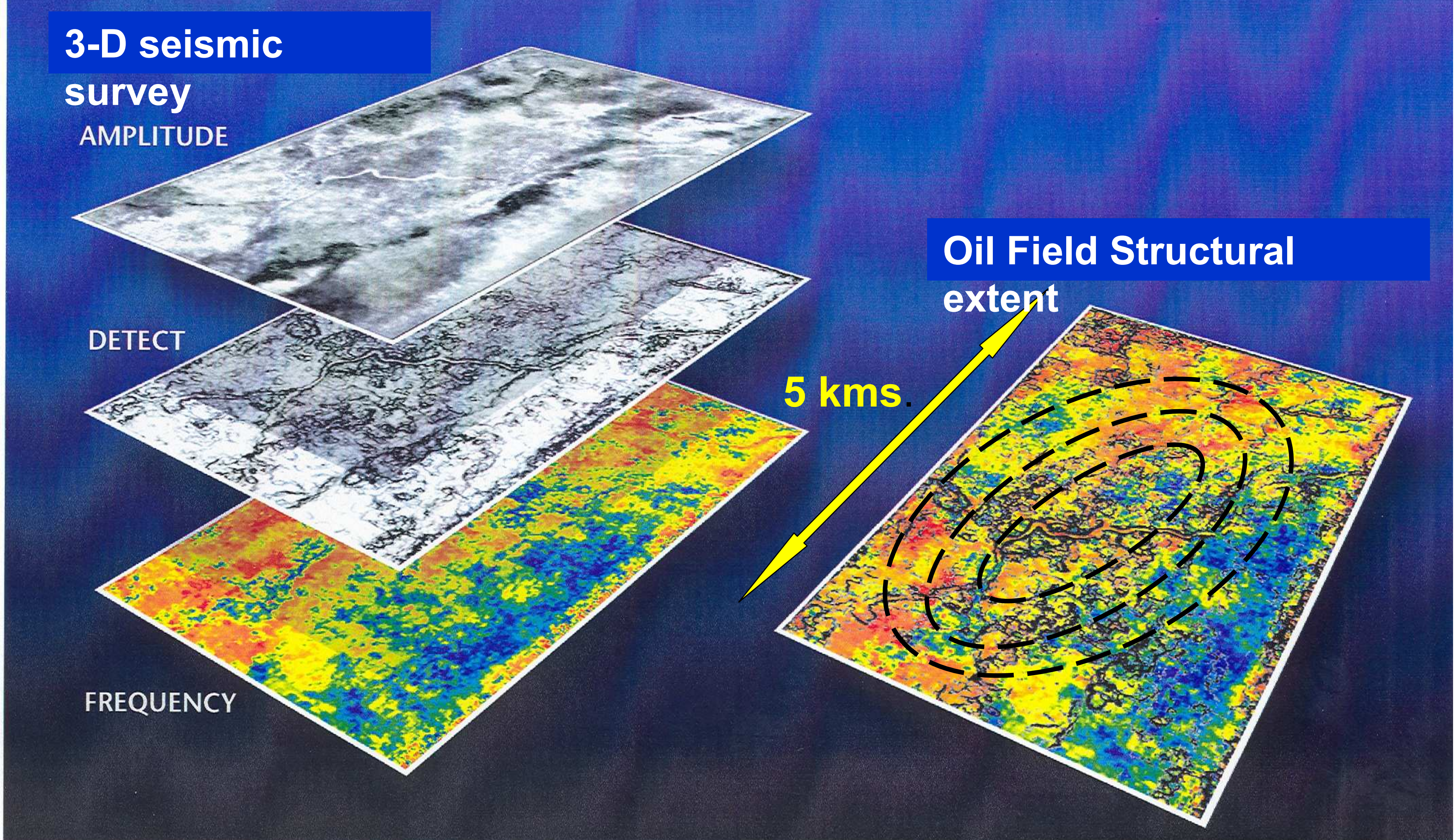
EIA outlook	4.2	4.2	4.3
Iran officials	4.2	4.6 - 5.4	

The giant fields of the Arabian Gulf average 41% depletion

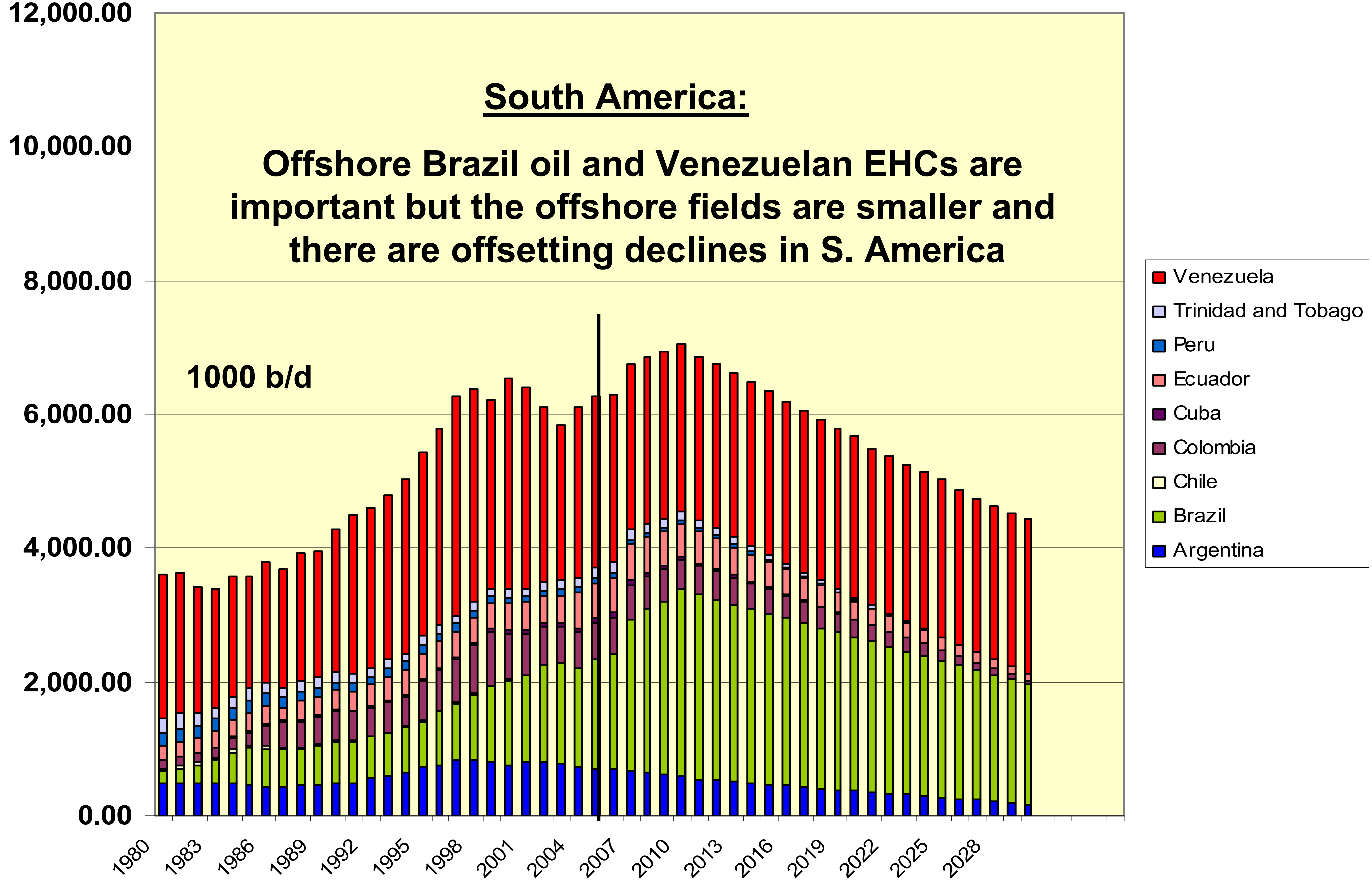
Iraq - 6	Iran - 8	Kuwait - 5	UAE - 6	KSA - 12	Qatar - 1
8 - Kirkuk 12 - Rumaila 16 - Majnoon 21- Rumaila North 24 - Zubair 27 - West Qurna	14 - Gachsaran 15 - Ahwaz 17 - Marun 25 - Agha Jari 32 - Rag e Safid 34 - Bibi Hakimeh 36 - Azadegan 37 - Parsi	2 - Burgan 23 - Raudhatain 29 - Sabriya 33 - Minagish 35 - Um Gudair	7 - Zakum 18 - Murban – Bab 20 - Murban Bu Hasa 26 - Fateh 30 - Asab 31 - Um Shaif	1 - Ghawar 3 - Safaniya 4 - Zuluf 5 - Manifa 6 - Khurais 9 - Abqaiq 10 - Berri 11 - Shaybah 13 - Marjan 19 - Qatif 22 - Abu Safa 28 - [illegible]	38 - Dukhan
49.5 Billion	84.6 Billion	90.2 Billion	45.7 Billion	336 Billion	3.2 Billion

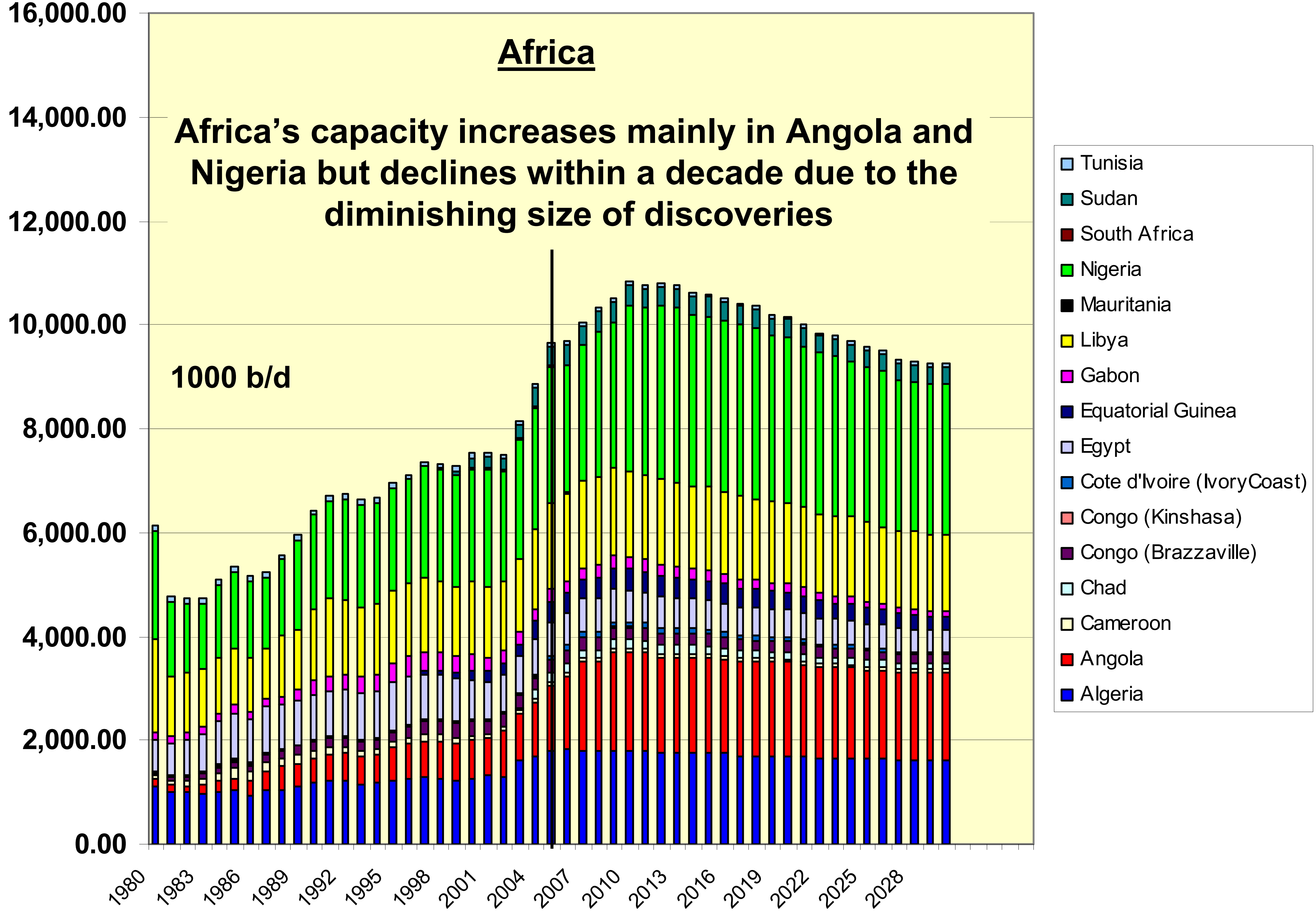
Est. original reserves ~ 605 B barrels
Est. remaining reserves ~ 360 B barrels

Technology is good but does not diminish production complexities

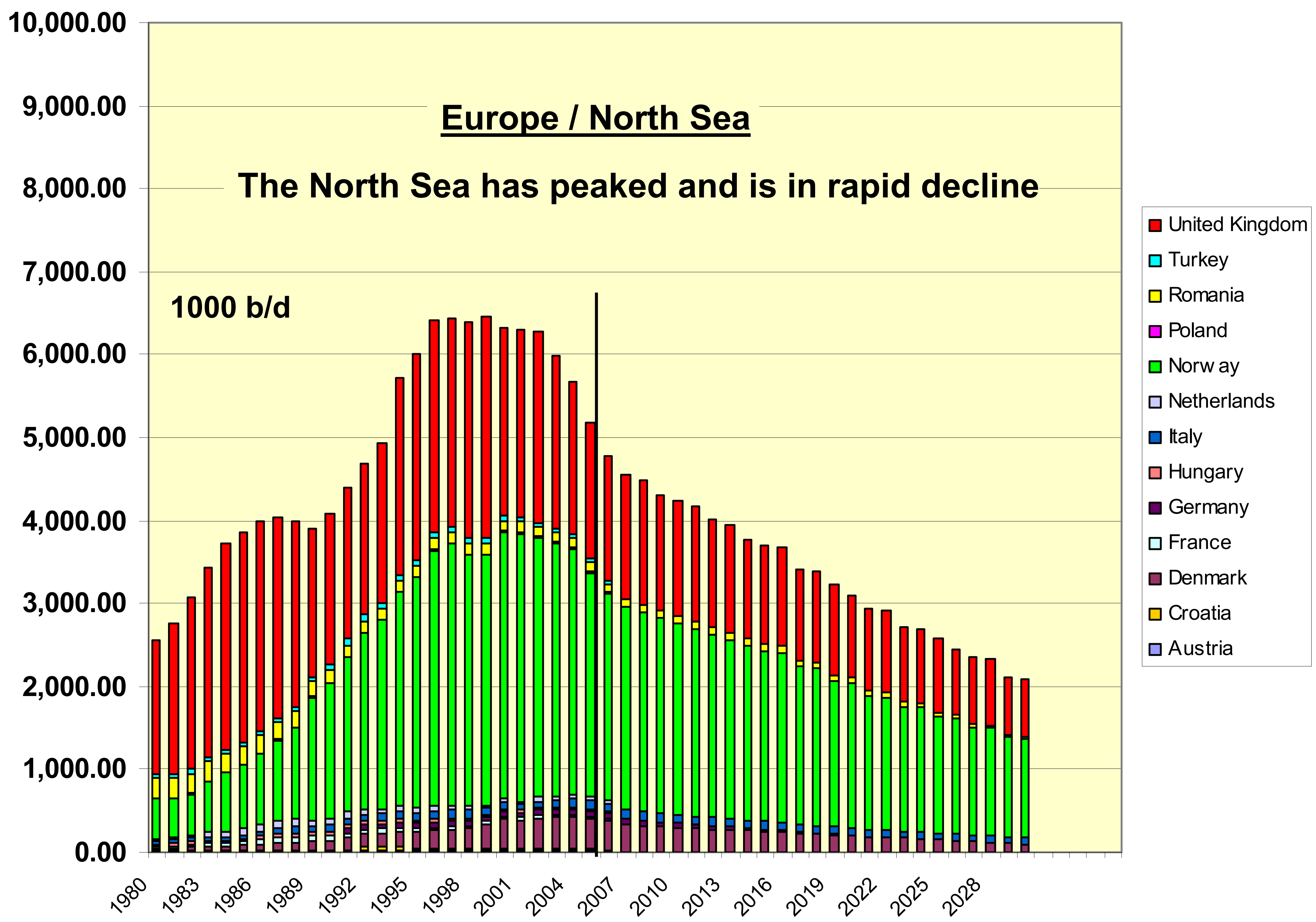


Oil outlook needs detailed scrutiny:

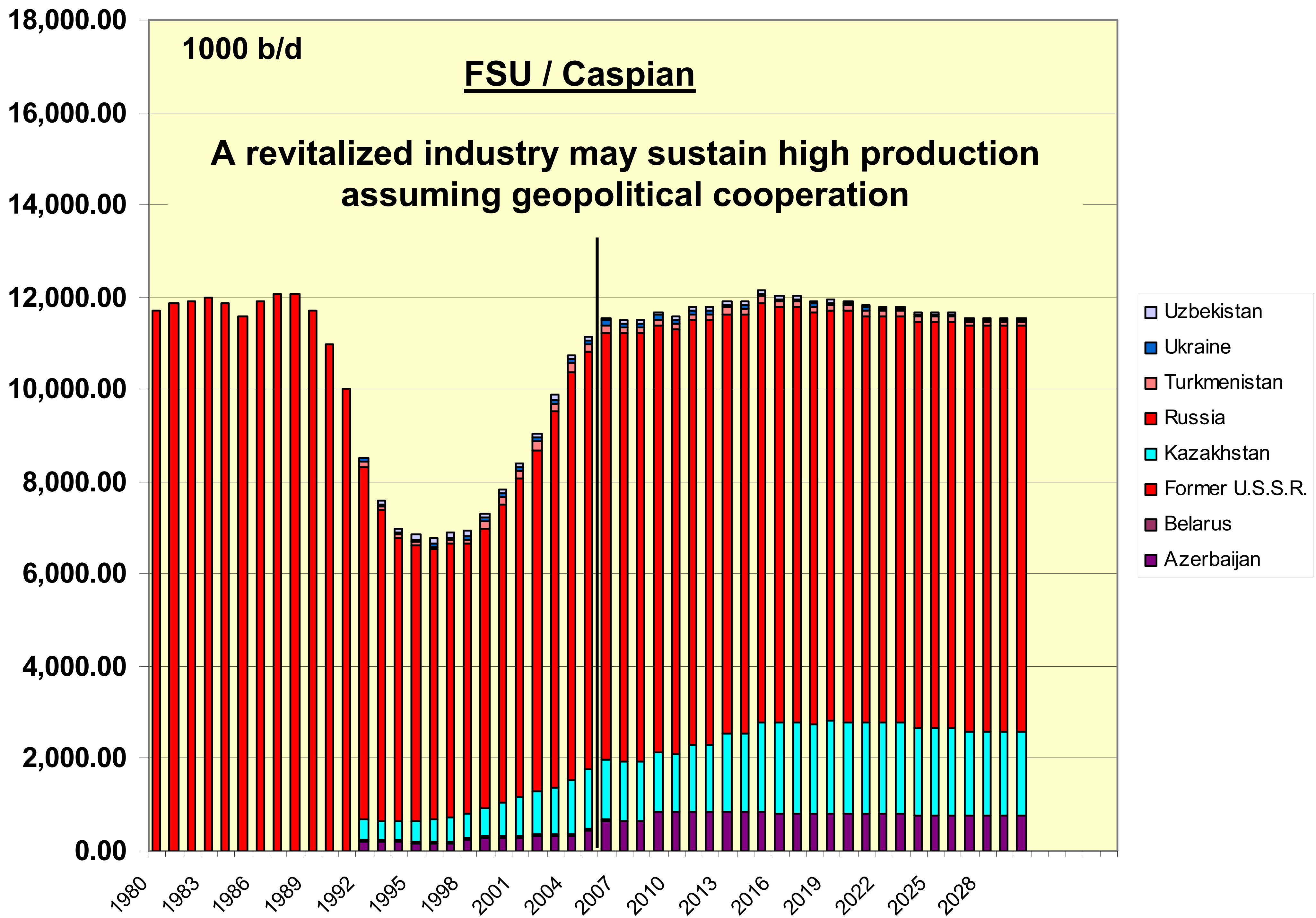




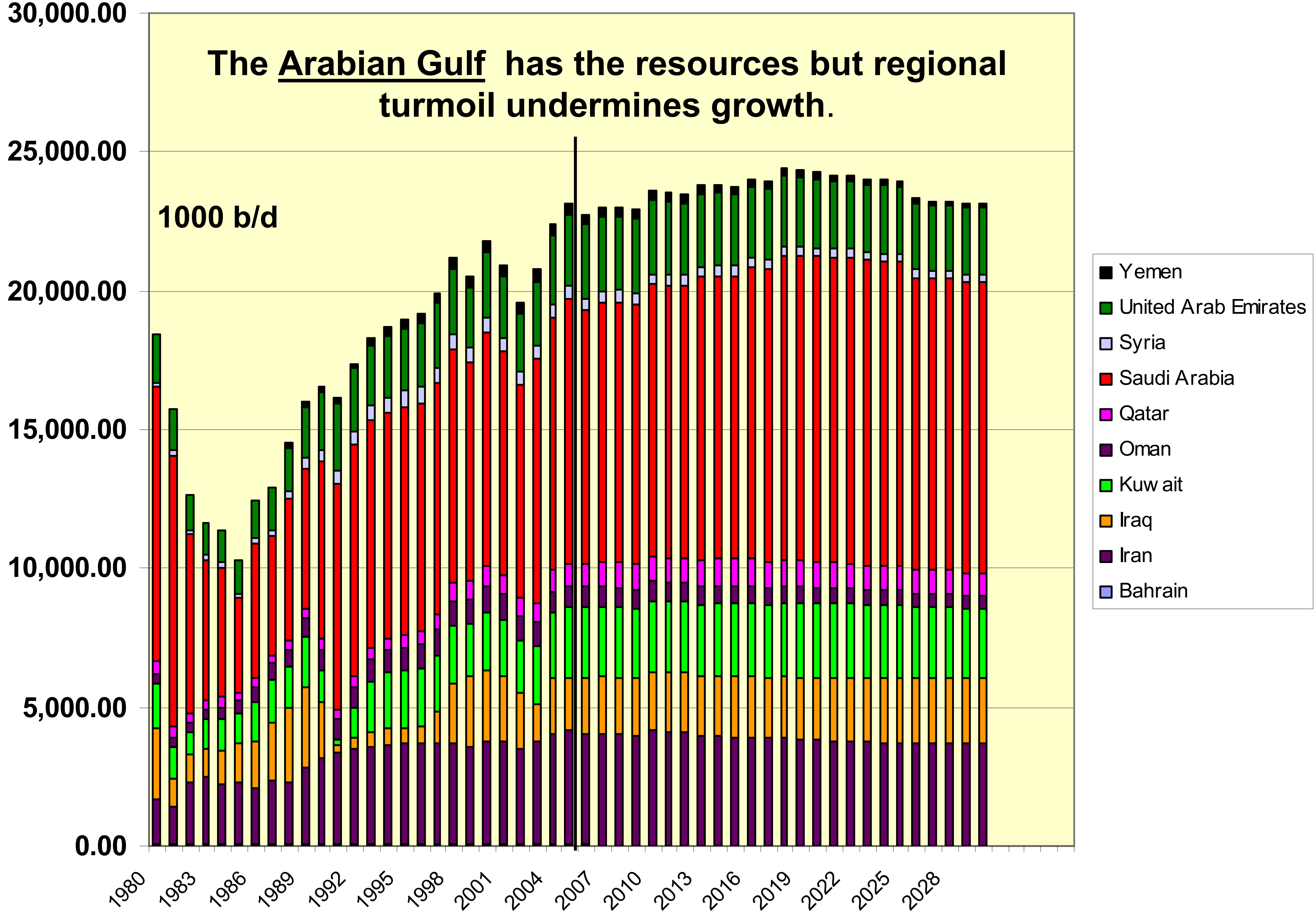
Africa
Africa's capacity increases mainly in Angola and Nigeria but declines within a decade due to the diminishing size of discoveries
1000 b/d
16,000.00
14,000.00
12,000.00
10,000.00
8,000.00
6,000.00
4,000.00
2,000.00
0.00
1980
1983
1986
1989
1992
1995
1998
2001
2004
2007
2010
2013
2016
2019
2022
2025
2028
Tunisia
Sudan
South Africa
Nigeria
Mauritania
Libya
Gabon
Equatorial Guinea
Egypt
Cote d'Ivoire (IvoryCoast)
Congo (Kinshasa)
Congo (Brazzaville)
Chad
Cameroon
Angola
Algeria



Europe / North Sea
The North Sea has peaked and is in rapid decline
1000 b/d
10,000.00
9,000.00
8,000.00
7,000.00
6,000.00
5,000.00
4,000.00
3,000.00
2,000.00
1,000.00
0.00
1980
1983
1986
1989
1992
1995
1998
2001
2004
2007
2010
2013
2016
2019
2022
2025
2028
United Kingdom
Turkey
Romania
Poland
Norw ay
Netherlands
Italy
Hungary
Germany
France
Denmark
Croatia
Austria

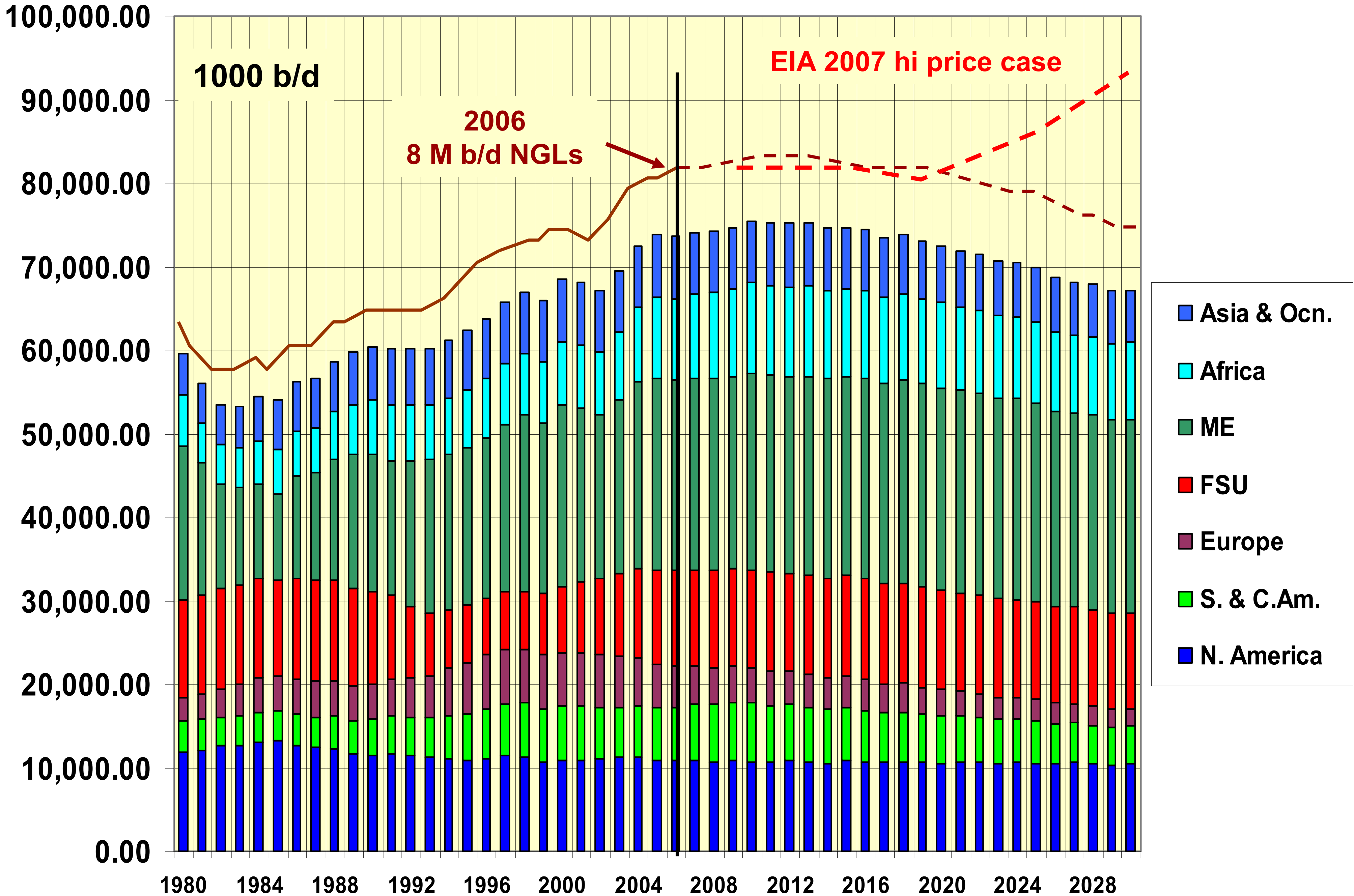


1000 b/d
FSU / Caspian
A revitalized industry may sustain high production assuming geopolitical cooperation
18,000.00
16,000.00
14,000.00
12,000.00
10,000.00
8,000.00
6,000.00
4,000.00
2,000.00
0.00
1980
1983
1986
1989
1992
1995
1998
2001
2004
2007
2010
2013
2016
2019
2022
2025
2028
Uzbekistan
Ukraine
Turkmenistan
Russia
Kazakhstan
Former U.S.S.R.
Belarus
Azerbaijan

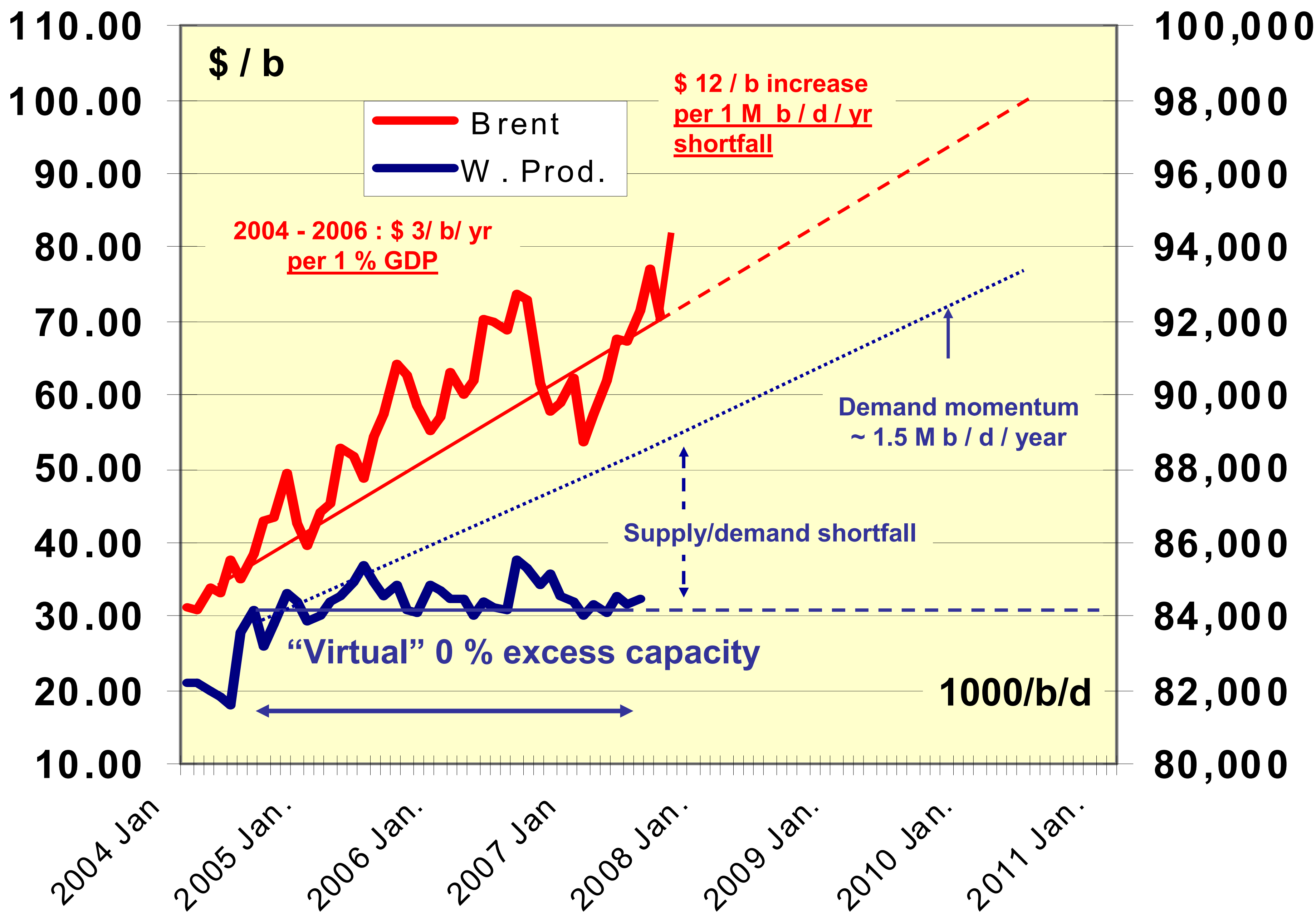


The Arabian Gulf has the resources but regional turmoil undermines growth.
1000 b/d
30,000.00
25,000.00
20,000.00
15,000.00
10,000.00
5,000.00
0.00
1980
1983
1986
1989
1992
1995
1998
2001
2004
2007
2010
2013
2016
2019
2022
2025
2028
Yemen
United Arab Emirates
Syria
Saudi Arabia
Qatar
Oman
Kuwait
Iraq
Iran
Bahrain

The total outlook: a 15 year production plateau . . .



GDP growth and supply shortfalls will raise the floor of oil prices $ 12 / year per million b/d shortfall



Conclusions

- **Proven oil "reserves" are overstated by >300 billion barrels of speculative "resources".**

- **Global oil and NGL capacity is on a 15 year plateau constrained by mature reservoirs and finite reserves.**

- **The momentum of growing oil demand and the gap with limited supplies will drive up the <u>floor</u> of oil prices $ 12 / yr for each million barrels of shortfall.**