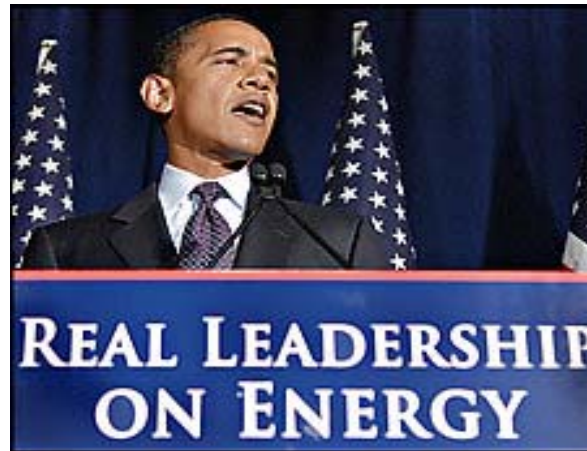


Iraqi Oil Potential and Middle East Turmoil: Implications for Oil Markets and OPEC

Amy Myers Jaffe
Wallace S. Wilson
Fellow for Energy
Studies

James A. Baker III
Institute for Public Policy,
Rice University



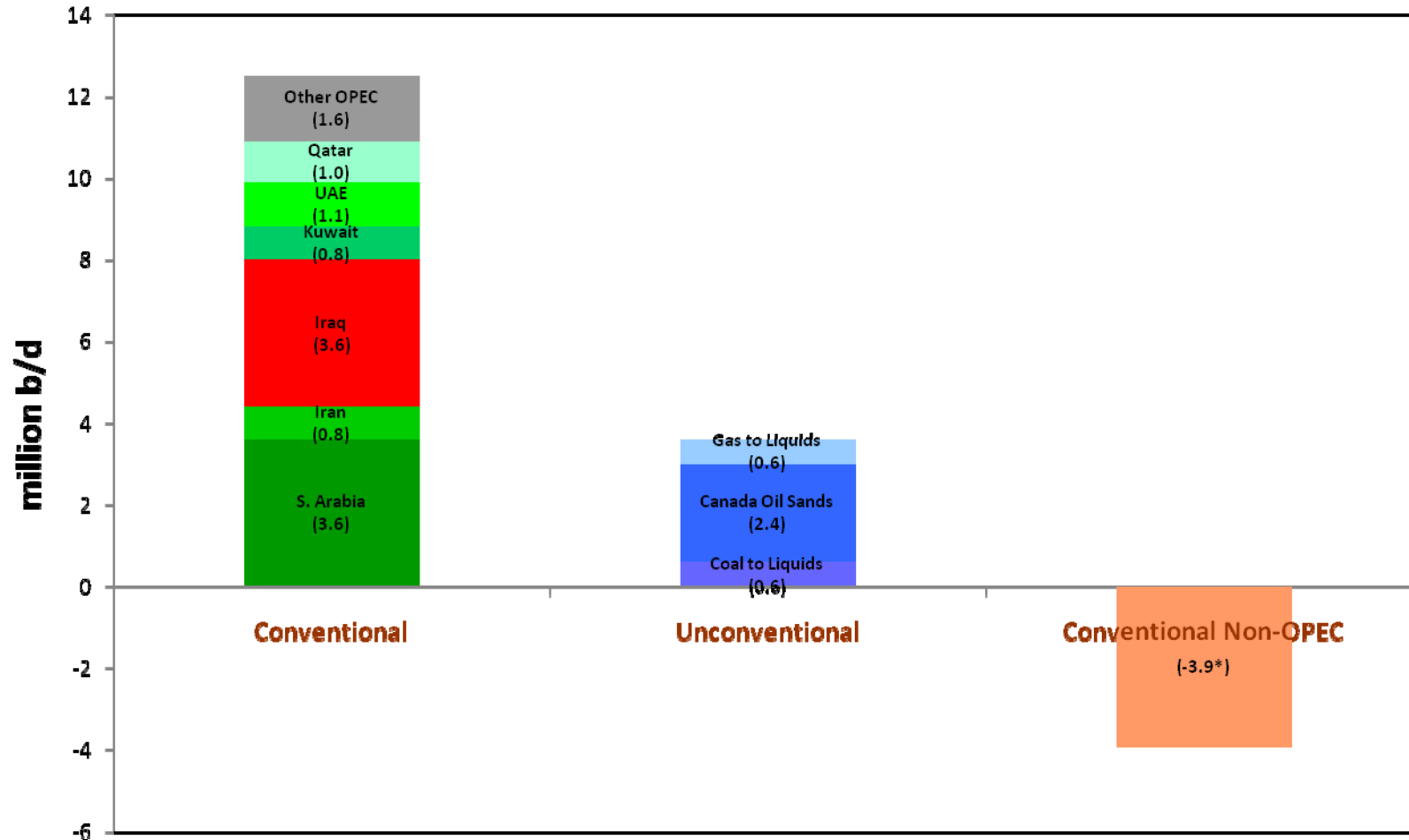
IEEJ Oil Seminar, Tokyo

February 28, 2011



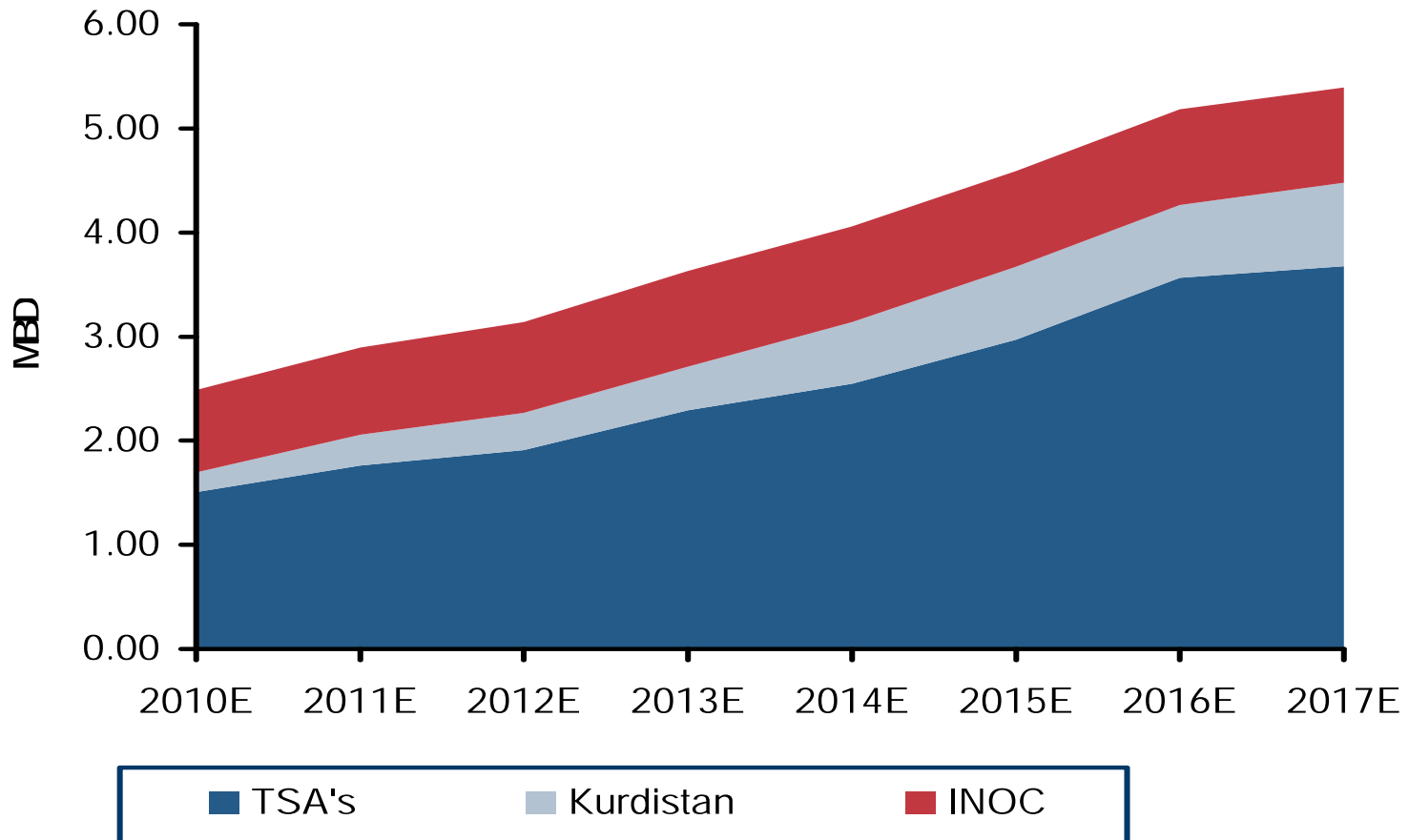
IEA 2010 Base Case Reference Scenario: Increase in World Oil Supply, 2009-2030

IEEJ: March 2011



- The IEA forecast does not include a full assessment of the potential of shale oil resources in the United States and elsewhere.

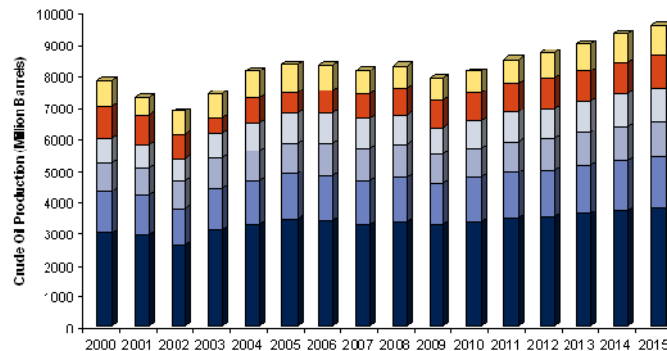
Iraq potential by 2017: High estimate is 7.2 million b/d but historical range more like 3.6 million b/d



Infrastructure development, not oil field potential, will likely be the constraining factor in Iraq

- Despite optimistic news reports, foreign oil companies still at early stage of mobilization
- Political decentralization inside Iraq still a barrier to rapid implementation of project development, especially infrastructure development; permitting process and other approvals cumbersome at variety of local and regional levels
- Oil investment policy compromises with the Kurds making progress but still not resolved
- Power sharing means that all federal decision making is extremely slow
- Citizens frustrated by lack of progress on the ground regarding basic services, leading to social protests and demonstrations

OPEC Production thru 2015



(in kb/d)	2010	2011	2012	2013	2014	2015
Iraq						
Low Case	2 400	2 700	2 800	3 150	3 400	3 600
High Case	2 400	2 970	3 670	4 670	5 970	7 270
Iran						
Low Case	3 680	3 580	3 480	3 380	3 280	3 180
High Case	3 680	3 730	3 780	3 830	3 880	3 930
Nigeria						
Low Case	2 200	2 400	2 600	2 600	2 650	2 700
High Case	2 200	2 450	2 700	2 950	3 200	3 500
Venezuela						
Low Case	2 200	2 150	2 100	2 050	2 000	1 950
High Case	2 200	2 150	2 150	2 300	2 600	2 620

Source for both figures: EIA, Credit Suisse Global Commodity Research

- There are critical unknowns about OPEC that could impact future balances.
- Will Iraq grow to 3.6m or 7.2m b/d?
- Will Iran slide due to civil unrest? Saudi Arabia?
- Will Libya lose production potential? Algeria?
- What will the politics of upstream investment be in Kuwait?
- Will Venezuela be able to grow its capacity?
- Will Nigeria stagnate or reverse course?

OPEC production and spare capacity could be impacted by current turmoil

Country	2009 Target	Output Dec. '10	Current Capacity	Spare Capacity	Est. 2015 Capacity
Algeria	1,202	1,265	1,270	5	1,370
Angola	1,517	1,550	1,700	150	2,490
Ecuador	435	470	480	10	460
Iran	3,336	3,560	3,600	40	3,100
Kuwait	2,223	2,430	3,150	720	3,300
Libya	1,469	1,550	1,600	50	2,020
Nigeria	1,673	2,195	2,240	45	2,800
Qatar	731	810	950	140	1,050
S.Arabia	8,051	8,770	12,080	3,310	12,980
UAE	2,223	2,450	2,850	400	3,250
Venezuela	1,985	2,350	2,350	0	2,350
OPEC 11	24,845	27,400	32,270	4,870	35,170
Iraq		2,600	2,400		3,750
OPEC 12		30,000	34,670		38,920

Source: IEA, Credit Suisse Global Commodities Research

- Libya could stagnate at 1.0 to 1.4 million b/d, instead of rising to 2.02 mb/d
- Iranian capacity could fall further than expected
- Saudi Arabia, Iraq could reverse upward course
- Kuwait growth could fail to materialize

Mideast turmoil driving oil prices now, especially long oil price

Post-Egypt, oil market faces new concerns related to the nature of domestic societies, economies, political leadership and “legitimacy” in key oil producing countries

- Contagion:
 - In an age of cyber communications, no one is totally “safe”
 - Many oil producing countries have experienced similar kinds of demonstrations and social unrest both recently and in the recent past
 - Saudi Arabia’s leading rulers are old and in failing health

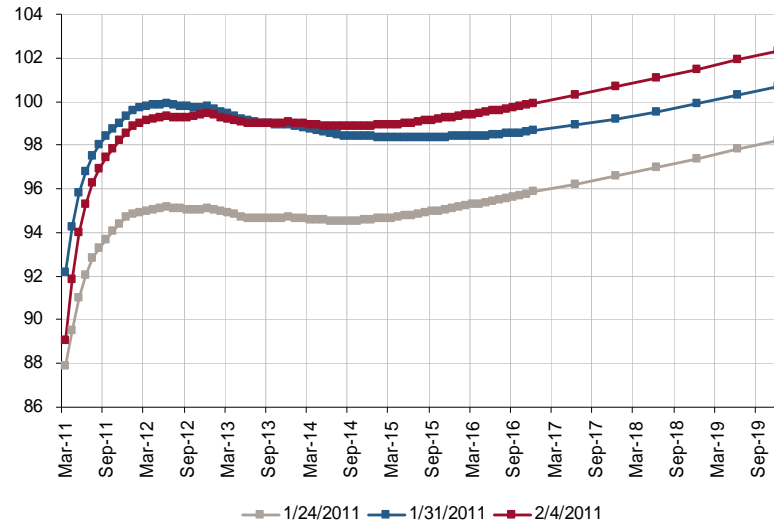
Over 21 million b/d of Middle East liquids production could be at stake

- -- Algeria: Median age 27.1 years, 10% unemployment, 2.1-m b/d
- Libya: Median age 24.2 years, 30% unemployment, 1.5-m b/d
- Syria: Median age 21.5 years, 8% unemployment, 0.4-m b/d
- Yemen: Median age 17.9 years, 35% unemployment, 0.4-m b/d
- KSA: Median age 24.9 years, 11% unemployment, 9.5-m b/d
- Iran: Median Age 26.3 years, 15% unemployment, 4.5-m b/d
- Iraq: Median Age 20.6 years, 15% unemployment, 2.8-m b/d

Contagion fears are not unfounded: Protests not limited to countries in the headlines

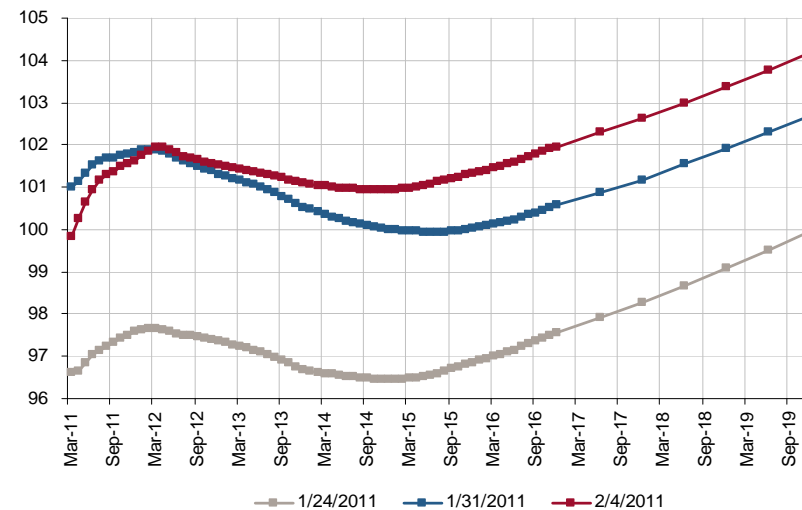
- Confrontation between Shi'ite pilgrims to Medina in Medina led to major protests in the city of Qatif in Saudi Arabia's Eastern Province in 2009; coincided with Shi'ite disappointment that no Shi'ite was appointed to the King's cabinet or as representative in the council of senior religious scholars; small protest in late February, prisoner release
- Kuwait Prime Minister Sheikh Nasser al-Mohammed al-Sabah, the Emir's nephew, faced impeachment hearings in late 2010 following the Kuwaiti government's use of force to break up a protest organized by academics and parliamentarians to protest alleged constitutional violations by the Kuwaiti government
- Ongoing Algerian protests linked to hike in food prices, unemployment, housing shortages and corruption scandals, the latter of which are seen as manifestations of struggle for power in the FLN and also between Boutefliqa and other factions of the Algerian military; long-standing oil minister Khelil was a casualty of ongoing struggle inside the government
- Iranian government, remembering the role of the oil industry in the fall of the Shah, have put more members of the Iranian Revolutionary Guard Corps into the oil sector

WTI Forward Curves



Source: the BLOOMBERG PROFESSIONAL™ service, Credit Suisse Global Commodities Research

Brent Forward Curves



Source: the BLOOMBERG PROFESSIONAL™ service, Credit Suisse Global Commodities Research

- Libyan oil went mainly to Europe
- Mideast turmoil –from possible Suez disruption to threat to Algerian exports– would impact Europe first.
- Threat of possible future position limit regulations in US makes Brent futures a more attractive market to put on long oil positions now. Open interest in forward Brent contracts on the rise.
- US West Texas Intermediate market experiencing local distortions due to Pad-2 surplus and pipeline bottleneck, making WTI a less useful marker for international prices trends. Contagion premium is playing out in Brent market.

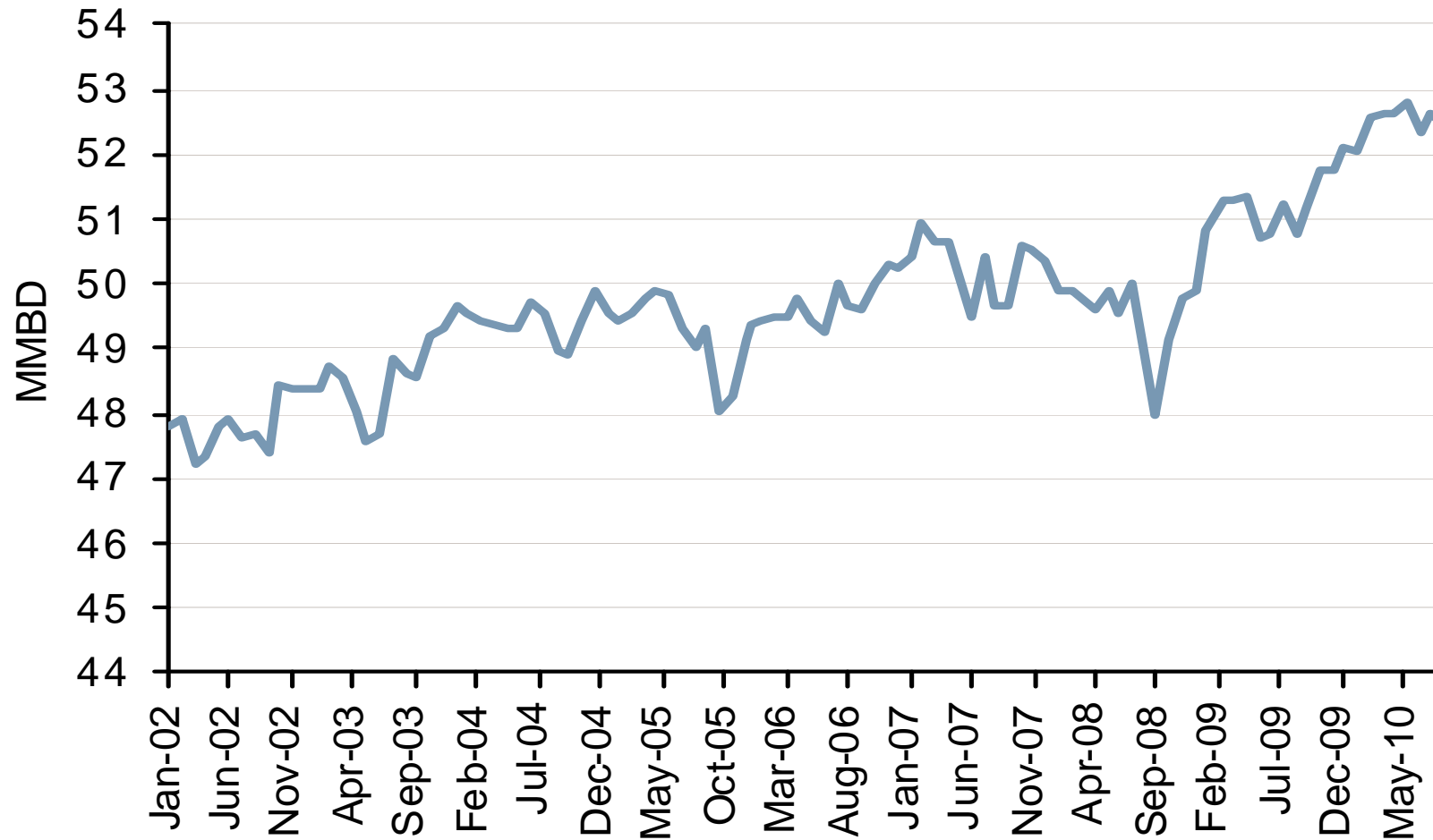
Cautionary Factors: \$147 harder to reach now than in 2008, barring major oil disruption event

- OPEC spare capacity is much higher
- Larger availability of drilling rigs
- Governments more focused on energy efficiency and security policy, INCLUDING CHINA
- Financial players dealing in oil but with far less leverage than 2007-2008
- China not hoarding ahead of Olympics
- New natural gas (shale) and oil (shale and pre-salt) plays are becoming known to the market as growing recoverable reserve opportunities
- Majors have increased E& P spending
- Substitution among fuels, especially in transport sector, is growing

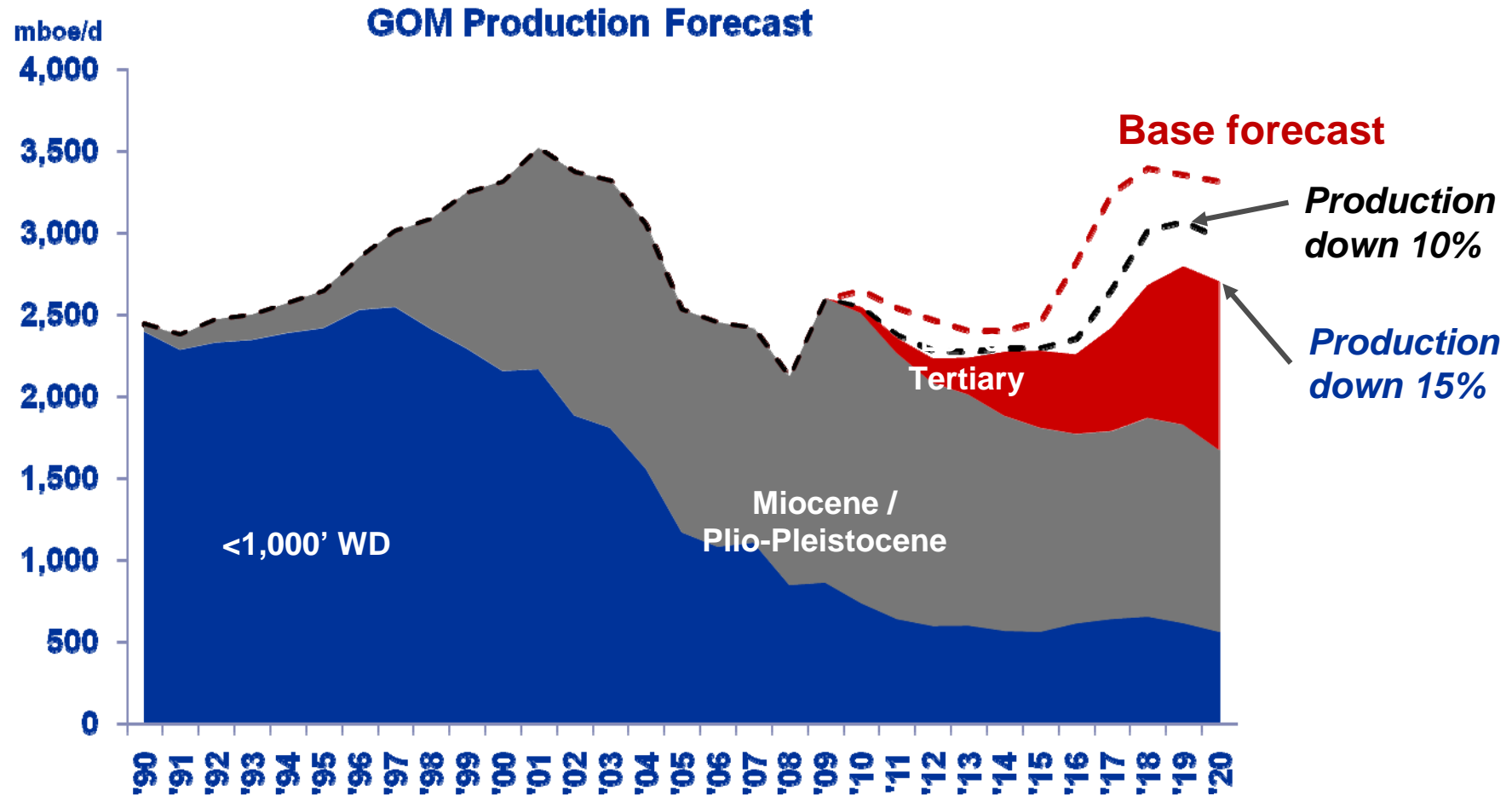
Still, long term factors point to sustained high oil prices

- Turmoil in Middle East likely to be sustained and may disrupt investment spending
- US Offshore regulatory uncertainty is taking a bite
- NOCs control an increasing share of investment spending and continue to exhibit inefficiency
- Bureaucratic and other geopolitical barriers blocking adequate investment in conventional resources in major countries such as Mexico, Iran, Russia, Kuwait, and Nigeria
- Saudi succession issues will remain a challenge to the kingdom's decision-making process

Non-OPEC Supply Surge has been rising since 2008

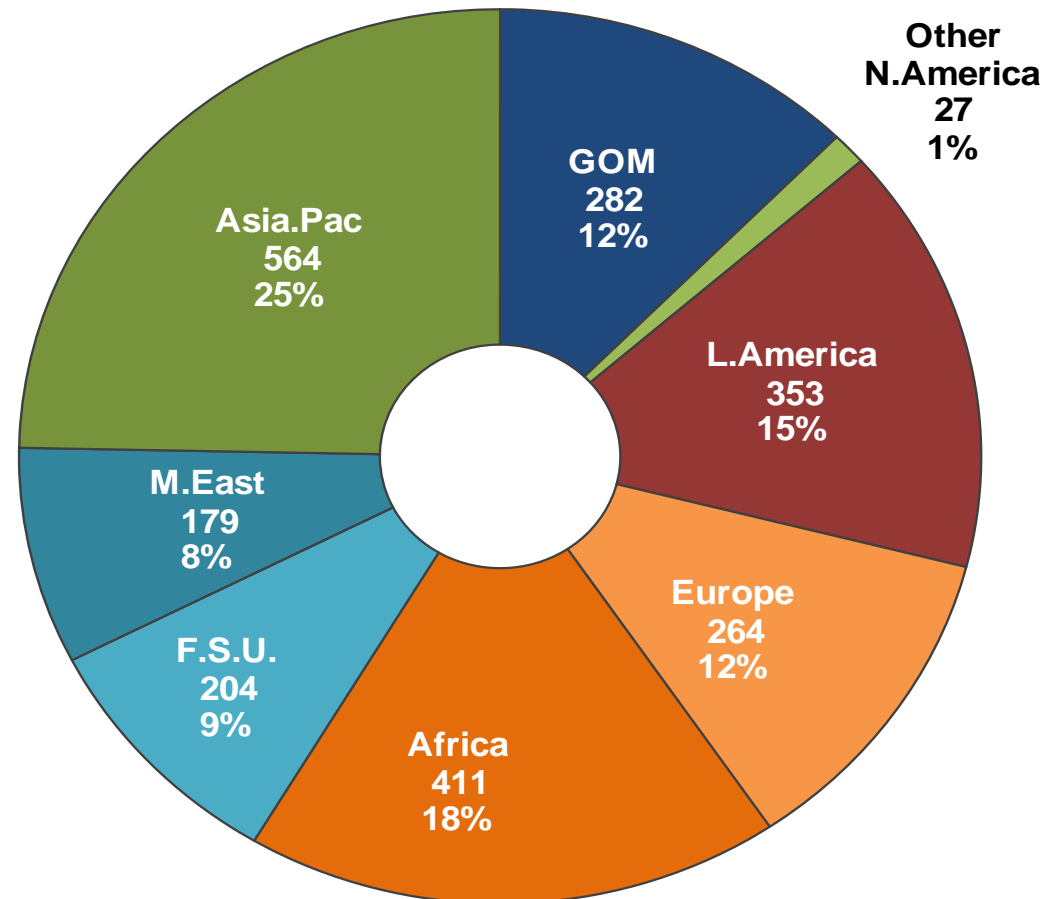


The Macondo blowout could have significant impact on GOM production



Source: PFC Energy Modeling

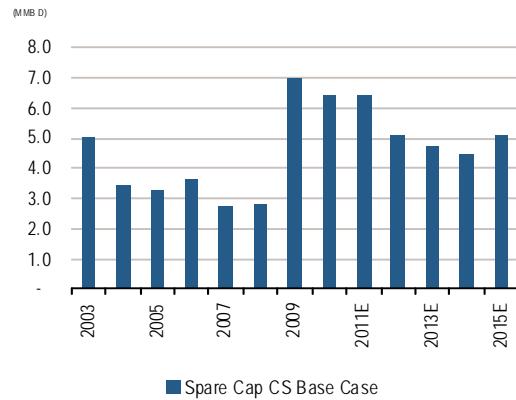
Offshore CAPEX Forecast 2011-2020 \$2,284 billion



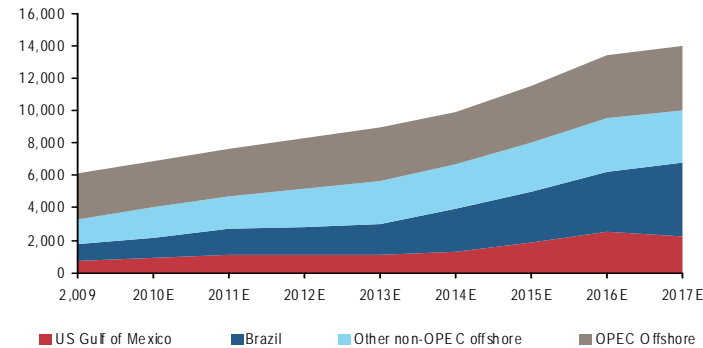
Projected spending could turn out to be larger if oil prices remain high and Middle East sources and investment are disrupted.

Source: PFC Energy Upstream Spending Model

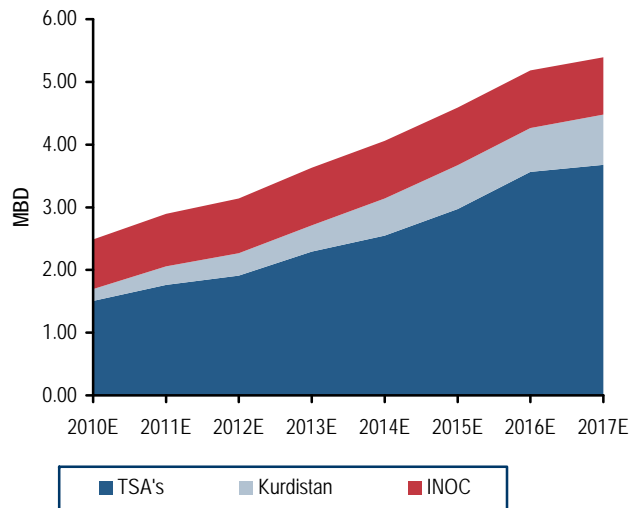
OPEC Spare Capacity Previously Expected to Slip



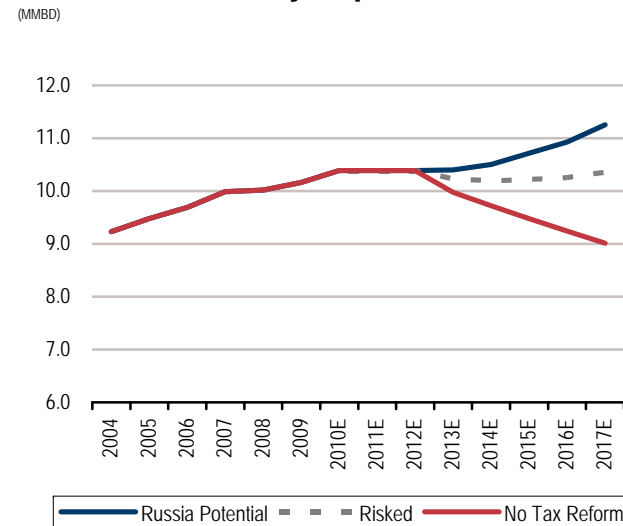
Significant New Offshore Projects Post 2014



Iraq – Lots of Potential

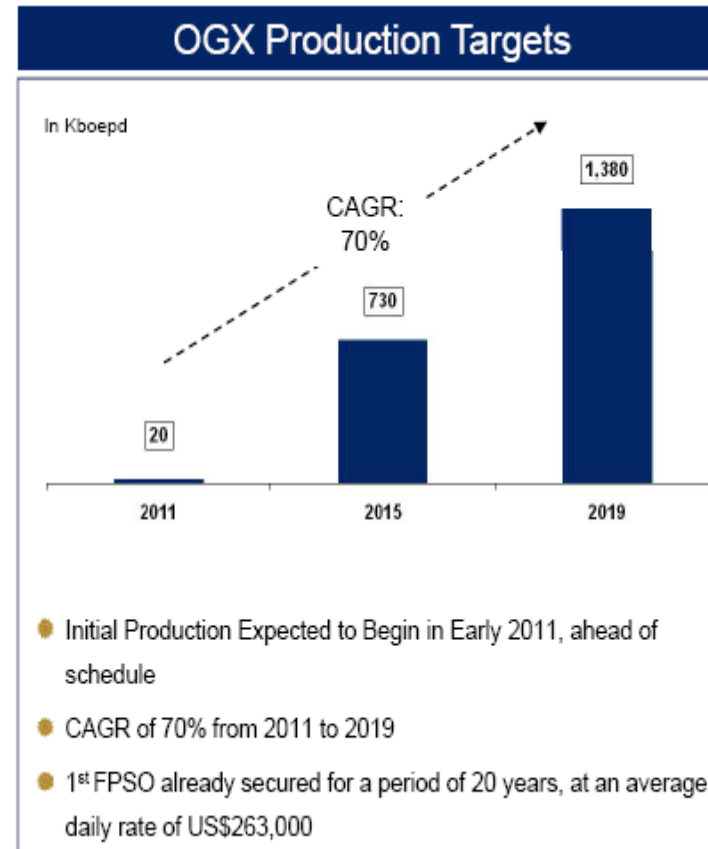
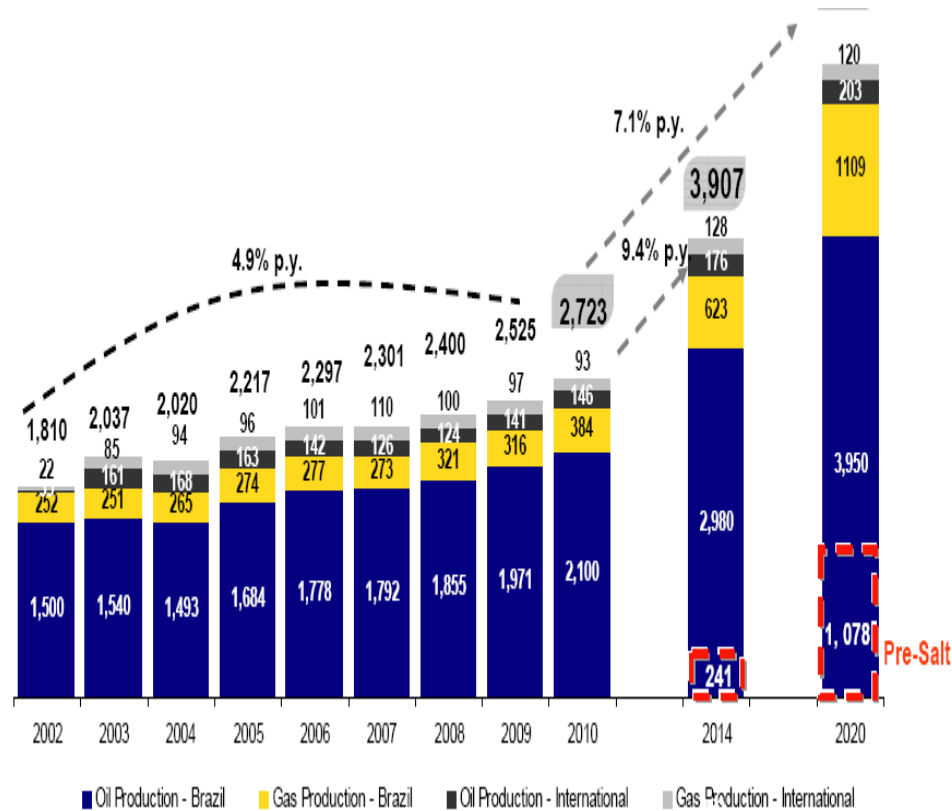


Russia – Productivity Improvements



Source for all charts: Credit Suisse

Players in Brazil have Ambitious Longer Term Goals



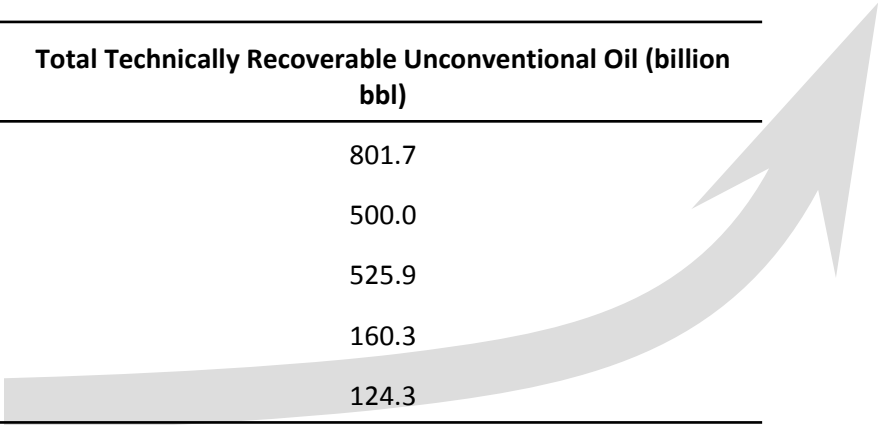
- **Project delays, like in GoM, may slow production**

Source for all charts: Credit Suisse

- Investment focus likely to shift to unconventional oil if prices remain high.

Much Unconventional Oil Outside Middle East

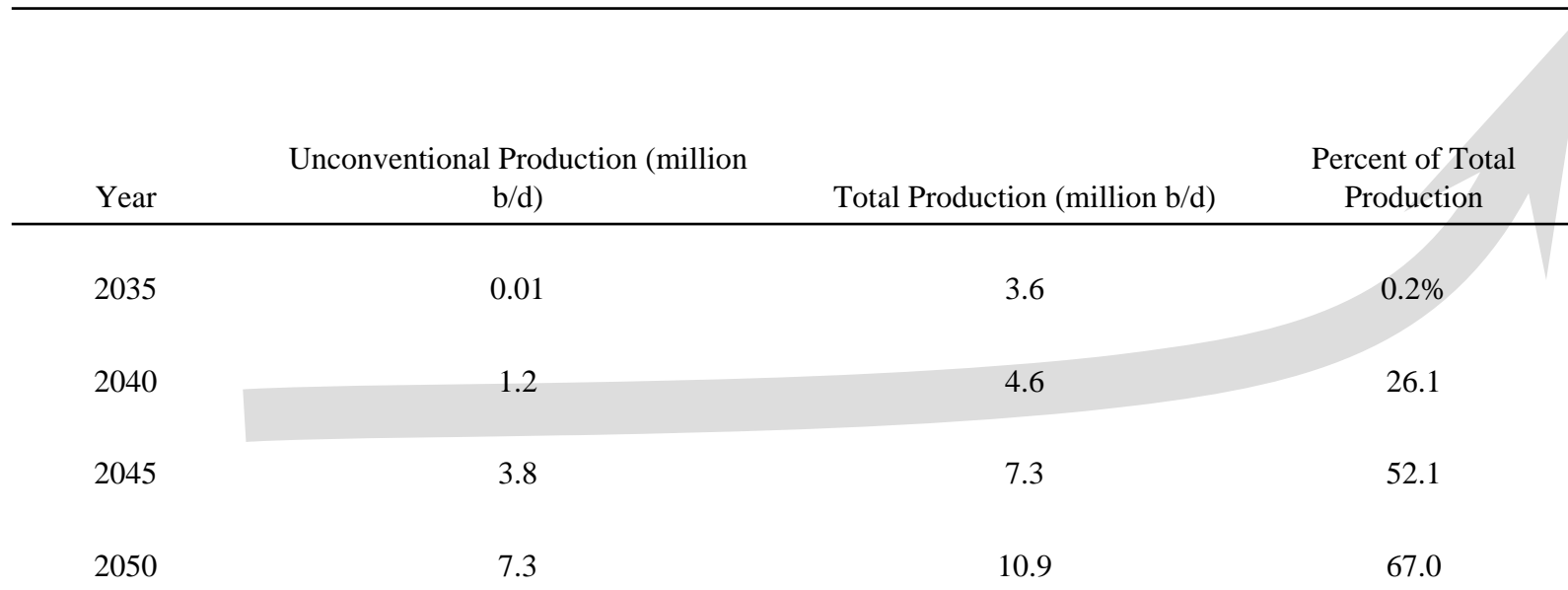
Country	Total Technically Recoverable Unconventional Oil (billion bbl)
USA	801.7
Canada	500.0
Other South America	525.9
Russia	160.3
Caspian	124.3
World	2129.5



Source: World Energy Council

Shale oil will be important in the long run: Might be hastened and expanded if current trends prevail.

Base Case Baker Institute Forecast U.S. Oil Shale Production

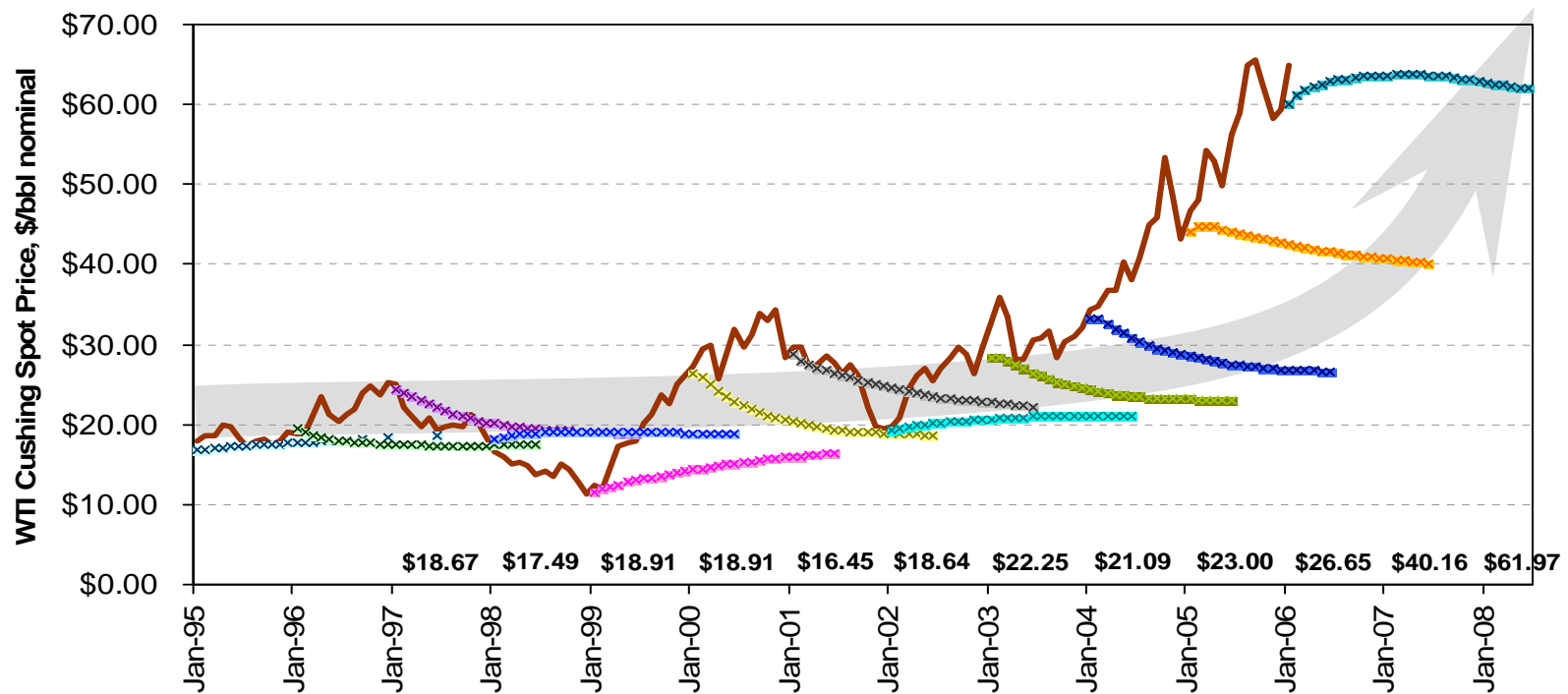


Year	Unconventional Production (million b/d)	Total Production (million b/d)	Percent of Total Production
2035	0.01	3.6	0.2%
2040	1.2	4.6	26.1
2045	3.8	7.3	52.1
2050	7.3	10.9	67.0

Note: Production from oil shale primarily comes online around 2035 (according to the model). The figures in the table do not include shale oil from the Bakken formation, for example, which approach about 900 thousand bbl/d then slowly decline after 2020.

Source: Hartley and Medlock, Rice World Energy Model, 2010

- Long Price of WTI largely traded in the \$20 range throughout the 1990s; Then in In 2006, new upward trend emerges.



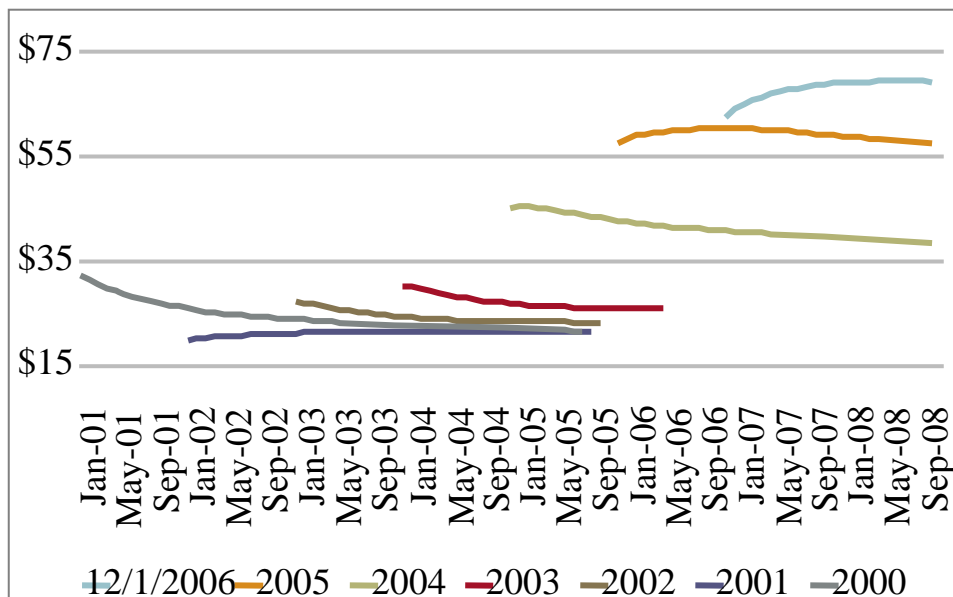
Why did the long oil price move upwards?

- Pessimism about NOC investment in new capacity
- Access restrictions for/lack of spending by IOCs
- Terror Premium created permanent change in attitudes about price floors
- F&D cost inflation
- China demand “story”

In late 2010-early 2011, pre-Egypt, long oil price was already rising:

Contact: report@tky.ieej.or.jp

The Long Oil Price Didn't Move Until 2006



Current Long Oil Price

