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Middle East Turmoil and Oil

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Thesis of Oil, Dollars, Debt and Crises

Middle East Instability is intricately tied to global financial and oil cycles; hence, repeating pattern of unrest/war and subsequent oil price crises.

Continuation of Middle East geopolitical conflicts driven by self-perpetuating arms races funded by petrodollars

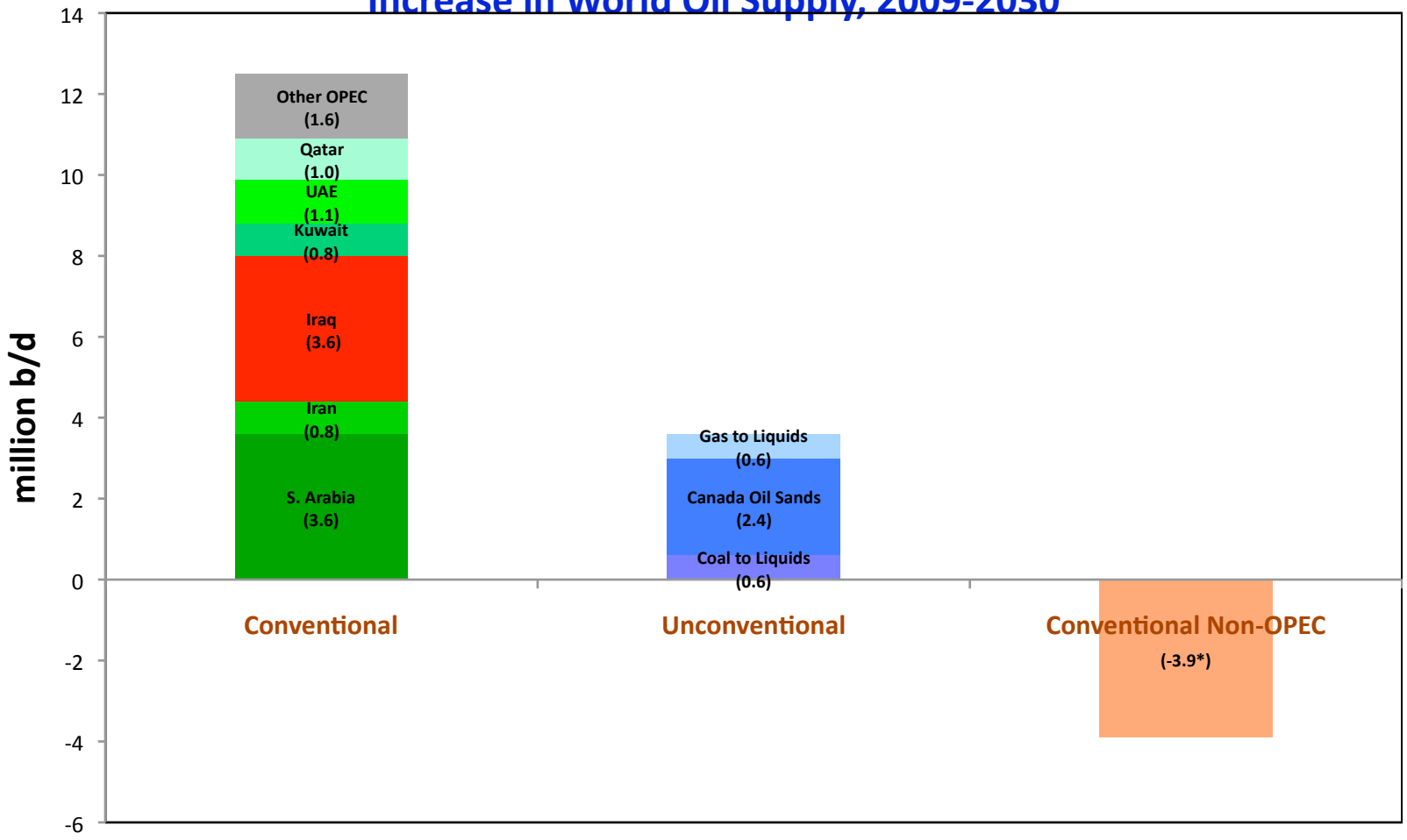
Façade of political and social stability in Middle East made possible by government spending on security during high oil price period masks significant threats in the region.

Nuclear arms race, conventional armed conflicts, sectarian strife, increasing income inequality, and failure to diversify economies driving the forces of future instability.

US plays into the pattern by selling arms and then trying to contain conflict through economic sanctions.

Economic disappointment during down part of cycle drives social unrest and discontent, terrorism and radicalism.

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



- **Predictions are that the vast majority of future oil supply increases will come from the Middle East and North Africa. But what if those increases from the Middle East fail to materialize as expected? The problem is not geology…it's geopolitics!**

Political contagion effect now a major component to oil price premium

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:
  - 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

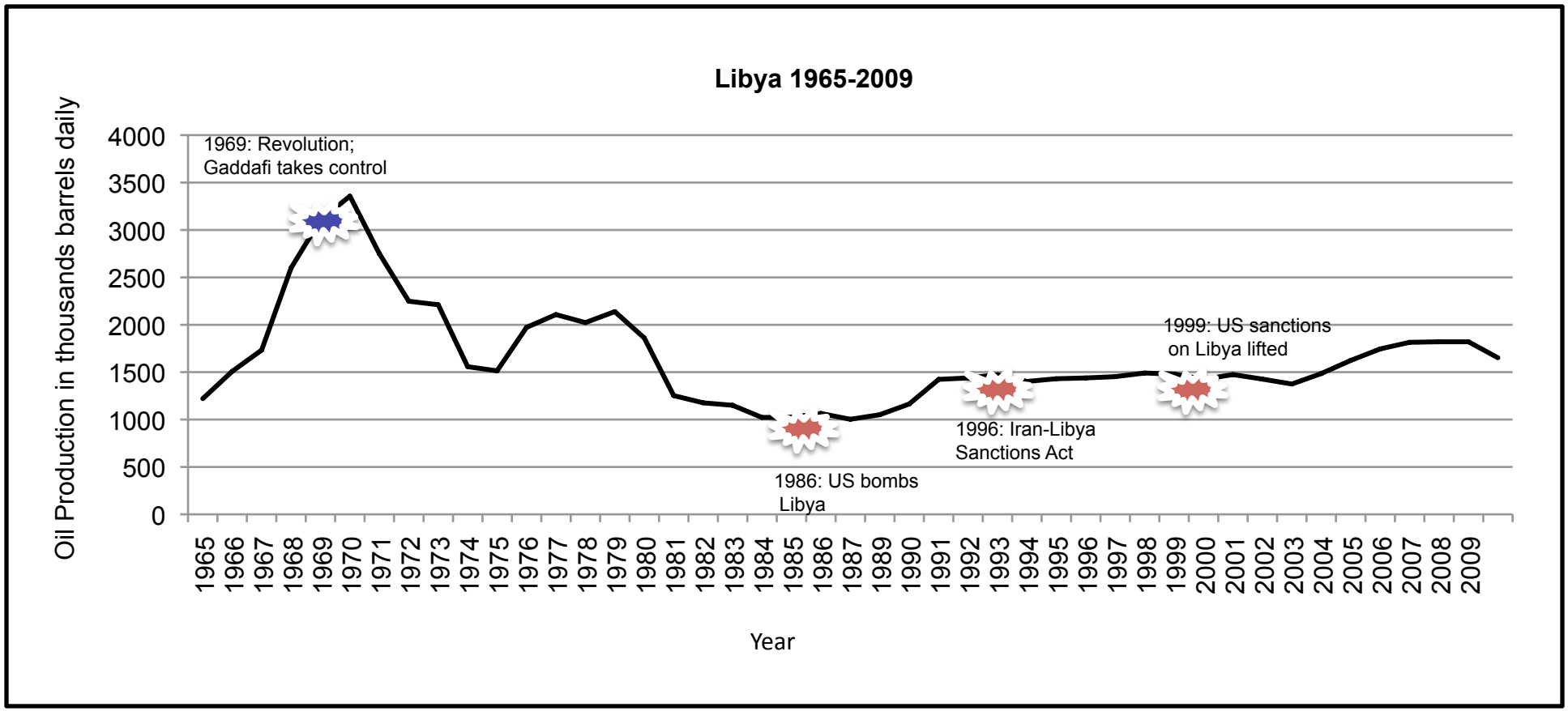
- -- Algeria: Median age 27.1 years, 10% unemployment, 2.1-m b/d
  - Libya: Median age 24.2 years, 30% unemployment, 1.5-m b/d
  - Syria: Median age 21.5 years, 8% unemployment, 0.4-m b/d
  - Yemen: Median age 17.9 years, 35% unemployment, 0.4-m b/d
  - KSA: Median age 24.9 years, 11% unemployment, 9.5-m 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

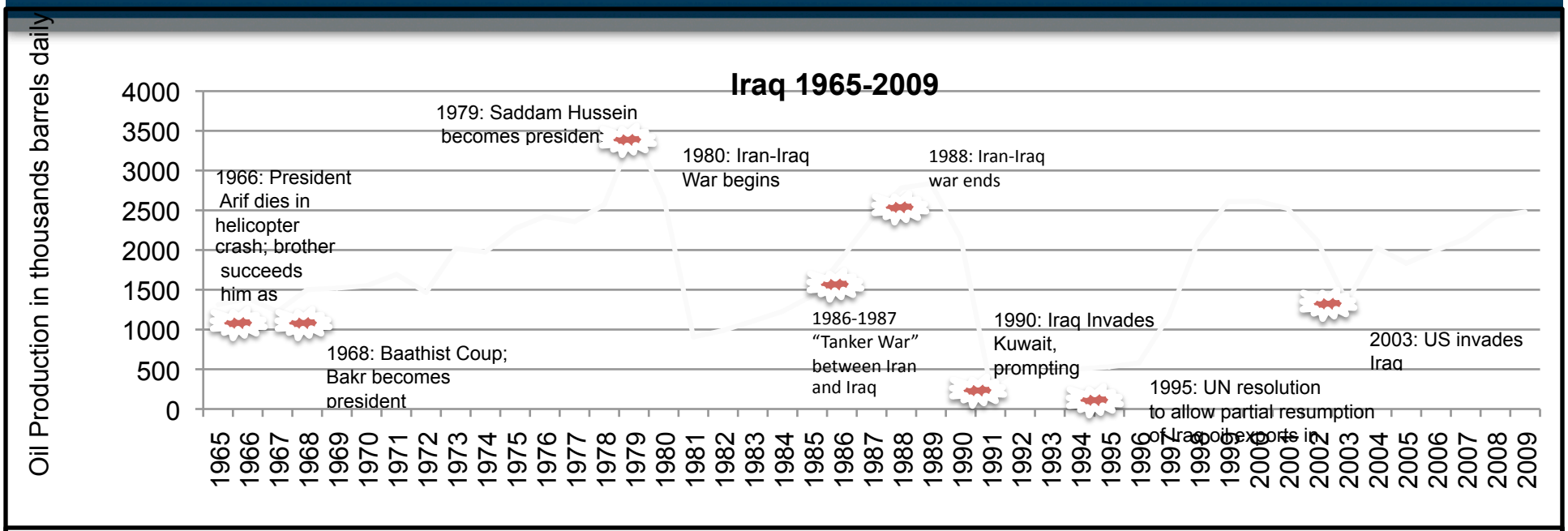
Active Geopolitical Risks

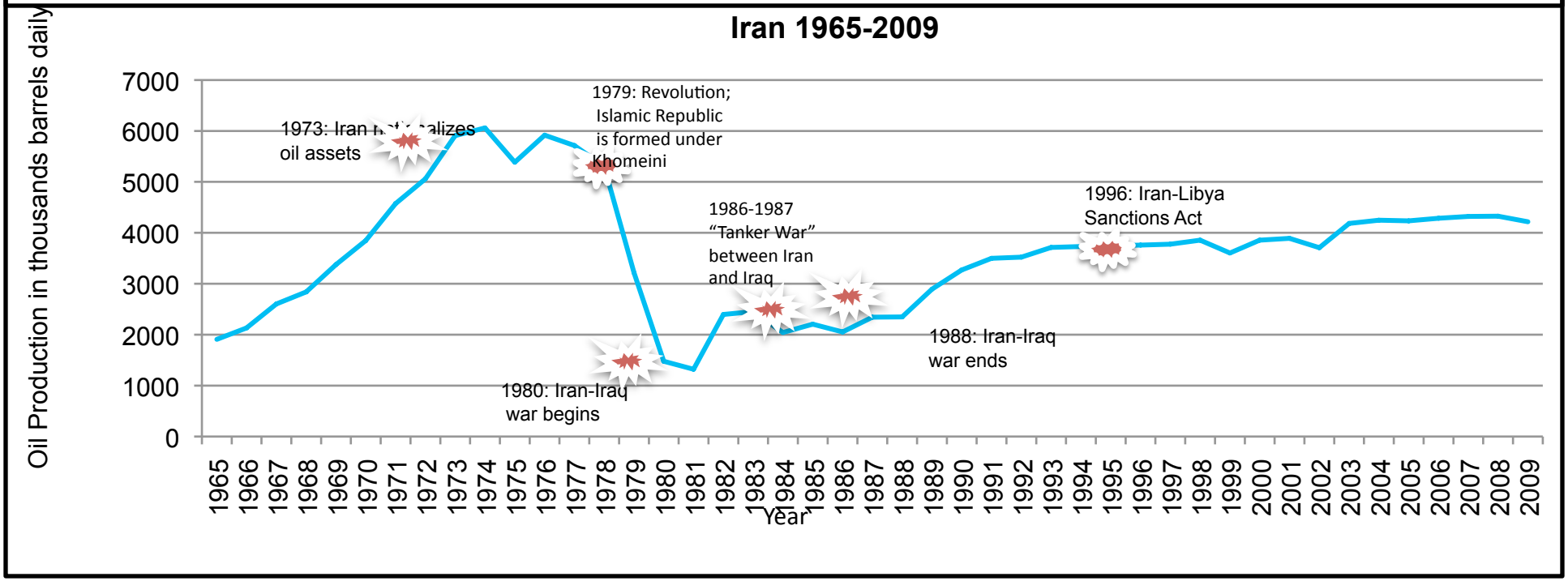
- Iranian Revolution X 2
- Libya-style disruptions
- Regime Change Usually Equals Supply Declines, Major Disruptions Possible
- Democracy Movement in Middle East: Will democracy stifle upstream investment?
- Saudi Succession Issues, plus Shi'a unrest
- Yemen War
- Proxy Fight between Saudi and Iran for supremacy –is escalation possible?

Regime Change Often Followed By Production Declines

Sudden change of government results in worker unrest, brain drain, lack of a clear chain of command, and investment decision slowdowns, all of which can contribute to declining oil sector.




Iraq 1965-2009
Oil Production in thousands barrels daily
4000
3500
3000
2500
2000
1500
1000
500
0
1966: President Arif dies in helicopter crash; brother succeeds him as
1968: Baathist Coup; Bakr becomes president
1979: Saddam Hussein becomes president
1980: Iran-Iraq War begins
1986-1987 "Tanker War" between Iran and Iraq
1988: Iran-Iraq war ends
1990: Iraq Invades Kuwait, prompting
1995: UN resolution to allow partial resumption of Iraq oil exports in
2003: US invades Iraq
1965 1966 1967 1968 1969 1970 1971 1972 1973 1974 1975 1976 1977 1978 1979 1980 1981 1982 1983 1984 1985 1986 1987 1988 1989 1990 1991 1992 1993 1994 1995 1996 1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007 2008 2009


Iran 1965-2009
Oil Production in thousands barrels daily
7000
6000
5000
4000
3000
2000
1000
0
1973: Iran nationalizes oil assets
1979: Revolution; Islamic Republic is formed under Khomeini
1980: Iran-Iraq war begins
1986-1987 "Tanker War" between Iran and Iraq
1988: Iran-Iraq war ends
1996: Iran-Libya Sanctions Act
1965 1966 1967 1968 1969 1970 1971 1972 1973 1974 1975 1976 1977 1978 1979 1980 1981 1982 1983 1984 1985 1986 1987 1988 1989 1990 1991 1992 1993 1994 1995 1996 1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007 2008 2009
Year

Democracy Does Not Necessarily Bring Higher Oil Production

Politics of competing political coalitions and stakeholders can slow investment process, siphon off funds from industry, and hinder decision making on complex technical projects

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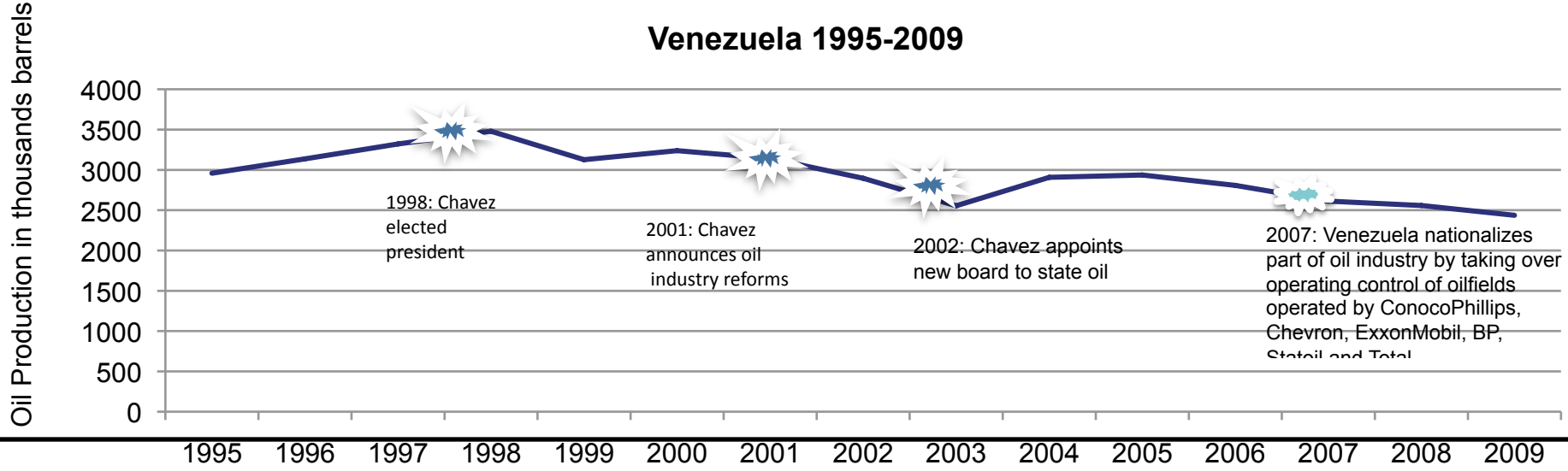
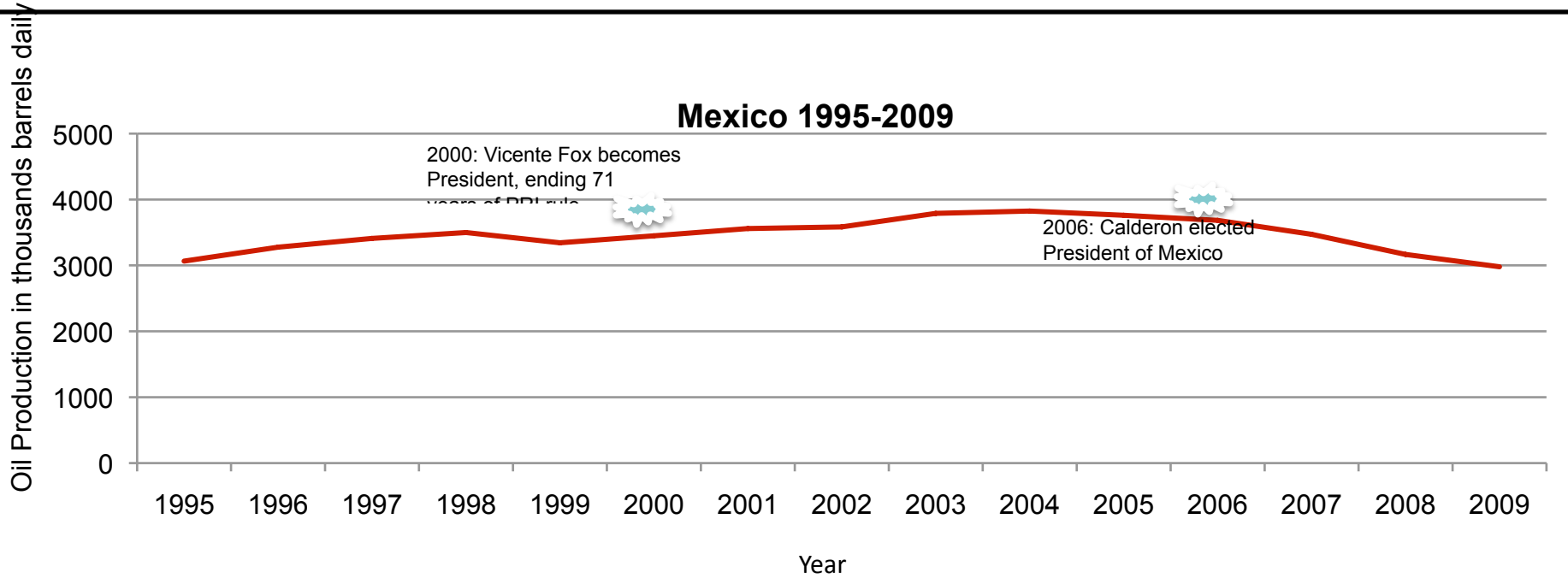
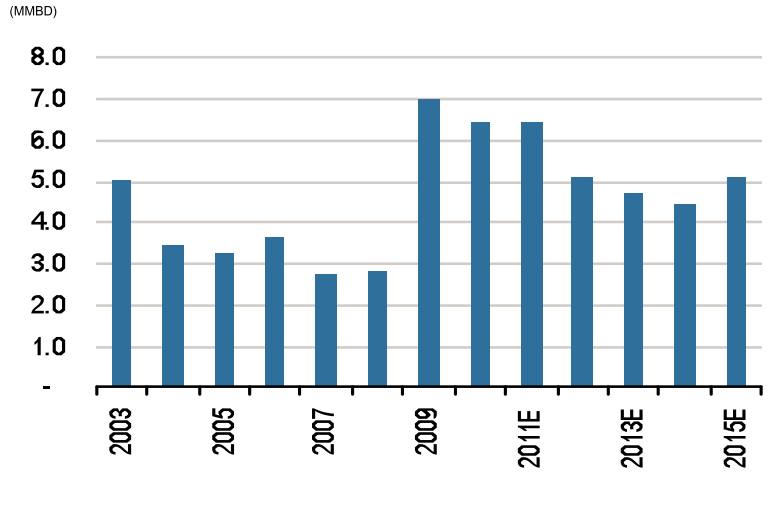




Surplus OPEC production capacity faces uncertainty

OPEC Spare Capacity could fall even more than expected in the coming years



						15
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?

Turmoil could affect OPEC capacity trends

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

Contagion fears are not unfounded

- 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

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Nuclear Infrastructure and Capabilities

States with no nuclear capabilities	States pursuing nuclear infrastructure/ capabilities		States with some nuclear infrastructure/ capabilities		States with significant nuclear infrastructure/ capabilities	
Bahrain	**Saudi Arabia**	Memoranda with US for nuclear development (2008) King Abdullah City for Nuclear and Renewable Energy (2010) Atomic energy deal with Japan	**Algeria**	2 research reactors 1 pilot uranium conversion plant 1 fuel fabrication plant 1 AURES I	**Iran**	1 power reactor (not operating) 1 research reactor 1 heavy water reactor under construction 3 critical assemblies facilities / mini reactors 1 UCF; 1 uranium chemistry lab 2 fuel fabrication plants 1 Mix Facility (reprocessing) 2 enrichment plants 2 storage facilities JHL
Qatar	**UAE**	Contract with South Korean consortium to construct 4 reactors	**Iraq**	2 research reactors (shot down since 1991) 1 storage facility	**Egypt**	2 research reactors 2 fuel fabrication plants Hydrometallurgy unit (reprocessing) 1 Molybdenum production unit
Tunisia	**Jordan**	Discovered uranium deposits and signed nuclear agreements with 9 countries	**Libya**	1 research reactor 1 uranium R&D facility	**Israel**	2 research reactors Nuclear weapons (~)
Yemen	**Kuwait**	Feasibility study of nuclear energy	**Morocco**	1 research reactor (under construction)	**Turkey**	2 research reactors + 1 additional research reactor under construction 1 Fuel Pilot Plant
Oman			**Syria**	1 alleged reactor capable of plutonium production, destroyed by Israeli airstrike in 2007		

Based on facilities under safeguards by the IAEA.
Source: GC(53)/7, 31 December 2008

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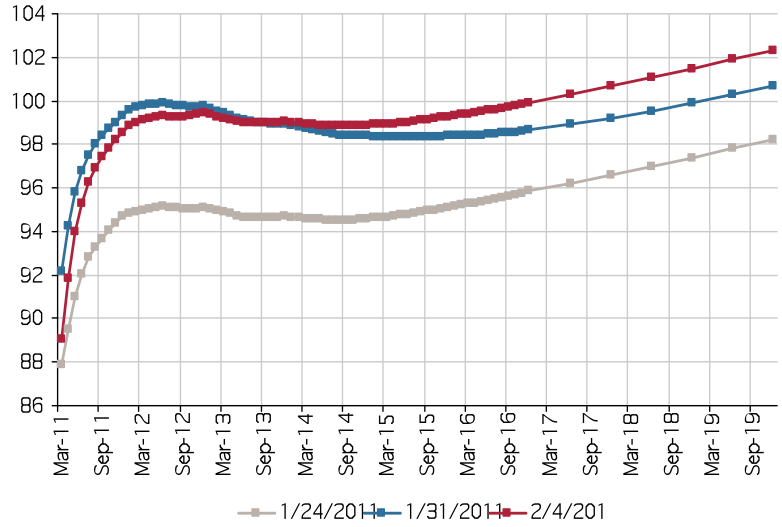
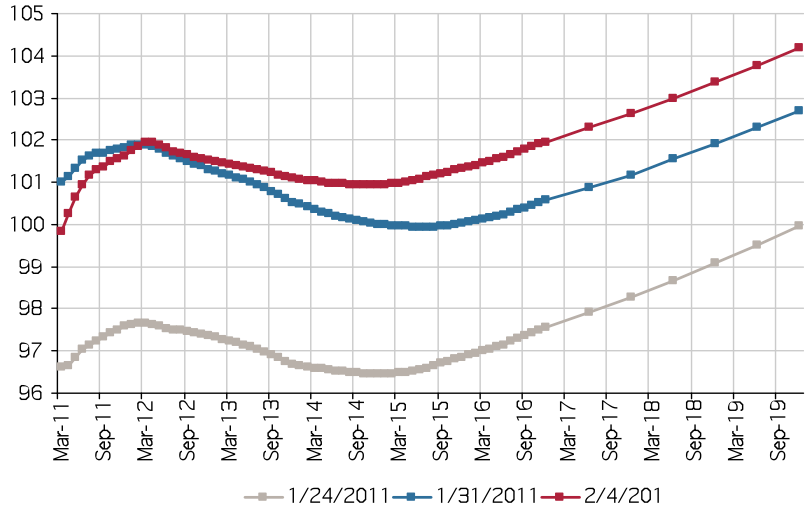
Mideast turmoil is impacting financial flows, shifting them from US to London

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.

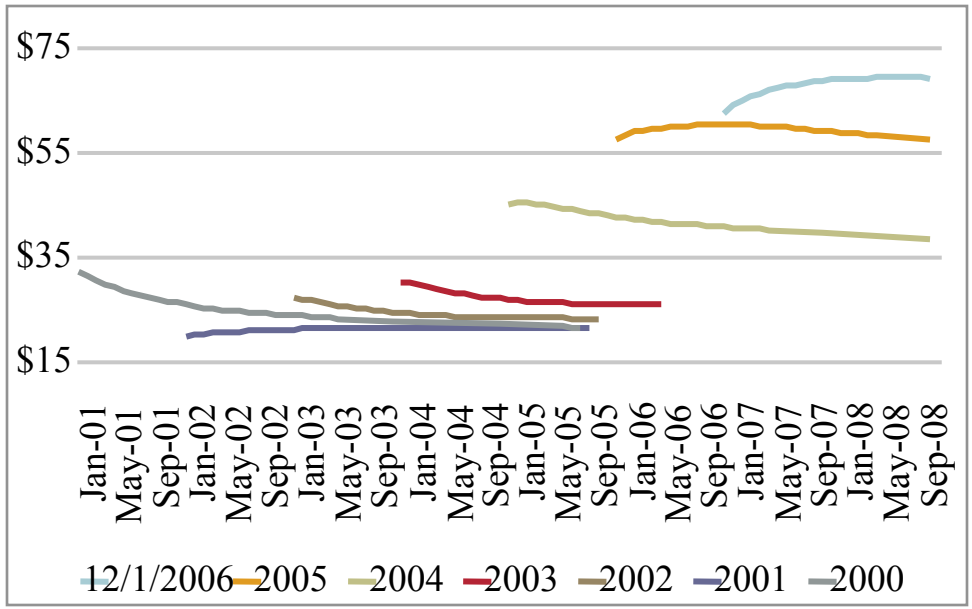
The changing oil price landscape

Why did the long oil price move upwards?

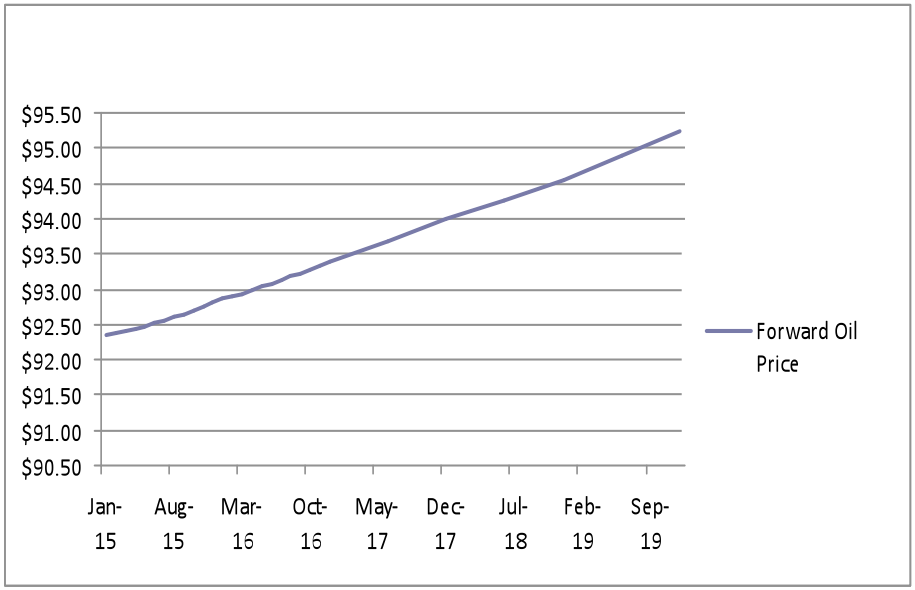
- Pessimism about NOC investment in new capacity
- Access restrictions for/lack of spending by IOCs
- Terror Premium created permanent change in attitudes about price floors
- F&D cost inflation
- China demand "story"

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

The Long Oil Price Didn't Move Until 2006



Current Long Oil Price



Barring a major economic downturn, current outlook points to sustained high oil prices

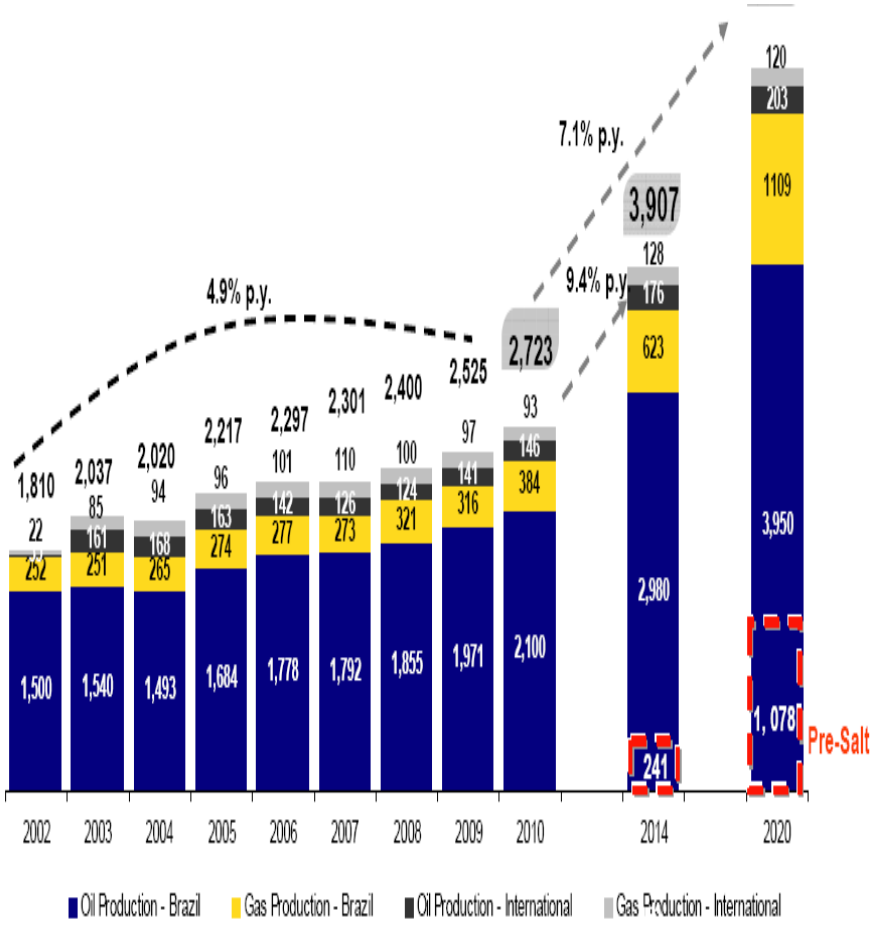
- Turmoil in Middle East likely to be sustained and may disrupt investment spending
- US Offshore regulatory uncertainty is taking a bite
- NOCs control an increasing share of investment spending and continue to exhibit inefficiency
- Bureaucratic and other geopolitical barriers blocking adequate investment 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

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

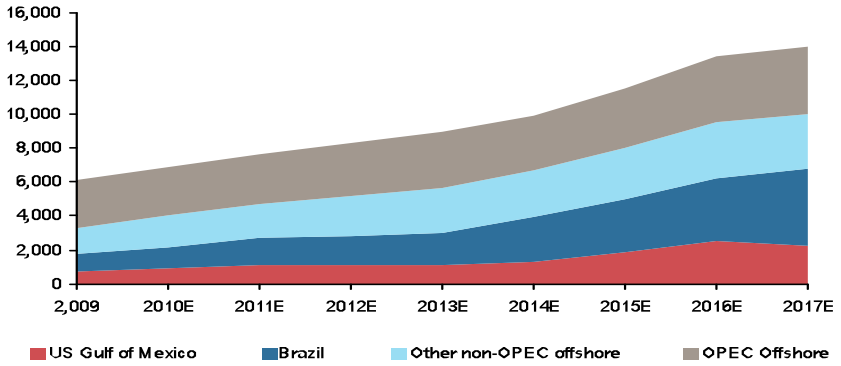
- OPEC spare capacity is much higher
- Larger availability of drilling rigs
- Governments more focused on energy efficiency and security policy, INCLUDING CHINA
- Financial players dealing in oil but with far less leverage than 2007-2008
- China not hoarding ahead of Olympics
- New natural gas (shale) 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

Robust supply normally follows high prices

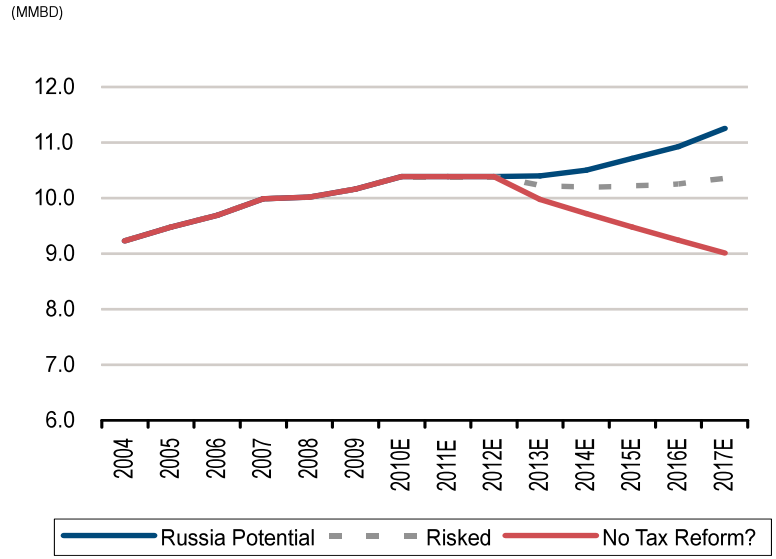
Brazil Could Make a Substantial Supply contribution



Significant New Offshore Projects Post 2014



Russia – Productivity Improvements



Source for all charts: Credit Suisse

Large Potential for Unconventional Oil

– **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

Large Potential for Unconventional Oil

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