



Global Supply Through 2010: Complacency Before The Storm?

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Modeling Conference

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**Strategic Advisors
in Global Energy**

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- **The deepwater and Central Asian “bulge” is upon us**
 - 2004-2005 was inflection point heading into better quality slate

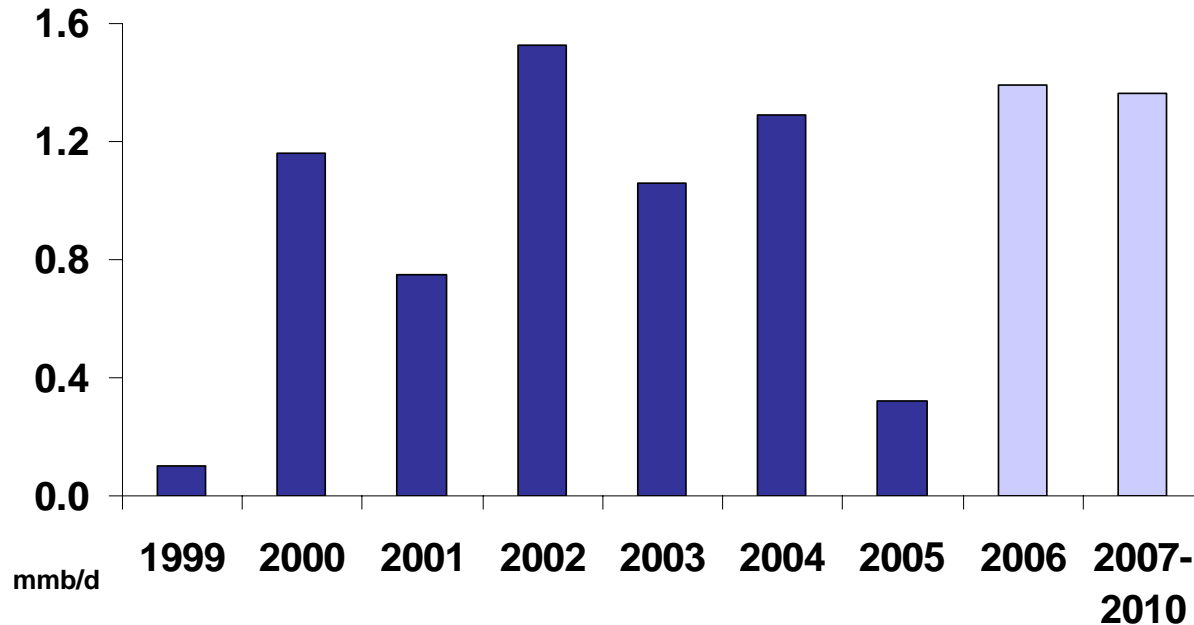
- **Danger these trends induce policy complacency**
 - More countries maturing, declining
 - Exploration trends not encouraging

- **Company strategies unlikely to change macro picture much**
 - At \$30+ WTI, IOCs going all out but are opportunity-constrained
 - NOCs face varied constraints; little production upside, some downside

- For each country **reserve** additions (field by field) have been documented along with production history
- A decline is modeled for the **producing base** using current withdrawal rates and remaining reserve estimates for fields in the existing production base (an additional 15-20% volume has been added to the current estimates of P1+P2 to account for possible higher recoveries).
- All **new discoveries with a development plan** are documented and probabilistically modeled to add to the producing base (P90, P50, and P10 reserves are used).
- All **undeveloped discoveries without a development plan** are modeled using country average peak rates, decline rates, development concepts, etc. and added to the producing base (The range of recoverable reserves modeled is +/- 20% of reported P1 and P2.
- **Probabilistic expected value exploration models** are built which assume that average field size discoveries, success rates, etc. (documented since 1990) continue over the next two decades; volumes from these EVA model resource discoveries (with appropriate development delays and production profiles) are added to base production.

2006 Marks Start Of Supply Surge

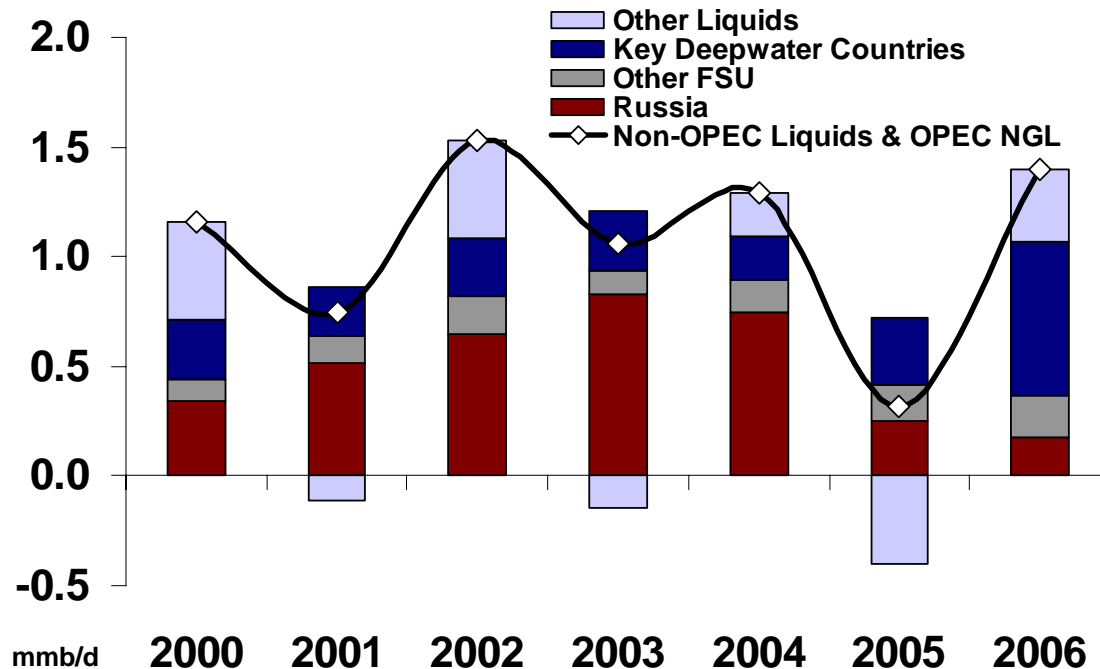
Annual Supply Growth, Non-OPEC Liquids & OPEC NGLs



- **Growth this year good at 1.4 million b/d (including OPEC NGLs)**
- **Follows very weak 2005 of 320,000 b/d**
- **Rest of decade expected to see growth average 1.4 mmb/d as well – 60% higher than the growth of the previous 10 years!**

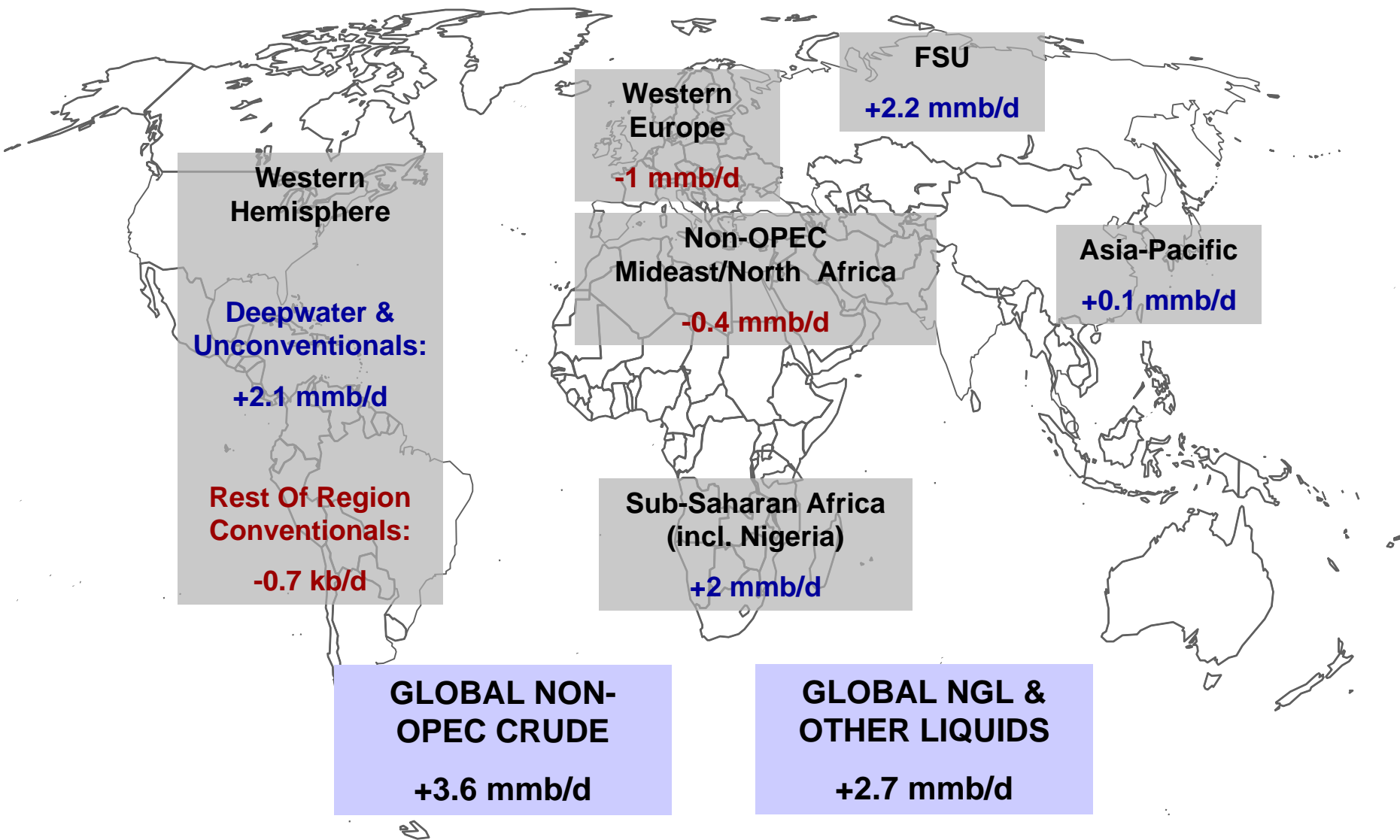
Components Of Growth Changing

Annual Supply Growth, Non-OPEC Liquids & OPEC NGLs



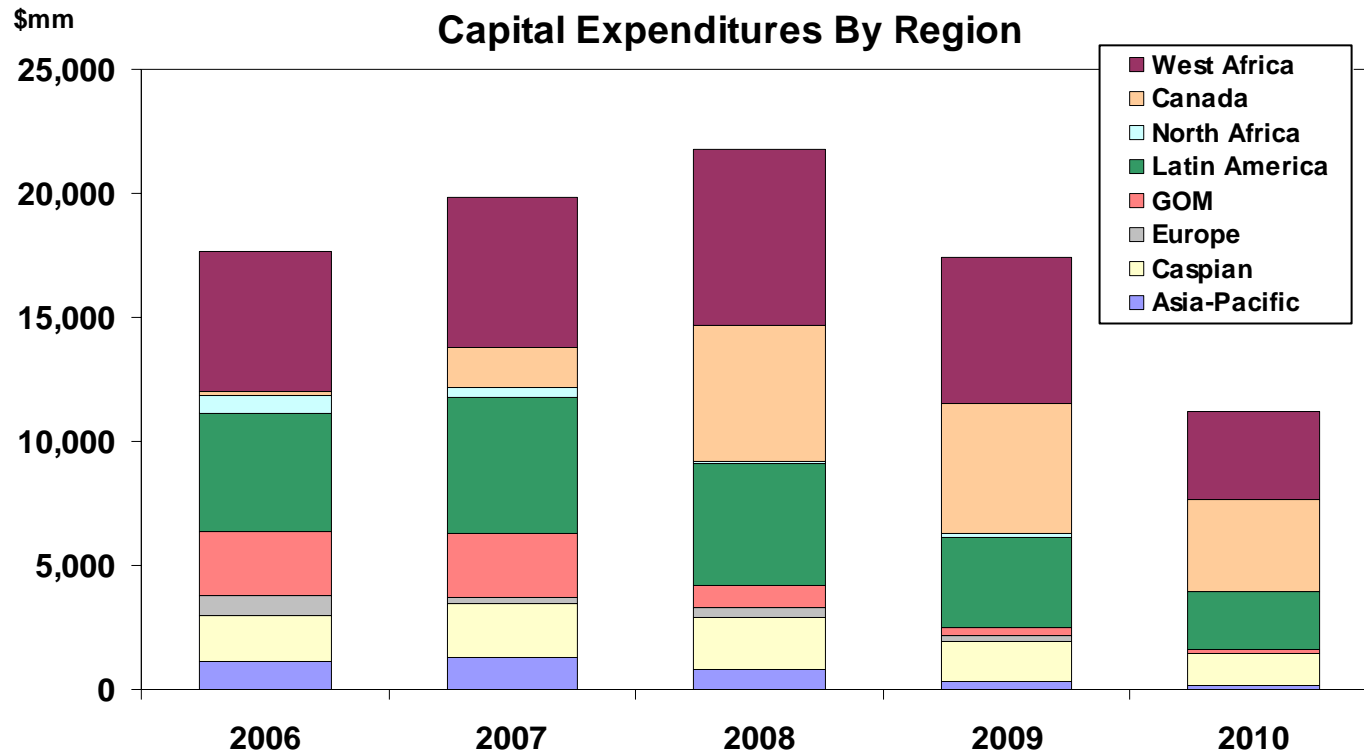
- **Russia no longer the driver**
- **Deepwater has displaced Russia as key growth driver**
- **Central Asia poised to become key driver as well**

2005-2010 Growth Versus Decline Regions

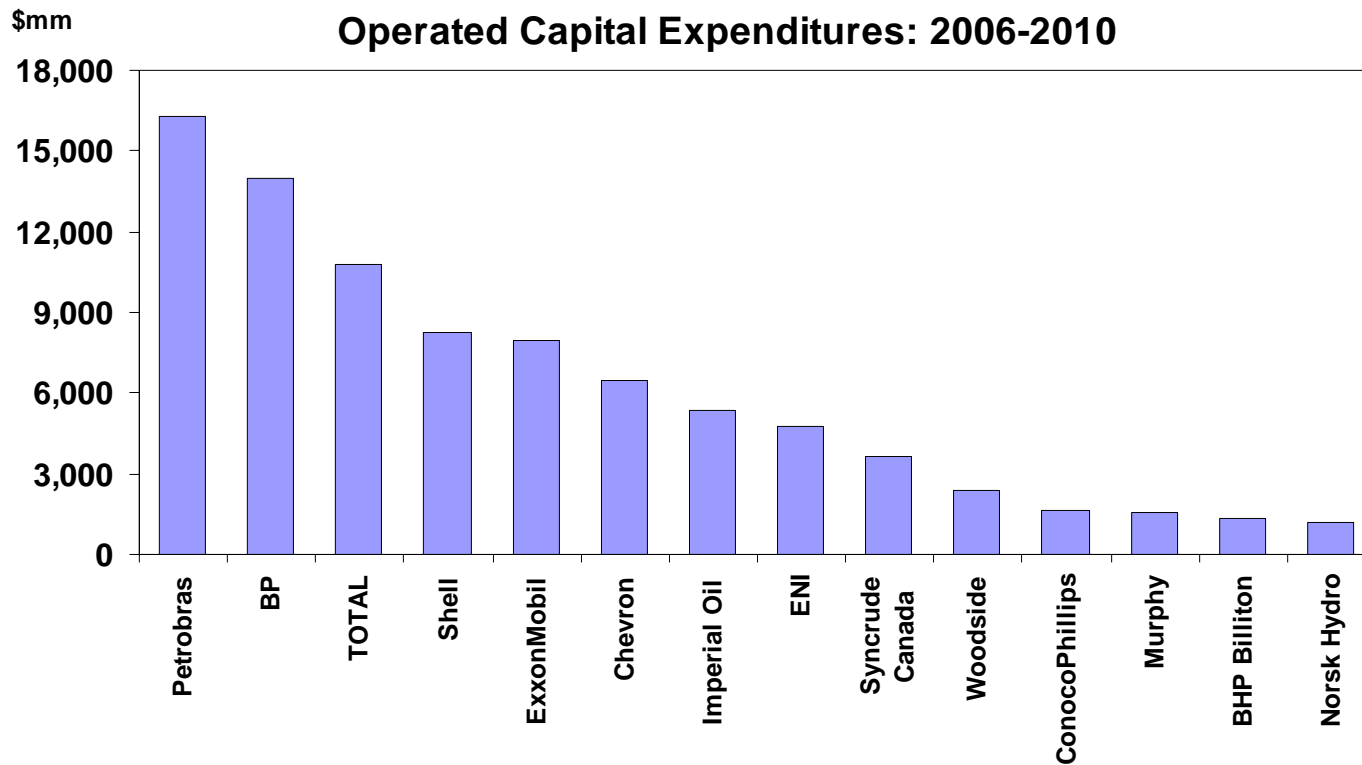


Capex Matches Production Growth Regions

Capital Expenditures By Region: 2006-2010



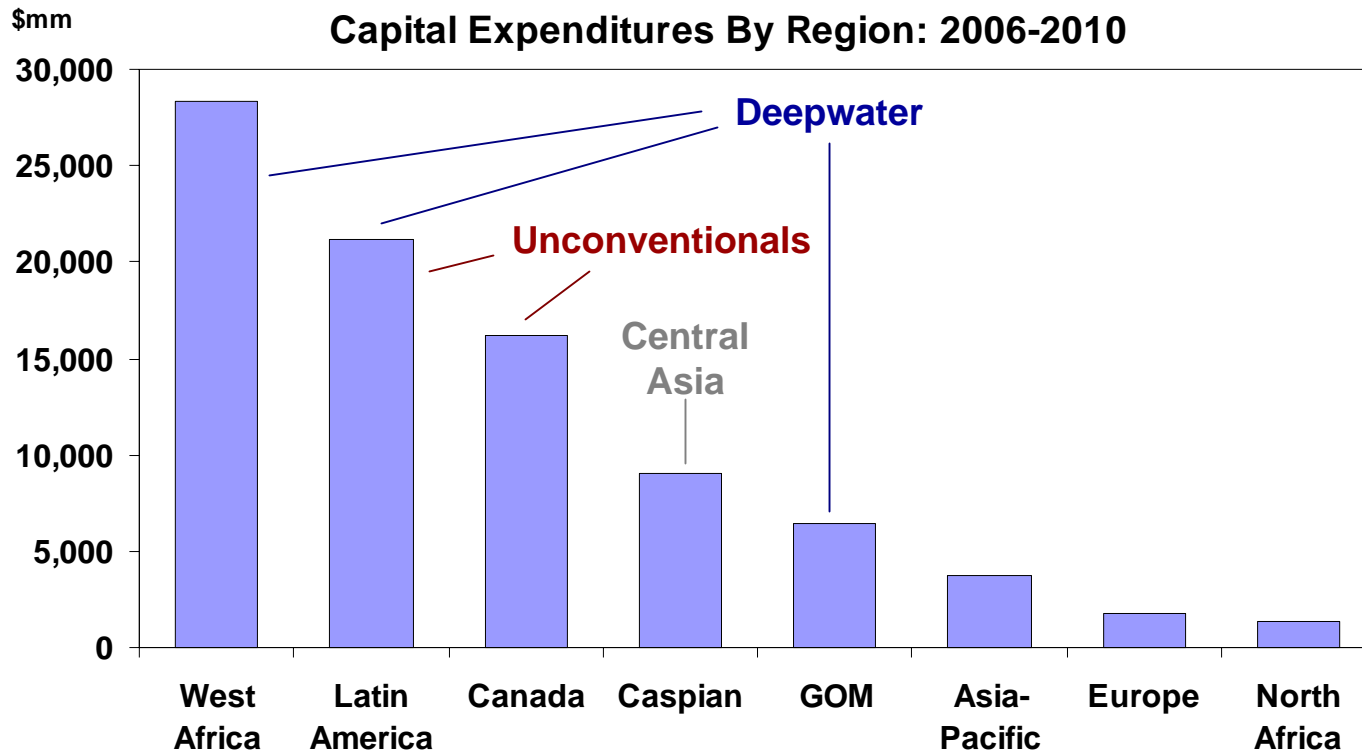
Gross Operated Capital Expenditures: 2006-2010



Note: Minimum \$1 Billion in total operated capex

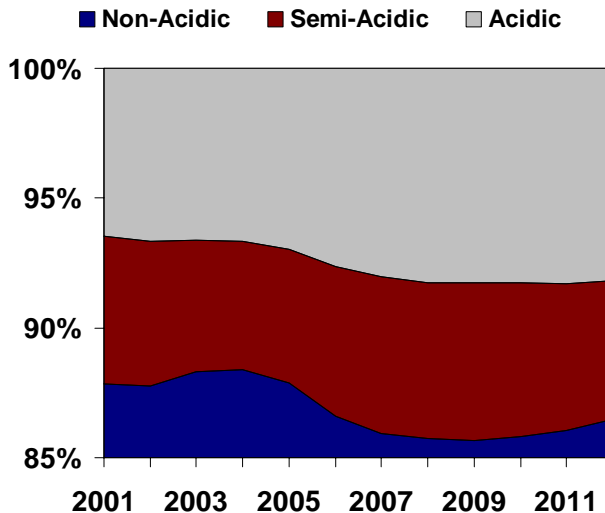
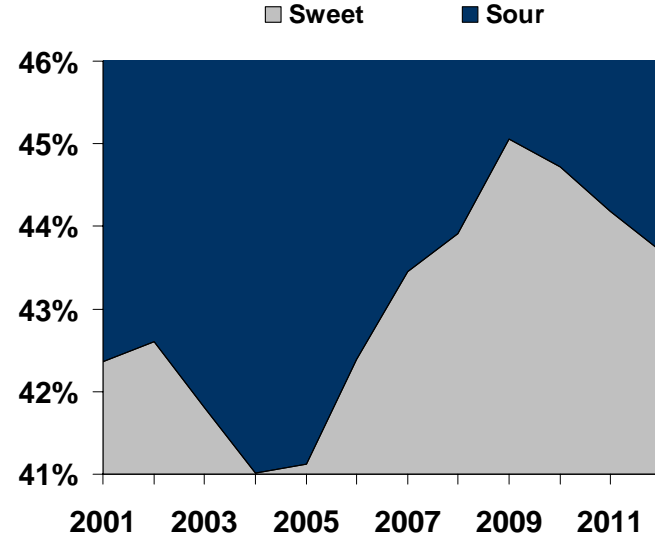
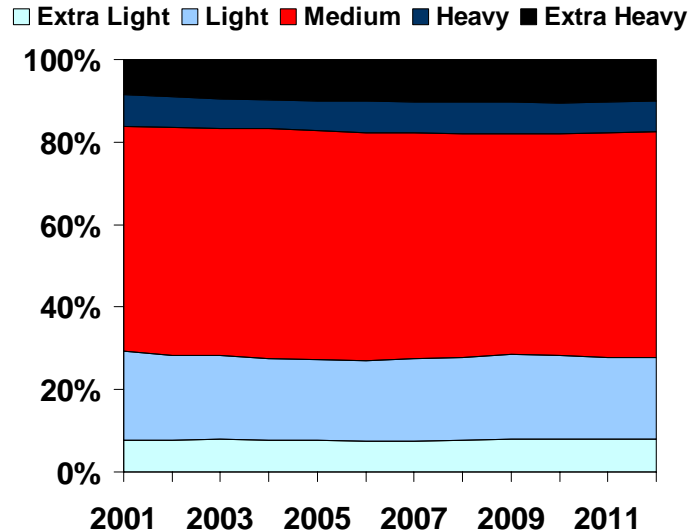
Capex Matches Production Growth Types

Capital Expenditures By Region: 2006-2010



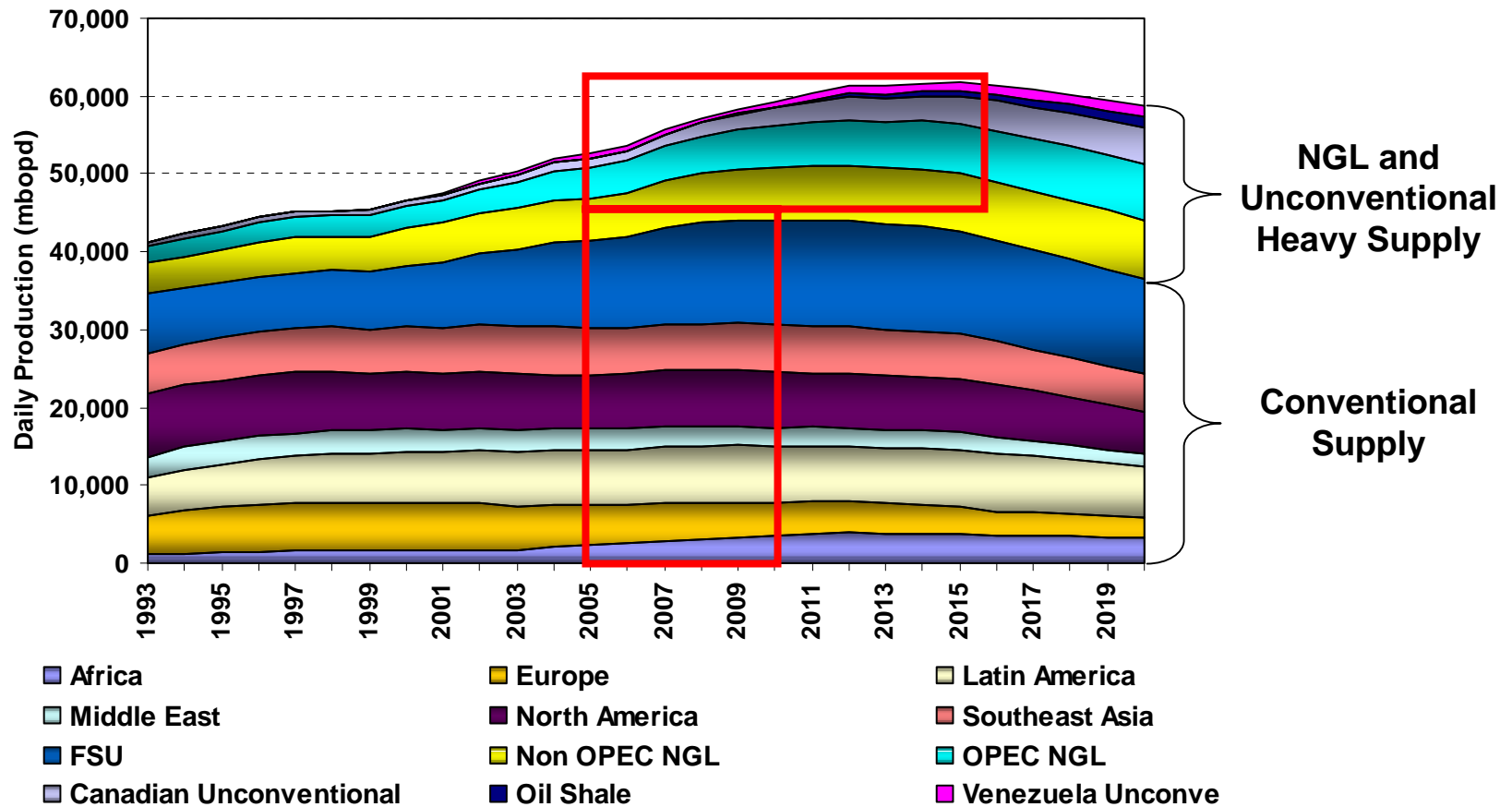
Quality Improvement Has Begun

Global Crude Slate By Gravity, Sulfur, Acidity



- In the next five years the global crude slate is going to grow:
 - Lighter
 - Sweeter
 - More acidic (one worse trend)
- After 2010, trends expected to begin reversing

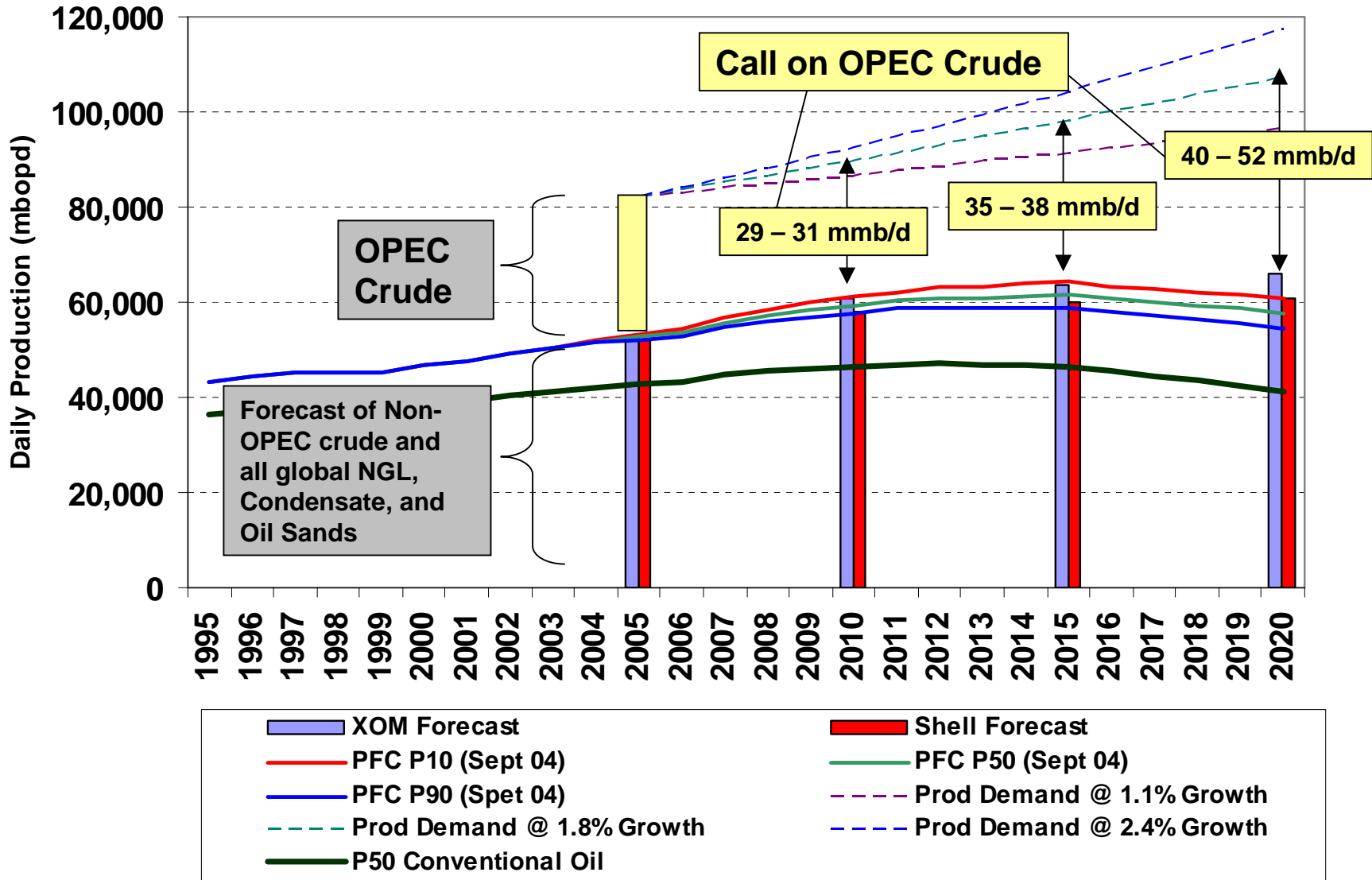
The Long-Term Context



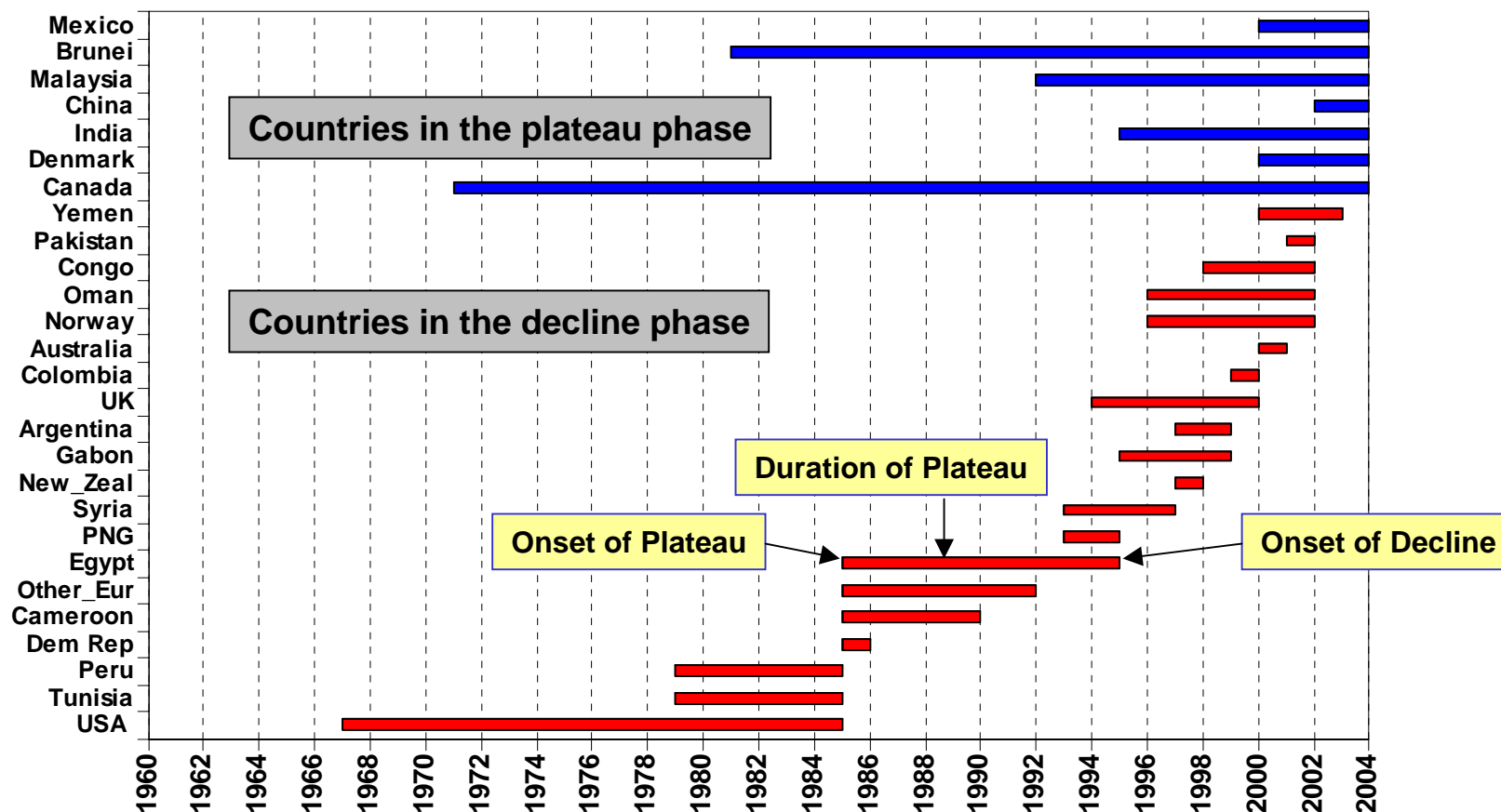
Conventionals: Deepwater and Central Asia are coming into their own now, temporarily overwhelming the impact of declining mature basins.

Unconventionals: Development speeding up, will keep Non-OPEC supply growth going beyond likely conventional peak early next decade.

The Problem - The Expected Growing Gap Between Global Demand and Global Non-OPEC Supply in the Next Decade

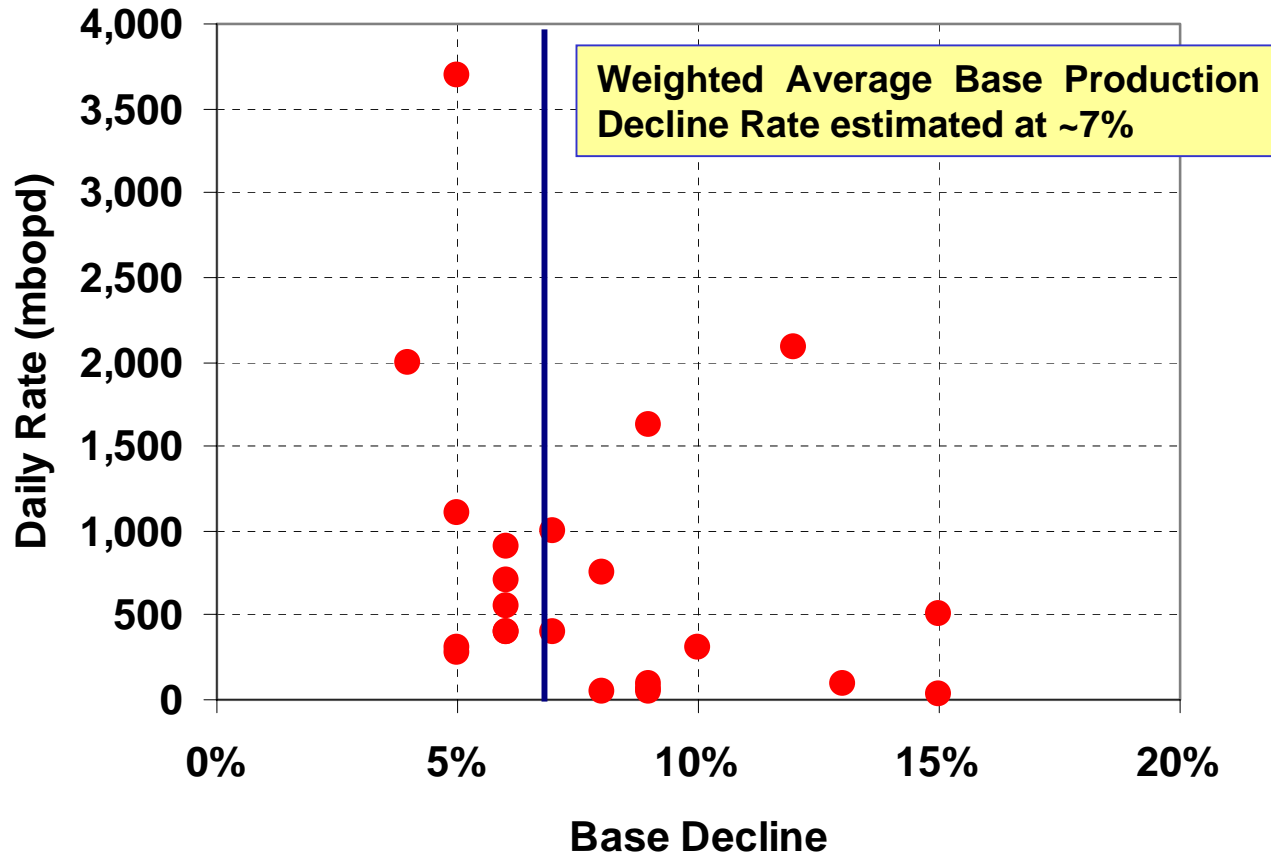


Many Non-OPEC Producers have Either Gone into Decline or Reached Plateau Since the Mid - 1990s



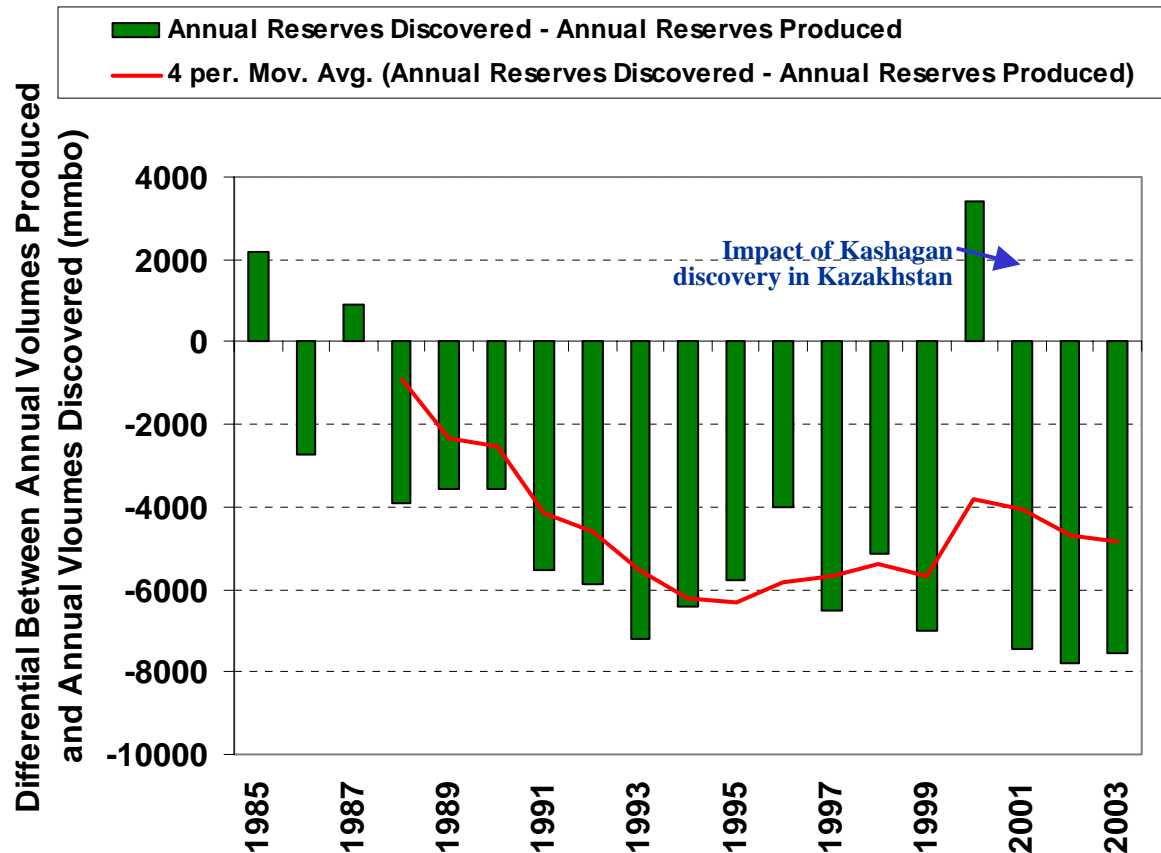
The above bars show the onset and duration of documented production peaks or plateaus – *tracking country life cycle shows an acceleration of the number of countries passing from peak to decline*

The Base Decline Underlying New Production is Higher than Generally Assumed



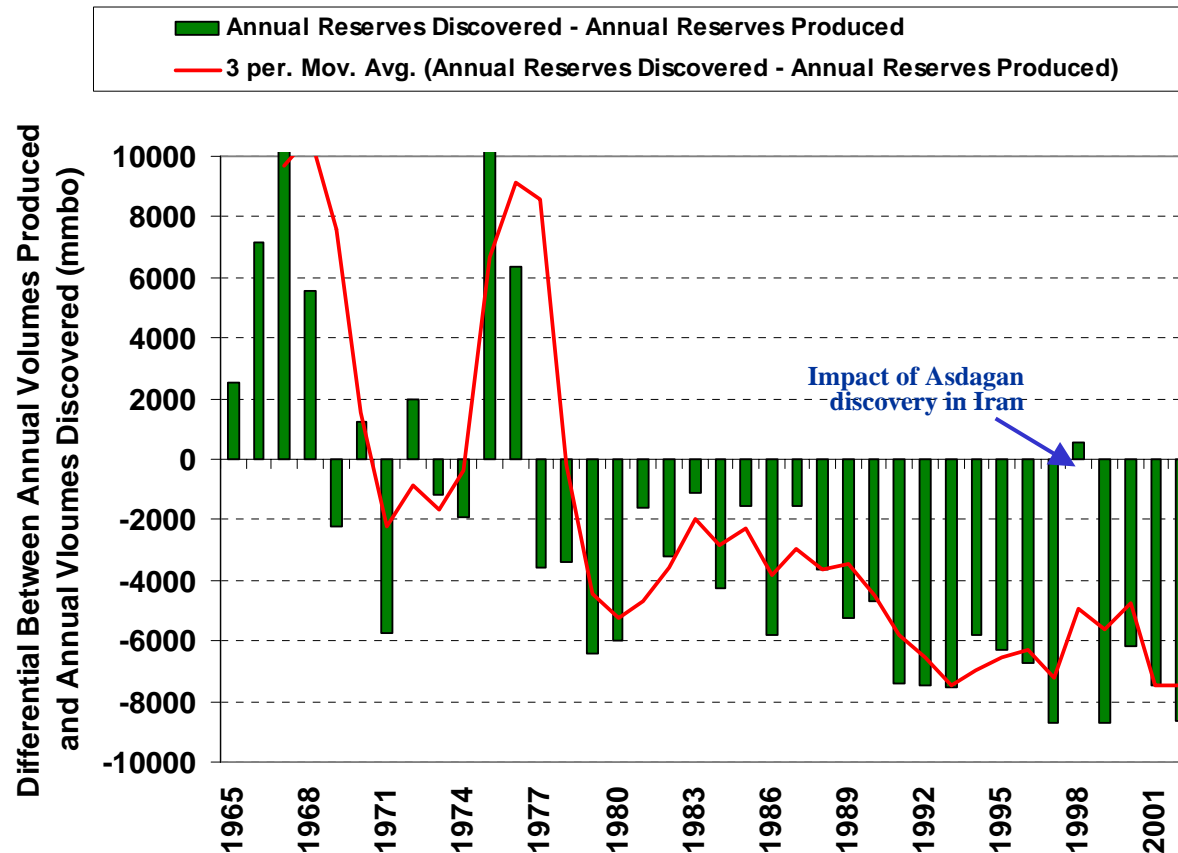
The above points show the decline rate in base production (*defined as fields onstream before 2000*), calculated by netting “new field” production from the gross production profile

Non OPEC Annual Crude Oil Production Balance



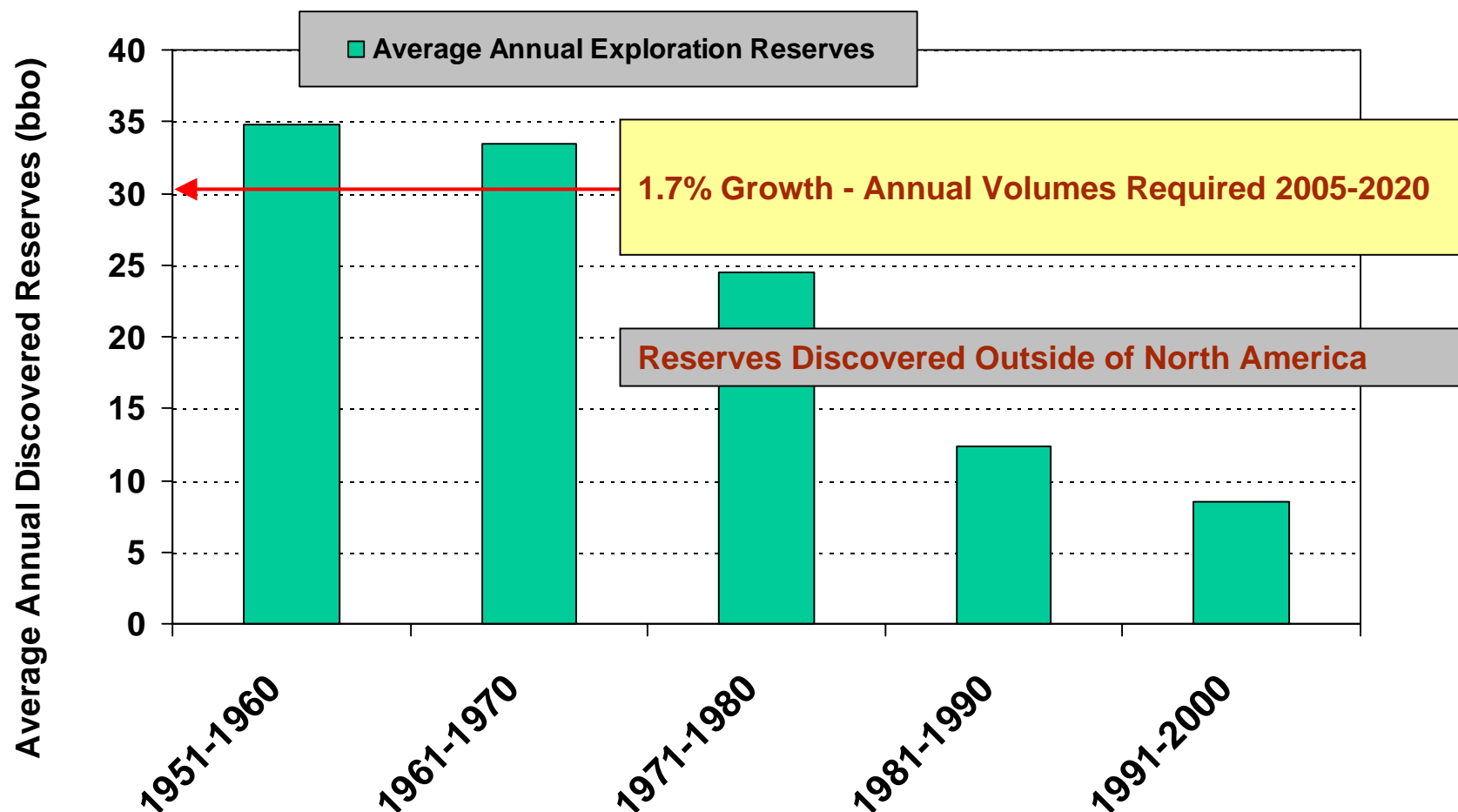
Global Non-OPEC crude production is currently exceeding reserves additions by as much as 8 billion barrels per year – *this continuing depletion of the reserve base will ultimately lead to the inability to continue growing production rate*

OPEC Historical Annual Crude Production Balance



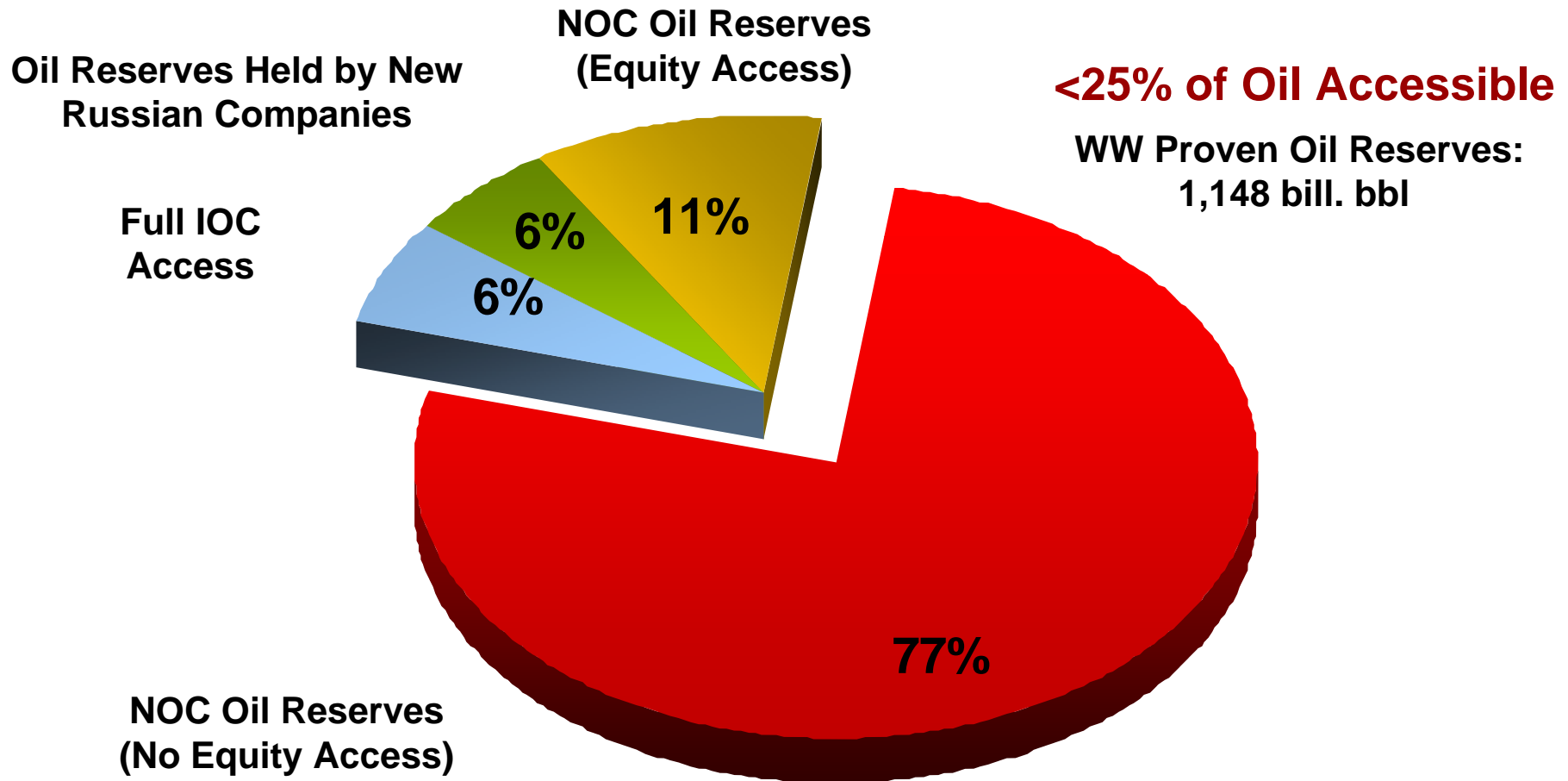
Global OPEC crude production is also exceeding reserves additions by ~8 billion barrels per year; here, the challenge lies in accelerated expansion of production capacity.

Decline in Reserves Additions + Growth in Demand => Consuming Global Liquids Inventory



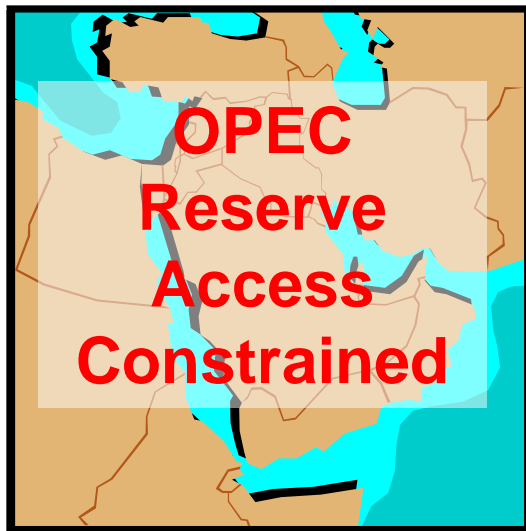
To stabilize depletion of Non – OPEC reserves => offset every barrel produced with a new barrel found (either through discovery or enhanced recovery); based on current and projected levels of consumption => need to return to success levels typical of the period prior to 1980

IOCs Don't Have Access To The Big Reserves



**NOCs control the big reserves...
As a result IOCs are rule takers and price takers**

IOC Attention Will Expand to Unconventionals



Plenty Of IOC Capital To Spend



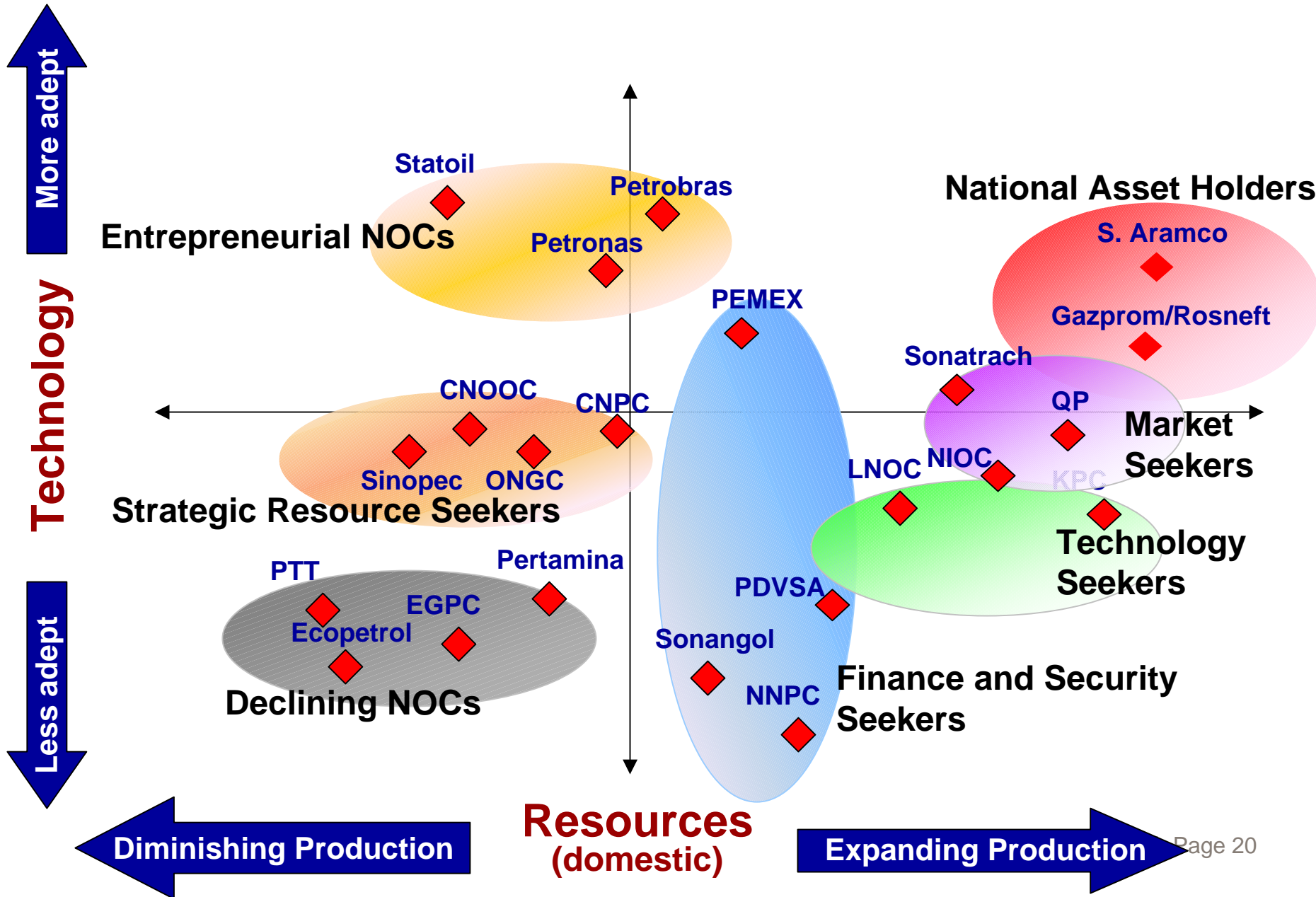
Non-OPEC Conventional Opportunities

- Shortage of conventional opportunities in Non-OPEC for IOCs
- Most projects at \$60 WTI are viable at \$30 as well, so supply outlook varies little
- With OPEC reserves largely unavailable, capital beyond conventional opportunities flows in greater amounts to gas and unconventionals
- These are “thin margin” barrels relative to conventional oil and gas; renewed “resource nationalism” will further erode the returns to the contractor (oil company)

Unconventional Opportunities

Gas & Related Liquids

NOCs Not Financially Constrained, But Technical Resource Constrained



- **Non-OPEC** countries are **not** running out of oil or other liquids.
- But there are going to be significant challenges to **growing conventional Non-OPEC** liquids production beyond 55 mmb/d and **total Non-OPEC** production beyond 62 mmb/d in the early part of the next decade, without a dramatic improvement in reserve additions through exploration.
 - **NOTE:** “Re-discovery” of the entire global deepwater resource play (some 52 billion barrels to date) would offset only 3 years of current deficit between global liquids consumption and global reserves additions
- Under average/moderate demand growth projections, **OPEC** will be challenged to expand production capacity fast enough to address the gap between demand growth and Non-OPEC supply.

- **If new supply sources are not found => demand will have to adjust, either abruptly/painfully, or pre-emptively/more smoothly**

- **Medium-term supply outlook presents a serious energy policy challenge:**
 - **Supply growth will be robust**
 - **If demand is moderate => see spare capacity build-ups throughout the industry**
 - **Combination results in (temporary) downward pressure on crude and product prices *but* with little in the “development hopper” once the deepwater production peak has been worked through**
 - **Result: Policymakers grow more complacent about the problems emerging next decade, rather than taking advantage of this “window” to accelerate initiatives (demand-side management, alternative fuels, bio-fuels, renewables, etc.)**



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