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Iraq's Energy Potential in Context

MEED Iraq Conference

Dubai 25-26th March 2013

Iraq's Energy Potential in Context

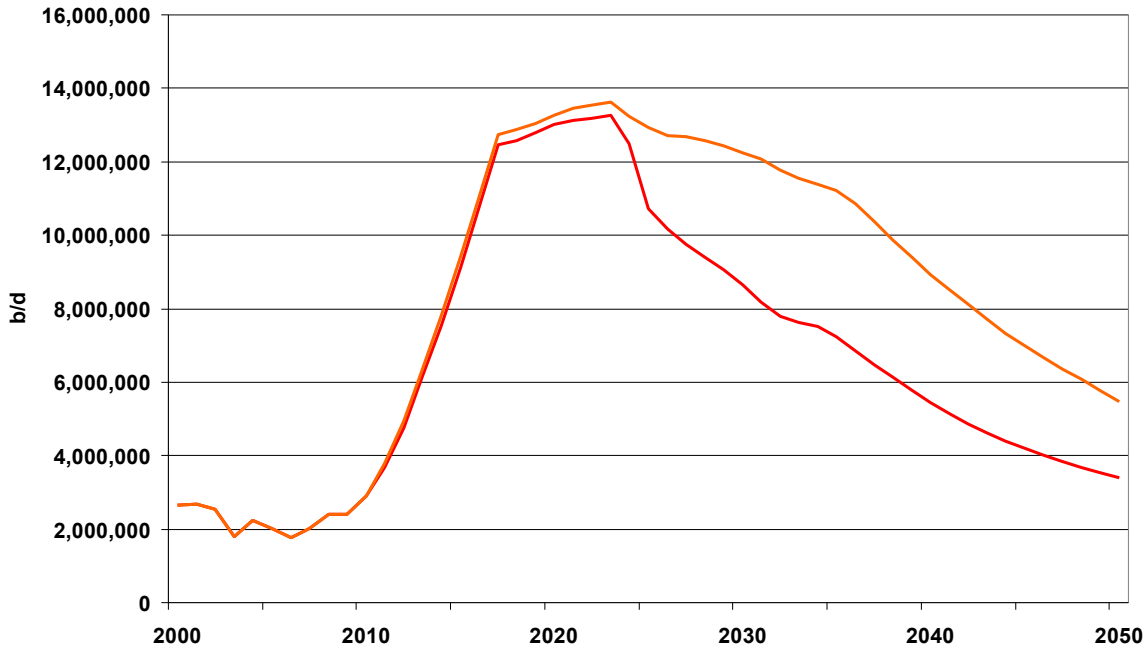
- From Bids to Common Sense
- Iraq's oil in the Global Supply-Demand balance
- Oil: Volumes, Drilling rigs, Export, Money and Water
- Gas: Volumes, Associated/Non-associated Issues, Export?
- Conclusions

From Bids to Common Sense

MEES op ed, November 2009
CGES paper March 2010
Oil & Money paper October 2010
IEA pre-study meeting April 2012

- "Not wise"
  - A short high peak is not optimum reservoir management and not in the long term national interest
- "Not Possible"
  - Infrastructure and rate of spend (drilling rigs, logistics), gas handling, water injection requirement
- "Not Needed"
  - Iraq is potentially the largest increment of new supply over the next decade and will come on top of NON-OPEC additions in Deep Water, tar sands and tight oil

Now Explore



Iraq's production profile based on bid target plateaux

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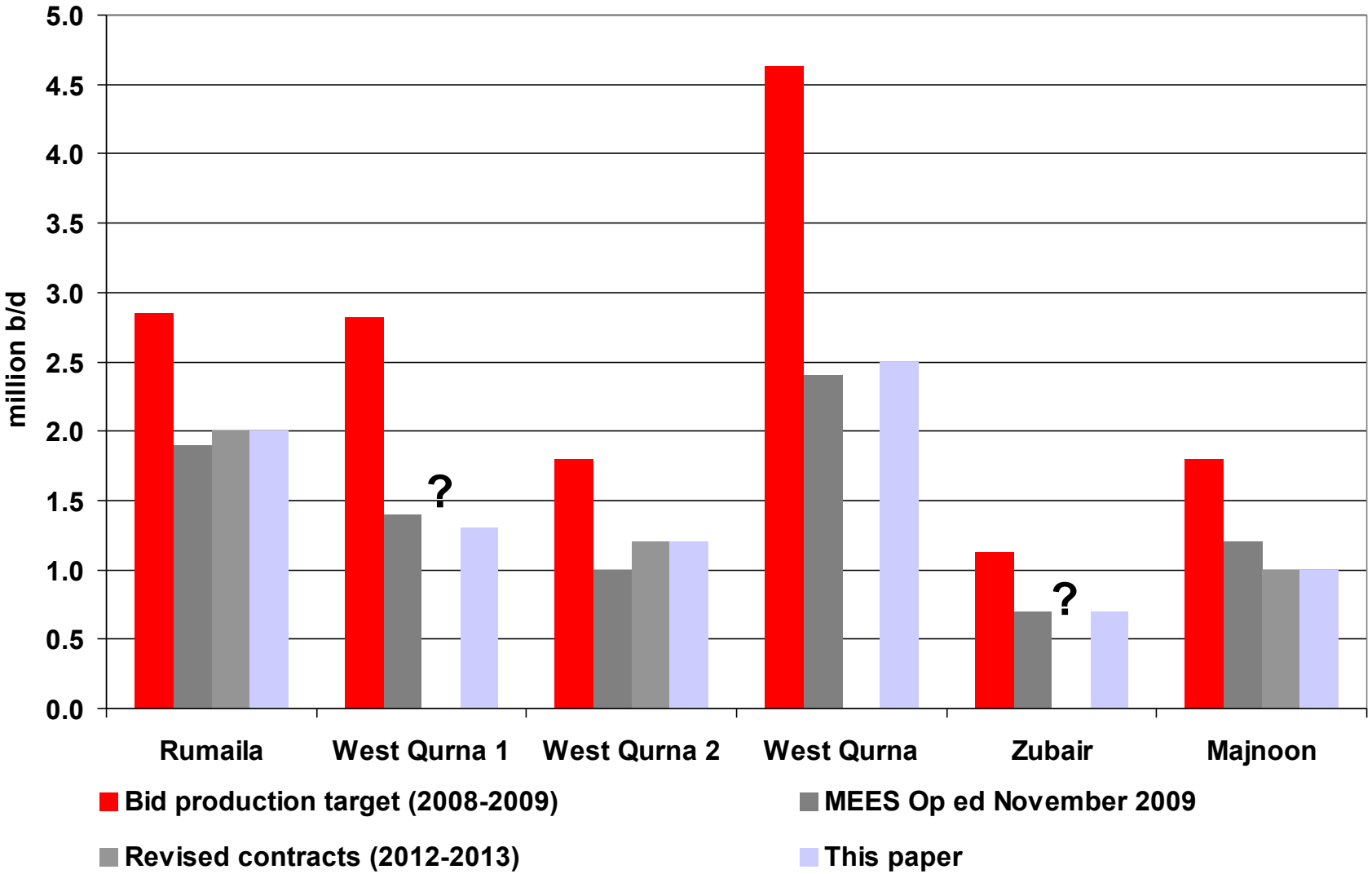
Contract revisions reflect these realities



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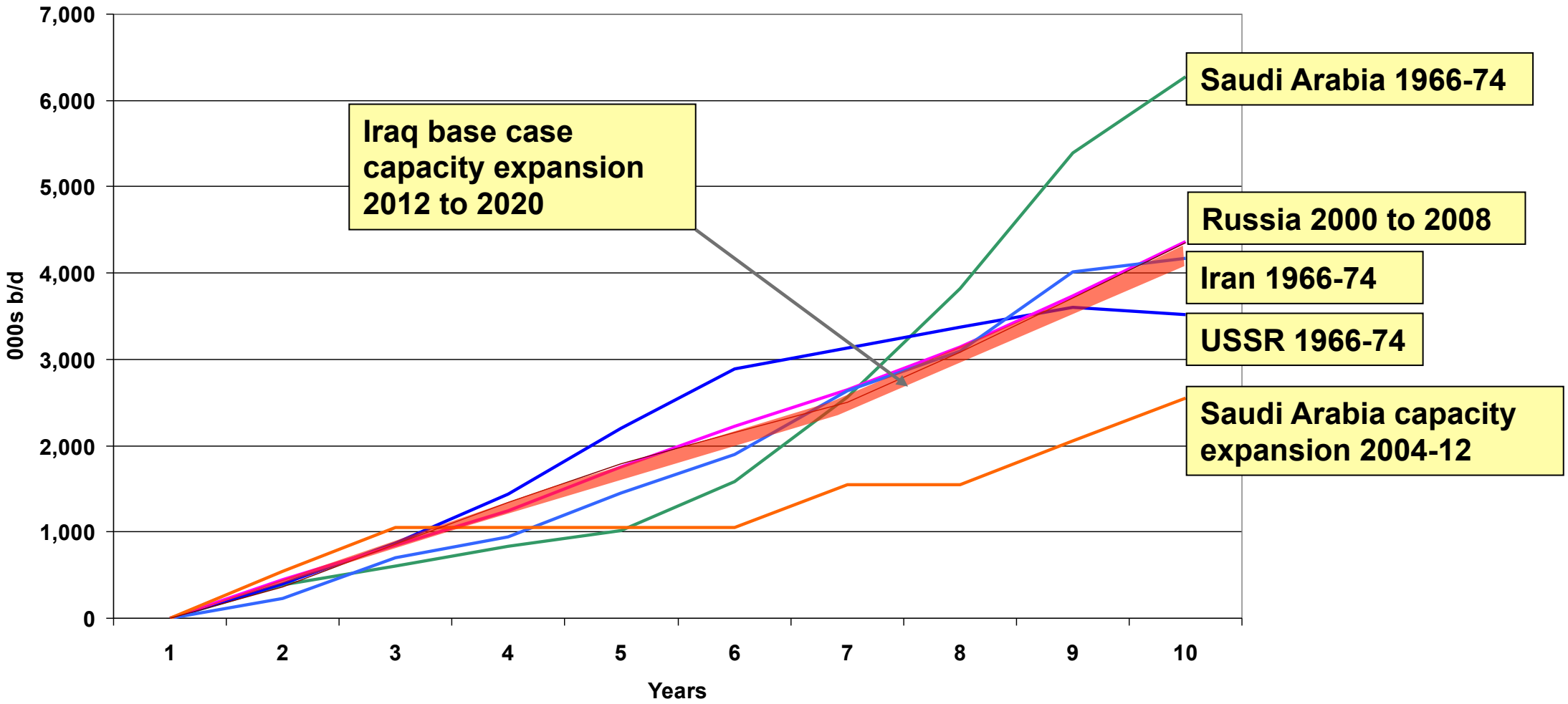
The **capacity** expansion in context – not unprecedented but…**challenging**



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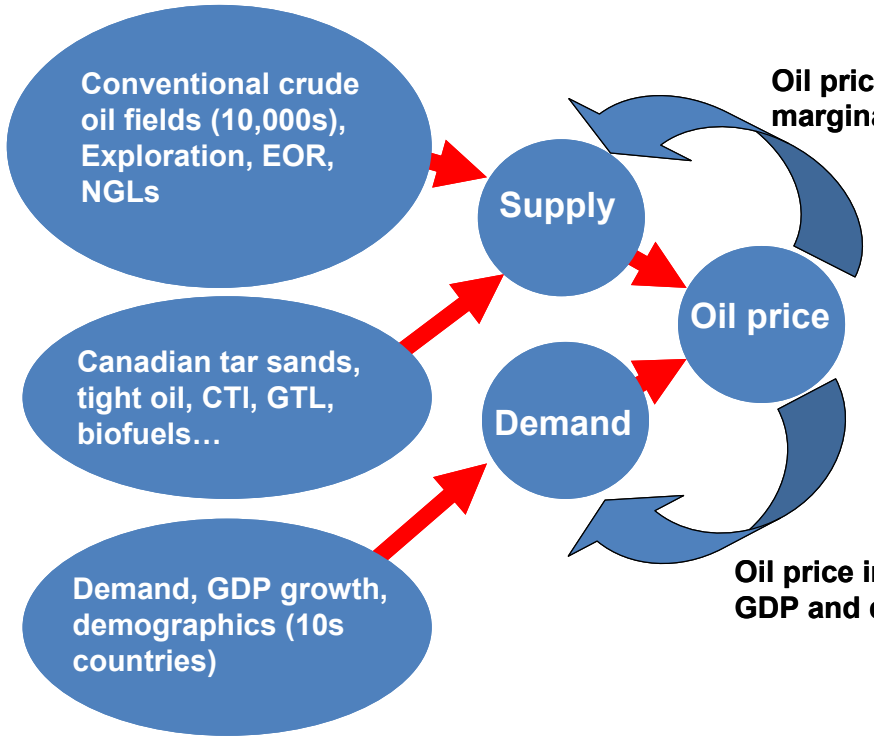
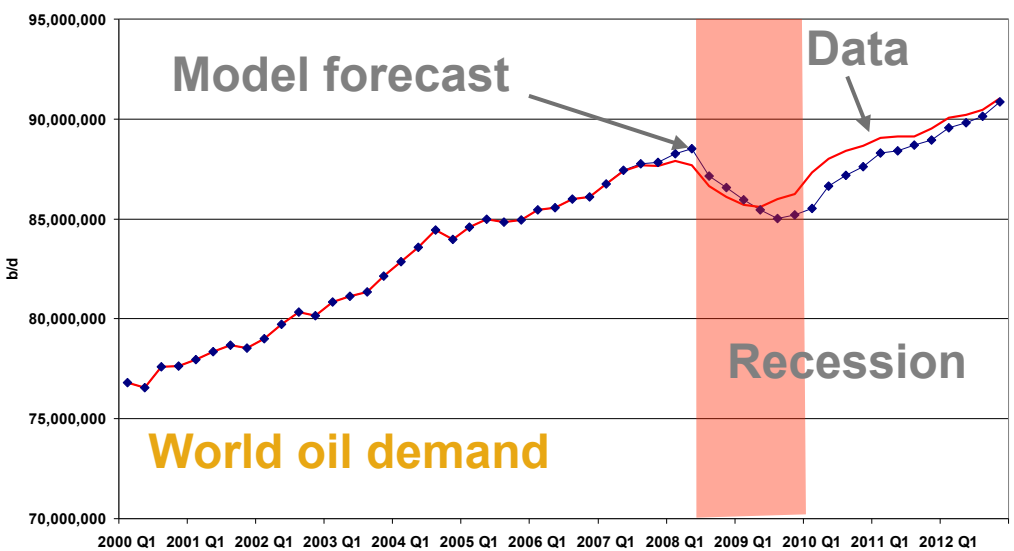
Global Context – Integrated supply-demand-price model

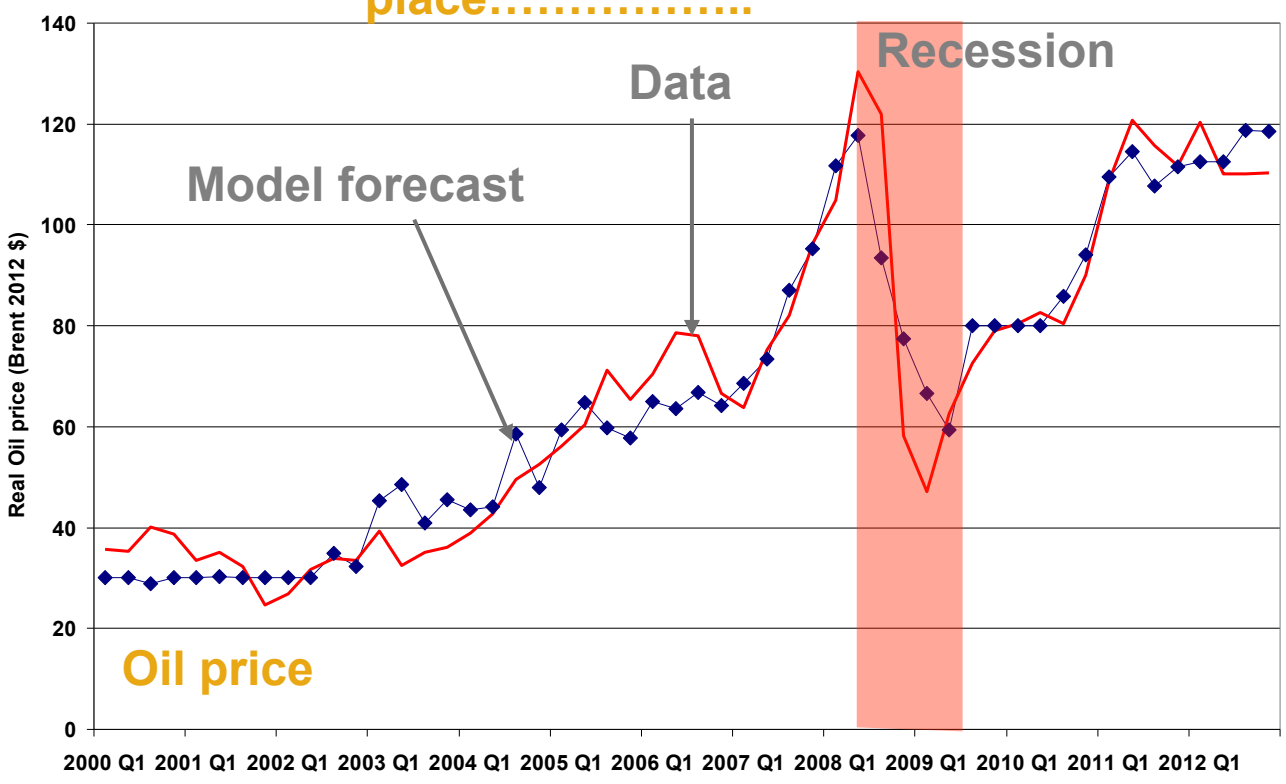


Scenario described by:-
- **Oil price**
- **Supply by component**
- **Demand, GDP by country**
- **Spare capacity**
- **OPEC10 supply by country**

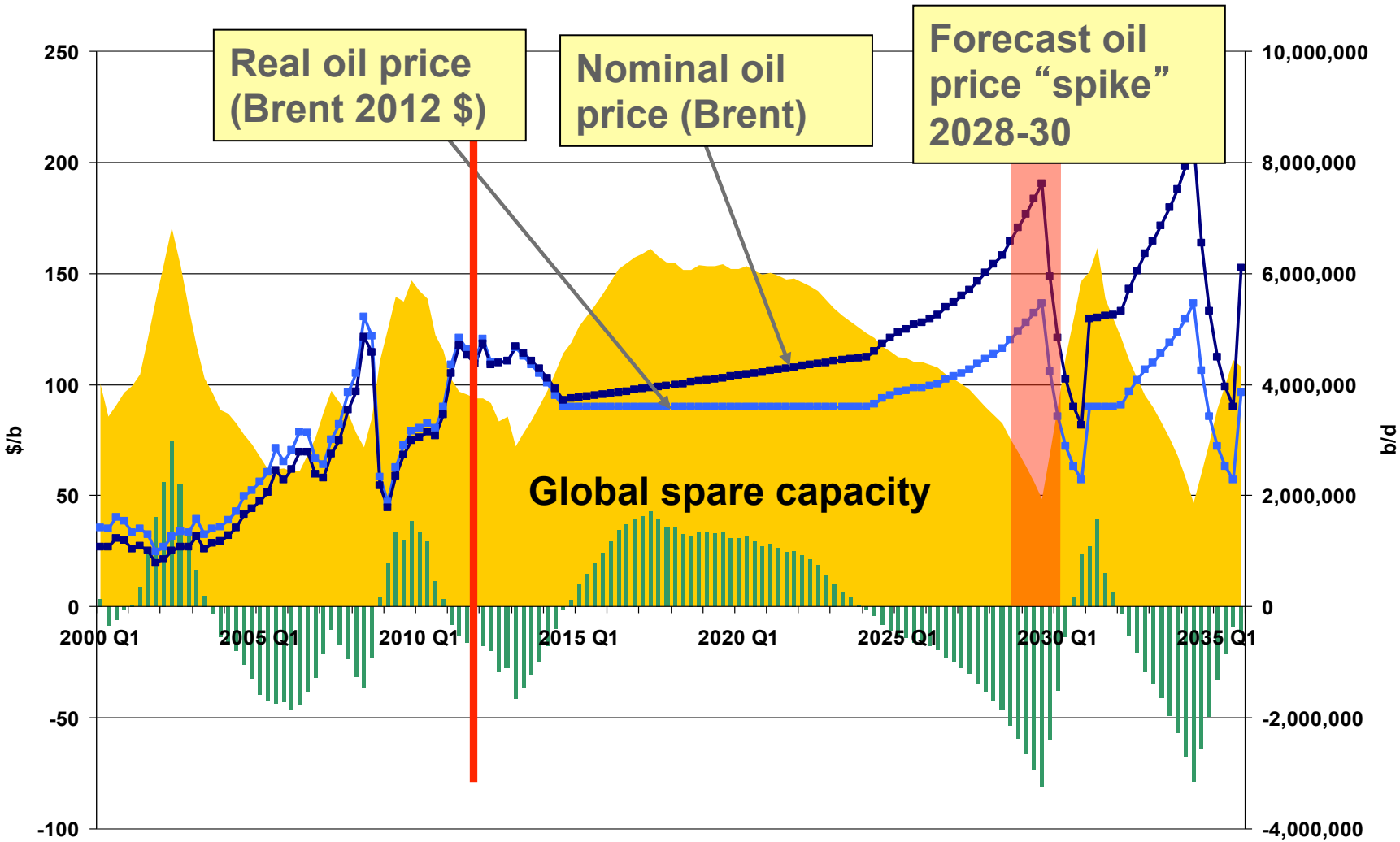
Events: supply disruptions, recessions, scenarios……

Running the model from 2000: even put the 2008-9 recession in the right place……..





Base Case Scenario – Iraq expands capacity + 6 million b/d, 2013 to 2030



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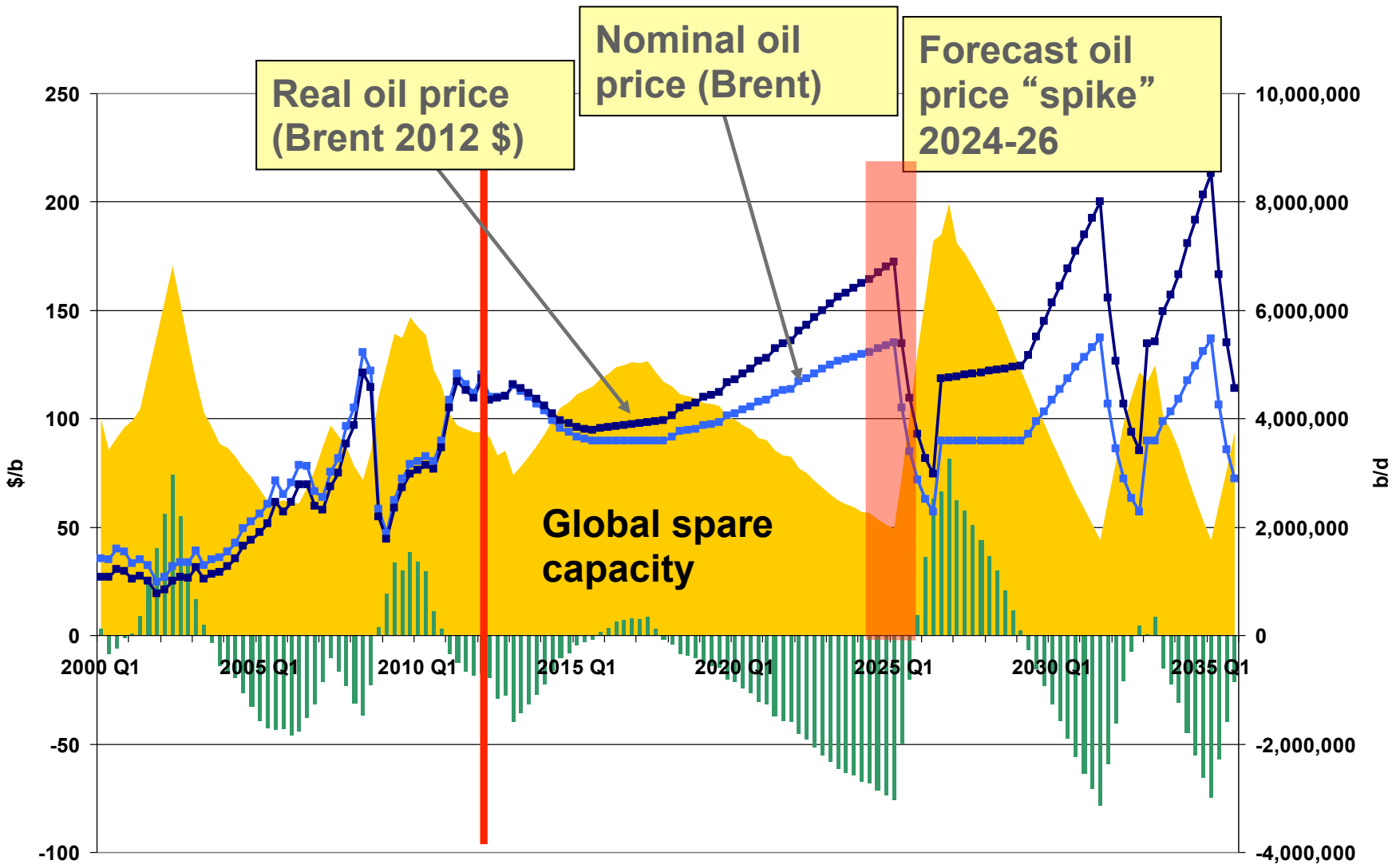
“Failure” Scenario = Iraq expands capacity +1.5 million b/d 2013 to 2030



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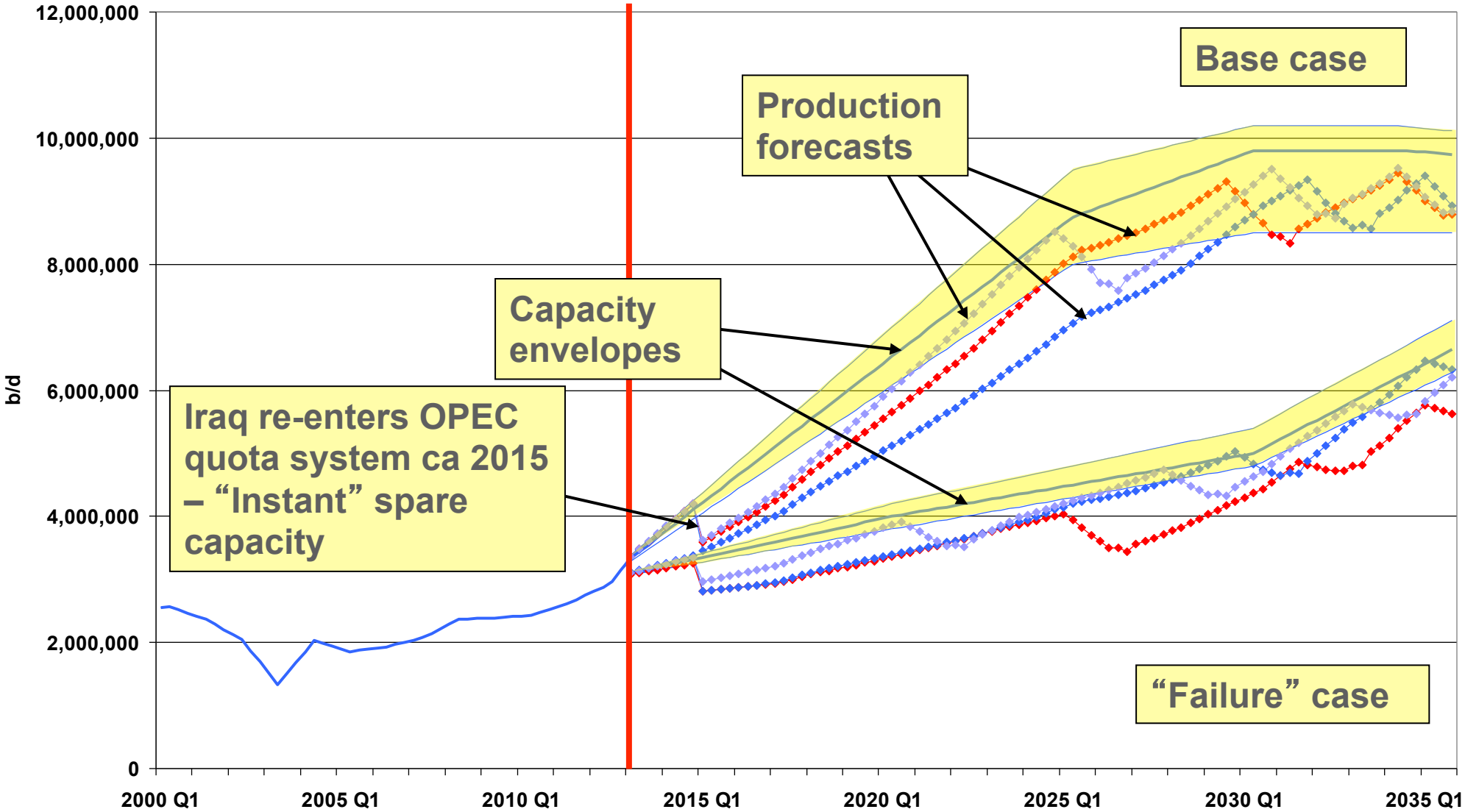
Iraq **capacity** expansion cases in in terms of **production**



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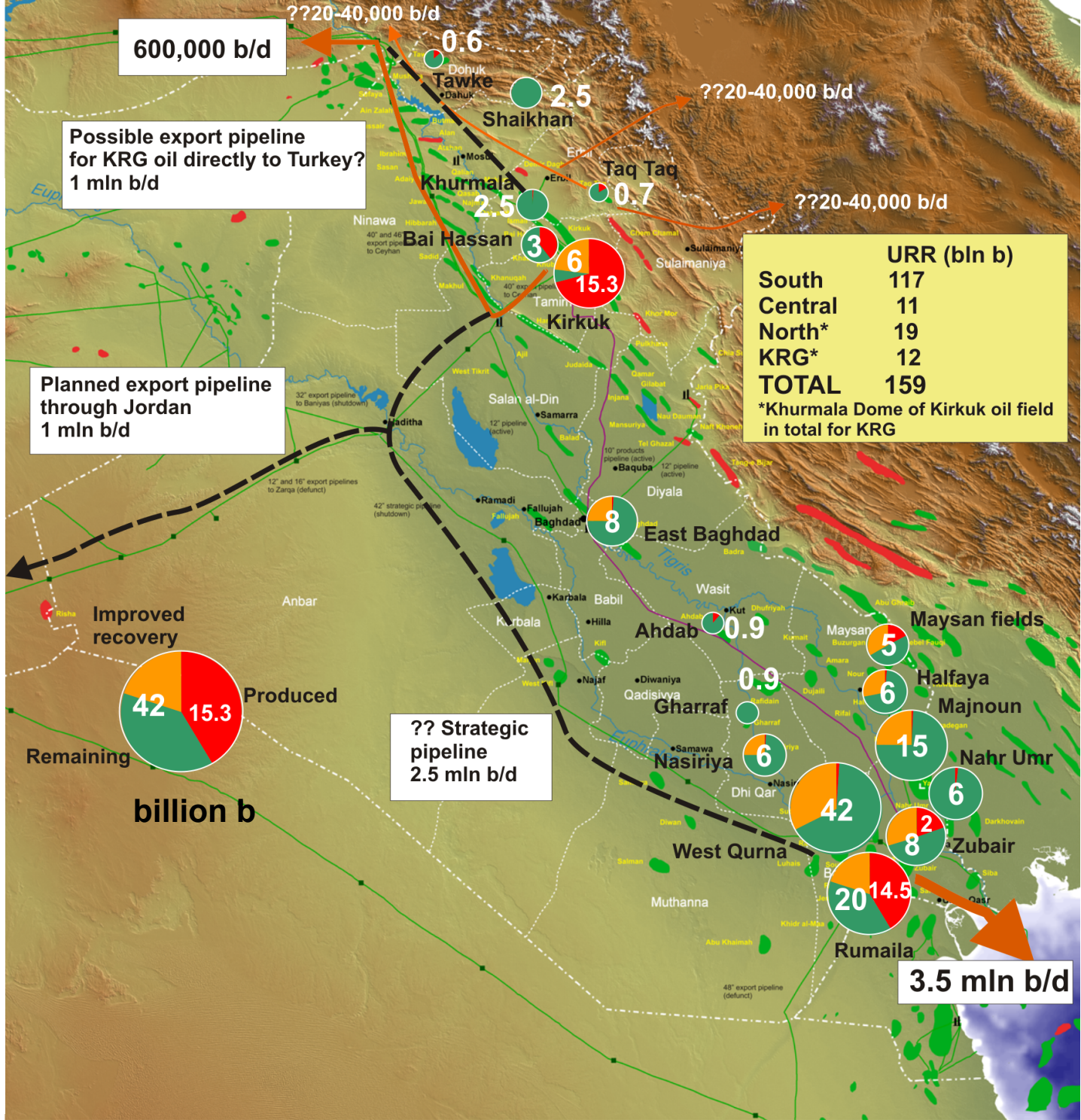
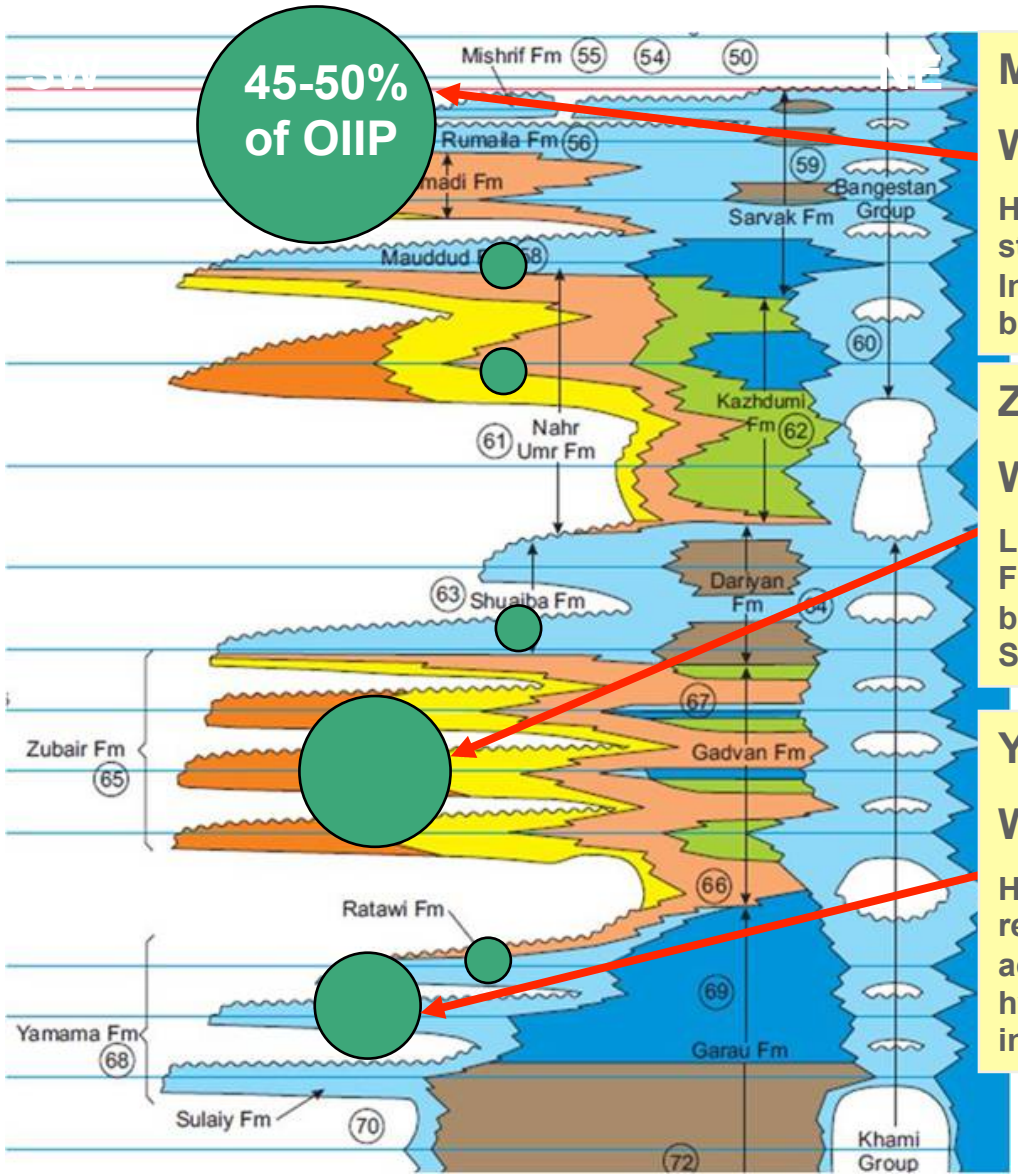
Proven and Probable Oil reserves

- Most (>70%) of the oil is in the South
- Most of the oil produced to date has come from four fields: Kirkuk, Rumaila, Zubair, Maysan fields
- The proven and probable oil discovered to date in the KRG-controlled area would support a long term plateau of 500,000 b/d
- Export capacities are sufficient without additional pipelines….BUT there are strategic issues
- West Qurna, Rumaila, Zubair and Majnoun are critical projects



GEOLOGY MATTERS!



Mishrif (22-28°API) (gas or water injection)

Well initial rates: 1-3,000 b/d

Heterogeneous, rudist development on top of active structures – notably West Qurna
Initial flow rates good from high permeability rudist facies but pressure support downdip is non existent

Zubair (32-36°API) (water injection)

Well initial rates: 5-20,000 b/d

Layered sand-shale – sands peter out to the east and north
Fining upwards so attic oil is in poor reservoirs; water breakthrough in permeable layers
Strong aquifer support from the west

Yamama (38-45°API) (gas – miscible flood?)

Well initial rates: 3-15,000 b/d

High quality packstones and grainstones, in layered reservoir
aquifer support due to downdip cementation below hydrocarbons
in Kuwait and asphaltenes in Iran

Limited

Tarmats

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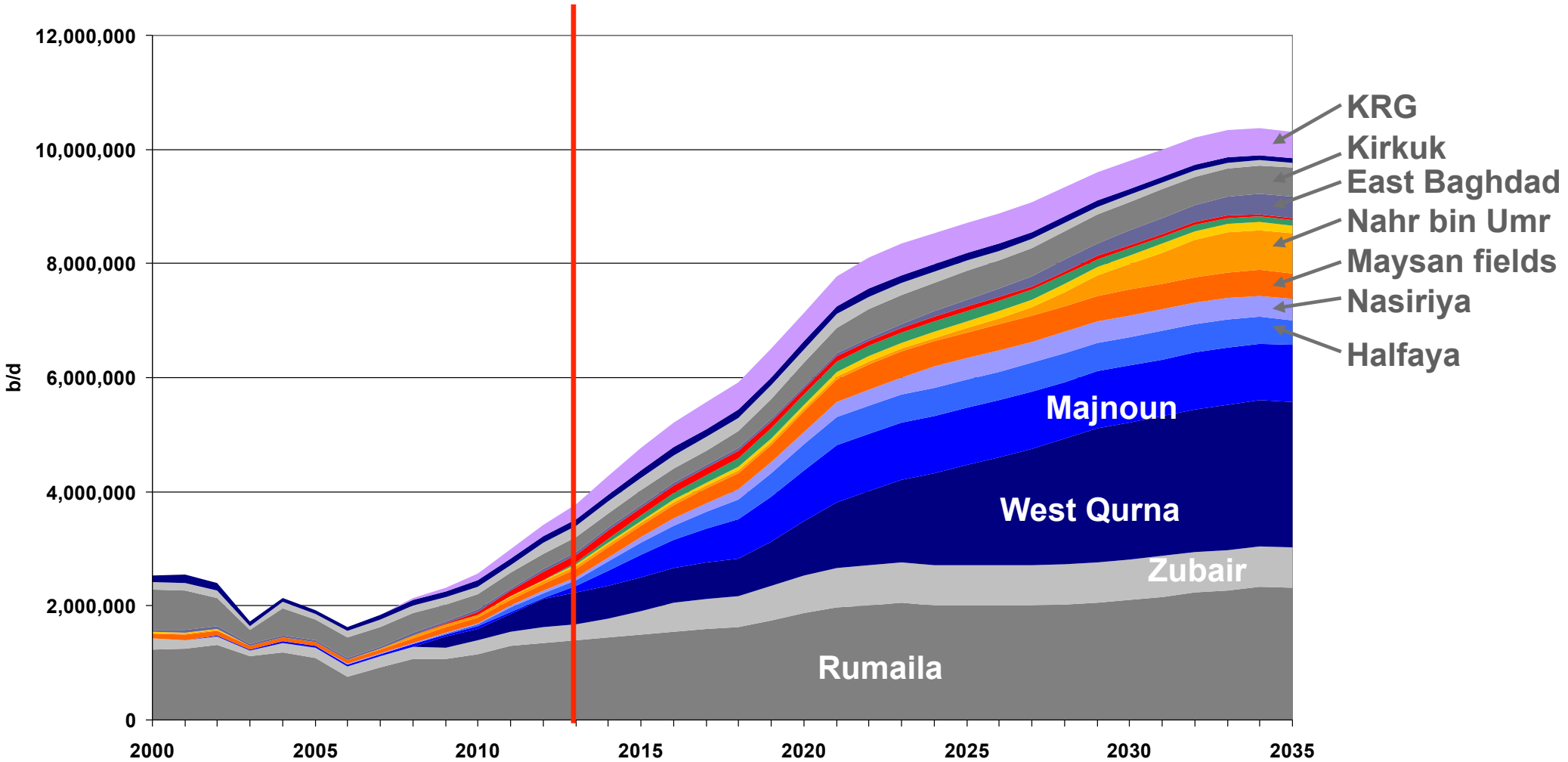
Forecast oil production **capacity**



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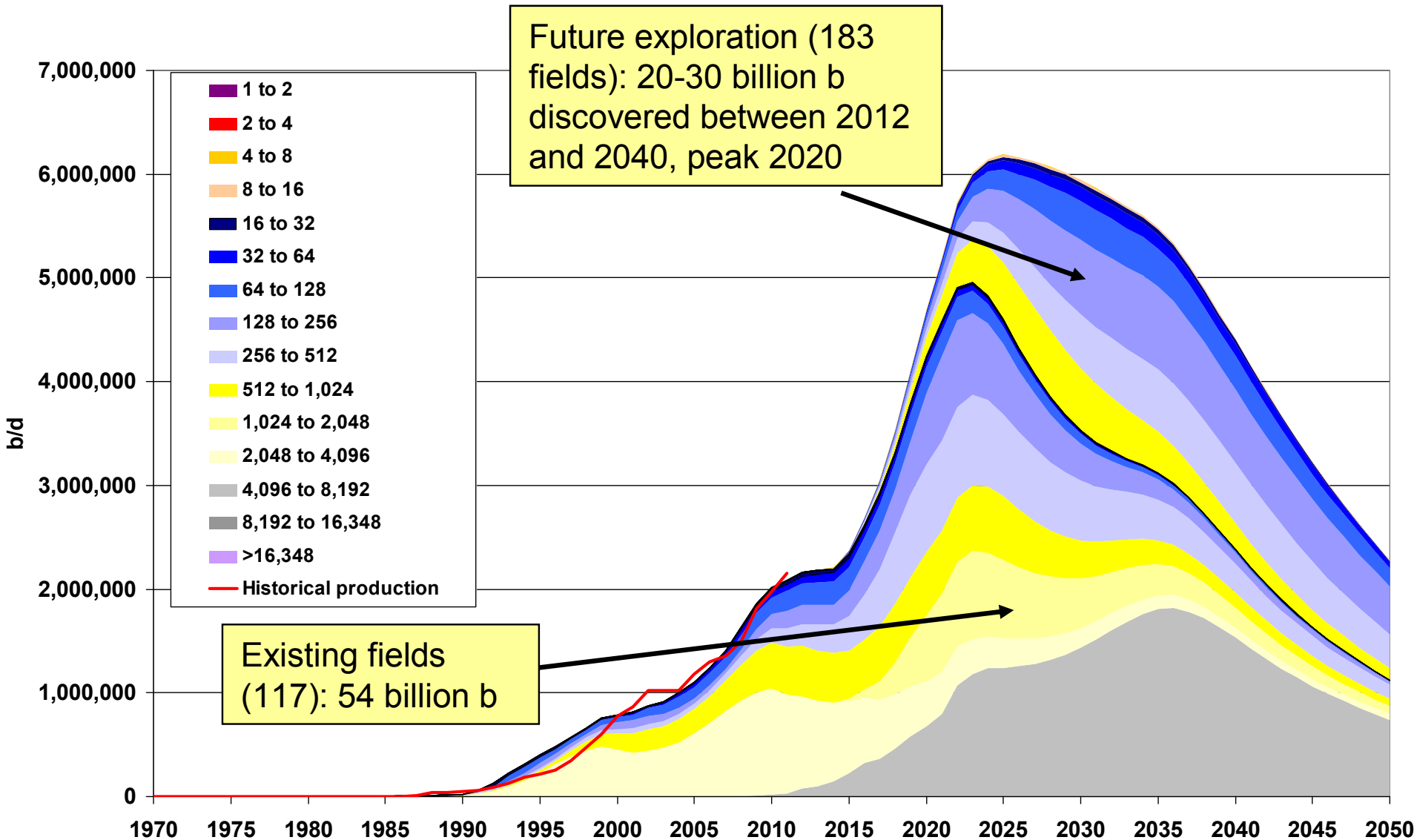
Brazil deep water….+4 million b/d in the same period



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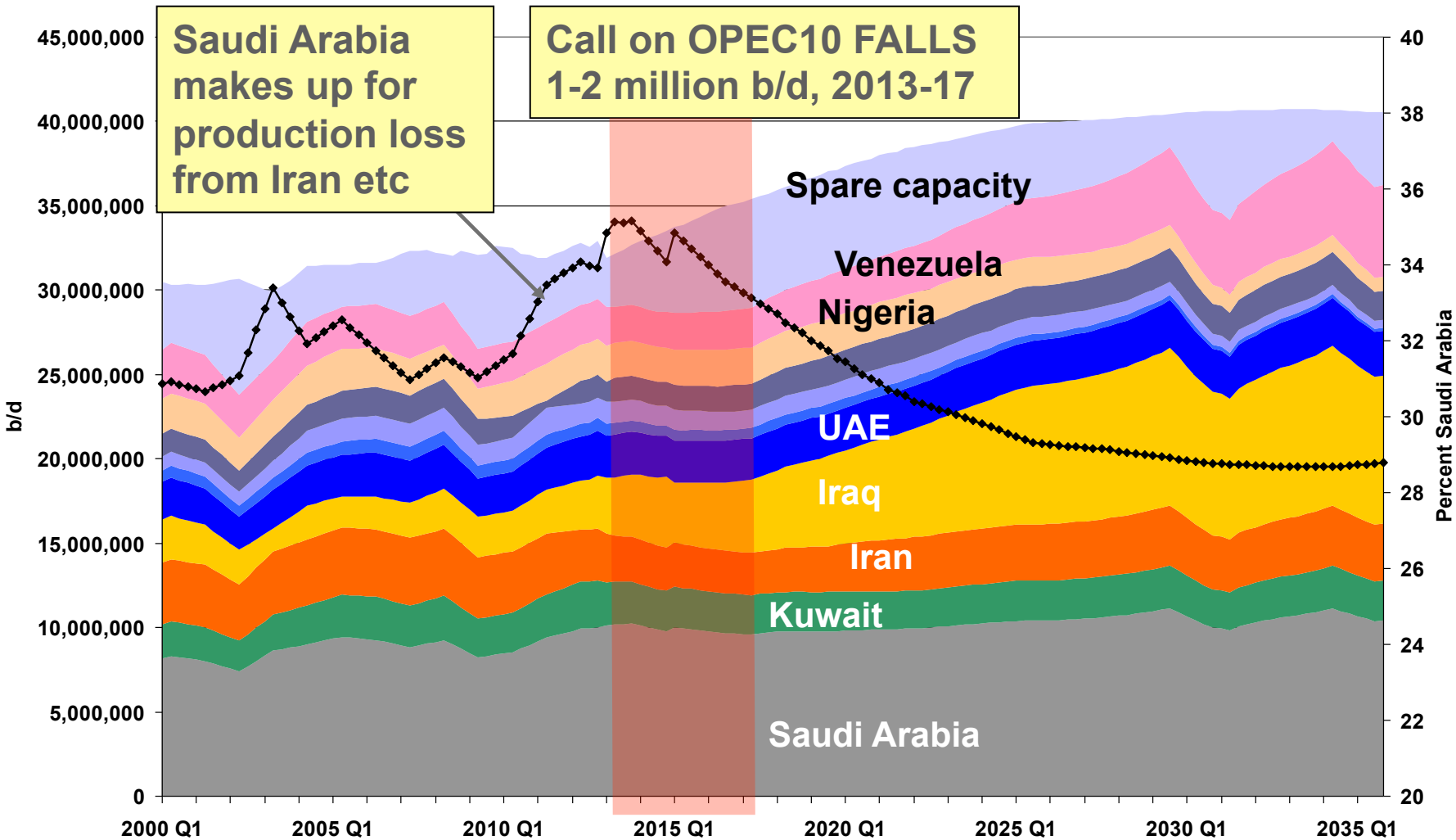
Call on OPEC10 **flat or declining** until 2018…Iraq rejoins quota system in 2015?



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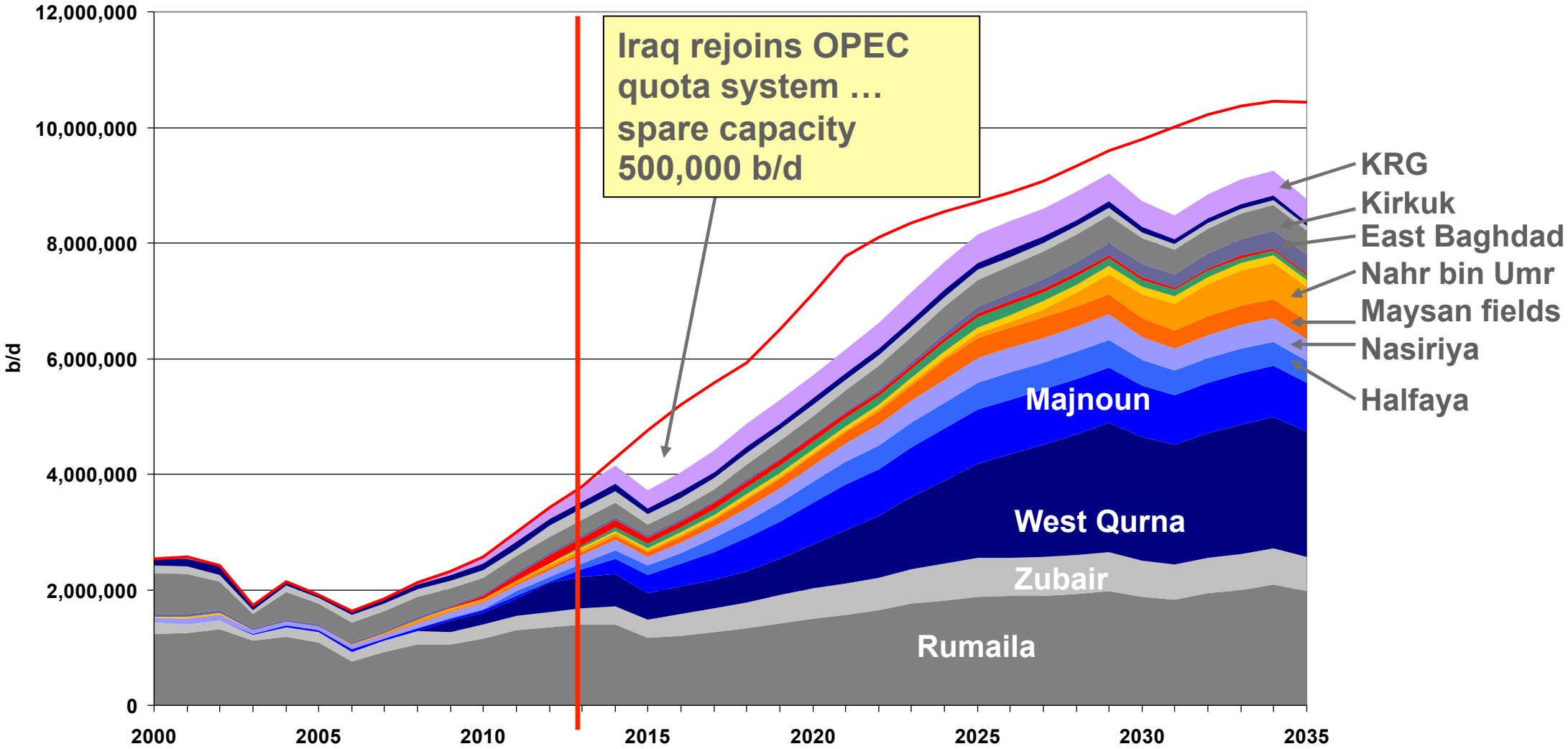
Required **production** growth to 2030 …4.5-5 million b/d



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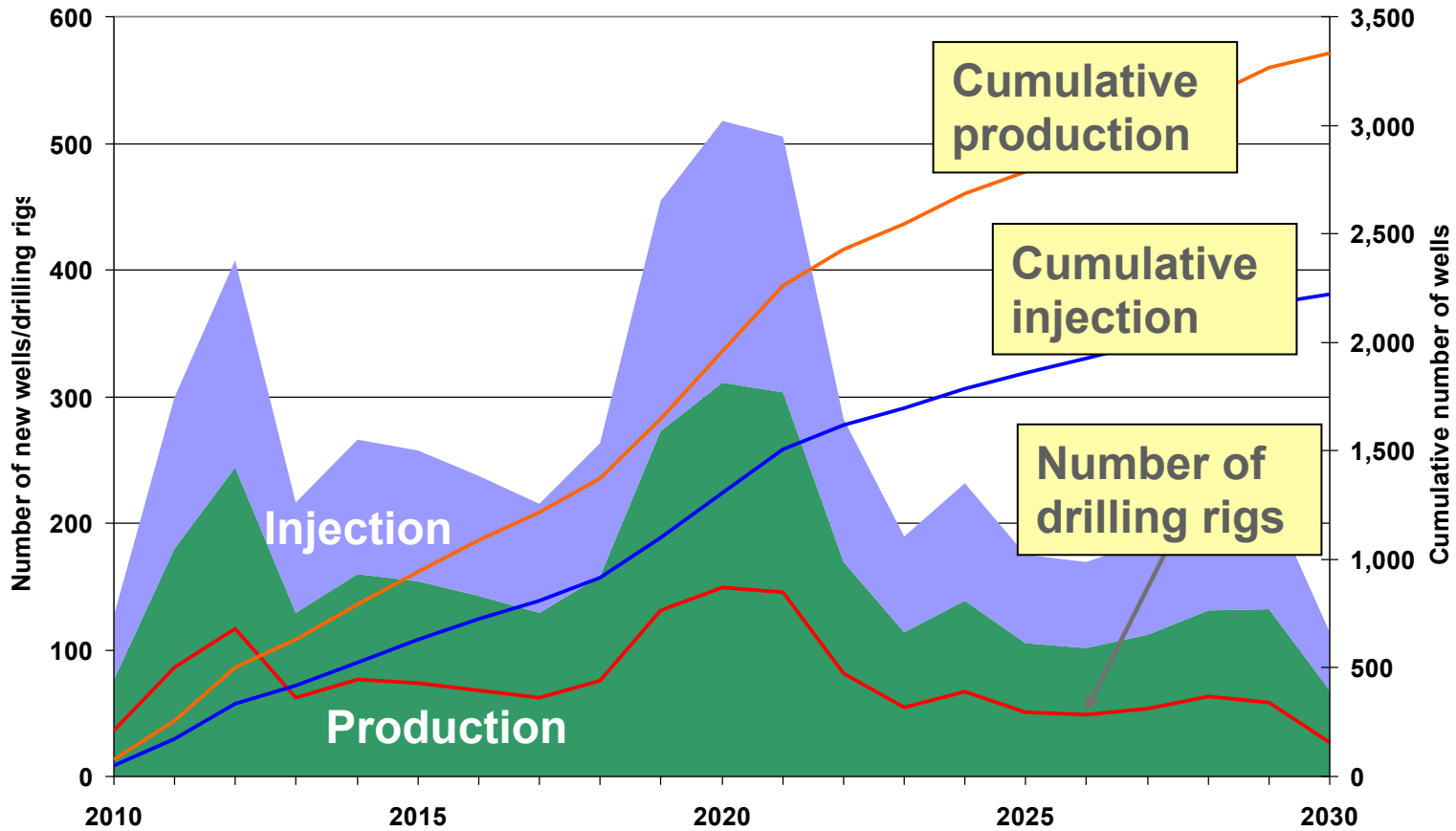
First wave of development - Wells and drilling rigs ….manageable



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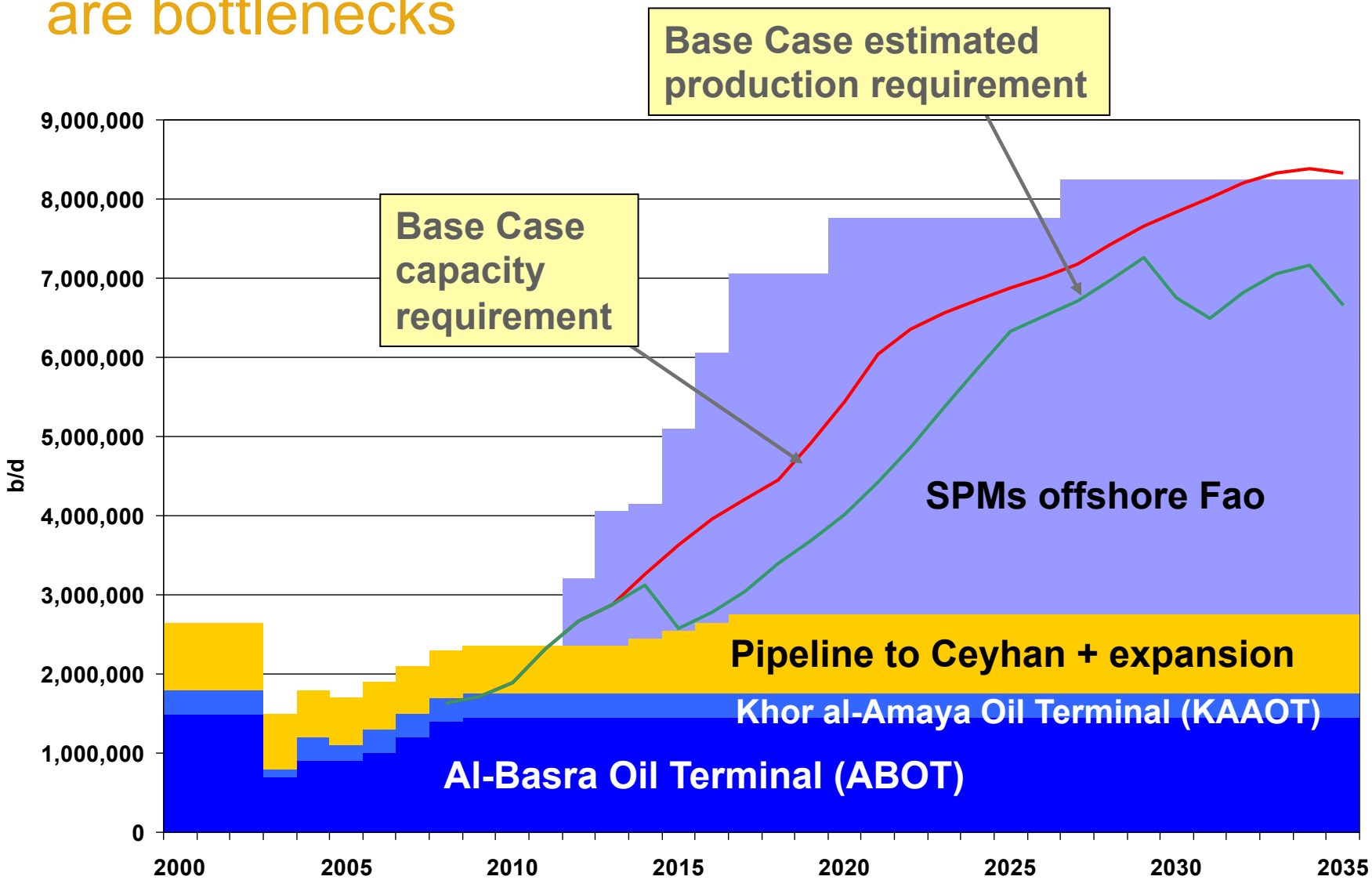
Export capacity….more than sufficient **BUT** internal pipelines are bottlenecks



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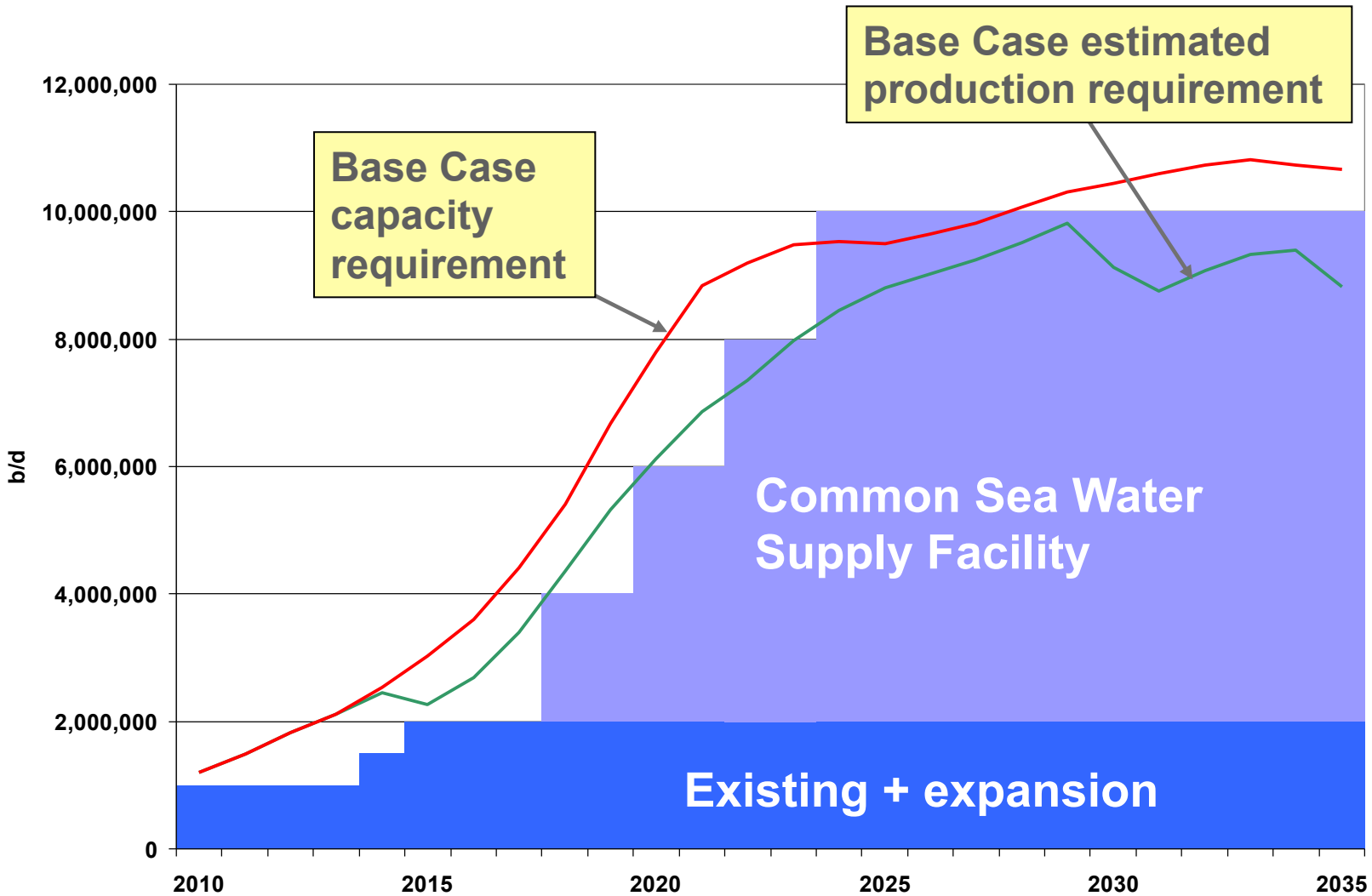
Water supply lags demand….**critical path project (Mishrif)**



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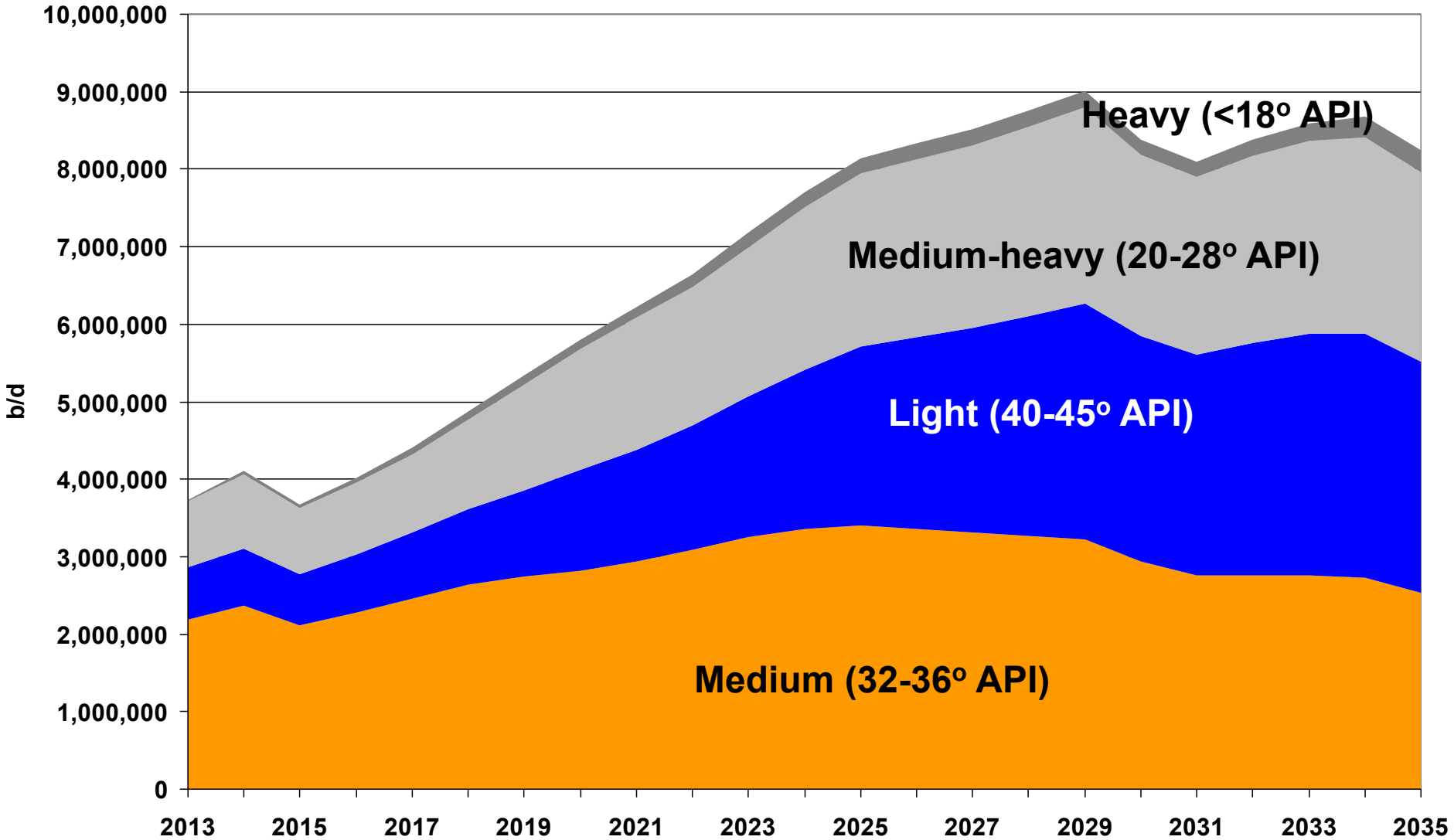
Crude stream quality diversifies… long term marketing issues



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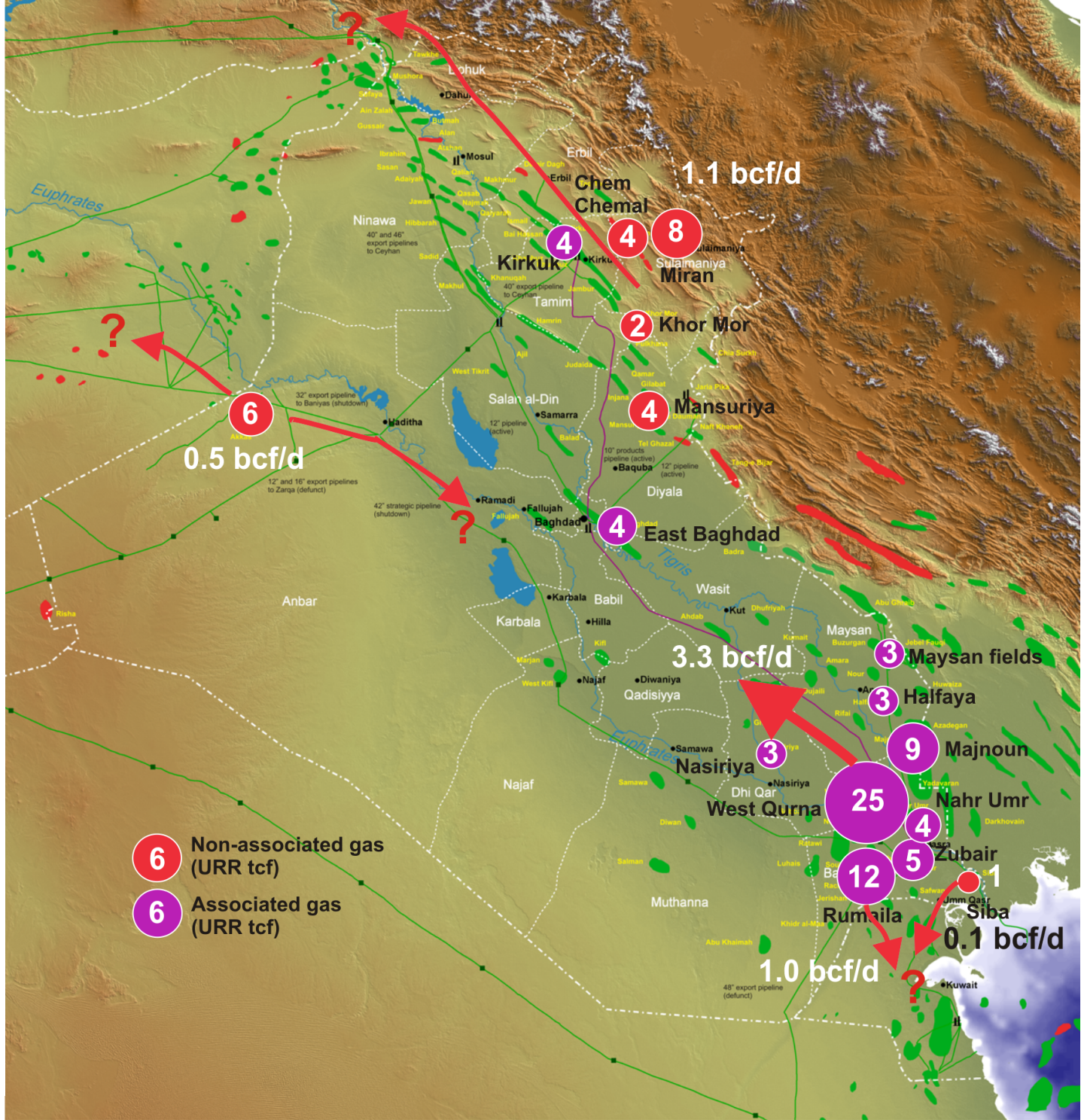
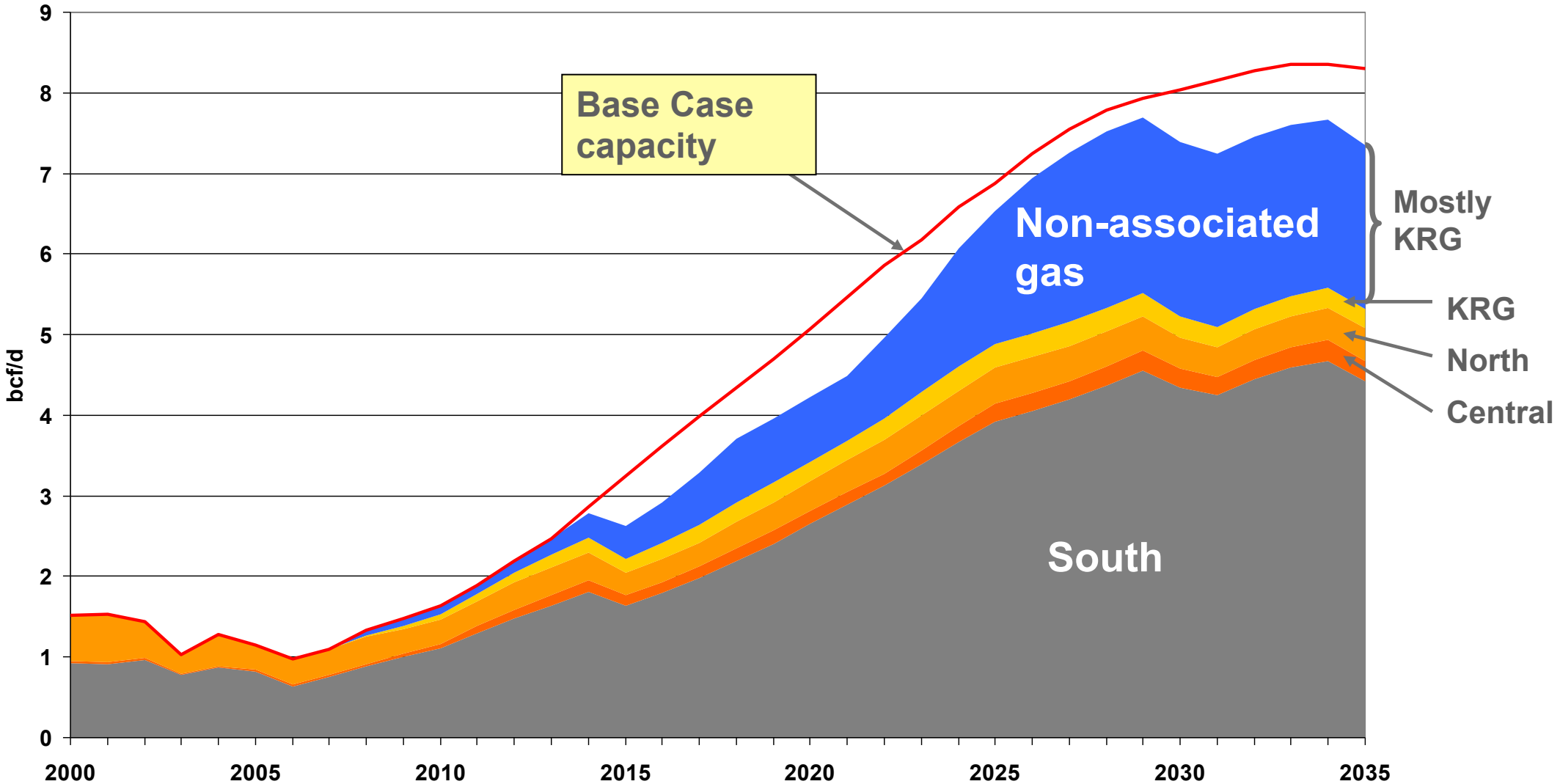
Proven and probable gas reserves

- Most of the gas is in the South (>70%)
- BUT most is associated (74%)
- Most non-associated gas is in KRG-controlled areas (70%)
- The dominance of associated gas creates demand management problems within an OPEC oil production quota system – gas supply fluctuates in line with oil production
- Imperative to discover more non-associated gas and to build in fuel flexibility in power generation



The gap between capacity and production is OPEC dependant



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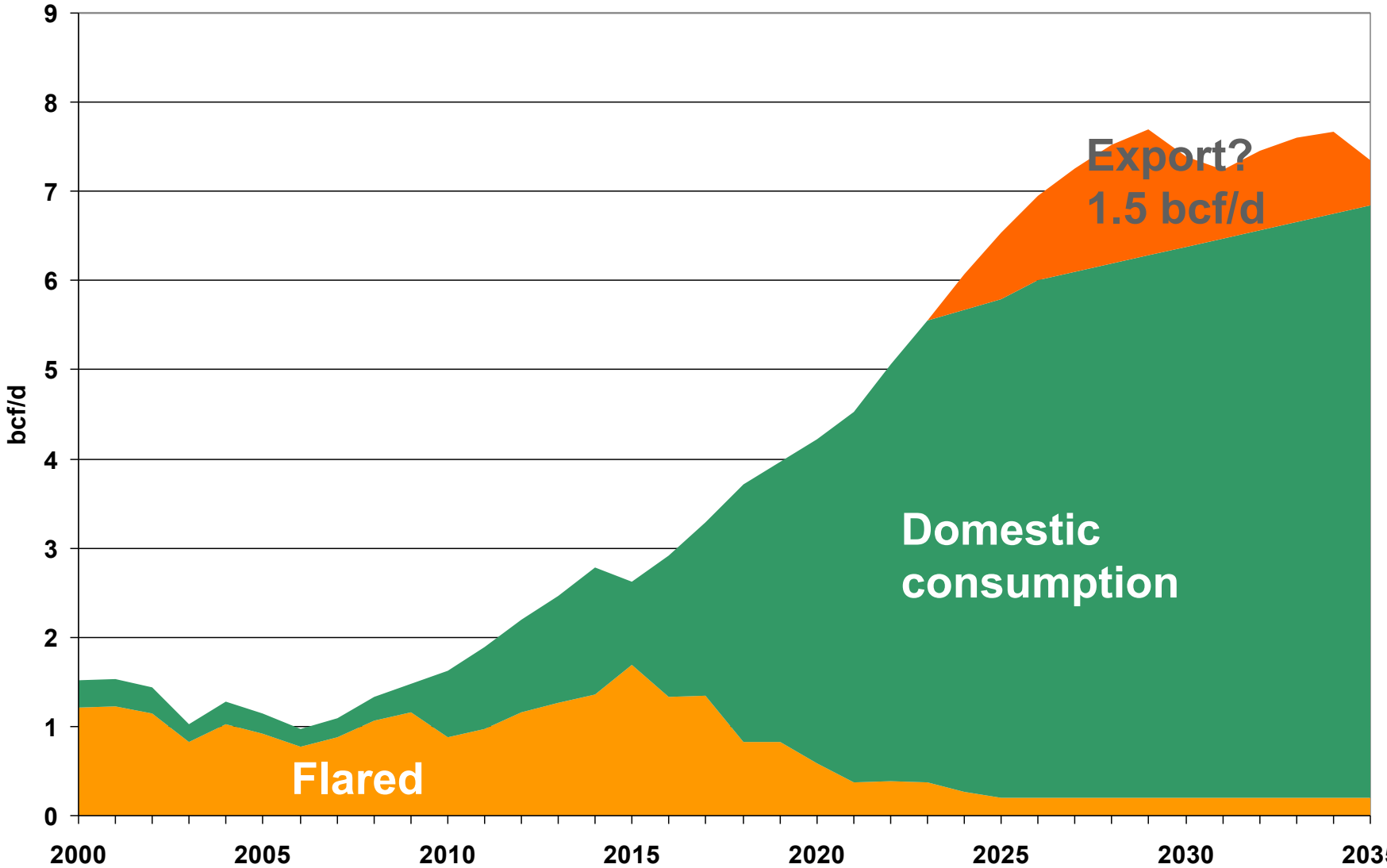
…..not much room for export if **potential** domestic demand is satisfied….fuel flexibility in power generation?



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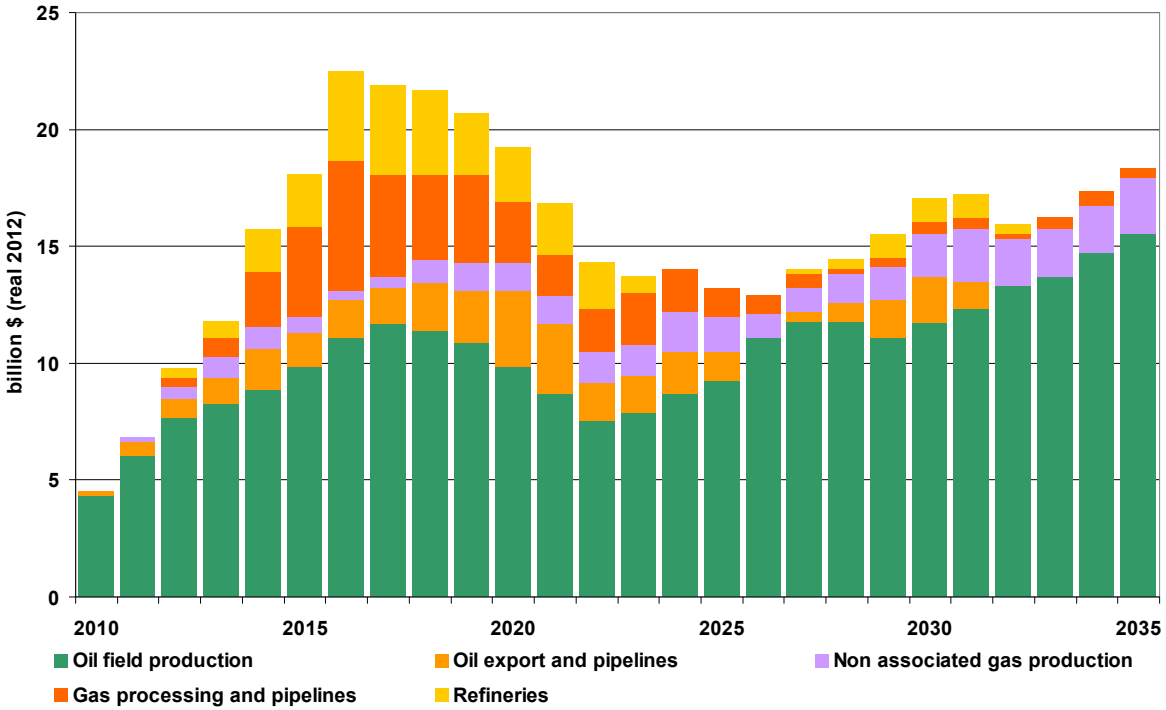
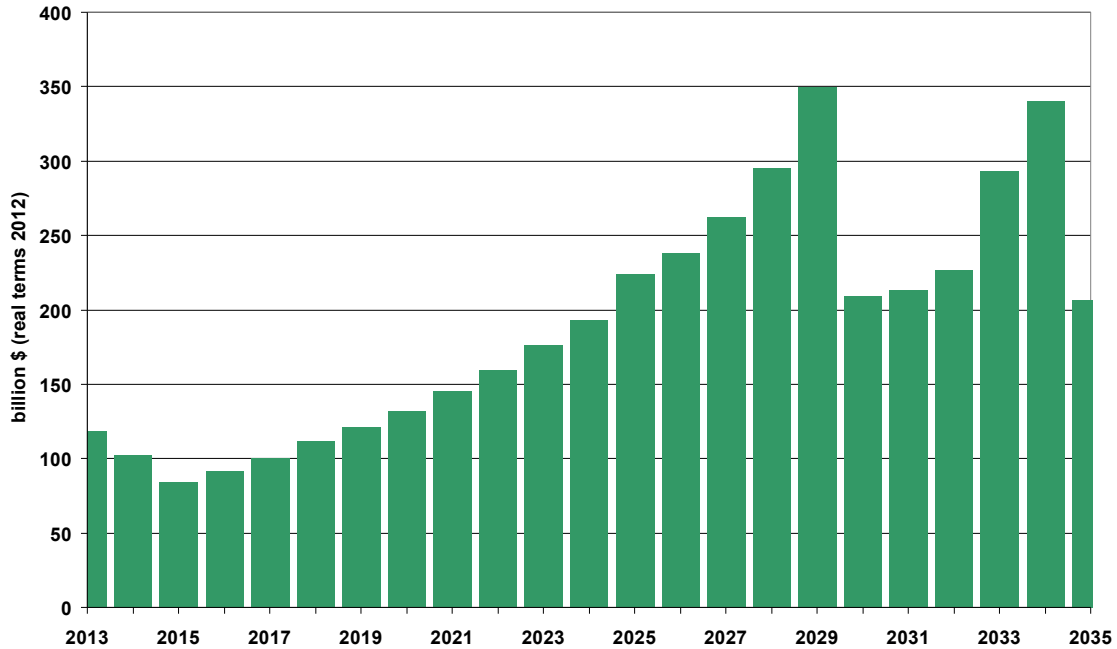
The Money….Investment and oil export revenues





- Upstream investment $10 billion per year
- Gas investment $5 billion per year
- Total investment $10-20 billion per year

Data from the IEA Iraq study 2012

- Oil revenues rise to $300 billion per year – spending efficiency??
- OPEC quota and risks of demand and oil price fluctuations in volatile markets after 2025 will require revenue-expenditure planning
- A strategic oil fund would smooth out the bumps

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Conclusions

- **Global Context**
  - Subdued global demand growth and rising non-OPEC production - Iraq's oil NOT as critical to global supply as in 2008 – capacity growth of >3 million b/d by 2025 would still be "comfortable" for global supply
  - Call on OPEC10 is flat or declining until 2018
- **Iraq – capacity and production**
  - Capacity expansion by +6 million b/d is possible (it has been done before) BUT challenging given the business/political environment
  - Water supply in the south is **critical** and if further delayed will particularly impact development of the Mishrif in West Qurna
  - OPEC quota re-entry is likely some time around 2015 – level unknown but WILL be less than capacity – instant Iraq spare capacity of 500,000 b/d
  - Iraq production growth likely to be 4.5-5 million b/d
- **OPEC quota compliance … uneven oil revenues and associated gas**
  - Smooth the bumps - strategic oil fund and fuel flexibility in power generation
  - Gas export is marginal – **more non-associated gas needed**