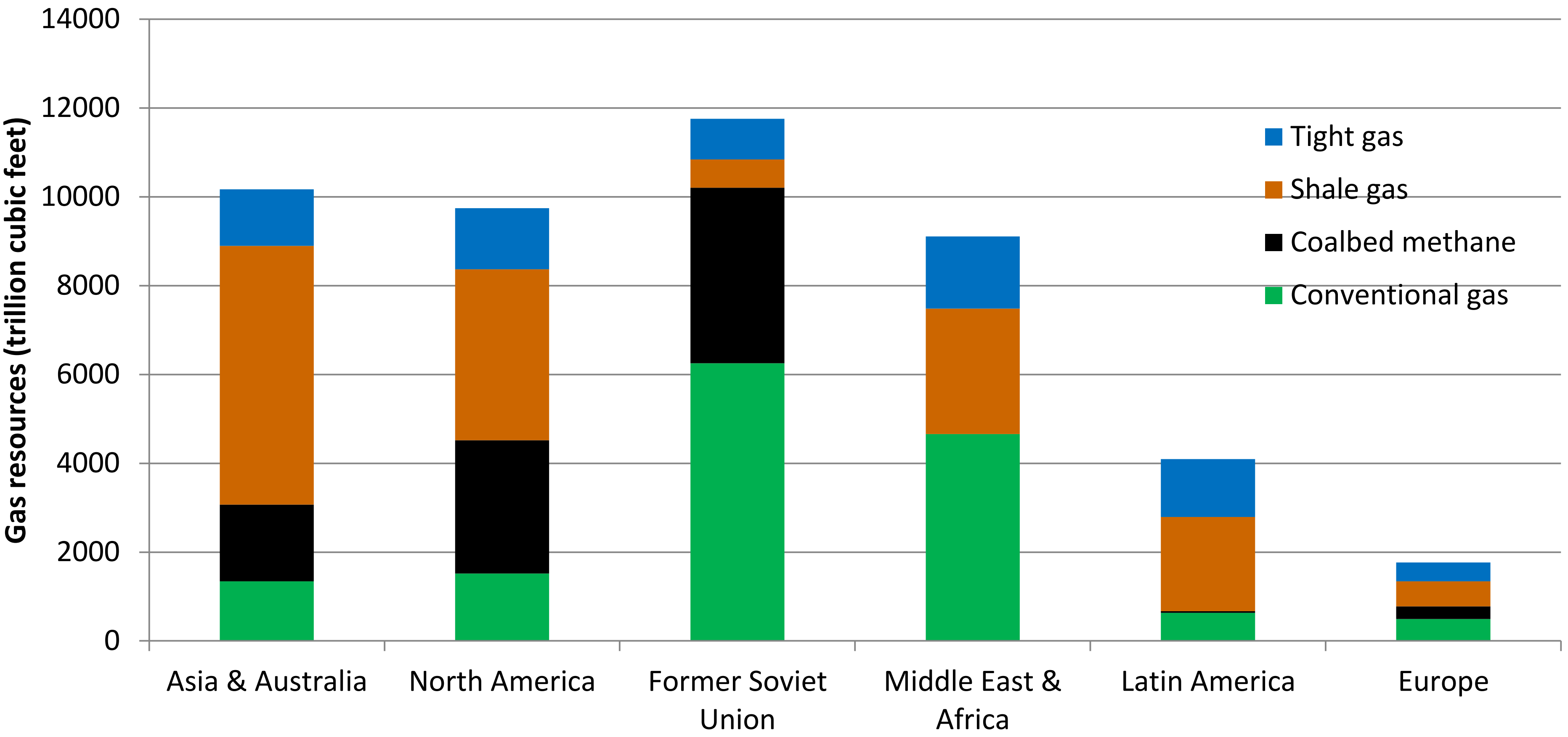
Gas Developments in the Middle East: the Impact on Product Demand

Agenda

1. **Current MENA gas situation**
2. Country examples (Saudi Arabia, Kuwait, UAE)
3. Implications for future flows
4. Conclusions

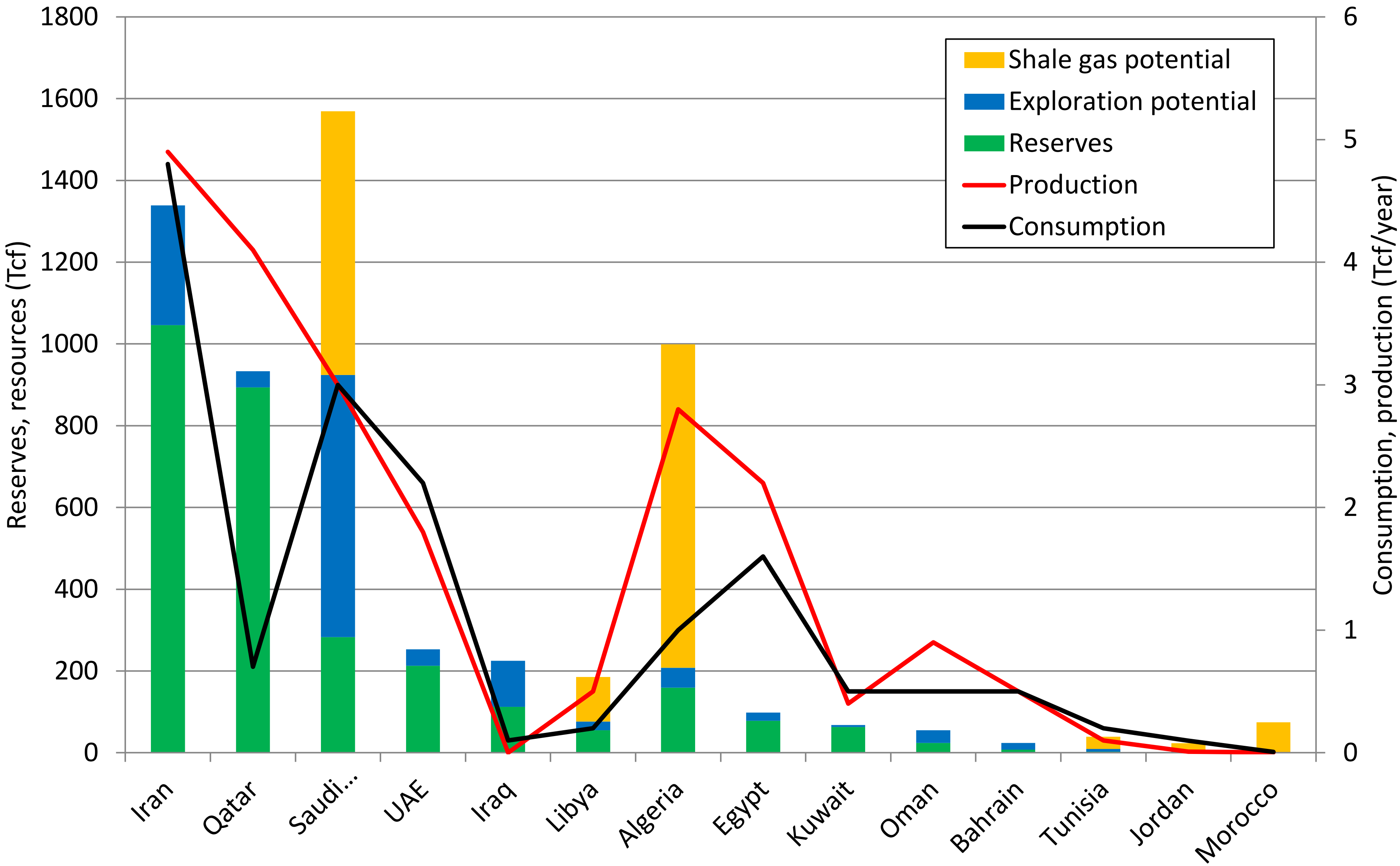
Global gas resources



- Detailed assessment of Middle East unconventional gas not publicly available
- MENA's dominance in conventional gas challenged by unconventional gas

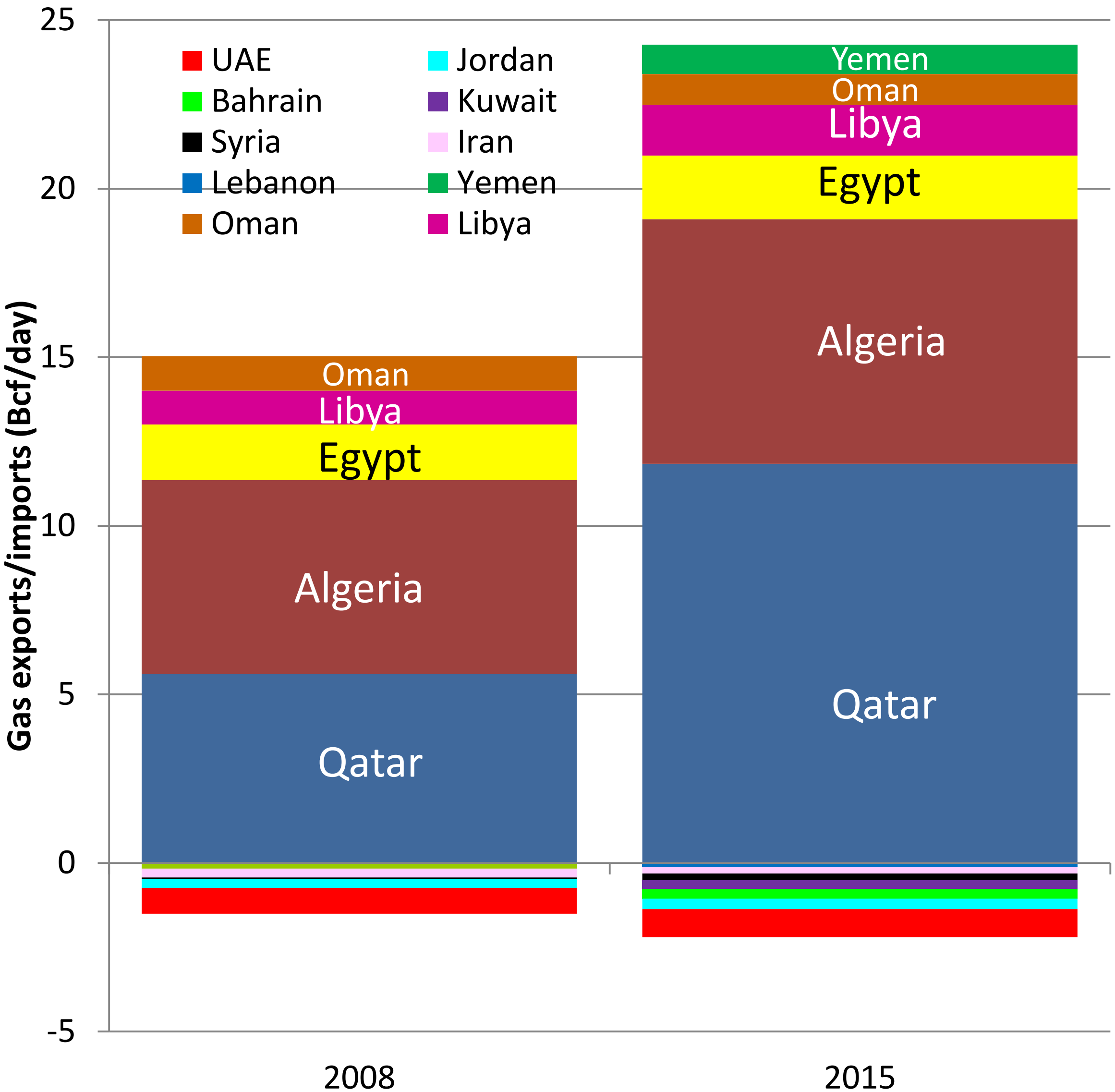
Source: Rogner (1997)

MENA gas: The haves and have-nots



Sources: BP, USGS, EIA, Petrenel, Baker Hughes, Manaar research

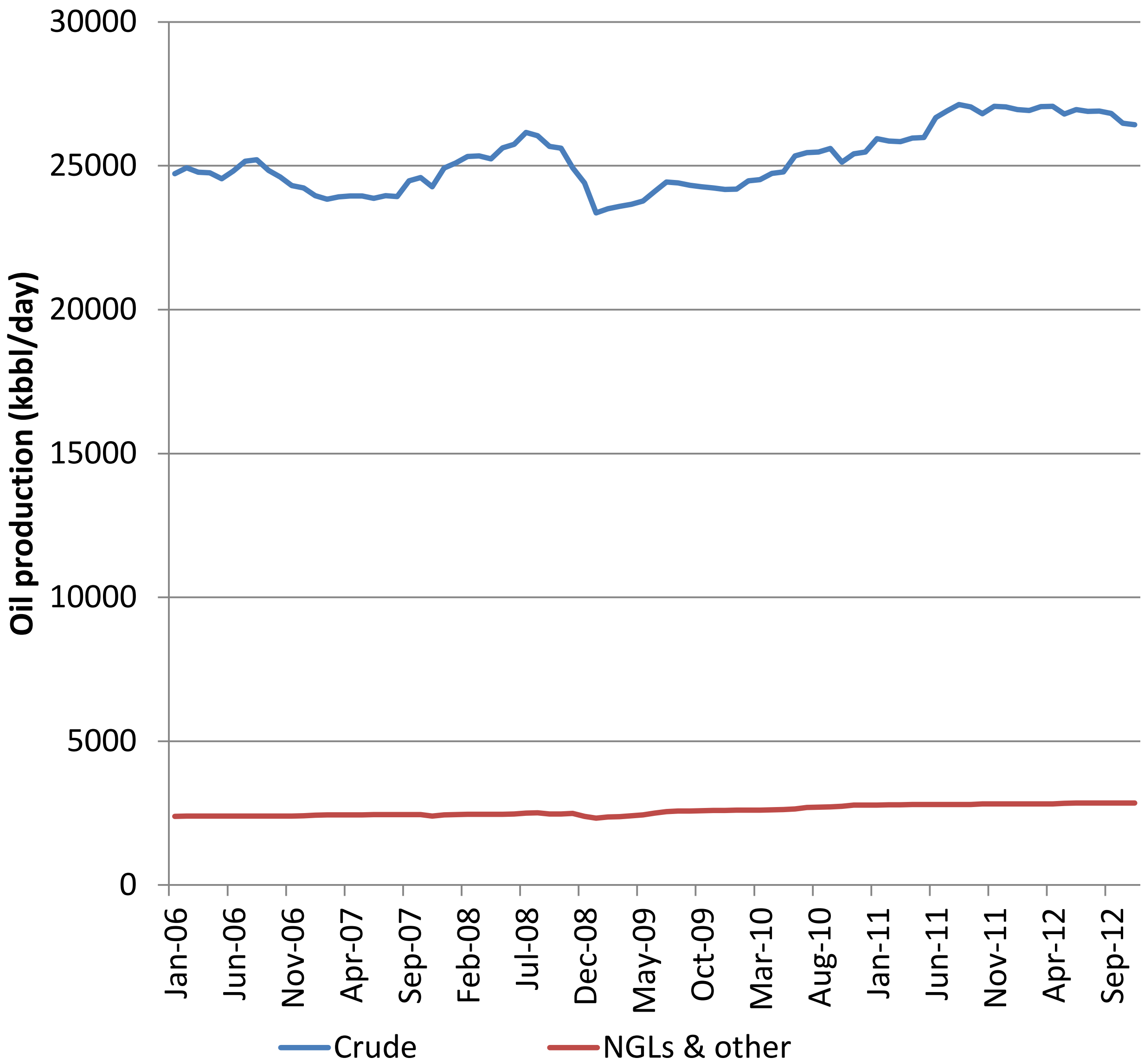
Some growth in MENA gas exports to 2015; little thereafter



- On current trends:
  - MENA gas export growth is virtually all driven by Qatar & Algeria
  - Neither will grow much after 2015
  - Oman exports declining
  - New importers appearing (Kuwait, Bahrain, Fujairah)
- Possible export growth from Israel, Iraq, (Libya and Iran?)
- More gas production (including unconventionals) a necessity for regional and global markets

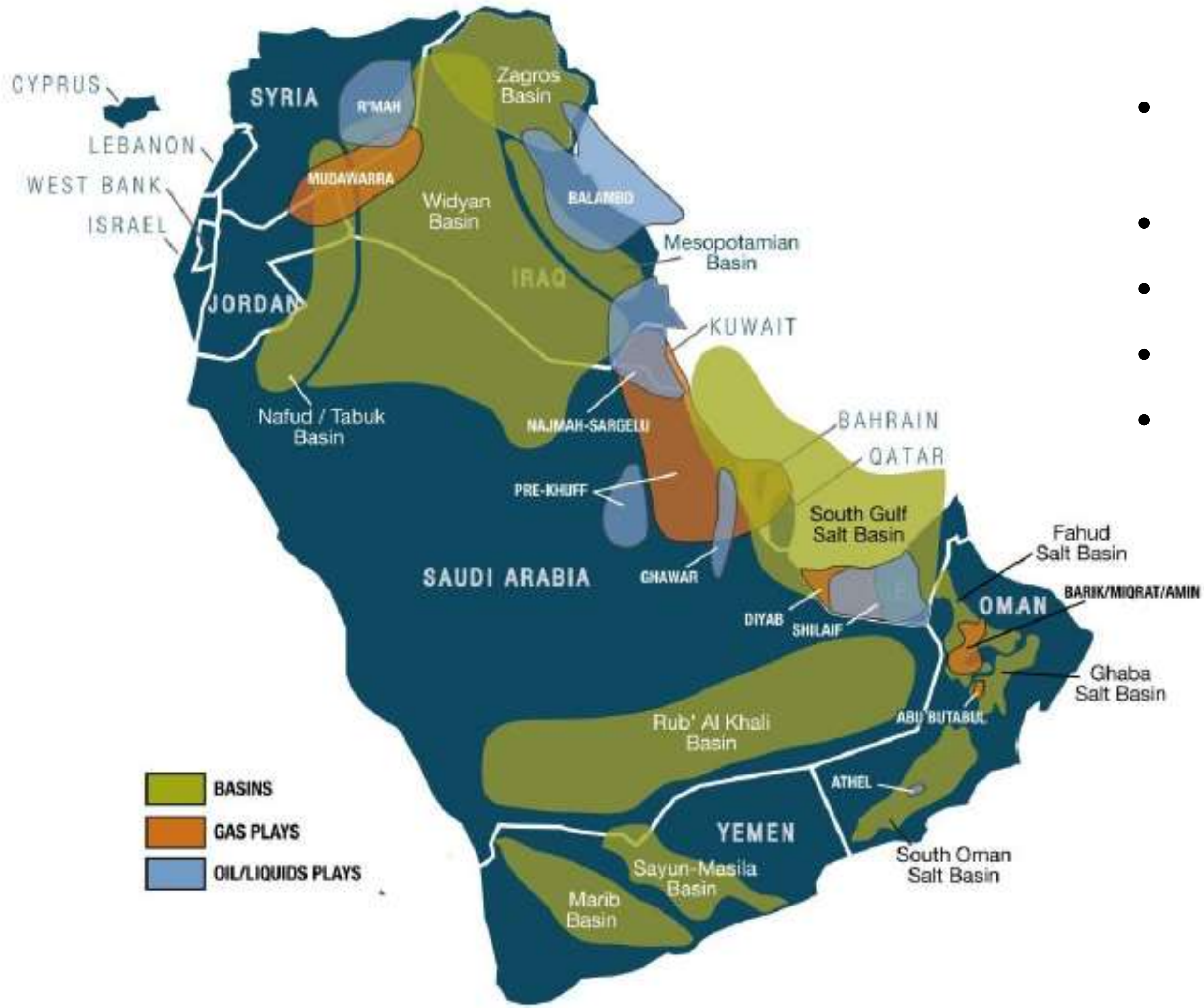
Source: Fattouh & Stern, eds. (2010)

Gulf NGLs growing; still small



- Gulf NGL production up 20% since 2006 (major gas projects in Qatar, Iran, Saudi Arabia, UAE, etc)
- But share of total output almost unchanged around 10%

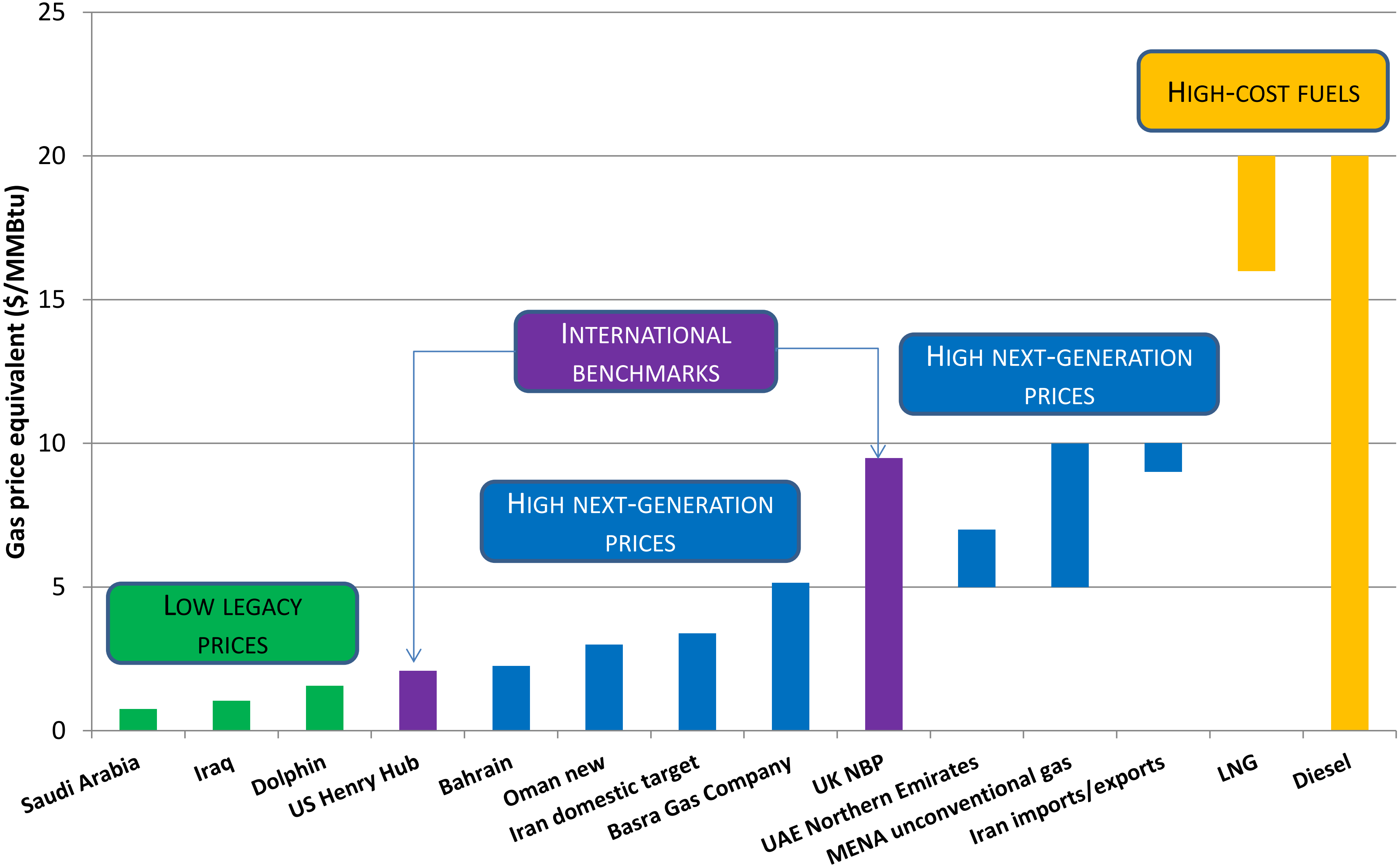
Numerous different Gulf unconventional gas plays



- Gulf unconventional plays varied, potentially large
- Sour and contaminated gas (CO_2, H_2S, nitrogen)
- Tight gas (sands & carbonates)
- Shale gas, condensate and oil
- Deep and ultra-deep
- Mixed resources (e.g. deep, tight and sour)

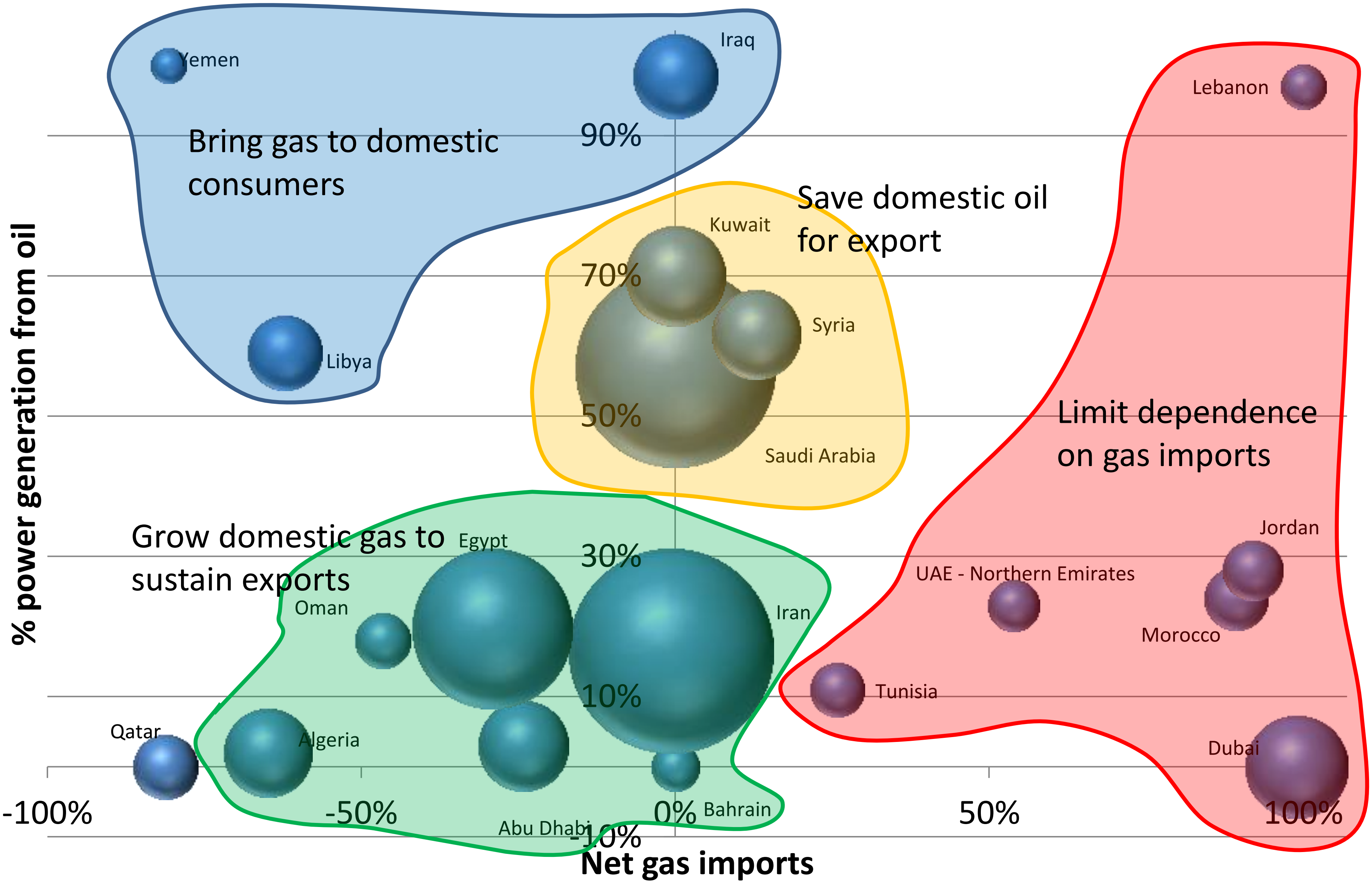
Source: PacWest; Manaar research

Gas pricing reform slowly materialising



Source: Manaar research

Gas policy motivations vary by country (bubble size indicates market size)



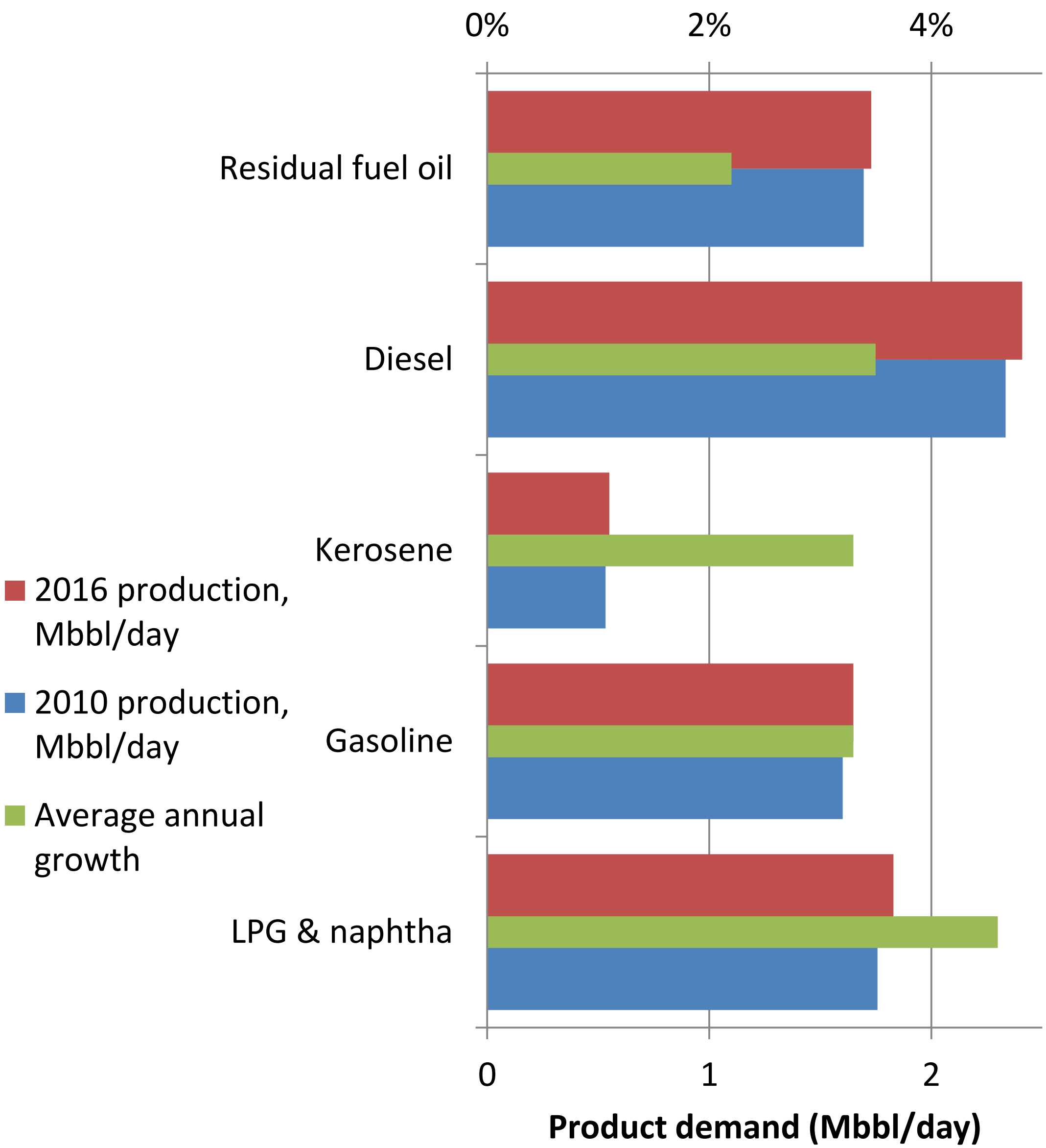
MENA gas challenges

- Explosive growth of demand
  - Economic and population growth
  - Air-conditioning
  - Petrochemicals, LNG, aluminium
  - Mature oil fields requiring EOR
- Very uneven reserves distribution
- Limited development of intra-regional gas trade
- MENA cross-border gas trade had limited success (AGP, Dolphin based on low gas prices)
- Maintaining LNG exports with long-term contracts (Qatar, Oman, UAE)
- Expansion plans: New industrial cities, expansion of existing plants and transportation systems (Saudi Arabia, Oman, UAE)
- Lower reliance on oil revenues for exports (mainly Saudi Arabia)
- Complex and expensive sour gas reserves (UAE)

MENA gas opportunities

- Potential new gas pipelines: Iran-Syria (doubtful), Iraq-Jordan, Kurdistan-Turkey
- Intra-regional LNG trade (Qatar to UAE, Kuwait, Egypt, Jordan)
- Tight and shale gas (Algeria, Libya, Tunisia, Morocco, Egypt, Saudi Arabia, Oman, UAE, Kuwait, Iraq, Jordan, Syria, Palestine)
- Undiscovered gas resources in Saudi Arabia, UAE, Qatar, Iran, Iraq, Kuwait, etc (e.g. Jurassic, Khuff and deep pre-Khuff plays)
- New gas basins: Eastern Mediterranean, Iraqi Kurdistan

Implications of current situation for product demand



Growing moderately, due to lack of gas for power

Growing use in construction & power sector due to gas shortages; low (subsidised) prices

Increasing air traffic, driven by Iran, Iraq, Saudi Arabia and UAE

Urbanisation, rising incomes, low (subsidised) prices

Surging petrochemical demand (especially Saudi Arabia, Iran). But NGL supply will become abundant

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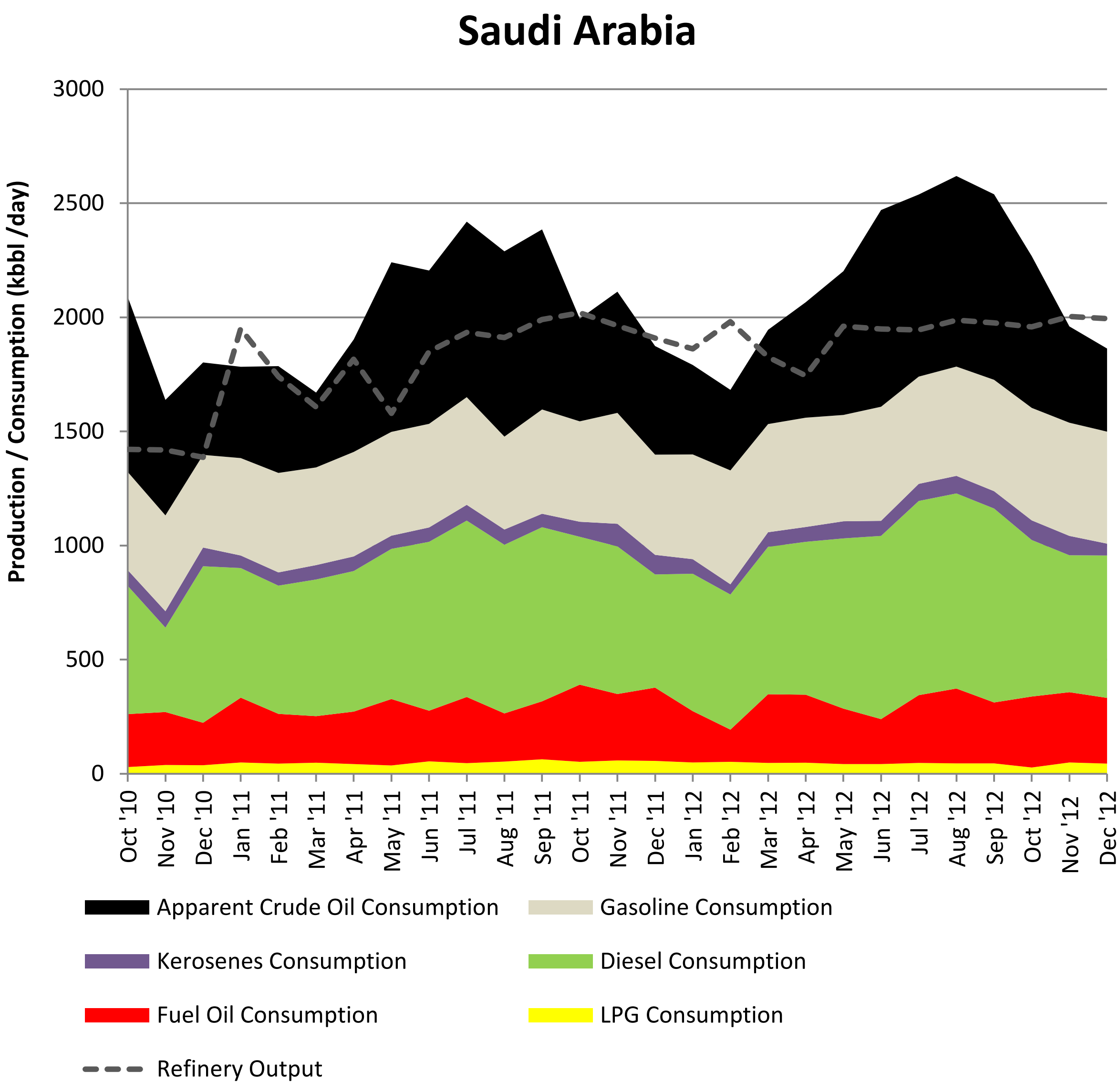
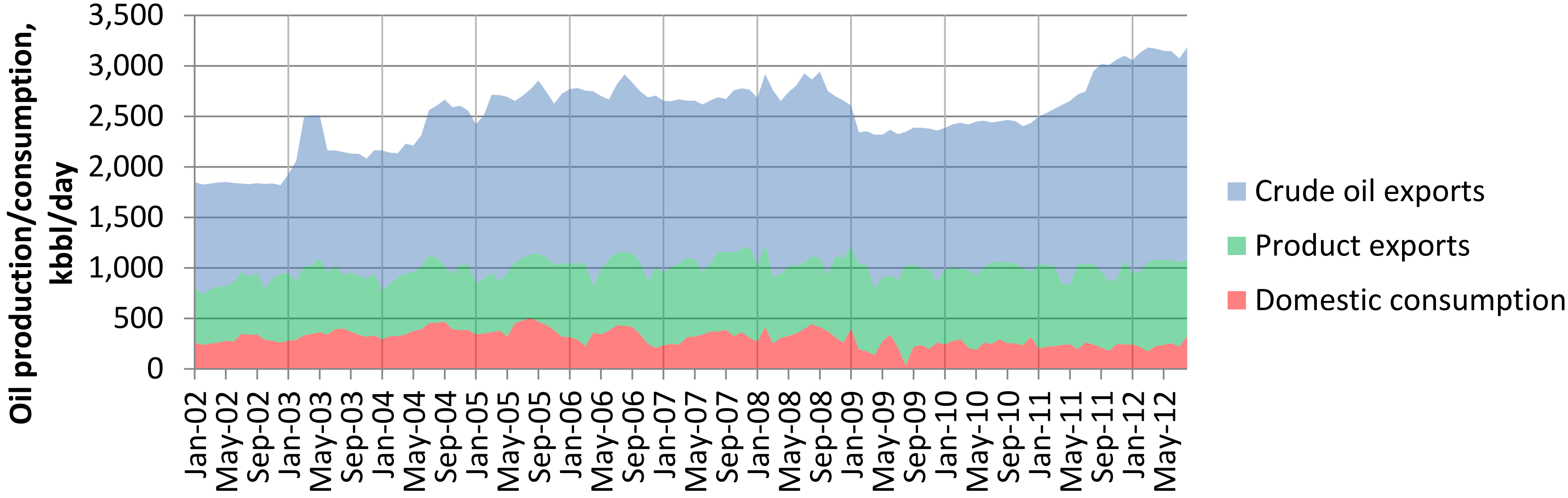
Saudi Arabia Gas Issues



- High, seasonal demand for direct crude burn for power generation
- Fuel shortages this summer
- Delays to Wasit gas development
- Refining mismatch – too much fuel oil, not enough diesel & gasoline
- Major refining expansions, but primarily for domestic use

Source: JODI; Manaar research

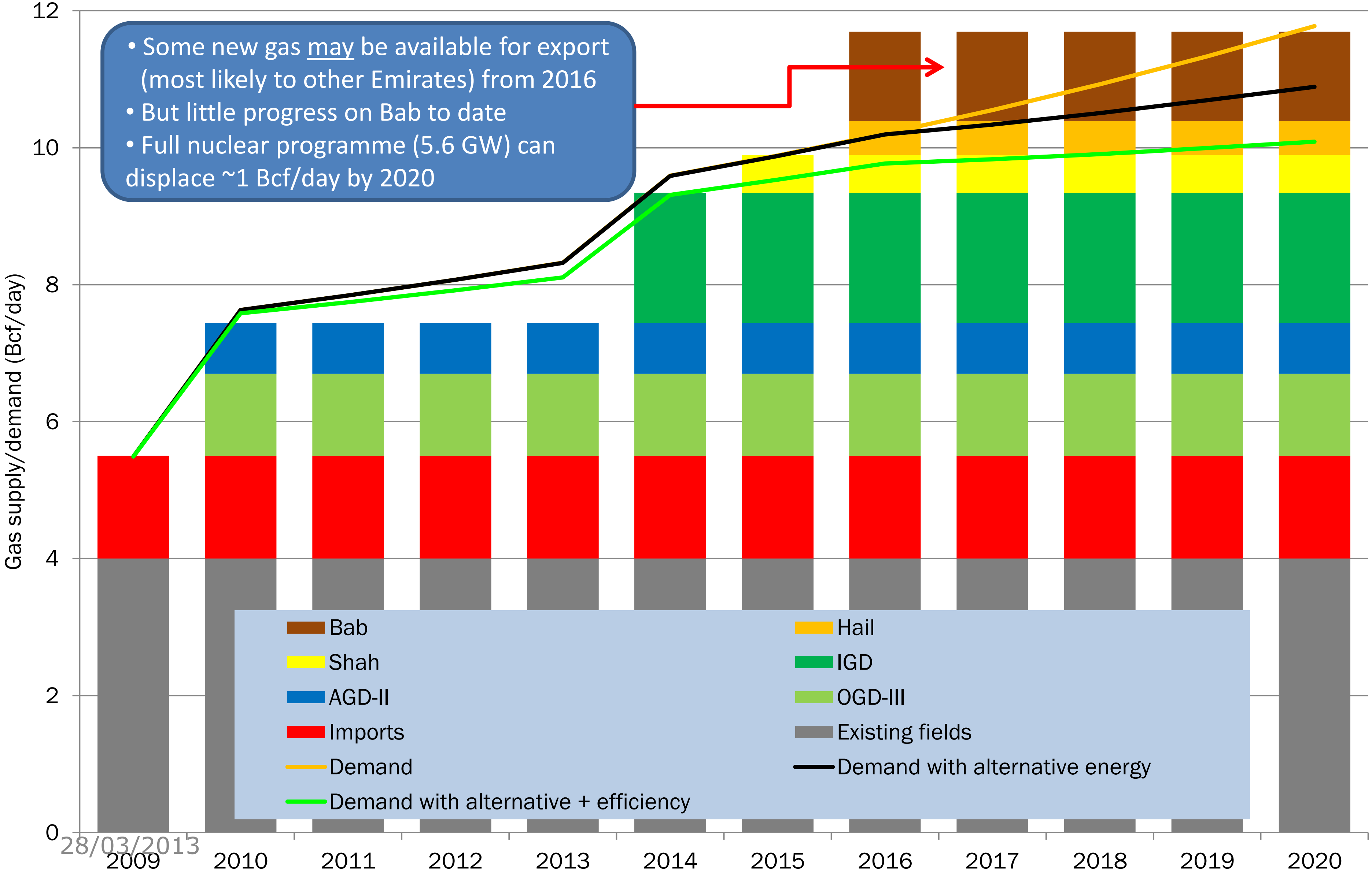
Kuwait: challenges on gas



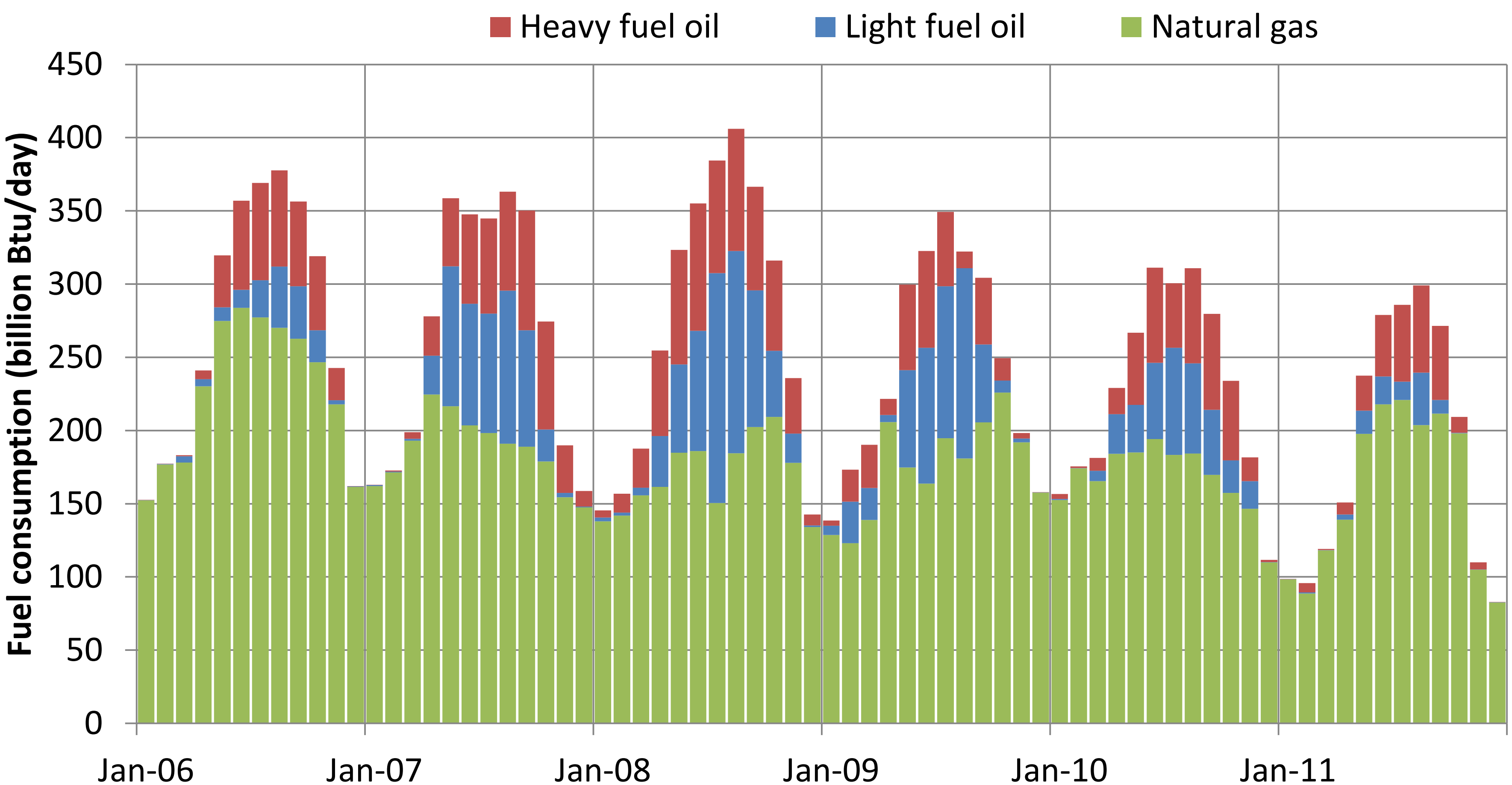
- The Middle East's first LNG importer
- LNG imports have cut domestic oil consumption (fuel oil) significantly
- However, progress on Jurassic gas/condensate (tight, sour, deep) limited by technical & political problems

Source: JODI; Manaar research

Abu Dhabi: gas supply squeezed to 2016



Sharjah increasingly gas-short



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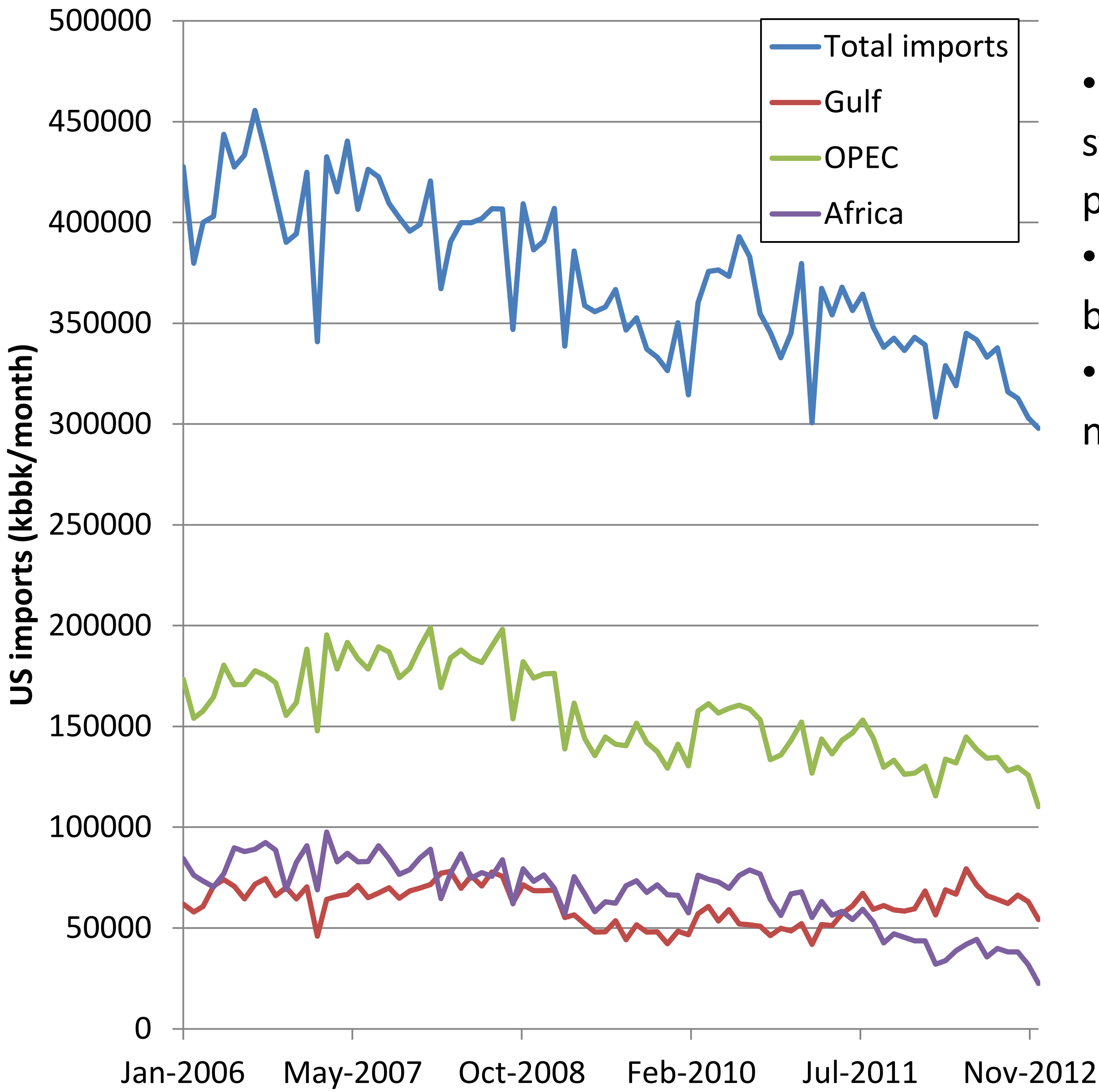
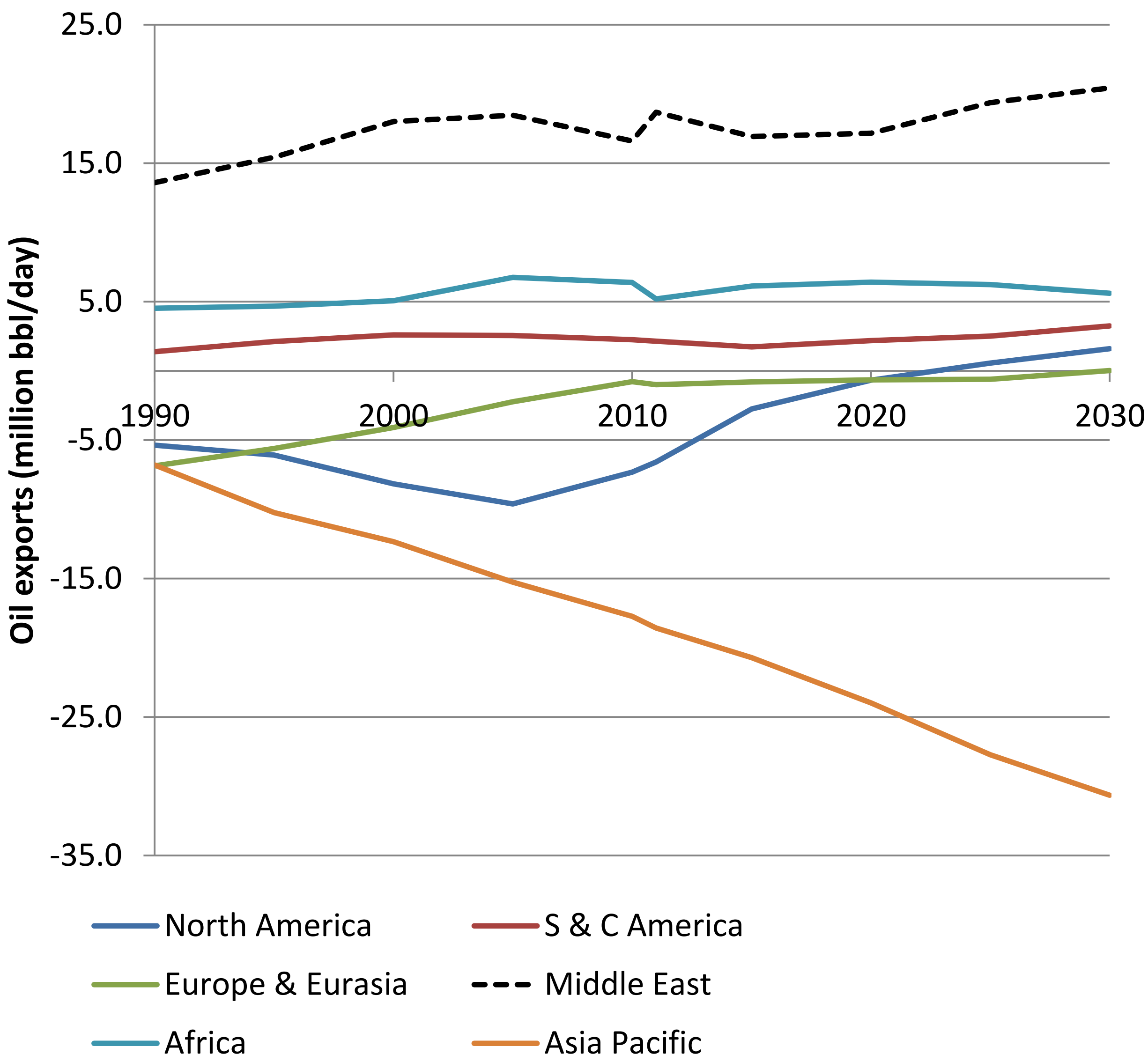
Source of US oil imports



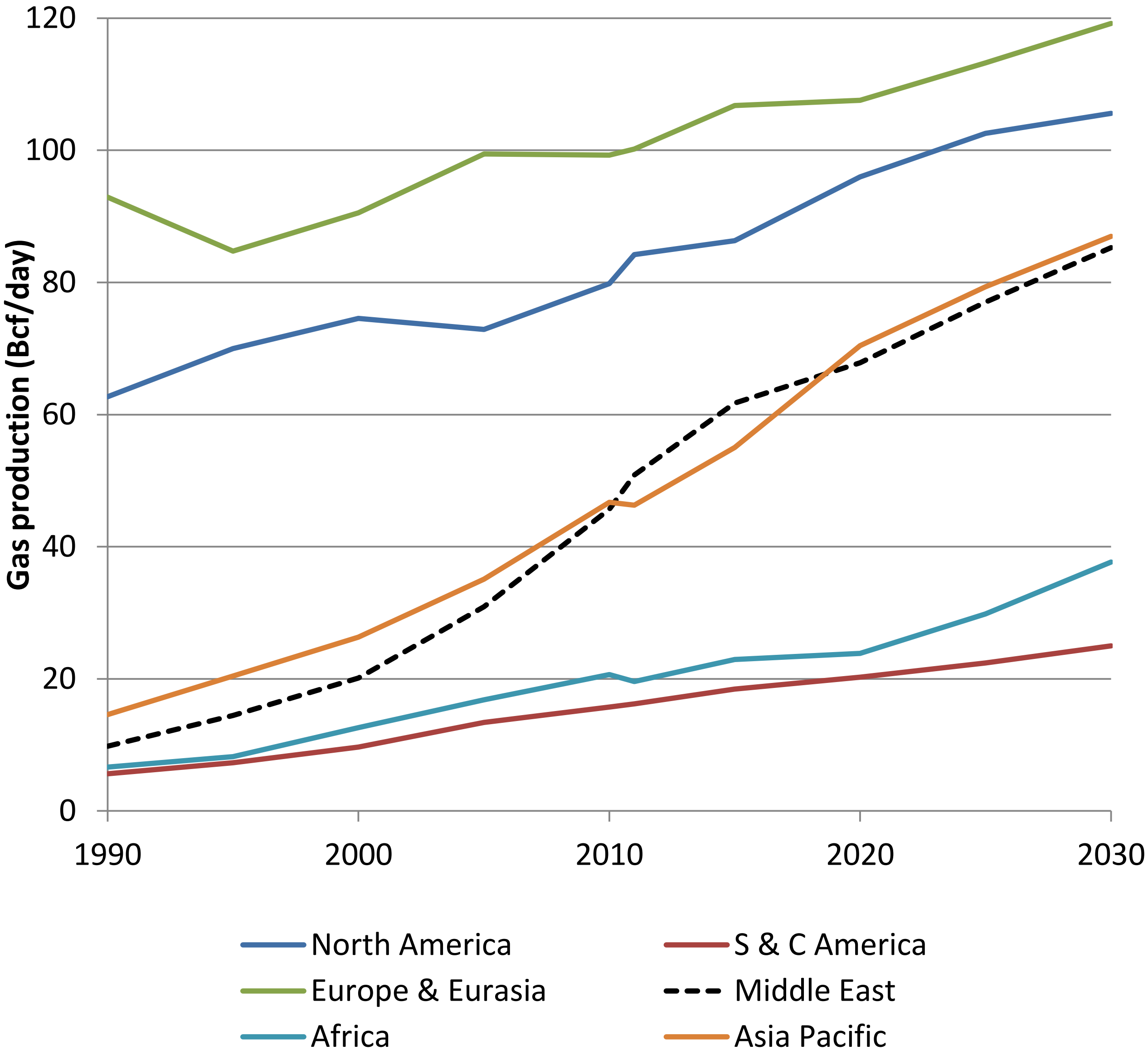
- US oil imports have fallen steadily since their August-2006 peak
- The burden has been taken up by OPEC and Africa
- US imports from the Gulf have not fallen much, if at all
    - Shale oil replacing African light, sweet crudes
    - Saudi objective to maintain US market share

Long-term global oil export balance



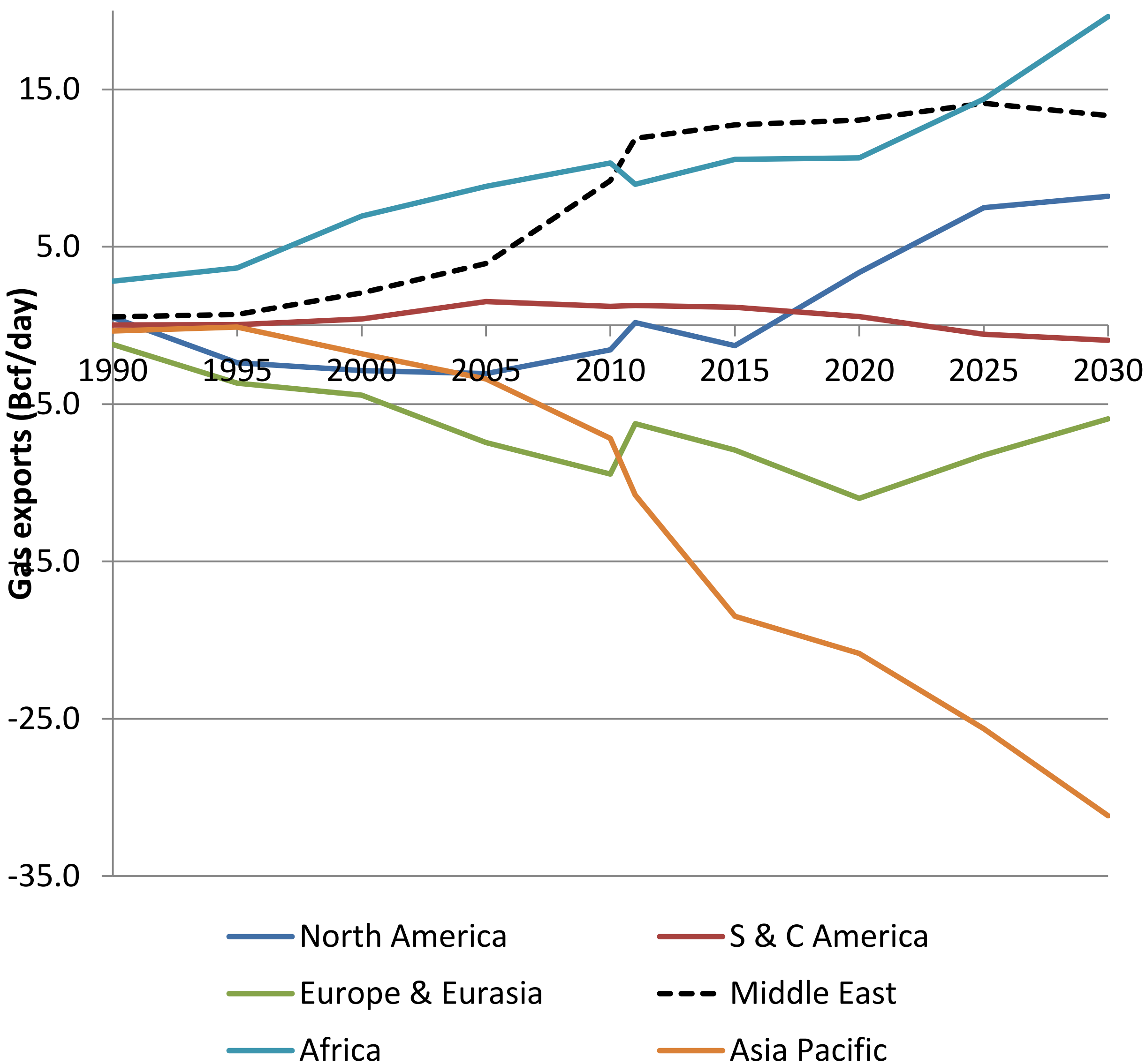
- In aggregate, Russia/Central Asia supplies Europe, Middle East/Africa supplies Asia, Americas self-sufficient
- But Middle Eastern oil exports not set to rise much
  - OPEC restraint
  - domestic consumption

Long-term global gas production



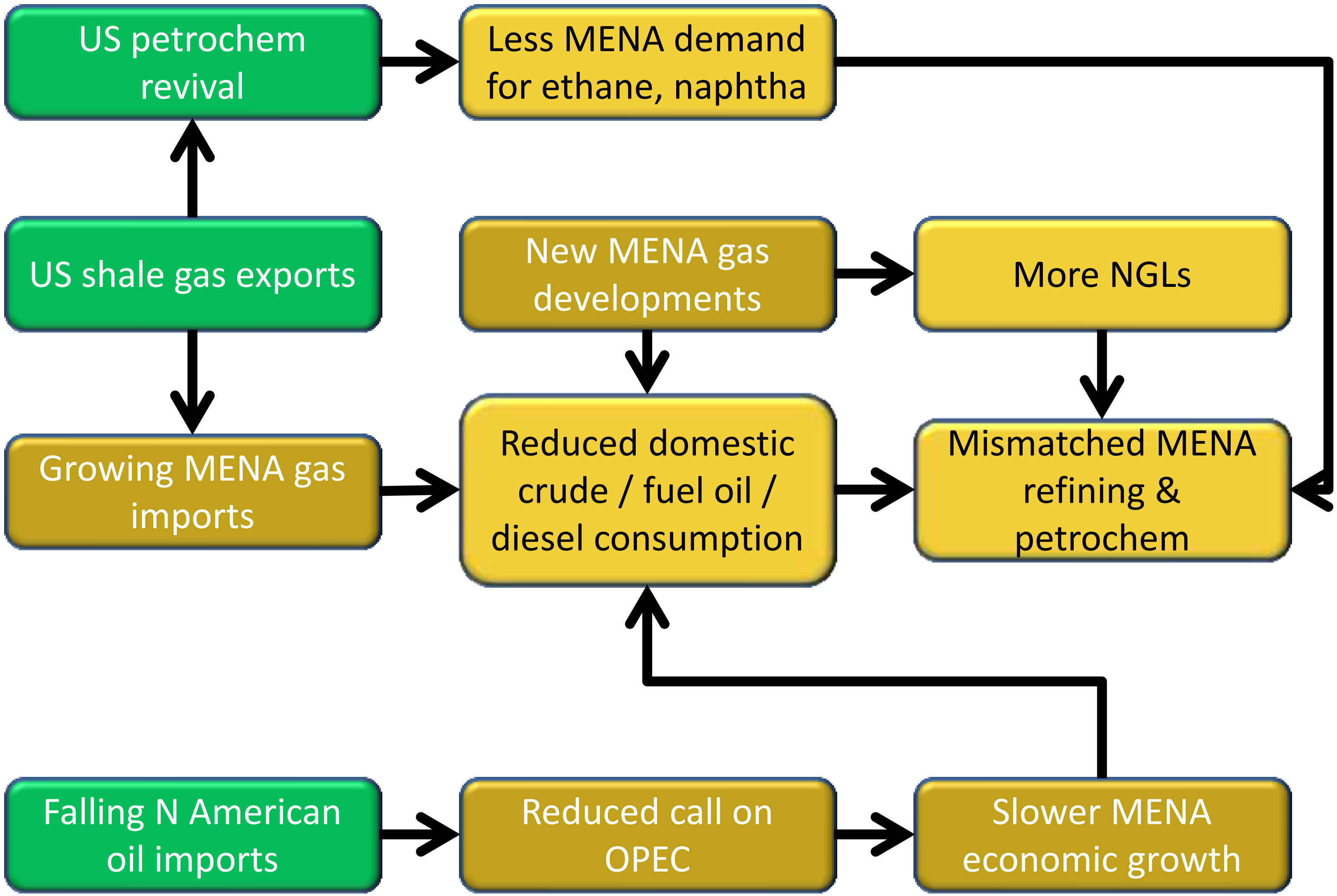
- Middle East set to be one of the fastest-growing gas producing regions
- But only if it can overcome economic, regulatory and political barriers

Long-term global gas export balance



- Middle East and Africa are the two major exporting regions
- Asia is the major importing region
- Russia supplies Europe
- Big change is the emergence of North American gas exports after 2015
- However, total Middle East gas exports do not grow much

Interaction of US shale and MENA gas issues



Uncertainties

- Market balance of MENA's light vs heavy crudes
- Role of alternative energy – especially nuclear – in displacing oil & gas in power sector
- Pace of new MENA gas developments (including unconventional) and intra-regional gas trade
- New regional markets for gas
  - Gasification of new areas (Iraq, Jordan, Lebanon, Palestine, Cyprus, etc)
  - Shipping (ECAs), ground transport
- Intra-OPEC dynamics (Saudi Arabia, Iraq, Iran)
- OPEC response to challenge of unconventional oil