



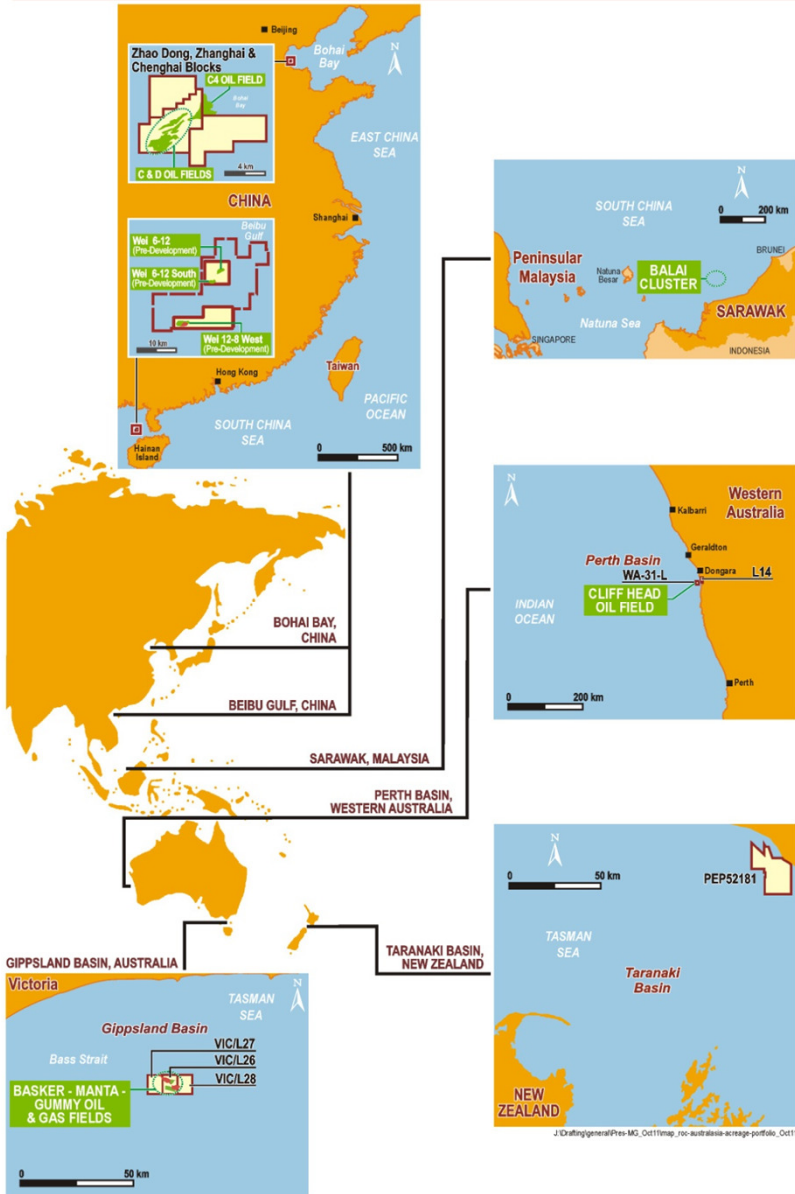
Topic: Role of Gas in Sustainable Development

Speaker Name: Alan Linn

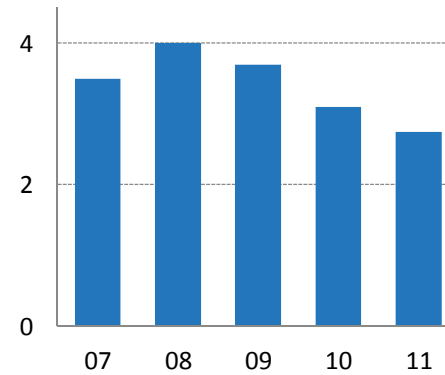
Session Date/Time : 7 June 10am



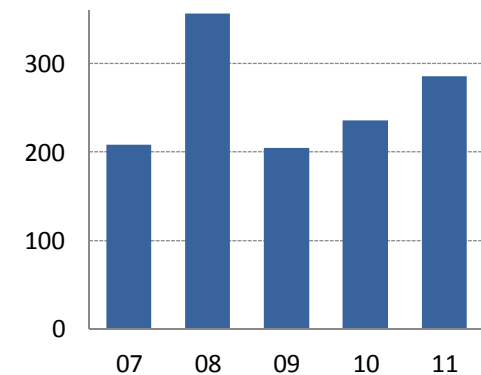
Introduction to Roc Oil Company Limited



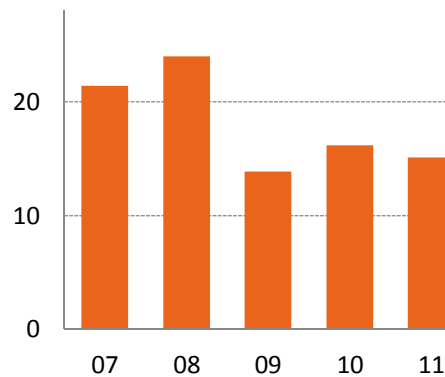
Production MMBOE



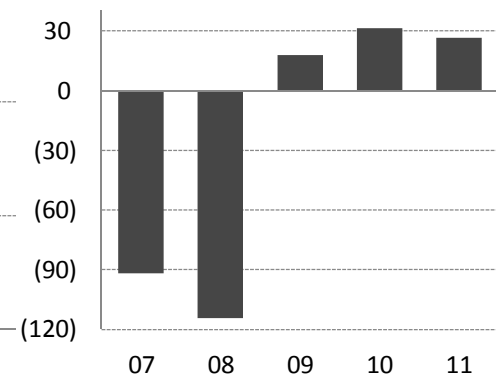
Revenue US\$M



2P Reserves MMBOE

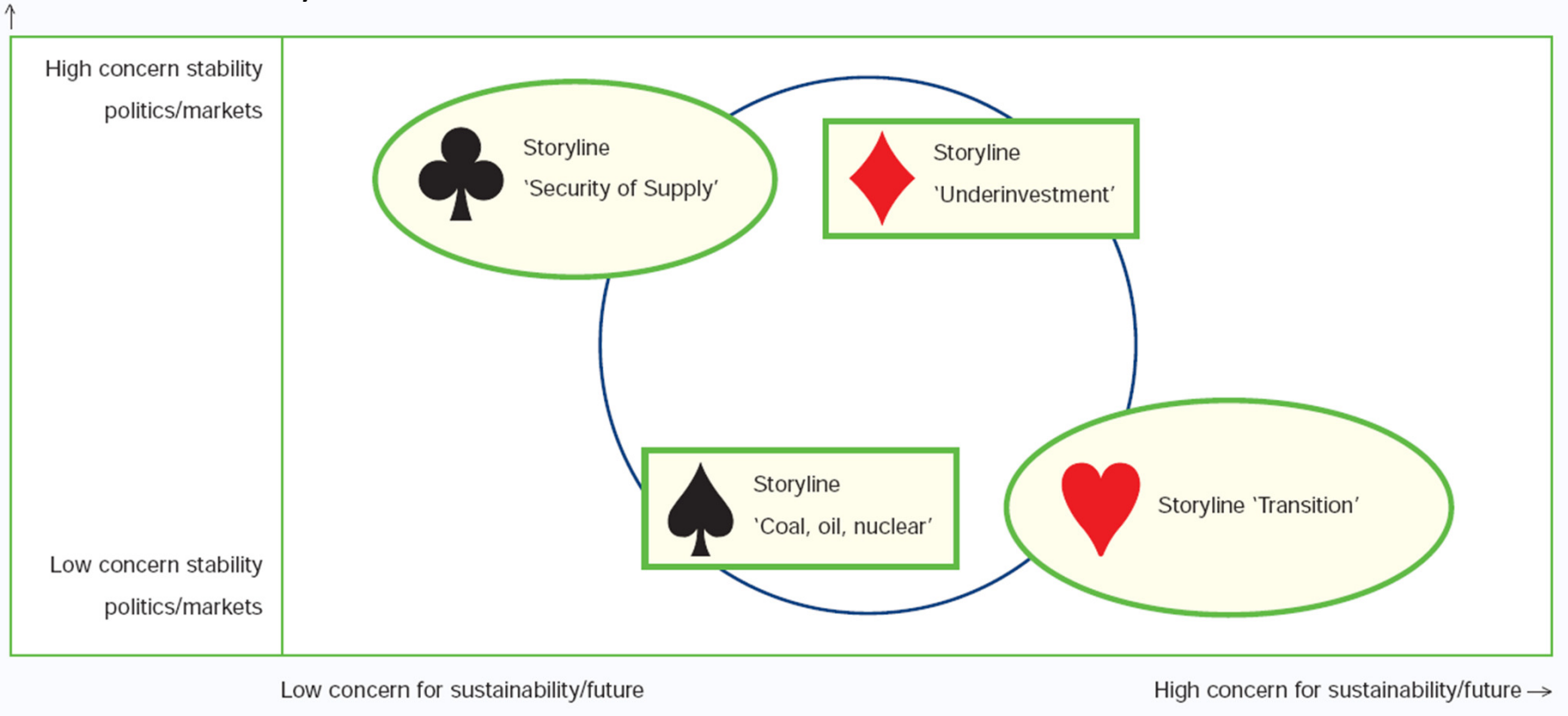


Net (Debt) / Cash US\$M



In 2006, the world set different priorities to the sustainable development challenges being faced...

....the global economy was booming; energy security and managing CO₂ emissions were key issues.



Source: WGC 2006: Sustainable Development and the role of Gas

Gas was recognised as playing a key role in addressing the energy challenges of the future and in that respect not a lot has changed.

Natural gas has been identified as a key component in supporting sustainable development of the global economy



There are several factors which increase gas's importance in sustainable development:

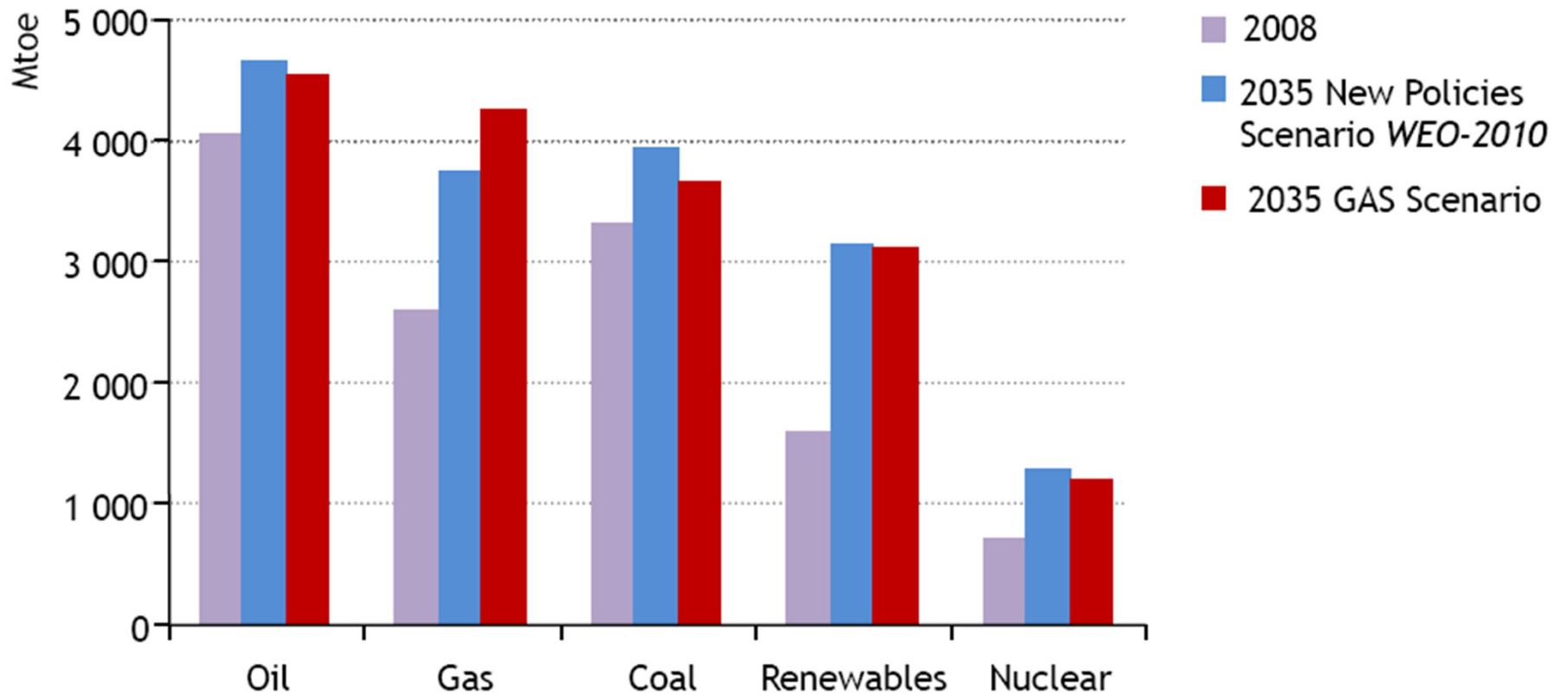
- ❑ Natural gas is an abundant fuel.
- ❑ There is demand for Natural Gas from traditional sectors and uses continues to increase.
- ❑ Natural gas plays a key role in helping to meet environmental targets.
- ❑ A global market exists for the trade of natural gas—and especially of LNG.
- ❑ The natural gas industry requires significant investment if it is to reach its full potential.
- ❑ Political and geopolitical issues can threaten the economic development of the gas industry.

Source: WGC 2009: The Global Energy Challenge: Reviewing the Strategies for Natural Gas, International Gas Union

Gas's importance in the primary energy demand is growing significantly in both IEA development scenarios.



World primary energy demand by fuel and scenario

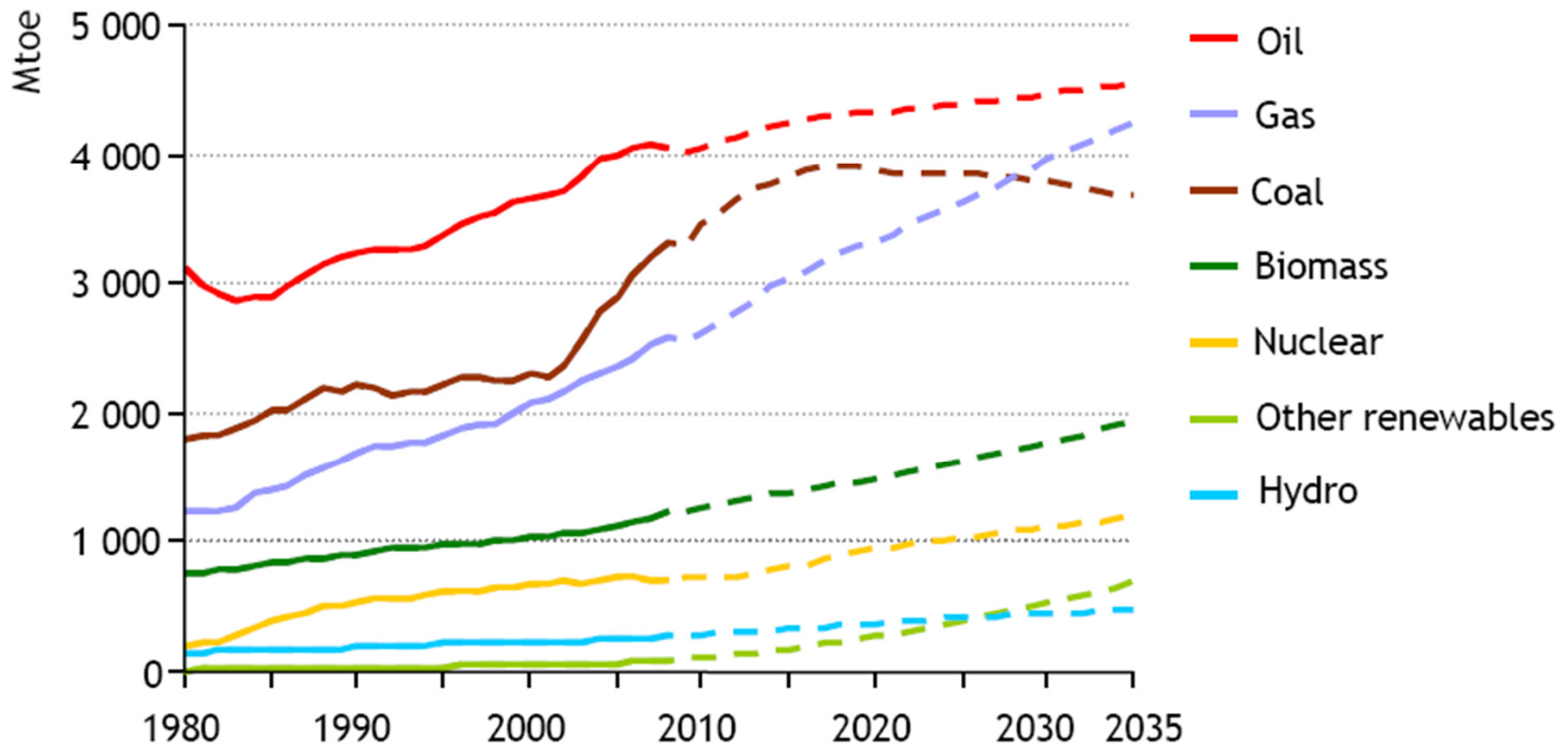


Source: IEA World Energy Outlook 2011

Gas's rapid growth is forecast to overtake coal's contribution to primary energy demand by 2030.

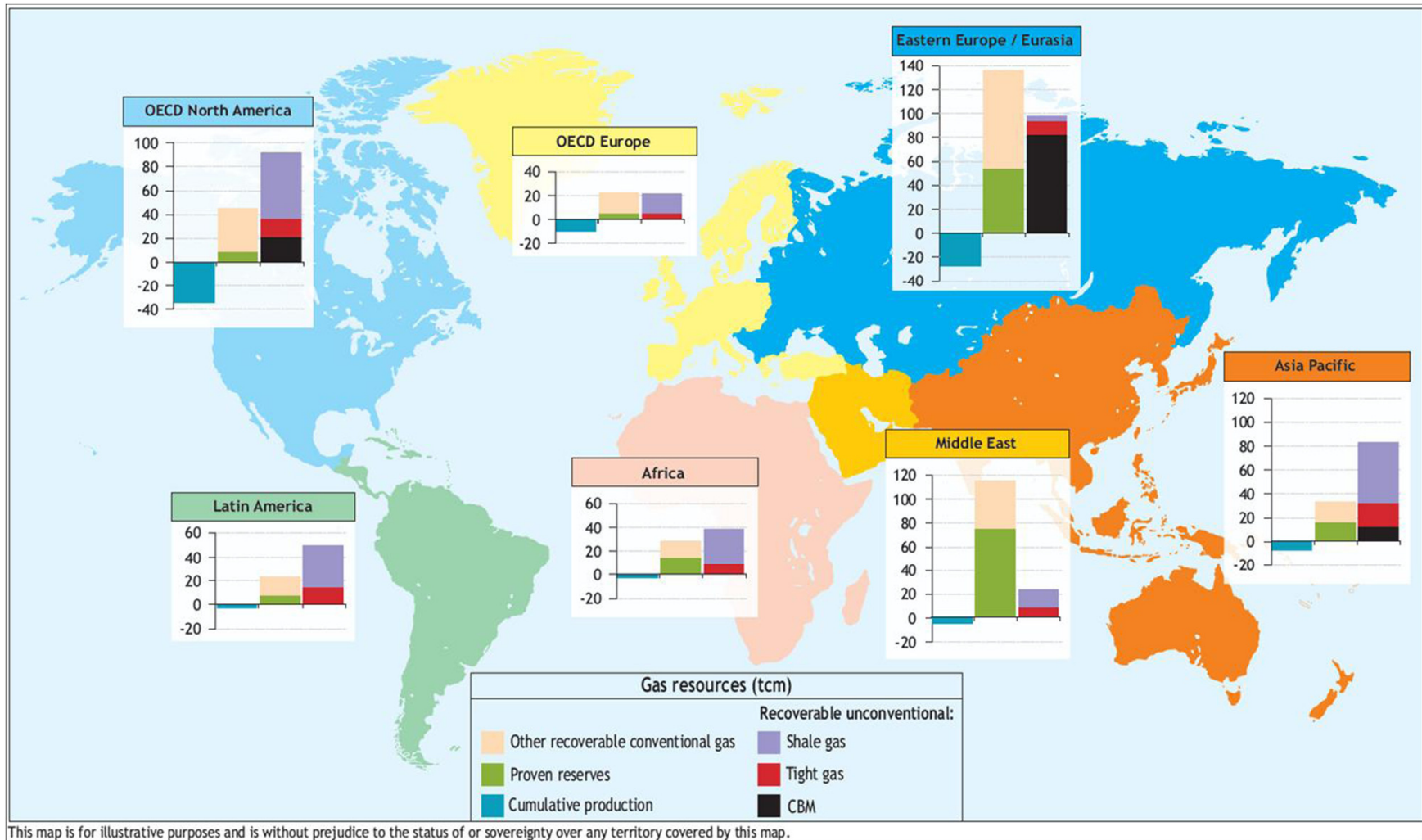


World primary energy demand by fuel in the GAS Scenario



Source: IEA World Energy Outlook 2011

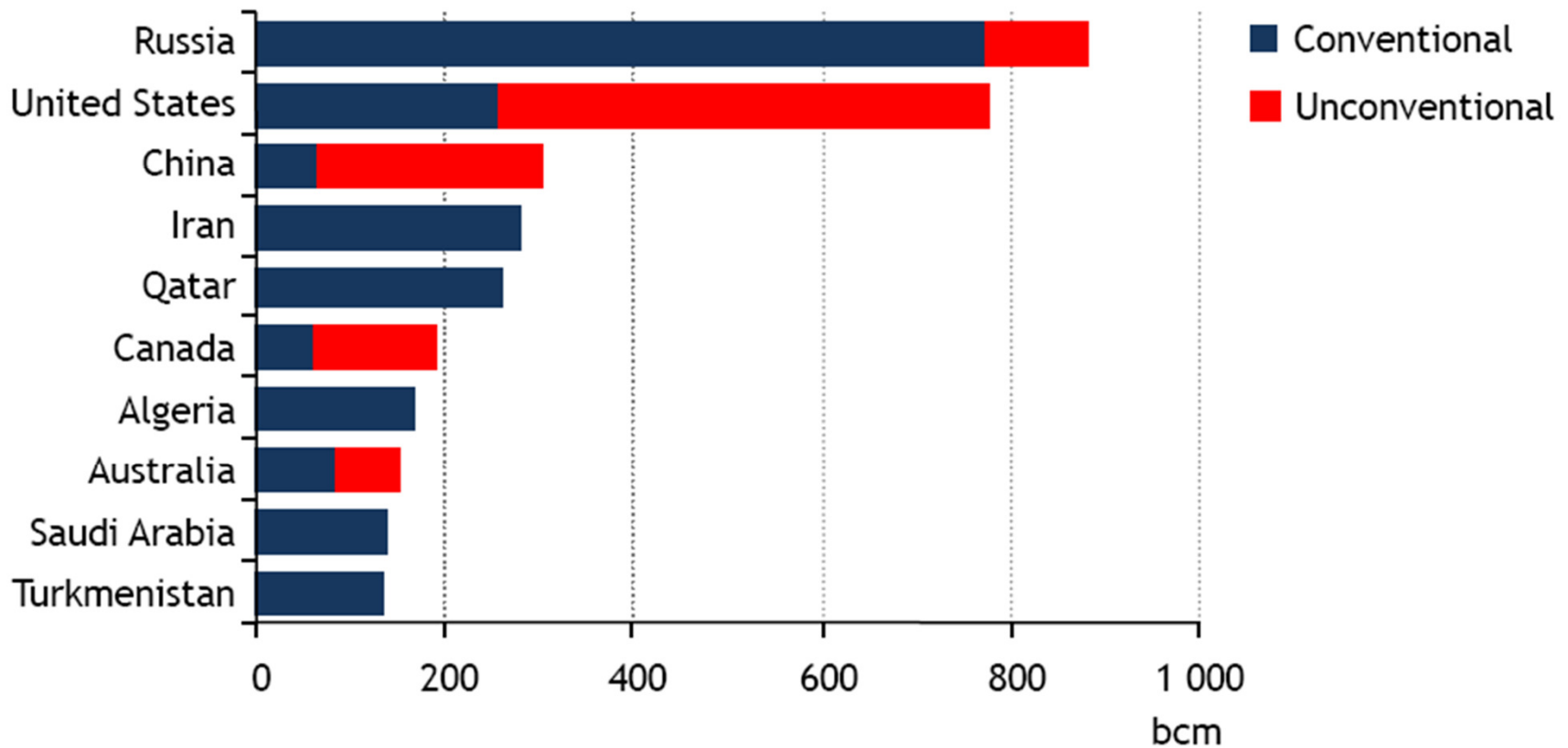
There is a global abundance of gas, with unconventional resources playing a significant role.



Source: IEA World Energy Outlook 2011

Unconventional gas supplies 40% of the increase in gas demand to 2035

Largest gas producers in the GAS Scenario, 2035



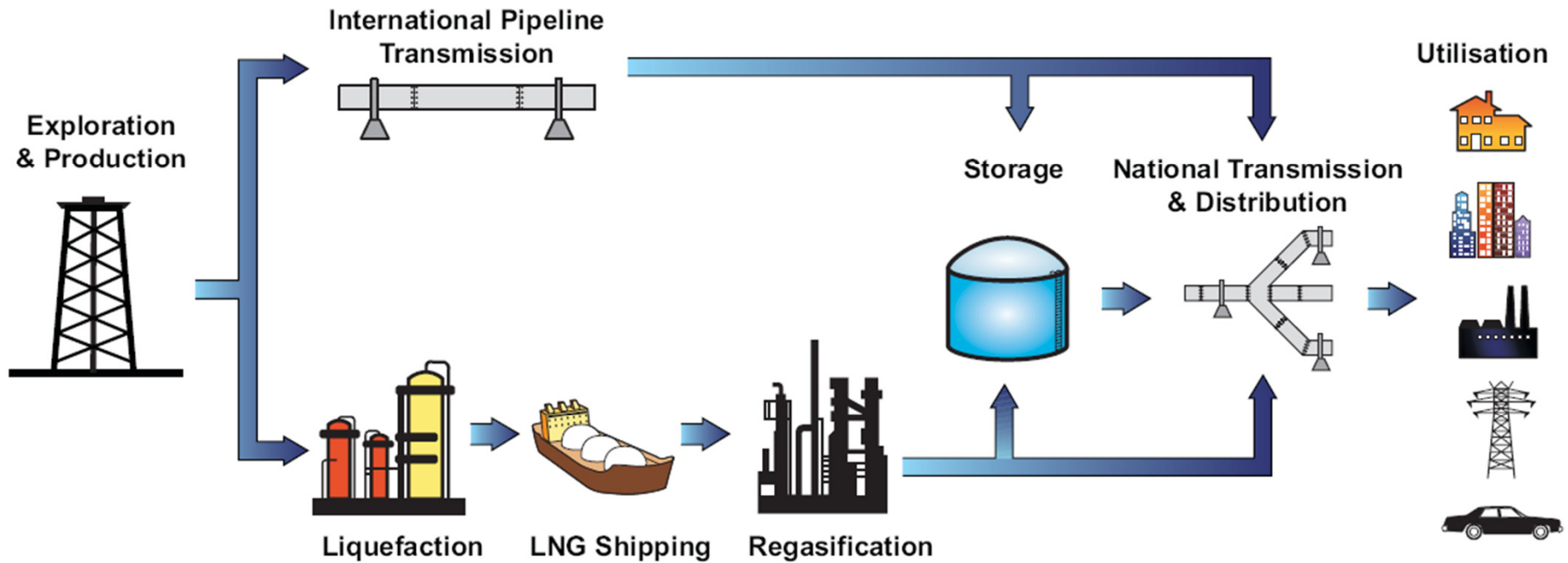
Source: IEA World Energy Outlook 2011

The value chain for gas is extremely capital intensive....



...with significant infrastructure and investment required to get products to market

The Gas Industry Value Chain

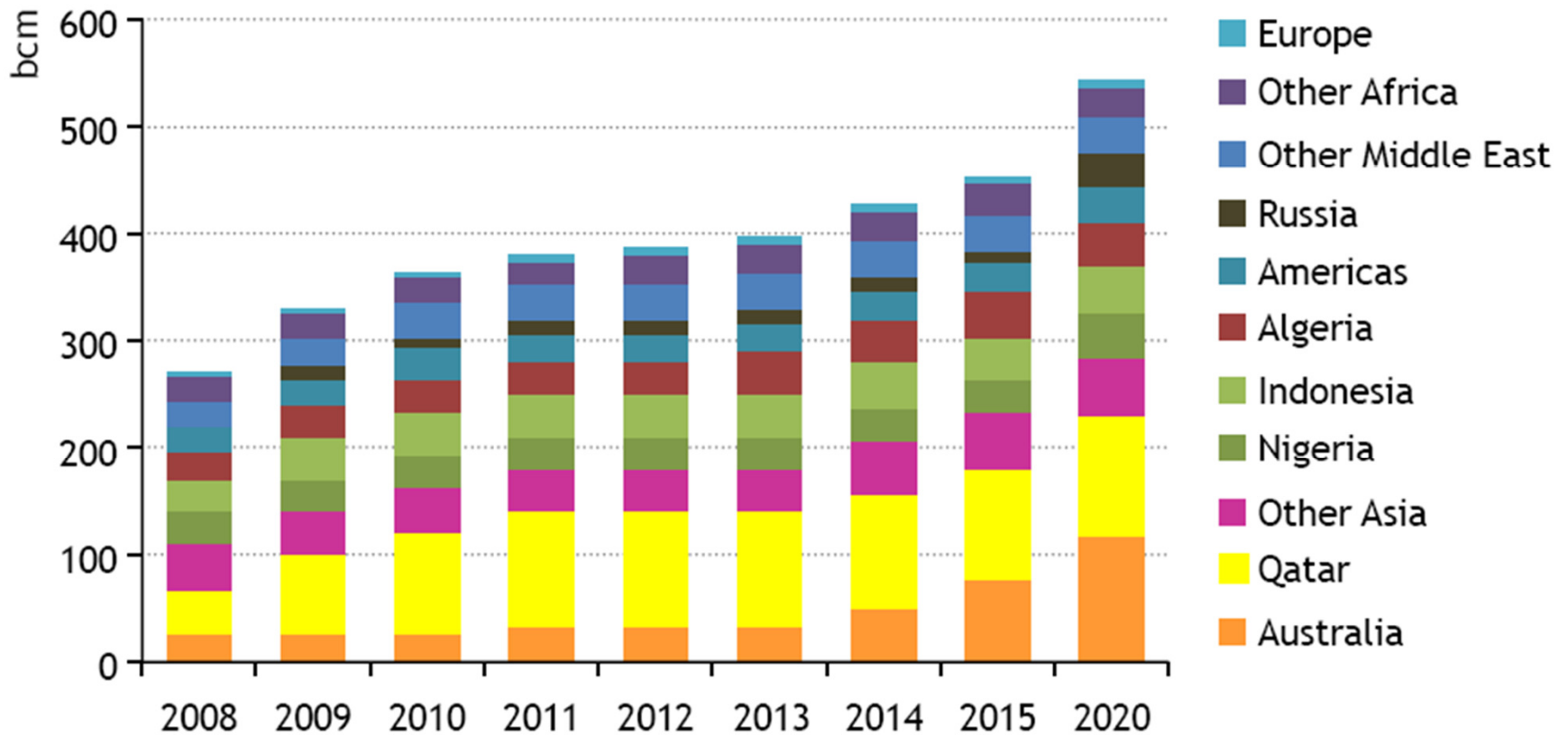


Source: IGU.
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Trade in natural gas between major regions doubles by 2035, with Australia becoming a leading LNG supplier



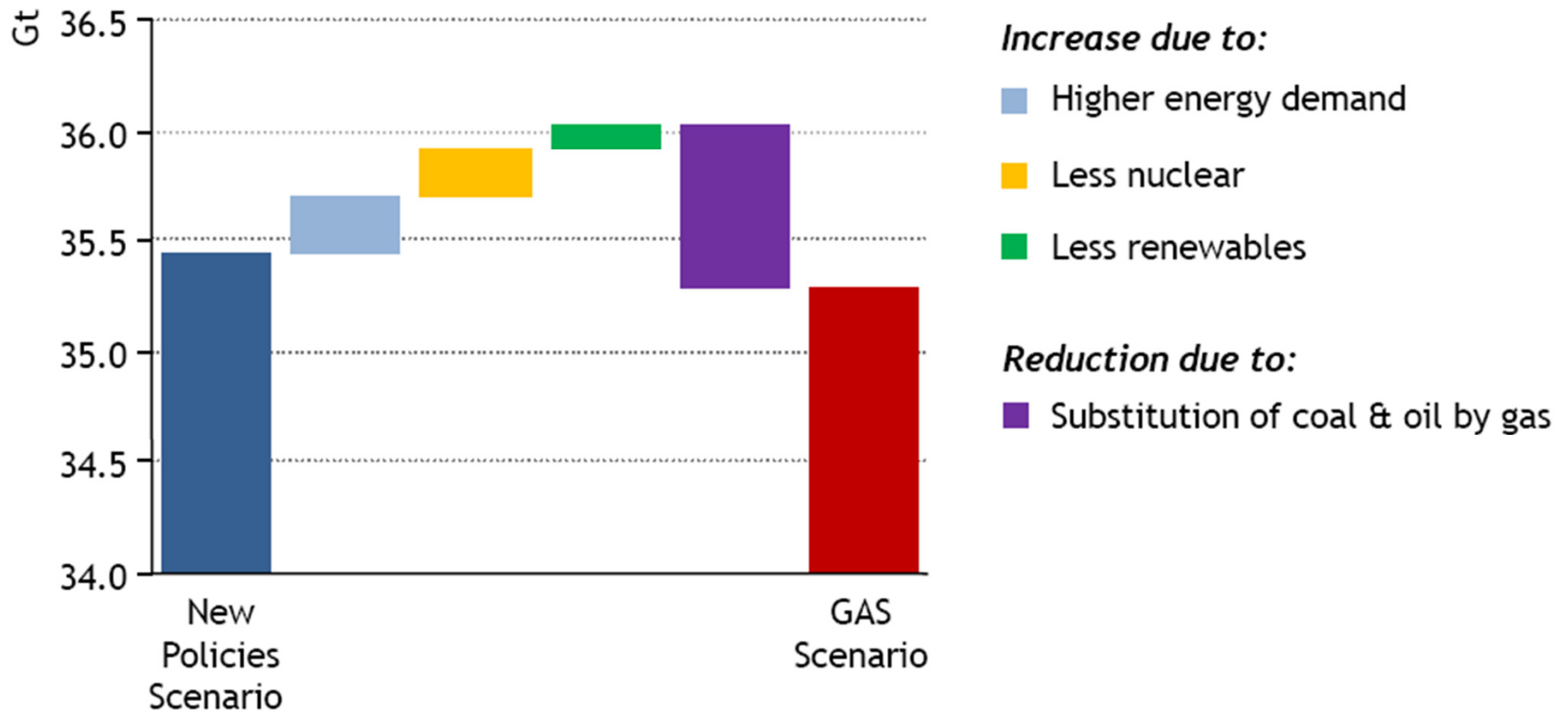
Projected LNG liquefaction capacity by country



Source: IEA World Energy Outlook 2011

Between the IEA scenarios substitution of coal & oil by gas cuts emissions, but this is largely offset by other effects

CO₂ emissions in the GAS Scenario compared with the New Policies Scenario, 2035



Source: IEA World Energy Outlook 2011

The future and its challenges.....



Market uncertainties create opportunities for natural gas

- Greater gas use could enhance regional energy security
- New supplies & trade routes emerge
- Gas has a role to play in a low-carbon energy economy
- Unconventional resources could boost supplies substantially
- Best practice regulation is essential to mitigate environmental risks
- In the IEA's GAS Scenario, demand for gas grows more than 50% by 2035, providing over 25% of world energy..... surely a prospect to designate the Golden Age of Gas



Let's introduce a little Chaos Theory



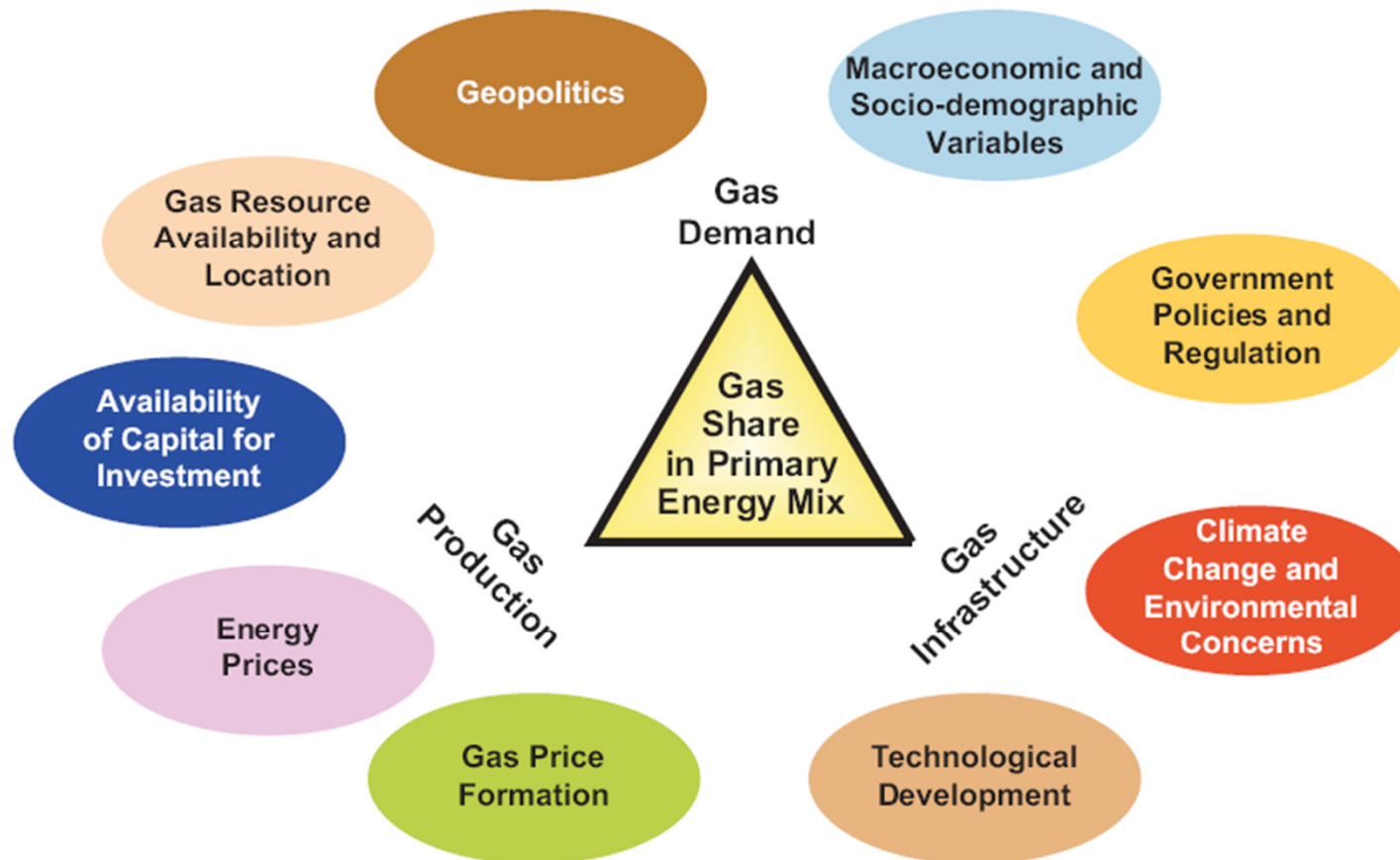
The accepted gas scenarios presented are complex and there is considerable averaging at work in the analyses.

Chaos theory is the study of nonlinear dynamics, where seemingly random events are actually predictable from simple deterministic equations.

The two main components of chaos theory are the ideas that systems - no matter how complex they may be - rely upon an underlying order, and that very simple or small changes in systems and events can cause very complex behaviours or events.

Successful development of a gas market is dependent on sustainable economic growth to help manage risk.

Main Drivers Influencing Gas Market Development



Source: IGU.
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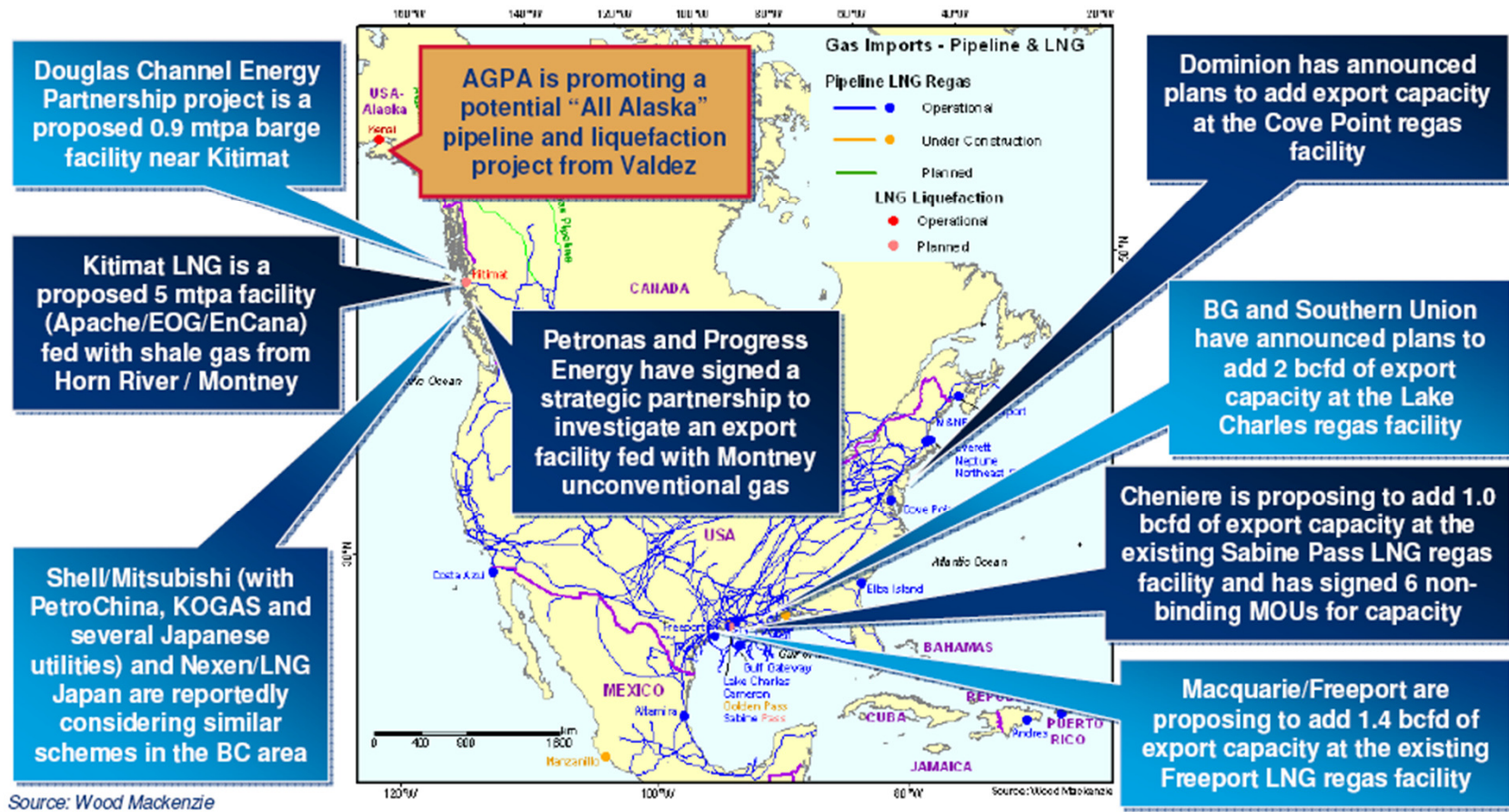
So what is going to happen when.....



So what is going to happen when.....

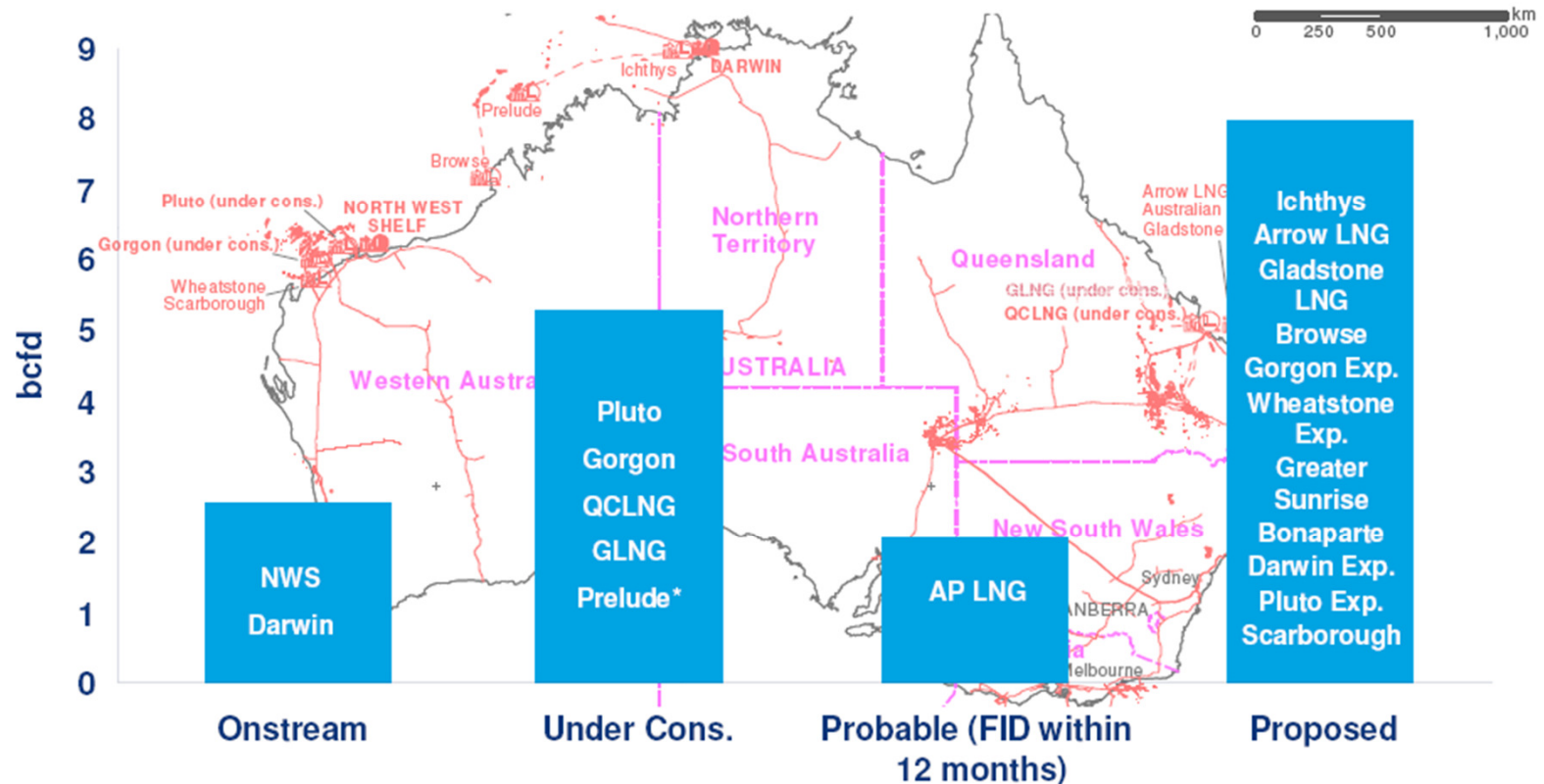
America begins to export LNG to keep domestic prices up and the small companies in the gas game.

There may be headroom for a few North American LNG export projects



What happens to the Australian LNG investments if the government reserves gas for domestic use?

Australia will help fill the Pacific supply gap with over 7 bcfd of capacity on-stream or currently under construction...

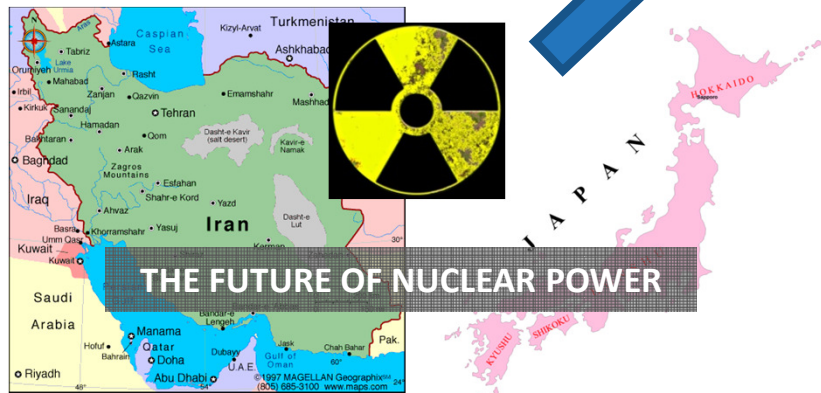


* Prelude took FID in mid May
 Source: Wood Mackenzie. As of May 2011.

What are the impacts upon the Golden Age of Gas when / if some or all of the following scenarios play out



Impact on Global Gas Market?... Chaos?



Is there a right answer!



We don't have the answer other than to say small changes in the variables within a complex system have the potential to produce dramatic changes in outcome

Within ROC Oil we have a number of very simple targets which support the growth of our business during this dynamic period in the development of the world's future sustainable energy supply:

- We have progressed over the last two years to zero venting and flaring during normal operations (this preserves gas for sales and reduces the environmental footprint of our business);
- We aim to consistently deliver high integrity/low cost operations (this helps ensure that we are competitive in some of the lower oil/gas price scenarios);
- We currently focus upon predominantly oil development and exploration and are watching gas closely.

Thankyou

Backup Slides

In Conclusion



The future is uncertain and the outcome probably won't look like any of the predictions

Gas is a clean and abundant fuel

The market will eventually move to a supply/demand linked spot price similar to the current oil market and the easy gas will be delivered first with the high price gas staying in the ground till the supply/demand driven price re sets

Re-newables remain a mystery to me, however, they have a place albeit probably less than the market thinks if unconventional continue to grow at pace.

What does this mean for ROC and its operations?

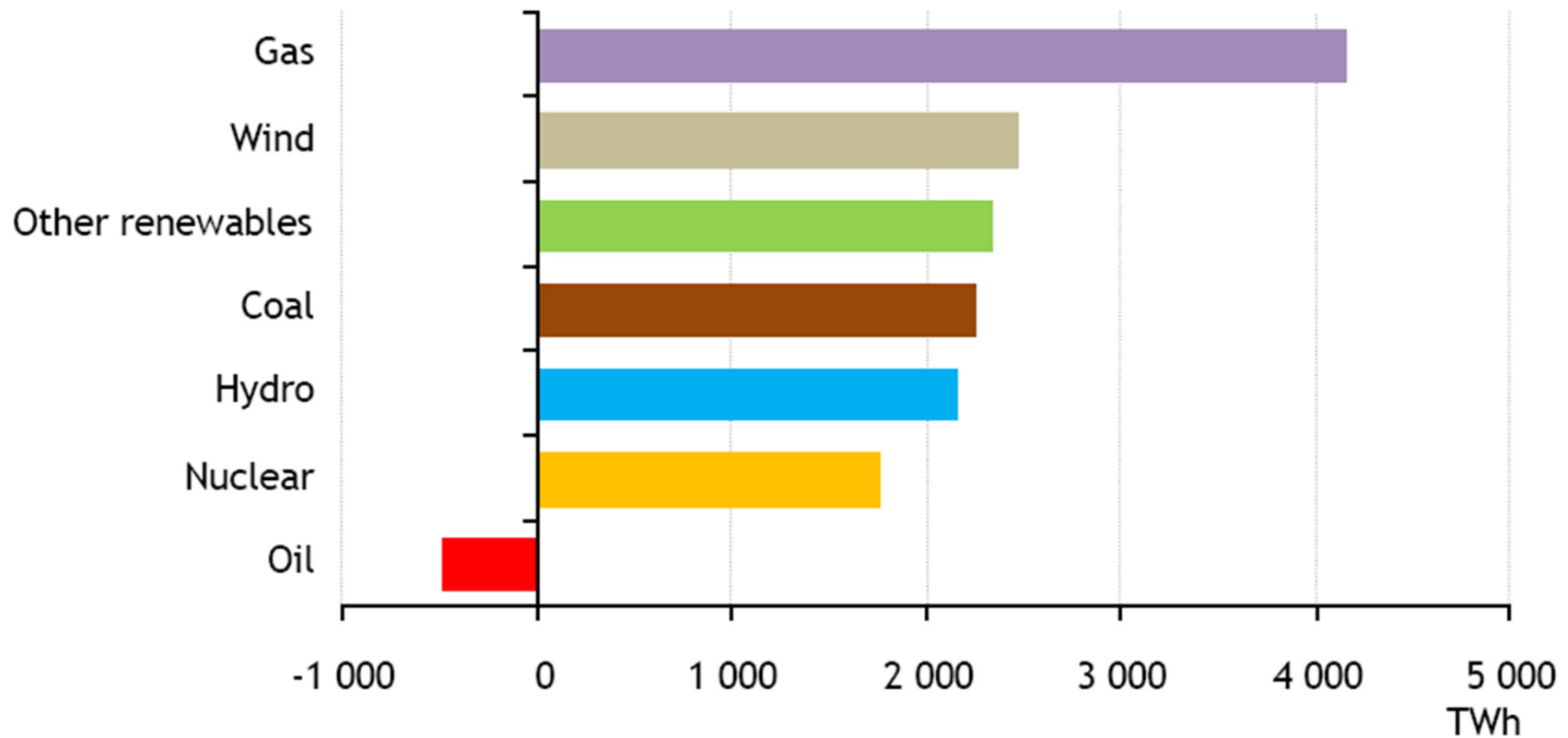


Existing regulatory regimes are being tested:

- Hydraulic fracturing: water use, contamination & disposal
- Greenhouse-gas emissions
- But regulatory & operational best practices can mitigate the risks
- Ensuring gas, water & chemicals cannot enter other formations
- Minimising water use
- Treating & disposing of water appropriately
- Limiting gas venting
- Using best practice, “well-to-burner” emissions from shale gas production are 3.5% higher than from conventional gas

The forecast growth in gas fired power generation out to 2035 is significantly higher than other sources.

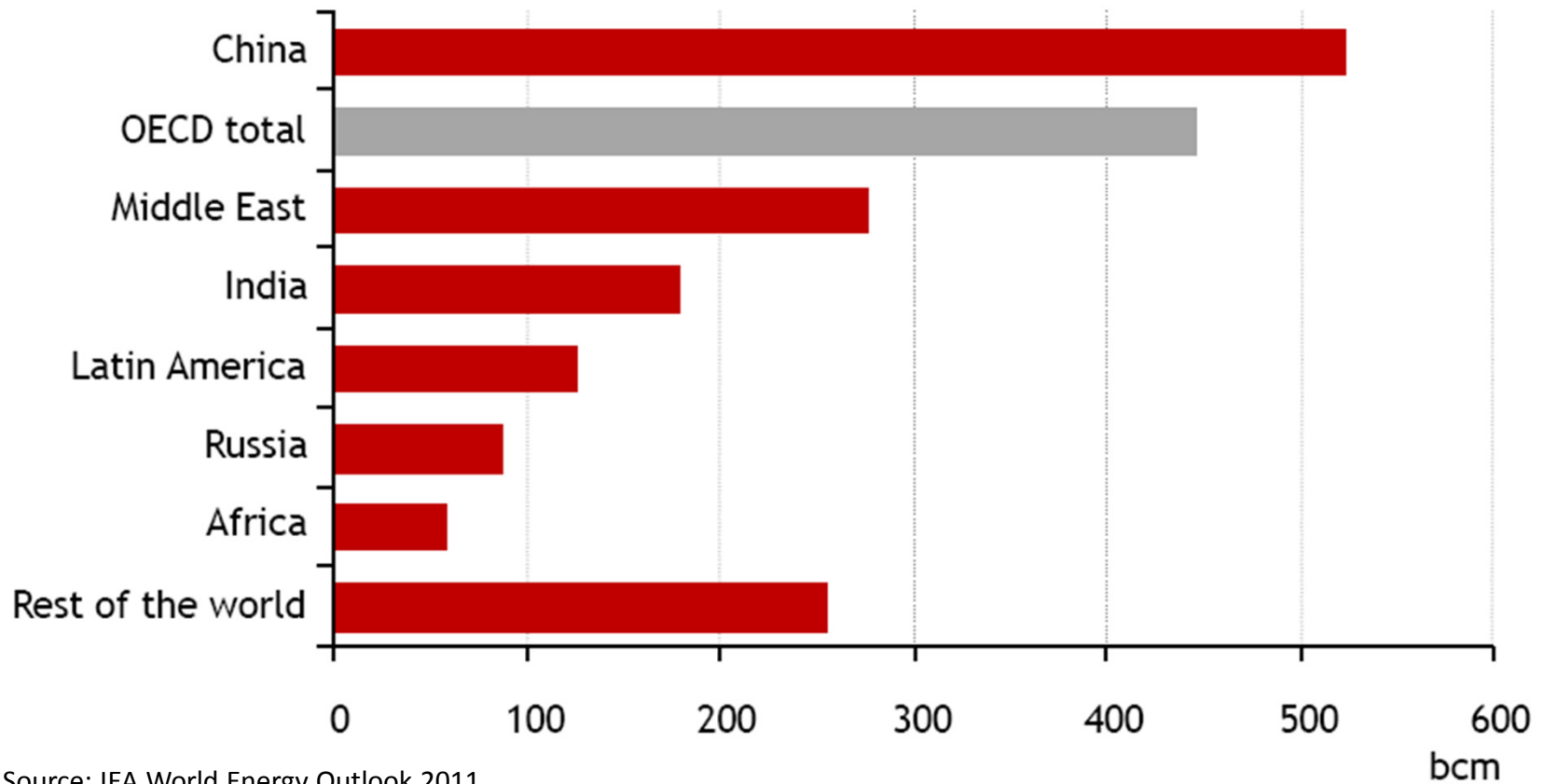
Change in power generation by fuel in the GAS scenario, 2010-2035



Source: IEA World Energy Outlook 2011

China leads the way in increased gas consumption

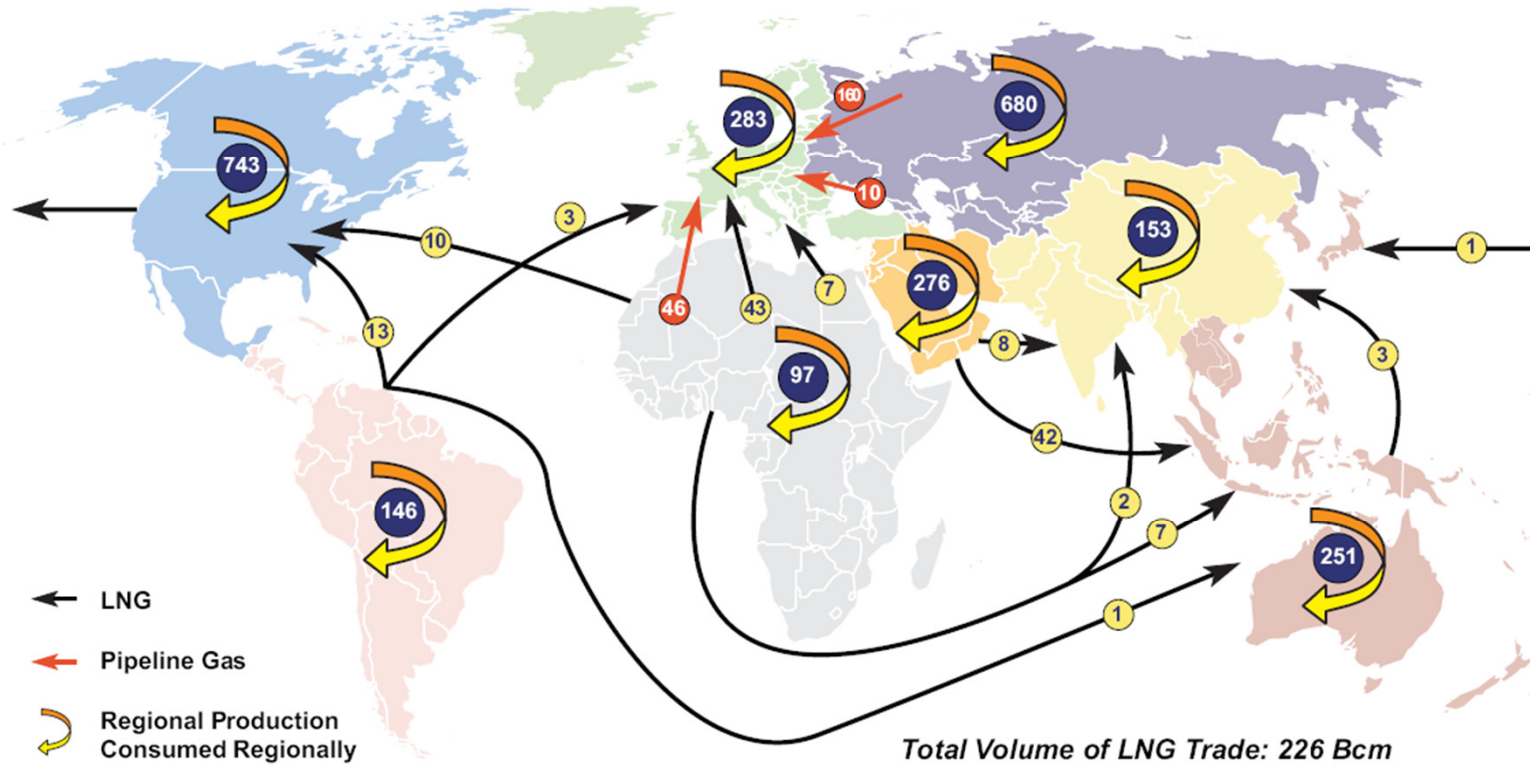
Increase in natural gas consumption in the GAS scenario, 2010-2035



Source: IEA World Energy Outlook 2011

Global Gas Trade in 2007

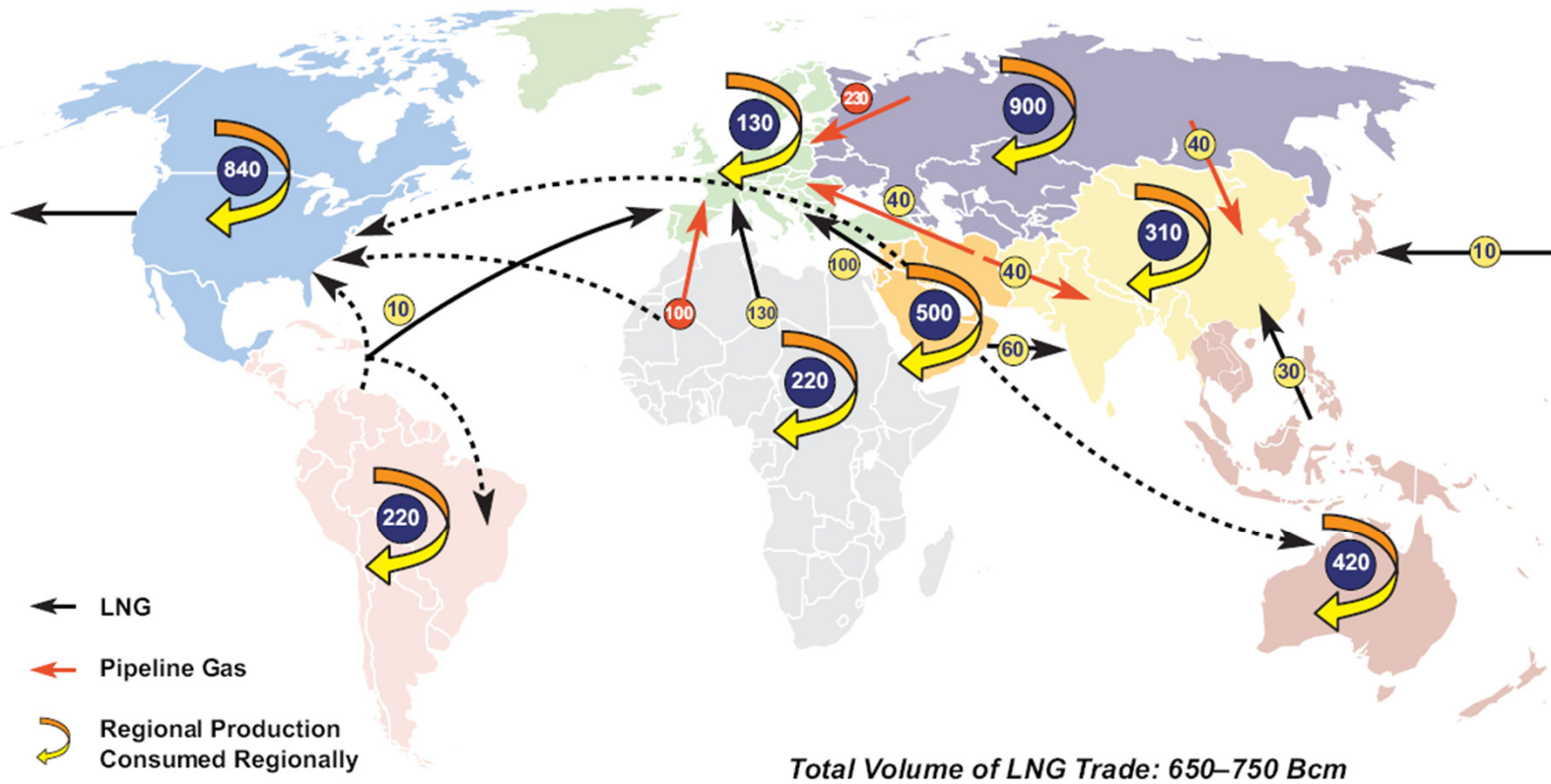
Inter-regional Gas Flows, 2007
 (billion cubic meters)



Source: IGU.
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What Global Gas Trade might look like in 2030

Estimated Inter-regional Gas Flows, 2030
(billion cubic meters)



Source: IGU.
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