

Gas in the Past and in the Future

...future energy mix and technology

“Gas: sustaining future global growth”

By:

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Copenhagen | Denmark



1. Introduction – Brief on IGU
2. World Energy Outlook in the Coming Years
3. Global Gas Outlook
4. Gas: Sustaining Future Global Growth
5. Issues & Resolutions
6. Closing Remarks





IGU as **THE** spokesman for the gas industry

KUALA LUMPUR
2012
WORLD GAS CONFERENCE



- Worldwide and non–profit organisation established in 1931
- Promotes technical and economic progress of the gas industry
- Emphasising sound environmental performance worldwide
- Increased focus on strategic, policy issues and gas advocacy
- Cooperation with IEA, United Nations, World Bank, IEF and others



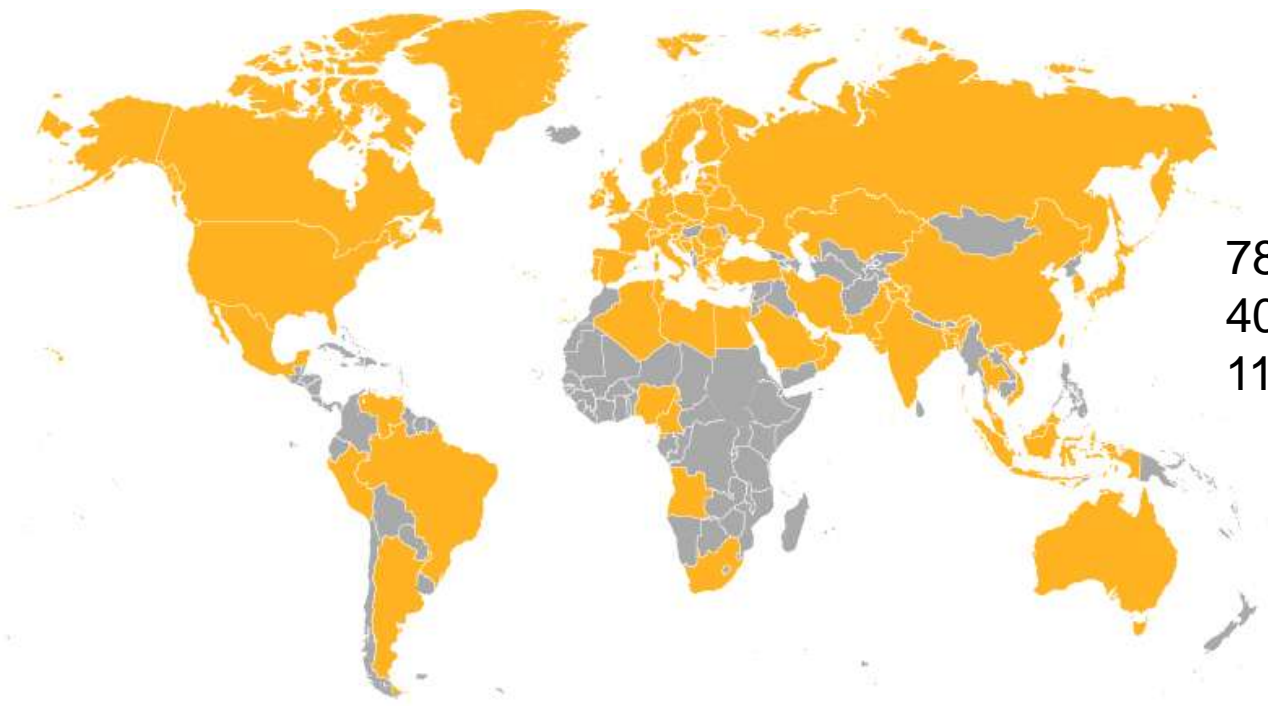
What do we do?

- Making a case for natural gas
- Engaging with stakeholders (NGOs, regulators, policy makers, etc)
- Fostering the consumer/producer dialogue
- Identifying and addressing global gas industry issues
- Promoting anti-flaring measures
- Monitoring geopolitics development and helping to develop solutions





IGU members represent 95% global gas sales



78	Charter	members
40	Associate	members
11	Affiliated	members

 IGU Members

As of October 2011





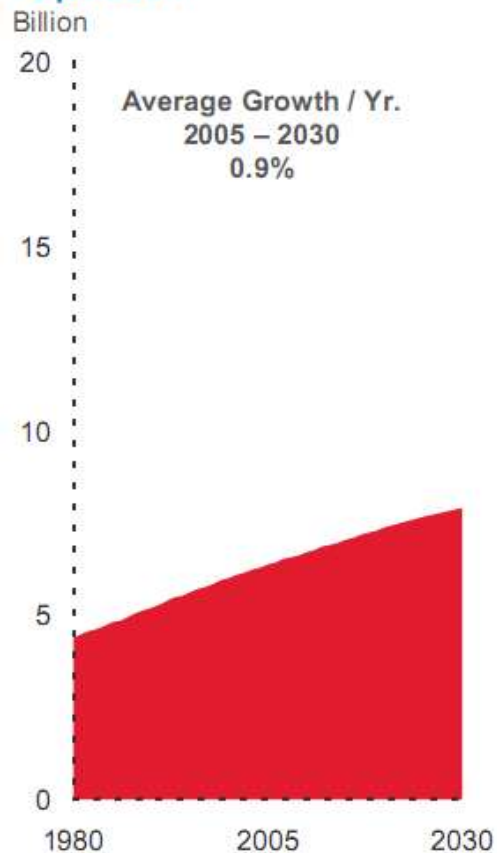
Malaysia heads the IGU in the 2009-2012 triennium

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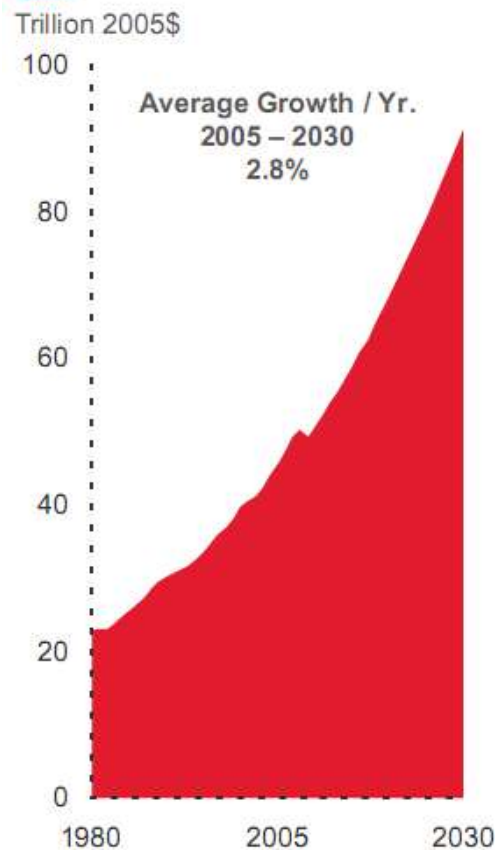


World demand for energy is increasing

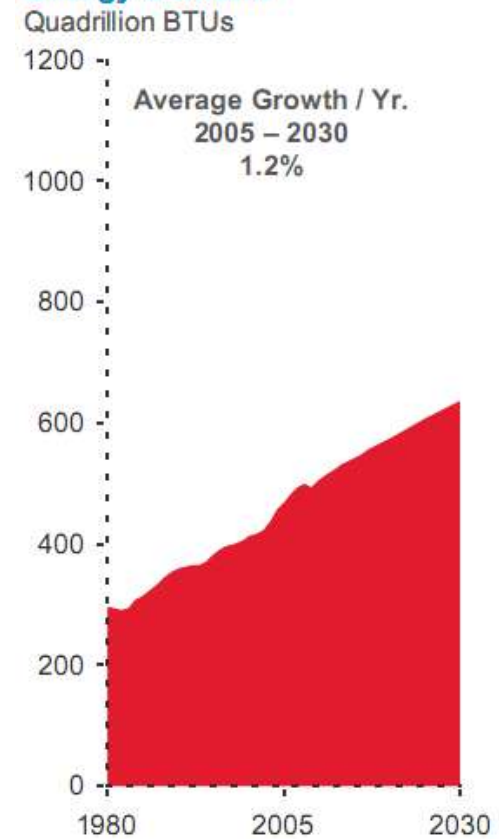
Population



GDP



Energy Demand

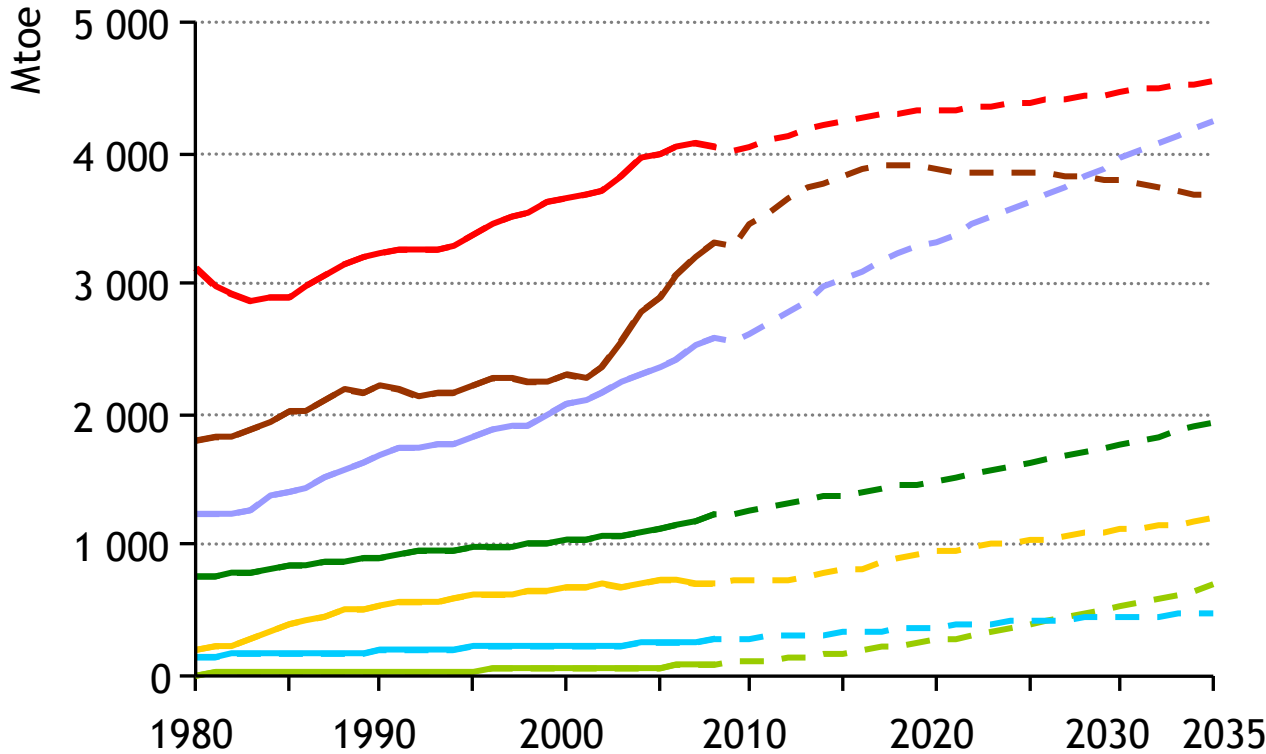


- Key drivers: population growth, economic expansion, urbanisation and individual's prosperity.
- The world faces a dual challenge of energy security and environmental issues.
- The world's energy equation becomes more complicated as sustainability takes place accordingly.



Gas grows nearly twice as fast as total energy...

World primary energy demand by fuel



- Oil
- Gas
- Coal
- Biomass
- Nuclear
- Other renewables
- Hydro

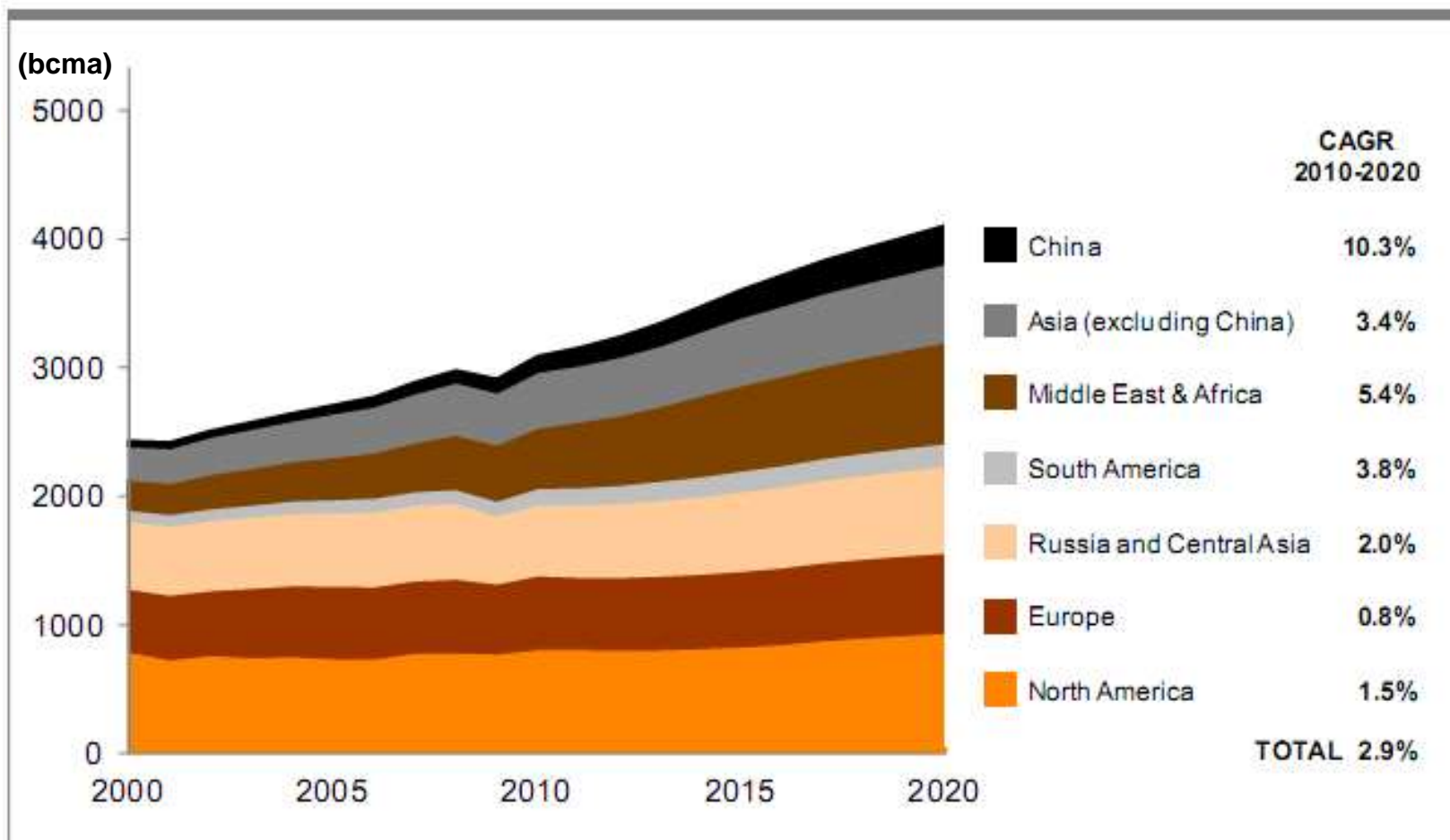
% of natural gas from total energy mix (1990-2030)

1990	22%
2005	23%
2010	23%
2030 - 2035	25% - 28%

- Gas overtakes coal before 2030 and meets one quarter of global energy demand by 2035.
- Through 2030, gas demand grows by 2% per year, compared with just 1.2% per year for total energy.



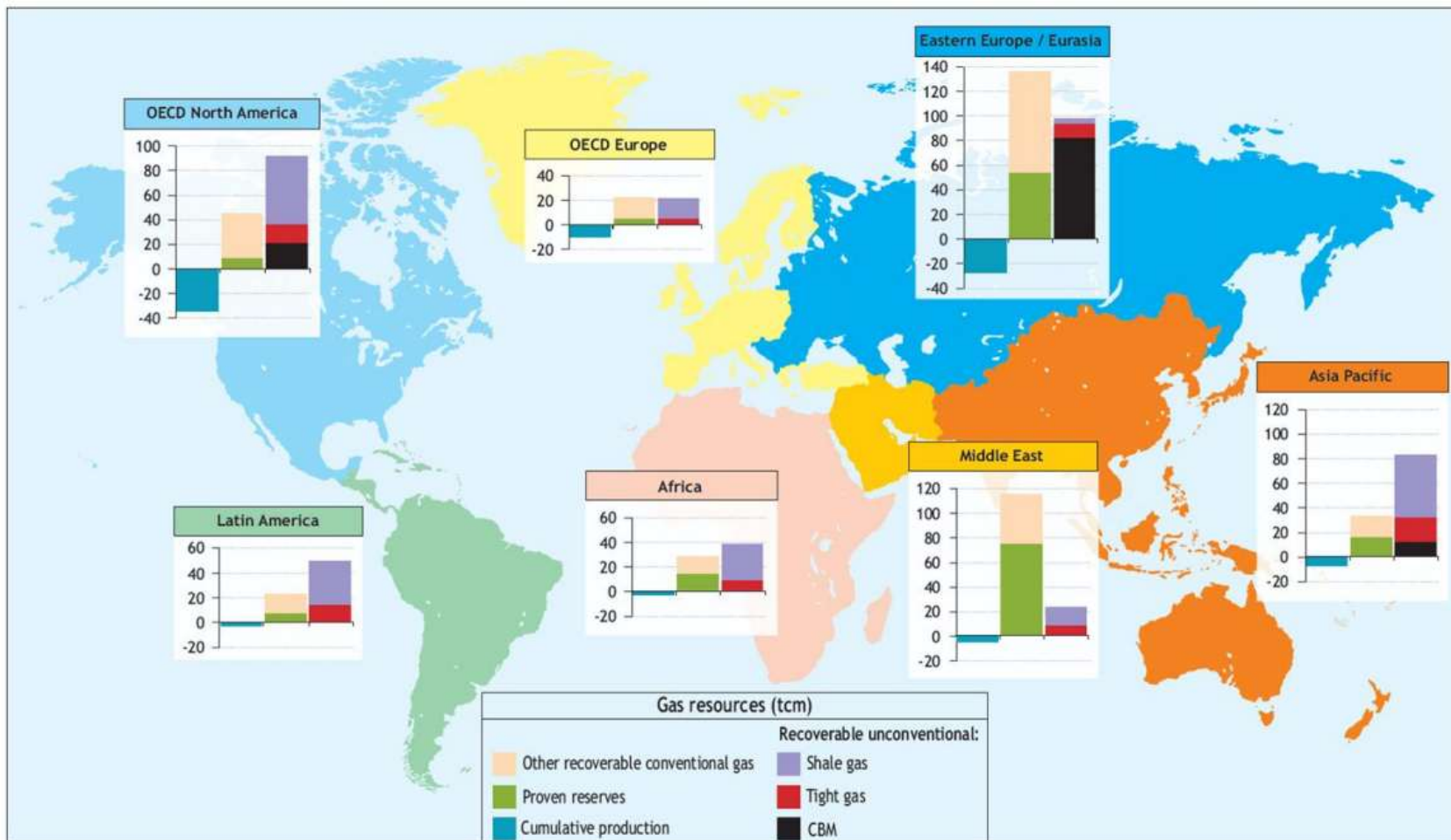
World gas demand future outlook to 2020



- Strong growth in worldwide gas demand with a CAGR of 2.9% per year through 2020



Gas becomes plentiful and geographically diverse



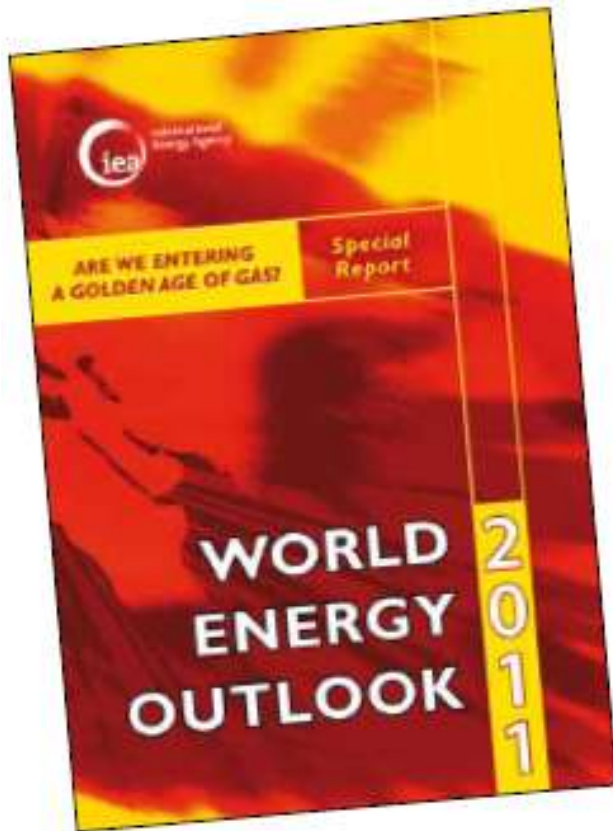
This map is for illustrative purposes and is without prejudice to the status of or sovereignty over any territory covered by this map.

- With unconventional, global gas resources reach 250 years of current production.
- In each region, gas resources exceed 75 years of current consumption.



The IEA's special report reinforces gas advocacy

A golden age of gas?



■ Highlights:-

- Gas is growing rapidly in the next 5 to 10 years
- Gas overtakes coal before 2030 to meet ¼ of global energy demand by 2035
- Australia could be LNG leader by 2020
- Many are betting heavily on Western Australia (WA), Queensland, and New South Wales (NSW) to play a major role in this scenario

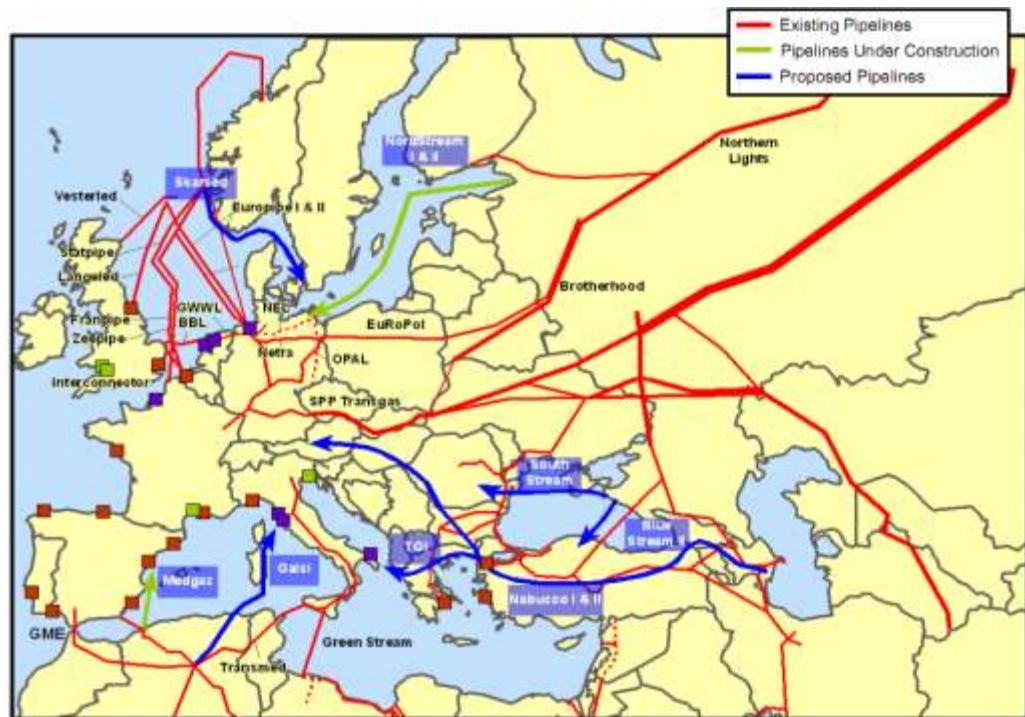
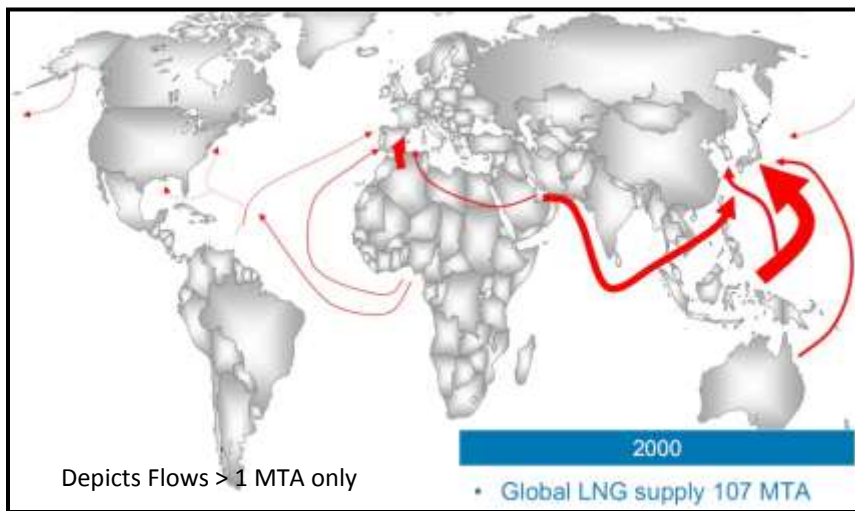
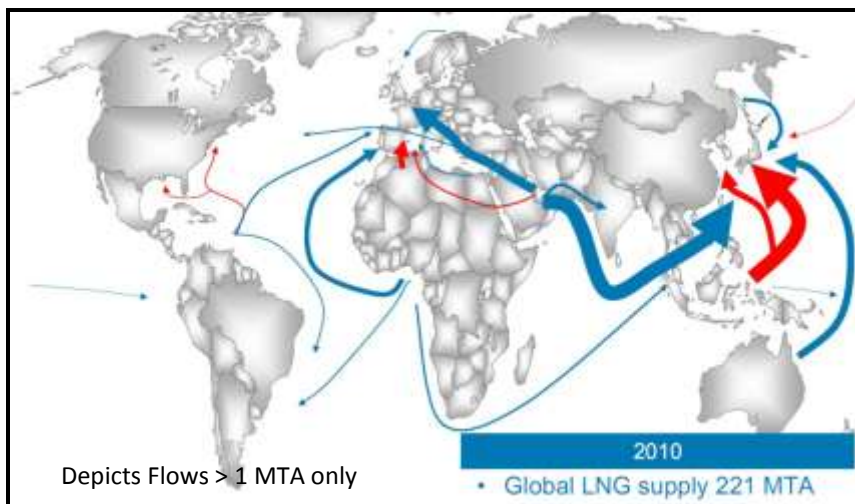
■ Key drivers include:-

- Widespread development of unconventional gas means lots more gas!
- Lower cost of production, USD 3 – 9/mmbtu
- Gas targets in the China's 12th Five-Year Plan
- Reduced growth of nuclear energy – Fukushima!
- Increased deployment of natural gas vehicles (NGVs)
- Global LNG trading is increasing

- Gas will grow at 2% per year versus 1.2% per year for total energy demand through 2030.
- Grabbing the opportunity requires competitiveness and collaboration.



Gas to be supplied at right time, place and price

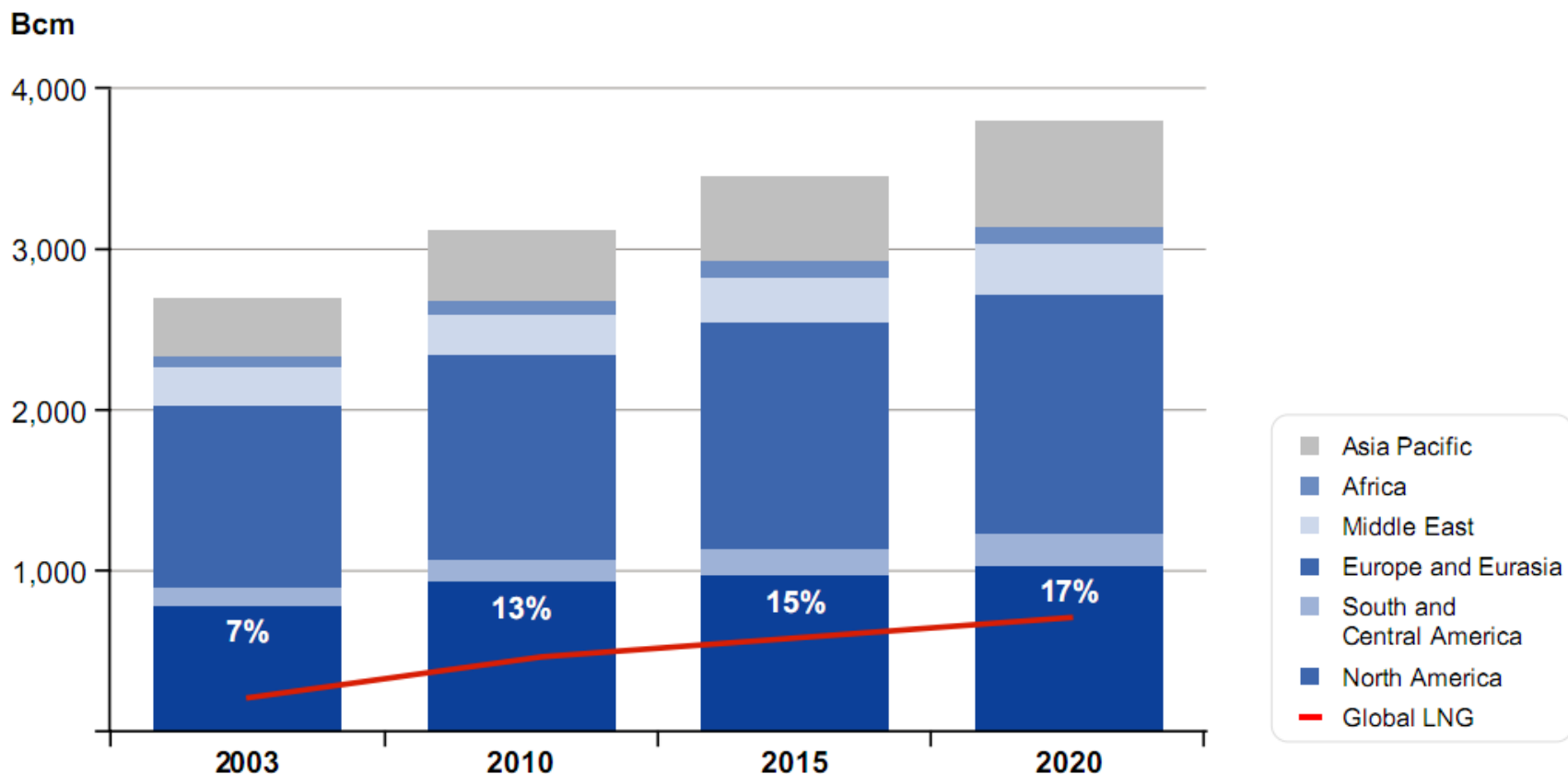


- Gas markets develop and are getting global.
- Flexibility becomes key success factor.



LNG becomes key component of global gas supply

Global natural gas demand and LNG's share



- With LNG, natural gas has become a global commodity and its role in the world's energy system is growing rapidly.



Some key issues for gas going forward

Issues impacting the global gas industry



What do we need to do?

- Get our story right with the right message to various stakeholders
- Have our own roadmap up to 2050
- Advocate for gas



Improved efficiency is vital throughout the value chain



Fuel for
Gas District Cooling



Fuel for
Residential



Fuel for
Commercial



Fuel for
Automotive



Fuel for
Industry



Fuel for
Power Generation



Fuel for
Petrochemical Feedstock

- Applications of technology and innovation to drive gas for attaining a sustainable energy future.
- Choices for wider utilisation of gas.

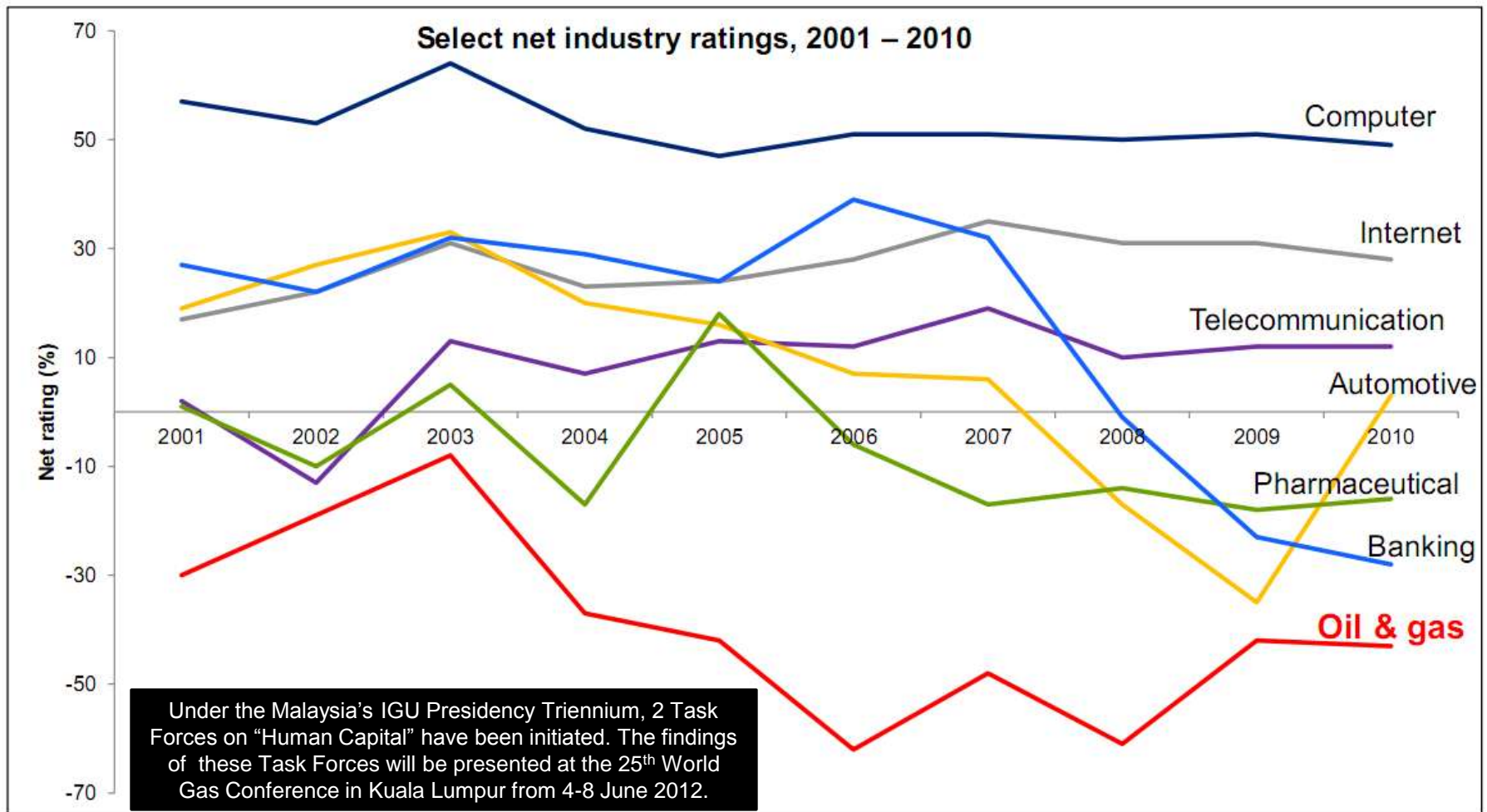
- Advancing technology and innovation to endure for the long term sustainability.

- **Eurogas Roadmap 2050:**
 - Increased energy efficiency of an equipment and a switch to less pollutant energy sources.





Human capital deficit is a pressing issue



- The negative perception among the youths on the O&G industry relative to other industries.
- Only 8% of the Top 50 most attractive employers to engineering students are O&G companies.



A need to realise brightening prospects for gas

Natural gas **CARES** for the world

C *Clean*

A *Affordable*

R *Reliable*

E *Efficient*

S *Secure*

Natural gas is clean.

Natural gas produces less nitrogen oxide than coal, and more than 50% less CO₂. Gas produces no sulphur and no solid waste.

Natural gas is the affordable choice.

Modern gas-fired plants have a capital cost that is half that of coal, one-third the cost of nuclear and one-fifth the cost of onshore wind.

Natural gas is available now.

Gas is readily available from a variety of sources, both pipeline and LNG. The environmental benefits of gas can be realised immediately.

Natural gas is efficient.

Modern gas-fired power plants are 40% more efficient than coal plants.

Natural gas is abundant.

Global production will increase over the next 20 years, with growing supplies from conventional, unconventional, frontier and LNG resources.

Natural gas promotes sustainable transport.

Natural gas vehicles can improve air quality and energy efficiency in large cities.

Natural gas does not require subsidies.

Unlike renewable technologies which must be heavily subsidized by governments, natural gas use allows countries to affordably reduce their emissions.

Natural gas is versatile.

Gas can serve as a flexible partner in power generation for intermittent energy sources like wind and solar, facilitating the phase-in of renewables.

Natural gas saves time.

Gas-fired plants require less construction time than nuclear or coal plants.

Natural gas is safe.

The natural gas sector has the best safety record in the industry.

- Natural gas is a clean, affordable, reliable, efficient, and secure energy source.



Triple A's slogan for gas represents a powerful message

ABUNDANT

- Abundant global gas resources ~250 years reserves at current production (IEA)

AFFORDABLE

- CCGT cheapest to build

CCGT: Combined Cycle Gas Turbine

ACCEPTABLE

- CCGT: gas-fired power compared to coal:
 - 40% more energy efficient
 - Emits 50-70% less CO₂
 - CCS retrofit at similar cost per MWh
 - Better complements with wind power
- Replacing coal with gas for electricity generation is the cheapest and fastest way to meet CO₂ reduction targets

CCS: Carbon Capture & Storage

Abundant

Natural Gas

Acceptable

Affordable

NATURAL GAS: A DESTINATION FUEL



IGU Message on Natural Gas

- It is abundant, affordable and acceptable
- Clean, efficient, versatile and environmental friendly fuel
- Continue to play a substantial role in global energy demand
- Basis for a sustainable economic growth



Natural gas
– major part of the long term energy solution



The 25th World Gas Conference (25th WGC)



**“GAS : SUSTAINING FUTURE
GLOBAL GROWTH”**

**Kuala Lumpur Convention Centre
4 to 8 June, 2012**

www.wgc2012.com/, www.igu.org/



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