Session 1 : Exploring the Opportunity

Global Unconventional Gas Opportunities

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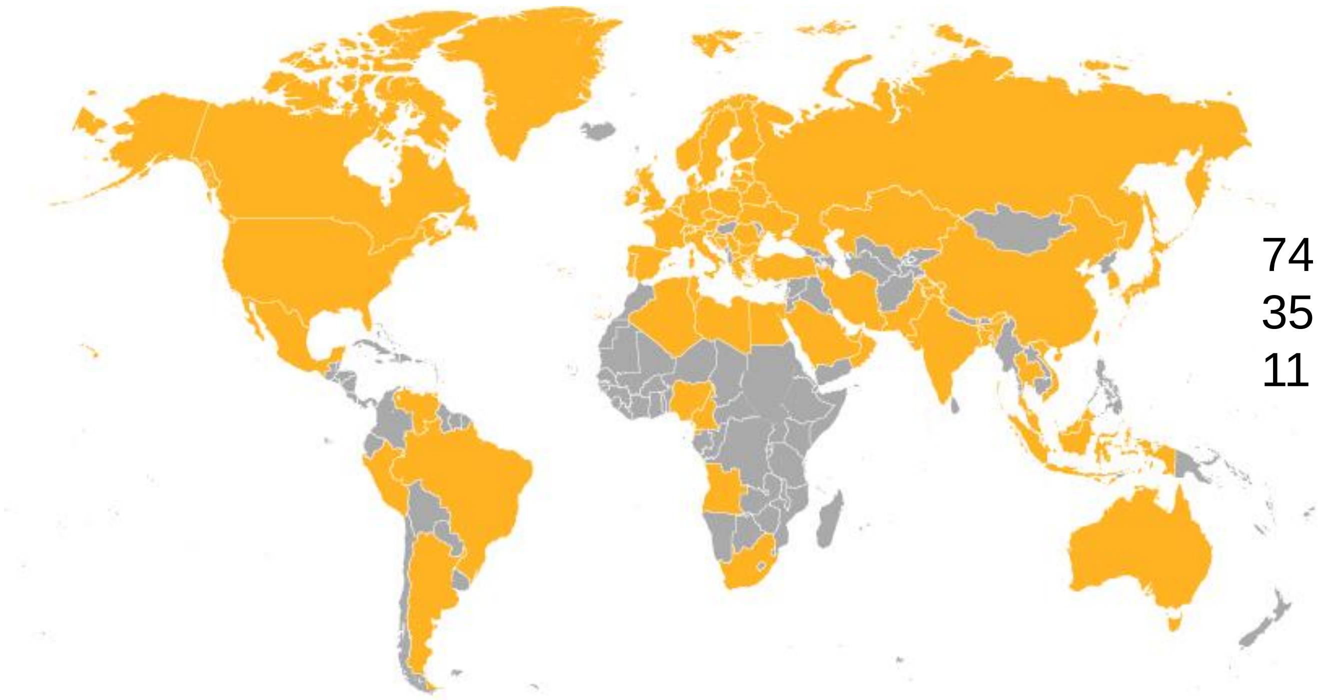
Outline

1. Introduction – Brief on IGU
2. Energy View – (Unconventional)Gas
3. Unconventional Gas Opportunities
4. Closing Remarks

IGU as THE spokesman for the gas industry

- Worldwide and non–profit organisation established in1931
- 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

IGU members represent 95% global gas sales



74 Charter members
35 Associate members
11 Affiliated members

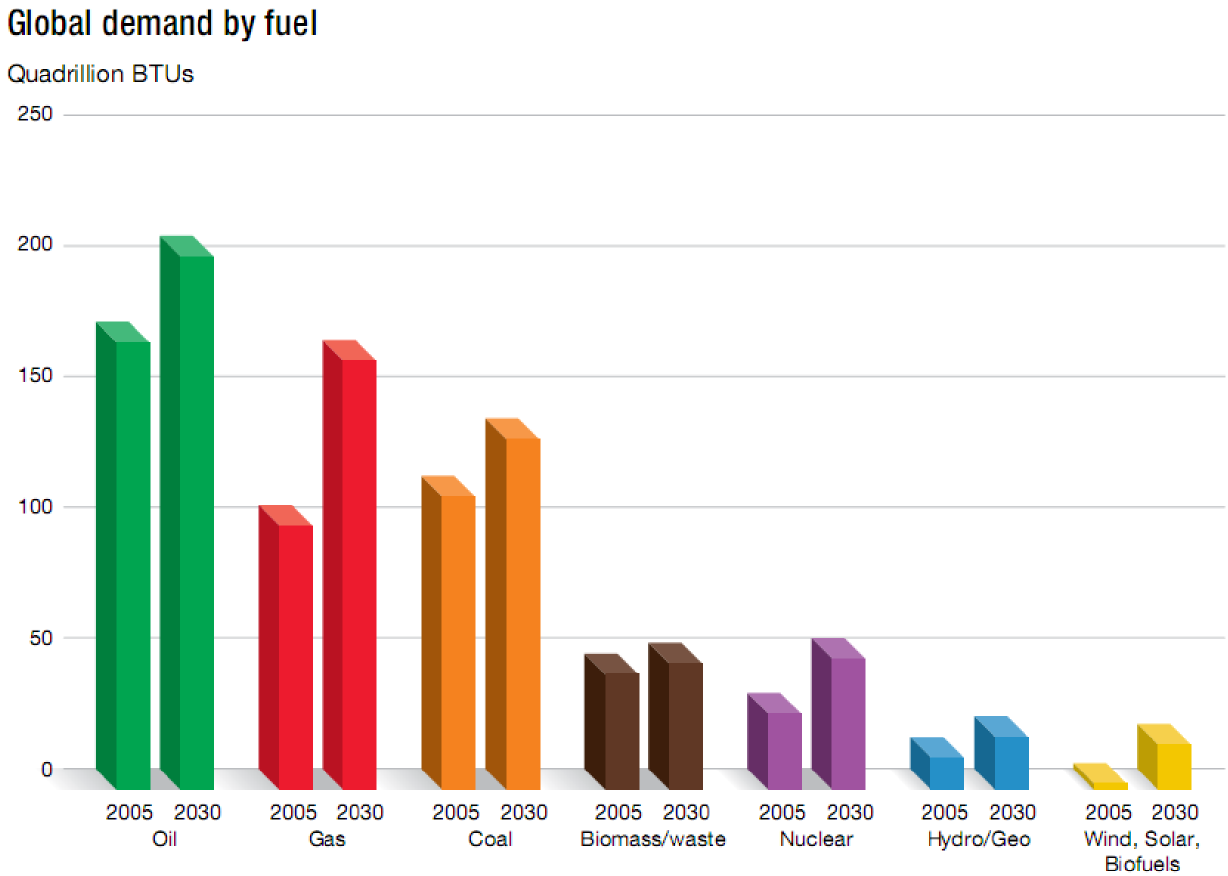
IGU Members

As of April 2011

IGU in the 2009 – 2012 Malaysian Triennium

Fossil fuels will still dominate for decades

Natural gas will be the fastest-growing major fuel source through 2030



Average growth rate per year Fuel Consumption 2005-2030

Oil	0.7%
Gas	2.0%
Coal	0.7%
Biomass/waste	0.4%
Nuclear	2.3%
Hydro/Geo	2.1%
Wind, Solar, Biofuels	9.9%

% of natural gas from total energy mix 1990-2030

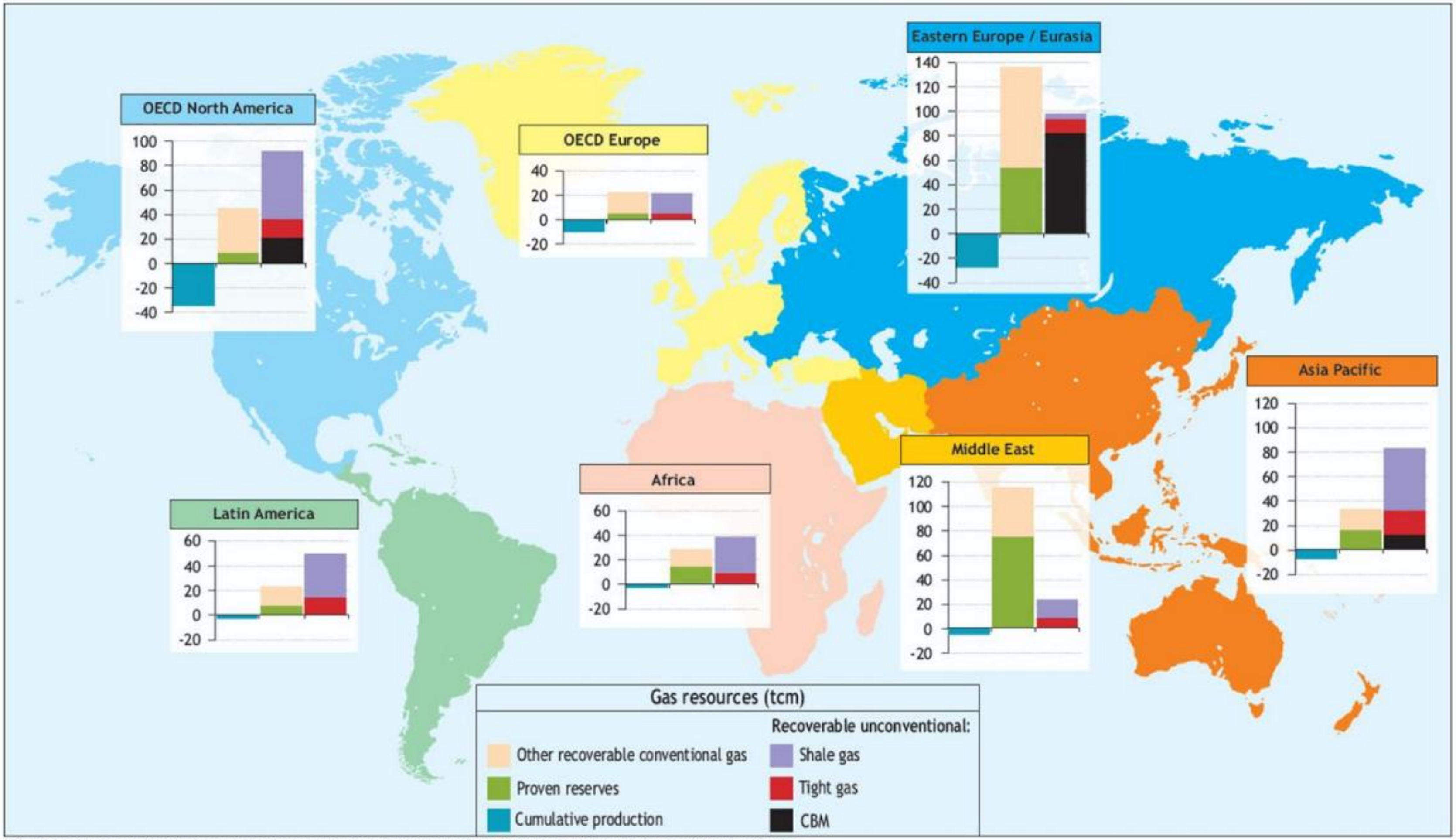
1990	22%
2005	23%
2010	23%
2030	25% - 28%

- Coal is abundant and cheap but environmentally unacceptable.
- Most vehicles still depend on petroleum products.
- Renewables are growing rapidly but remain expensive.

Source(s): ExxonMobil 2010, IGU 2010

Gas becomes plentiful and geographically diverse

Recoverable unconventional gas resources match conventional natural gas

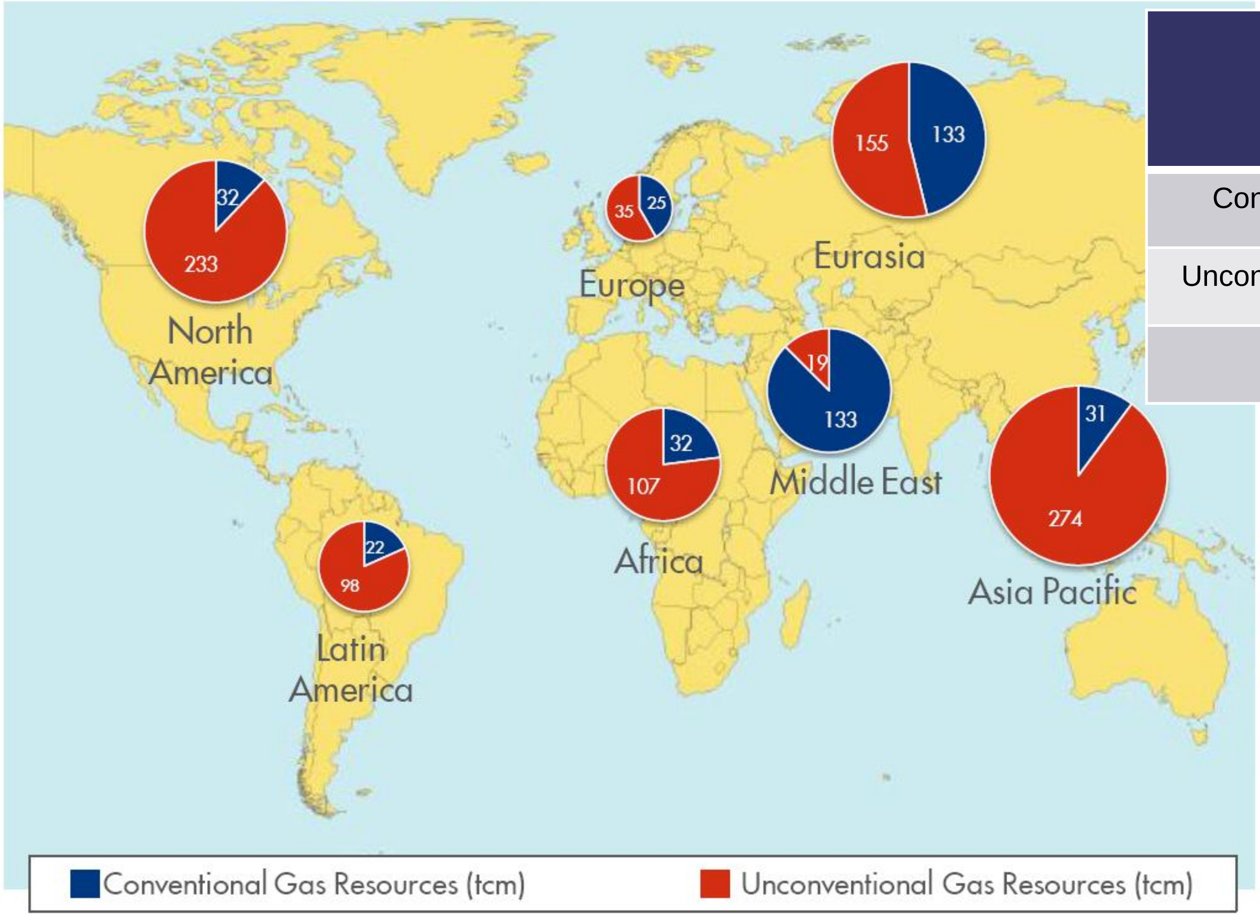


This map is for illustrative purposes and is without prejudice to the status of or sovereignty over any territory covered by this map.

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

Source(s): IEA 2011

Abundant global gas reserves worldwide



	Remaining recoverable resources (Tcm)	Equivalent in years of current production
Conventional	404.5	130
Unconventional	380.5	123
Total	**785**	**253**

- Conventional and unconventional gas recoverable gas resources can supply for 250 years of current global gas consumption.
- The enormous scale of gas is necessary to meet the world's rising energy needs.

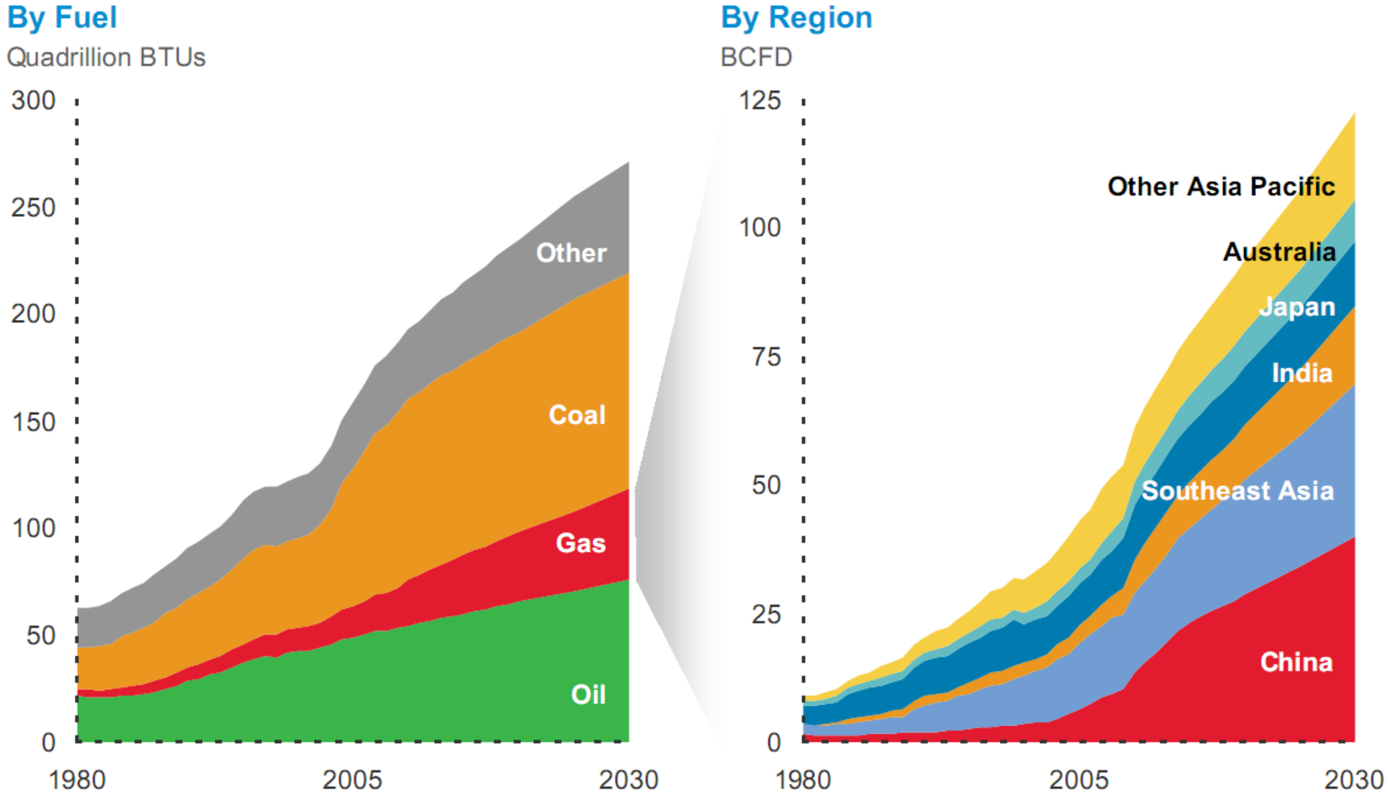
Source(s): ExxonMobil 2010

Global unconventional gas developments

- Unconventional gas production is most likely to take off in Asia first.
- Opportunities to meet domestic's surging energy needs and for the nation's energy security.

Source(s): EIA 2011

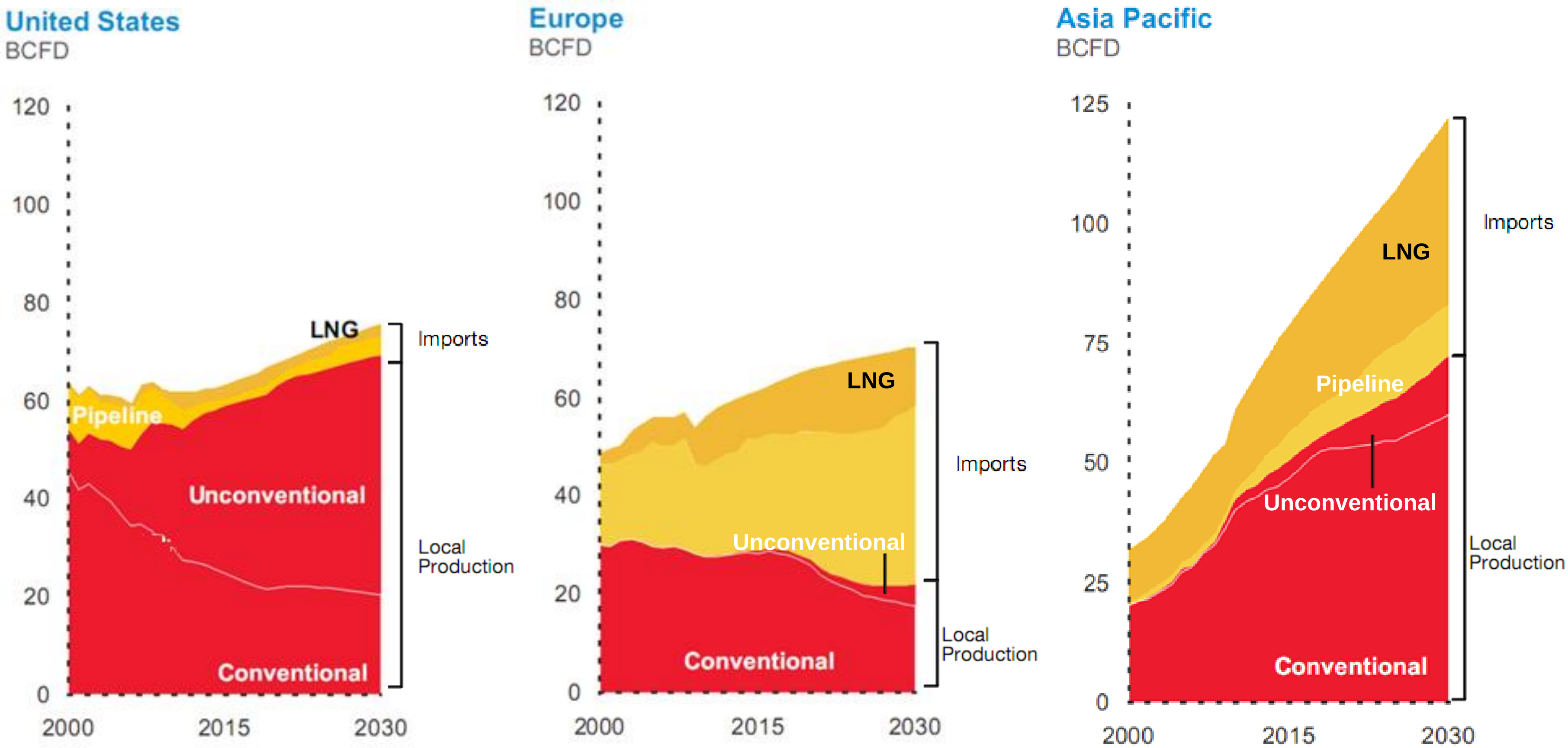
Gas demand outlook accelerates in Asia Pacific



- The share of natural gas in Asia Pacific's energy mix accounted for 10% in 2010 as compared to the global natural gas's share of 23%.
- Accelerating economies of the Asia Pacific region have sparked a ferocious appetite for energy sources. China will be the largest gas use dominator with about 35% by 2030.

Source(s): ExxonMobil 2010/2011

Global gas supply grows and diversifies…



- Unconventional gas now accounts for over half of total US gas production with tight gas is the leading one, and shale gas is the fastest.
- Increased reliance on imported gas especially LNG that will make up for more than 1/3 of the Asia Pacific region's gas supply in 2030.

Source(s): ExxonMobil 2009/2010

Unconventional gas worldwide potential

The US experience highlights several key success factors need to be in-place

- Its play varies on a play-by-play basis. Understanding the above ground risks is vital!

US Unconventionals		China Unconventionals
Established thick shale deposits with high organic content at accessible depths.	**Geology**	With only a very small number of shale gas wells drilled, we do not know the true potential.
Highly competitive environment pushing technology.	**Technology**	Lack of a competitive environment slows the pace of transfer; limited horizontal drilling.
Regulatory agencies quick to understand and react to operators needs.	**Licensing & Regulation**	NDRC cautious and conservative. Shale gas regulation under consideration.
US land owners own their mineral rights - facilitates land access.	**Land Access**	State holds mineral rights. Land ownership is complex.
Open market, multiple players. Open licensing of acreage.	**Competition**	CBM PSCs require local partner (changing?). The first shale gas licensing round has been commenced.
Service sector highly developed/competitive with 600 rigs able to drill horizontal wells.	**Service Sector**	Supply chain is limited – scaling up drilling fleets will take time and add cost pressures.
US gas suppliers have access to a vast liberalised pipeline transmission system.	**Infrastructure & Markets**	PetroChina / Sinopec dominate – no third party access

Source(s): Wood Mackenzie 2011, BERNSTEIN RESEARCH 2011

Unconventional gas worldwide potential

Hurdles remain to be addressed despite optimism

Reserves certification & subsurface data

Production ramp up, infrastructure

Resources – technology transfer, labour, materials, and plant

Land access and environmental compliance

Market pricing, lack of liquids to support revenue

Water sourcing and disposal

Source(s): Wood Mackenzie 2011

Its future outlook as the catalyst for energy mix

What unconventional gas makes possible…

- Ensures the nation's long term energy security
- Provides implications for pipeline gas and LNG
- Enhances sentiment among local players
- Reduces climate change risk
- Creates wealth, jobs and investment

Source(s): GTI 2010, BERNSTEIN RESEARCH 2011

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)

KUALA LUMPUR 2012 WORLD GAS CONFERENCE

"GAS : SUSTAINING FUTURE GLOBAL GROWTH"

Kuala Lumpur Convention Centre

4 to 8 June, 2012

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

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