

## APPEA CONFERENCE & EXHIBITION 2010 BRISBANE CONVENTION & EXHIBITION CENTRE

# “A NEW ENERGY LANDSCAPE – IGU PERSPECTIVE”

By:

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Queensland, Australia



- 1. Introduction**
- 2. Global Natural Gas and LNG Industry**
- 3. Changing Gas and Energy Landscape**
- 4. Key Challenges and Opportunities**
- 5. Closing Remarks**

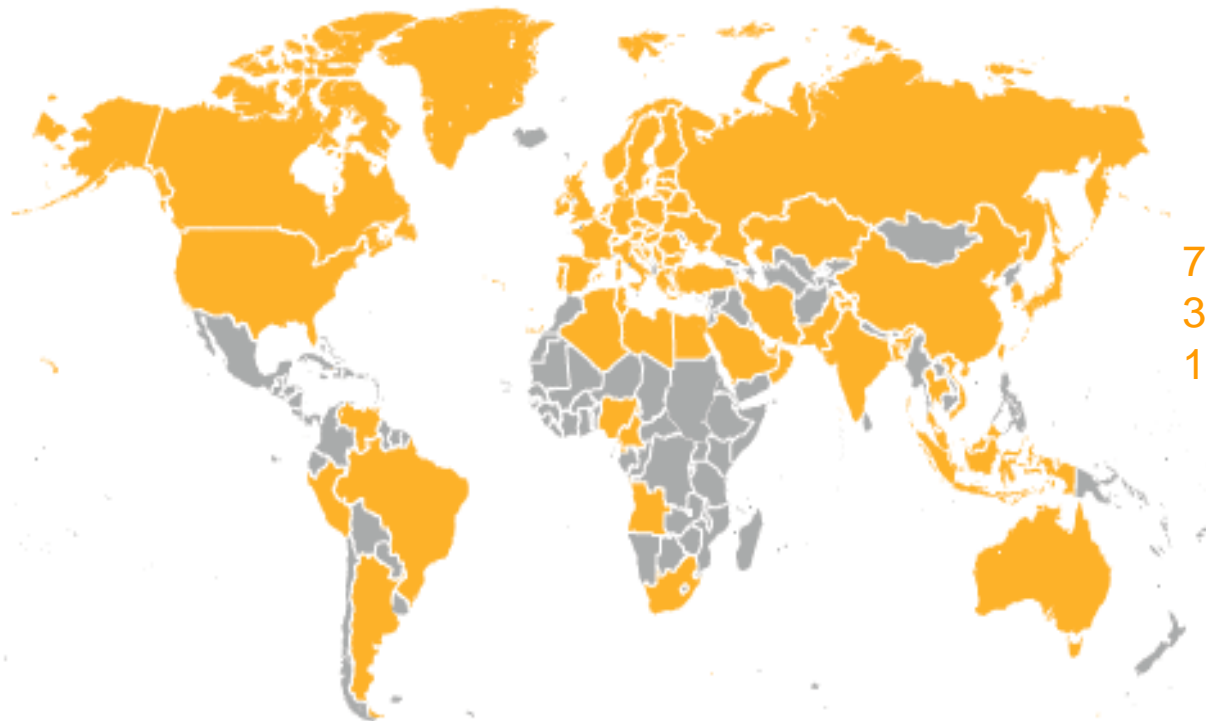


# IGU as **THE** spokesman for the gas industry

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



# IGU Members responsible for 95% of Global Gas Sales

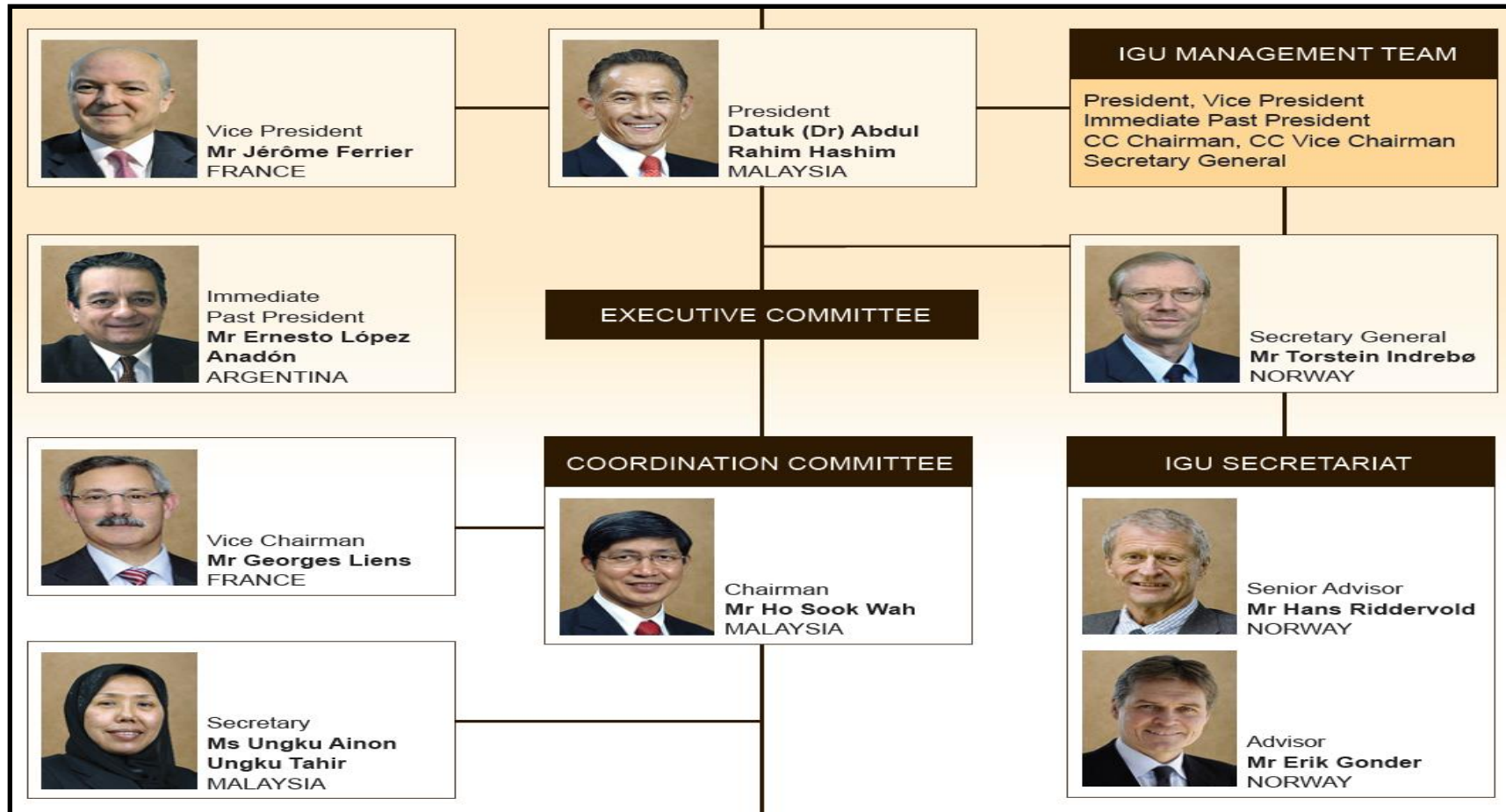


IGU members

75 Charter members  
35 Associate members  
10 Affiliated members



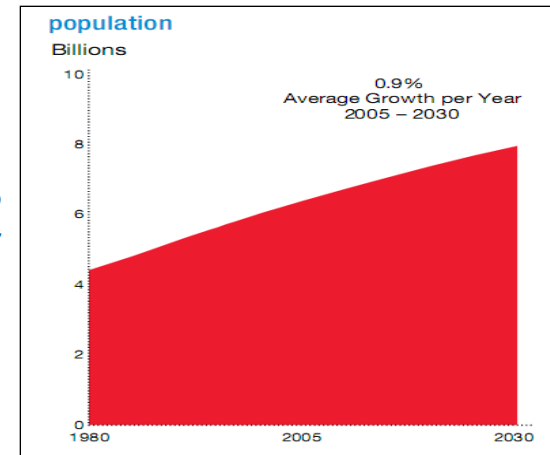
# IGU Organisation Chart for Malaysian 2009 – 2012 Triennium



# Key facts defining world's increasing gas demand

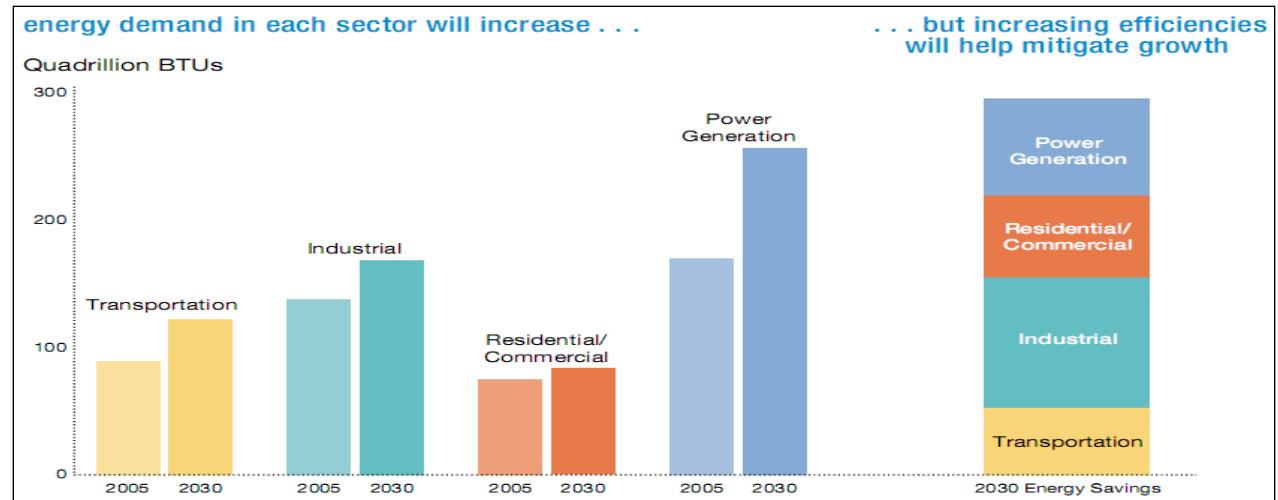
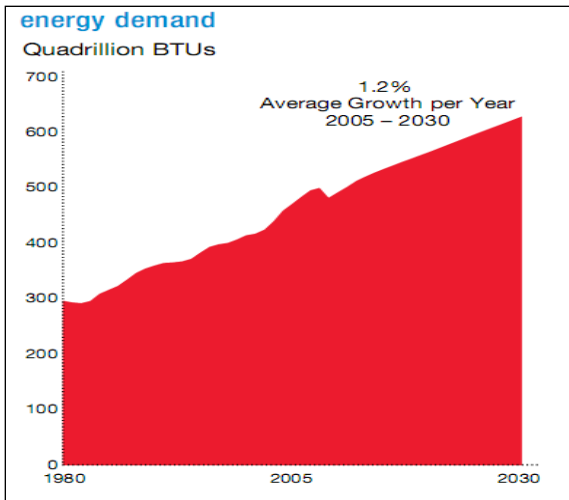
## Demand

- Rising world's population from 6.7 billion today to almost 8 billion by 2030
- Increased living standards and countries' prosperity
  - ⊙ Energy demand to grow 1.2% per year on average through 2030
  - ⊙ By 2030, global energy demand will almost be 35% higher than in 2005
  - ⊙ Without efficiency improvements, demand in 2030 could be 95% higher
  - ⊙ Non-OECD energy demand rises more than 60%
  - ⊙ By 2030, power generation accounts for 40%, the largest sector



## Supply

- A need to expand all economics energy sources
- Demand will be strongest for fuels that can help reduce CO<sub>2</sub> emissions, e.g. natural gas
  - ⊙ Fossil fuels (e.g. oil, coal, natural gas) will meet close to 80% of total global energy need



- ◉ Clean, efficient, versatile and environmental friendly
- ◉ Available and abundant
- ◉ Continue to play a substantial role in global energy demand
- ◉ Basis for sustainable economic growth



***Natural gas  
– major part of the long term energy solution***





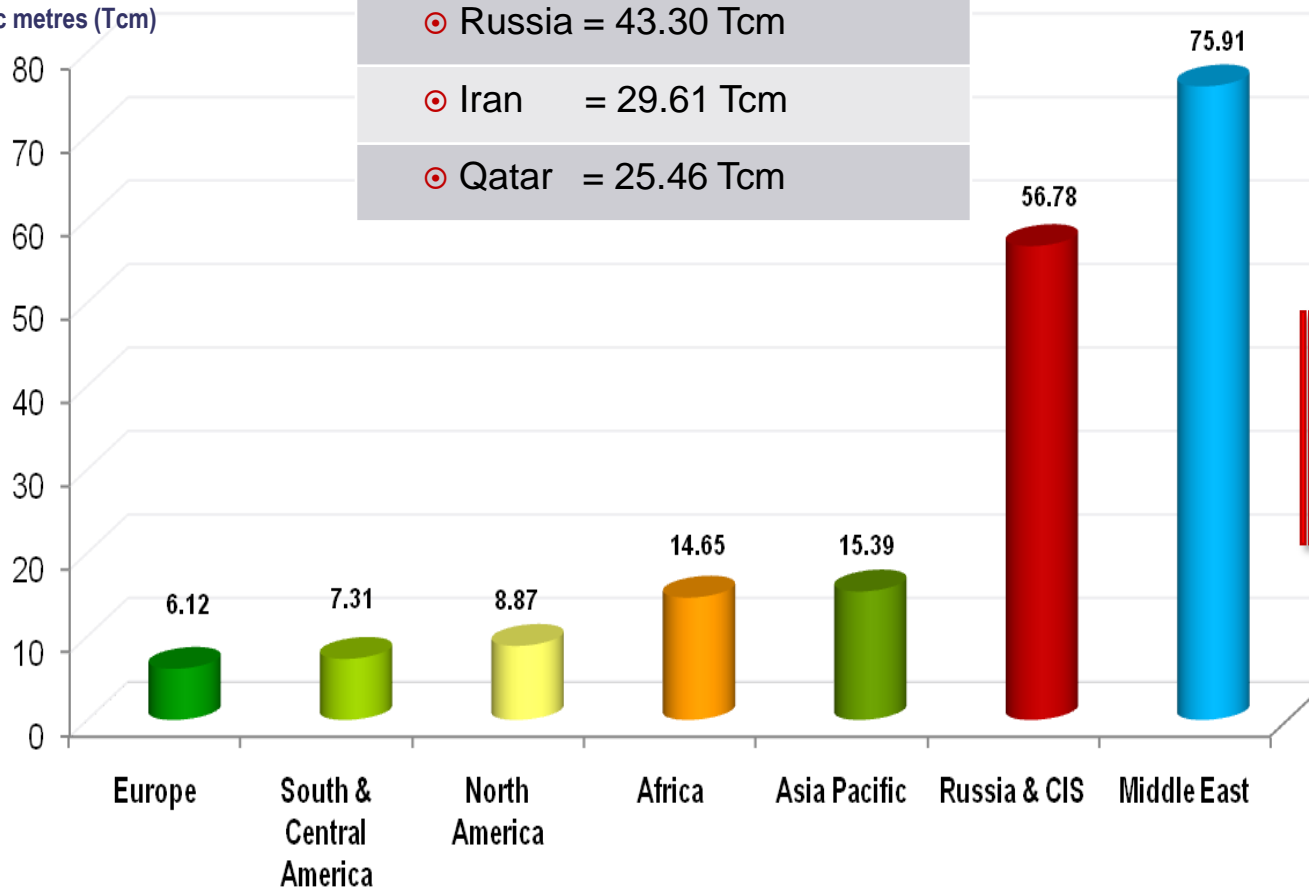
# The world's proven gas reserves amounted to 185 Tcm

## 3 key gas producing countries:

- Russia = 43.30 Tcm
- Iran = 29.61 Tcm
- Qatar = 25.46 Tcm

Proven gas reserves at end 2008

Trillion cubic metres (Tcm)

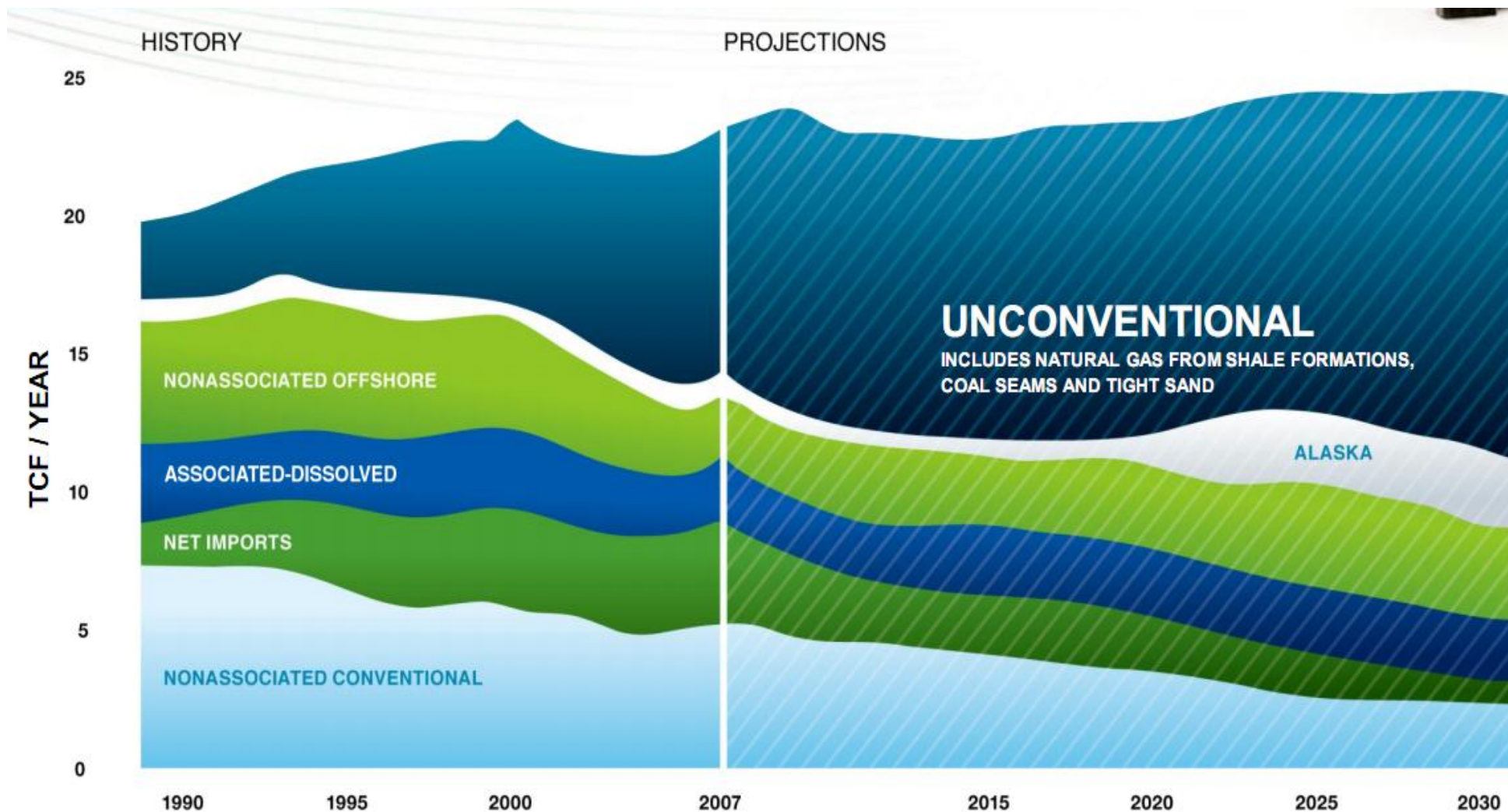


**Total volume represents more than 60 years of consumption at today's rate**

Source: BP, "Statistical Review of World Energy", June 2009







## Long term global recoverable gas reserves more than 850 Tcm

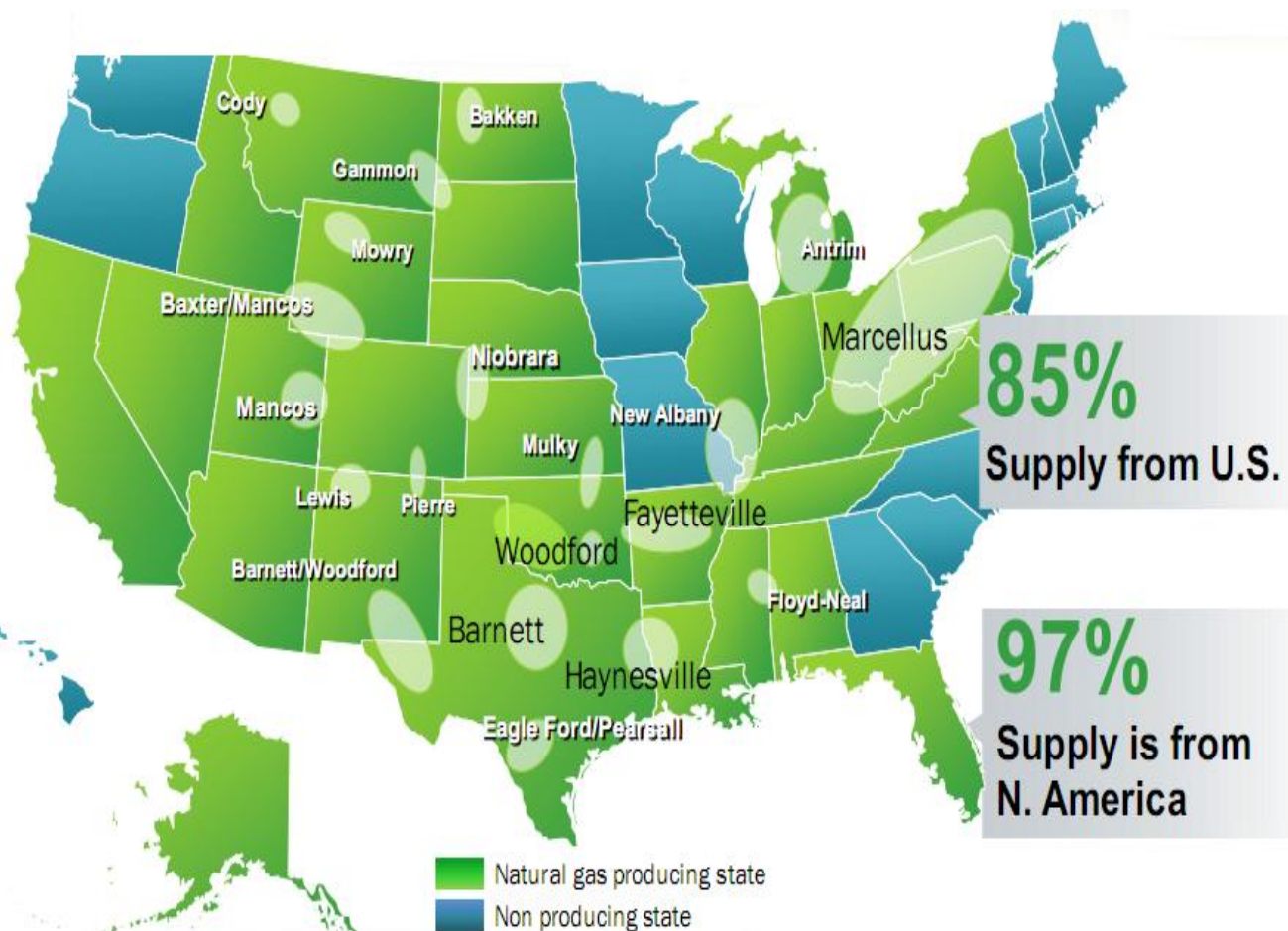
**“The world’s remaining resources of natural gas are easily large enough to cover any conceivable rate of demand increase through to 2030 and well beyond, though the cost of developing new resources is set to rise over the long term. The long-term global recoverable gas resources base is estimated at more than 850 Tcm, of which 45% is unconventional gas (shale gas, tight gas and coal-bed methane). To date, only 66 Tcm of gas has been produced (or flared) – equal to less than 8% of total recoverable resources.”**

Source: World Energy Outlook 2009 (WEO-2009): Executive Summary



# In the era of unprecedented change

**Discoveries are widespread across the U.S.  
- 32 States produce Natural Gas**



**85%**  
Supply from U.S.

**97%**  
Supply is from N. America

- ◉ Emphasis on commercially develop unconventional gas sector
- ◉ The U.S. regional gas market is now overwhelmingly enriched with vast shale gas being monetized
- ◉ It is believed could in the future contribute to the global natural gas balance

Source: EIA 2009

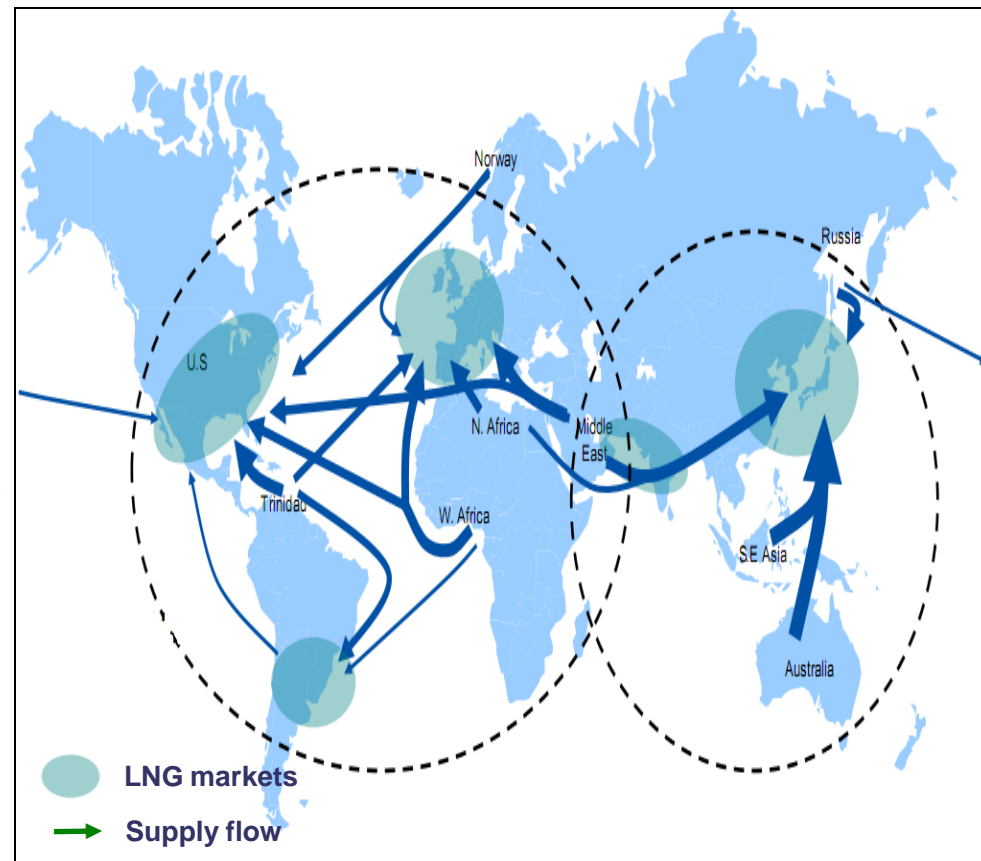
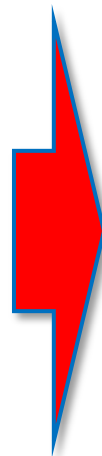
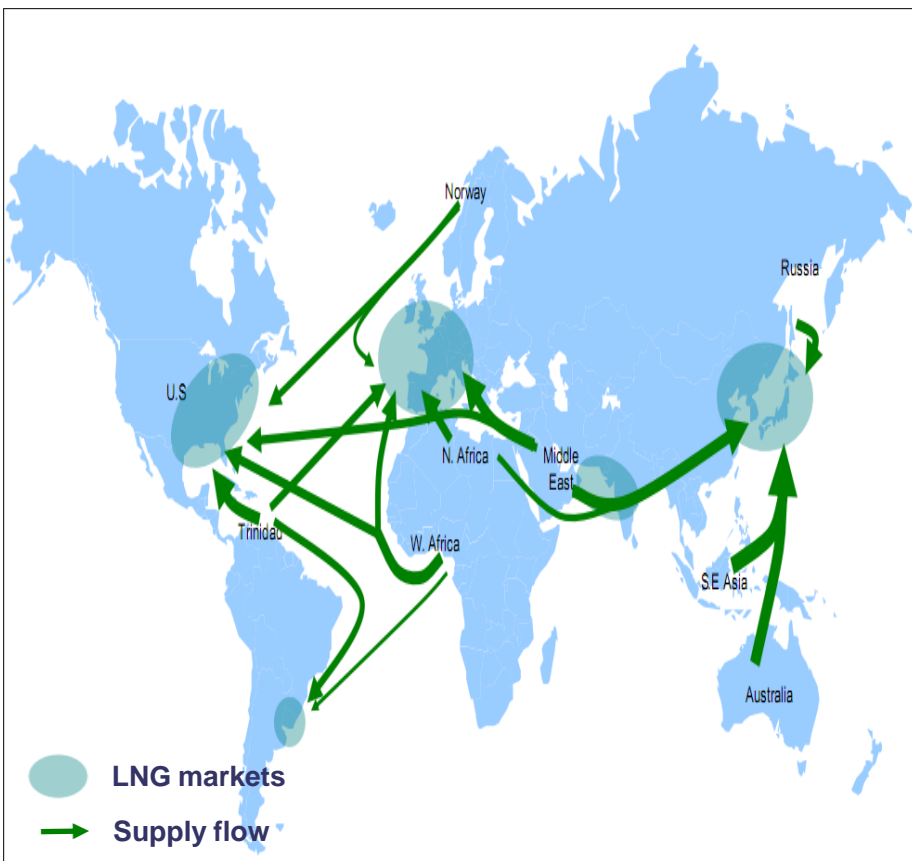




# In the transitional state of change

2009

2010 & beyond



- ⊙ Clear linkage between American, European, Middle East & Asian gas markets
- ⊙ Starting to open up access to LNG worldwide

- ⊙ Greater overlap between global LNG markets with ample LNG supply
- ⊙ Wider access to gas market through LNG established





# Proposed world's LNG liquefaction plants

	Jan	Feb	March	April	May	June	July	Aug	Sept	Oct	Nov	Dec
2009				Sakhalin-2 Train 1 Qatargas 2 Train 4		Sakhalin-2 Train 2	Tangguh Train 1		RL 3 Train 1 Qatargas 2 Train 5	Tangguh Train 2	Yemen Train 1	
2010		RL 3 Train 2				Yemen Train 2	Peru Qatargas 3				Qatargas 4	
2011	Pluto											
2012									Angola			
2013			Skikda									
2014							PNG LNG			Gorgon Train 1		
2015	Arzew						Gorgon Train 2					

■ Unchanged   
 ■ Delayed   
 ■ Accelerated

Source: WoodMackenzie, "Short term developments and longer term considerations in the LNG Industry", February 2010



## Modest growth in LNG imports of 5% registered at the global gas market

Country	2008 (mmtpa)	2009 (E) (mmtpa)	Abs Change (mmtpa)	% Change
Japan, Korea & Taiwan	104.9	97.8	-7.1	-6.7%
China	3.2	4.9	1.7	50.9%
India	8.3	8.6	0.3	3.4%
NW Europe (UK, Belgium & France)	12.6	22.4	9.7	76.8%
Other Europe	29.7	28.9	-0.8	-2.7%
North America	10.8	13.6	2.9	26.7%
South America	0.4	1.5	1.1	291.9%
Middle East	-	0.6	0.6	na
<b>Total</b>	<b>169.9</b>	<b>178.2</b>	<b>8.3</b>	<b>4.9%</b>

2009 Figures are provisional estimates only. North America includes US, Mexico, Canada, Puerto Rico and the Dominican Republic.

Source: WoodMackenzie, LNG Service Insight, "2009 Global LNG Review", January 2010



# Proposed regasification terminals in Southeast Asia

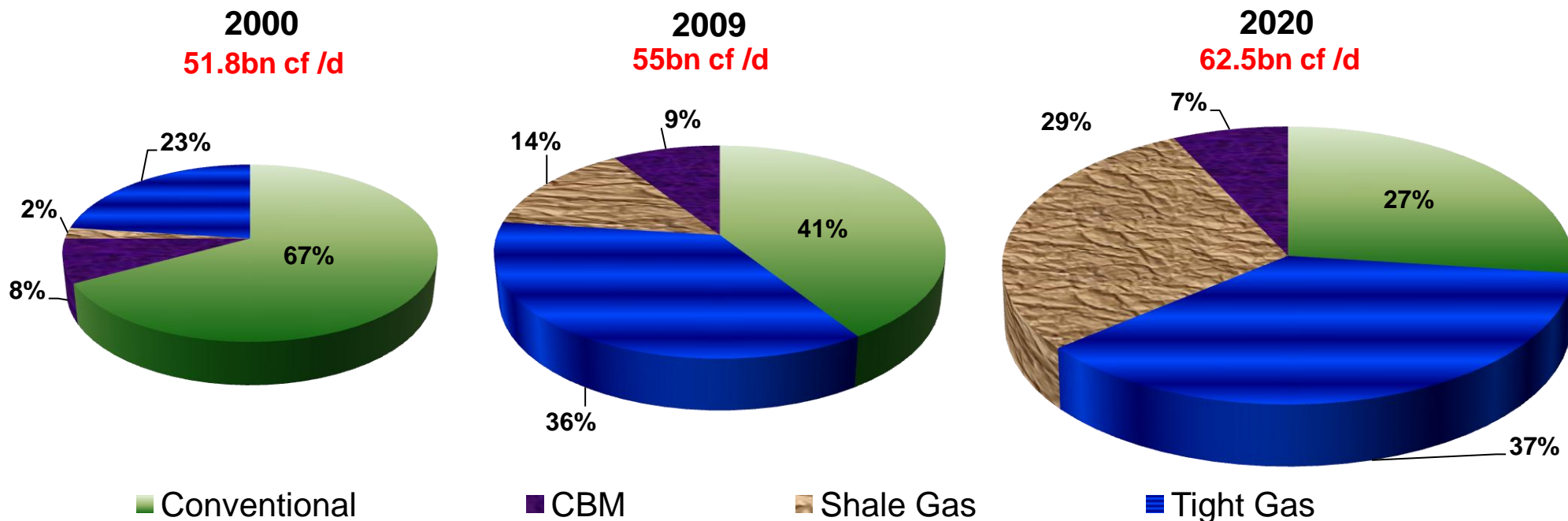


Country	Terminal	Developer	Capacity (mtpa)	Status	Company-Announced Start	Likely to Proceed Before 2015?
Indonesia	Bali	PLN, PPS	0.2	Proposed	2012	No
Indonesia	East Java (Offshore)	PGN	1.5	Proposed	2012	No
Indonesia	East Java	PT Petrogas, 4Gas	N/A	Stalled	N/A	No
Indonesia	North Sumatra (Offshore)	PGN	1.5	Proposed	2012	No
Indonesia	West Java (Offshore)	PGN, PERTAMINA	1.5	Proposed	2012	Possibly
Malaysia	Malaysia LNG	PETRONAS	5.0	Proposed	N/A	Possibly
Philippines	Limay	PNOC	1.3	Stalled	N/A	No
Philippines	Mariveles (Bataan)	GNPower	1.3	Stalled	N/A	No
Philippines	Philippine LNG Hub	Energy World Corp	1.0	Proposed	2011	No
Singapore	Jurong Island LNG	EMA	3.0	Proposed	2013	Yes
Thailand	Rayong	PTT	5.0	Under Construction	2011	Yes
Thailand	Rayong (Expansion)	PTT	5.0	Proposed	2018	-
Vietnam	Vietnam	PetroVietnam	1.0	Proposed	2015	No
Vietnam	Vietnam (Expansion)	PetroVietnam	2.0, 3.0	Proposed	2020, 2025	-





# Shale Gas Production in the United States



Source: PETROLEUM ECONOMIST, World Gas 2009, “Unconventional gas gaining momentum worldwide”, by Rhodri Thomas

“The United States proven gas reserves have elevated to 245 Tcf in 2008 from 177 Tcf in 2000, equivalent to more than half of the total proved reserves of Qatar. At current level of demand, the U.S. has about 90 years of proven and potential supply – a number that is bound to go up as more and more shale gas is found.”

(Source: “America’s Natural Gas Revolution: A ‘shale gale’ of unconventional and abundant U.S. gas is transforming”, by Daniel Yergin and Robert Ineson )



## CBM-to-LNG ventures in Eastern Australia

No.	Date	Value (A\$/GJ)	Seller Buyer
1	March 2007	\$0.43	Queensland Gas Company Ltd. (QGC) AGL Energy Limited (AGL)
2	February 2008	\$0.67	Queensland Gas Company (QGC) BG Group (BG)
3	May 2008	\$1.32 - \$1.65	Santos PETRONAS
4	June 2008	\$0.46 - \$0.69	Arrow Energy Royal Dutch Shell
5	August 2008	\$0.74	Sunshine Gas Queensland Gas Company Ltd. (QGC)
6	September 2008	\$1.39 - \$1.88	Origin Energy ConocoPhillips
7	October 2008	\$0.67	Queensland Gas Company Ltd. (QGC) BG Group (BG)
8	December 2008	\$0.46 – \$0.53 (1)	Molopy-AJ Lucas AGL Energy Limited (AGL)
9	December 2008	\$1.04 (2)	Sydney Gas AGL Energy Limited (AGL)
10	February 2009	\$0.31 (3)	Pure Energy BG Group (BG)

(1) Based on AGL Indication of 700 – 800 PJ of 3P

(2) Assumes \$1.15 million of the \$171 million transaction was to acquire Huner acreage

(3) Based on BG's \$8.25/share takeover offer announced February 27



# Australia's CBM-to-LNG projects

No.	Project	Proponent	Site	Capacity	Startup
1	Gladstone LNG	PETRONAS(40%) Santos (60%)	Curtis Island	3 MTPA (up to 10 MTPA)	2014
2	Queensland Curtis LNG	Queensland Gas Company (wholly-owned by BG)	Curtis Island	3 MTPA (up to 10 MTPA)	2013
3	Pacific LNG	Origin (50%) ConocoPhillips (50%)	Curtis Island	Up to 4 trains of 3.5 MTPA each	2014
4	Gladstone LNG (Fisherman's Landing)	LNG Ltd. (30%) Arrow LNG (70%)	Fisherman's Landing	1.5 MTPA	2013
5	Sun LNG	BG – Sojitz	Fisherman's Landing	0.5 MTPA	2012
6	LNG Impel Gladstone	LNG Impel (wholly-owned by Galveston LNG) Royal Dutch Shell	Curtis Island	n/a	n/a

Source: Platts, April 2009



## Global Unconventional Gas Activity



### Countries where commercial production exists or will soon exist:

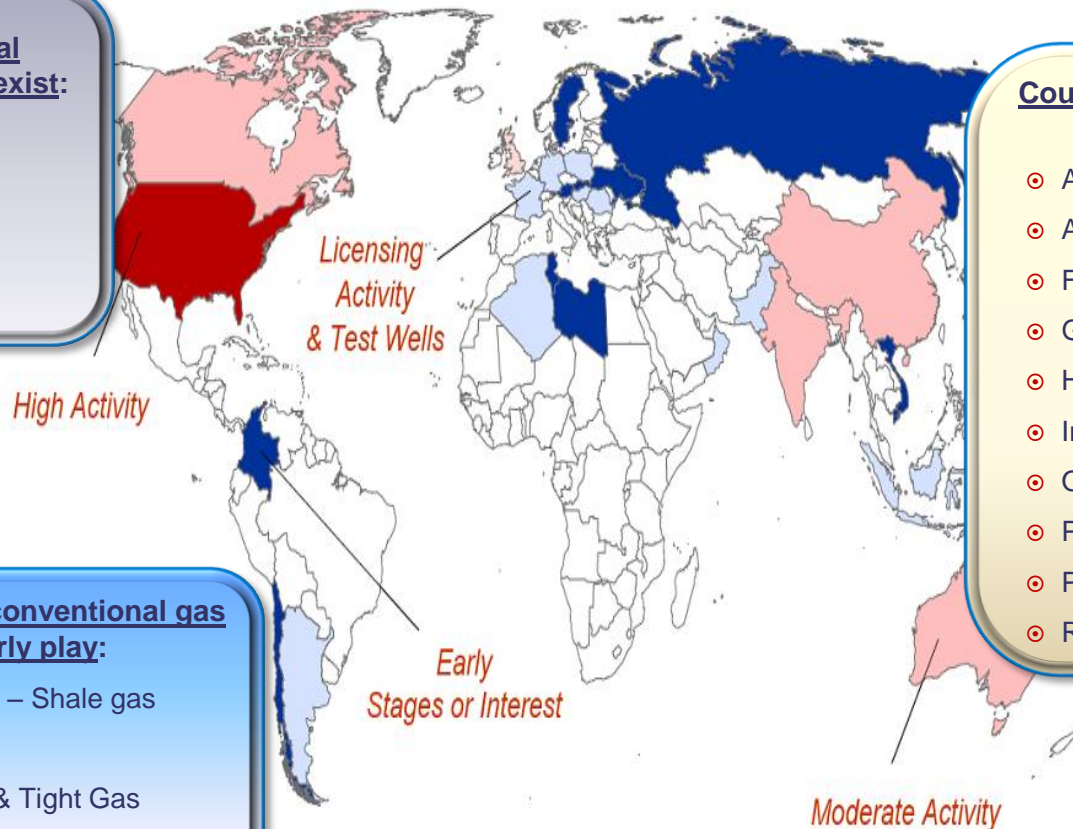
- ◉ Australia - CBM
- ◉ China – CBM, Tight Gas
- ◉ India – CBM
- ◉ United Kingdom - CBM

### Countries with acreage allocation and test-well activity:

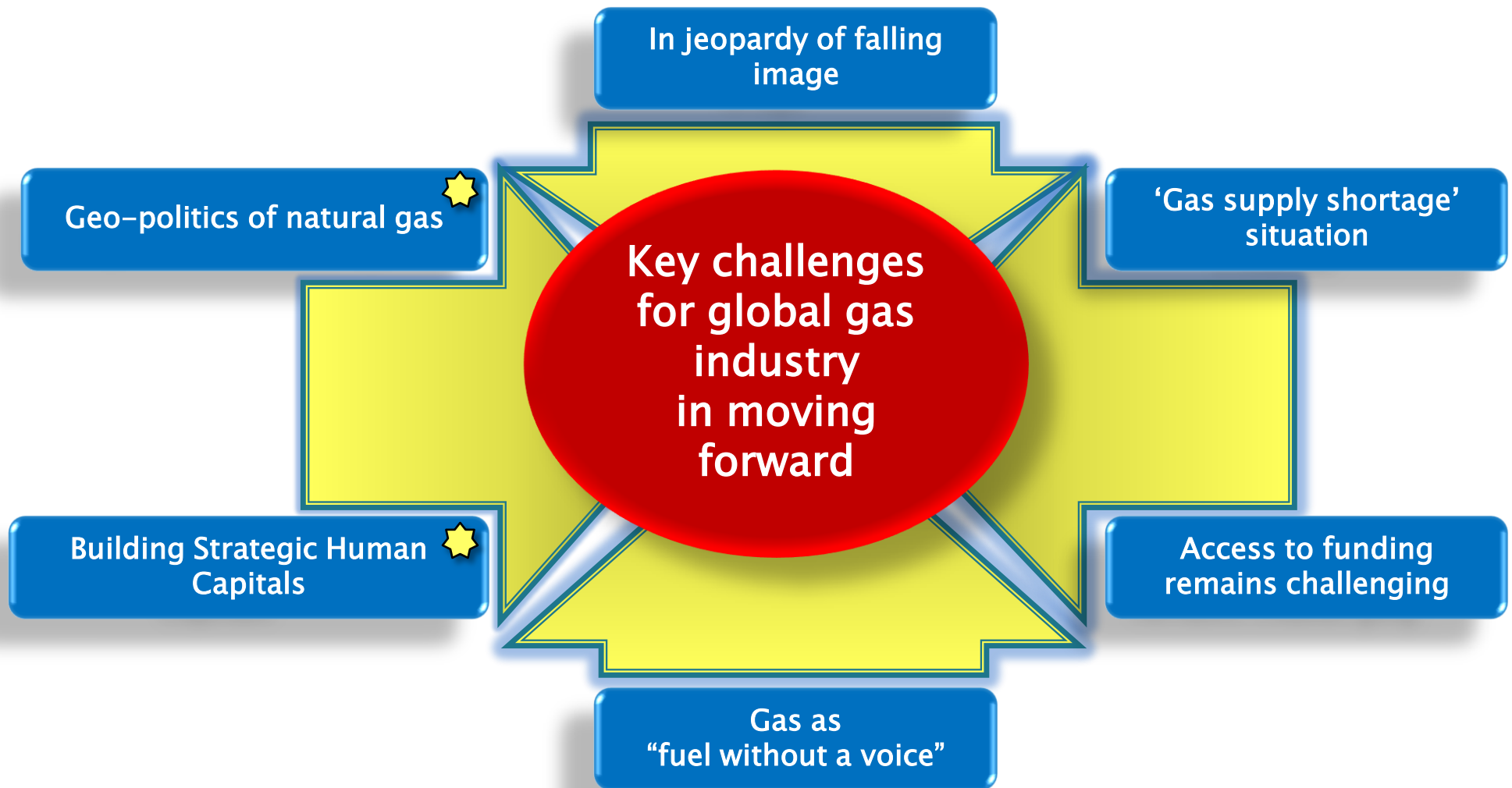
- ◉ Algeria – Tight Gas
- ◉ Argentina – Tight & Shale Gas
- ◉ France – CBM, Tight & Shale gas
- ◉ Germany – Tight Gas
- ◉ Hungary – Tight Gas
- ◉ Indonesia – CBM
- ◉ Oman – Tight Gas
- ◉ Pakistan – Tight Gas
- ◉ Poland – CBM, Shale & Tight gas
- ◉ Romania – Tight gas & CBM

### Countries where unconventional gas is still an early play:

- ◉ Austria & Slovakia – Shale gas
- ◉ Chile – CBM
- ◉ Columbia – CBM & Tight Gas
- ◉ Libya – Tight gas



# Unconventional gas prospects as the catalyst for future gas and overall mix outlook



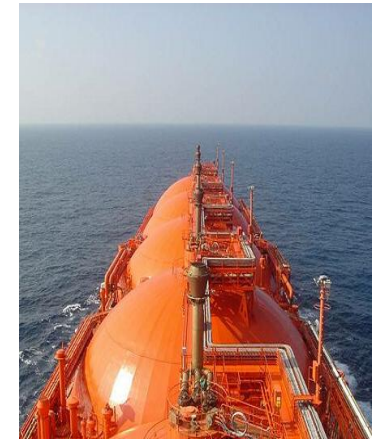
★ Key Deliverables at the 25<sup>th</sup> World Gas Conference, Kuala Lumpur in 2012





## IGU Messages on Natural Gas

- ◉ Clean, efficient, versatile and environmental friendly
- ◉ Available and abundant
- ◉ Continue to play a substantial role in global energy demand
- ◉ Basis for sustainable economic growth



***Natural gas***  
***– major part of the long term energy solution***





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

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





**THANK YOU FOR KIND ATTENTION**

**Welcome to**

**25<sup>th</sup> World Gas Conference  
and Exhibition**

**4-8 June 2012**

**Kuala Lumpur, Malaysia**

**<http://wgc2012.com>**

