Gas: Answer to Energy Challenges

By:
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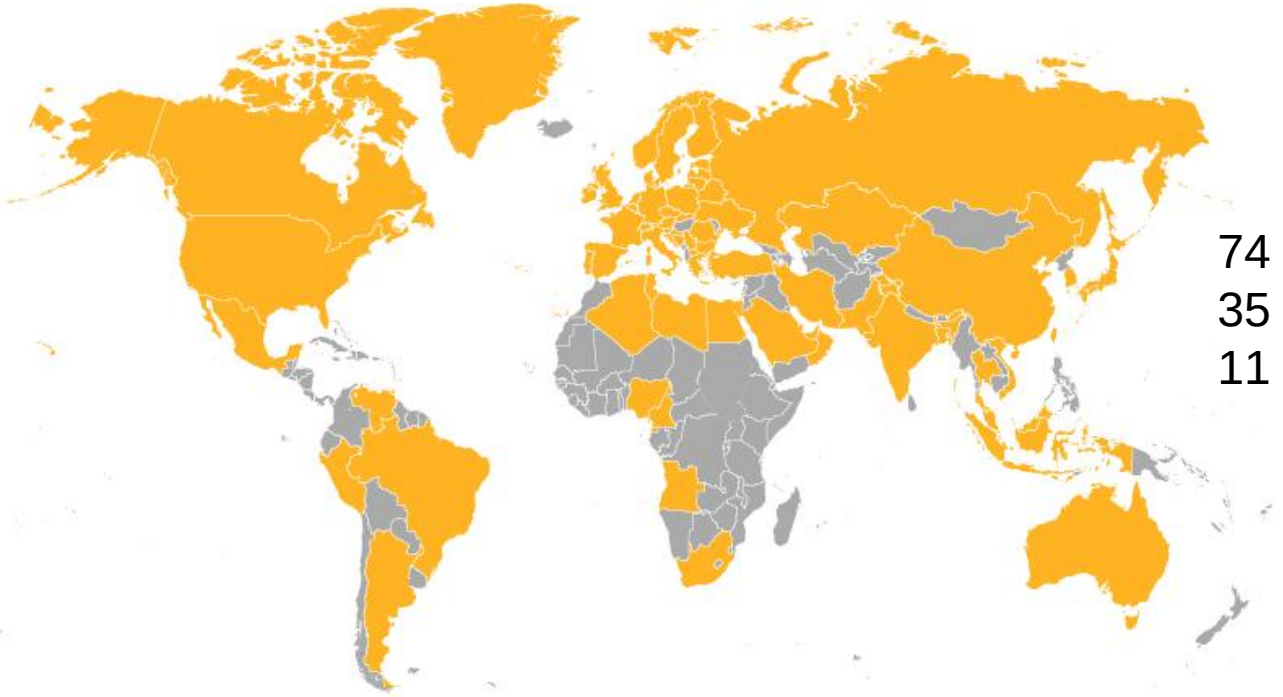
Outline

1. Introduction – Brief on IGU
2. Global Energy Scenario by 2030
3. Gas: Answer to Energy Challenges
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 and policy issues
- Cooperation with IEA, United Nations, World Bank, IEF and others

IGU Members responsible for 95% of Global Gas Sales



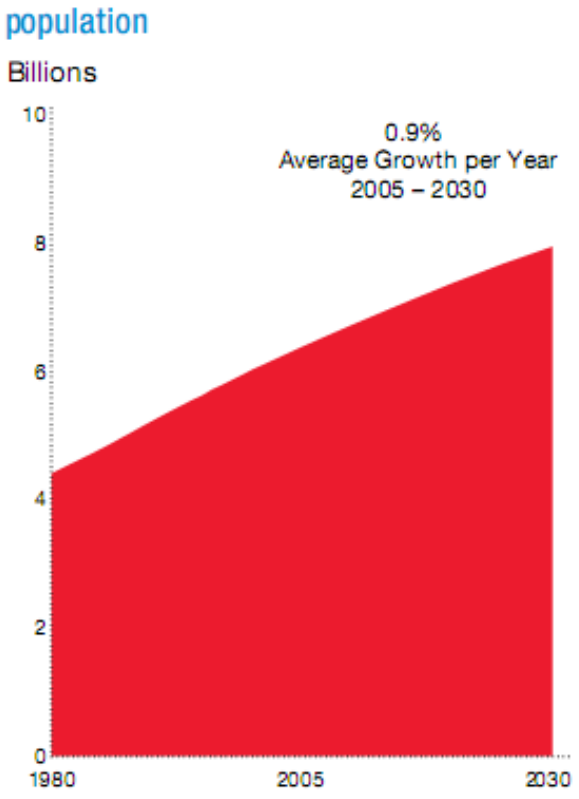
IGU Members

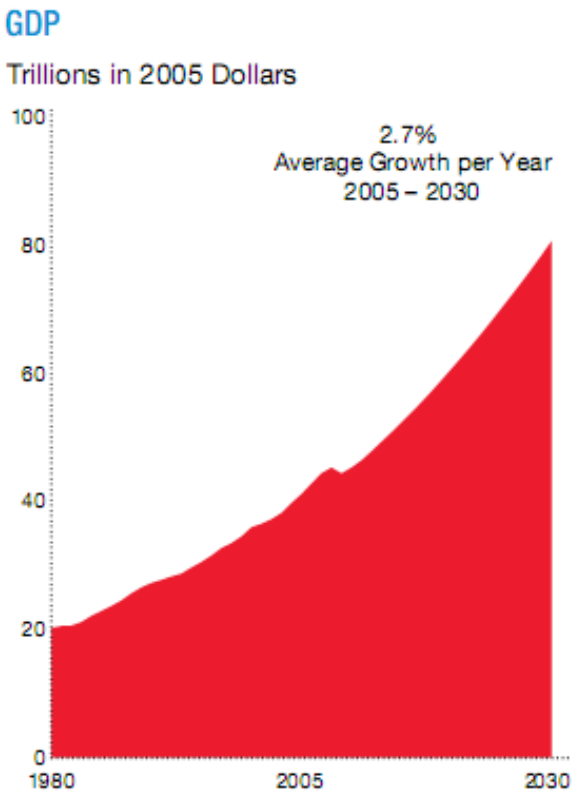
74 Charter members
35 Associate members
11 Affiliated members

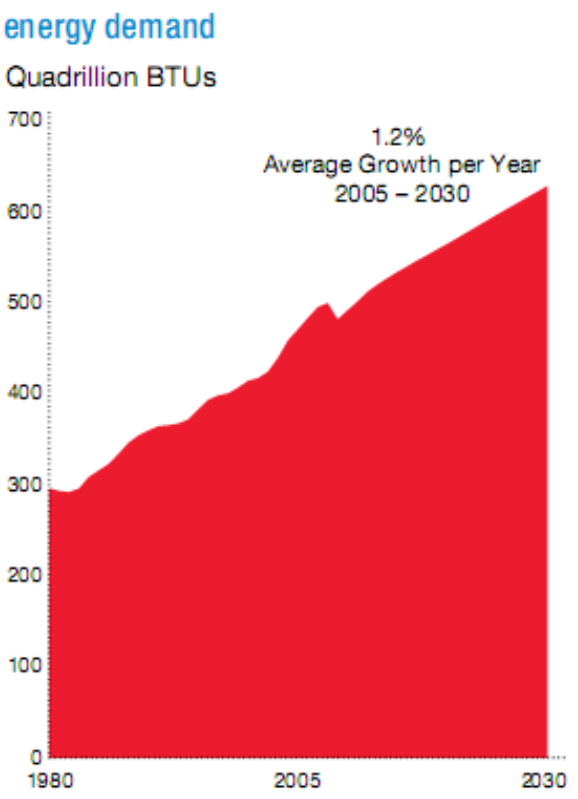
As of April 2011

IGU Organisation Chart for the 2009 – 2012 Malaysian Triennium

World demand for energy is increasing



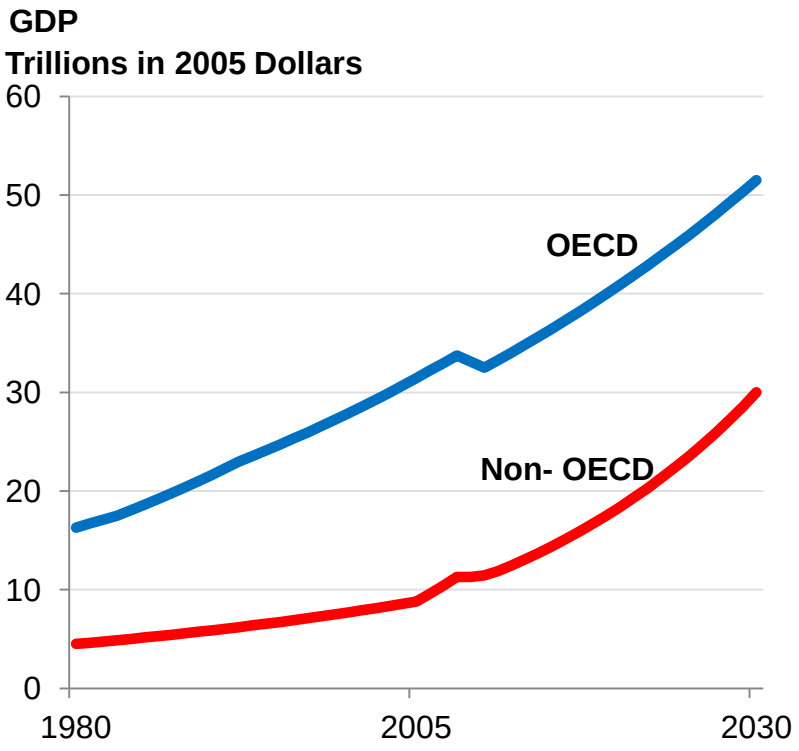


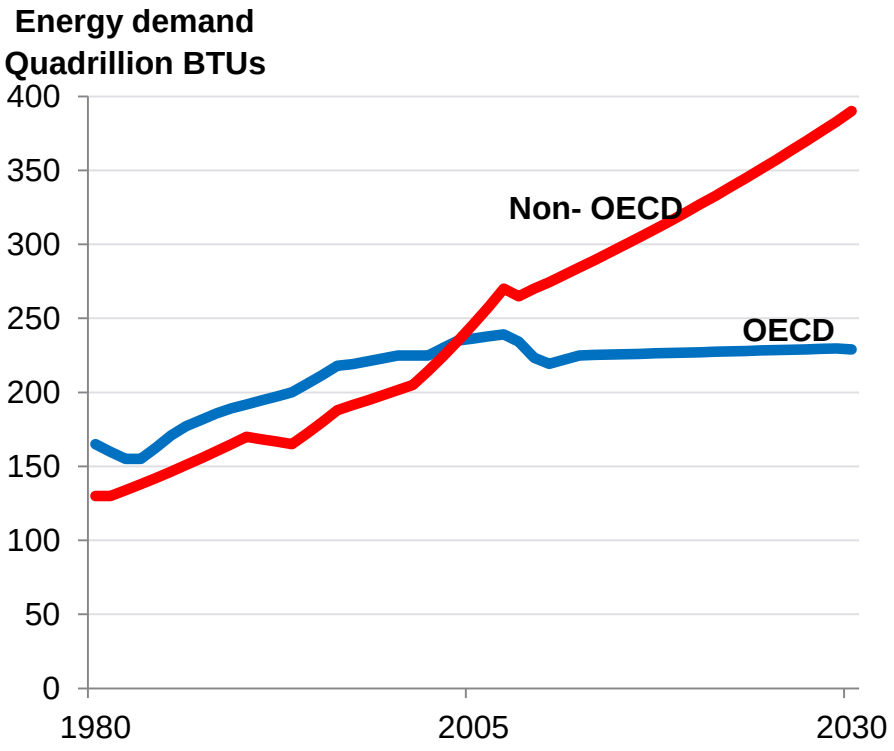


- population growth, economic expansion, urbanisation and individual's prosperity

Source(s): ExxonMobil 2009, OECD/IEA 2010

The growth of energy demand will be led by Non-OECD countries





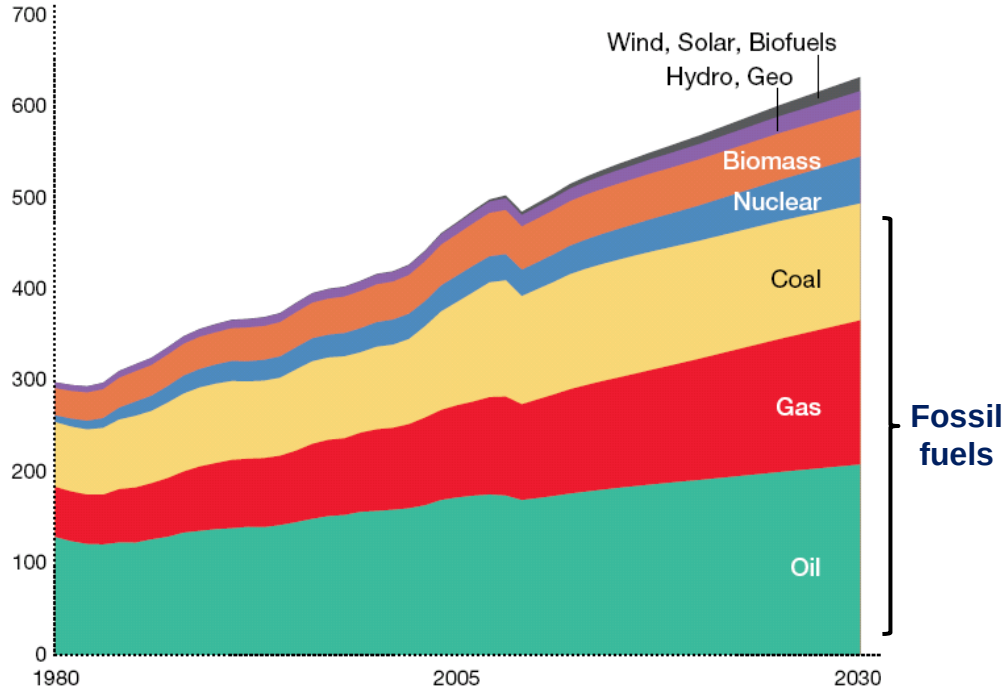
- Non-OECD energy will grow about 65% of total energy demand notably driven by emerging markets e.g. China & India. Per-capita energy demand will remain lower.
- OECD energy demand slightly lower in 2030 versus 2005 due to substantial gains in efficiency.

Source(s): ExxonMobil 2009

World will still depend on fossil fuels in decades to come

by energy type

Quadrillion BTUs



CAGR of Fuel Consumption 2010-2030

Liquids	1.3%
Natural Gas	2.0%
Coal	2.1%
Nuclear	1.7%
Other	3.0%

% of natural gas from total energy mix 1990-2030

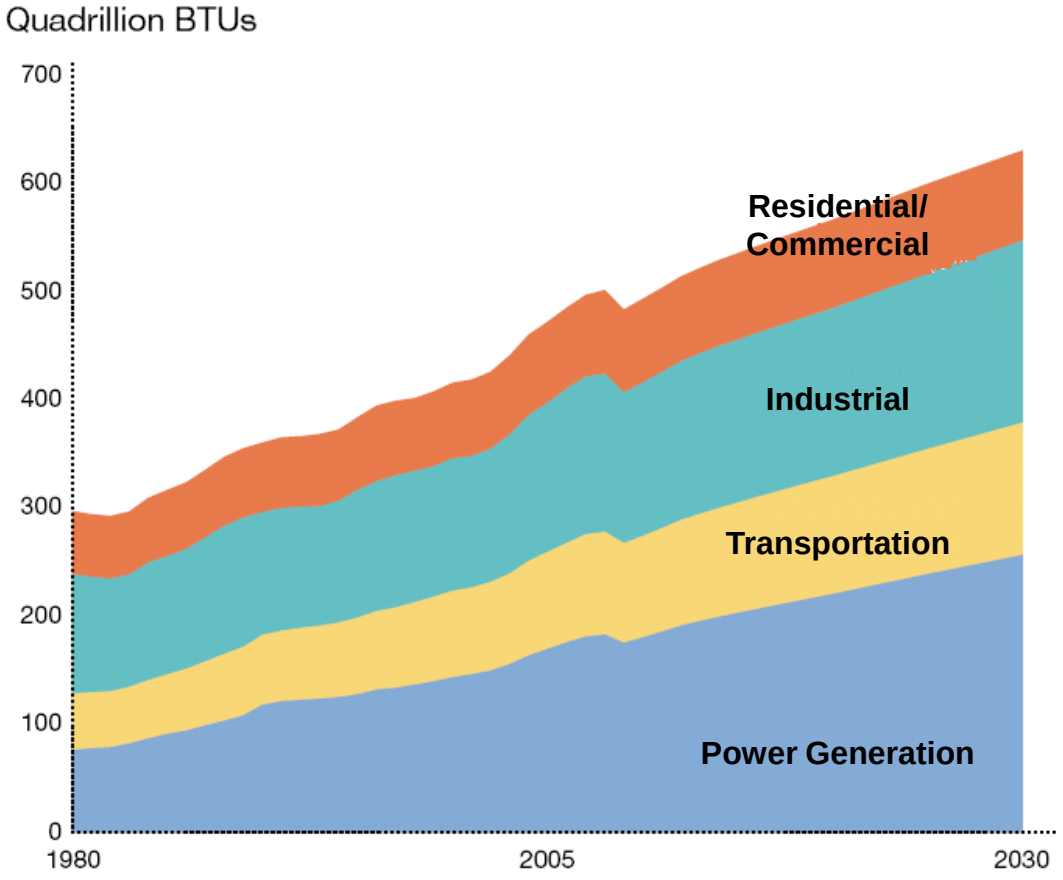
1990	22%
2005	23%
2010	23%
2030	?

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

Source(s): ExxonMobil 2009, EIA/IEO 2009, PETRONAS 2009, IEA 2010, IEF 2010, IGU 2010

Gas demand will increase accordingly

by sector



Sector	CAGR
1) Power Generation	1.7% p.a.
2) Industrial	1.5% p.a.
3) Transportation	1.2% p.a.
4) Residential / Commercial	0.8% p.a.

- power generation & industrial demand

*CAGR = Cumulative Average Growth Rate

Source(s): ExxonMobil 2009, EIA/IEO 2009, PETRONAS 2009

The reality is the world faces twin challenges…

- Increased demand for energy

versus

- need to address environmental issues & climate change

The global energy equation certainly becomes more complicated…

- The increased relevance of sustainability

Natural gas is key to addressing global energy challenges

ABUNDANT

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

AFFORDABLE

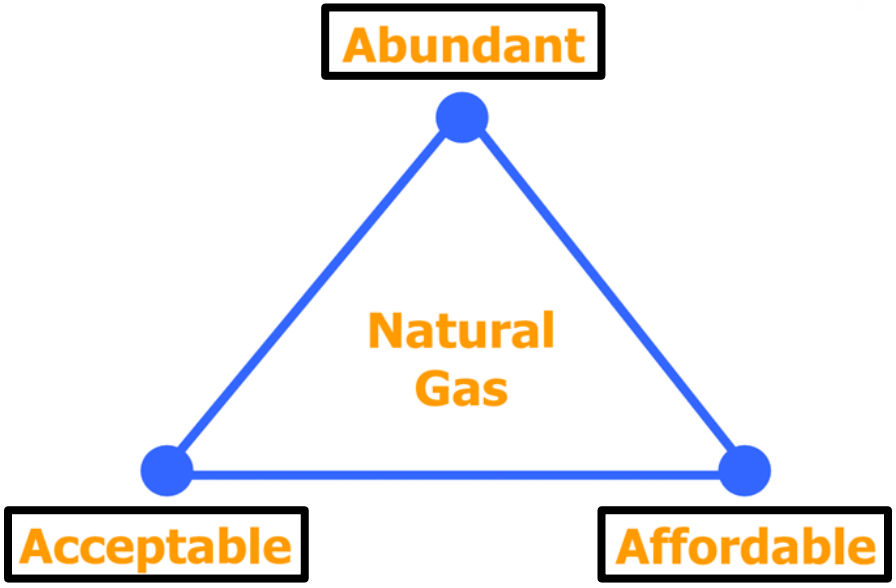
- CCGT cheapest to build

CCGT: Combined Cycle Gas Turbine

ACCEPTABLE

- CCGT: gas-fired power compared to coal:
  - 40% more energy efficient
  - Emits 50-70% less CO_2
  - 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 CO_2 reduction targets

CCS: Carbon Capture & Storage



NATURAL GAS: A DESTINATION FUEL

Source(s): Shell 2011

Natural gas: a responsible choice for a sustainable future

Natural gas CARES for the world

C Clean

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 promotes sustainable transport.

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

A Affordable

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 does not require subsidies.

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

R Reliable

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 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.

E Efficient

Natural gas is efficient.

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

Natural gas saves time.

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

S Secure

Natural gas is abundant.

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

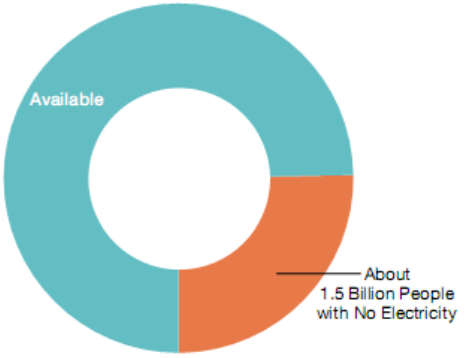
Natural gas is safe.

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

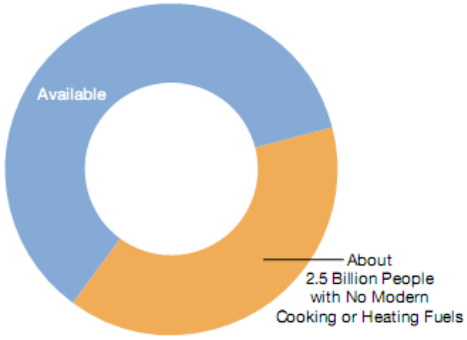
- It is a clean, affordable, reliable, efficient, and secure energy source.

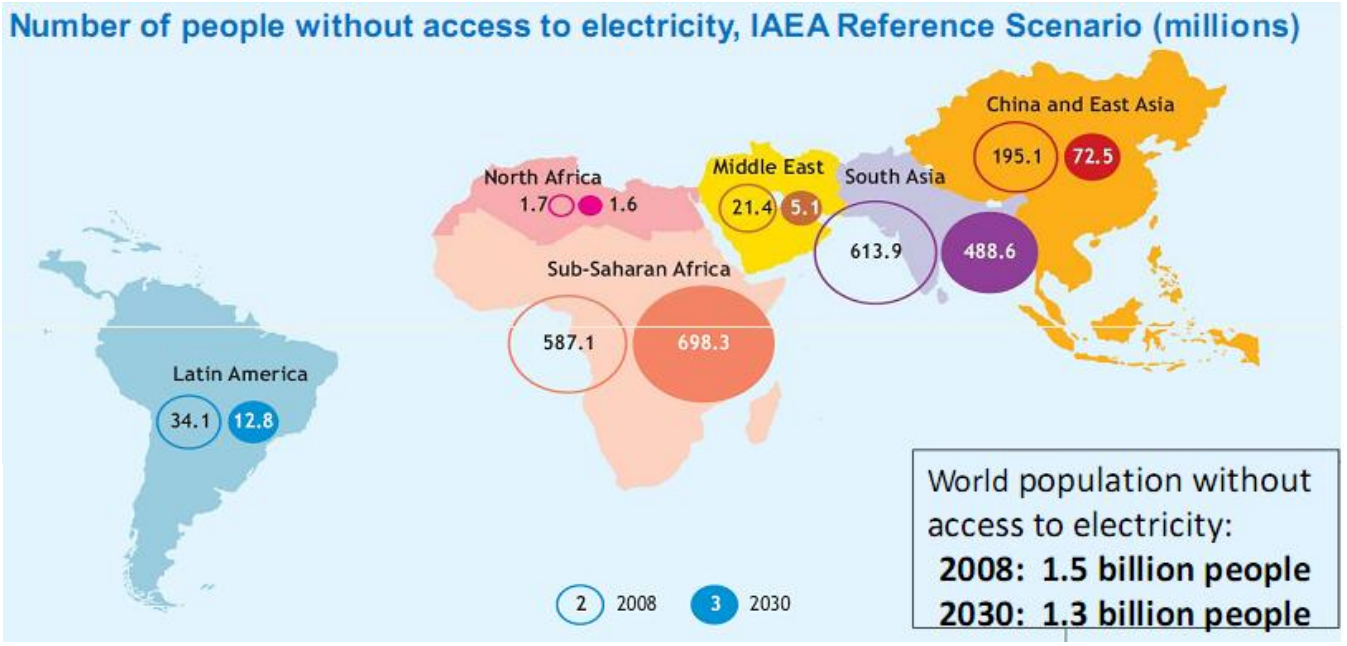
The growing role of natural gas to meet energy service needs

electricity



modern cooking and heating fuels



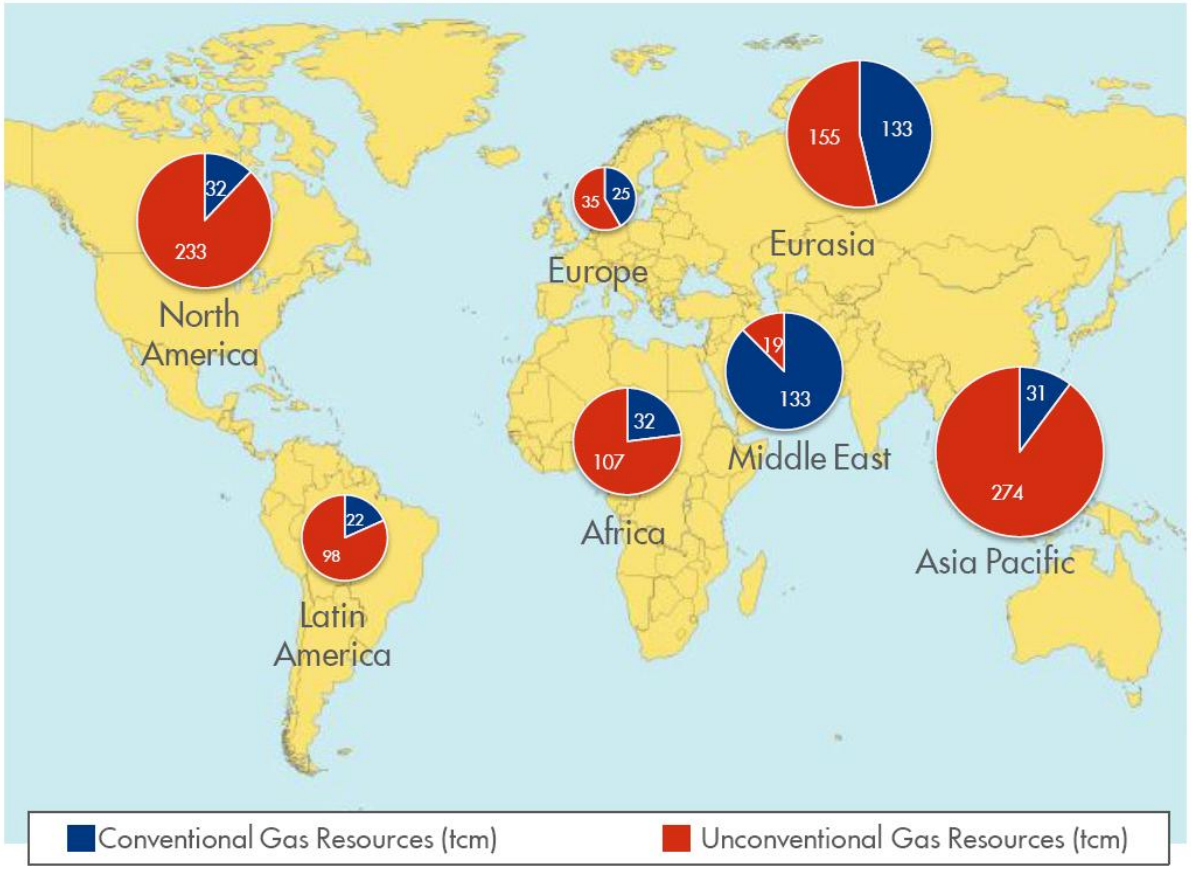


By 2030, about 1.3 billion people do not have access to electricity despite more widespread prosperity and more advanced technology

- The energy-deprived countries should not be neglected!

Source(s): OECD/IEA 2009, IAEA 2010, ExxonMobil 2009

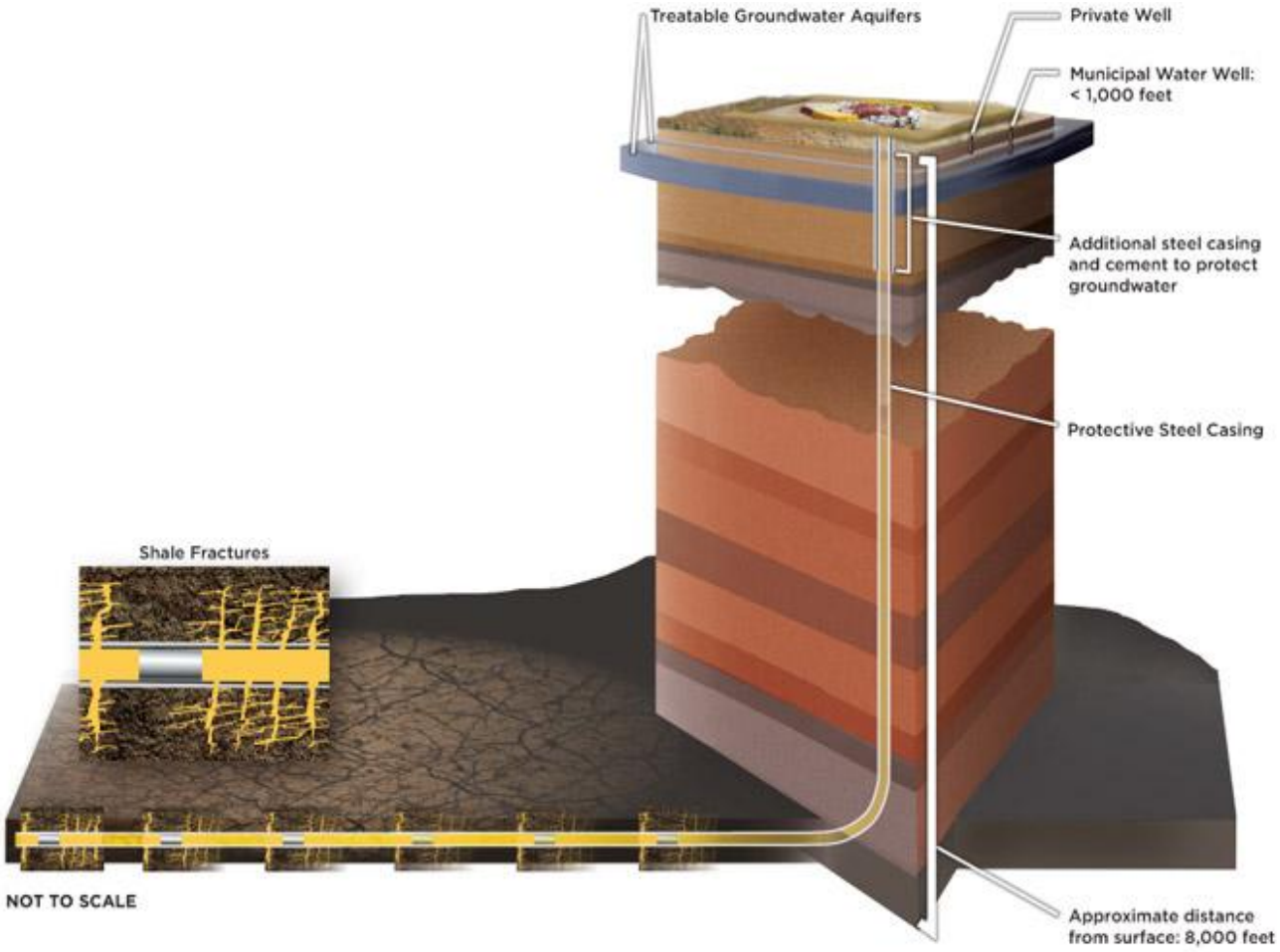
Gas resources are becoming plentiful and geographically diverse



- Availability: 60 years to 250 years
- Abundant global gas reserves

Source(s): Shell 2011

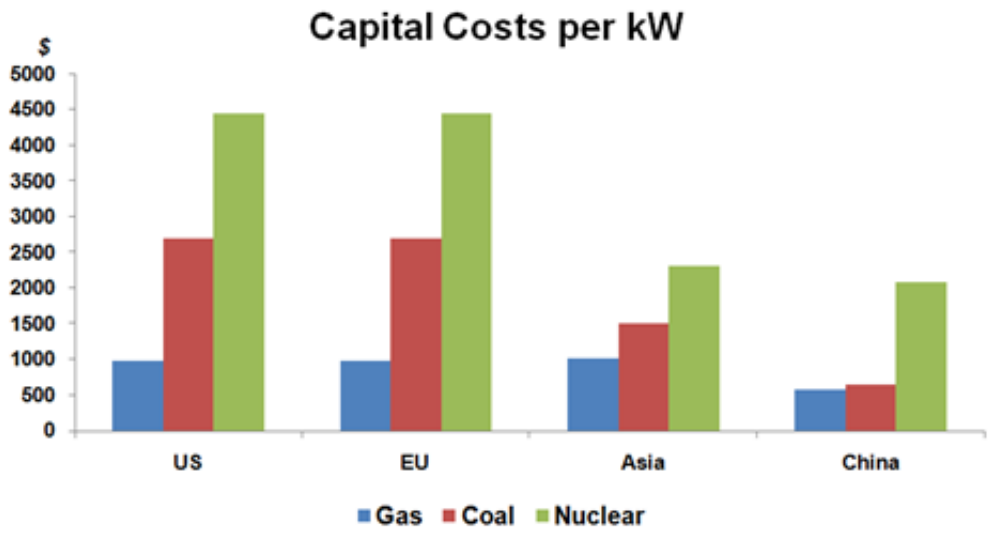
The technological breakthrough for unconventional gas



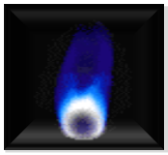
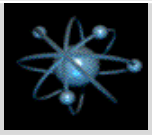
- Technology – hydraulic fracturing

Source(s): AGA 2010

Natural gas is the affordable choice



Capital Costs (measured by multiples)

	Gas	1
	Coal	2 – 3
	Nuclear	5
	Onshore wind	7 – 15
	Offshore wind	10 - 15

- On a per kW basis, natural gas is very competitive relative to coal and nuclear.
- In terms of capital costs, natural gas is compelling in a world's short of money.

Source(s): PFC Energy 2010, Shell 2010/2011

Energy technologies for short-to-medium term targets

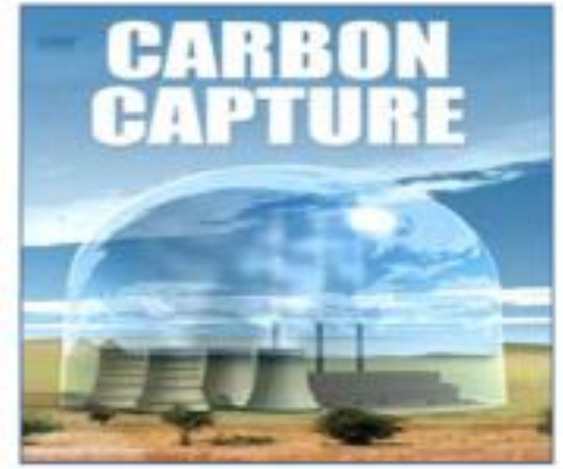
- Energy efficiency & conservation
- Natural gas

Source(s): PETRONAS 2010

Advancing technology to endure for the long term energy sustainability

- Make gas green!

  - from biogas, synthetic natural gas (SNG) & landfill gas



- Carbon Capture & Storage (CCS)
- Fuel cells

Source(s): PETRONAS 2010, Senternovem 2010

The role of government is imperatively important…

- To encourage investments in all parts of the value chain
- To encourage use of clean burning fuels
  – legislate, incentivise
- To encourage R&D for game changing technology
- To encourage multifaceted approaches to solutions
  – don’t pick winners/losers
- To encourage & grow demand for gas
- To encourage efficiency & conservation of energy

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 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/

The programme for the 25th WGC is ready

	Monday, 4 June	Tuesday, 5 June	Wednesday, 6 June	Thursday, 7 June	Friday, 8 June
Theme		Foundation for growth	Securing gas supply	Enhancing gas demand	A sustainable future
8:30		KA1 Shell	KA5 Chevron	KA9 JGA	KA13 Total
9:15		KA2 ExxonMobil	KA6 Rasgas	KA10 GAIL	KA14 TBA
9:45		Committee Sessions	Committee Sessions	Committee Sessions	SP9 Gas and Renewables
11:45		7 sessions	8 sessions	9 sessions	SP10 WPC
		Lunch - IEA	Lunch - EU	Lunch - Climate	Lunch - CERA
13:45		KA3 Gazprom	KA7 Pertamina	KA11 CNPC	
14:30	Opening	KA4 KVGN	KA8 Statoil	KA12 AGA	
14:30	SA1 Prime Minister	SP1 Attracting and Retaining Talents	SP3 Impact of Geopolitics	SP6 Case for Natural Gas	TWP 2012-2015
	SA2 United Nations	SP2 Youth Roundtable Forum	SP4 Unconventional gas	SP7 NGV in sustainable transport	
	SA3 PETRONAS		SP5 Future of LNG	SP8 Growing gas demand w innovation	
16:30	Exhibition	Committee Sessions	Committee Sessions	Committee Sessions	Closing Ceremony
18:30		8 sessions	8 sessions	8 sessions	Handover
	Gala Dinner				Farewell Party

SA - Special Address KA - Keynote Address SP - Strategic Panel

THANK YOU FOR YOUR KIND ATTENTION !

BACK-UP SLIDES

www.wgc2012.com

callforpapersisnowopen

25th World Gas Conference, 4 - 8 June 2012

"Gas: Sustaining Future Global Growth"

Confirmed Keynote Speakers:

American Gas Association
NICK STAVROPOULOS
Chairman, American Gas Association &
Executive Vice President & COO
of US Gas Distribution, National Grid

Chevron Corporation
GEORGE KIRKLAND
Vice Chairman & Executive Vice President,
Global Upstream & Gas

ExxonMobil
REX W TILLERSON
Chairman & CEO

GAIL (India) Limited
B C TRIPATHI
Chairman & Managing Director

Gasunie
PAUL VAN GELDER
Chairman of the Executive Board & CEO

OAO Gazprom
ALEXEY MILLER
Deputy Chairman of the Board of Directors &
Chairman of the Management Committee

RasGas Company Limited
HAMAD RASHID AL MOHANNADI
Managing Director

Royal Dutch Shell
PETER VOSER
CEO

Statoil ASA
HELGE LUND
President & CEO

TOTAL
CHRISTOPHE DE MARGERIE
Chairman & CEO

The Japan Gas Association
MITSUNORI TORIHARA
Chairman

Confirmed Luncheon Speakers:

IHS Cambridge Energy Research Associates (IHS CERA)
DR DANIEL YERGIN
Chairman

International Energy Agency
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