Help Wanted:

Young Professional to Take Over $1 Trillion/year Business

Must be responsible, smart, able to manage complex issues…….

WGC 2012 YOUTH PROGRAMME Kuala Lumpur

Natural Gas: *Beyond the Facts and Figures*

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KUALA LUMPUR 2012 WORLD GAS CONFERENCE

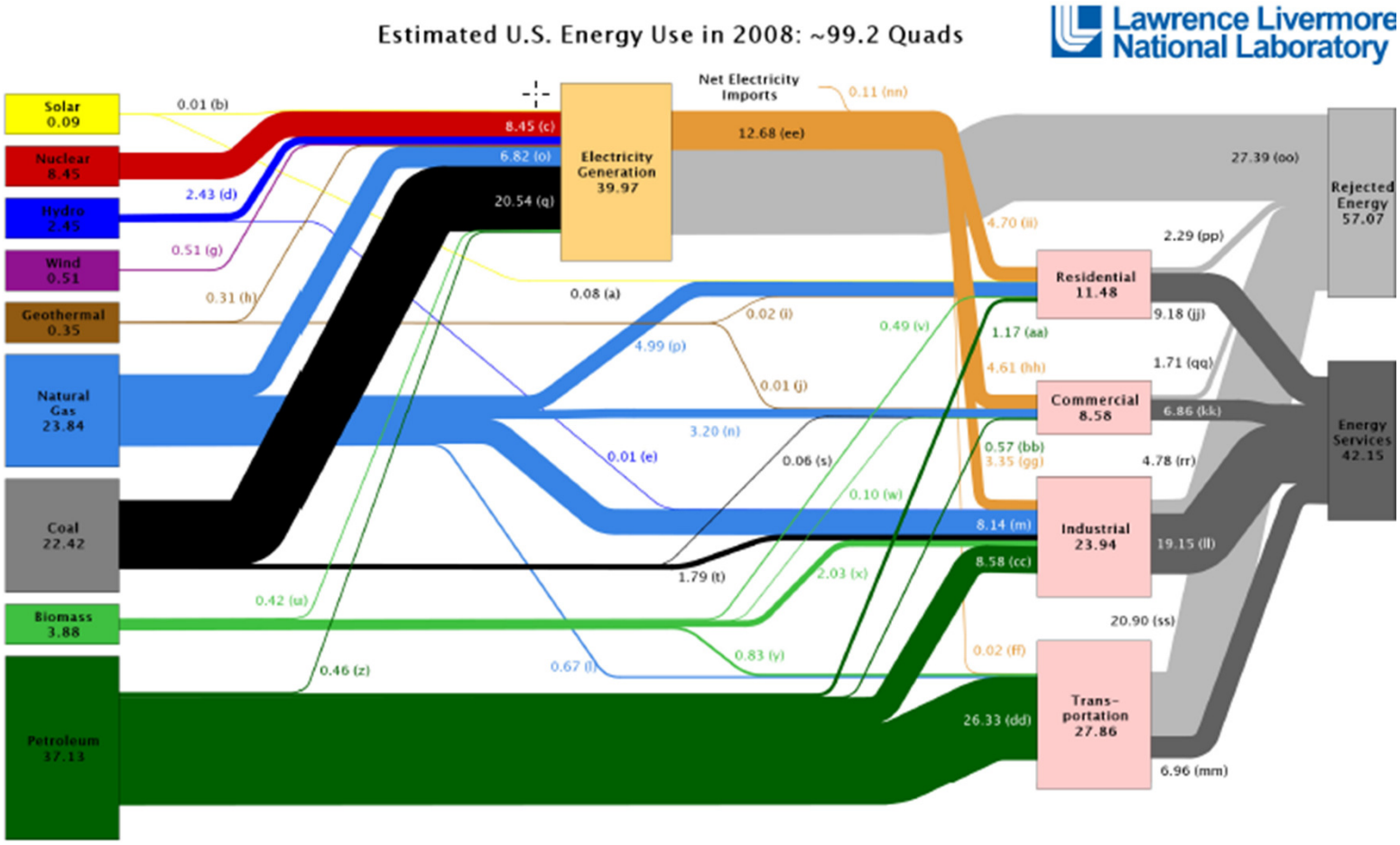
INTERNATIONAL GAS UNION · UNION INTERNATIONALE DE L'INDUSTRIE DU GAZ ·

NATURAL GAS
PART OF THE PROBLEM OR PART OF THE SOLUTION?

Clean		Affordable		Reliable		Efficient		Secure
Natural gas is clean.	Natural gas produces less nitrogen oxide than coal, and more than 50% less CO_2. 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 realized immediately.	***Natural gas is efficient.***	Modern gas-fired power plants are 40% more efficient than coal plants.	***Natural gas is abundant.***
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 heavily subsidized renewable technologies, natural gas use allows countries to affordably reduce their emissions.	***Natural gas is flexible.***	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.***

Natural gas is a clean, affordable, reliable, efficient, and secure energy source. It has a vital role to play in a sustainable energy future.

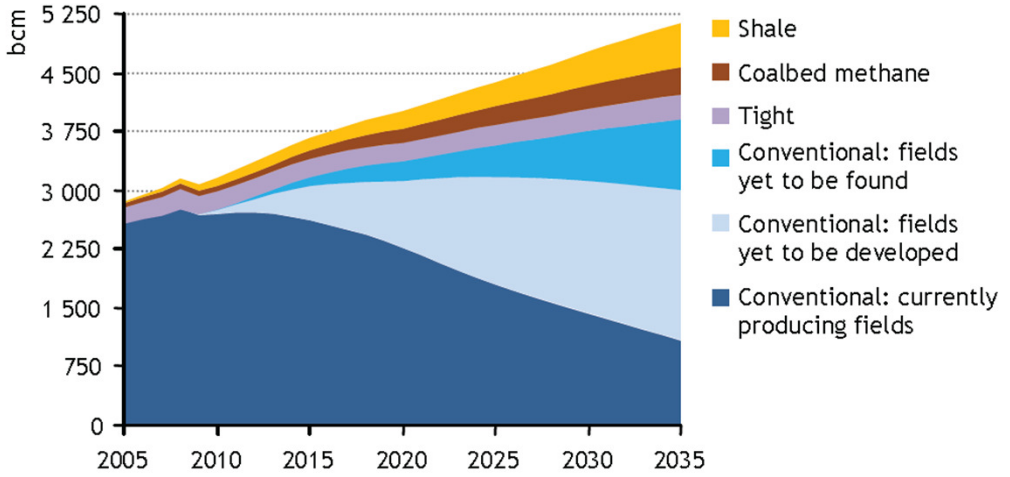
NATURAL GAS: THE MOST VERSATILE FUEL IN THE MIX



ENERGIZE THE WORLD, RESPECT THE ENVIRONMENT

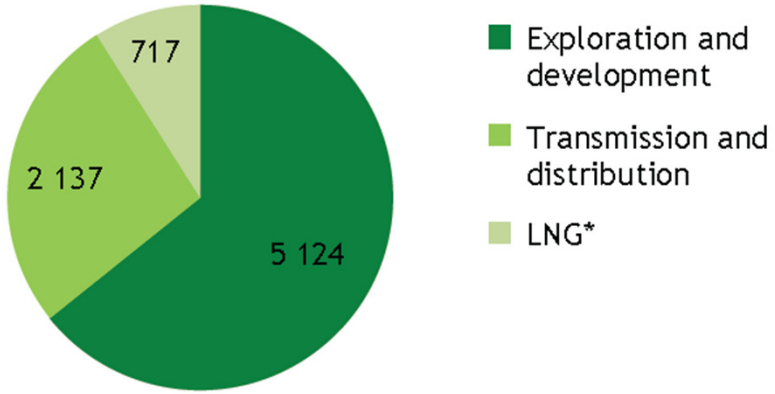
- Improve living standards as population grows from 6.6 to 8.5 billion in 2035
- Find and develop 3 new Russia's to global gas production
- Deliver profit on $8B investment
- Reduce environmental impacts
  - Maximize efficiency, particularly power generation
  - Displace coal and oil
  - Enable intermittent renewables

Figure 1.13 ▻ World natural gas production by source in the GAS Scenario



GAS Scenario

Total = $7 978 billion



Environmental Benefits – Beyond CO_2

Electricity Generation
#1 Energy growth market

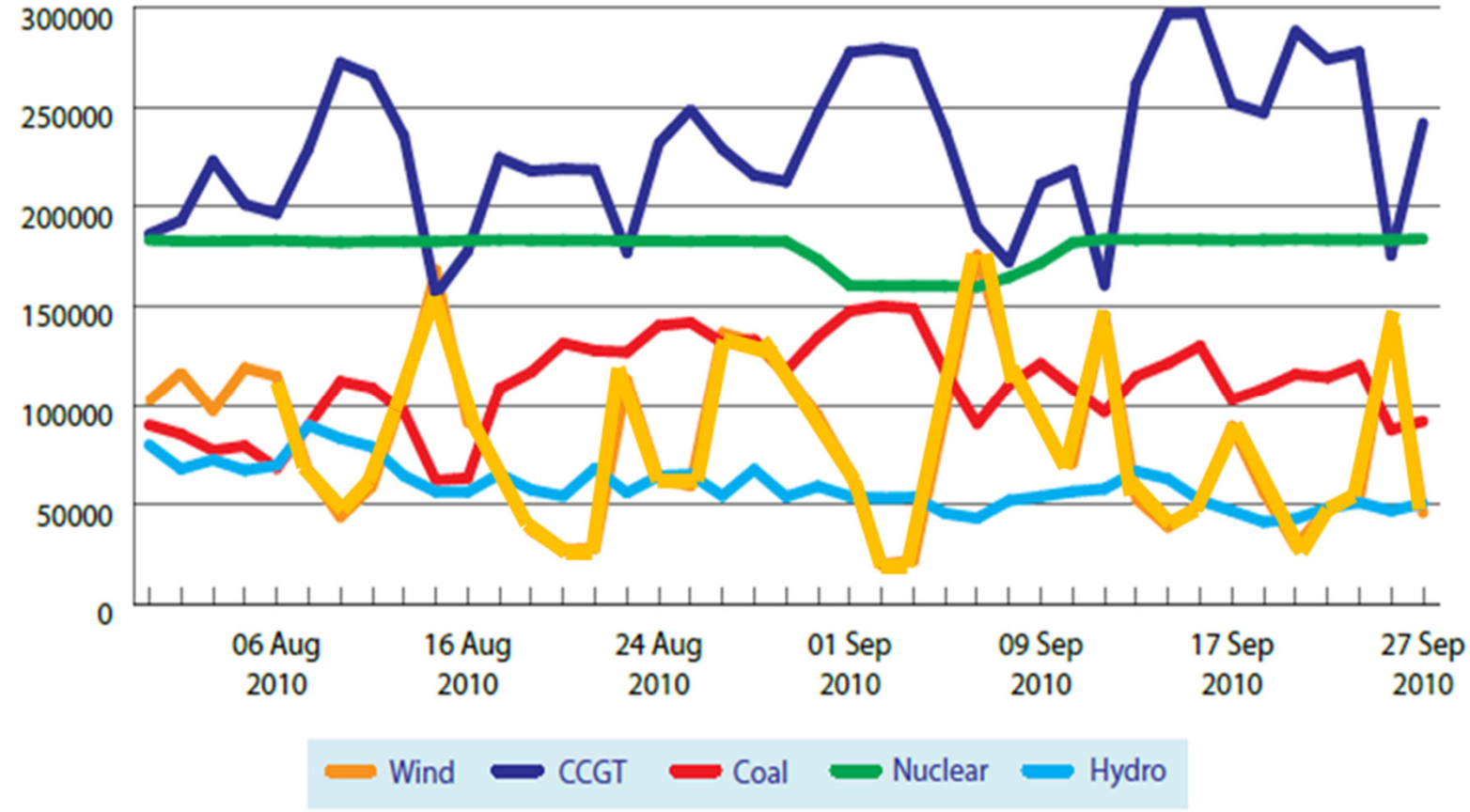
Fossil Fuel Emission Levels
- Pounds per Billion Btu of Energy Input

Pollutant	Natural Gas	Oil	Coal
Carbon Dioxide	117,000	164,000	208,000
Carbon Monoxide	40	33	208
Nitrogen Oxides	92	448	457
Sulfur Dioxide	1	1,122	2,591
Particulates	7	84	2,744
Mercury	0.000	0.007	0.016

Transportation
#2 Energy growth market

NATURAL GAS: ENABLING INTERMITTENT RENEWABLE ENERGY

EXAMPLE OF IMPACT OF VARIABLE WIND POWER ON SUPPLY FROM GAS- AND COAL-FIRED GENERATION (Spanish electricity market)



Source: REE, Heren, 2010

SKILLS TO EARN YOUR KEYS

- Communications
  - Listen as well as speak
  - Across borders, languages, cultures
  - With experts and non-experts
  - Effective in teams
- Technical
  - Every branch of knowledge, including science, engineering, sales, marketing, finance, law, human resources, sociology, political science, etc.
- Perspective
  - Able to see the big picture and focus on the details
  - Flexible and resilient

ARE YOU UP FOR THE CHALLENGE?