



International Gas Union



Gas & LNG Business Forum

World Gas Supply (Conventional and Unconventional Gas Map), Market and Commercialization

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Secretary General of IGU

24 January 2011, Jakarta, Indonesia



- **Rising population – 9 billion in 2050**
- **Human strive for a better life**
- **Technological progress**
- **Climate change concerns**

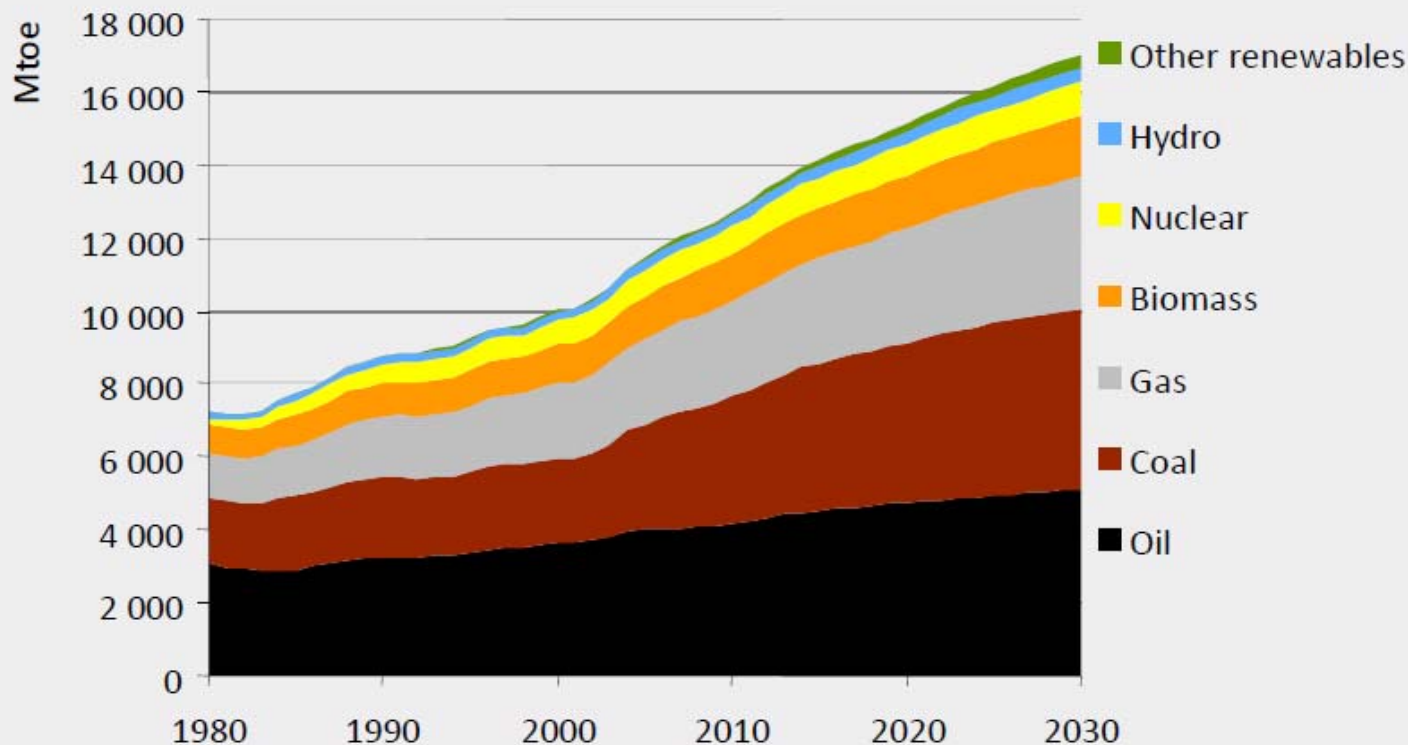




IEA forecasts growing gas demand in the future



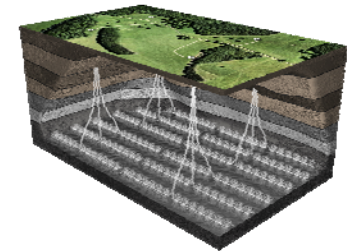
Source: IEA WEO 2010



World energy demand expands by 45% between now and 2030 – an average rate of increase of 1.6% per year – with coal accounting for more than a third of the overall rise

- **Unconventional gas**

- Shale gas, tight gas and coal bed methane



- **LNG Developments**

- Large scale plants, ships, terminals



Impact on availability and affordability



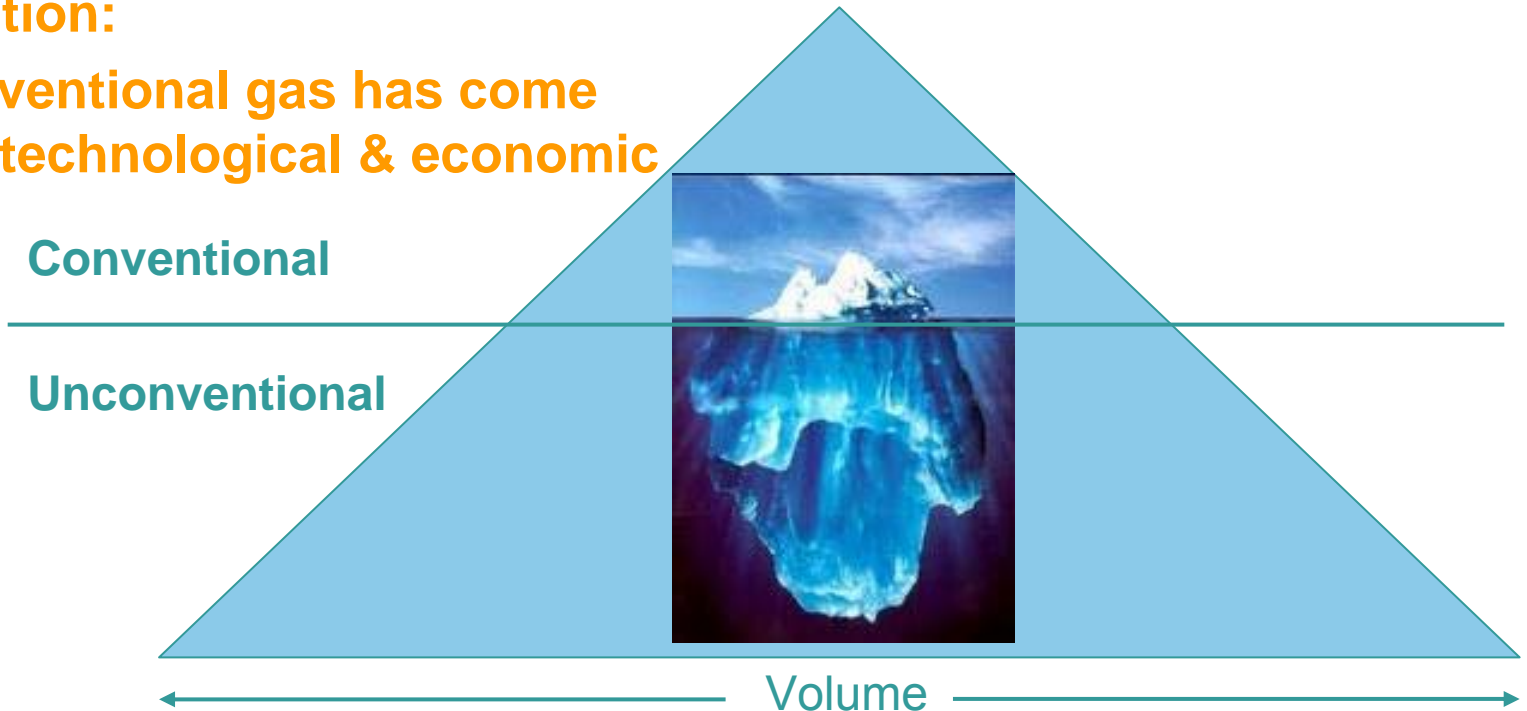
Natural Gas reserves: plenty & more to come



Proven conventional reserves* are growing

In addition:

Unconventional gas has come within technological & economic reach



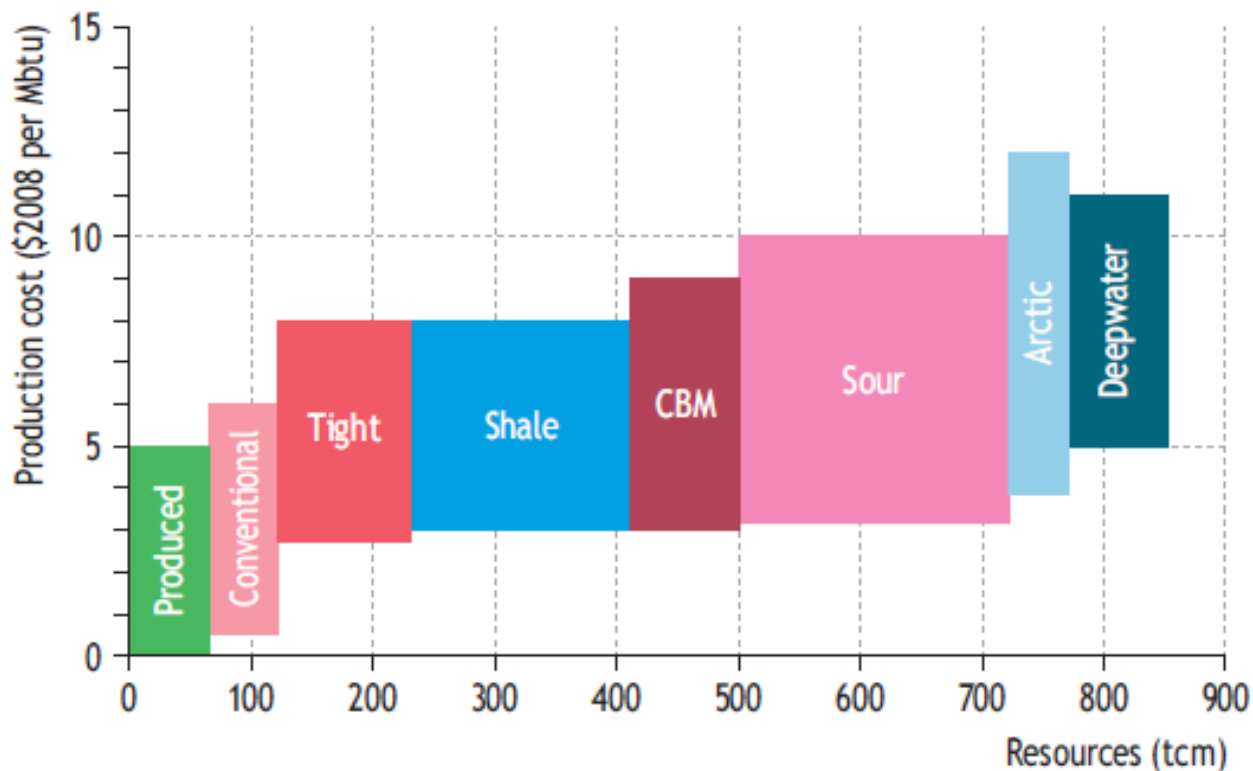
The total long-term recoverable gas resource base is more than 850 tcm, only 66 tcm has already been produced.

- IEA-WEO2009 -



* 185 tcm in 2008

Long-term gas production cost curve



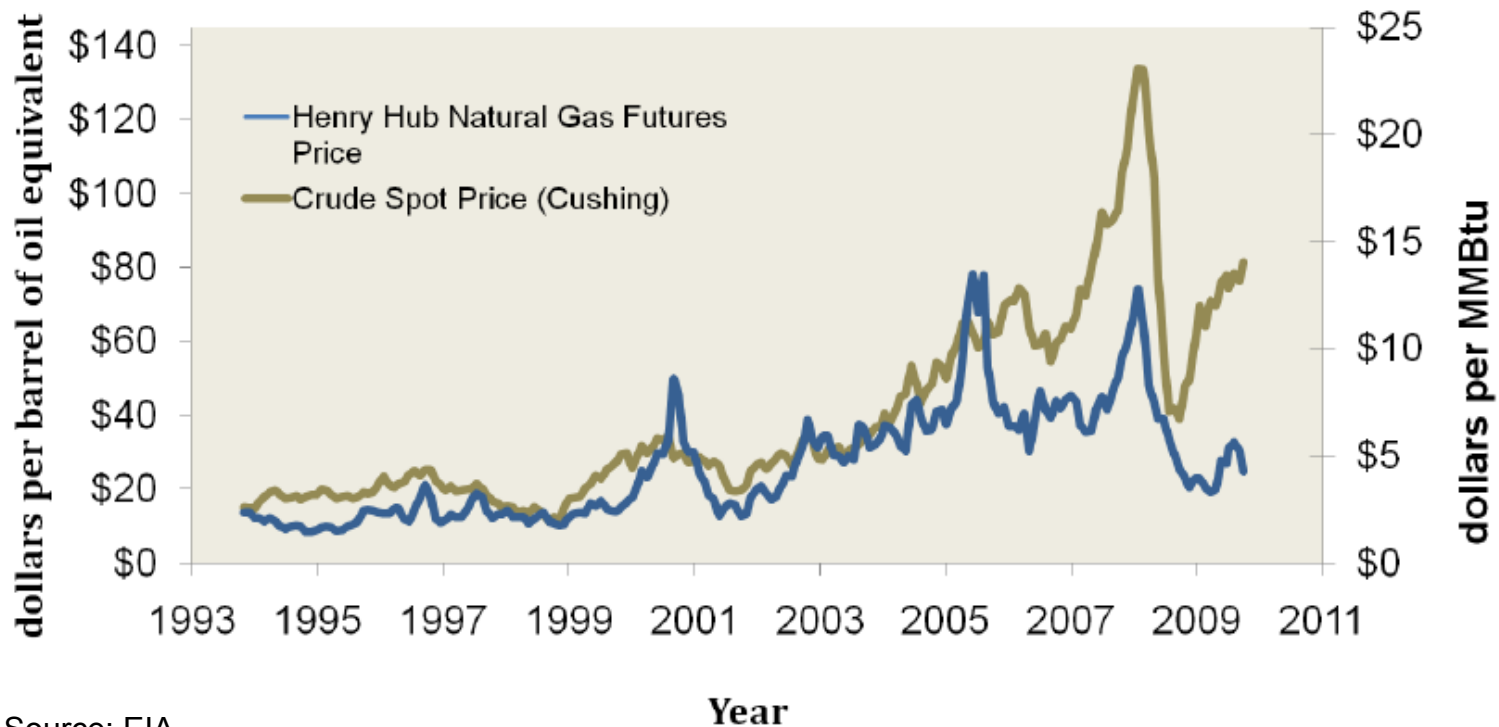
Note: 5 \$/MMBtu gas compares to less than 30 \$/bbl oil



Affordability of Gas



U.S. Oil and Natural Gas Prices 1994-2009



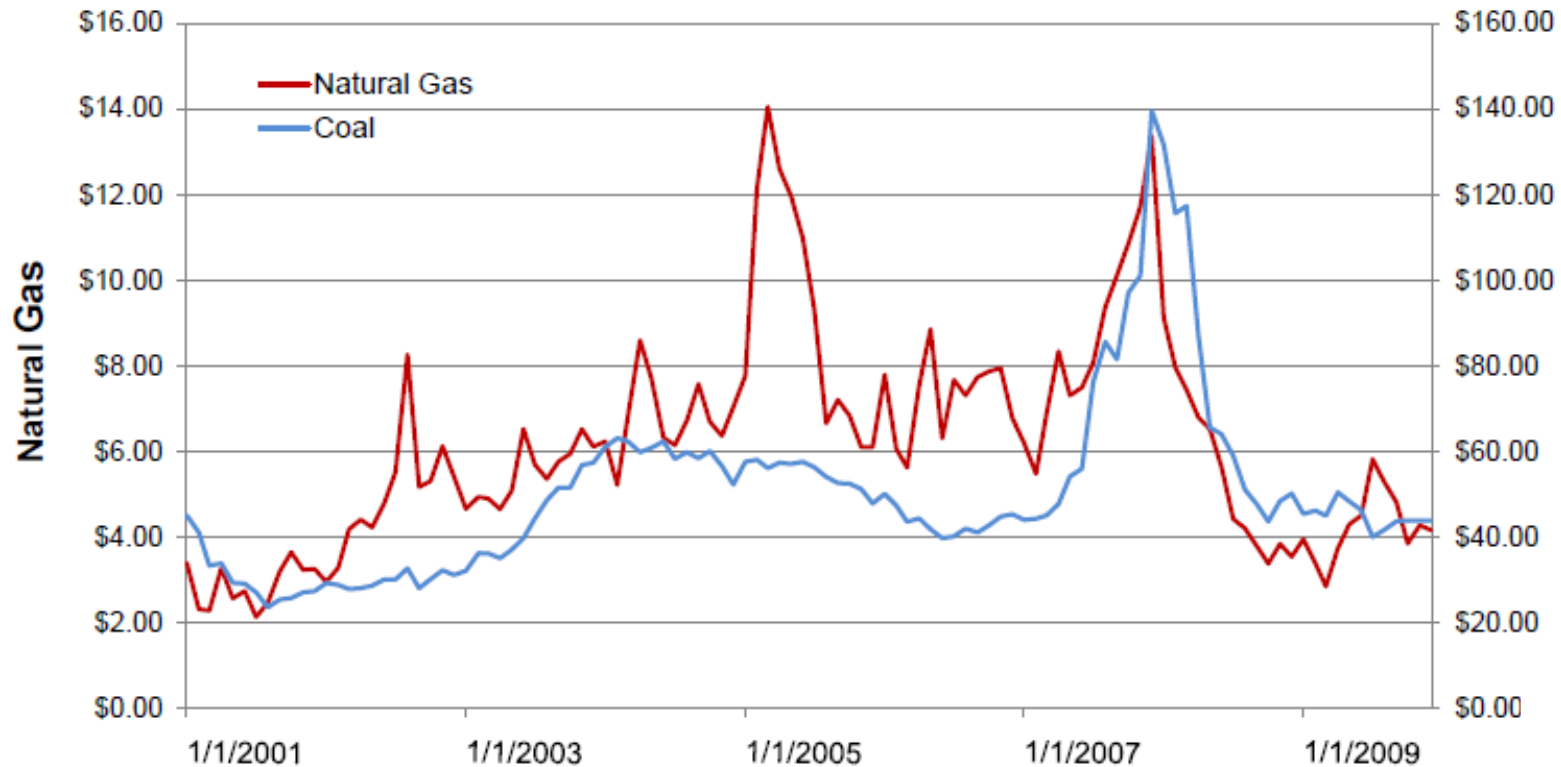
Source: EIA



Affordability of Gas



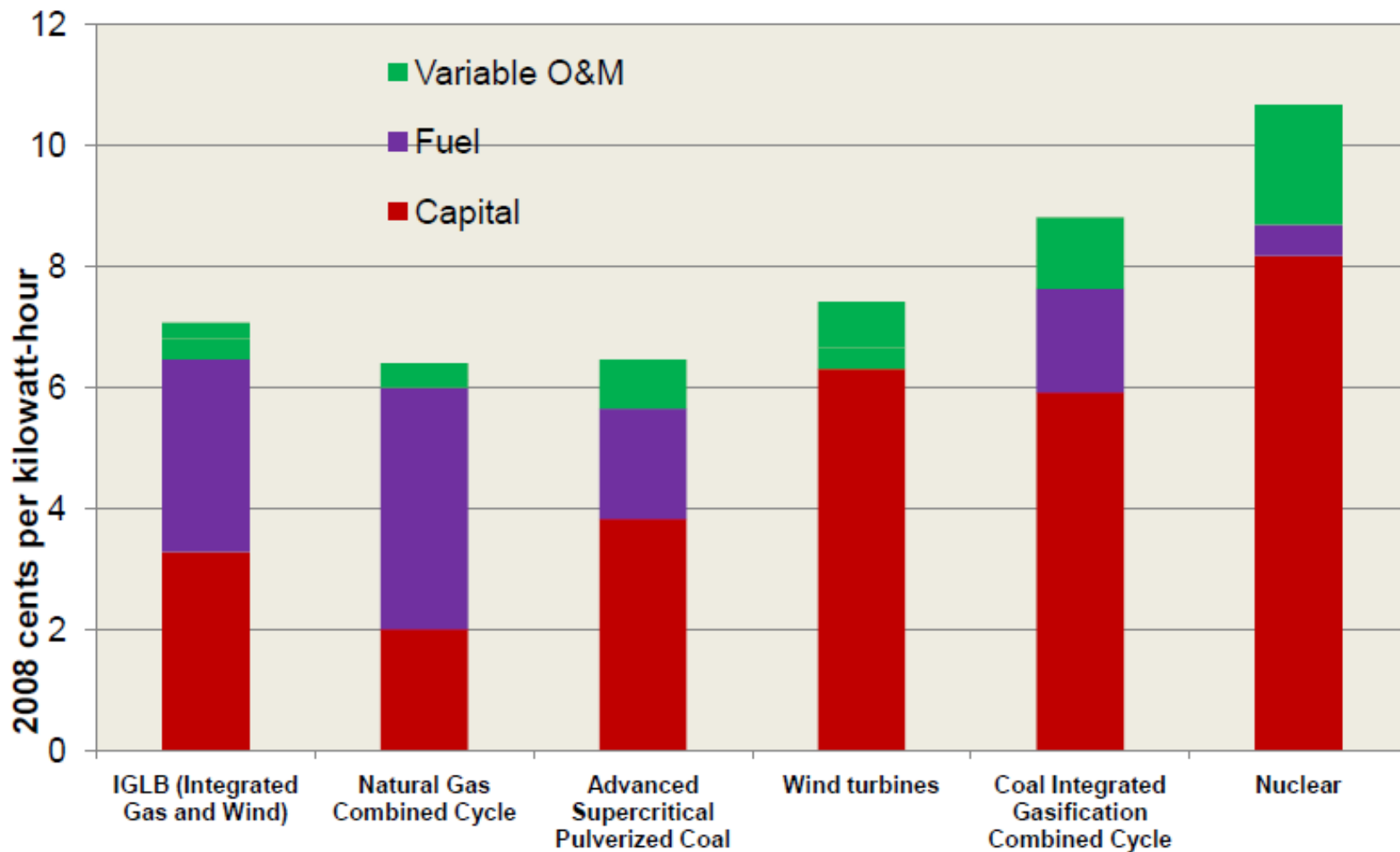
Prices of Natural Gas and Coal 2007-2009



Source: CME, NGSA



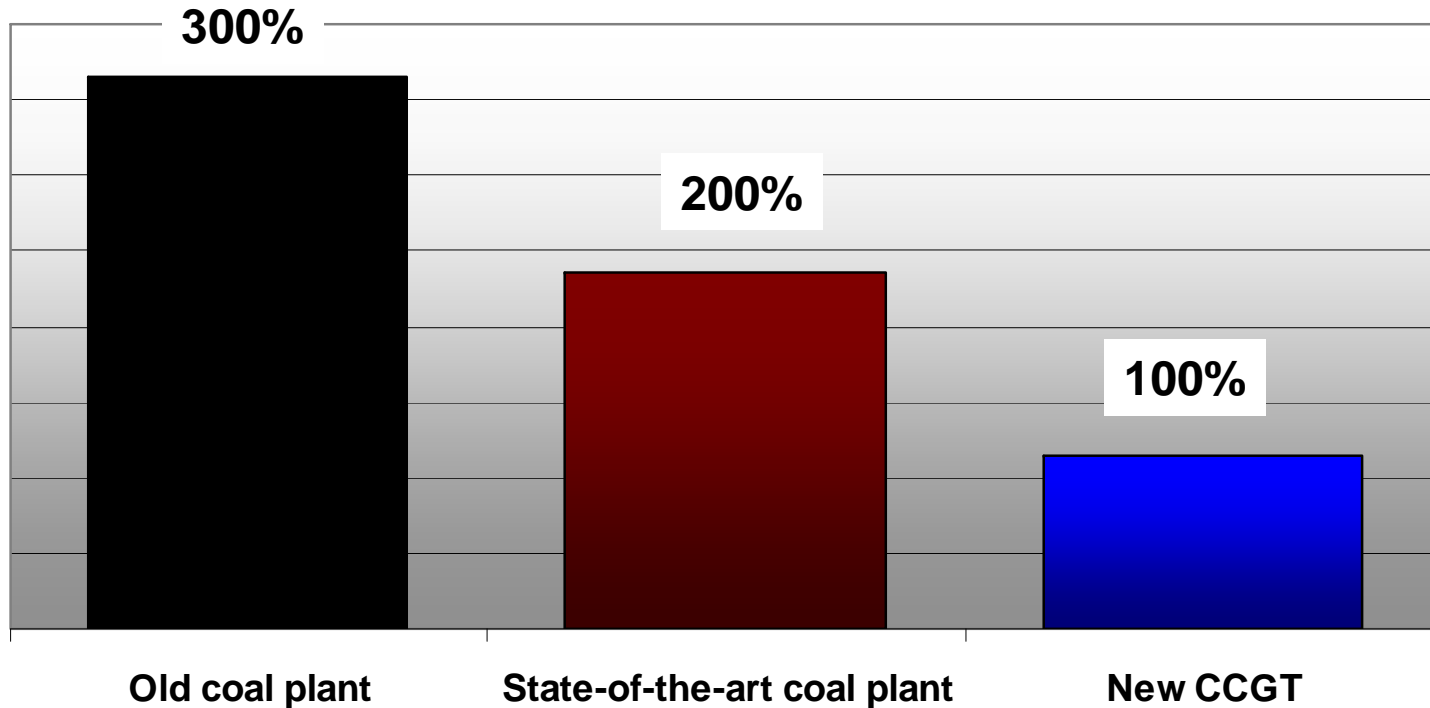
Cost of Electricity Generation



Natural gas in power generation - climate friendly

- Replace coal with gas
- GHG reduction potential

CO2 emission for different types of power generation



Source: Deutsche Bank/Statoil

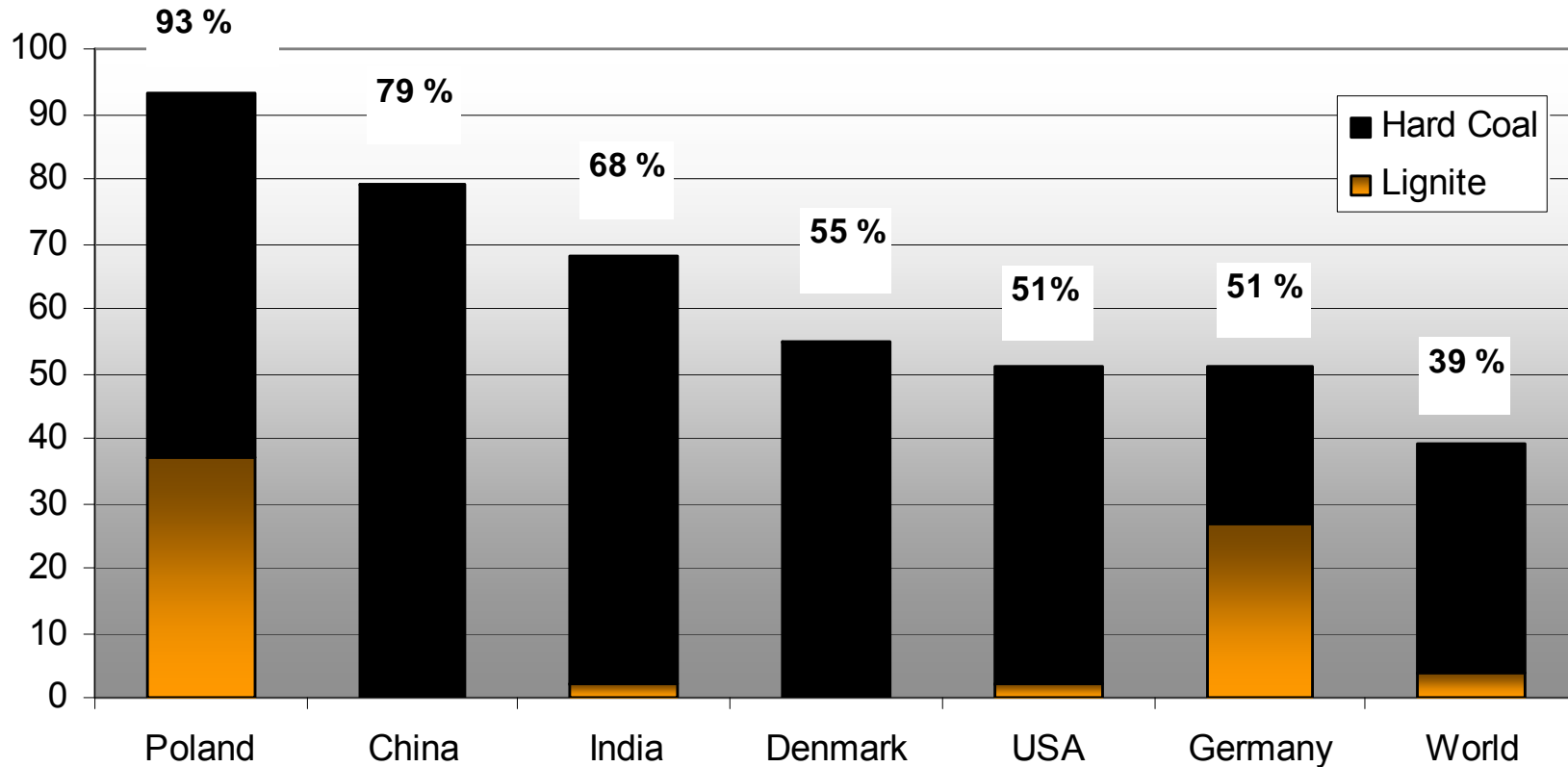


Replace coal with gas



Reduction of particles and soot

Percentage of lignite and hard coal in power generation





Natural Gas can enable renewable energy



Natural Gas - Wind - Solar

Natural gas can
facilitate production
of intermittent
renewables



An ideal combination



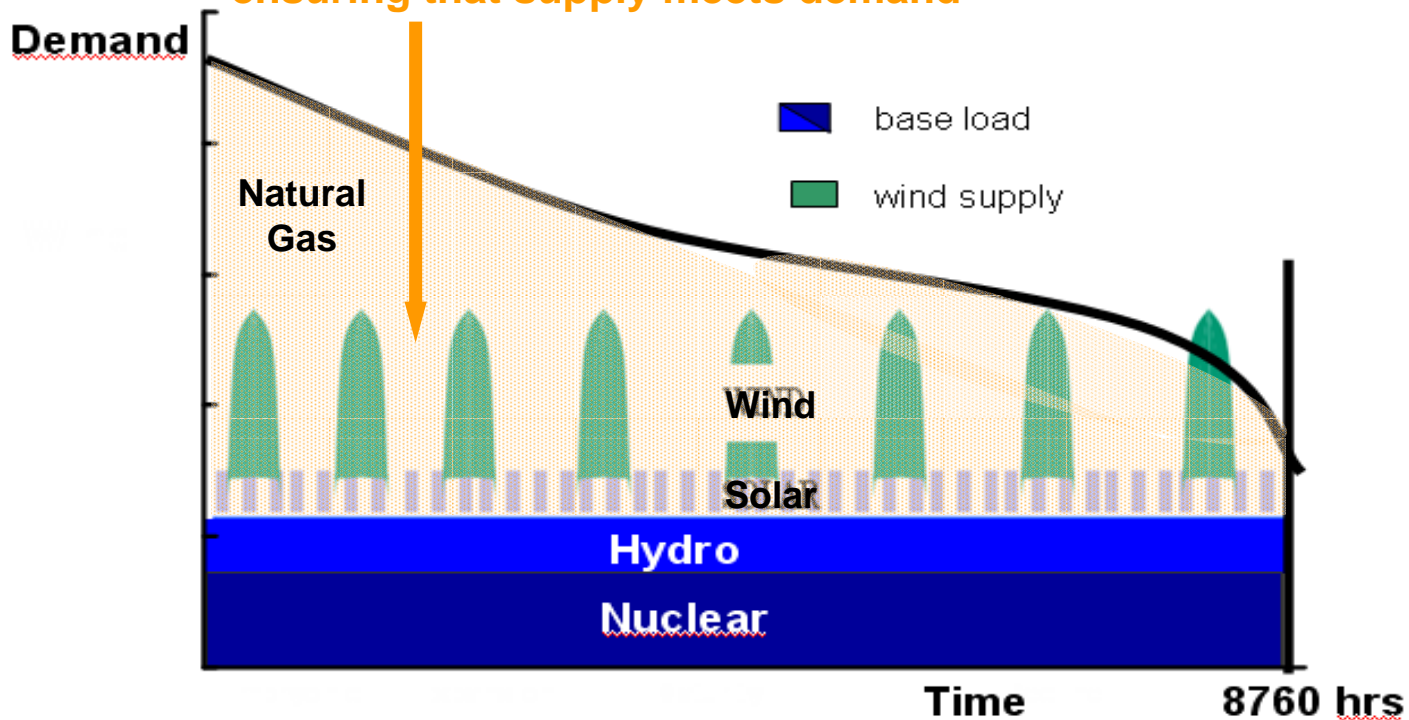
Efficient and clean partner for renewables



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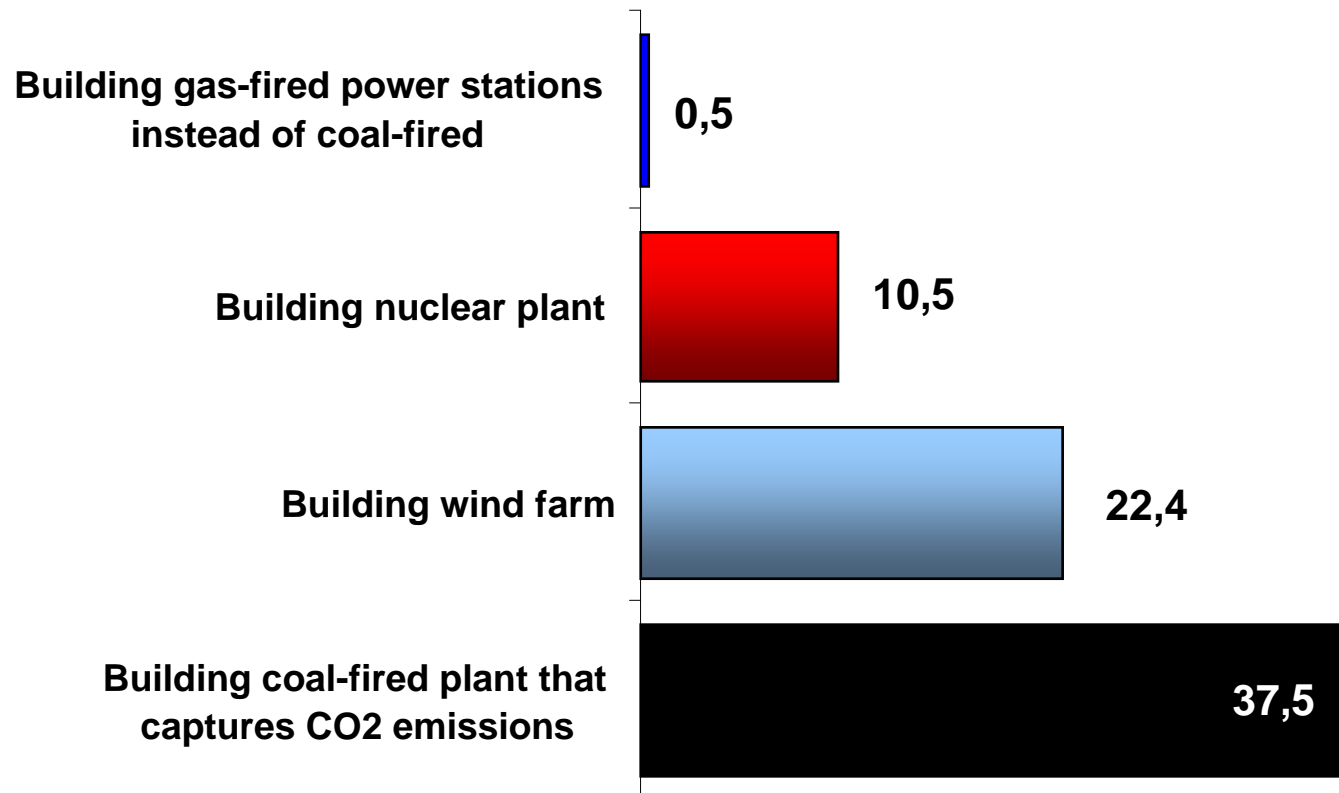
Example

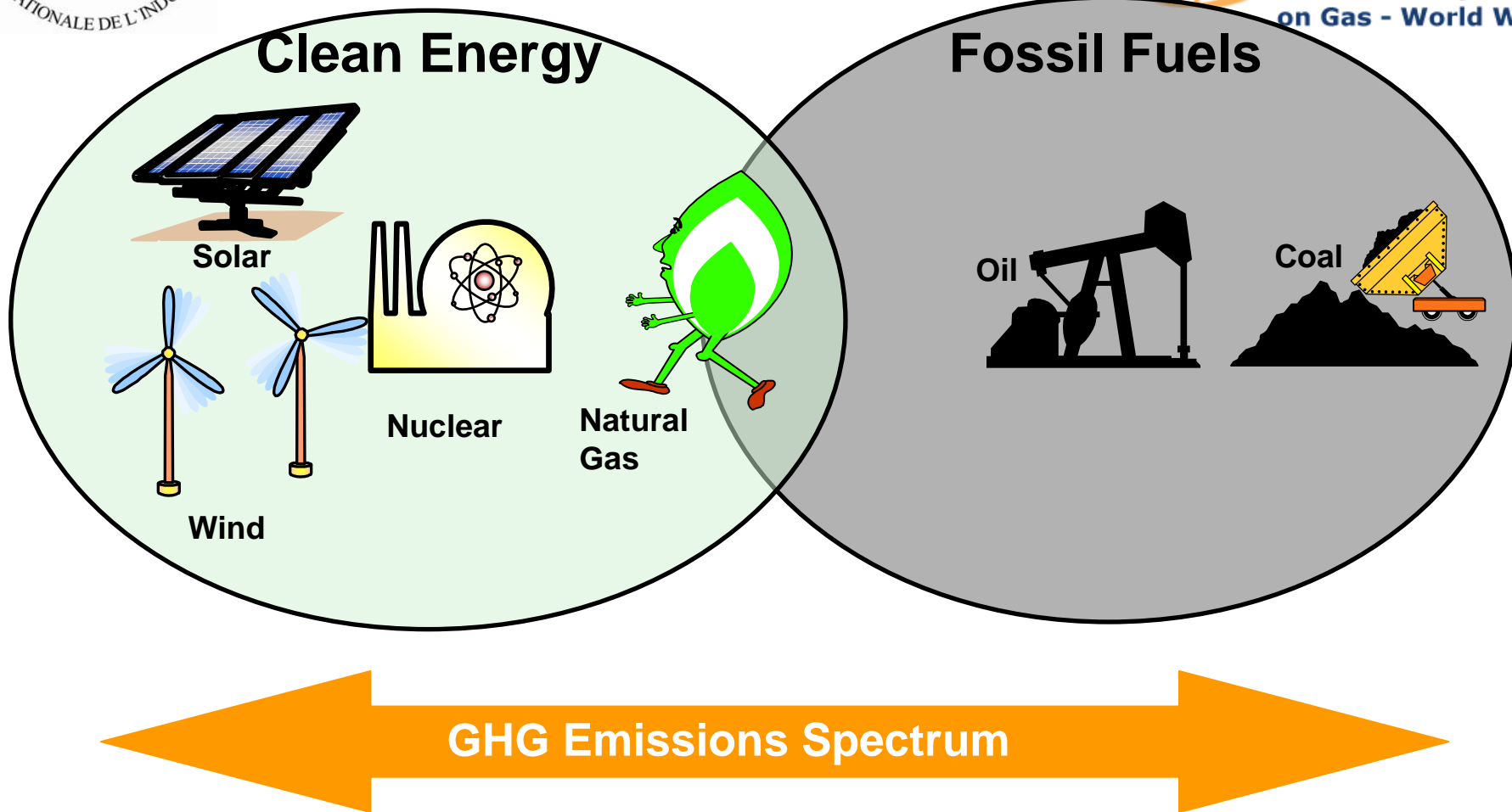
Onshore wind supplies some 2700 hrs of intermittent power backed up by 4300 hrs of gas-fired power, ensuring that supply meets demand



- Wind and solar energy is volatile.
- Gas-fired generation capacity can enable wind and solar power supplies

Cost of saving carbon emissions € per tonne of CO2 by 2030







A robust & climate-friendly energy policy



- Enhance energy efficiency and savings
- Increase the use of gas in power generation
 - Gradually replace coal with gas
- Phase in cost-effective renewable energy
- Develop Carbon Capture and Storage technology

➔ Pick the "low-hanging fruits" first!



Messages - energy policy



Policy-makers and regulators:

- Give natural gas the role it deserves in the energy future
- Give clear signals to the industry
- Gas supports employment and a sustainable economy

Gas:

Part of the long term energy solution





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