Global Vision for Gas
The Pathway towards a Sustainable Energy Future

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- Charter members 79
- Associate mbrs. 38
Growing energy demand – need for all energy sources available

Source: IEA, The Golden Age of Gas, 2011 (the GAS scenario)
Natural Gas: Addressing the World’s Challenges

Key Global Challenges
- Population Growth & Resource Availability
- Economic Development & Employment
- Energy Poverty & Public Health
- Air Quality & Climate Change
- Mobility
- Affordability

Role of Natural Gas
- Abundant
- Feedstock and employment
- Reduce smog and pollution
- Low SO\textsubscript{x}, NO\textsubscript{x} and CO\textsubscript{2}
- LNG and CNG for transport
- CCGT low cost
Global Vision for Gas

Lays out a clear pathway towards a sustainable energy future

- Abundant
- Available & Accessible
- Affordable
- Adaptable
- Acceptable:
  - Sharply reduced greenhouse gas emissions.
  - Improved air quality and public health
Conventional reserves: plenty and more to come

Growing proven reserves

Global proven gas reserves have more than doubled since 1980, reaching 190 trillion cubic metres at the beginning of 2010

Source: IEA 2011
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 conventional gas resource base is more than 400 tcm, another 400 tcm is estimated for unconventional: only 66 tcm has already been produced.

* 190 tcm in 2010
Resource Availability

What is the Global Availability of Natural Gas?
Global Natural Gas Recoverable Resources vs Demand
(Trillion Cubic Meters)

Cumulative Historic Production: 93
Proven Reserves: 187
Conventional Potential: 217
Unconventional Potential: 385
Global Natural Gas Potential: 789

Cumulative Demand 2011-2050

Annual Demand Growth at 1 Percent: 3.5 Percent

Chart does not include --
• Biogas
• Natural Gas Hydrates

Source: BP, IHS CERA, IEA.
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Natural gas can contribute to better air quality and to mitigating climate change

Natural gas is a clean-burning and low carbon fuel

Carbon Dioxide Emitted During Electricity Generation by Fuel*

NOx and SOx Content by Fuel

Ad *: Power generation efficiencies assumed: Natural gas 55%, crude oil 37%, coal 39%
Gas for pairing with renewables

Fabulous renewable resources:
- Windpower needs wind
- Solar power needs sun

Ideal pairing resource
- Gas quickly in place when sun and wind temporarily is gone
Natural gas for transportation

Natural gas is applicable for most kinds of transportation
The Pathway towards a Sustainable Future

Meeting future global energy needs whilst addressing air quality and climate change concerns

Global Emissions Trajectory Base Case

- Other
- Residential and Commercial
- Industrial
- Transport
- Power Generation

CO₂ Emissions (billion tons)

1990 2000 2010 2020 2030 2040 2050
Vision Pathway highlights various CO₂ abatement options and technology choices

Calculation for 2050

- CO₂ Emissions (billion tons)
- Reductions from Greater Gas Use
- Reductions from Other Technologies
- Reductions from Both Greater Gas Use and Other Technologies

Base Case, Reducing Demand, Coal to Gas Substitution, Oil to Gas Substitution, Transport Oil Substitution, Renewables and Nuclear, Biogas, Carbon Capture, Pathway
The Vision Pathway Trajectory

Global Emissions Reductions by Sector

CO₂ Emissions (billion tons)

- Base Case
- Power Generation
- Transport
- Industrial
- Other
- Residential and Commercial
- Pathway
The Vision Pathway Trajectory

Global Emissions Reductions by Region

CO₂ Emissions (billion tons)

Base Case
Asia Pacific
North America
Middle East
Latin America
Africa
Europe
CIS
Pathway
Requirements to realise the potential of gas / LNG for the future

Politics
- Conducive policy and regulatory framework
- Stable and predictable
- Consideration of cost of carbon

Industry
- Improve technologies used
- Establish trust with all stakeholders

All
- Realise the benefits and synergies of integrated energy concept solutions
Conclusion

5 Cornerstones of Natural Gas

Affordable
Available & Accessible
Adaptable
Acceptable
Abundant