Global Vision for Gas
The Pathway towards a Sustainable Energy Future

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- Charter members 79
- Associate members 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

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 unconventionals: only 66 tcm has already been produced.

- IEA-Golden Age of Gas 2011-

* 190 tcm in 2010
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: 789
Annual Demand Growth at 3.5 Percent: 789

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*

![Bar chart showing CO2 emissions for Natural Gas, Crude Oil, and Coal]

NOx and SOx Content by Fuel

![Bar chart showing NOx and SOx emissions for Natural Gas, Crude Oil, and Coal]

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
- Pathway

CO₂ Emissions (billion tons)
Vision Pathway highlights various CO$_2$ abatement options and technology choices

**Calculation for 2050**

- **Base Case**
- **Reducing Demand**
- **Coal to Gas Substitution**
- **Oil to Gas Substitution**
- **Transport Oil Substitution**
- **Renewables and Nuclear**
- **Biogas**
- **Carbon Capture**
- **Pathway**

**CO$_2$ Emissions (billion tons)**

- Reductions from Greater Gas Use
- Reductions from Other Technologies
- Reductions from Both Greater Gas Use and Other Technologies
Gas Market Share of Primary Energy

- Solid Waste and Biomass
- Primary Electricity
- Oil
- Coal
- Natural Gas

- 1990
- 2010
- 2035 BasePathway Case
- 2035 BasePathway Case
- 2050 BasePathway Case
- 2050 BasePathway Case
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
Global Vision for Gas: The Pathway towards a Sustainable Energy Future

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