

International Gas OCTOBER 2009
INTERNATIONAL GAS UNION

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CHANGING THE GUARD

IGU Presidency passes from
Argentina to Malaysia





LNG storage facility at the PETRONAS LNG Complex in Bintulu

Natural gas is becoming increasingly important in our daily lives. It is one of the cleanest, safest and most useful of all fossil fuels. As natural gas is an essential component of the world's supply of energy and as demand for it grows, a reliable supply is crucial.

At PETRONAS, we have developed distinctive strengths in our gas business, making us a trusted partner and reliable supplier of choice. Our proven capabilities in fully integrated liquefied natural gas (LNG) and gas processing and transmission pipeline network operations are among our strengths. Leveraging on our ability to ensure security of supply from our gas reserves and the full integration of our gas business, we are able to meet our customers' needs with a high level of reliability and flexibility.



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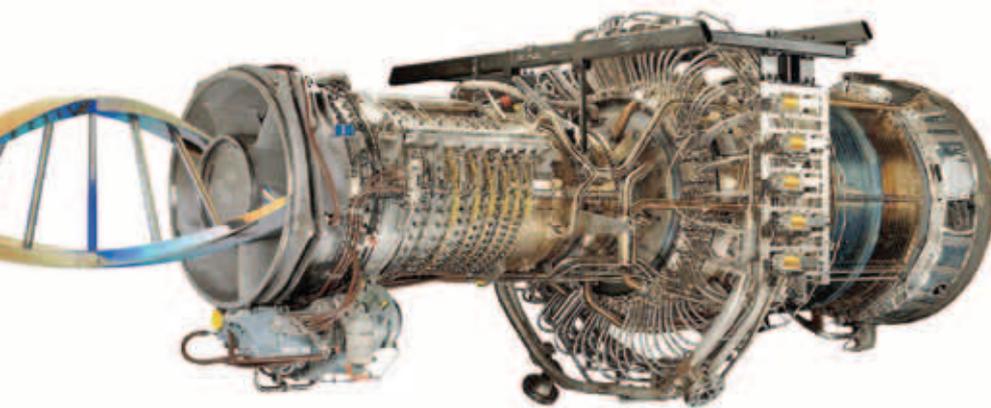
Efficiency: it's genetic

It starts with the right people and it ends with the right solution.

With over 40 years of experience, GE's Oil & Gas business is a recognized leader in turbocompression packages for large pipelines. A perfect example is the PGT25+G4 which was recently installed as the core unit driving 14 compressor stations across a 3,700-km North American mainline system. The PGT25+G4 is a two-stage, high-speed power turbine coupled with an enhanced gas generator using proven aeroderivative technology that achieves significantly higher efficiency and availability than non-aero alternatives. The unit offers 34-MW power output and 41% thermal efficiency – the highest in its class. At 6,100 RPM, it can directly drive a compressor without a gearbox in most oil and gas applications, and comes in both standard and dry-low emissions (DLE) versions.

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imagination at work

International Gas OCTOBER 2009

The IGU Magazine

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Vision, Mission and Objectives

The International Gas Union (IGU) is a worldwide, non-profit organisation promoting the progress of the gas industry. Through its many member countries representing approximately 95% of global gas sales, IGU covers all aspects of the natural gas industry.

● The Vision

Recognising that natural gas has an important part to play in satisfying the global need for an environment-friendly energy source, IGU will be the most influential, effective and independent non-profit organisation, while serving as the spokesman for the gas industry worldwide.

● The Mission

IGU will actively, directly and through its members, promote the technical and economic progress of the global gas industry.

IGU will work towards improving the competitiveness of gas in the world energy markets. By promoting the development and application of new technologies and best practices, IGU will help optimise the economics of the entire gas chain, while emphasising sound environmental performance, safety and reliability.

IGU – serving as a global information clearing house – will promote transfer of technology and know-how.

In carrying out this mission, IGU will maximise value to its members and gas customers.

● Objectives

In striving towards the vision and fulfilling the mission, IGU will regarding:

ECONOMY: Promote all activities within the entire gas chain, which can add to the technical and economic progress of gas;

CUSTOMERS: Encourage development of good customer services and customer relations;

TECHNOLOGY: Encourage research and development towards new and better technologies for the gas community;

SAFETY: Promote the safe production, transmission, distribution and utilisation of gas;

ENVIRONMENT: Encourage and promote development of clean technology, renewable energy applications and other activities, which will add to the environmental benefits of gas;

INTERNATIONAL GAS TRADE: Encourage international trade in gas by supporting non-discriminatory policies and sound contracting principles and practices;

LEGAL: Promote and contribute to the development of legislation concerning:

- the establishment of equitable, non-discriminatory and reasonable environmental and energy efficiency regulations, and
- efforts to establish appropriate and relevant international standards, as well as
- the promotion of and participation in the exchange of information relating to regulatory processes;

COOPERATION: Enhance partnership with industry and manufacturers, and cooperation with governments, policy makers and international energy related organisations, and promote the exchange of information among members in order to help them in improving the efficiency and safety of gas operations.



the eni award 2009

ideas for a brighter future

Eni has always promoted advanced scientific research, rewarding the most innovative projects and discoveries in sustainable energy. The eni award is a prestigious prize awarded once a year to researchers who stand out internationally for their work on the new frontiers of hydrocarbons, unconventional renewable energies and environmental protection. To build a better future out of today's brightest ideas.

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A natural gas partner.

BP is one of the world's largest and most experienced energy providers, and this year we celebrate our centenary. Working with our partners across the value chain we produce over 8bcfd of natural gas, and are developing new gas supplies in the Middle East, Africa, the Americas and Asia Pacific.

Expanding and investing in our global LNG business, BP is leading the new Tangguh liquefaction project in Indonesia. We are using our expertise to manage complex projects and supply chains, and are enhancing security and ensuring the flexibility our customers require.

We are an active marketer and trader in the world's most liquid markets – North America and the UK. We are also increasingly active in European and Asian markets.

Mutual advantage, experience and commercial innovation make BP a natural gas partner.



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Contents

Introduction

Vision, Mission and Objectives	4
Message from the President	10
Message from the Secretary General	14
Countries Represented in IGU	18
IGU Organisation	26
News from the Secretariat	30
From IGM to PGC E: The IGU Marketing Committee <i>By Marc Hall</i>	46
IGU's Gas Efficiency and Social Gas Awards <i>By Florijana Đedović</i>	52
News from Organisations Affiliated to IGU	56
Welcome to the 24th World Gas Conference <i>By Eduardo Ojea Quintana</i>	72
Algeria Prepares for LNG-16 <i>By Mark Blacklock</i>	76

Coordination Committee

Progress Report	81
Introduction and Key Developments	84
Reports from the Committees	88
Reports from the Task Forces	112

The New IGU Triennium

117	
Malaysia Assumes the Presidency <i>By Datuk (Dr) Abdul Rahim Hj Hashim</i>	118
The Strategic Guidelines for the Malaysian Triennium	122
The Triennial Work Programme 2009-2012 <i>By Ho Sook Wah</i>	128
The IGU Charter Member for Malaysia	131

Features

135	
LNG in 2009 – From Famine to Feast but For How Long? <i>By Andy Flower</i>	138
SIGTTO – 30 Years of Serving the Industry <i>By Andrew Murray</i>	154

LNG Carrier Fleet Surges as Trade Stagnates <i>By Mike Corkhill</i>	158
Life Cycle Assessment of the European Natural Gas Chain – A Eurogas-Marcogaz Study <i>By M. Papadopoulo, S. Kaddouh, E. Dridi- Dastrevigne, A. Cigni and D. Hec</i>	168
Research Collaboration – Meeting the Challenges Facing the Natural Gas Pipeline Industry <i>By George W. Tenley, Jr.</i>	174
Promoting Decentralised Energy in China <i>By David M. Sweet and Ju Ning</i>	180
ENE•FARM Fuel Cell Systems for Residential Use <i>By Shunichi Eguchi</i>	186
Case Studies from TF GMI: North America Gas Market Integration: Status and Steps	192
The Trans-ASEAN Gas Pipeline – Accelerating Gas Market Integration within the ASEAN Region	204
LNG Market Integration from the Asian Perspective <i>By Ryo Fukushima</i>	218
Developments on the GTL Front <i>By Mark Blacklock</i>	234
Libya's Natural Gas Potential <i>By New IGU Charter Member National Oil Corporation of Libya</i>	238
Publications and Documents Available from IGU	242
Events and Acknowledgements	244

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Unless otherwise stated, the dollar (\$) values given in this magazine refer to the US dollar.

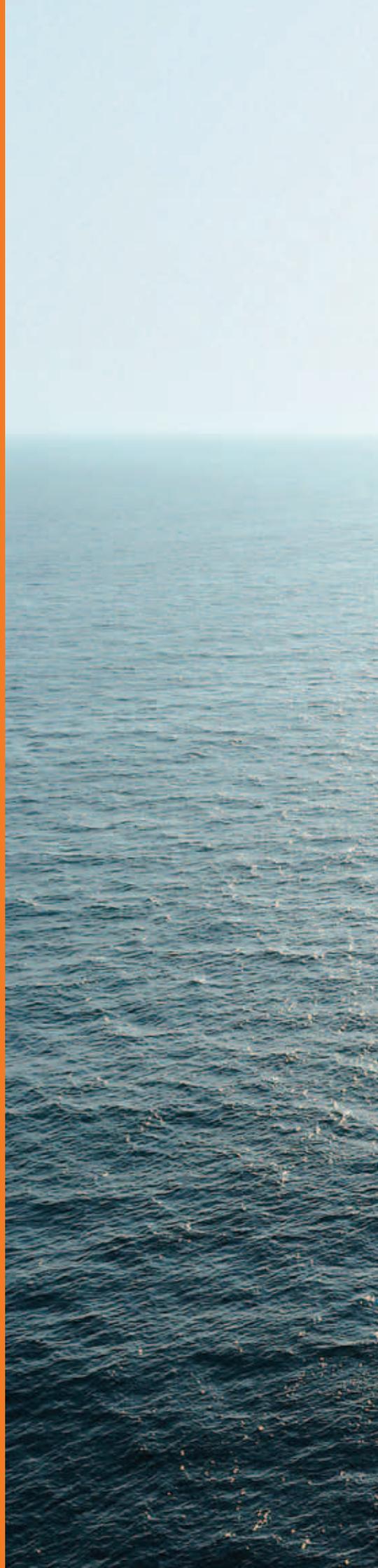
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In the energy business, strong working partnerships are the key to success. At every stage, from gas exploration to distribution, we work closely with our partners. We share with them our technical expertise, employ local people, invest in their communities and work together to find the right markets to maximise the value of our partners' natural resources. Their potential. Our expertise. It's a partnership you can rely on.

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into prosperity.**





Message from the President

Natural gas, an enabler of solutions

Dear Colleagues

I am addressing you for the last time through this message, and therefore cannot avoid experiencing a slight tinge of nostalgia while writing these lines. However, the feeling is outweighed by one of satisfaction, for several reasons I would like to share with you in the following paragraphs.

In preparation to taking over for the 2006-2009 Triennium, we were faced with the challenge of deciding the most adequate focus on which to concentrate IGU's energies during the Argentine Presidency. Given the dynamic changes and trends affecting global society in general and the gas industry in particular, we opted for a strategic standpoint, which is clearly reflected in our Triennium's theme "The Global Energy Challenge: Reviewing the Strategies of Natural Gas".

Reviewing the events of these last three years, we are satisfied to conclude that the perspective assumed proved to be very fitting indeed.

And of course, we are very pleased with the technical programme we have prepared for you during the 24th World Gas Conference in Buenos Aires.

Many of the studies conducted by the IGU Technical Committees as well as some of the Special Projects embarked upon during this Triennium have converged in a few key messages. Some of these – which will be strongly highlighted during the conference – are the following:

- The world is facing two major – and opposing – challenges: a growing demand for energy and the need to decisively curb the global warming effects associated with this demand. Natural gas is one of the key solution-enablers to address these challenges.

- To effectively set in motion a global-reaching gas expansion project an integrated approach is needed, both internally – between policy-makers and the industry – as well as between the countries that can be naturally networked by a regional gas industry.

- The world gas industry needs to promote the notions of austerity and efficiency in the use of energy. We could sum it by saying: do it less, do it efficiently and do it with natural gas.

You can find a preview of the programme in the Progress Report of the Coordination Committee, which highlights the highly productive work recently concluded by the IGU technical teams. I wish to extend my sincere appreciation to the leaders and members of these groups for the commitment they have shown throughout the Triennium.

Further, you can read directly from Datuk Rahim Hashim, who will be leading IGU after the conference, that these messages are also included in the agenda for the next Triennium.

In its role as industry spokesman, IGU has released its new Strategic Statement for 2009 which is focused on the environmental angle of sustainability, and the role, responsibilities and challenges of the gas industry as regards this highly sensitive topic. A copy of the text approved by the Executive Committee is included in this issue's news section, and two articles in the feature section – about programmes to promote decentralised energy in China and residential fuel cells in Japan – provide evidence of the value our industry can offer on this front.

Asia is also the focus of two case studies in the continuing series of contributions from the Task Force on Gas Market Integration, while other features look at the major developments seen this year in the LNG chain and the challenges facing the pipeline sector.

In IGU we share a deep satisfaction in seeing how the organisation has grown. We are

delighted to welcome an article from the National Oil Corporation of Libya, which became a Charter Member last year, and hope we may continue to expand in the African continent which has significant gas potential.

I look forward to the opportunity of personally extending our welcome to you in Buenos Aires

during the celebration of the 24th World Gas Conference, without question the greatest satisfaction of all.

Ernesto López Anadón



Ernesto López Anadón, President.



NATURAL GAS & LNG



*To supply different markets: residential, electric generation, industrial.
To meet the safety and environmental standards.*

YPF



Message from the Secretary General

Dear Reader

This edition of the Magazine will be available at the high point of the IGU cycle which is the World Gas Conference (WGC), this time taking place in Buenos Aires.

The WGC is the main arena for presenting and discussing the short- and long-term issues facing the gas industry. It also offers a unique opportunity to meet old friends and make new ones in the energy business.

A large number of experts from the IGU community will present the results and conclusions of the extensive study programme that has been carried out by the Committees and Task Forces during this Triennium. The reports will be made available to the gas community to further the technical, economic and strategic progress of the gas industry.



Torstein Indrebø, Secretary General.

The WGC also represents the transfer of the IGU Presidency from Argentina to Malaysia. IGU enters the 2009-2012 Triennium stronger than ever with an increasing number of members as



This is a crucial year in the international effort to address climate change – talks were held in June in Bonn to prepare for COP 15 at the end of the year.

the industry is experiencing substantial changes and becoming more global. The transfer takes place at a time when the global economy and financial markets are experiencing a turmoil and volatility which have not been seen since the Great Depression of the 1930s.

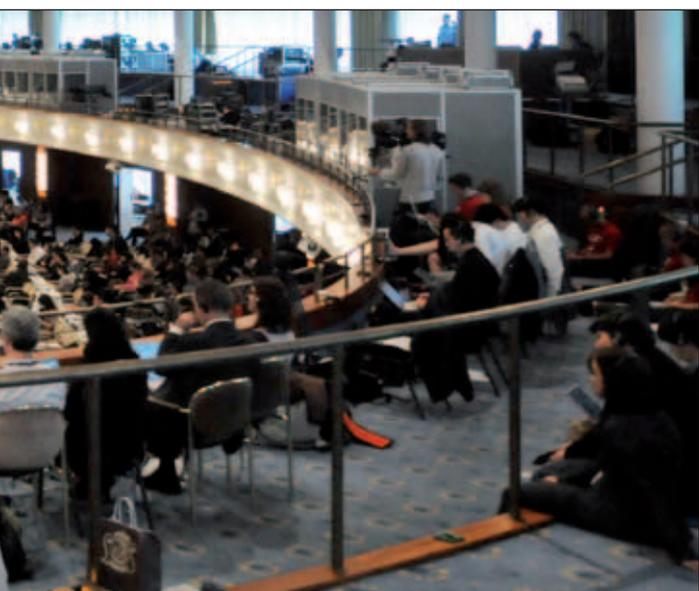
The 2009-2012 Triennial Work Programme prepared by the new Presidency will address the challenges facing our industry in the years to come. These include in addition to the global economic downturn, mitigation of climate change, security of supply and demand, globalisation of the gas markets, and securing the human resources that are required to ensure further progress of the gas industry.

IGU will address the issues in several ways through study work, conferences and seminars, by creating meeting places within the IGU community and in cooperation with related institutions like the International Energy Agency, the International Energy Forum, United Nations and others.

We have all experienced increased focus on the risk of climate change and the need for sustainability in recent years. The efforts to reduce green-



Held every three years (the picture shows delegates registering for the last WGC in Amsterdam), the WGC is the main arena for discussing issues facing the gas industry.



house gas emissions will impact our industry. IGU has therefore decided to team up with a number of partners to launch a special gas event at the UN Climate Change Conference (COP 15) in Copenhagen in December this year to inform the COP 15 delegates and decision-makers about the role of gas in the climate debate. This event is described more in detail in the Magazine.

In these times of change and on the 200th anniversary of the birth of Charles Darwin, let us remember Darwin's conclusion: "It is not the strongest of the species that survive, nor the most intelligent, but the ones most responsive to change".

The gas industry has a long history of successful adaptation to the changes taking place.

Torstein Indrebø

Energy to go even further

Petrobras has entered the international market for liquefied gas (LNG) with the installation of the first two LNG regasification terminals in Brazil – one in Ceará, the other in Rio de Janeiro. Using an innovative technology LNG is transferred from the supplying vessel to a gasifier vessel by means of cryogenic arms. These ships are the first to supply and regasify LNG, which is pumped to the network of gas pipelines by pressurized natural gas arms. Which means more energy to fuel Brazil's growth.





Guanabara Bay Terminal - Rio de Janeiro - Brazil.

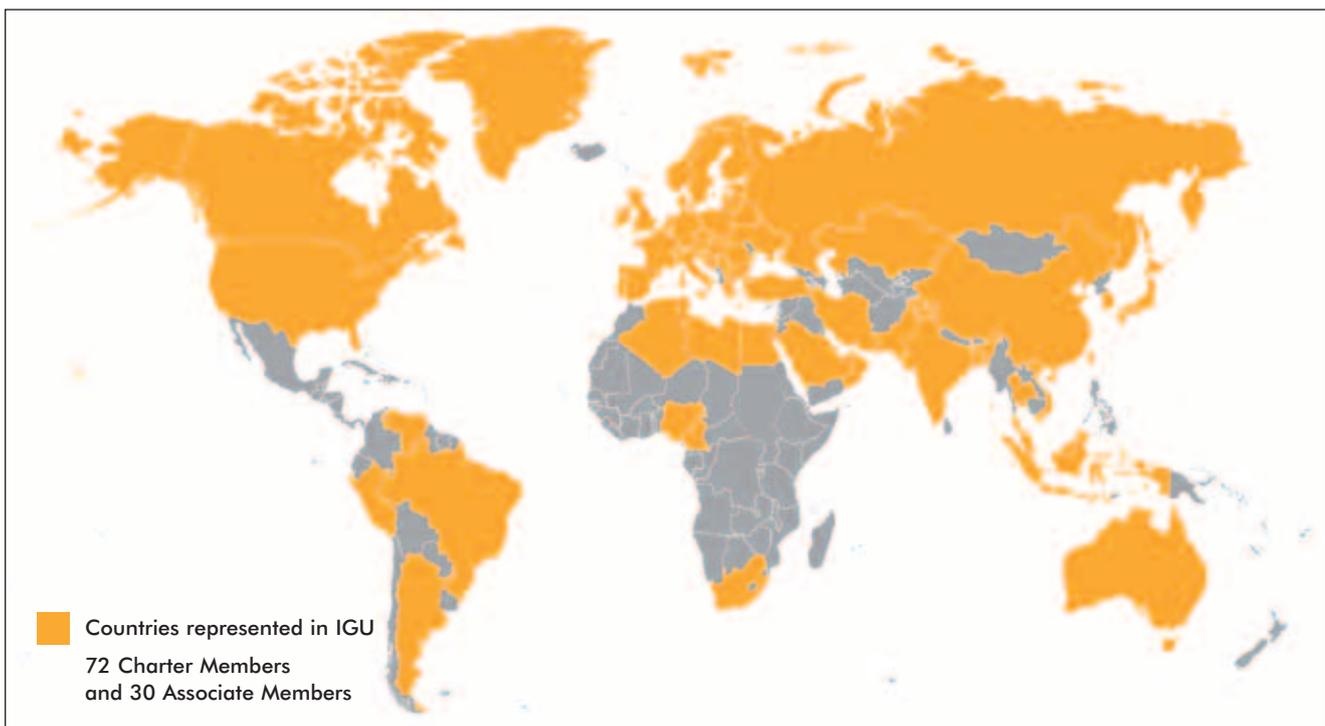


PETROBRAS



Countries Represented in IGU

Algeria	Estonia	Lithuania	Slovak Republic
Argentina	Finland	Macedonia	Slovenia
Australia	France	Malaysia	South Africa
Austria	Germany	Monaco	Spain
Bangladesh	Greece	Netherlands, The	Sweden
Belarus, Republic of	Hong Kong, China	Nigeria	Switzerland
Belgium	Hungary	Norway	Taiwan, China
Bosnia and Herzegovina	India	Oman, Sultanate of	Thailand
Brazil	Indonesia	Pakistan	Trinidad and Tobago
Brunei	Iran	Peru	Tunisia
Bulgaria	Ireland	Poland	Turkey
Cameroon	Israel	Portugal	Ukraine
Canada	Italy	Qatar	United Arab Emirates
China, People's Republic of	Japan	Romania	United Kingdom
Croatia	Kazakhstan	Russia, Federation of	United States of America
Czech Republic	Korea, Republic of	Saudi Arabia	Venezuela
Denmark	Latvia	Serbia	Vietnam
Egypt	Libya	Singapore	



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to live our way.
Let's give our energy
to let her live her way.

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Association Algérienne de
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Argentina
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del Gas

Australia
Australian Gas Industry Trust
c/o Energy Networks Association

Austria
Österreichische Vereinigung für
das Gas- und Wasserfach
(ÖVGW)

Bangladesh
Petrobangla (Bangladesh
Oil, Gas & Mineral Corporation)

Belarus, Republic of
Beltransgas

Belgium
Association Royale des Gaziers
Belges

Bosnia and Herzegovina
Gas Association of Bosnia and
Herzegovina

Brazil
Associação Brasileira das
Empresas Distribuidoras de Gás
Canalizado (ABEGAS)

Brunei
Brunei Energy Association

Bulgaria
Overgas Inc.

Cameroon
Société Nationale des
Hydrocarbures

Canada
Canadian Gas Association

China, People's Republic of
China City Gas Society

Croatia
Croatian Gas Association
c/o INA-Naftaplín

Czech Republic
Czech Gas Association

Denmark
Dansk Gas Forening – Danish
Gas Association

Egypt
Egyptian Gas Association

Estonia
Estonian Gas Association

Eurogas

Finland
The Finnish Natural Gas
Association

France
Association Française du Gaz
(AFG)

Germany
Deutsche Vereinigung des Gas-
und Wasserfaches e.V. (DVGW)

Greece
Public Gas Corporation of
Greece (DEPA) S.A.

Hong Kong, China
The Hong Kong & China Gas
Co. Ltd

Hungary
Association of Gas Distribution
Companies

India
Gas Authority of India Ltd (GAIL)

Indonesia
Indonesian Gas Association
(IGA)

Iran
National Iranian Gas Company
(NIGC)

Ireland
Irish Gas Association – Bord
Gais Eireann

Israel
The Israel Institute of Petroleum
& Energy

Italy
Comitato Italiano Gas (CIG)

Japan
The Japan Gas Association

Kazakhstan
KazTransGas

Korea, Republic of
Korea Gas Union

Latvia
JSC Latvijas Gāze

Libya
National Oil Corporation of
Libya

Lithuania
Lithuanian Gas Association

Macedonia
Macedonian Gas Association

Malaysia
Malaysian Gas Association
c/o Petronas

Monaco
Société Monégasque de
l'Électricité et du Gaz (SMEG)

Netherlands, The
Koninklijke Vereniging van
Gasfabrikanten in Nederland
(KVGN)

Nigeria
Nigerian Gas Association
c/o Nigeria LNG Ltd

Norway
Norwegian Petroleum Society
(NPF) – Norwegian Gas
Association

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Oman LNG L.L.C.

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This year we are proud to celebrate the 40th anniversary of our establishment. As a pioneer in the industry with a confirmed track record of reliability and operational excellence, Brunei LNG is a proven LNG player and we are ready for more business.



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<p><i>Portugal</i> GDP – Gás de Portugal, SGPS, S.A.</p>	<p><i>South Africa</i> CEF Ltd</p>	<p><i>Tunisia</i> Association Tunisienne du Pétrole et du Gaz (ATPG) c/o ETAP</p>
<p><i>Qatar</i> Qatar Liquefied Gas Company Ltd (Qatargas)</p>	<p><i>Spain</i> Spanish Gas Association – Asociación Española del Gas (SEDIGAS)</p>	<p><i>Turkey</i> BOTAŞ</p>
<p><i>Romania</i> S.N.G.N. Romgaz S. A.</p>	<p><i>Sweden</i> Svenska Gasföreningen – Swedish Gas Association</p>	<p><i>Ukraine</i> Naftogaz of Ukraine NJSC</p>
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<p><i>Singapore</i> Power Gas Ltd</p>	<p><i>Trinidad and Tobago</i> The National Gas Company of</p>	<p><i>Venezuela</i> Petróleos de Venezuela S.A. (PDVSA)</p>
<p><i>Slovak Republic</i> Slovak Gas & Oil Association</p>		<p><i>Vietnam</i> Vietnam Oil and Gas Group (PetroVietnam)</p>



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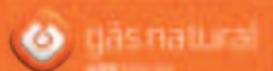
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Société Anonyme Suisse pour le Gaz Naturel
Società Anonima Svizzera per il Gas Naturale



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Galp Energia is the leading seller of Natural Gas in Portugal and one of the main energy players in the Iberian Peninsula. To keep growing is our goal, it is our nature.





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GDF SUEZ (France)	TOTAL S.A. (France)
IGDAŞ – Istanbul Gas Distribution Co. (Turkey)	Unión Fenosa Gas (Spain)
Indian Oil Corporation Ltd (India)	Union of Independent Gas Producers (Russia)
Instituto Brasileiro de Petróleo, Gás e Biocombustíveis – IBP (Brazil)	
Interstate Natural Gas Association of America (USA)	

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European Gas Research Group (GERG)	Marcogaz
Gas Infrastructure Europe (GIE)	National Gas Vehicle Association of Russia (NGVRUS)
International Association for Natural Gas Vehicles (IANGV) including its regional affiliates	Pipeline Research Council International, Inc. (PRCI)
IGU Research Conference Foundation	

How green is gas?



Demand for energy is continuing to rise, together with demand for renewable energy solutions. Natural gas plays a crucial role in meeting this requirement. It is the cleanest fossil fuel and has the lowest emissions of CO₂ (greenhouse gases). Moreover, we can always rely on gas, anywhere and at all times, partly due to our advanced gas transport network. This flexible, tried and tested energy base gives innovations the opportunity to grow. For example, in the form of micro-combined heat and power units or gas-powered cars. We are also working on ways to further 'green' gas through the application of biogas, which is derived from renewable residual gas flows. With our extensive knowledge of transport, we can also ensure that CO₂ is removed to storage sites rather than released into the atmosphere.

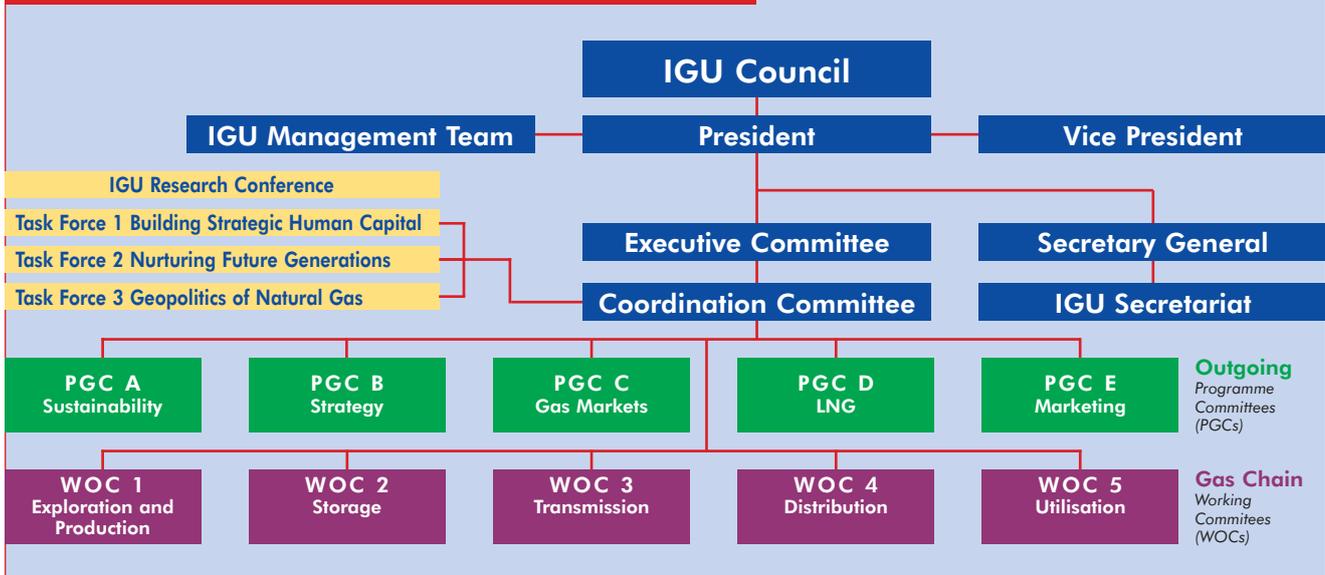
gasunie

takes gas transport further

Together we can create a greener future



IGU Organisation 2009–2012



LEFT

This photograph was taken at the Executive Committee (EXC) meeting in London, UK, in June.

From left to right in each row starting at the front are:

Gordon Davies (President of the meeting host IGEM and not a member of the EXC), Ieda Correia Gomes, Datuk (Dr) Abdul Rahim Hj Hashim;

Daniel Paccoud, Robert J. Harris, Ernesto López Anadón;

Evgeni Riazantsev, Hae-jung Oh, George H. B. Verberg;

David N. Parker, Yves Tournié, Seiichi Uchino (who was substituting for Kunihiro Mori), Torstein Indrebø (who attended as Secretary General and is not a member of the EXC);

Miloš Kebrdle (who was substituting for Tomáš Tichý), Klaus Homann, Peter I. Hinstrup;

John Williams (CEO of IGEM), Ho Sook Wah, João Carlos de Luca;

Jan Rune Schøpp, Domenico Dispenza, Antoni Peris Mingot.

Wan Zulkiflee Wan Ariffin's substitute Zenorai Rambli missed the photo session, while Otto Musilek and Chawki Mohamed Rahal could neither attend the meeting nor send a substitute.

IGU MANAGEMENT TEAM



Mr Ernesto López Anadón



Datuk (Dr) Abdul Rahim Hj Hashim



Mr George H. B. Verberg



Mr Jérôme Ferrier



Mr Roberto D. Brandt



Mr Ho Sook Wah



Mr Georges Liens



Mr Torstein Indrebø

The triennial World Gas Conference marks the changing of the guard at IGU. Under the current Argentine Presidency the six members of the Management Team are:

Mr Ernesto López Anadón, IGU President (Argentina)
 Datuk (Dr) Abdul Rahim Hj Hashim, IGU Vice President (Malaysia)
 Mr George H. B. Verberg, Immediate Past President (The Netherlands)
 Mr Roberto D. Brandt, Chairman of IGU Coordination Committee (Argentina)
 Mr Ho Sook Wah, Vice Chairman of IGU Coordination Committee (Malaysia)
 Mr Torstein Indrebø, Secretary General

When Malaysia assumes the Presidency at the close of the 24th WGC the Management Team will comprise:

Datuk (Dr) Abdul Rahim Hj Hashim, IGU President (Malaysia)
 Mr Jérôme Ferrier, IGU Vice President (France)
 Mr Ernesto López Anadón, Immediate Past President (Argentina)
 Mr Ho Sook Wah, Chairman of IGU Coordination Committee (Malaysia)
 Mr Georges Liens, Vice Chairman of IGU Coordination Committee (France)
 Mr Torstein Indrebø, Secretary General



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