

International Gas Union 1931-2012

Commemorating more than 80 years of service to the
global gas industry and 25 World Gas Conferences



INTERNATIONAL GAS UNION
UNION INTERNATIONALE DU GAZ





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The International Gas Union

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. IGU is registered in Vevey, Switzerland and the Secretariat is currently located in Oslo, Norway until November 1, 2016.

Vision

IGU shall be the most influential, effective and independent non-profit organisation serving as the spokesperson for the gas industry worldwide.

Mission

- IGU will advocate for natural gas as an integral part of a sustainable global energy system.
- IGU will promote the political, technical and economic progress of the global gas industry, directly and through its members and in collaboration with other multilateral organisations.
- IGU will work to improve the competitiveness of gas in the world energy markets by

promoting the development and application of new technologies and best practices, while emphasising sound environmental performance, safety and efficiency across the entire value chain.

- IGU will support and facilitate the global transfer of technology and know-how.
- IGU will maximise the value of its services to members and other stakeholders.

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

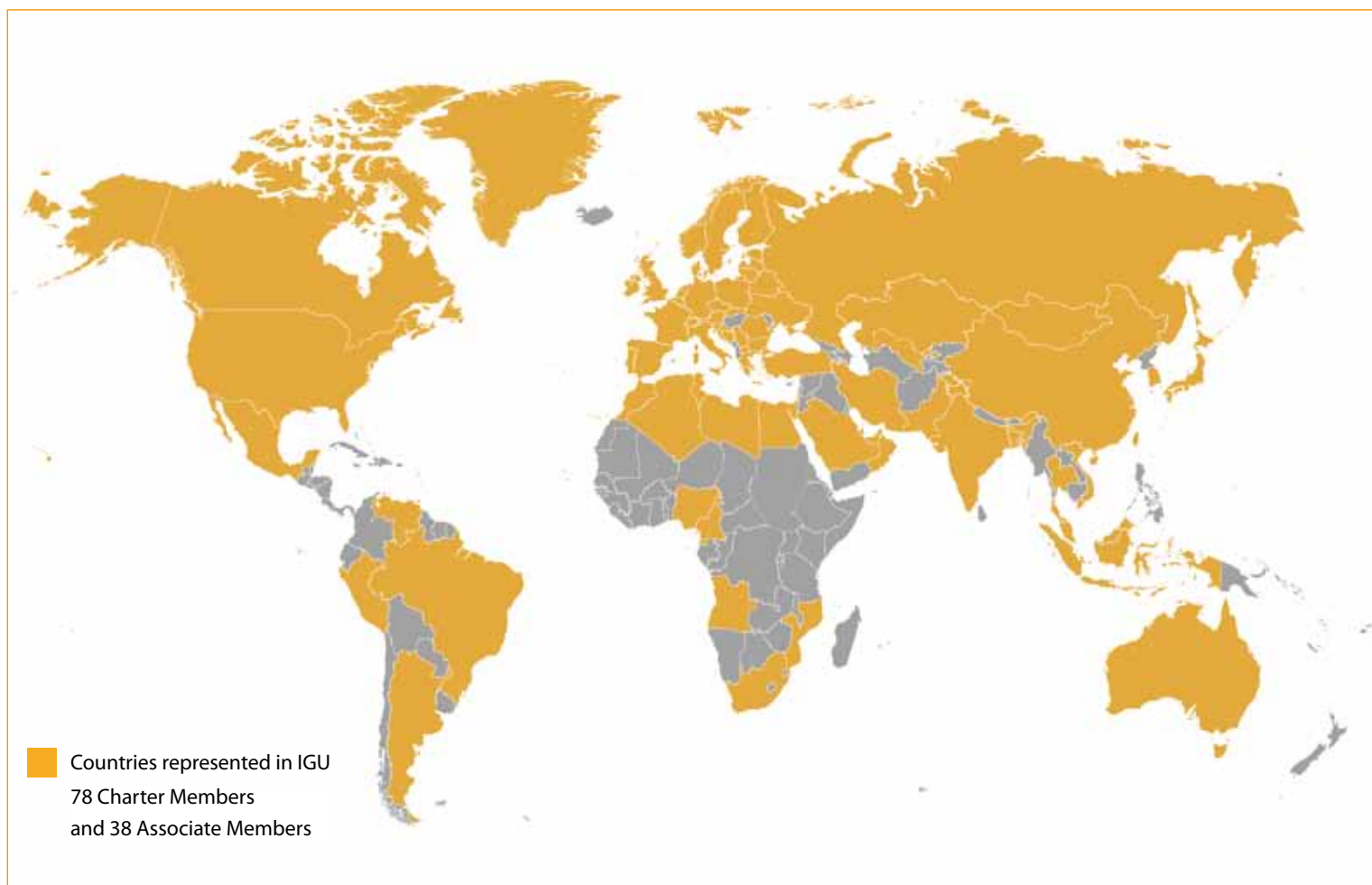
energy applications and other activities, which will add to the environmental benefits of gas;

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, policymakers 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.



Countries represented in IGU

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

Charter Members

<i>Algeria</i> Association Algérienne de l'Industrie du Gaz – AIG	<i>France</i> Association Française du Gaz (AFG)	<i>Mozambique</i> Empresa Nacional de Hidrocarbonetos, E.P. (ENH)	<i>Switzerland</i> Schweizerische Aktiengesellschaft für Erdgas (SWISSGAS)
<i>Angola</i> Sonangol Gás Natural	<i>Germany</i> Deutsche Vereinigung des Gas- und Wasserfaches e.V. (DVGW)	<i>Netherlands, The</i> Royal Dutch Gas Association – Koninklijke Vereniging van Gasfabrikanten in Nederland (KVGN)	<i>Taiwan, China</i> The Gas Association of the Republic of China, Taipei
<i>Argentina</i> Instituto Argentino del Petróleo y del Gas	<i>Greece</i> Public Gas Corporation of Greece (DEPA) S.A.	<i>Nigeria</i> Nigerian Gas Association c/o Nigeria LNG Ltd	<i>Thailand</i> PTT Public Company Ltd
<i>Australia</i> Australian Gas Industry Trust	<i>Hong Kong, China</i> The Hong Kong & China Gas Co. Ltd	<i>Norway</i> Norwegian Petroleum Society (NPF) – Norwegian Gas Association	<i>Timor-Leste</i> Secretariat of State for Natural Resources (Government of the Democratic Republic of Timor-Leste)
<i>Austria</i> Österreichische Vereinigung für das Gas- und Wasserfach (ÖVGW)	<i>India</i> Gas Authority of India Ltd (GAIL)	<i>Oman, Sultanate of</i> Oman LNG L.L.C.	<i>Trinidad and Tobago</i> The National Gas Company of Trinidad and Tobago Ltd
<i>Belarus, Republic of</i> Beltransgas	<i>Indonesia</i> Indonesian Gas Association (IGA)	<i>Pakistan</i> Petroleum Institute of Pakistan	<i>Tunisia</i> Association Tunisienne du Pétrole et du Gaz (ATPG) c/o ETAP
<i>Belgium</i> Association Royale des Gaziers Belges	<i>Iran</i> National Iranian Gas Company (NIGC)	<i>Peru</i> Perúpetro S.A.	<i>Turkey</i> BOTAS
<i>Bosnia and Herzegovina</i> Gas Association of Bosnia and Herzegovina	<i>Ireland</i> Irish Gas Association – Bord Gais Eireann	<i>Poland</i> Polskie Zrzeszenie Inżynierów i Techników Sanitarnych (PZITS) – Polish Gas Association	<i>Ukraine</i> Naftogaz of Ukraine
<i>Brazil</i> Associação Brasileira das Empresas Distribuidoras de Gás Canalizado (ABEGAS)	<i>Israel</i> The Israel Institute of Petroleum & Energy	<i>Portugal</i> Associação Portuguesa das Empresas de Gás Natural	<i>United Arab Emirates</i> Abu Dhabi Liquefaction Company Ltd (ADGAS)
<i>Brunei</i> Brunei Energy Association	<i>Italy</i> Comitato Italiano Gas (CIG)	<i>Qatar</i> Qatar Liquefied Gas Company Ltd (Qatargas)	<i>United Kingdom</i> The Institution of Gas Engineers and Managers
<i>Bulgaria</i> Overgas Inc.	<i>Japan</i> The Japan Gas Association	<i>Romania</i> S.N.G.N. Romgaz S.A.	<i>United States of America</i> American Gas Association
<i>Cameroon</i> Société Nationale des Hydrocarbures	<i>Kazakhstan</i> KazTransGas JSC	<i>Russian Federation</i> OAO Gazprom	<i>Uzbekistan</i> Uzbekneftgaz (UNG)
<i>Canada</i> Canadian Gas Association	<i>Korea, Republic of</i> Korea Gas Union	<i>Saudi Arabia</i> Saudi Aramco	<i>Venezuela</i> Petróleos de Venezuela S.A. (PDVSA)
<i>China, People's Republic of</i> China Gas Society	<i>Latvia</i> JSC Latvijas Gāze	<i>Serbia</i> Gas Association of Serbia	<i>Vietnam</i> Vietnam Oil and Gas Group (PetroVietnam)
<i>Croatia</i> Croatian Gas Association	<i>Libya</i> National Oil Corporation	<i>Singapore</i> Power Gas Ltd	
<i>Czech Republic</i> Czech Gas Association	<i>Lithuania</i> Lithuanian Gas Association	<i>Slovak Republic</i> Slovak Gas & Oil Association	
<i>Denmark</i> Dansk Gas Forening – Danish Gas Association	<i>Macedonia</i> Macedonian Gas Association	<i>Slovenia</i> Geoplin d.o.o. Ljubljana	
<i>Egypt</i> Egyptian Gas Association	<i>Malaysia</i> Malaysian Gas Association (MGA)	<i>South Africa</i> CEF (Pty) Ltd	
<i>Equatorial Guinea</i> Sociedad Nacional de Gas G.E.	<i>Mexico</i> Asociación Mexicana de Gas Natural, A.C.	<i>Spain</i> Spanish Gas Association – Asociación Española del Gas (SEDIGAS)	
<i>Estonia</i> Estonian Gas Association	<i>Monaco</i> Société Monégasque de l'Électricité et du Gaz (SMEG)	<i>Sweden</i> Swedish Gas Association – Energigas Sverige	
<i>Eurogas</i>	<i>Mongolia</i> Baganuur Joint Stock Company		
<i>Finland</i> Finnish Gas Association	<i>Morocco</i> Fédération de l'Énergie de la Confédération Générale des Entreprises du Maroc (CGEM)		

Associate Members

Australian Petroleum Production & Exploration
 Association – APPEA (Australia)
 Bayerngas (Germany)
 BG Group plc (United Kingdom)
 BP Gas, Power & Renewables (United Kingdom)
 Bursagaz (Turkey)
 Cheniere Energy Inc. (USA)
 Chevron Corp. (USA)
 China National Petroleum Corporation (China)
 ConocoPhillips Company (USA)
 DanaGas (UAE)
 Det Norske Veritas (Norway)
 E.ON Ruhrgas AG (Germany)
 ExxonMobil Gas & Power Marketing (USA)
 Gaslink – Gas System Operator Ltd (Ireland)

GasTerra (The Netherlands)
 GAZBIR – Association of Natural Gas Distributors of
 Turkey
 GDF SUEZ (France)
 İGDAŞ – Istanbul Gas Distribution Co. (Turkey)
 Indian Oil Corporation Ltd (India)
 Instituto Brasileiro de Petróleo, Gás e
 Biocombustíveis – IBP (Brazil)
 KEMA Nederland BV (The Netherlands)
 Liander (The Netherlands)
 N.V. Nederlandse Gasunie (The Netherlands)
 OMV Gas & Power (Austria)
 Origin Energy Limited (Australia)
 Petróleo Brasileiro S.A. – Petrobras (Brazil)
 Russian Gas Society (Russia)

RWE Deutschland AG (Germany)
 Shell Gas & Power International B.V. (The Netherlands)
 Société Suisse de l'Industrie du Gaz et des Eaux –
 SSIGE/SVGW (Switzerland)
 Sonorgás (Portugal)
 Spetsneftegaz NPO JSC (Russia)
 Taqa Arab Company for Energy (Egypt)
 TBG – Transportadora Brasileira Gasoduto Bolívia-
 Brasil S/A (Brazil)
 TOTAL S.A. (France)
 Vopak LNG Holding B.V. (The Netherlands)
 Wintershall (Germany)
 Woodside (Australia)

Organisations affiliated to IGU

Energy Delta Institute (EDI)
 Gas Infrastructure Europe (GIE)
 Gas Technology Institute (GTI)
 GERG – Groupe Européen de
 Recherches Gazières/European Gas
 Research Group
 GIIIGNL – Groupe International des
 Importateurs de Gaz Naturel Liquéfié/
 International Group of LNG Importers
 International Pipeline & Offshore
 Contractors Association (IPLOCA)
 Marcogaz
 NGV Global (International Association
 for Natural Gas Vehicles)
 Pipeline Research Council
 International, Inc. (PRCI)
 Russian National Gas Vehicle
 Association (NGVRUS)



The staff of the IGU Secretariat:
(from left to right in the front row)

Hans Riddervold, Director; Torstein Indrebø,
 Secretary General; Sjur Bøyum, Communication
 Manager & Webmaster;

(from left to right in the back row)

Ksenia Gladkova and Carolin Oebel, Advisors to the
 Secretary General; Silje Storsul, Administrative
 Assistant; Mats Fredriksson, Senior Advisor to
 the Secretary General.



Presidents of IGU since 1931

<i>From/to</i>	<i>President, country</i>	<i>From/to</i>	<i>President, country</i>	<i>From/to</i>	<i>President, country</i>
For the duration of the 1st International Gas Conference in June 1931	Harold E. Copp (UK)	1955-1958	Mario Boselli (Italy)	1985-1988	John Kean (USA)
1931-1934	Fritz Escher (Switzerland)	1958-1961	Bengt M. Nilsson (Sweden)	1988-1991	Herbert Richter (East Germany)
1934-1937	Auguste Baril (France)	1961-1964	Jacob van Dam van Isselt (The Netherlands)	1991-1994	Luigi Meanti (Italy)
1937-1940	Hermann Müller (Germany)	1964-1967	Georg Düwel (West Germany)	1994-1997	Hans Jørgen Rasmusen (Denmark)
1940-1946	During WWII IGU was dormant	1967-1970	Alexei I. Sorokin (USSR)	1997-2000	Claude Détourné (France)
1946-1949	Cyril M. Croft (UK)	1970-1973	Georges H. Robert (France)	2000-2003	Hiroshi Urano (Japan)
1949-1952	Marcel Brabant (Belgium)	1973-1976	Leslie J. Clark (UK)	2003-2006	George H. B. Verberg (The Netherlands)
1952-1955	Robert W. Hendee (USA)	1976-1979	James W. Kerr (Canada)	2006-2009	Ernesto López Anadón (Argentina)
		1979-1982	Eric A. Giorgis (Switzerland)	2009-2012	Datuk (Dr) Abdul Rahim Hashim (Malaysia)
		1982-1985	Christoph A. Brecht (West Germany)	2012-2015	Jérôme Ferrier (France)

IGU Secretaries General since 1931

<i>From/to</i>	<i>Secretary General</i>	<i>Country hosting the Secretariat</i>
1931 – 1937	Pierre Mougín	France
1937 – 1949	Hermann Zollikofer	Switzerland
1949 – 1970	Raoul H. Touwaide	Belgium
1970 – 1979	Albert G. Higgins	UK
1979 – 1988	Bernard Goudal	France
1988 – 1994	Jean-Pierre Lauper	Switzerland
1994 – 2000	John F. Meeder	The Netherlands
2000 – 2007	Peter K. Storm	Denmark
2007 – 2016	Torstein Indrebø	Norway

The World Gas Conferences*

<i>Conference</i>	<i>Date</i>	<i>Venue</i>	<i>Total attendance</i>
1st	June 2, 1931	London	28**
2nd	September 2-4, 1934	Zurich	495
3rd	June 12-16, 1937	Paris	697
WORLD WAR II	–	–	–
4th	June 15-17, 1949	London	667
5th	June 16-19, 1952	Brussels	666
6th	September 27-30, 1955	New York	271
7th	September 25-28, 1958	Rome	847
8th	June 27-30, 1961	Stockholm	945
9th	September 1-4, 1964	Scheveningen	1,500
10th	June 6-10, 1967	Hamburg	2,250
11th	June 9-12, 1970	Moscow	3,100
12th	June 4-6, 1973	Nice	2,800
13th	June 7-11, 1976	London	2,800
14th	May 27-June 1, 1979	Toronto	2,300
15th	June 14-18, 1982	Lausanne	3,000
16th	June 24-27, 1985	Munich	3,600
17th	June 6-10, 1988	Washington	3,800
18th	July 8-12, 1991	Berlin	4,300
19th	June 6-9, 1994	Milan	5,300
20th	June 10-13, 1997	Copenhagen	4,600
21st	June 6-9, 2000	Nice	4,600
22nd	June 1-5, 2003	Tokyo	5,200
23rd	June 6-9, 2006	Amsterdam	3,900
24th	October 5-9, 2009	Buenos Aires	3,500
25th	June 4-8, 2012	Kuala Lumpur	
26th	June 1-5, 2015	Paris	

* From 1931 to 1970 International Gas Conferences were held. The event was renamed World Gas Conference with effect from 1973.

** The figure is for overseas delegates only. The 1st International Gas Conference formed part of the 68th AGM of the Institution of Gas Engineers, which was attended by some 1,500 people in total.

The IGU logo

IGU's first logo was commissioned by the German Presidency for the 10th International Gas Conference in Hamburg in June 1967. The job was given to a staff member of the Hamburg Gas Company, who designed a lower case "g" with a grid representing the world and two flames. The Council was impressed and adopted the logo for general IGU use. It went on to serve for four decades.

The name "International Gas Union" generally appeared alongside the logo, but not as part of it, and from 1975 the words "A Worldwide Organisation" were added where appropriate (e.g. on letterheads and other documents). In 2005, the logo was revised by including the name in English and French in a circle around it and adding a 3D effect.

In 2011, a new logo was commissioned as part of an initiative to improve communications with stakeholders outside the gas industry, among others policymakers, international organisations and environ-

mental groups. It will be officially launched at the 25th World Gas Conference in June 2012.

Design concept

The new logo retains some elements from the old one such as the colour blue and dual language text, while enhancing the name of the Union and using the three initials, IGU. It signals a new chapter in the history of IGU reflecting the dynamic, forward looking and global organisation it has become.

The new logo is meant to:

- Be simple and clean
- Have a clear readable font
- Have some similarity to the existing logo to aid in the transition
- Be reproducible and legible in many sizes and in multiple media
- Be usable with or without text
- Be timeless
- Reflect IGU core values through the utilisation of blue and green colours

- Unify IGU members through a common identity

The new logo represents the blue flame of burning gas while use of the green colour conveys the environmental-friendly properties of gas. Green is the dominant colour for communication related to sustainable development and environment. The blue colour, beyond representing natural gas, is an important communication colour creating security and confidence. The light blue hue gives the impression of new energy and an innovative spirit.

The transparency of the overlapping flames illustrates the integration of the IGU vision and offers a more dynamic impression. The visibility of IGU has been enhanced by clearly putting the letters "IGU" as the main element of the logo. The logo is designed to transmit energy, environmental qualities, stability, credibility and an international dimension.

Changing and promoting the new logo will be a crucial part of the re-branding of IGU as the proactive spokesperson for the gas industry.



▲
IGU's original logo was launched in 1967.



▲
The logo was revised in 2005.



▲
The new logo will be officially launched at the 25th World Gas Conference.

Message from the President



In June 2011, the International Gas Union celebrated its 80th anniversary, a significant milestone for what began as a grouping of national gas associations from Europe and North America and has developed into an organisation with a truly global reach. Indeed, the history of IGU has been tied closely to the evolution of the role of gas.

Back in 1931, the gas industry was based mainly on manufactured gas, its use having expanded over the previous century from lighting to heating, cooking and manufacturing processes. Each city had its own gas works and local distribution network. But that year saw the opening of the first long-distance gas pipeline in the USA, bringing natural gas from the Texas panhandle to Chicago and heralding a period of major change for the industry.

This gathered pace in the second half of the 20th century as reserves of natural gas were discovered around the world and infrastructure was built to carry the gas to market. In addition to new national and international pipelines, liquefaction was introduced to transport gas by sea and underground storage was developed. Ultimately, the industry switched completely to

natural gas which was then regarded as the global, flexible fuel meeting about 20% of global energy needs. As the industry expanded, IGU's membership grew beyond Europe and North America to include other continents.

By the turn of the century, gas was taken almost for granted. At the same time, there was heightened concern about the environment and the effects of CO₂ emissions from extensive use of fossil fuels. This led to a shift of focus to renewables and other forms of clean energy including nuclear. Natural gas was relegated to the background and was regarded as a "fuel without a voice", despite all its credentials as a clean, efficient, reliable and abundant energy source.

During the Malaysian Presidency of IGU, we started a major initiative to advocate for the natural gas industry. This came about as a result of the recognition that the natural gas industry throughout the world needs a stronger voice and a more coherent message if it is to play a major role in the low-carbon future. Although natural gas has significant advantages as a preferred fuel in the context of a low-carbon economy, its attributes are not well understood

and appreciated, especially among policy- and decision-makers.

As the spokesman for the natural gas industry, IGU has an important role to play in spearheading the industry's effort to rebrand itself and make a stronger case for gas to policymakers, politicians and other stakeholders. This effort has achieved a high degree of success and there is now a greater awareness and recognition of the role of gas in achieving a low-carbon energy future.

Moving forward, we believe natural gas has a bright future in meeting the world's expanding energy needs while mitigating the effects of climate change in an increasingly carbon-constrained world. However, to sustain the availability of natural gas, we need continued innovation and investment in technology and human capital.

Finally, Malaysia is proud to be the host of the 25th World Gas Conference in Kuala Lumpur, June 4-8, 2012, another significant milestone as we celebrate the Silver Jubilee of the largest gas event in the world.

*Datuk (Dr) Abdul Rahim Hashim
President, International Gas Union*

Message from the Secretary General



As we entered the new millennium, there were growing expectations for the natural gas industry. Coal had been the fuel of the 19th century, oil dominated the 20th century, and now it would be the turn of gas.

However, although within the industry we were well aware of the potential and the challenges, policymakers and the public were starting to take gas for granted. Special interest groups were also lobbying, and gas risked being pushed out of the picture through over-enthusiasm for renewable energy at any price.

Social, technical and economic changes during the last decade have had far-reaching effects on the energy market. Concerns grew about “resource nationalism”, security of supply and volatility of gas prices. In climate change discussions, world leaders sought a global agreement on a low-carbon economy. Then the 2008 economic crisis in OECD countries led to falls in GDP and lower energy demand. Global gas demand recovered, with Asian markets leading the way, while there was a surge in LNG supply and an astonishing increase in shale gas

production in the USA. But economic and political uncertainties remain.

The gas industry is a long-term international business, and IGU members need to continue investing in production, transportation and marketing of gas throughout each economic cycle if gas is to make its full contribution to the global energy mix.

A new external focus – gas advocacy

The IGU vision includes being “the most influential, effective and independent non-profit organisation, while serving as the spokesperson for the gas industry worldwide”. Given the global background that I have described, we decided that the International Gas Union should make a new effort to reach stakeholders outside the industry. We needed clear messages about natural gas and what the industry can do to satisfy growing energy demand in a world concerned about climate change and obtaining secure energy supplies.

The IGU Secretariat has expanded in recent years and we now have seven staff members based in the Oslo office hosted by Statoil AS.

But the gas industry’s biggest resource is the collective action of IGU members. Our initiatives in the Secretariat aim to provide the coordination and tools to enable effective advocacy by our membership throughout the world. A prime example is the gas advocacy toolkit on the IGU website.

Members can download presentations about gas from for their own use, tailoring the message to their particular circumstances, but always based on the same foundations, facts and figures. The application might vary for different countries around the world, but in each case gas “CARES”, being a Clean, Affordable, Reliable, Efficient and Secure energy source. Natural gas has a vital role to play in a sustainable energy future.

Energy politics

Energy is a political issue and, with the large investments required to link gas producing and consuming countries, the natural gas industry faces an increasingly complex geopolitical environment. The involvement of high-level politicians can be crucial to establish fair

IGU organises side events at the annual UN Climate Change Conferences. At the 2010 event speakers included Dr Kandeh Yumkella, Director General of UNIDO and a member of IGU's Wise Persons Group.



regional policies and advance international projects.

The outstandingly successful Ministerial Gas Forums have enabled us to take the first steps in developing a shared understanding of the political and business challenges we face.

The 1st IEF-IGU Ministerial Gas Forum took place on November 24, 2008 in Vienna, Austria, at a time when companies were reviewing their investment budgets following the sudden downturn in global demand. Ministers and high-level executives from gas producing and consuming countries discussed the challenges facing regional developments and the globalisation of the gas market. A major challenge was, and continues to be, raising finance: expanding the gas market around the world will require hundreds of billions of dollars to be invested every year.

I believe that this 1st IEF-IGU Ministerial Gas Forum started a global dialogue between natural gas producing and consuming countries in a way that will help share understanding and ensure that there are no undue political barriers to investment.

The 2nd IEF-IGU Ministerial Gas Forum was held in Doha, Qatar on November 30, 2010, and considered "The Role of Natural Gas in a Sustainable Energy Future". This further

important step to strengthen the global dialogue between natural gas producing and consuming countries showed that a bigger role for natural gas could help meet political and economic objectives in an efficient way. I was particularly pleased that everyone appreciated our message that "natural gas is an essential part of the global solution to climate change".

A fuel with a voice

During the last few years, we have taken on board the concern that natural gas has been neglected in the wider policy discussion about energy. To some we were even perceived as a fuel without a voice! We have taken the initiative to remedy this, but more needs to be done to ensure that the views of the gas industry on economic and climate change issues that are closely linked to energy are given greater weight by the most influential institutions and forums dealing with energy policy, such as the International Energy Agency, United Nations and World Bank.

IGU has enhanced its involvement in the annual UN Climate Change Conference, an arena which has seen intensive lobbying by other fuels. Firstly, we targeted COP 15 in Copenhagen in December 2009, where IGU

organised a side event highlighting the role of natural gas in facilitating a low-carbon economy. This was well received, but with limited attendance. To make a greater impact we decided to organise a follow-up event at COP 16 in Cancún, in cooperation with the Worldwatch Institute. This event provided a clear focus on how the gas industry can contribute to reaching targets for greenhouse gas emissions, and helped others understand the importance of some recent developments in the gas industry. Most recently, we organised a symposium at COP 17 in Durban in December 2011. Videos of the event are available on the IGU website.

International issues in a global market

Climate change is an on-going issue, but there are other events that are shaping energy policy and affecting IGU members. The fact is that many of the developed gas markets have declining indigenous production, at least from conventional gas reserves, while many of the nations with large gas production potential would require large investments not only to develop their reserves, but also to transport the gas to the markets of consuming countries. Trust and confidence are needed between the parties so that consumers have security of supply and producers have security of demand.

The price of gas varies throughout the world, while the different market structures – ranging from national gas companies to fully liberalised competitive markets – mean that there are different price formation mechanisms. However, despite the absence of a global gas market, we certainly have very strong interactions that drive the economics of the gas business throughout the world. Trade in LNG continues to grow and to increase the economic links between the regional gas markets of the world. Indeed, the shale gas "revolution" in the USA has led to a big increase in local gas production with the result that there is less need for imports and many LNG cargoes have been diverted to Asia or Europe.



The wider impact of the tsunami of March 2011 that led to the disaster at the Fukushima nuclear plant in Japan is another example of how events can cause a shift in energy policy. The expected nuclear revival in Europe was suddenly put into reverse with Germany announcing the closure of all its nuclear plants. Suddenly politicians were looking at gas again – they were starting to see that natural gas could be the flexible, efficient, low-carbon fuel that we should rely on for the future.

Increased IGU membership and value for members

During the last decade IGU membership has doubled, reaching 116 by early 2012. Today, our 78 Charter Members cover more than 95% of the global gas market, both in terms of production and consumption.

In response to companies who wished to participate directly in IGU activities, rather than through their country's Charter Member, we introduced the category of Associate Member in 2003. This has proved to be popular, and a wide variety of local and global companies with different interests in all parts of the gas chain have applied for Associate Membership since then.

The IGU Presidency rotates every three years. Argentina handed over to Malaysia in October 2009 and in June, at the end of the 25th World Gas Conference, Malaysia will hand over to France. Working closely with the IGU Presidency is an essential feature of the Secretariat's role. Together we are continuously striving to improve the value of IGU membership and looking for ways to focus on what will benefit members. Some of the initiatives we carry out in the Secretariat include:

- Maintaining and updating the IGU website, including the new knowledge database that is available to all members;
- Issuing publications and papers on topics of special interest;
- Speaking at members' conferences and energy events in addition to the work the Presidency does in this area;
- Presenting IGU to stakeholders outside the gas industry;
- The Secretariat has lead responsibility for the Sustainability Development Work Group which carries out work advocating natural gas, making available reports and presentations in formats which are easily

adapted for local use (e.g. on the sustainable properties of natural gas);

- IGU's World Gas Conference has its own National Organising Committee, but IGU has secretariat functions for other global events such as the LNG Conference and Exhibition (which is a joint event with GTI and IIR).

And of course there are also the events that I have already mentioned, like the IGU Ministerial Gas Forum and the Gas Symposium that has now become an established event during the UN Climate Change Conferences.

Looking ahead

The challenge for the future is to upgrade our activities in a dynamic but uncertain world.

Our focus will be to help promote a shared understanding of the challenges and benefits of increasing the efficient use of natural gas throughout the world. I believe that will be worthwhile not only for our members, but for their customers too, and indeed for the benefit of all mankind.

Torstein Indrebø

Secretary General, International Gas Union



◀ The IGU Secretariat moved from Denmark to Norway in 2007, under the Argentine Presidency. IGU President Ernesto López Anadón visited a few months later when Oslofjord was covered by ice and snow. It was hard to convince him that there was a fjord view from our offices with only snow and ice in sight!



◀ In October 2009, Malaysia took over the Presidency and IGU President Datuk Abdul Rahim Hashim (second right) and Coordination Committee Chairman Ho Sook Wah (third right) visited us in the winter of 2010. We dressed them up in cross-country ski outfits, and with Director Hans Riddervold (far right) as the instructor, they both experienced Nordic skiing for the first time. The IGU Presidents must master all climate zones of the world!

IGU's Triennial Work Programme

The professional work of IGU is carried out in triennial cycles culminating in the World Gas Conference. For each Triennium, the Presidency sets a theme and Strategic Guidelines that provide the framework upon which the Triennial Work Programme (TWP) is developed. The TWP is managed by the Coordination Committee and implemented by standing technical committees and ad hoc task forces. Members serve on a voluntary basis and benefit from gaining access to an international knowledge-base and a network of contacts. During the 2009-12 Triennium under the Malaysian Presidency, over 900 people from more than 50 countries joined the committees and task forces, setting a new record.

The theme for the Malaysian Presidency is "Gas: Sustaining Future Global Growth". Natural gas is the cleanest and most efficient of the fossil fuels and plays a vital role in meeting the world's expanding energy needs. But the growth of the industry must be sustainable and the four Strategic Guidelines are to:

- Enhance the role of gas for sustainable development, balancing the needs of all stakeholders;
- Improve availability of gas and access to markets;
- Maximise efficiency throughout the gas value chain; and
- Ensure adequate human capacity to enable the growth and integrity of the industry.

Committees

Over the years, the committee structure has changed in response to the changing demands of the gas industry. There are currently five Working Committees (WOCs) dedicated to the gas chain and five Programme Committees (PGCs) which cover other technical, economic and policy issues. A sixth PGC will operate with effect from the 2012-15 Triennium under the French Presidency.

Each committee is chaired by a Charter Member who also provides secretarial services, while the Vice Chair comes from the Charter Member who will take over the

chairmanship in the next Triennium. Study groups are set up within each committee to deal with specific topics. The committees usually meet twice a year and the results of their work are presented during the World Gas Conference.

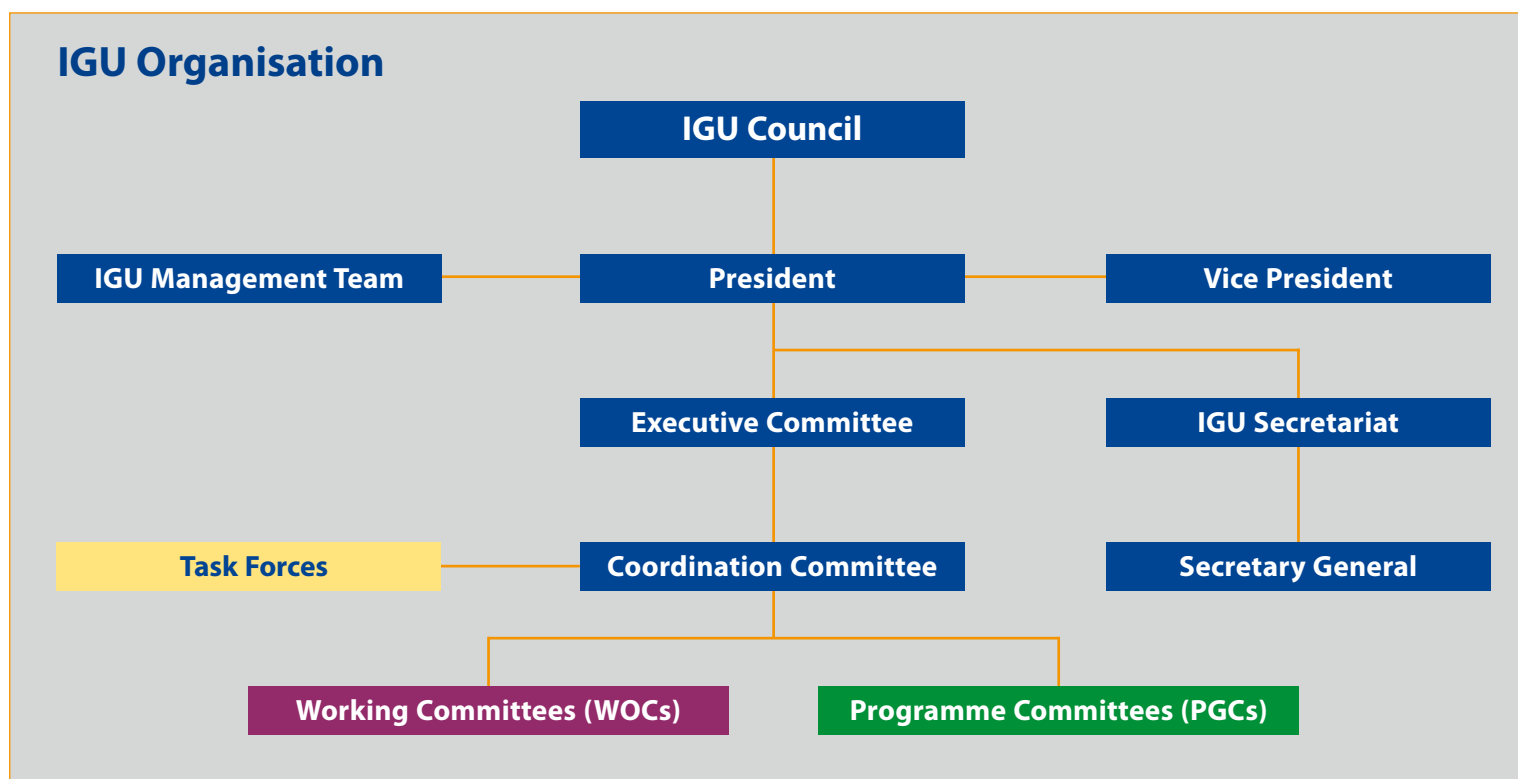
Task forces

Task forces are set up to address concerns that emerge when developing plans for the Triennium and that do not come under the direct remit of a standing committee. Under the Malaysian Presidency, two task forces have been looking at different aspects of the human resource challenge, and one has been examining the influence of geopolitics in the evolution of the gas industry. The incoming French Presidency will have one task force looking at human resources, one at geopolitics and one at gas advocacy.

Collaboration

In carrying out the TWP, IGU collaborates with a wide range of other international energy organisations. These include EDI, GIE, GTI, GERG,

IGU Organisation



Leadership of the Technical Committees

Committee		Chair 2009-12	Chair 2012-15
WOC 1	Exploration & Production	Algeria	Brazil
WOC 2	Storage	France	Slovak Republic
WOC 3	Transmission	The Netherlands	Argentina
WOC 4	Distribution	Italy	Germany
WOC 5	Utilisation	Japan	Russia
PGC A	Sustainability	Spain	Japan
PGC B	Strategy	UK	Algeria
PGC C	Gas Markets	Brazil	Korea
PGC D	LNG	Qatar	The Netherlands
PGC E	Marketing*	Germany	Spain
PGC F	R&D & Innovation	Set up 2012	USA

*From 2012 Marketing & Communications

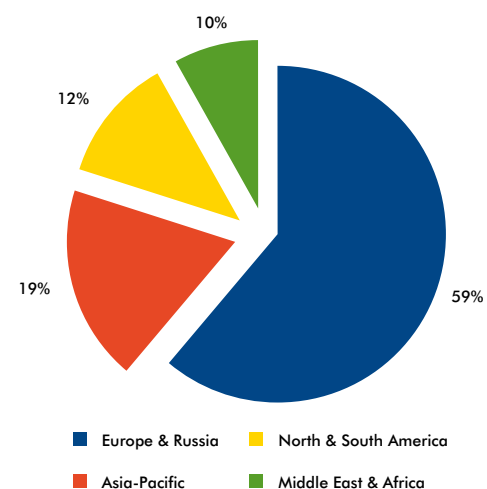


The Chairman of the Coordination Committee for 2009-12 is Ho Sook Wah (FAR LEFT). The Vice Chairman, Georges Liens (LEFT) will become Chairman for 2012-15.

Task Forces

2009-12	2012-15
Building Strategic Human Capital	Human Resources
Nurturing the Future Generations	Gas Advocacy
Geopolitics and Natural Gas	Geopolitics

Membership by region of the Technical Committees during the 2009-12 Triennium





GIIGNL, IPLOCA, Marcogaz, NGV Global, PRCI and NGVRUS, which are affiliated to IGU, as well as the United Nations, International Energy Agency (IEA), International Energy Forum (IEF), World Bank, World Energy Council (WEC) and World Petroleum Council (WPC).

Meetings

The meetings of the committees and task forces usually take place twice a year, each time hosted in a different country. As well as providing a venue for the work sessions, the host members and their companies aim to give

participants a flavour of the local gas industry and culture with a technical visit and social programme. The Chairman and/or the Secretary of the Coordination Committee also attend these meetings to brief participants on IGU's wider activities.



▲
Delegates to WOC 1's meeting in Paris in September 2011 pose for a group photograph.

▶
WOC 2 met in St Petersburg at the end of June 2011.



▲▲
WOC 3 met in Brisbane in November 2011.

▲
WOC 4 met in Ljubljana in September 2011 and enjoyed a tour of the Postojna caves as part of the social programme.

▶
WOC 5 met in Livorno in March 2011 and made a technical visit to a fuel station supplying natural gas and hydrogen as well as petrol and diesel.



PGC A met in Tokyo in September 2010.



PGC B met in New Delhi in September 2011.



PGC C met in Houston in March 2011.



PGC D met in Doha in January 2010 and made a technical visit to the LNG plants in Ras Laffan.



PGC E met in Prague in May 2011.



Task Force 1 met in Bilbao in January 2012.



Task Force 2 met in Hong Kong in August 2010.

Task Force 3 members and delegates to the Middle East and North Africa roundtable on geopolitics and natural gas organised by TF 3 in Muscat in April 2011.







A Proud History

This section starts with a short overview of the development of the gas industry and the founding of national gas associations, before covering the history of IGU and the World Gas Conferences in three parts. The first part covers the Union's foundation and early years up to the outbreak of World War II; the second takes up the story from the ending of hostilities in 1945 to the turn of the century; and the third completes the story to 2012. The section is rounded off with chapters looking at the history of the international LNG conferences, of which IGU is a co-sponsor, and the IGU Research Conference (IGRC).

Let There Be Light

By Hanne Thomsen

Gas use dates back millennia with seepages of natural gas providing the fuel for the “eternal fires” of the Zoroastrians. But the credit for starting the gas industry goes to the Scottish engineer and inventor William Murdoch (1754-1839), who developed gas lighting in 1792. Most inventors in the early days of the industrial revolution tried to use coal as motive power for steam machines. Murdoch was the first to see the potential in producing gas with the particular purpose of using it for lighting, instead of the traditionally used whale oil.

William Murdoch moved to England in 1777 to work in the innovative environment of Birmingham, where he joined the firm of Boulton & Watt which later transferred him to Cornwall.

Murdoch spent a lot of time experimenting at his employers and at home. He worked at developing steam pumping engines, he invented a steam-powered vehicle, and he obtained patents for a process to produce coal tar dyes and for making paint from coal. Then in 1792, he heated coal in a closed iron retort connected with a hollow pipe. The gas which he

produced from the heated coal ran from the retort through the pipe to the end where it burned with a steady flame.

Murdoch lit his home in Redruth, Cornwall with gas in 1794, supplying it from a small gasworks in his garden. It was the first practical system of gas lighting in the world. In a possibly apocryphal story he is also said to have astounded the locals by crossing the moors at night in a gas-lit carriage.

In 1798, Murdoch moved to Smethwick to manage Boulton & Watt’s Soho Foundry, where he built a gas plant and storage facilities sufficient to provide regular lighting for several of the offices. In 1802, Murdoch installed two gas lamps outside the Soho Factory and on one occasion that year the whole plant was illuminated by gas.

It did not take long before all large factories were using gaslights. While Murdoch was interested in illuminating individual buildings, each with its own gas production, others saw the possibilities of lighting many buildings, whole streets or even towns by gas mains, fed with gas from large gasworks.

Lebon and Winzler

It was not only in England that ideas had been developed for using gas for lighting. Philippe Lebon worked in Paris on the problems of carbonisation and by 1799, he had made sufficient progress to obtain a patent for his work on producing fuel for heating and lighting. In 1801, Lebon demonstrated gas lighting publicly in Paris. Lebon was interested in producing gas from wood, and with this he wanted to light Paris, but he did not gain much support from his compatriots.

The results that Murdoch and Lebon had achieved were spread far and wide in Europe. In 1802, the Czech Friedrich Winzler read a French summary of a lecture given by Lebon about gas lighting in Paris. Winzler went to see Lebon and he managed to absorb sufficient knowledge of Lebon’s process of producing gas; afterwards he set himself up as an authority on gas and, realising that there was no more to be gained in Paris, he left for England.

In 1803, Winzler arrived in London where he anglicised his name to Winsor. He obtained a patent for a gas lighting system and soon



Initially the primary use of gas was for lighting.

afterwards began to flood the capital with pamphlets advocating gas lighting. In 1807, he demonstrated the use of gas, and later on he lit parts of Pall Mall with lamps connected by lead pipes to his gasworks. The experiment was a complete success, nothing like it had ever been seen before. However, the indoor lectures were not very successful on account of the violent headaches which afflicted the audience due to the use of unpurified gas. Moreover, there were still several difficulties with the production of gas. Despite these problems, Winsor's practical work began to receive serious attention.

In 1807, Winsor announced the formation of a National Light and Heat Company, making extravagant claims and seeking a Royal Charter. This proved to be more difficult than he had imagined, and in 1809 a new application was made to Parliament for lighting only in London, Westminster and Southwark.

Even the revised project met with a great deal of opposition and it was not until 1812 that Winsor was successful in obtaining a Royal Charter. In 1812, he founded the first gas company in the world, the Gas Light and Coke Company, which built the first gasworks in London. The company's chief engineer was Samuel Clegg, who was a former Boulton & Watt man and invented the gas meter.

Gas lights the world

Within a few years many other cities in the UK, the rest of Europe and the United States had followed suit. Gas lights were lit in Paris in 1815 and in Baltimore – the first US city – in 1816. The expansion continued around the globe reaching Latin America (Buenos Aires) in 1823, Asia-Pacific (Sydney) in 1841 and Africa (Cairo) in 1863. While the focus was on manufactured gas, there were natural gas developments and

the US was a pioneer in this field. William Hart drilled the first commercial natural gas well in 1825 in Fredonia, New York State, and used the gas to light shops and a mill.

As the gas industry developed, national associations were set up. The Verein Deutscher Gasfachmänner und Bevollmächtigter Deutscher Gas-Anstalten was established in 1859, followed by the British Association of Gas Managers in 1863, Schweizerischer Verein von Gas- und Wasserfachmännern and Vereniging van Gasfabrikanten in Nederland in 1873, Société Technique de l'Industrie du Gaz en France in 1874 and Association des Gaziers Belges in 1877. The other founding members of IGU, Svenska Gasverksföreningen and Plynárenské a Vodárenské Sdružení Československé, were set up in 1915 and 1919 respectively.

Hanne Thomsen is the Director of the Danish Gas Museum (www.gasmuseet.dk).

The Foundation and Early Years of IGU

London was enjoying a warm early June in 1931, the pleasant weather in stark contrast to a grim economic situation. The global recession was deepening and most companies were focused on day-to-day survival. But the gas industry was looking ahead and saw the need to enhance international cooperation. On June 2, representatives of the national gas associations of Belgium, France, Germany, The Netherlands, Sweden, Switzerland and the UK met in London for the inaugural Council meeting of the International Gas Union. This was the culmination of cooperative efforts dating back to the beginning of the century, when the primary use of gas was for lighting.

In September 1900, the Société Technique de l'Industrie du Gaz en France¹ organised an International Gas Congress in connection with the Paris Exposition. At the congress it was decided to set up an International Commission on Photometry to coordinate lighting standards. With the development of electric

¹ In 1927, the Société Technique de l'Industrie du Gaz en France became the Association Technique de l'Industrie du Gaz en France, which changed its name to the Association Française du Gaz with effect from 2001.

lighting, this body evolved into the International Commission on Illumination in 1913, but international collaboration on other uses of gas continued. The European and North American national gas associations regularly invited foreign representatives to attend key meetings as observers, and also to conferences and exhibitions.

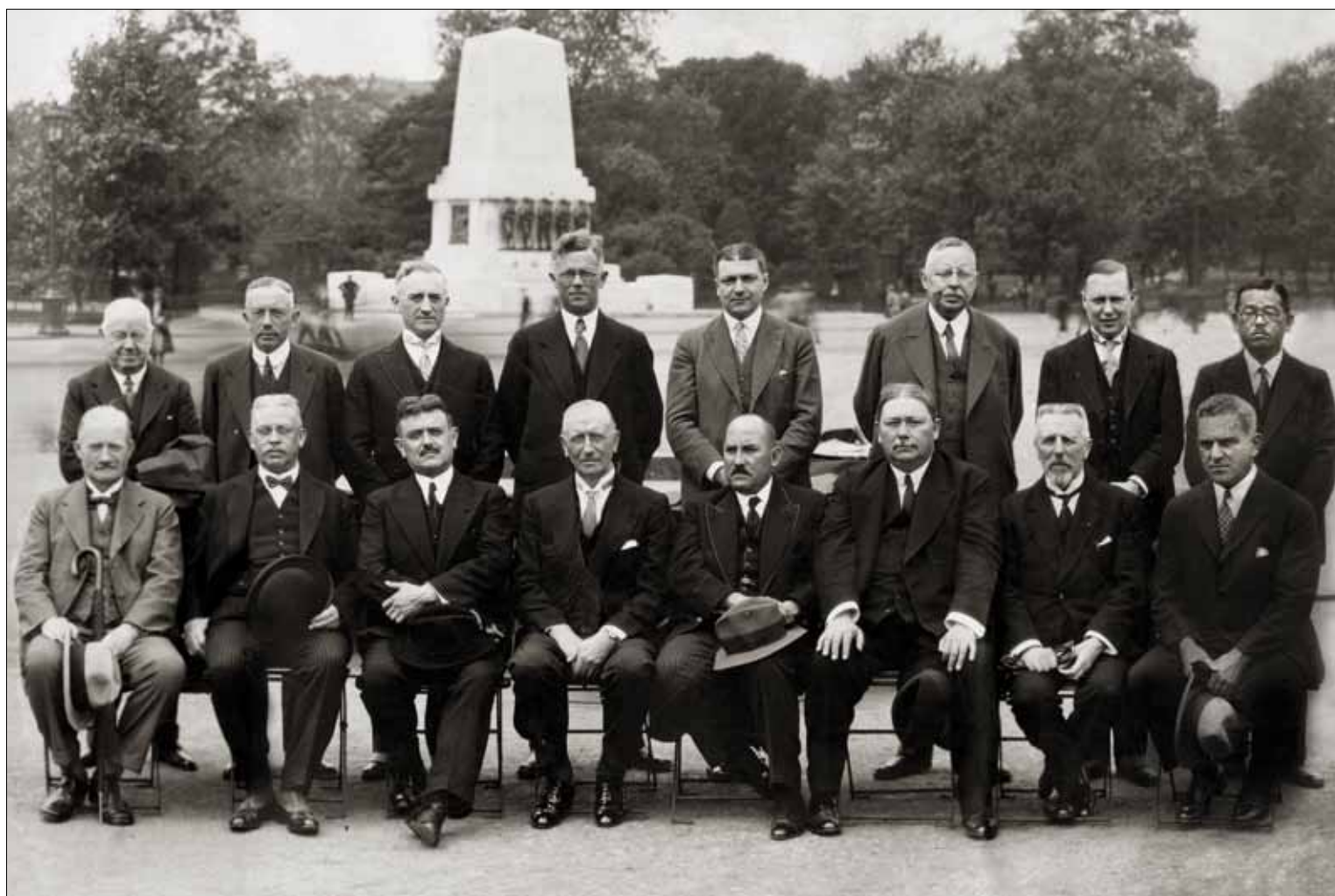
By the late 1920s, there were two schools of thought as to how relations should develop, either by maintaining the existing informal liaisons – an approach favoured by the UK's Institution of Gas Engineers (IGE)² – or by setting up a formal international union, an approach promoted by the Union Syndicale de l'Industrie du Gaz en France, an umbrella body for the various French gas organisations.

The French initiative took shape in September 1929 when Auguste Baril, President of the Association Technique de l'Industrie du Gaz en France (ATG) suggested to the Union

² The British Association of Gas Managers had changed its name to the Gas Institute in 1881. Meanwhile, a separate organisation called the Institution of Gas Engineers had been set up in 1880. These bodies merged in 1903 as a newly constituted Institution of Gas Engineers, which changed its name to the Institution of Gas Engineers and Managers (IGEM) in 2001.

Syndicale's President Robert Ellissen that the possibility of founding an International Gas Union should be floated with their colleagues in other national gas associations. The idea was to provide a centre for the acquisition, collation and distribution of technical and other information concerning the gas industry and the promotion of its wellbeing generally. Baril started sounding out his foreign colleagues and the responses were encouraging enough to persuade the Union Syndicale's Council to approve the start of formal negotiations. The next step was the convening of a meeting at the Maison du Gaz in Paris on November 25, 1930.

While keeping a watching brief on the French initiative, the IGE, in line with its approach of developing international cooperation within the framework of existing national bodies, decided to devote one day of its 1931 Annual General Meeting (AGM) to international business and to invite overseas representatives. By coincidence, the IGE and Union Syndicale invitations went out to national gas associations within 24 hours of each other at the end of October 1930.



Participants in IGU's first Council meeting and H. Morioka from the Kobe Gas Company (Japan did not join IGU until 1952) pose for a group picture in London on June 3, 1931.

In the back row from left to right are: W. E. Price (UK), Gerardus A. Brender à Brandis (The Netherlands), Alexander Forward (USA), Hermann Zollikofer (Switzerland), Pierre Mougin (France and Secretary General 1931-37), Karl Lempelius (Germany), J. R. W. Alexander (UK) and H. Morioka (Japan).

In the front row from left to right are: G. H. Hultman (Sweden), Heinrich Schütte (Germany), Auguste Baril (France), Harold Copp (UK), Fritz Escher (Switzerland and President 1931-34), H. de la Paulle (Belgium), Prosper de Lachomette (France) and Clifford Paige (USA).

French gas companies and organisations joined forces to have a gas pavilion at the 1900 Paris Expo.

The Paris meetings

Apart from the French hosts, the meeting convened in Paris by the Union Syndicale was attended by representatives from Belgium, Czechoslovakia, Germany, Greece, Italy, The Netherlands, Switzerland and the United States. Czechoslovakia had a mandate to represent Yugoslavia, while Spain gave Auguste Baril a mandate to act on its behalf. The UK sent a memorandum but no personal representatives as the timing of the meeting conflicted with the IGE's autumn research meeting.

Significant progress was made and a provisional IGU committee was set up with Fritz Escher, a former President of the Schweizerischer Verein von Gas- und Wasserfachmännern (SVGW) and Director of the Zurich city gasworks as President, Vice Presidents from Czechoslovakia,

Belgium, France, Germany and Italy and Pierre Mougin, Secretary General of the Union Syndicale, as Secretary General. The Union Syndicale also offered to host the provisional secretariat at its Paris headquarters. Work then started on preparing the draft statutes, and a further meeting was convened in Paris on May 8, 1931.

The second Paris meeting enabled delegates to settle some outstanding matters relating to the draft statutes. The British urged that only the national gas association of each country should be eligible to apply for IGU membership and this was accepted. Additionally the British, Dutch and French wanted the IGU Secretariat to include an office of statistics and documentation while the Germans opposed this. A compromise was reached whereby the





▲ Members of the IGE Council and overseas delegates to the 1st International Gas Conference pose for a group photograph.

statutes allowed for the possibility of creating such an office.

It was agreed that members would be entitled to nominate one or two representatives to the IGU Council, but that each delegation would only have one vote. Every three years the Council would elect a President and a minimum of three and a maximum of seven Vice Presidents who would form the Bureau. The President was given the power to fix the headquarters of the Union and appoint a Secretary General. In addition, it was agreed

that the Union would hold conferences at intervals of three years and that the national association holding the presidency would host each conference. However, as part of IGU's inauguration it was agreed that the event being organised by the IGE in conjunction with its forthcoming AGM would be recognised as the 1st International Gas Conference. The official languages were to be English, French, German and the language of the country hosting the triennial conference. The annual subscription was set at 500 Swiss francs.

International Gas Conference and the election of Fritz Escher as IGU President for the following three years. Pierre Mougin was appointed Secretary General with the Secretariat based in Paris. Belgium, France, Germany and the UK were invited to nominate Vice Presidents.

The day was rounded off with a reception and dance at the Park Lane Hotel hosted by Harold Copp and his wife. The dancing went on until two in the morning!

After the London celebrations, IGU got down to business with a meeting of the Bureau in Paris on October 17, 1931. Czechoslovakia's national association, having been involved in the original discussions to establish IGU, now formally declared its adhesion as a member and was invited to nominate a Vice President. Areas of technical study were allocated. Three countries were charged with looking at the development of gas usage: Belgium in the industrial field including hotels, the UK in the domestic field and Czechoslovakia in terms of pricing. France's responsibility was the harmonisation of methods for testing gas appliances and the unification of certification standards. Germany was responsible for the coordination and guarantee of methods for testing gas manufacturing equipment.

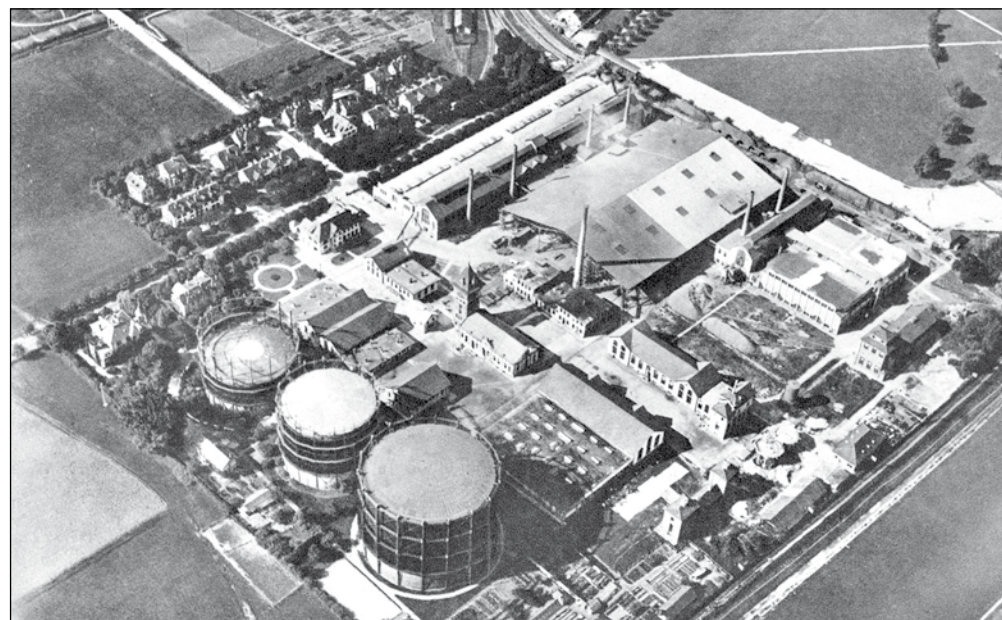
▶ Harold Copp (1875-1940) was the President of the 1st International Gas Conference and served as an IGU Vice President from 1931 to 1934.



IGU is born

At 10:00 on Tuesday, June 2, 1931, the 68th AGM of the IGE and the 1st International Gas Conference opened in the Great Hall of the Institution of Civil Engineers in London. Later that day, at 17:15, representatives of Belgium, France, Germany, The Netherlands, Sweden, Switzerland and the UK repaired to the IGE headquarters at 28 Grosvenor Gardens to hold the first meeting of the IGU Council. They were accompanied by observers from Norway and the United States.

The Council formally approved the IGU statutes, the election of the IGE President Harold E. Copp as President of the 1st



◀
The programme for the 2nd International Gas Conference included a technical visit to Zurich's municipal gasworks in Schlieren.

Switzerland was given responsibility for reporting on gas safety.

Further new members from Austria, Italy, Poland, the United States and Yugoslavia were welcomed at a Council meeting held in Basle on February 26, 1932, with Italy and the US being invited to nominate Vice Presidents. Preparations for the next conference were discussed and the level of the annual subscription was also raised. It was acknowledged that SFr500 might be too much of a burden for smaller countries and that this level should be reviewed. Canada joined the following year and also entered the debate. Along with The Netherlands, it suggested a reduction to SFr200 and this was agreed in 1934.

Meanwhile, contacts were established with the Joint International Committee for Tests relating to the Protection of Telecommunication Lines and Underground Ducts (CMI from its French initials) and the World Power Conference.

The Zurich conference

The 2nd International Gas Conference and the first to be organised under IGU's auspices took place in September 1934 in Zurich. Hosted by SVGW, it was held in the Swiss Federal Institute

of Technology. On September 1, the IGU Council met and elected Auguste Baril as President for 1934-37. As France was assuming the presidency there was a vacant vice presidency which was offered to The Netherlands. The following day the conference started. It ran until September 4 and was attended by 365 delegates and 130 "ladies" (the term accompanying persons was only introduced officially in 1964) from 14 European countries and the US.

Professor Dr Arthur Rohn, President of the Swiss Board of Higher Education was the guest of honour at the opening ceremony, which was also addressed by Fritz Escher, A. Dind, SVGW President, and Auguste Baril. In his address Baril proposed that Escher be elected Honorary President, which delegates approved, thereby starting an IGU tradition of giving the retiring president a lifetime honorary title.

The associations of Belgium, Czechoslovakia, France, Germany, Switzerland and the UK presented reports on the areas of technical study for which they had responsibility, and individual papers were given by Clifford E. Paige of the US on "Coordinated Research and Coordinated Rate Making", Professor Gerardus A. Brender à Brandis of The Netherlands on "A Contribution to the Study of Coal", Italy's

Michelangelo Böhm on "The Use of Electricity in the Manufacture of Town Gas" and Poland's B. Klimczak on "The Development of the Gas Industry in Poland".

The official banquet was held in the Grand Hotel Dolder and there was a technical visit to Zurich's gasworks in Schlieren, while social activities included an outing to the Stadttheater for a performance of "Der Rosenkavalier" and a trip to Lugano on the day following the close of business.

Gas consumption in IGU member countries, 1932 (mcm)

USA	70,000
UK	9,000
Germany	3,500
France	1,800
The Netherlands	642
Italy	560
Belgium	500
Austria	300
Sweden	200
Poland	140
Switzerland	140
Czechoslovakia	100
Yugoslavia	13

Source: IGU Council minutes for March 10, 1934.



The 1934-37 Triennium

Two important decisions concerning IGU's work programme were made in the 1934-37 Triennium.

At the Zurich Council meeting, Czechoslovakia, Poland and Yugoslavia had proposed that IGU's

activities be expanded to cover water as some member associations covered gas and water but a decision had been postponed. After due consideration, the Bureau recommended that the proposal be rejected and the Council approved this in May 1935.

The other decision was to internationalise committee membership rather than relying solely on the members of the national association in charge of a particular study topic. This brought in a much wider range of experience and helped ease the work load. New topics were added including pipe corrosion, the materials used for pipes and industry promotion in terms of advertising and public relations. A group was also set up to agree a vocabulary of gas terms in English, French and German in order to produce a dictionary for sale.

In 1936, Australia joined while the outbreak of the Spanish Civil War removed any chance of Spain joining in the near future (in the event Spain did not become a member until 1951).

At the end of his three-year term as President, Auguste Baril hosted the 3rd International Gas Conference, which was held in Paris from June 12-16, 1937 in the Arts and Crafts Engineers Hall. It was attended by 526 delegates including the first woman, Madame J.

Pierre Mougin (1892-1973)

Pierre Remi Mougin was IGU's first Secretary General, serving from 1931 to 1937. Born in France in 1892, he graduated from the Paris engineering school (École Centrale des Arts et Manufactures) in 1914 and was called up for military service. After World War I, he worked briefly in an iron foundry before joining the Central Committee of French Coke Plants as an engineer. In 1927, he became Secretary General of the three major French gas organisations: the Association Technique de l'Industrie du Gaz en France, the Syndicat Professionnel and the Union Syndicale. At the ATG his responsibilities included being secretary of the editorial board of the magazine *Journal des Usines à Gaz* (later *Gaz d'aujourd'hui*).

Mougin played a key role in the formation of IGU before taking up the



post of Secretary General in 1931 in addition to his national responsibilities. He was succeeded as IGU Secretary General by Hermann Zollikofer in 1937.

Mougin was called up at the outbreak of World War II and served until the armistice, whereupon he resumed his duties with the French gas organisations.

In 1946, when the French gas industry was nationalised and the Syndicat Professionnel and Union Syndicale were dissolved, Mougin stepped down as Secretary General of the ATG, although he continued as Chairman of the magazine's editorial board. He had a number of roles in the nationalised industry and then in 1952 was appointed Inspector General of Gaz de France with responsibility for international relations. In the same year, he was elected as a Vice President of IGU, in which role he served until 1961.

In 1959, Mougin was appointed Chairman of SEMAREL, a company set

up by Gaz de France, the Sahara Methane Company and the Petroleum Research Bureau to study exporting Algerian gas to Europe by pipeline. In the event, Algerian gas was exported as LNG with the first cargo arriving in France in 1965 when SEMAREL was wound up. In retirement he worked on his memoirs which were published in 1966 (*Mémoires*, Paris: Imprimerie Barneoud).

Mougin was given two IGU honours, being named Honorary Secretary General in 1950 in recognition of his pre-war service and Honorary Vice President in 1961; while the ATG made him an Honorary President in 1955 and in 1971 gave him a medal to commemorate 50 years of membership. He was also made an Officer of the Légion d'Honneur. He died on June 14, 1973.

Czaplicka, a gas engineer from Krakow in Poland, and 171 accompanying persons from 14 European countries and the US.

A Council meeting was held immediately prior to the start of business during which Hermann Müller, a former President of the Deutscher Verein von Gas- und Wasserfachmännern³, was elected President for 1937-40. The vacant vice presidency went to Sweden. The Council also accepted an offer from SVGW to host the Secretariat in Zurich and appointed Colonel Hermann Zollikofer, Secretary General of SVGW, as IGU's new Secretary General.

The conference opened on Saturday, June 12 with addresses by Auguste Baril, Hermann Müller and Pierre Mougin. There was a lecture by Professor Louis de Broglie of the Sorbonne on "Atomism in Modern Physics". The main business sessions ran June 14-16 during which delegates received reports on the technical study areas and approved the vocabulary of gas terms, while nine individual papers were presented.

The official banquet took place in the gas pavilion of the International Exposition being held that year in Paris, which delegates had a separate opportunity to visit, and there was a reception hosted by the Municipal Council of Paris. Other social activities included visits to the Château de Méry, Royaumont Abbey and a ballet performance at the Paris Opera, while there were technical visits to two gasworks, a research centre and a meter manufacturer.

The unfinished Triennium

After the Paris conference, Hermann Zollikofer took up his duties as Secretary General. In November 1937, the first Council meeting of the German presidency was held in Freiburg. It was agreed that the pricing committee

³ The Verein Deutscher Gasfachmänner und Bevollmächtigter Deutscher Gas-Anstalten had become the Verein von Gas- und Wasserfachmännern Deutschlands in 1870 and the Deutscher Verein von Gas- und Wasserfachmännern in 1882. It went on to become the Deutscher Verein des Gas- und Wasserfaches in 1976.



The 1937 Expo (OPPOSITE PAGE) was being held in Paris at the time of the 3rd International Gas Conference and the conference banquet took place in the exposition's gas pavilion (LEFT) also seen in a sketch on the cover of the ATG magazine (BELOW).

would be disbanded and the technical work programme was streamlined into four areas: production (Germany), distribution (Switzerland), use (France) and promotion (UK).

However, the storm clouds were gathering in Eastern Europe. In March 1938, Germany annexed Austria and later that year, following the Munich Agreement, the dismemberment of Czechoslovakia started.

Austria remained a separate member of IGU and hosted a meeting of the Bureau in Vienna in August 1938 when Hungary, which had had informal links with the Union since 1932, joined.

The last Council meeting before the outbreak of World War II took place in Stockholm in June 1939 and among other matters discussed preparations for the 4th International Gas Conference which was scheduled to take place in Berlin, June 18-21, 1940. In the event, the German and Soviet invasion of Poland in September 1939 propelled Europe into war and Berlin had to wait until 1991 to be a host city. When the conferences were resumed in 1949, London was the first post-war venue.

During the hostilities, Hermann Zollikofer maintained the IGU Secretariat in neutral

Switzerland. Fortunately the subscriptions and income from the sale of the dictionaries received between 1937 and 1939 were sufficient to cover expenses and provide a reserve until the war was over.



The Development and Expansion of IGU

As World War II drew to a close in Europe, the national gas associations started thinking about re-establishing international contacts. First off the mark was the Union Syndicale, which sent a delegation to visit the IGE in London in February 1945.

Once the war was over in Europe and Asia, and with the agreement of Hermann Zollikofer, the Union Syndicale called a meeting in Paris for December 18 and 19. The defeated countries were not invited and representatives of Belgium, France, Switzerland and the UK attended, while The Netherlands and Sweden sent messages of support. It was decided to reorganise IGU and convene a Council meeting in London on June 5 and 6, 1946. This was attended by representatives of Belgium, Canada, Czechoslovakia, France, The Netherlands, Sweden, Switzerland and the UK. Wilfred Philpot of the Canadian Gas Association had a mandate to represent the American Gas Association (AGA), and Norway sent an observer.

The Council meeting was opened by Auguste Baril in his capacity as Honorary President, who asked for a minute of silence to

honour those colleagues in the gas industry who had died in the war. Delegates then elected Colonel Cyril M. Croft, President of the UK's IGE, as IGU President for 1946-49, while Belgium, Czechoslovakia, France, The Netherlands, Sweden and the USA were invited to nominate Vice Presidents. The statutes were reviewed and minor amendments made. The main changes were to remove German as an official language and allow the President to appoint a President's Secretary as well as a Secretary General. Cyril Croft appointed the IGE Secretary, Dr Walter T. K. Braunscholtz, to assist him and asked Hermann Zollikofer to carry on as Secretary General. The subscription remained at Sfr200 initially but was increased to Sfr500 the following year.

During the 1946-49 Triennium, the gas industries of IGU's second and third highest gas consuming members, the UK and France, were nationalised. Gaz de France was set up in 1946 (whereupon the Union Syndicale was disbanded and the ATG became the French IGU member), while the Gas Act of 1948 reorganised the British gas industry into 12 Area Boards.

Indeed, reorganisation and reconstruction were the major issues of the time as the post-war recovery got underway. It was clear that greater international cooperation was essential to reduce the risk of future conflict, and new global and regional bodies were set up. IGU was keen to start developing links with them. Relationships with CMI and the World Power Conference¹ were re-established; and, in 1949, IGU was granted observer status at relevant meetings of the Coal and Power Division of the UN Economic Commission for Europe (UNECE).

As regards the technical work programme, topics were allocated to national member associations and it would not be until 1951 that the first international committees were set up.

The 1949 conference

Dansk Gasteknisk Forening from Denmark was welcomed as the 10th post-war member in the run-up to the 4th International Gas Conference, which was held in London, June 15-17, 1949. The venue was the same as in 1931 – the

¹ From 1968, the World Energy Conference and from 1990, the World Energy Council (WEC).



Delegates to the Council meeting in Brussels, May 6, 1947, pose for a group photograph. IGU's President, Cyril Croft, is at centre with the cigarette; the President's Secretary, Walter Brauholtz, is behind him to the right with glasses; the Secretary General, Hermann Zollikofer, is the second to the right of Cyril Croft.

Institution of Civil Engineers – and the conference was attended by 483 delegates and 184 accompanying persons from 16 countries.

Meeting the day before the opening ceremony, the Council elected Marcel Brabant of Belgium as President for 1949-52 with Vice Presidents from Czechoslovakia, France, The Netherlands, Sweden, Switzerland, the UK and the USA. Marcel Brabant announced that Belgium would take over responsibility for the Secretariat from Switzerland, and appointed Raoul Touwaide, Secretary General of the Association des Gaziers Belges, to succeed Hermann Zollikofer.

The conference was opened by the British Minister of Fuel & Power, Hugh Gaitskell, with Cyril Croft and Marcel Brabant also giving addresses during the opening ceremony. In the subsequent sessions, 21 reports and papers were presented, which had been printed and

distributed to delegates in advance to allow immediate discussion. On the evening of the first day, the British Government hosted a reception at the Science Museum, while the official banquet was held the following day in the Dorchester Hotel. There were technical visits to three gasworks and major industrial gas consumers such as the Ford car factory at Dagenham. The social programme included visits to Cambridge, Hampton Court, Windsor Castle and a performance of "Pelléas et Mélisande" at the Royal Opera House.

The Belgian Presidency

The first Council meeting under the Belgian Presidency was held in Brussels in February 1950; and Norway, having been an observer at both the birth of IGU and its revival, was finally welcomed as a member. It was agreed that an information bulletin would be published

twice a year, while Walter Brauholtz, Pierre Mouglin and Hermann Zollikofer were made Honorary Secretaries.

In 1951, international committees were set up to study the harmonisation of performance tests of gas appliances (otherwise known as the stamping committee) and the development of gas utilisation. Membership grew this year with Austria, Italy, the Saarland (which had been separated from Germany after the war²), Spain and West Germany joining or rejoining. IGU also became affiliated to the International Union of Technical and Engineering Associations (UATI). However, sad news was received from Switzerland where Honorary President Fritz Escher died.

International cooperation continued to be developed in 1952, when IGU gained observer

² The Saarland's separate membership ended when it became part of West Germany on January 1, 1957.



▲ Delegates to the 4th International Gas Conference and accompanying persons pose for a group picture in Horse Guards Parade in London.

status at meetings of the working party on long-distance gas transport of the Organisation for European Economic Cooperation (OEEC). However, this was also the year when Czechoslovakia temporarily reduced its IGU activities pending the establishment of a new professional entity,

the Czechoslovak Society for Science and Technology, within the structure of which the Czechoslovak Gas Society was established and authorised as the IGU representative in 1957.

The Belgian Presidency culminated in the 5th International Gas Conference, which was held in Brussels, June 16-19, 1952, as the host association was celebrating its 75th anniversary. To mark the occasion, King Baudouin granted the association the status of a royal society to become the Association Royale des Gaziers Belges (ARGB).

The conference was attended by 476 delegates and 190 accompanying persons from 17 countries. Although overall attendance was similar to the previous conference, the international proportion was higher. Nearly three-quarters of the delegates in 1949 were British, whereas in 1952 the Belgian contingent accounted for around one-third.

Meeting immediately before the opening ceremony, the Council elected Robert W. Hendee of the USA as President for 1952-55 with Vice



▶ Delegates at the opening ceremony of the 5th International Gas Conference in the Palais des Académies in Brussels.

INSET ABOVE
IGU President Marcel Brabant addresses delegates. President-elect Robert Hendee is on the left and Secretary General Raoul Touwaide on the right.





Presidents from Austria, France, Italy, The Netherlands, Sweden, Switzerland and the UK. The Council also welcomed Japan as a new member.

The opening ceremony was held in the Palais des Académies with the Belgian Minister of Economic Affairs, Jean Duvieusart, doing the honours. General Armand Pirot, President of the ARGB, Marcel Brabant and Robert Hendee also gave addresses. The working sessions were held in the Palais des Beaux Arts and 28 papers were presented with the UN Educational, Scientific and Cultural Organisation (UNESCO) providing a grant of \$3,000 to help fund the printing of the conference proceedings. A marketing exhibition was also organised with displays of printed matter and screenings of films made by gas companies. Technical visits were offered to a range of coking plants, gas works, foundries and meter manufacturers.

The College of Mayor and Aldermen and the City Council of Brussels hosted an evening reception at the Hôtel de Ville on the first day, and the official banquet was held in the Concert Noble on June 17. The social programme included tours of Brussels as well as visits to Antwerp, Bruges and Namur and a concert given by the National Broadcasting Institute's orchestra.

The first US Presidency

Developments during the 1952-55 Triennium included the first contacts with the European Coal and Steel Community, the granting of consultative status with the UN Economic and Social Council and participation in a UNECE study of the European gas industry. Two new committees were also set up: one within IGU to work on compiling a new edition of the dictionary of gas terms, and one outside the Union's framework.

While the statutes allowed IGU to study all aspects of the gas industry, the Council felt that the Union should concentrate on technical issues and economic issues directly related to them. Consequently, a separate economic research committee was set up in 1954 and this was called Cometec-Gaz after its name in French (Comité d'Études Économiques de l'Industrie du Gaz). The original proposals for Cometec-Gaz envisaged an informal set-up without a secretariat, statutes or subscription, but then it was decided that a secretary was needed and Raoul Touwaide was appointed.

Honorary President Cyril Croft died in 1954; and, in September that year, the Council met in Germany for the first time since the war. Members marked the occasion in Düsseldorf by making Hermann Müller an Honorary President

in recognition of his service between 1937 and 1939. This was also the meeting at which Australia was welcomed back as a member.

The 6th International Gas Conference was held in New York, where the AGA was then based, September 27-30, 1955. This was the first time the event had been held outside Europe and attendance fell dramatically to 216 delegates and 55 accompanying persons from 14 countries. IGU's membership was still predominantly European and transatlantic travel was expensive, while US delegates faced the expense of two conferences in quick succession. The AGA scheduled the international conference a month before its own

▼
Seen at the 6th International Gas Conference in New York are President Robert Hendee (left), President-elect Mario Boselli (centre) and Raoul Touwaide.





▲
The 7th International Gas Conference was held in Rome in September 1958. ABOVE A group of delegates outside the FAO headquarters where the conference was held. OPPOSITE, TOP LEFT A plenary session underway. OPPOSITE, TOP RIGHT The reception at the Capitol.

▶
OPPOSITE, BELOW The Vatican's newspaper *L'Osservatore Romano* carried a report of the audience Pope Pius XII gave to conference delegates.

annual convention rather than running the events concurrently as previous host associations had done and as IGU's statutes suggested. When the 17th World Gas Conference was held in Washington DC in 1988, the AGA held its convention at the same time and there was a record US attendance.

For those Europeans who did travel to the USA, the journey was a memorable one with Hurricane Ione battering their liners and delaying their arrival into New York. Sea travel was still preferred for long hauls and it would not be until 1958 that aircraft out-carried ships in the North Atlantic market.

Gas marketing

The International Colloquium on Gas Publicity had its first meeting in 1959. It was later renamed the International Colloquium on Gas Marketing and its terms of reference widened to include public relations. It had a regular slot at the WGCs to present papers. In 1990, the name was changed again to Intergas Marketing, which became an organisation affiliated to IGU in 2003, was brought back under the Union's umbrella as the IGU Marketing Committee in 2006 and became Programme Committee E – Marketing in 2009.

At its customary pre-conference meeting, the Council elected Dr-Eng. Mario Boselli of Italy as President for 1955-58 with Vice Presidents from Austria, France, West Germany, The Netherlands, Sweden, Switzerland and the UK. It also decided to put the statistics committee on an international footing. Statistics had previously been Belgium's responsibility and Belgium retained the chairmanship of the new committee.

The opening ceremony was held on September 27 in the North Ballroom of the New Yorker Hotel, which was also the venue for the formal banquet the following day. Robert Hendee asked the deputy US representative to the UN, James J. Wadsworth, to give the welcome speech, and there were addresses by Mario Boselli, Raoul Touwaide and Marion Banks, AGA President. Carl Sorby, Vice President of the George Roper Corporation, a manufacturer of pumps and gas appliances, gave a presentation on marketing and sales promotion, and a film called "Natural Gas on the Move" was shown.

The film reflected the major role natural gas played in US energy supply (accounting

for a quarter of primary energy consumption). Natural gas still played a small role in Europe although exploration efforts were gathering pace. There was also discussion during the conference of the prospects for exporting natural gas from the Middle East to Europe either by pipeline or as LNG. Ultimately LNG proved to be the first choice with initial supplies coming from North Africa. When Western Europe did start importing gas via long-distance pipelines it came from the USSR.

The President's report and the report on statistics were given during the opening ceremony, the latter by Raoul Touwaide, and a further 25 reports and papers were presented in subsequent sessions. There was also an extensive programme of technical visits to gas companies and equipment manufacturers in New York, New Jersey, Pennsylvania, Ohio and Illinois.

Italy takes the helm

During the 1955-58 Triennium, three new international committees were set up, a booklet was published to commemorate IGU's 25th



anniversary and a two-tier subscription was introduced. Members paid either Sfr500 or Sfr1,250 depending on the size of the gas industry in each country.

Committees studying new distribution techniques and the interchangeability of gases started work in 1956, followed in 1957 by one on safety in the utilisation of gas. It was also decided that year to leave marketing to Cometec-Gaz. The committee for the development of gas utilisation was disbanded and Cometec-Gaz set up an International Colloquium on Publicity. This body, under various names, cooperated closely with IGU and was ultimately brought back under the Union's umbrella in 2006 (see box).

The 7th International Gas Conference was held in Rome, September 25-28, 1958, in the headquarters of the UN Food and Agriculture Organisation (FAO). Attendance recovered from the low of three years previously, with 551 delegates and 296 accompanying persons from 18 countries.

At its pre-conference meeting, the Council elected Bengt M. Nilsson of Sweden as President for 1958-61 with Vice Presidents from

Austria, Belgium, France, West Germany, The Netherlands, Switzerland and the UK. It also approved the membership applications of Romania and the USSR.

The opening ceremony was held in the FAO's Aula Magna and was addressed by Mario Boselli, Bengt Nilsson and five dignitaries: Dr Friedrich T. Wahlen, FAO Deputy Director General, Dr-Eng. V. De Biasi, President of the Italian Gas Association, Mr Gatto, Under Secretary of the Ministry for Industry & Commerce, G. de Corval, the UN's official representative to the conference and R. W. Otto, AGA President. Mario Boselli's address included a comprehensive report on the role of gas in IGU member countries. In the subsequent working sessions, a further 46 reports and papers were presented.

On September 25, there was a reception given by the City of Rome in the Capitol and the banquet was held the following day at the Excelsior Hotel. In addition to the usual range of technical and social visits, delegates were granted an audience with Pope Pius XII on September 28 at Castel Gandolfo, the Papal summer residence.





▶ Delegates to the IGU Council meeting in London in March 1961 pose for a group photograph. Bengt Nilsson, IGU President 1958-61, is seated sixth from left.

▼ The voyage of the *Methane Pioneer* from Lake Charles, Louisiana to Canvey Island, UK in early 1959 paved the way for the start of commercial LNG trading in 1964.



The Swedish Presidency

The 1958-61 Triennium saw Poland rejoining IGU in 1960 and Finland joining in 1961, and significant developments on the natural gas front. In 1959, the Slochteren field in the Dutch province of Groningen was discovered and there was a successful trial to transport the first

LNG cargo across the high seas, while Algeria began production in 1961.

The Triennium also saw requests for IGU's help from the gas committees of the UNECE and OEEC. The UNECE asked IGU to draw up a summary of codes of safe practice for the construction and operation of gas transmission pipelines, while the OEEC asked for input to a study on gas safety.

As regards IGU's own work programme, it was agreed to widen the remit of the committee studying new distribution techniques to include transmission and to work on an edition of the new dictionary in Czechoslovakian, Polish, Romanian and Russian. Proposals were also made to reorganise the committee structure for future triennia with a view to giving a more complete coverage of all the issues in the gas industry.

Two personalities who had been involved in IGU's activities since 1931 retired from the

Bureau and were made Honorary Vice Presidents. Gerard Brender à Brandis of The Netherlands was honoured at the Council meeting in November 1959 in Amsterdam, and Pierre Mougin at the pre-conference meeting. This was also when the Council elected Jacob van Dam van Isselt of The Netherlands as President for 1961-64 with Vice Presidents from Austria, Belgium, Czechoslovakia, France, West Germany, Switzerland and the UK.

The 8th International Gas Conference was held in Stockholm, June 27-30, 1961. It was attended by 641 delegates and 304 accompanying persons and the venue was the Folkets Hus conference centre.

The first formal function was a reception given by the President of the City Council in City Hall on June 27. The opening ceremony took place the following day and was addressed by Gösta Agrenius, President of the Industrial Department of the City of Stockholm,



Mr and Mrs Nilsson make their way into the official banquet of the 8th International Gas Conference.

K. Neuerburg, Chairman of the OEEC Gas Committee, Bengt Nilsson and Jacob van Dam van Isselt.

Bengt Nilsson presented the new dictionary of gas industry terms in seven languages (English, Dutch, French, German, Italian, Portuguese and Spanish). This was published with financial assistance from UNESCO which also helped fund the printing of the conference proceedings. Bengt Nilsson also announced the



new committee structure to be implemented with effect from the 1961-64 Triennium (*see box*).

In subsequent sessions, 48 reports and papers were presented. Several gas marketing films were also shown, and an exhibition of gas publicity material was mounted by the International Colloquium on Gas Publicity in the foyer of the Folkets Hus.

Social events included a banquet at City Hall and a performance of Giovanni Battista Pergolesi's "Il Maestro de Musica" at the Royal Court Theatre at Drottningholm, to which delegates travelled by boat. The technical visit programme included a visit to Svenska Skifferolje, whose extraction of crude oil, gas and sulphur from shale was one of the biggest such operations in the world at the time.

Conference venue change

The Dutch Presidency originally intended to organise the 9th conference in Amsterdam. However, it was decided to switch the venue to Scheveningen, a coastal resort within the Municipality of The Hague, and Amsterdam had to wait until 2006 to host the 23rd World Gas Conference.

During the 1961-64 Triennium, the new committee structure was introduced, and with it a new practice of inviting the chairmen to Council meetings to report on the progress of their work. Although separate committees had been set up for transmission and distribution, both were initially chaired by the same country. However, this proved rather onerous and the Council decided to allocate them to different countries in future.

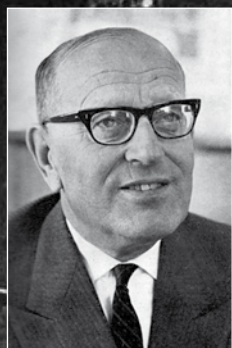
Other business included the re-admission of Hungary in 1962, the addition of Hungarian and Swedish to the second edition of the dictionary and the establishment of contacts with research

Bengt Nilsson addressing the opening ceremony of the 8th International Gas Conference. Seated at bottom left is Raoul Touwaide.

Technical Committee structure with effect from the 1961-64 Triennium

Committee and area of study	Chair 1961-64 and 1964-67
1 Natural Gases*	USA
2 Production of Manufactured Gases	UK
3 Transmission of Gases	West Germany
4 Distribution of Gases	West Germany (Italy 1964-67)
5 Utilisation of Gases	France
6 Statistics	Belgium
7 Documentation & Sundry Questions	The Netherlands

* From 1964, Natural Gases & Mass Storage



▶ Jacob van Dam van Isselt, IGU President 1961-64, addressing the opening ceremony of the 9th International Gas Conference (and in close-up INSET). The flowers were orange dahlias, orange being the Dutch national colour.

organisations such as the European Gas Research Group (GERG, from its initials in French). In 1963, IGU mourned the death of Hermann Zollikofer, the Union's second Secretary General.

At the end of the Triennium, the Council was ready to elect Georg Düwel of West Germany President for 1964-67 with the usual seven Vice Presidents when it received offers from France and the USSR to take over the Presidency for 1967-70. This was the first time more than one

country had put itself forward and the Council temporarily amended the statutes to allow the election of eight Vice Presidents to ensure both countries were represented while the offers were considered. Thus, Vice Presidents from Austria, Belgium, Czechoslovakia, France, Switzerland, the UK, USA and USSR were elected.

The 9th International Gas Conference was held in Scheveningen, September, 1-4, 1964. The opening ceremony was held in the Kursaal of the Kurhaus hotel and conference centre,

and the official reception given by the Dutch Government and the Municipality of The Hague was held in the Knights' Hall (Ridderzaal).

For the first time the number of delegates passed the 1,000-mark at 1,008, together with 505 accompanying persons. There were 57 presentations.

The opening ceremony was addressed by Johannes Bakker, the Dutch Minister of Economic Affairs, Hans Kolfschoten, the Mayor of The Hague, Jacob van Dam van Isselt and Gerard Brender à Brandis, who spoke on mankind and energy over the centuries.

In his welcome address Jacob van Dam van Isselt informed delegates that The Hague was about to switch over from manufactured to natural gas. Indeed, the growth of the natural gas sector and the development of international grids were keenly discussed. There were already pipeline links between Canada and the US and between the USSR and Poland, but now a substantial increase in international gas trading was set to begin. Work on an LNG supply chain linking Algeria with France and the UK had been underway for some time; LNG exports to the UK would start a month after the conference with exports to France following in 1965.



▶ A packed audience for the opening ceremony of the 9th International Gas Conference.



Statutes revised

A key event of the West German Presidency was a revision of IGU's statutes to restructure the Bureau. Henceforth, there would only be one Vice President, who would succeed the President, and a new position of Immediate Past President was created. The Bureau would also have a representative of each of the countries chairing the technical committees plus representatives of two other countries. Additionally, the new statutes gave the Council rather than the President the power to appoint the Secretary General and made provision for a Deputy Secretary General if required.

The Council agreed this in 1965 and awarded the Presidency for 1967-70 to the USSR and for 1970-73 to France. The following year a new Bureau was elected with Alexei I. Sorokin of the USSR as Vice President.

Membership continued to grow, with Yugoslavia (the last of the pre-war members to be welcomed back) and Pakistan joining in 1965 and Iran in 1967, while a request was received from the UNECE to look at establishing a safety code for compressor and reception

stations. This followed IGU's work on the safety code for gas transmission pipelines.

The groundwork was laid for a smooth transition of the Secretariat with the UK's IGE offering to take over as host from the ARGB upon Raoul Touwaide's expected retirement in 1970. Meeting in Barcelona in March 1966 (the same meeting at which the new Bureau was elected), the Council appointed the IGE's Secretary, Albert G. Higgins, as Deputy Secretary General. Higgins had been involved with IGU business since the London conference in 1949, when he worked closely with Walter Brauholtz.

Meanwhile, Georg Düwel and his team were gearing up for the first IGU conference to be hosted in Germany. As part of the preparations a conference logo was designed which the Council liked so much it adopted for general IGU use. This went on to serve for 45 years – with a slight alteration in 2005 – until the current logo was introduced in 2012.

The Council adopted the first logo at the pre-conference meeting during which it elected

Alexei I. Sorokin as President and Georges Robert of France as Vice President for 1967-70, with Georg Düwel becoming Immediate Past President.

The 10th International Gas Conference was held in Hamburg, June 6-10, 1967, against the backdrop of the Six-Day War between Israel and Egypt, Jordan and Syria. Indeed, the German Minister of Economic Affairs, who was supposed to address the conference, was called away at the last minute to join his European counterparts in discussing an oil embargo announced by Arab states.

The opening ceremony was held in the Musikhalle (today the Laeiszhalle) where the Hamburg Philharmonic State Orchestra welcomed delegates with the Flying Dutchman overture by Wagner before addresses by Georg Düwel, Alexei Sorokin, Gerhard Woratz, Permanent Secretary of the German Ministry of Economic Affairs, and Helmuth Kern, Hamburg's Senator for Economic Affairs & Transport.

The business sessions were held in the Hamburg Conference Centre and there were 77 reports and papers. Attendance sent a new record with 1,771 delegates and 481 accompanying persons from 30 countries.



▲
Georg Düwel, IGU President 1964-67.

▼
The opening ceremony of the 10th International Gas Conference was held in Hamburg's Musikhalle. The new IGU logo was on display.

▼
Hamburg's Mayor, Herbert Weichmann (second left) greets IGU President-elect Alexei Sorokin (far right) watched by IGU President Georg Düwel (left) and Hamburg's Senator for Economic Affairs & Transport Helmut Kern (centre).





▲ Seen touring a British exhibition of gas appliances with Raoul Touwaide is Albert Higgins (left) who became IGU's Deputy Secretary General in 1966 and took over as Secretary General in 1970.

▶ The International Colloquium on Gas Marketing organised an exhibition of gas advertising from around the world during the 10th International Gas Conference.

The official reception was given by the Hamburg Senate in City Hall. There was a special performance of "Orpheus and Eurydice" in the Hamburg State Opera, a banquet at the Hotel Atlantic, an evening boating excursion on the River Elbe and a Baltic cruise farewell party.

The Hamburg conference was marked by a strong Russian presence. Although the USSR had been a member of IGU since 1958, it had previously only sent a handful of delegates to the triennial conferences – four in 1958, six in 1961 and 17 in 1964. In 1967, it sent 302 delegates in a specially chartered ship, the *Mikhail Kalinin*. This was the largest delegation after the German one.

Of course, the USSR was about to take over the Presidency of IGU, but the size of the delegation also reflected plans to increase natural gas exports. Sorokin told delegates that exports to Czechoslovakia would start later in 1967 and that negotiations were underway with Austria, Finland, France and Italy. Subsequently, negotiations were opened with West Germany too.

The Russian Presidency

The first Council meeting of the 1967-70 Triennium was held in Montreal in October 1967. Delegates received the report on the Hamburg conference and appointed Alexis Lihmann of France Honorary Secretary General



in recognition of his assistance to Raoul Touwaide in preparing the minutes of the Council meetings and his work on the compilation of the dictionary.

In 1968, Czechoslovakia suggested that observer members be admitted from countries which had not yet set up a technical gas association, and this was approved by means of a protocol rather than amending the statutes. The same year the first LNG conference was organised by the US Institute of Gas Technology,

Raoul Touwaide (1900-1990)

Raoul Henri Touwaide was IGU's longest-serving Secretary General, holding the post from 1949 to 1970. Born in Belgium on January 12, 1900, he graduated as a mining engineer from the University of Liège and initially worked in the coal industry before moving over to the gas industry in 1928. In 1946, he was appointed Secretary General of the Belgian Gas Association and Director of the Belgian Gas Industry Federation (which merged with the Federation of Electricity Producers in 2005 to become Synergrid).

In 1949, the IGU Council accepted the Belgian Gas Association's offer to host the Secretariat. Touwaide was appointed Secretary General of IGU and demonstrated his prodigious capacity for work by retaining his domestic roles and taking on the secretary-ship of Cometec-Gaz when it was



Raoul Touwaide kept in touch with the industry after his retirement. This picture was taken in 1977 at a meeting of the Belgian Gas Association.

set up in 1954. Indeed, an admiring reporter of *Gas World* later observed, "At every triennial conference of the Union Touwaide appears to get younger and more active".

He was made an Officer of the Order of the Belgian Crown in 1965 and retired in 1970, whereupon he was made an Honorary Vice President of IGU.

Even in retirement Touwaide was busy and wrote a number of books including an iconographic and typographical analysis of the Belgian editions of Lodovico Guicciardi's descriptions of The Netherlands (*Les éditions belges de la descriptions des Pays-Bas par Lodovico Guicciardi*, published in 1973), a biography of Guicciardi (*Messire Lodovico Guicciardi, gentilhomme Florentin*, 1975) and a study of Guicciardi's cartography (*La cartographie dans les éditions belges de la description de tous les Pays-Bas de Lodovico Guicciardini*, 1976). He died in January 1990.

and IGU subsequently agreed to co-sponsor the event (see the chapter on the history of the international LNG conferences). Cooperation was also started with the Union des Industries Gazières des Pays du Marché Commun (Marcogaz), which was set up to coordinate standards for gas appliances in the European common market and liaise with the European authorities on gas matters.

In November 1969, the Council convened in Karachi, Pakistan, the first time it had met outside Europe and North America. Bulgaria was admitted to statutory membership with effect from the beginning of 1970 and Turkey



The Nice conference of 1973 was the 12th in the IGU series and the first to be called “World” (Mondial in French) rather than “International”.

became the first observer member, while the UK offered to take over the Presidency for 1973-76.

This offer was accepted at the pre-conference Council meeting in Moscow, when Georges Robert was elected President and Leslie J. Clark Vice President for 1970-73. The Council also welcomed East Germany as a new member, admitted India and Portugal as observers and appointed Albert Higgins as Secretary General. Raoul Touwaide was made an Honorary Vice President and his assistant, Cecile Lacroix, was presented with a gold watch. Furthermore, the Council accepted Alexei Sorokin’s proposal of an honorary title for retiring members and elected M. Q. Zaman of the Petroleum Institute of Pakistan as the first Honorary Council member.

The 11th International Gas Conference opened in the Great Hall of the Kremlin Palace in Moscow on June 9, 1970 and ran until June 12. For the first time an exhibition of gas equipment ran alongside the conference and attendance, boosted by strong local support, reached a new record of 2,756 delegates and 346 accompanying persons.

Raoul Touwaide was given a grand send-off in Moscow, being presented with a specially-commissioned gold medal by Alexei Sorokin during the closing ceremony of the conference.

The second French Presidency

As France took over the Presidency for 1970-73, IGU mourned the death of the Union’s first French President, Auguste Baril. Honorary Secretary General Walter Brauholtz also died in 1970, while Honorary President Mario Boselli died in 1971.

This was the Triennium when the global order established after World War II began to change. In 1971, dollar-gold convertibility was formally abandoned, bringing an end to the Bretton Woods system of fixed exchange rates, and the People’s Republic of China was recognised at the United Nations.

The Triennium also marked a broadening of IGU’s reach, with Argentina becoming the first member from Latin America in 1970 and Algeria becoming the first African member in 1971. To reflect this, the conference name was changed from “International” to “World”.

There was a further reorganisation of the technical committee structure. LNG and LPG were initially covered by a sub-group of the natural gases and mass storage committee, but this was made a full committee in 1972. Work



A film has survived in the Gazprom archives of the 11th International Gas Conference which was held in Moscow in June 1970. These frames show (TOP) delegates arriving from Vienna, (CENTRE) the conference hall and (BOTTOM) IGU President Alexei Sorokin giving Raoul Touwaide a gold medal on his retirement as Secretary General.



▲
The opening ceremony of the 12th WGC.

on utilisation was divided between two committees and those for statistics and documentation were merged (*see box*). In addition, a papers committee was set up to coordinate the technical programme of what was now the World Gas Conference (WGC). The technical committee chairmen started reporting to this new committee which met immediately prior to the Council.

Other developments included decisions to organise periodic symposia between WGCs and to enhance cooperation with WEC. The Council also discussed how IGU could help with training and technical advice for the gas industries of developing countries. Offers were received from

▶▶
Georges Robert, IGU President 1970-73 (BELOW) opening the Nice exhibition which featured 185 exhibitors (BELOW RIGHT).



Canada to take over the Presidency for 1976-79 and Switzerland for 1979-82.

The Triennium culminated in the 12th World Gas Conference, which was held in Nice, June 5-9, 1973. Delegates celebrated the enormous strides the industry had made in finding and developing natural gas reserves around the world, but there was some concern that demand would outstrip supply with a number of papers looking at the production of synthetic natural gas from various feedstocks. Overall, a record 146 papers and reports were presented, although attendance fell compared to Moscow with 1,946 delegates and 852 accompanying persons.

Technical Committee structure as amended in 1972

Committee and area of study	Chair 1973-76 and 1976-79
A Natural Gases & Mass Storage*	USSR
B Production of Manufactured Gases	USA
C Transmission of Gases	Italy
D Distribution of Gases	The Netherlands
E Domestic & Collective Utilisation of Gases	France
F Industrial & Commercial Utilisation of Gases	West Germany
G Statistics, Documentation & Sundry Questions	Canada
H Liquefied Gases	UK

Note: The committees were now referenced by letter rather than number.

* From 1975, Production, Treatment and Underground Storage of Natural Gases

At its pre-conference meeting, the Council elected Leslie Clark of the UK President and James W. Kerr of Canada Vice President for 1973-76. The conference was opened at the Palais des Expositions on June 5, and that evening there was a reception with a carnival procession and a traditional battle of flowers. Later in the week, the Municipality of Nice hosted a garden party in Cimiez Park.

The programme for accompanying persons included a visit to Monte Carlo and there was an amusing incident when more people turned up than expected. A group of ladies stood in front of the coaches to prevent the excursion leaving until an extra coach was provided!



Energy moves up the global agenda

The 1973-76 Triennium was marked by the first oil crisis, which pushed energy to the top of the global agenda.

The Triennium had got off to a sad start with the death of Pierre Mougins a few days after the Nice conference. Then, in the wake of the Arab-Israeli War of October 1973, the Organisation of the Petroleum Exporting Countries (OPEC) flexed its new-found muscle to institute an embargo which resulted in a quadrupling of the oil price. Western countries responded by setting up the International Energy Agency (IEA) in 1974 to address disruptions in oil supplies and provide a statistical and information service covering all energy sectors. Overnight, energy conservation became a key issue and IGU was invited to participate in the work of WEC's new International Energy Conservation Commission.

In 1974, the Bureau member for the USSR, Professor Y. P. Korotaev suggested that IGU's name be changed to the World Gas Union just as the conference name had been changed in the previous Triennium. Members were consulted and most were against the change. Meeting in Dresden in May 1975, the Council agreed the name "International Gas Union" should be retained, but that the words "A Worldwide Organisation" should be added on stationery and other printed material where appropriate.

This was also the meeting at which the Council accepted France's offer to be the next host of the Secretariat and appointed Bernard Goudal, Assistant Secretary General of the ATG, as Deputy Secretary General.

Two Honorary Presidents died during the Triennium, Hermann Müller in 1974 and Marcel Brabant in 1975.

As regards membership, Turkey ceased to be an observer, two new observers were welcomed – Iraq in 1974 and New Zealand in 1975 – and Brazil became a statutory member in 1975. However, South Africa's application split the Council. Some members felt that South Africa's



◀ The 13th WGC was held on London's South Bank, seen here in a water colour painted by Leslie Clark.

unique experience with coal gasification would be valuable to IGU while others were opposed to the apartheid regime. Rather than going to a formal vote, a compromise was agreed whereby South Africa withdrew its application but was invited to nominate a delegate to the manufactured gases committee, IGU's committee rules allowing experts from non-members to be co-opted.

The number of papers presented at IGU's conferences had been steadily increasing, and for the 13th World Gas Conference it was decided to accept no more than 100 to allow each speaker more time. In the event, 89 reports and papers were presented during the 13th WGC, which was held on London's South Bank, June 7-11, 1976. HRH the Duchess of Gloucester formally opened the conference in a ceremony in the Royal Festival Hall. The working



sessions were held in the adjacent Queen Elizabeth Hall and National Film Theatre, technical films also being shown in the latter. The exhibition was held in tents on the South Bank. Attendance was similar to Nice with just under 2,000 delegates and over 800 accompanying persons.

Unusually, the Council met on the last day of the conference rather than immediately before, and this was when James Kerr of Canada and Eric A. Giorgis of Switzerland were elected President and Vice President for 1976-79. Council members also approved Bangladesh's application to become an observer.

The Canadian Presidency

An important development of the 1976-79 Triennium was the setting up of task forces to study issues that cut across the work of all the technical committees. A task force to study improved end uses of gases was set up in 1977 and gave a full report at the 14th World Gas Conference in Toronto, while one on energy conservation in the gas industry was set up in 1978 and gave an interim report at Toronto. The Council approved the establishment of a third task force to investigate the future resources of natural gas, methods of transportation and development of markets on a global basis, but work did not get underway until the following Triennium.

◀ Leslie Clark, IGU President 1973-76.

▶ The IGU Council at work in Hamburg in April 1978.



▲ James Kerr, IGU President 1976-79.

Work on the latest edition of the dictionary in nine languages (Czech, Hungarian, Polish, Romanian, Russian and Swedish for the first time with revised English, French and German) was completed, and it was decided to publish separate booklets to save on printing costs.

In 1977, both German states offered to assume the Presidency, West Germany for 1982-85 and East Germany for 1985-88. Meeting in Hamburg in April 1978, the Council formally designated Bernard Goudal (who was now Secretary General of the ATG) to succeed Albert Higgins on his retirement, and approved Hong Kong's application to become an observer. The following year, IGU became one of the co-sponsors of the new International Gas Research Conference (see the chapter on the history of the IGRCs).

The Triennium saw the beginnings of deregulation in the USA with The Natural Gas Policy Act of 1978. Deregulation was to gather pace during the 1980s and culminate in the early 1990s with the abolition of controls on wellhead prices and the separation ("unbundling") of sales and marketing activities from transmission and distribution. Deregulation then spread to Europe and other regions.



In the run-up to the 14th WGC two major events, the Iranian Revolution and the Three Mile Island nuclear plant accident impacted energy markets.

Following increasing unrest in Iran, the Shah was forced into exile in January 1979. Ayatollah Khomeini returned to the country in February and an Islamic Republic was set up. Oil production plummeted and exports stopped. As a result the oil price surged. Then, on March 28, one of the reactors at the Three Mile Island

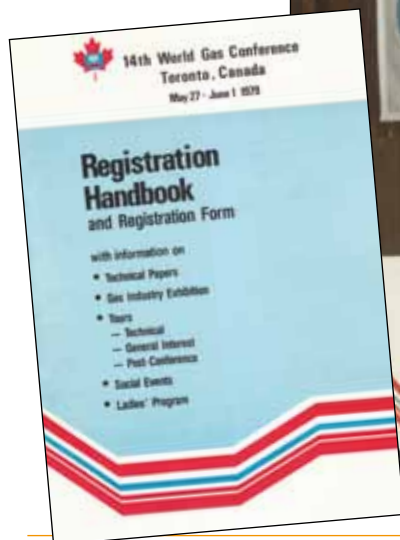
nuclear power plant in Pennsylvania overheated and radiation was released. Although no demonstrable injuries from radiation were observed, the accident increased fears about the safety of nuclear power.

The 14th WGC was held in Toronto, May 27-June 1, 1979, and was opened by William G. Davis, Premier of Ontario. Meeting just before the opening ceremony, the Council elected Eric Giorgis of Switzerland as President and Dr Christoph Brecht of West Germany as Vice President for 1979-82. It also appointed Bernard Goudal as Secretary General with the Secretariat hosted by the ATG in Paris. Albert Higgins was made an Honorary Vice President.

The opening and closing ceremonies were held in Toronto's O'Keefe Centre (today the Sony Centre for the Performing Arts), the conference sessions took place in the Royal York Hotel and the exhibition was held in the convention centre of the Toronto Harbour Castle Hilton Hotel.

A special feature on two days was a delegates' luncheon with an invited speaker, which proved to be very popular. Overall, 1,585 delegates and 719 accompanying persons attended the conference and 66 papers were presented. The technical visit programme included a tour of the Ontario Centre for Resource Recovery, an experimental plant looking at ways to convert waste to energy and material resources.

▶ The 14th WGC was held in Toronto and (INSET) the registration handbook.



There was a moment of high drama for one group of delegates on a post-conference tour of western Canada, who got stuck in a cable car half-way up a mountain near Jasper, Alberta in a raging blizzard. The rescue forces swung into action and they were brought to safety in 50 minutes.

IGU's 50th anniversary

The first Council meeting of the 1979-82 Triennium was held in Algiers in October 1979. Amongst other business on the agenda there was a bid from the USA for the 1985-88 Presidency. As East Germany had already put itself forward, a decision was postponed pending consultations with both parties. It was subsequently agreed that the USA would be the candidate for 1985-88, followed by East Germany for 1988-91.

Sadly, relations between two other IGU members were far from amicable. Iraq invaded Iran in September 1980, starting a war that would last for eight years.

Apart from the normal work of the technical committees, two task forces operated during the Swiss Presidency. Studies continued on energy conservation and started on global gas supply and demand. Preparations also started for a new volume of the dictionary covering a larger vocabulary in English, French, German and Russian. Meanwhile, membership con-



From left to right in the foreground at the 15th WGC in Lausanne are: IGU Vice President, Dr Christoph Brecht; Dr Eduard Kiener, Director of the Swiss Federal Office of Energy; Dr W. Hunziker, President of Swissgas; IGU President, Eric Giorgis; and R. Kohler, President of SVGW.

tinued to grow. In 1980, Indonesia and Taiwan joined, New Zealand moved from observer to statutory membership and Egypt became an observer. Mexico and Venezuela joined the following year.

IGU turned 50 in 1981 but the celebrations were held over to coincide with the 15th World Gas Conference, which was held in Lausanne, June 14-18, 1982. In the run-up to the conference, the Swiss post office issued a commemorative stamp, while the programme

in Lausanne included an audio-visual show celebrating the history of IGU and a 50th anniversary gala dinner.

The Council met the day before the conference and elected Christoph Brecht of West Germany as President and John Kean of the USA as Vice President for 1982-85. It also extended the life of the task force on global gas supply and demand.

The 15th WGC began on June 14 with a morning ceremony outside the Palais de

The Swiss post office issued a commemorative stamp to mark IGU's 50th anniversary.

Pierre Alby, CEO of Gaz de France, addresses the 15th WGC. Note the special logo designed by the Swiss Presidency to commemorate 50 years of IGU and 15 WGCs.





▲ Eric Giorgis visiting the DVGW stand at the 15th WGC's exhibition. He is talking to Christoph Brecht with Dr Werner Feind, Managing Director Gas of the DVGW at far left. The local industry was also represented (INSET).

▼ A globe sculpture with a flame fed by gas from the Groningen field was a feature of the 15th WGC.

Beaulieu convention centre at which the IGU and conference flags were raised and Roland Mages, Chairman of the National Organising Committee (NOC), lit a gas flame. The burner was mounted on top of a globe and was fed by gas from the Groningen field, symbolising international cooperation in the gas industry.

Eric Giorgis formally opened the conference that afternoon, with Fritz Honegger, President of the Swiss Confederation, and Marcel Blanc,

▶ The 16th WGC was held in the Munich Exhibition Centre. RIGHT Christoph Brecht, IGU President 1982-85 (right) shakes hands with Vice President John Kean outside the venue and (OPPOSITE, TOP LEFT) the conference in session.



President of the Canton of Vaud as the guests of honour.

During the working sessions, 84 papers and reports were presented, the latest edition of the dictionary was launched and 17 films were shown. Workshop and roundtable sessions were introduced, providing an opportunity for detailed discussion of topical questions within the terms of reference of the technical committees. The social programme started with a reception and was rounded off on the final evening by a cruise on Lake Geneva with dinner and dancing on board.

Attendance was high at Lausanne, with 2,142 delegates and 835 accompanying persons from 53 countries, while the exhibition was the biggest to date with 243 exhibitors.

Cooperation with the World Bank

IGU established contacts with the World Bank during the 1982-85 Triennium, and the Bank agreed to cooperate in organising a WGC workshop on the problems faced by less developed countries in the development of their gas resources.

IGU also launched a new symposium on computing in the gas industry as part of the programme of organising periodic symposia between WGCs. The first was held in Gatwick, UK in April 1984.

In other developments, the new edition of the dictionary was published in Arabic, Italian, Portuguese and Spanish, while the Council agreed a further revision of the technical



Technical Committee structure with effect from the 1988-91 Triennium

Committee and area of study	Chair 1988-91
A Production, Treatment & Underground Storage of Natural Gas	USSR
B Production of Manufactured Gases	East Germany
C Transmission of Gases	UK
D Distribution of Gases	West Germany
E Domestic & Collective Utilisation of Gases	USA
F Industrial & Commercial Utilisation of Gases	Canada
G Information & Communication	Italy
H Liquefied Gases	France
J World Gas Supply & Demand	The Netherlands
K Computing & Personnel Services	Czechoslovakia



committee structure to take effect from the 1985-88 Triennium. The task force on global gas supply and demand became a permanent committee and Committee G (covering statistics, documentation and sundry questions) was split into two as its workload was increasing (see box).

In 1984, Switzerland offered to take over from France as the next host of the Secretariat,

and Italy offered to assume the 1991-94 Presidency. The Council accepted Switzerland's offer but postponed a decision on Italy's. Sadly, 1984 was also marked by the deaths of Honorary Presidents Robert Hendee and Alexei Sorokin.

There were several changes in membership during the 1982-85 Triennium. Ireland joined, Portugal moved from observer to statutory membership and Libya, South Korea and



Thailand became observers. However, Mexico and Romania left.

Munich was the venue for the 16th World Gas Conference, which was held in the city's exhibition centre (Messe), June 24-27, 1985. It was attended by 2,504 delegates and 1,065 accompanying persons from 55 countries. Dr Martin Bangemann, Federal Minister of Economics, Anton Jaumann, Bavarian Minister

▲ ▼
Social events during the 16th WGC included a traditional Bavarian evening (ABOVE) and a dinner in the Munich Residenz, the former palace of the Bavarian dukes, electors and kings (BELOW).

◀
This ceremonial gas burner for the 16th WGC was built by apprentices of Ruhrgas.





▲► US President Ronald Reagan was the guest of honour at the opening ceremony of the 17th WGC in Washington DC. ABOVE IGU President John Kean introducing Ronald Reagan and ABOVE RIGHT the President giving his address.

▼ Tickets for the opening ceremony and the First Lady's tea party.

for Economic Affairs and Commerce, and Georg Kronawitter, Mayor of Munich were the guests of honour at the opening ceremony, while the chess grandmaster Anatoly Karpov challenged visitors to the Ruhrgas stand in the exhibition.

Meeting the day before the conference started, the Council elected John Kean of the USA as President and Dr Herbert Richter of East

Germany as Vice President for 1988-91. It also accepted Italy's offer to assume the 1991-94 Presidency and appointed Dr Jean-Pierre Lauper, Delegate of the Board of Swissgas, as Deputy Secretary General.

Environmental focus

An important policy of the second US Presidency was to emphasise the contribution natural gas could make to reducing air pollution. Governments were paying increasing attention

to environmental issues thanks partly to the work of the World Commission on Environment and Development. Chaired by Gro Harlem Brundtland, then Prime Minister of Norway, the Commission published its report in 1987 and introduced the world to the concept of "sustainable development". IGU needed to show that natural gas had an important role to play as the cleanest of the fossil fuels. Meanwhile, the Chernobyl disaster of April 1986 had renewed fears about the safety of nuclear power.

► A daily newspaper in French and English was produced during the 17th WGC.



Another initiative was to reach out to developing countries which needed help to build their gas industries, building on the cooperation already established with the World Bank.

During the Triennium, the Council accepted Denmark's offer to assume the 1994-97 Presidency and received bids from France and Norway for 1997-2000; the People's Republic of China and Malaysia joined, Peru became an observer and South Korea moved from observer to statutory membership; and the latest edition of the dictionary was published in Chinese.

The 17th World Gas Conference was held in Washington DC, June 6-10, 1988 with the theme "Creating a One-World Gas Industry".

Meeting on June 5, the Council elected Herbert Richter of East Germany as President and Luigi Meanti of Italy as Vice President for 1988-91. It also appointed Jean-Pierre Lauper as Secretary General with the Secretariat to be hosted at the Swissgas office in Zurich. Bernard Goudal was made an Honorary Vice President.

President Ronald Reagan was the guest of honour at the opening ceremony in the Sheraton Washington Hotel, which was also addressed by John Kean, the Mayor of Washington DC, Marion Barry, and the AGA President, George Lawrence. Nancy Reagan hosted a tea party for accompanying persons on June 9, and the farewell party was held in the Smithsonian Museum of American History.

Overall attendance set a new record with 2,693 delegates and 1,060 accompanying persons, although the Moscow delegate total had yet to be beaten.

Change sweeps Eastern Europe

The 1988-91 Triennium was a momentous one which saw political change sweep Eastern Europe, with perhaps the most dramatic event being the opening of the Berlin Wall on November 9, 1989. Just under a year later, on October 3, 1990, Germany was unified with the five newly-reconstituted eastern states acced-

ing to the Federal Republic. The East German state apparatus was dismantled and the state-owned enterprises known as Volkseigene Betriebe (VEB) were passed to a special agency called the Treuhand charged with restructuring and privatising them. This meant that local industry support for the 18th World Gas Conference disappeared.

The gas industry in West Germany moved swiftly to help with Rolf Beyer of Ruhrgas, who was Vice President Gas of the DVGW at the time (he later became President), coordinating the efforts. Beyer became co-chairman of the 18th WGC with IGU President Herbert Richter. Honorary IGU President Christoph Brecht was also brought in as a consultant and Jan Kätelhön became co-chairman of the NOC with Dieter Boi.

Change was certainly in the air when the Council convened in Dresden in September 1988 for its first meeting of the Triennium. After all, Mikhail Gorbachev had come to power in the USSR in April 1985 and begun a process of reform. But few people expected the pace to accelerate so quickly.

The Dresden meeting was notable for the launch of an IGU prize worth SFr5,000 and

Japan's offer to assume the Presidency for 2000-03 – the first country outside Europe and North America to do so.

When he was Vice President Herbert Richter had floated the idea of a prize to recognise the contributions of young scientists to gas research and technology. The Secretariat had then worked on a formal proposal which the Council now approved. The first prize would be awarded at the 18th



▲
Herbert Richter, IGU
President 1988-91.



▲▲▲
The 18th WGC was held in the ICC in Berlin. ABOVE A packed plenary session LEFT delegates are greeted by traditional barrel organ players and BELOW a set of commemorative stamps issued by the German post office.



WGC, which was due to be held in East Berlin in June 1991.

After the dramatic events of 1989, plans for the 18th WGC were changed to include venues in both parts of Berlin. The conference sessions and exhibition were switched to the International Congress Centre (ICC) in West Berlin,

necessitating a slight postponement to July as the ICC was fully booked in June, while some social events remained in East Berlin including a gala dinner in the Palace of the Republic. But the swift move to unification and the closing of the Palace of the Republic forced further amendments to the programme.

On German unification in 1990, the East German IGU member Kammer der Technik ceased its activities and the DVGW became the sole German member of IGU.

Germany was not the only focus of the world's attention during the Triennium for, in August 1990, Iraq invaded Kuwait. Against this backdrop, IGU's work continued.

The technical committees were asked to study the interaction of gas and the environment in their specific fields, and a dedicated task force was set up. This worked on a publication "Gas – the Solution, A Route to Sustainable Development" and organised an environmental workshop for the 18th WGC. A second task force was set up to look at natural gas vehicles, and cooperation started with the International Association for Natural Gas Vehicles. A long-term review of the technical committee structure was also begun.

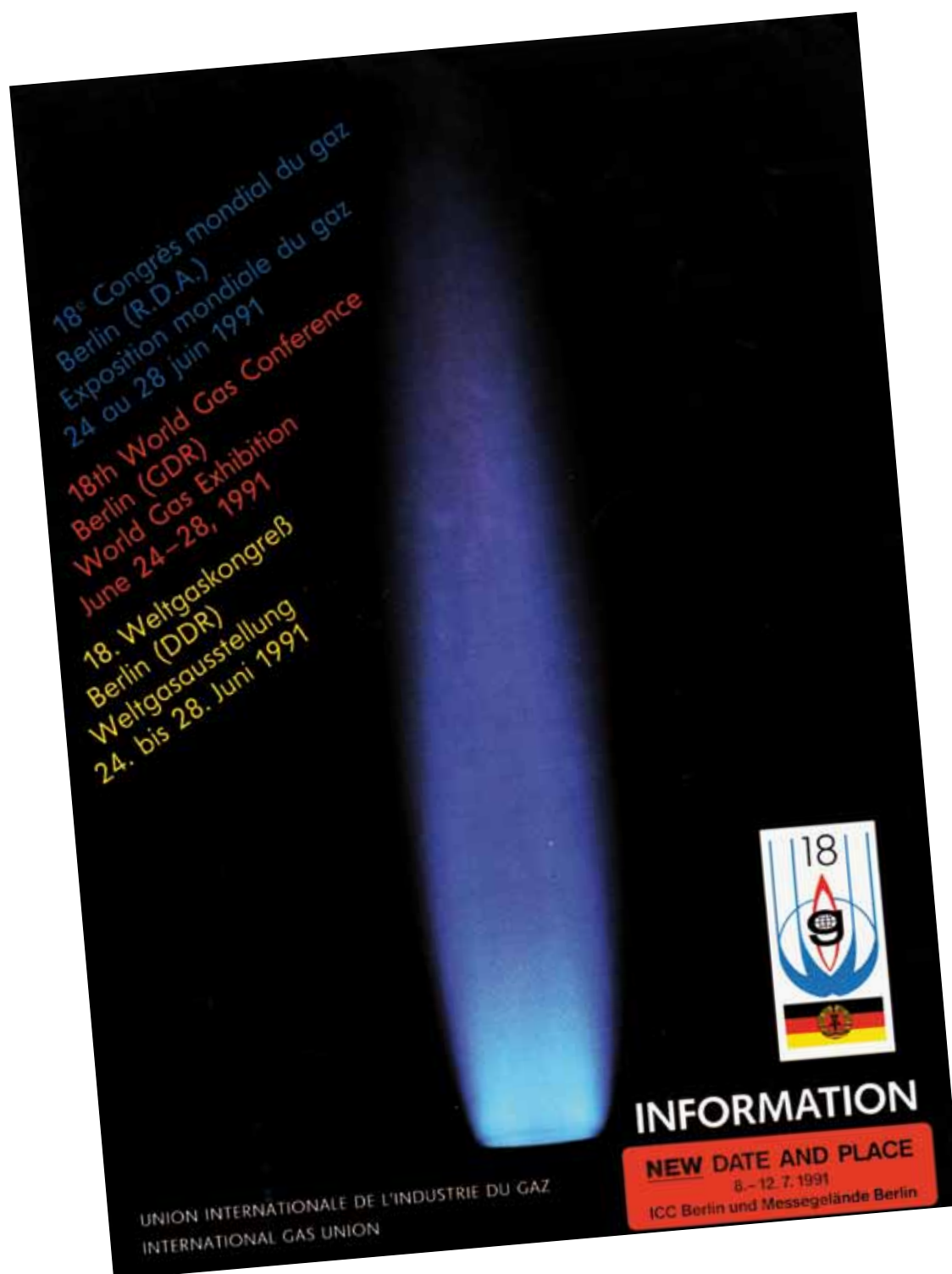
The IGU diploma was introduced to honour committee chairmen, secretaries and other people who had dedicated time to IGU work. The first diploma was given to J-P Dartigalongue, who represented IGU on the WEC Programme Committee and stepped down in 1989.

There was a change in a long-standing cooperative relationship in 1990, when Cometec-Gaz was succeeded by a new association called Eurogas with a wider remit to promote the development of the European natural gas industry considering scientific, economic, legal and technical issues. The same year brought the sad news from Belgium of the death of Raoul Touwaide, who had been IGU's longest-serving Secretary General.

The USSR joined France and Norway in bidding for the 1997-2000 Presidency, the first time three countries had put themselves forward. After discussions, Norway and the USSR switched their bids to 2000-03 and the Council approved France's candidature.

On the membership front, North Korea joined IGU, Egypt moved from observer to statutory membership and Iraq left.

▶ The programme for the 18th WGC changed several times.





◀◀
 FAR LEFT Luigi Meanti, IGU President 1991-94, addresses delegates to the 19th WGC and LEFT presents the IGU Prize to Chris Rose from the UK, and two other prizes to Gabriele Olivieri from Italy and Iromori Kozubo from Japan. The pictures are taken from a video in the Eni archives.

Despite all the challenges, the 18th WGC was a resounding success. Herbert Richter and Rolf Beyer presided at the opening ceremony on July 8, and the guests of honour were Dr Christine Bergmann, Mayor of Berlin and Klaus Beckmann, Secretary of State at the Ministry of Economics.

Records were set for delegates (3,100), accompanying persons (1,200) and the number of exhibitors (380). Apart from the reports of the 10 technical committees, there were 115 individual papers, 74 contributions to workshop sessions, 65 posters and 43 films and videos. The technical visit programme included a tour of Europe's largest facility for the recovery of landfill gas, and the USSR brought the Tupolev Tu-155 to Berlin. This was a test aircraft which used LNG as a fuel.

Meeting the day before the conference started, the Council elected Luigi Meanti of Italy President and Hans-Jørgen Rasmussen of Denmark Vice President for 1991-94. The IGU Prize was awarded to Christine Ribes and the late Eric Siaudeau of France for their work "New criteria for evaluating odourisation techniques and their use in a new odourant". Two other papers were awarded prizes sponsored by the German gas industry and the NOC. A number of

diplomas were also awarded, notably to Olga Huvalé who was retiring from the Secretariat having served as assistant to Bernard Goudal and adviser to Jean-Pierre Lauper.

New states and new Articles of Association

As the 1988-91 Triennium drew to a close, the wars of Yugoslav succession started. Then, in December 1991, the USSR was dissolved followed by Czechoslovakia in December 1992. The three states ultimately became 23 with a big impact on the membership of all international organisations.

As far as the immediate changes in IGU's membership were concerned, Russia assumed the USSR's obligations, the Czech Republic and Slovakia joined and Croatia and Estonia became observers. Additionally, Romania rejoined as an observer, Colombia and Tunisia joined and Brazil left.

IGU's statutes were reviewed during the 1991-94 Triennium. The aim was to improve the running of the Union while retaining the concept of a cost-effective body based on voluntary work backed up by a modest Secretariat. As IGU had grown so had the size of the Council, which was meeting twice a year, while the

Bureau lacked executive powers and the Papers Committee did not have statutory status.

It was decided to reduce the number of annual Council meetings to one (except in World Gas Conference years), convert the Bureau into a slightly larger Executive Committee meeting twice a year and create a new organ of IGU, the Technical Coordinating Committee (TCC), to replace the Papers Committee. The members of the Bureau were the President, Vice President and Immediate Past President, representatives of the countries chairing technical committees and two representatives

▼
 Jean-Pierre Lauper, IGU Secretary General 1988-94 (left) makes a point to Luigi Meanti.



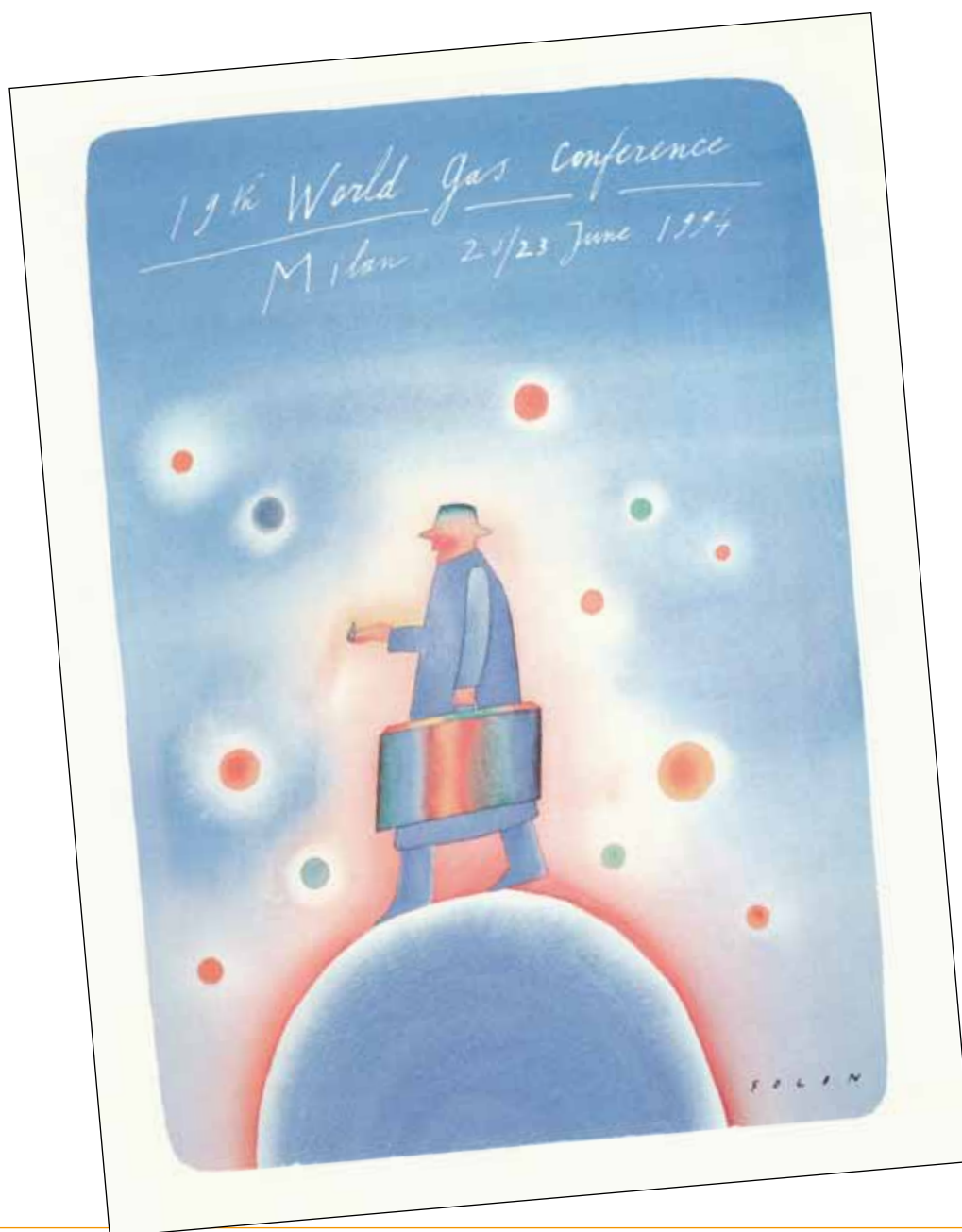
elected from among countries not chairing a technical committee. The new Executive Committee would include two more elected members and the TCC Chairman. Additionally, provision was made to confer the status of Honorary Member of IGU on people who had rendered outstanding service to the Union.

New Articles of Association were approved by the Council in 1993, whereupon the statutory members became known as Charter Members. The revision of the technical committee structure started in the previous Triennium was also completed and approved to take

Technical Committee structure for the 1994-97 Triennium

<i>Committee and area of study</i>	<i>Chair 1994-97</i>
A Production, Treatment & Underground Storage of Natural Gas	Germany
B Production of Manufactured Gases & Hydrogen	UK
C Transmission of Gases	Canada
D Distribution of Gases	USA
E Domestic & Collective Utilisation of Gases	Italy
F Industrial Utilisation of Gases & Power Generation	The Netherlands
G Information & Communication	Spain
H Liquefied Gases	Japan
J World Gas Prospects, Strategies & Economics	France
K Utilisation of Gases for Transport	Russia

▶
The Belgian artist
Jean-Michel Folon
designed this poster for
the 19th WGC.

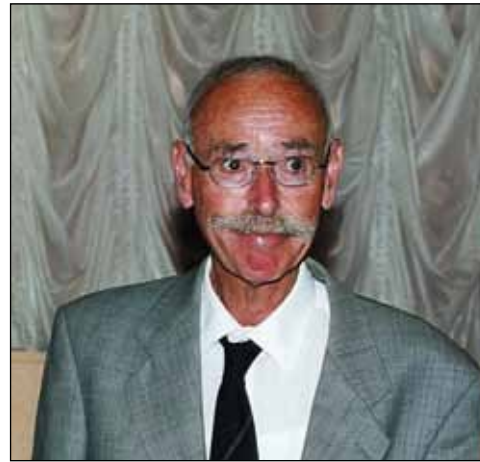


effect from the 1994-97 Triennium (see box). The main change was to bring computing and personnel services under the remit of the information and communication committee (G) in order to dedicate a committee (K) to the utilisation of gases for transport. The life of the task force looking at gas and the environment, which had been extended into the 1991-94 Triennium, was extended again and a new task force set up to study gas and developing countries.

Meanwhile, The Netherlands had offered to take over from Switzerland as the next host of the Secretariat and, meeting in Stavanger in June 1992, the Council appointed John F. Meeder, Public Affairs Manager of Gasunie, as Deputy Secretary General. As regards the 2000-03 Presidency, Norway and Russia withdrew their bids and the Council approved Japan's candidature.

Among other developments during the Triennium, two Honorary Presidents died, Leslie Clark in 1992 and Georg Düwel in 1994, and IEA invited IGU to become involved with a new International Centre for Gas Technology Information (ICGTI). This was going to be set up under the IEA's auspices, based on a joint proposal of the Danish Gas Technology Centre and the US Gas Research Institute. IGU went on to become an observer at the ICGTI when it was launched in 1995.

When the Italian NOC, chaired by Gianfranco Merri, started planning the 19th World Gas



◀◀
Herbert Richter (left), IGU President 1988-91, and Hans Jørgen Rasmussen, IGU President 1994-97 at the 19th WGC.

◀◀
John Meeder, IGU Secretary General 1994-2000.

◀
John Meeder presenting a gift to the retiring Secretary General, Jean-Pierre Lauper.

Conference in Milan, it looked as if renovation works would rule out the Milan Fair as a venue. Consequently, the city's Fiori Convention Centre was booked for early June 1994. However, in July 1992 it became possible to book the Milan Fair, albeit two weeks later, and the 19th WGC was held there.

Luigi Meanti's guests of honour at the opening ceremony on June 20 were Marco Formentini, the Mayor of Milan, Giampiero Beccaria, Under Secretary of State at the Ministry of Industry, and Viktor Chernomyrdin, Prime Minister of Russia.

The 19th WGC ran until June 23 and set new records with 3,900 delegates, 1,400 accompanying persons and 420 exhibitors. It also introduced keynote speeches to replace the traditional presentation of national and international papers at the plenary sessions. Faisal Abda'oe, President of Pertamina, gave the first of six keynote speeches on June 20. There were also three luncheon speeches, while 98 reports and papers, 71 posters and 69 videos were presented. A further 15 papers were published together with three handbooks prepared by the information and communication committee (Statistical Data, International Classification for the Documentation of the Gas Industry and IGU Terminology).

The IGU Prize was presented during the closing ceremony to Chris Rose from the UK for his paper, "Establishing the level of methane

leakage from the British Gas distribution system". A prize sponsored by IGU's Italian Charter Member went to Gabriele Olivieri from Italy and the prize of the 19th WGC went to Iromori Kozubo from Japan.

The social programme included a special opera recital at La Scala, and technical visits

were offered to Snam's gas dispatching centre, a compressor station, cogeneration plants and a pipeline crossing of the Alps.

Meeting the day before the conference started, the Council meeting elected Hans-Jørgen Rasmussen of Denmark President and Jacques Maire of France Vice President for



◀
The first issue of IGU's newsletter was published in December 1994.



▲
Banners at Copenhagen airport welcome delegates to the 20th WGC.

▲▲
HRH Crown Prince Frederik of Denmark (*left in the foreground*) arrives at the 20th WGC with IGU President Hans Jørgen Rasmusen.

▶
The 20th WGC was held in Copenhagen's Bella Center.



1994-97. It also elected John Meeder as Secretary General, with the Secretariat to be hosted by Gasunie in Groningen, and appointed the first two Honorary Members of IGU – the retiring Secretary General Jean-Pierre Lauper and Masafumi Ohnishi in recognition of his service to the Japanese gas industry.

IGU raises its profile

An important initiative of the Danish Presidency was to raise the Union's profile between World Gas Conferences. Steps were taken to send IGU representatives to more conferences, increase personal contacts with members, make more efforts to attract new members and develop a press relations strategy. A newsletter and website were launched, a formal statement of IGU's objectives drawn up and an overview of the



◀ The President's dinner during the 20th WGC was held in the turbine hall of the Gothersgade power station in Copenhagen. In the foreground are: Peter Storm, then NOC Chairman (left); his wife Bodil Storm (centre); and Ineke Nijbroek, assistant to the Secretary General (right).



◀ Seven gas companies brought hot air balloons to the 20th WGC.



▶
The first Council meeting of the 1997-2000 Triennium was held in Deauville in October 1997.

technical work programme published for worldwide distribution.

Although there had been recent changes to IGU's committee structure, the pace of change in the gas industry was increasing and policy issues were becoming as important as technical ones. A working group was set up to carry out a thorough review of technical activities. The members were the TCC Chairman Peter Hinstrup, Vice Chairman Francis Dewerdts and Jaime Elgström, Chairman of Working Committee G.

The working group recommended that the way in which IGU's technical work programme was developed be changed from a bottom-up to a top-down approach based on strategic guidelines from the President, approved and developed by the Executive Committee. It also reviewed the committee structure and the allocation of committee chairs. The main changes recommended here were to discontinue certain information activities such as the dictionary or make them the responsibility of the Secretariat, and merge two of the utilisation committees, thus allowing committees to be

dedicated to gas and developing countries and to the environment, safety and health. Additionally, it was proposed to restrict a country's chairmanship to one Triennium. The idea was to introduce a system of chairs and vice chairs from different countries with the vice chair in one Triennium taking over the chair in the next.

These recommendations were accepted by the Council at its meeting in Edinburgh in October 1996, and the Articles of Association were amended with the new committee structure taking effect from the 1997-2000 Triennium (see box).

Meanwhile, the annual UN Climate Change Conferences had started, with IGU being

Technical Committee structure with effect from the 1997-2000 Triennium

<i>Committee and area of study</i>	<i>Chair / Vice Chair 1997-2000</i>
1 Exploration, Production, Treatment & Underground Storage of Natural Gas*	Norway / Russia
2 Production of Manufactured Gas**	USA / Germany
3 Liquefied Gases	Italy / Spain
4 Transmission	Russia / Italy
5 Distribution	UK / France
6 Utilisation of Gases for the Domestic, Commercial & Transportation Sectors	Canada / The Netherlands
7 Industrial Utilisation & Power Generation	Germany / UK
8 Environment, Safety & Health	The Netherlands / Canada
9 World Gas Prospects, Strategy & Economics	Japan / USA
10 Gas & Developing/Transitional Economy Countries	Algeria / Argentina

* From 2000 Exploration & Production of Gas

** From 2000 Underground Storage of Gas

Note: The committees now reverted to being referenced by number.

granted non-governmental organisation (NGO) status. The United Nations Framework Convention on Climate Change (UNFCCC) had been agreed at the Rio Earth Summit in 1992 and the first Conference of the Parties (COP) to the UNFCCC was held in Berlin in 1995. The chairman of the task force on gas and the environment, Frank Shephard represented IGU at the COPs. The task force also worked on a joint publication with Eurogas and Marcogaz for the 20th WGC and drafted an environmental charter to underline the commitment of IGU's members to sustainable development and good environmental practice. This charter was adopted by the Council at the Edinburgh meeting.

The efforts to raise IGU's profile entailed an increase in the Secretariat's workload and in turn raised the question of whether IGU should have a full-time Secretary General and a permanent Secretariat in future. Up to now the Secretary General had combined his national job with part-time work on IGU duties, backed up by a full-time assistant. A working group was set up to investigate and seek the views of members.

The drive to increase membership bore fruit with a net increase of seven: Estonia, Croatia and Ukraine became Charter Members, Bosnia and Herzegovina, Israel, Latvia, Lithuania, Qatar and Slovenia became observers and Brazil rejoined as an observer, while Colombia, North Korea and Peru left.

Three Honorary Presidents died during the Triennium, Jacob van Dam van Isselt in 1994, Bengt Nilsson in 1996 and James Kerr in 1997. Among other developments, Jacques Maire stood down as Vice President on becoming CEO of Gaz de France and Claude Détourné was elected Vice President in 1996. He went on to be elected President for 1997-2000, along with Hiroshi Urano of Japan as Vice President, when the Council met the day before the 20th World Gas Conference, which was held in Copenhagen's Bella Center, June 10-13, 1997.

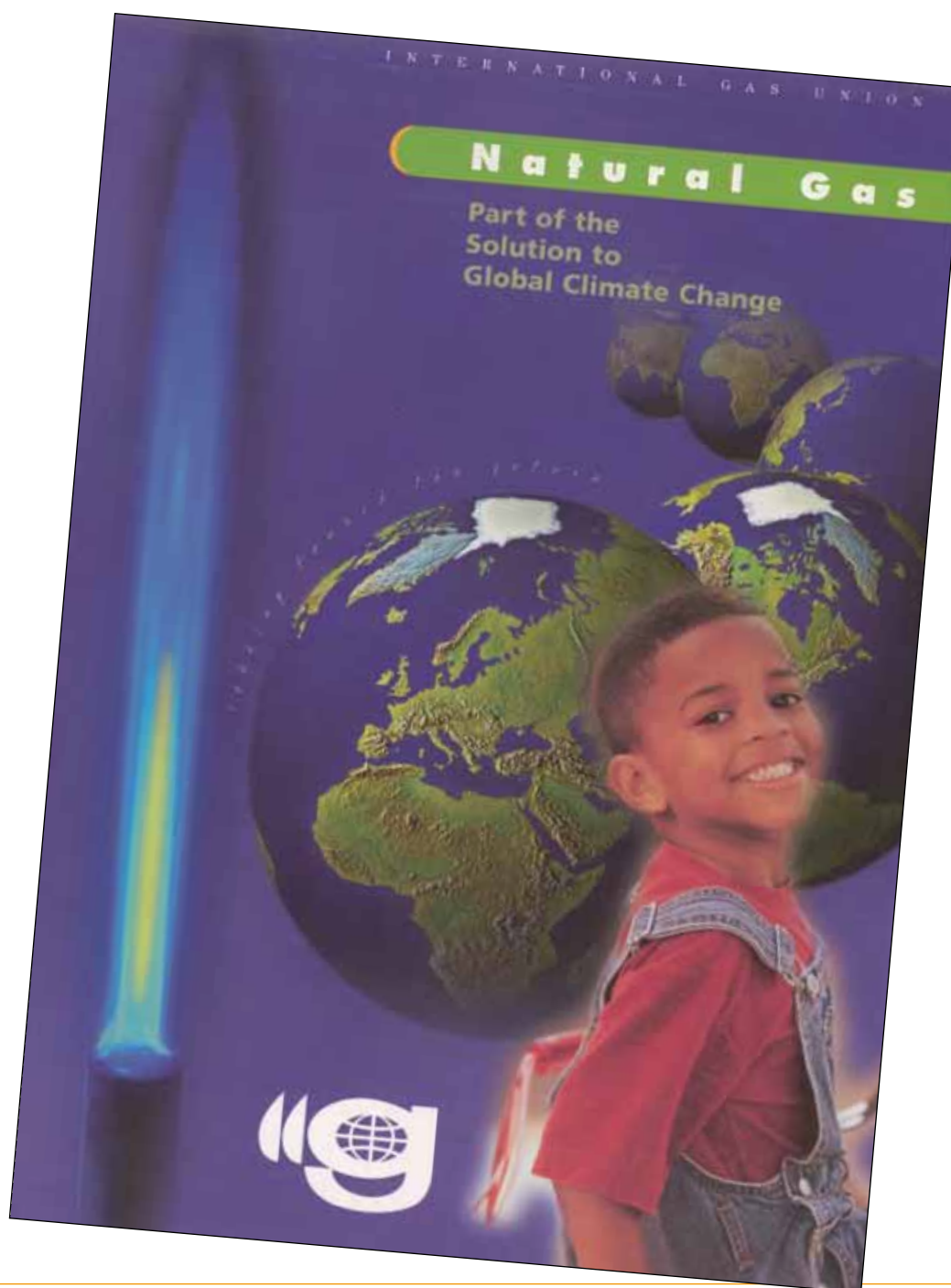
In line with its theme "Technology for Business Development", there were a number of

innovations for the 20th WGC. The proceedings were published on a CD-Rom which was included in the registration package, while an area called the technology forum was created to group together the poster exhibition, video room and documentation centre. It also included computer facilities and a café.

As a further innovation, the NOC recruited close to 200 volunteers from Danish gas companies and organised them into 30 "service

teams" to answer questions and help delegates. They were stationed wherever WGC activities were taking place as well as in the airport and the main hotels.

HRH Crown Prince Frederik of Denmark formally opened the conference on June 10 in a ceremony that was also addressed by Hans Jørgen Rasmusen, Svend Auken, Minister of Environment & Energy and Jens Kramer Mikkelsen, Mayor of Copenhagen. Later that



As part of its work in promoting gas, IGU distributed this brochure at COP 4 in 1998.



▲ Claude Détourné, IGU President 1997-2000 (left) congratulates Francis Dewerd, TCC Chairman 1997-2000 on being made an Honorary Member during the June 2000 Council meeting in Nice.

▶ Claude Détourné addresses the 21st WGC.

▶ HRH Prince Laurent of Belgium (left in the foreground) at the ARGB stand in the exhibition during the 21st WGC with Jacques Peyrat, Mayor of Nice (centre) and Claude Détourné.

day the technical sessions started, during which the reports of the 10 committees and two task forces were presented along with 80 papers, 90 posters and 49 videos. There were also 22 roundtables, six keynote speeches and three luncheon speeches, while the last hard-copy edition of the dictionary and the joint IGU/Eurogas/Marcogaz collection of case studies "Climate Change, the Case for Gas" were launched.



As well as the usual technical visit and social programmes, a sporting event was organised. In "The Tour de Gaz" cycle race, 60 contestants from gas companies in five countries set off from Nancy in France on June 4 and arrived at the Bella Center on the last day of the conference.

The 20th WGC was attended by 3,300 delegates, 1,000 accompanying persons and 300 press representatives from 68 countries. The fall compared to the 19th WGC in Milan reflected the smaller size of the Danish gas industry compared to the Italian. However, the 20th WGC did have the highest-ever number of participants from outside the host country.

France takes the helm again

The new technical committee structure came into operation for the 1997-2000 Triennium and a task force on computing was also set up. This took over responsibility for the next IGU-sponsored symposium on computing in the gas industry. Following the first in 1984, similar events had been held in 1988, 1990 and 1996. The fifth would be hosted by the Italian Charter Member in Florence in April 1999.

Work continued under the French Presidency to raise IGU's profile and promote the role of gas.



The Chairman of Working Committee 9, Tsunenori Tokumoto presented a paper at the 15th World Petroleum Congress, heralding deeper cooperation between IGU and the World Petroleum Congresses (WPC).³ WPC's 15th Congress was held in Beijing four months after the 20th WGC, and preparations were already in hand to have the next edition of the two events in 2000. IGU, WEC and WPC agreed that it would be better to stagger their triennial conferences in future, and WPC moved its 17th Congress from 2003 to 2002 to set up the current cycle. The three organisations also agreed to offer each other a stand free of charge in their respective exhibitions, and to extend standing invitations to address each other's Council meetings. From 2000, IGU started attending the Council meetings of WEC and WPC on a regular basis.

IGU also stepped up its presence at the UN Climate Change Conferences with the aim of promoting the contribution of gas to sustainable development more effectively. For COP 5, which was held in Bonn in 1999, IGU got together with Eurogas to set up a stand and organise a seminar.

³ In 2001, the organisation dropped the plural to become World Petroleum Congress and in 2005 changed its name to World Petroleum Council.



Claude D tourn s' guests of honour at the opening ceremony in the Acropolis Convention Centre were Loyola de Palacio, Vice President of the European Commission, and Jacques Peyrat, Mayor of Nice. The increasingly popular roundtable format accounted for 30% of the technical programme, with reports on the triennial activities accounting for 40% and the plenary sessions for 30%. Overall, there were 180 presentations in addition to the luncheon speeches, and the IGU Prize was won by Keith Wild of BG Technology for his paper "Controlling processes that are sensitive to natural gas quality". Attendance was similar to Copenhagen with 3,300 delegates, 1,000 accompanying persons and 350 press representatives, while the exhibition was the largest yet in terms of space sold – a net 17,300 m².

▲
Hector Olea, President of Mexico's energy regulator CRE, gives a luncheon speech during the 21st WGC.

The working group looking into the possibility of having a permanent Secretariat ruled this out on the grounds of cost, but in future the post of Secretary General would be full-time. Denmark offered to take over as the next host of the Secretariat and, meeting in Buenos Aires in October 1998, the Council elected Peter K. Storm, who had been the NOC Chairman for the 20th WGC, as Deputy Secretary General. This was also the meeting at which a further change to the technical committee structure was approved. With effect from the 2000-03 Triennium, WOC 1 would cover exploration and production of gas, both manufactured and natural, while WOC 2 would cover underground gas storage.

Argentina and The Netherlands made formal bids for the 2003-06 Presidency and for the first time the issue was decided via a secret ballot. Meeting in Cheju Island, Korea in October 1999, the Council listened to presentations by both countries and then chose The Netherlands. The Council also mourned the death of Albert Higgins, who had served as Secretary General between 1970 and 1979. Honorary President Georges Robert died in 2000.

As regards new members, there was a net increase of three during the Triennium:

Nigeria joined and Turkey rejoined as Charter Members; Belarus, Chile, Monaco and Singapore joined as observers; Colombia rejoined as an observer; and Bulgaria, Libya, New Zealand and Thailand left. Additionally, Brazil and Lithuania moved from observer to Charter membership.

"Gas, the Energy for the 21st Century" was the theme for the 21st World Gas Conference, which was held in Nice, June 6-9, 2000.

Meeting the day before the 21st WGC, the Council elected Hiroshi Urano of Japan President and George H. B. Verberg of The Netherlands Vice President for 2000-03. John Meeder retired as Secretary General and was appointed an Honorary Member. Peter Storm took over from him with the Secretariat to be hosted by DONG in H rsholm just outside Copenhagen.

▼
Seen outside the Acropolis Convention Centre are (from left to right): Jacques Deyrimejian, President of the ATG; Pierre Gadonneix, Chairman & CEO of Gaz de France; Jacques Peyrat; Claude D tourn ; Hiroshi Urano and Guy Peignelin, NOC Chairman.



Speaking for the Gas Industry Worldwide

While IGU had had members from outside Europe and North America since Australia joined in 1936, it was not until 2000 that countries from outside these regions started to lead the Union. Japan held the Presidency for the 2000-03 Triennium, Argentina for 2006-09 and Malaysia is at the helm for the current 2009-12 Triennium.

The Japanese Presidency

Under the Japanese Presidency, IGU redoubled efforts to demonstrate that natural gas could support growing energy needs on a global scale over a lengthy time-horizon. The theme for the Triennium was “Catalysing an Eco-Responsible Future”, which was reflected in three special projects carried out in addition to the work of the technical committees and task forces.

“Global Energy Scenarios” looked at the potential for natural gas and gas-based technologies to meet the growing need for clean and affordable energy; while “Catalysing Asia’s Infrastructure” studied the technical, commercial and policy issues affecting the development of Asia’s gas infrastructure. The third special

project, “Sustainable Urban Systems Design”, was organised as a competition to generate innovative proposals to help resolve the challenges of accelerating urbanisation.

Three task forces operated during the Triennium. One focused on climate change and sustainable development, and produced a set of Guiding Principles for Sustainable Development to supersede the IGU Environmental Charter of 1996. Another looked at information and communication technology (ICT) – a wider concept than the former focus on computing – and prepared a symposium on ICT in the gas industry. This was hosted by the Czech Charter Member in Prague in April 2002. The third task force reviewed IGU’s structure in the light of developments in the gas industry. It drafted a new statement of IGU’s Vision, Mission and Objectives and recommended major changes to the Articles of Association. The new Articles were approved by the Council when it met in Kuala Lumpur in September 2002.

The most significant change was the introduction of a new category of membership allowing companies and organisations related

to the gas industry from any Charter Member country to join IGU as Associate Members. This would broaden the Union’s knowledge-base and network considerably. Observer status was abolished with all observers as of January 1, 2003 automatically becoming Charter Members.

A new technical committee structure was introduced with five Working Committees (WOCs) covering the gas chain and four Programme Committees (PGCs) covering other technical, economic and policy issues, while the TCC became the Coordination Committee. This took effect from the 2003-06 Triennium.

The custom of the principal officers working together to deal with day-to-day business was formalised as the Management Team comprising the President, Vice President, Immediate Past President, Secretary General and Chairman and Vice Chairman of the Coordination Committee.

English became the working language although French remained an official language, and the convening of electronic Council sessions was formalised. The first electronic Council session had been held in October 2001,




 Tokyo's International Exhibition Centre with its distinctive 58m-high conference tower (LEFT) was the venue for the 22nd WGC (BELOW), the first to be held in Asia.

when many organisations had travel restrictions in place following the terrorist attacks of September 11.

The Kuala Lumpur meeting was also the one during which the ballot was held to decide the 2006-09 Presidency. Argentina, Korea and Malaysia were the contenders and the Council chose Argentina.

Meanwhile, IGU continued to step up its involvement in the UN Climate Change Conferences and was invited to address a plenary session during COP 6, which was held in The Hague in November 2000. Vice President George Verberg gave the presentation. IGU was also granted NGO status at the 2002 World Summit on Sustainable Development.

Among other developments during the Triennium, IGU marked its 70th anniversary in



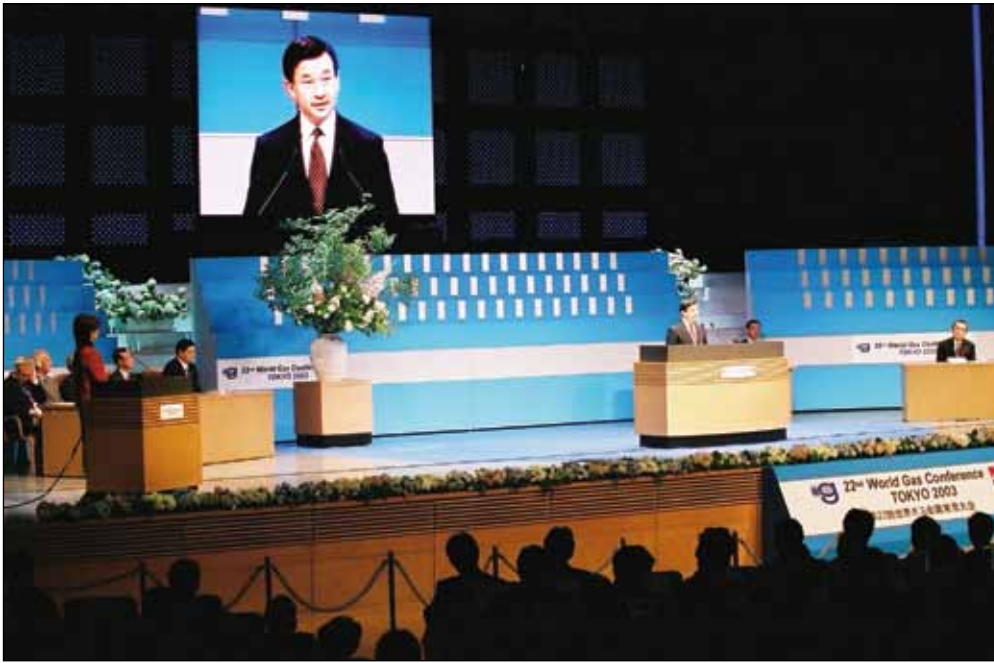
2001 by publishing a new general brochure on the Union and commissioning a book called *Seven Decades with IGU* to be ready for the next WGC in 2003. However, the last hard-copy edition of the newsletter was published in March 2001 as it was becoming increasingly expensive to produce and distribute. Sadly, 2001 was also marked by the death of Bernard Goudal, who had served as Secretary General between 1979 and 1988.

In 2002, a redesigned website was launched during the ICT symposium that April; and in 2003, the new status of an organisation affiliated to IGU was introduced. The first agreement was signed with Intergas Marketing.

Membership grew significantly with Bolivia, Brunei, Cameroon, Greece, Kazakhstan,

▶
 HIH Crown Prince Naruhito of Japan addresses the opening ceremony of the 22nd WGC.

▶▶
 Hiroshi Urano, IGU President 2000-03 (TOP), Chiaki Gomi, TCC Chairman 2000-03 (CENTRE) and Peter Storm, IGU Secretary General 2000-07 (BOTTOM).



Oman, Saudi Arabia, South Africa, Trinidad and Tobago and the UAE joining and Thailand rejoining, although Colombia left. The first Associate Members were BP Gas, Power & Renewables, ChevronTexaco Overseas Petroleum, İGDAŞ – Istanbul Gas Distribution Co., Natargas Fyn, NUON, Ruhrgas, Shell International Gas Ltd, TOTAL and Tractebel.

Towards the end of the Triennium, the outbreak of SARS (Severe Acute Respiratory Syndrome) posed a serious threat to global health. The 22nd World Gas Conference was set to take place in Tokyo, June 1-5, 2003, and the NOC had to make the difficult decision to ask people from affected areas to refrain from attending. However, Japanese industry representatives turned out in force and the final total of 4,326



▶
 The President's dinner was held in the Tokyo National Museum.





delegates was a record. It was only because the number of accompanying persons fell to 543 that overall attendance did not set a record.

Meeting on the morning of June 1, the Council elected George Verberg of The Netherlands President and Ernesto López Anadón of Argentina Vice President for 2003-06. The opening ceremony of the 22nd WGC was held that afternoon with HIH Crown Prince

Naruhito as the guest of honour. Hiroshi Urano, Kunio Anzai, Chairman of the NOC, and Takeo Hiranuma, Minister of Economy, Trade and Industry also addressed delegates.

The technical sessions started on June 2, with the programme designed to provide a broad scope of interest not only to gas industry delegates but also to representatives of government, regulators and international organisations.



There were 10 keynote speeches in morning and afternoon plenary sessions followed by a series of strategic roundtables. These addressed the three special projects, fuel cells, the future of natural gas related technology, new LNG markets and business models in the context of deregulation and liberalisation. The committee sessions and technology forum ran in parallel with 284 oral and poster presentations.

▲ ▲
Peter Hinstrup, TCC Chairman 1994-97 (left) in conversation with Francis Dewerd, TCC Chairman 1997-2000 during the President's dinner.

▲
The Japanese Gas Association set up the Japan Atrium in the 22nd WGC's exhibition.



◀ ◀
Strategic roundtable panellists at the 22nd WGC included (from left to right) Baihaki Hakim, CEO of Pertamina; Tan Sri Dato Mohd Hassan Marican, CEO of Petronas, Faisal Al-Suwaidi, Managing Director of Qatargas; and Linda Cooke, CEO of Shell Gas & Power.

◀
Hiroshi Urano (left) and Kunio Anzai, NOC Chairman at the closing ceremony of the 22nd WGC.



▶ George Verberg (left) and Ernesto López Anadón took over as President and Vice President for the 2003-06 Triennium at the end of the 22nd WGC.

▶▶ The ICT conference was held in Busan in May 2005. Seen addressing the opening ceremony is Kyu-sun Lee, then-President of IGU Charter Member the Korea Gas Union.



The second Dutch Presidency

The gas industry had changed dramatically since The Netherlands first held the Presidency. Deregulation in the US had been followed by liberalisation and privatisation in Europe, and the move towards competitive markets was accelerating in other regions. In the new environment gas companies were examining every aspect of their expenditure, including the

time spent on IGU work. Consequently, a key concern of the Dutch when developing the 2003-06 Triennial Work Programme was to enhance the value that IGU gave members.

The theme for the Triennium was "Gas: Powers the People, Preserves the World, Promoted by IGU". The new technical committee structure came into operation, together with three special project teams and two task forces.

The special projects looked at the use of gas for power generation, the role of gas in a sustainable energy system and the different regulatory regimes around the world. The ICT task force continued from the previous Triennium and was now charged with preparing a global conference on ICT in energy to be hosted by the Korean Charter Member in Busan in May 2005.

▶ Prior to the start of the Dutch Presidency, the incoming leaders of the technical committees met in Amsterdam in January 2003.



The second task force covered research and development.

A collaboration portal was introduced as an adjunct to the website to make it easier for committee members to share reports and comment on them, and a magazine was launched to complement electronic communications. Rather than being a cost as the old newsletter had been, the magazine was contracted to a publishing company and financed by the sale of advertising with a royalty paid to IGU. *International Gas* was launched at the Executive Committee meeting in Doha in March 2004 with a frequency of two issues a year. Amongst other news, the first issue contained the obituary of Honorary President Eric Giorgis who had died in December 2003.

Another innovation was the setting up a panel of independent energy experts to advise the President called the Wise Persons Group (see box).



Membership continued to grow during the Triennium, with Eurogas joining and Peru rejoining as Charter Members and 16 new Associate Members. The European Gas Research Group (GERG), Gas Infrastructure Europe (GIE),



Marcogaz, NGV Global (International Association for Natural Gas Vehicles) and Pipeline Research Council International (PRCI) became affiliated organisations. Ties with WPC were strengthened, and IGU organised a natural gas



The Dutch Minister of Economic Affairs, Laurens Jan Brinkhorst addressing the opening ceremony of the 23rd WGC (FAR LEFT) and Amsterdam's Mayor, Job Cohen (LEFT) opening the exhibition.

Wise Persons Group

The idea for IGU's Wise Persons Group came from the task force set up to produce the Union's new Articles of Association during the 2000-03 Triennium, and it started work in the following Triennium. As IGU's President for 2003-06, George Verberg, explained at the time: "We deemed it appropriate within IGU to have the Presidency advised by an outside group of energy experts from around the world. They are being asked to think about major energy issues, particularly in the natural gas sector, and to give their general viewpoint. It's about broad brush strokes rather than the nitty-gritty and about being thought-provoking rather than drawing definite conclusions. The idea is to start a good discussion among the IGU membership."

The group comprises four experts, three of whom have served since the beginning. The three are Professor Dr Coby van der Linde,



Coby van der Linde.



Tim Eggar.



Daniel Yergin.



Kandeh K. Yumkella.

Director of the Clingendael International Energy Programme, the Right Honourable Tim Eggar, Chairman of Cape plc, and Dr Daniel Yergin, Chairman of IHS CERA. The fourth member was initially Mr Yoshihiro Sakamoto, President of Arabian Oil Company Holdings, who was followed by Dr Rajendra K. Pachauri, Chairman of the Intergovernmental Panel on Climate Change. Since 2010, the fourth member has been Dr Kandeh K. Yumkella, Director General of UNIDO.

Apart from serving in an advisory role, members also participate in IGU meetings and conferences. Professor Coby van der Linde was the first member of the group to address the IGU Council when she took part in the meeting in Oslo in September 2004. More recently, Dr Yumkella gave a presentation at IGU's Gas Symposium during COP 16. Looking forward, Tim Eggar will chair a strategic panel during the 25th World Gas Conference.

▶ Professor Coby van der Linde, a member of IGU's Wise Persons Group, addresses a press conference during the 23rd WGC.



▲ Lisbeth Koefoed worked in the Secretariat between 2000 and 2006.



▲ Lotta Hällén-Kragh worked in the Secretariat between 2003 and 2007.

▶ The 23rd WGC was held in Amsterdam's RAI Congress & Exhibition Centre.

session at the 18th World Petroleum Congress in Johannesburg in September 2005. Indeed, a proposal to merge IGU and WPC was floated, but it was ruled out after evaluation by the management teams of the two organisations.

In 2005, arrangements were made to bring the International Gas Research Conference and Intergas Marketing into the IGU fold with effect from the next Triennium. The former became the IGU Research Conference, retaining the IGRC acronym, and a special committee was set up to prepare for the next IGRC in 2008. A separate IGRC Foundation had been set up by the Dutch gas industry following the IGRC in Amsterdam in 2001, and this became an organisation affiliated to IGU. Intergas Marketing moved from being affiliated to become part of IGU as a new marketing committee.

As IGU grew so did the work of the Secretariat. The team increased to three people when Peter Storm and his assistant Lisbeth Koefoed were joined by Lotta Hällén-Kragh as webmaster. One of her responsibilities was overseeing the development of a new website to integrate the collaboration portal. A secondment programme was also launched, and members were invited to second a young staff member to the Secretariat in the next Triennium.



▼ This picture was taken in Amsterdam just before the opening of the 23rd WGC. Seated are George Verberg, President 2003-06 and John Kean, President 1985-88. Behind them (from left to right) are: Ernesto López Anadón, President 2006-09; Hiroshi Urano, President 2000-03; Claude Détourné, President 1997-2000; Hans Jørgen Rasmussen, President 1994-97; and Rolf Beyer, co-chairman of the 18th WGC in 1991.





Denmark's term as host of the Secretariat was due to end in 2006, and France, Germany and Norway offered to take over. This was the first time there had been more than one candidate so a ballot was called. Moreover, it was decided to switch the changeover date from end- to mid-Triennium to avoid coinciding with the rotation of the Presidency. Meeting in Tianjin in October 2005, the Council elected Norway and extended Denmark's term to 2007. This was also when the election for the 2009-12 Presidency was held. Malaysia and Russia were the contenders and the Council chose Malaysia.

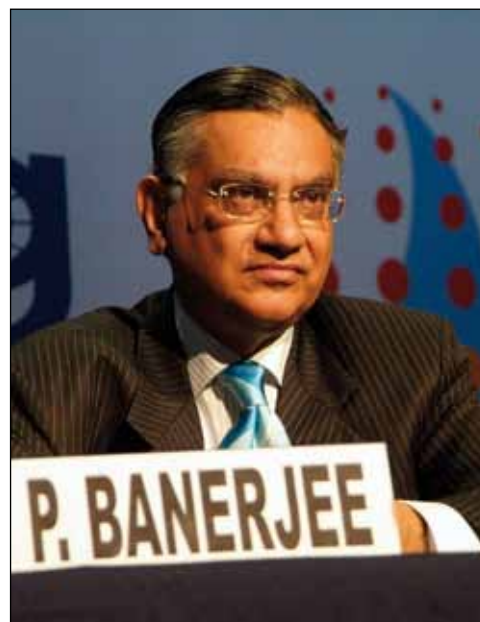
In its following, pre-WGC meeting, the Council elected Ernesto López Anadón of Argentina President and Datuk Abdul Rahim Hashim of Malaysia Vice President for 2006-09, together with Petter Nore as Deputy Secretary General. Mr Nore worked for Hydro which was going to host the Secretariat in Oslo.

The 23rd World Gas Conference was held in Amsterdam, June 5-9, 2006, coinciding with IGU's 75th anniversary. Attendance fell compared to Tokyo because the home delegation was much smaller. There were 3,318 delegates, 356 accompanying persons and 200 press representatives.

George Verberg's guests of honour at the opening ceremony in the RAI Congress &

Exhibition Centre were Laurens Jan Brinkhorst, the Dutch Minister of Economic Affairs, and Viktor Khristenko, the Russian Minister of Energy. The ministers talked about the importance of partnerships and also stressed the need for greater transparency in energy policies and market structures, issues taken up throughout the conference by many of the keynote speakers.

Over the following three days, plenary keynote addresses opened the morning and afternoon sessions followed by strategic panels.



The results of the special projects were reported as well as the findings of the R&D task force, and there were also panels looking at ICT, investment, LNG, marketing, NGVs and other fuels. In parallel, the technical committees gave their oral and poster presentations.

The last day of the conference was dedicated to plenary sessions. In the morning, George Verberg chaired a ministerial panel on natural gas and geopolitics with contributions from the European Commission, Pakistan, Qatar, Yemen

▲ George Verberg takes a question while chairing the plenary session addressed by Kunio Anzai, Chairman of the Japanese Gas Association, and Pierre Gadonneix, Chairman & CEO of EDF.

▲ Bert Panman, Coordination Committee Chairman 2003-06, escorting delegates.



▲ Other keynote speakers included Frank Chapman, CEO of BG Group (LEFT) and Proshanto Banerjee, Chairman & Managing Director of GAIL India (FAR LEFT).

▶ As the 23rd WGC coincided with IGU's 75th anniversary, the Global Gas Historical Network organised a small exhibition. Its Chairman, Jacob Fentz (left) is seen with (from left to right) Robert Doets, NOC Chairman for the 23rd WGC; Fritz Verweel, a volunteer at the Energetica Museum in Amsterdam; and Hanne Thomsen, Director of the Danish Gas Museum.



▶▶ The Council met in St Petersburg in October 2007 (BELOW RIGHT) and during the meeting Ernesto López Anadón presented Peter Storm with an Argentine poncho on his retirement as Secretary General (OPPOSITE TOP LEFT).



▲ Ernesto López Anadón, IGU President 2006-09.



▲ Roberto Brandt, Coordination Committee Chairman 2006-09.

and the US, before the panel was opened to industry leaders and international organisations. The session was moderated by Daniel Yergin of IHS CERA and IGU's Wise Persons Group. In the afternoon, the incoming Argentine Presidency gave a presentation on the Triennial Work Programme for 2006-09, followed by the closing and prize-giving ceremony. IGU and the Energy Delta Institute sponsored two thesis prizes, each of €10,000,

and there were four awards for the best papers and posters. The prize for a thesis on social responsibility was won by Line Friis Lindner-Madsen from Denmark, and the prize for the sustainable development category was won by Giel Ramaekers from The Netherlands.

The Argentine Presidency

Argentina became the first country from South America to assume the IGU Presidency with the

theme "The Global Energy Challenge: Reviewing the Strategies for Natural Gas". This was reflected in special projects on CO₂ mitigation, preparing an outlook study for the natural gas industry to 2030, energy efficiency indicators and best practices. The Argentine Presidency also set up two task forces. One looked at how gas market integration could facilitate economic growth, social development and sustainability; and the second looked at how research and development programmes could be supported and enhanced. The standing committees were joined by the new IGU Marketing and IGU Research Conference committees, with the latter tasked with preparing for the IGRC in Paris in October 2008.

The Secretariat started the Triennium by welcoming its first secondee, Barbara Annette Schmid from RWE, and launching the new website. An enhancement to add interactive maps with gas industry information to the website would go live in 2007. However, Petter Nore stood down as Deputy Secretary General for personal reasons. Meanwhile, in Norway, Hydro decided to merge its oil and gas interests with those of Statoil. The new company result-





Barbara Annette Schmid was the first secondee to the Secretariat (2006-08, far right). She was followed by Florijana Dedović (2008-10, far left). They are seen here in Oslo with (from left to right) Erik Gonder, Åse Nicolaysen, Torstein Indrebø and Hans Riddervold.

ing from the merger was StatoilHydro (later Statoil), which agreed with the Norwegian Charter Member that Torstein Indrebø would be nominated as the candidate for Secretary General. Mr Indrebø had been involved in IGU work since 1994, initially serving as a technical committee member and later as a member of

the Council. He was formally elected to succeed Peter Storm, who was made Honorary Secretary General, when the Council met in St Petersburg in October 2007.

The Secretariat moved to Oslo the following month, and additional staff were recruited to deal with the growing responsibilities. Working

for Torstein Indrebø were Hans Riddervold, Erik Gonder and Åse Nicolaysen, with Barbara Schmid continuing as a secondee. They were joined in April 2008 by Florijana Dedović, who was seconded from Plinacro. After Barbara's secondment ended, Jeanet van Dellen joined from Gasunie. The secondment programme



Eduardo Ojea Quintana, NOC Chairman for the 24th WGC.



Jeanet van Dellen was seconded to the Secretariat from February 2009 to November 2011.

The September 2008 meetings of the Executive Committee (pictured) and Council were held in Gyeongju, Korea.

was proving of great benefit to IGU, the young people involved and their companies.

During the Triennium, IGU joined the Global Roundtable on Climate Change, strengthened cooperation with IEA, which agreed to participate in the 2030 gas industry outlook study, and developed a new relationship with the International Energy Forum (IEF). This led to the launch of the IEF-IGU Ministerial Gas Forum to enhance the dialogue between governments, organisations and companies involved in the global gas industry. The first forum took place in Vienna in November

2008 (see the chapter on engaging with international policymakers).

There were a number of other innovations as IGU worked to increase its engagement with policymakers and stakeholders around the world. An annual Strategic Statement was introduced in 2008, with the first on gas market integration; the IGU Gas Efficiency Award was launched in 2008 and the Social Gas Award in 2009 (*see box below*); and four regional coordinators were appointed in 2009 (*see box opposite*).

As regards membership, Angola, Bulgaria, Equatorial Guinea, Macedonia, Timor Leste and

Vietnam joined, and Libya rejoined, as Charter Members, although Hungary left; while there was a net increase of eight Associate Members.

The number of affiliated organisations grew, and agreements were signed with the Energy Delta Institute (EDI), International Group of LNG Importers (GILGNL, from its initials in French), International Pipeline & Offshore Contractors Association (IPLOCA) and Russian National Gas Vehicle Association (NGVRUS).

IGU also signed a protocol to coordinate activities and exchange information on LNG with five organisations: the US Center for LNG,

IGU Awards

IGU considers energy efficiency as one of the most important ways of achieving a more sustainable energy future, of reducing greenhouse gas emissions, enhancing security of supply and reducing energy related costs.

The IGU Gas Efficiency Award was launched in 2008 in order to call for new ideas and projects aiming at obtaining better efficiency in the use of natural gas. All IGU members were invited to nominate projects and 40 were submitted covering all parts of the gas chain. They were judged by an Evaluation Committee comprising Ernesto López Anadón, IGU President 2006-09; Roberto Brandt, Coordination Committee Chairman 2006-09; Torstein Indrebø, IGU Secretary General; Nobuo Tanaka, IEA Executive Director; and Prof. Dr-Ing. Rainer Reimert of the Engler-Bunte-Institut, Universität Karlsruhe, Germany.

Two prizes of €10,000 were awarded to a Dutch-German project entitled "A new generation of gas-fired heat pumps" (author Paul Vloon), and a Japanese project entitled "An economical thermal network cogeneration system for apartment buildings" (authors Hideki Yamaguchi and Yoshinori Hisazumi). The Dutch-



German project was judged the overall winner and Paul Vloon was invited to the 24th World Gas Conference.

In 2009, the Gas Efficiency Award was joined by the IGU Social Gas Award. This called for new ideas and projects to encourage people to use gas more efficiently and was judged by the same Evaluation Committee. The winner was Mohammad Rezaei from Iran with a project to provide free home insulation

for natural gas consumers in Mazandaran Province. There was no cash prize but he was invited to the 24th WGC.

For the current 2009-2012 Triennium there is a prize of \$5,000 for each Award and an invitation to the 25th World Gas Conference. The members of the Evaluation Committee are Datuk Abdul Rahim Hashim, IGU President; Ho Sook Wah, Coordination Committee Chairman;



Ernesto López Anadón, IGU President 2006-09, and Torstein Indrebø, Secretary General, congratulate IGU Award winners Paul Vloon (ABOVE LEFT) and Mohammad Rezaei at the 24th WGC (ABOVE RIGHT).

Torstein Indrebø, IGU Secretary General; Maria van der Hoeven, IEA Executive Director; and Prof. Dr-Ing. Rainer Reimert. The Awards will be presented at the Council meeting in Kuala Lumpur immediately prior to the 25th WGC.

Eurogas, GIIGNL, the LNG infrastructure branch of GIE and the Society of International Gas Tanker and Terminal Operators (SIGTTO).

These positive developments for IGU were taking place against the background of the global financial crisis. This pushed some countries into recession and slowed growth in others, with a consequent impact on energy demand. The crisis reached its most critical stage in September 2008, as the Council was meeting in Gyeongju, but concerted action by governments and central banks around the world laid the ground for recovery to start in 2009.

Amongst the business on the agenda in Gyeongju was the election for the 2012-15 Presidency. The contenders were Brazil, France and Qatar, and the Council chose France.

At its following, pre-WGC meeting in Buenos Aires, the Council went on to elect Datuk Abdul Rahim Hashim of Malaysia President and Jérôme Ferrier of France Vice President for 2009-12. The Council also approved the management team's recommendation to levy a royalty on World Gas Conferences from 2018 and to



The 24th WGC was opened by Argentina's President, Cristina Fernández de Kirchner who is seen flanked by Ernesto López Anadón, IGU President 2006-09 (right), Datuk Abdul Rahim Hashim, IGU President 2009-12 (far right) and Torstein Indrebø, Secretary General (left).

consider joint bids in future for the Presidency and the WGC. This would allow two Charter Members to pool resources with one taking responsibility for the Presidency and the other for hosting the WGC. However, the option of split responsibilities does not rule out one country bidding for both.

The 24th World Gas Conference was held in Buenos Aires, October 5-9, 2009, which was somewhat later in the year than usual to coincide with spring in the southern hemisphere. In another change, the programme was half an hour longer each day than the 23rd WGC so that the keynote addresses

Regional Coordinators

While it is a global organisation, it is important for IGU to increase its regional presence and improve its understanding of regional gas market developments. There are significant differences between the regions when it comes to the number of countries, gas production and consumption, market integration and IGU membership.

To this end, the IGU Council approved the appointment of Regional Coordinators during its meeting in Buenos Aires in October 2009. An initial four regions were set up and the Executive Committee elected the following Regional Coordinators: Khaled Abubakr of TAQA Arabia (Africa and the Middle East); James Kwan of the Hong Kong & China Gas Company Ltd (Asia and Asia-Pacific); Marcel Kramer of South



Khaled Abubakr.



James Kwan.



Marcel Kramer.



João Carlos de Luca.

Stream (Europe and the CIS); and João Carlos de Luca of the Brazilian Petroleum, Gas and Biofuels Institute – IBP (North and South America).

The Regional Coordinators are working to increase knowledge about the regions within IGU, to encourage existing members to increase their engagement with IGU and

to recruit new members. Furthermore, and with respect to their regions, they monitor developments, represent and promote the Union, advise the President and the Secretariat in connection with presentations, contribute to the development of the Triennial Work Programme and advise on the content of external statements by the Union.

▶
Andrés Kidd, Coordination
Committee Secretary for
the 2006-09 Triennium
(right) with the incoming
Secretary, Ungku Ainon
Ungku Tahir.



▶▶
The 24th WGC was held in
La Rural Conference &
Exhibition Centre, Buenos
Aires.

▶
Energy ministers taking
part in the conference
included Algeria's Dr Chakib
Khelil (seated left) and
Argentina's Julio de Vido
(seated right).

and strategic panels did not overlap with the
technical sessions.

The opening ceremony was held in the Luna
Park arena, where Ernesto López Anadón's
guest of honour was Argentina's President,
Cristina Fernández de Kirchner. The venue for
the conference sessions was La Rural Conference



and Exhibition Centre. Overall attendance
including delegates, accompanying persons
and press was just over 3,500, while 351 reports,
papers and posters were presented.

As well as reviewing the work done during
the 2006-09 Triennium, delegates discussed
how they were managing the short-term strains

of the financial crisis, while developing the
long-term potential of natural gas as the
cleanest of the fossil fuels.

IGU's "Natural Gas Industry Study to 2030"
was launched during the first of nine strategic
panels, and speakers throughout the confer-
ence went on to set out a roadmap to tackle

▶
Rune Bjørnson, Statoil's
Executive Vice President
Natural Gas, gave one of
four luncheon addresses.



carbon emissions by expanding the role of the gas industry, improving its efficiency and working with the renewables sector. A key message of the 24th WGC was the need for the industry to step up its lobbying of policymakers to promote gas as part of the solution to climate change. IGU would go on to play its part with the launch of a gas advocacy initiative in the next Triennium.

Other important messages were the enormous potential of unconventional gas, and the advantages of gas market integration in terms of supply and demand security.

The potential of unconventional gas was brought home to delegates by reports of shale developments in the US, where combining horizontal drilling and hydraulic fracturing with greater understanding of the formations had paid off dramatically; while the task force on gas market integration presented a model based on an analysis of nine case studies from around the world to identify the key issues and stages in a successful integration process. The flexibility of LNG was highlighted as one of the factors helping to integrate regional markets, and there was much discussion of the long-term growth prospects for global trade.

Pricing was also discussed given the major disconnect that had developed between gas and oil prices in the run-up to the conference,



when gas was trading at around 25% of the equivalent energy value of oil, and the divergence of gas prices across regional markets. Delegates noted that the Gas Exporting Countries Forum, originally set up in 2001 as an informal grouping, had recently become a formal body and intended to study a number of issues including wholesale gas pricing.

The conference sessions were rounded off by a presentation on the Triennial Work Programme for 2009-12 by the incoming Malaysian Presidency, before the official handover from Argentina to Malaysia during the closing ceremony.

The Malaysian Presidency

When developing the theme and work programme for the 2009-12 Triennium, the Malaysian Presidency was conscious of the need to promote technological innovation and efficiency, develop human capital and advocate for gas.

The theme is "Gas: Sustaining Future Global Growth", and a record number of over 900 gas industry professionals have been taking part in the work of the committees and task forces. For this Triennium, the marketing committee has been brought into the standing committee structure as PGC E, while a work group for sustainable development has been set up together with three task forces: two looking at different aspects of the human resource challenge, and one looking at geopolitics and the gas industry. Initially the IGU Research Conference committee continued outside the standing structure – it prepared a successful IGRC in Seoul in October 2011 – but will now become PGC F.

In a particularly important development, the Triennium has seen IGU launch the gas advocacy initiative to give natural gas a more effective and consistent voice and improve communications with stakeholders outside the industry.

Gas has a key role to play in meeting the challenge of providing additional energy



During the closing ceremony, Ernesto López Anadón handed over as IGU President to Datuk Abdul Rahim Hashim (right).



The exhibition featured 270 companies and organisations.



▶ Prior to the handover from Argentina to Malaysia, a meeting of the incoming Coordination Committee was held in Kuala Lumpur in February 2009.

▶ In November 2009, IGU President Datuk Abdul Rahim Hashim launched the preparations for the 25th WGC in Kuala Lumpur.



supplies and at the same time reducing emissions by replacing more polluting fuels. Gas is clean, affordable, reliable, efficient and secure, and the industry is a major employer and investor. However, the benefits of gas need to be communicated more effectively than in the past. The gas advocacy initiative is a long-term programme aimed at making sure IGU's messages reach policymakers and regulators, NGOs and the general public.

IGU has developed a communications strategy that will resonate with each stakeholder group and can be adapted to regional or local circumstances. An inaugural workshop on gas advocacy was held at the Executive Committee meeting in Jimbaran, Indonesia in April 2010, and workshops have been held at each subsequent meeting of the Council and Executive Committee. The



▲
David Carroll of the USA is set to be elected Vice President for 2012-15 as the USA prepares to assume the Presidency for 2015-18.

▶
IGU Secretary General Torstein Indrebø addressing the second World Shale Gas Conference in November 2011.



reports presented and discussed in these workshops have been made available to all members in the form of a “toolkit” via the website (see the chapter on the gas advocacy initiative).

As part of the communications strategy, IGU has launched new publications such as the *World LNG Report* and worked with the Energy Delta Institute to develop an improved version of the interactive world gas map. This is

accessed via a link at the foot of the IGU home page and provides statistics and information on each country’s natural gas industry.

The successful IEF-IGU Ministerial Gas Forums are continuing, with the second held in Doha in November 2010 and the third due to take place in November 2012, and IGU has also become involved with a new conference. The World Shale Gas Conference is organised jointly by IGU, the Charter Member for the USA, the

American Gas Association, and the CWC Group. The conference is held annually and the inaugural event was held in Dallas-Fort Worth in November 2010.

During the Malaysian Presidency, IGU has continued to expand its membership. Mongolia, Morocco, Mozambique and Uzbekistan have joined and Mexico has rejoined as Charter Members, although Bangladesh left at the end of 2010. There has been a net increase of five



▲
Datuk Anuar Ahmad, Chairman of the NOC for the 25th WGC (TOP) and Zahariah (Liza) Abdul Rahman, Head Directorate of the NOC (ABOVE).



▲
Two secondees joined the Secretariat during the Malaysian Presidency: Carolin Jeanet Oebel in 2010 (TOP) and Ksenia Gladkova (ABOVE) in August 2011.

▶
The 2011 Council meeting in Dubrovnik was the highest-attended in IGU’s history.





▶
The venue for the 25th WGC will be the Kuala Lumpur Convention Centre.

Associate Members, and the Gas Technology Institute (GTI) has become an affiliated organisation.

There have been several staff changes in the Secretariat. In 2011, Erik Gonder left and Sjur Bøyum took over as Communication Manager and Webmaster, while Åse Nicolaysen left and Silje Storsul took over as Administrative Assistant. A new position was created in March 2012 when Mats Fredriksson joined as Senior Advisor to the Secretary General. As regards the secondment programme, Florijana Dedović left in 2010 and Carolin Jeanet Oebel from E.ON Ruhrgas joined, while in 2011 Jeanet van Dellen left and Ksenia Gladkova from Total joined.

In other developments during the Triennium, Honorary President Christoph Brecht died in 2010, and the election for the 2015-18 Presidency was held. Meeting in Dubrovnik in October 2011, the Council

Winners of the IGU Awards for the 2009-12 Triennium

IGU GAS EFFICIENCY AWARD

Title: Commercialisation of a residential proton exchange membrane (PEM) fuel cell for CHP, "ENE-FARM"

Note: ENE-FARM, derived from "energy" and "farm", is a brand for fuel cell systems launched by the Fuel Cell Commercialisation Conference of Japan in 2009.

Authors:

Kunihiro Nishizaki, Deputy General Manager, PEFC Development, Department of Technology Solutions, Tokyo Gas; and

Kazuhiro Hirai, Manager, micro-CHP Development Department, Residential Energy Business Unit, Osaka Gas

Summary:

The Japanese project presents a highly efficient residential combined heat and power (CHP) system using a PEM fuel cell combined with a natural gas fuel processor.



Kunihiro Nishizaki.



Kazuhiro Hirai.



Luis Felipe Fernández Perez.

The technology can generate power efficiently with a very low environmental impact (clean exhaust, low noise and vibration etc.). Its high efficiency allows primary energy use to be reduced by 23% and CO₂ emissions by 38%. Bringing this technology to the international market would make a great contribution to the growth of the global gas industry.

IGU SOCIAL GAS AWARD

Title: Increasing vehicle conversions to dual gasoline/CNG from 150 to 100,000 in five years in Peru

Author: Luis Felipe Fernández Perez, Crude Oil Commercial Manager, Pluspetrol Norte S.A.

Summary:

This project has created a fleet of motor vehicles running on compressed natural gas (CNG). It was initially focused on taxis in Lima, and was later extended to mass public transport throughout the country. The gas comes from Peru's Camisea reservoir.

By encouraging the conversion of engines to use domestically-produced natural gas rather than less environmentally friendly fuels, the project has reduced pollution in the transport sector. It has also helped increase the share of gas in the country's energy mix. Moreover, the project has promoted social inclusion by offering access to simple credit mechanisms to fund the conversions for people such as taxi drivers excluded from the main financial system.

listened to presentations from three contenders – Korea, Qatar and the USA – and elected the USA.

The Malaysian Presidency culminates in the 25th World Gas Conference in Kuala Lumpur, June 4-8, 2012, and the NOC is expecting around 5,000 people to attend. The Council will meet in the morning of June 4, and be asked to elect Jérôme Ferrier of France President and David Carroll of the USA Vice President for

2012-15. Amongst other business, the IGU Awards will be presented (*see box*). The 25th WGC will be formally opened in the afternoon, with the conference sessions starting on June 5.

Each day of the conference will have a theme – Foundation for Growth, Securing Gas Supply, Enhancing Gas Demand and A Sustainable Future – and the NOC has lined up debates on current topics related to these themes. There will be 14 keynote speakers, four

luncheon speakers and 10 high-level strategic panel sessions. The results of the Triennial Work Programme will be shared in committee sessions, expert forums and a new type of poster session called the Interactive Expert Showcase. The 25th WGC will also feature a Youth Programme for the first time in the series of World Gas Conferences, and a range of exciting activities will run concurrently with the main event.

Message from the incoming President

2011 was an exceptionally eventful year. The Arab Spring saw political repercussions across North Africa and the Middle East, the financial and economic crisis created a shockwave that increased unemployment and social pressures, while the economic climate and the catastrophe in Japan, which revived the debate over nuclear power, caused an energy crisis.

What challenges are in store for 2012? Will peace return to the North African and Middle Eastern countries affected by the spring uprisings? Will the financial world stabilise and release the investment needed for growth? Will natural gas become the energy of the future, complementing renewable energies and supporting sustainable development? Of these questions, the last two will be central to the discussions at the 25th World Gas Conference in Kuala Lumpur in June.

That is when France takes over the Presidency of IGU. It's an honour and a privilege for us to take on this role at such a challenging time.

As candidates in 2008, we made "Growing Together" the theme of our campaign. To mark the start of our three-year term, we've expanded this to "Growing together towards a friendly planet". Of course, we want the entire energy sector to grow together, not just the gas community. We can only succeed by working together.

To achieve this, the gas industry must be united. Today, IGU comprises 78 Charter Members and 38 Associate Members, but we



Jérôme Ferrier.

need to expand our activities and convince the gas industry's new players – from Africa, Latin America and Asia – to join us.

For many years, the gas industry has had a low profile – now we have to raise our profile and our voice. A lot of progress has been made over the past few years as we've realised how important it is to present our point of view, supported by realistic and relevant arguments. In particular, we need to target the European Union. Europe's national gas associations were the driving force behind IGU's creation in 1931 and European countries continue to be leading gas consumers, but unlike America or Asia, Europe has so far failed to give much consideration to the role

that natural gas can play in optimising the energy mix. It is up to us to use the powers of persuasion of the Gas Advocacy Task Force to convince politicians of the benefits of natural gas.

Putting research and innovation at the heart of our business is the second focal point for our Presidency. That is why we will be launching a new Programme Committee dedicated to research and innovation (PGC F) in June. PGC F will take over the organisation of the triennial IGU Research Conferences – the next being scheduled for Copenhagen in 2014. This is particularly relevant in the light of the unbundling of activities imposed on major energy groups in the EU, as this affects their research strategies and makes the funding of certain programmes subject to approval from the regulatory authorities.

Thirdly, we will be putting emphasis on mobilising the human resources required for the future development of the natural gas industry. It will be a major challenge to find people with the right skills and to persuade them to join us. This will be a primary focus for our Presidency.

The French team is ready to set to work on these objectives, prepared for whatever new situation arises, and willing to defend the benefits of natural gas with strength and conviction.

Jérôme Ferrier is the Vice President of IGU and will become President at the close of the 25th WGC.

The History of the International LNG Conferences

By Colleen
Taylor Sen

The world's leading forum for the exchange of information on liquefied natural gas is the LNG series of conferences sponsored by IGU, the Gas Technology Institute (GTI) and the International Institute of Refrigeration (IIR). The first conference, LNG 1, was held in Chicago in 1968 and was organised by the Institute of Gas Technology (IGT), which merged with the Gas Research Institute in 2000 to form GTI. The next conference, LNG 17, will be held in Houston in 2013.

Organisation

Three committees run these prestigious and well-attended conferences. The first is the Steering Committee (SC), which has the responsibility for selecting the host countries and venues of future conferences, inviting the keynote and plenary speakers and overseeing all aspects of each conference. The SC is composed of two representatives of each of the three official sponsors, plus the Chairman of the Programme Committee (latterly the Vice Chairman and Secretary have attended as well) and representatives of the National Organising Committee. For the early confer-

ences, IGU provided the Conference Chairman and IGT provided the Chairman of the SC. After LNG 7, the SC chair alternated between IGT (later GTI) and IGU.

The Programme Committee (PC) is responsible for the conference technical programme, which is the backbone of a successful information exchange. The PC plans all the paper sessions, workshops, poster session and films; solicits, reviews and selects the presentations; organises the sessions; and works with GTI on the preparation of the Conference Proceedings. The Chairman and Secretary are appointed by IIR and they invite others to serve on the PC to perform the required tasks.

The National Organising Committee (NOC), which represents the host country, is responsible for the physical organisation of the conference. This includes arranging the conference facilities, securing hotel space and contracting with a professional exhibition manager to run the exhibition. With typically between 2,000 and 3,000 people attending the conference and a requirement for some 15,000m² of exhibition space, this is a major undertaking.

The NOC also arranges the opening and closing ceremonies, hosts the opening and closing receptions and organises post-conference tours. Most importantly, the NOC handles the registrations and manages the revenues from registration and exhibition fees to ensure at least a break-even financial operation. The NOC Chairman is selected by the host country.

From LNG 1 to LNG 17

The very first international conference on LNG, organised by IGT, took place April 7-12, 1968, in Chicago, USA. At the time, the LNG industry was in its infancy. The only exporting nation was Algeria, which delivered 1.5 bcm/year to the UK and France. However, as one conference participant noted, LNG was already regarded as "the fuel with a great future".

IGT was an independent not-for-profit energy research and education organisation created by the American gas industry in 1941. IGT researchers had been involved in various LNG projects in the 1950s and 1960s, including basic research on LNG's physical properties, the analysis and improvement of liquefaction and



regasification systems, studies of storage systems, and engineering and design work for the construction of storage tanks in Barcelona, Spain. IGT staff members received so many requests for information from gas and oil companies, construction firms, equipment manufacturers and government officials that it was obvious a common forum for the exchange of LNG information was needed.

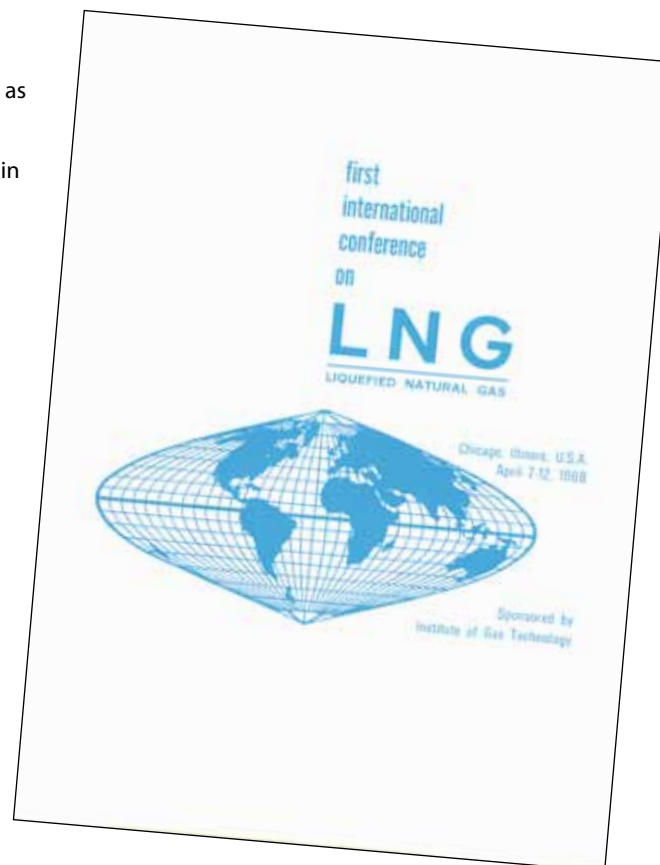
As a result, an IGT team led by Amanullah Khan and Thomas Joyce decided to hold a three-day LNG forum in Chicago. IGT Director Henry Linden was invited to be Conference Chairman and outstanding people in seven areas spanning the LNG industry were asked to serve as session chairmen. Papers were solicited by personal contact and announcements in trade journals. The session chairmen reviewed the abstracts submitted and selected the ones they considered to be of greatest interest and importance.

This early conference had seven sessions which are as relevant today as they were in 1968:

The Role of Natural Gas and LNG in World Gas Supply;

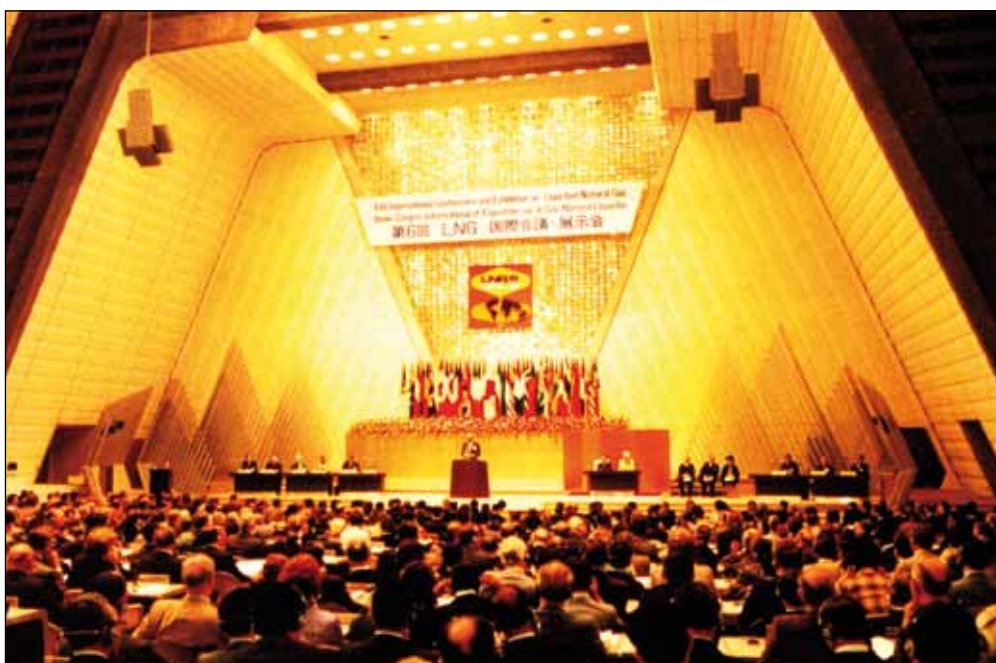
- Operating Plant Experiences;
- Ocean Transportation;
- Peak-shaving Systems;
- New Developments in LNG Technology;
- Transportation of LNG; and
- Utilisation of LNG.

The meeting lasted six days and attracted 760 delegates, far exceeding the organisers' expectations. Around 600 people came from the US, while 16 other countries sent 150 delegates. English and French were the official languages and simultaneous interpretation was provided.



▲ The LNG tanker *Arctic Princess* delivers a cargo – the world's LNG trade is growing strongly.

▲ Four years after commercial LNG trading started the first LNG conference was held in Chicago.



▶ LNG 6 was held in Kyoto. Japan started LNG imports in November 1969 and is the world's largest LNG importer.

The tradition of organising field trips was established at this conference by visits to a peak-shaving plant and a storage field. The proceedings were pre-printed in a 750-page volume weighing nearly 2kg!

▼ Luigi Meanti (*second from left*), Bernie Lee (*third from left*) and colleagues tour the exhibition at LNG 9.

It was obvious that such a successful event should be continued, so plans were discussed

to hold such a meeting every two years. The second conference, LNG 2, was held in Paris, France in October 1970 and IIR and IGU came on board as co-sponsors with IGT. Georges Robert represented IGU as SC Chairman. Paris was an appropriate place since France was the second country in the world to import



LNG (after the UK). By now, Japan, Italy and Spain had entered the ranks of LNG importers, and the US was exporting LNG from Alaska. More than 1,200 delegates from 37 countries attended.

A special dinner speaker was the great pioneer of the LNG industry, William Wood Prince, former head of Chicago's Union Stockyards and Transit Company, who in the 1950s first conceived the idea of liquefying gas and shipping it as LNG by barge. Field trips were to receiving terminals at La Spezia, Italy; Barcelona, Spain; and Le Havre, France; and to St Nazaire where the LNG tanker *Descartes* was under construction.

LNG 3 was held in 1972, at the Hilton Hotel in Washington DC, a year after the US received its first cargo of LNG from Algeria. Georges Robert of IGU chaired both the conference and the SC, while Aman Khan headed the PC. The conference attracted 1,700 delegates, not including spouses or visitors to the exhibition. Many US government officials, including then-president Richard Nixon, discussed the important role LNG could play in the US energy future.

Two years later, in 1974, the conference moved to Algeria where LNG 4 was held in the Palace of Nations 25km from Algiers on the Mediterranean shore. This marked the first time the event was held in a producing country. Leslie Clark of IGU was Conference Chairman, Aman Khan chaired the SC, and Geoffrey G. Haselden (representing IIR) chaired the PC. Algerian President Houari Boumedienne and US Federal Power Commission Chairman John Nassikas gave keynote addresses at the opening ceremony, underscoring the importance of the growing trade between the two countries. Optimism was high about the future of the industry, with one expert predicting that world LNG demand could go as high as 260 bcm by the late 1990s. (In fact, it was not until 2010 that LNG imports surpassed this level).

As attendance increased, the conference switched from a two-year cycle to the three-

year cycle common among major international energy conferences. LNG 5 was held in 1977 in Düsseldorf, West Germany. James Kerr and Christoph Brecht were the Conference Chairmen, Christoph Brecht chaired the SC and Geoffrey Haselden again chaired the PC. Although Germany was not and never became an LNG importer, at the time there were plans to build a receiving terminal.

LNG 6 in Kyoto, Japan in 1980 drew a record 2,200 attendees (including spouses), half of whom came from 41 countries outside Japan. Eric Giorgis of IGU and Hiroshi Anzai were Conference Chairmen; Aman Khan and Geoffrey Haselden chaired the SC and PC, respectively. At the opening session, the heads of Pertamina and Tokyo Gas expressed rather different opinions about LNG prices – plus ça change!

LNG 7 took place in 1983 in Jakarta, Indonesia, which by 1980 had become the world's leading exporting country. Christoph Brecht (IGU) and Joedo Sumbono were Conference Chairmen; IGT President Bernard Lee was Chairman of the SC, and Maurice Grenier became PC Chairman. In 1986, the



conference returned to the United States, this time to Los Angeles, where a receiving terminal was planned and imports were expected to begin in the near future. John Kean and Joseph Rensch were Conference Chairmen of LNG 8. Christoph Brecht chaired the SC and Maurice Grenier again led the PC.

In 1989, France hosted the conference for a second time with LNG 9 being held in Nice. A highlight was the opportunity for delegates to tour the first commercial dual-fuel jet that used LNG, a Tupolev Tu-155 brought by the then Soviet Union especially for the conference. Pierre Gaussens and Luigi Meanti were Conference Chairmen. Bernie Lee chaired the SC and Jean-Pierre Dufresne the PC.

Malaysia, by now a major exporting country, hosted LNG 10 in Kuala Lumpur in 1992. The SC Chairman was Luigi Meanti and the PC Chairman was again Jean-Pierre Dufresne. Tan Sri Datuk Azizan Zainul Abidin and Bernie Lee were Conference Chairmen.

Birmingham was the venue for LNG 11 in 1995, although the UK had discontinued its LNG imports in 1990 (they were to restart in 2005). Messrs. Lee and Dufresne chaired the SC and PC. In 1998, Perth, Australia was the venue for LNG 12. SC Chair was Claude Détourné and Nirmal Chatterjee chaired the PC for the first time. Delegates visited the North West Shelf project which had begun operations in 1989. In 2001, Korea, now the world's second largest LNG importing nation, hosted LNG 13 in Seoul. Bernie Lee headed the SC and Nirmal Chatterjee the PC.

LNG 14 was held in Doha in 2004 with Hiroshi Urano chairing the SC and Nirmal Chatterjee the PC. Having started LNG exports in 1996, Qatar was rapidly expanding its capacity and a focus of LNG 14 was on the use of larger capacity liquefaction trains to achieve economies of scale. Other developments covered included Darwin LNG, which was under construction and would be the first liquefaction

▲
HH Sheikh Hamad bin Khalifa Al-Thani, Emir of Qatar, opens LNG 14.

▼
Bernie Lee addresses LNG 9.

▶ HE Abdullah Bin Hamad Al-Attiah, then Qatar's Minister of Energy & Industry, opens the LNG 14 exhibition.

▶▶ Dr Nirmal Chatterjee has chaired the PC since LNG 12.



plant to use aero-derivative gas turbines, and the Sñøhvit project in Norway, which was also going to use aero-derivative gas turbines and had the added innovation of a CO₂ capture and storage facility. A late addition to the programme was a presentation on the initial lessons to be learned following an explosion at Skikda LNG in Algeria in January 2004.

Spain hosted LNG 15 in Barcelona in 2007. Michael Duggan chaired the SC and Nirmal Chatterjee the PC, and the event attracted a record 3,000 delegates. A key concern was how rising raw material prices and competition from other industries for engineering and contracting services were forcing up the cost of building liquefaction plants. Delegates looked

at ways of countering these cost pressures through modularisation to allow off-site fabrication, building even larger trains than Qatar's 7.8-mtpa supertrains, where feedstocks made that feasible, and improving the efficiency of smaller trains. On the transportation front, they debated the pros and cons of larger ships and different propulsion systems.

▶ María Teresa Costa, then President of Spain's National Energy Commission, opens the LNG 15 exhibition flanked by Antoni Peris, President of the IGU Charter Member for Spain, Sedigas, (left) and Antoni Llardén Honorary LNG 15 Chairman (right).



There are many eventualities to plan for when mounting a large international conference, but the eruption of a volcano 4,000km from the venue which had been dormant for nearly two centuries was not something the organisers of LNG 16 in Oran could have imagined in their wildest dreams – or nightmares. When Eyjafjallajökull spewed a cloud of volcanic ash into the atmosphere which paralysed air traffic in northern Europe from April 15 to 20, 2010, the travel plans of LNG 16 delegates from or routeing through Europe were badly affected. Some were delayed and many were not able to attend at all. However, a swift response by the Algerian NOC chaired by Abdelhafid Feghouli, the SC chaired by Ernesto López Anadón and the PC chaired by Nirmal Chatterjee mitigated the impact.



While the exhibition opened as planned on April 18, the conference start was delayed and the programme condensed from three and a half to two days. Some stranded speakers nominated substitutes to give their papers

while two recorded podcasts. And for those who registered but were unable to travel, all the presentations were videoed and made available for download from the LNG 16 FTP site. At the forefront of delegates' minds were

demand-side issues such as the impact of growing supplies of unconventional gas, particularly in the US.

Indeed, the US is hosting the next conference with Houston as the venue for LNG 17, April 16-19, 2013. Heading up the organising committees are John Somerhalder as NOC Chairman, David Carroll as SC Chairman and Nirmal Chatterjee who is chairing the PC for the sixth time.

Conclusion

The key to the success of the LNG conferences has been the clear assignment of responsibilities to the committees and the close coordination and productive teamwork among IGU, IIR and GTI and the national organising committees. From their very inception, the LNG conferences have provided a sterling example of international cooperation in a spirit of friendship and mutual good will.

Colleen Taylor Sen, LNG Training & Consulting, Gas Technology Institute (www.gastechnology.org).

◀
The opening ceremony of LNG 16.

▼
Dr Abdelhafid Feghouli (left) hands over the conference banner at the closing ceremony of LNG 16 to Jay Copan, Executive Director of LNG 17 (right), while Dr Chakib Khelil, then Algeria's Minister of Energy & Mines (centre) and Ernesto López Anadón (far right) look on.

The dates and venues of the LNG conferences

Conference	Date	Location
LNG 1	April 7-12, 1968	Chicago, USA
LNG 2	October 19-23, 1970	Paris, France
LNG 3	September 24-28, 1972	Washington DC, USA
LNG 4	June 24-27, 1974	Algiers, Algeria
LNG 5	August 29-September 1, 1977	Düsseldorf, West Germany
LNG 6	April 6-10, 1980	Kyoto, Japan
LNG 7	May 15-19, 1983	Jakarta, Indonesia
LNG 8	June 15-19, 1986	Los Angeles, USA
LNG 9	October 17-20, 1989	Nice, France
LNG 10	May 25-28, 1992	Kuala Lumpur, Malaysia
LNG 11	July 3-6, 1995	Birmingham, UK
LNG 12	May 4-7, 1998	Perth, Australia
LNG 13	May 14-17, 2001	Seoul, Korea
LNG 14	March 21-24, 2004	Doha, Qatar
LNG 15	April 24-27, 2007	Barcelona, Spain
LNG 16	April 18-21, 2010	Oran, Algeria
LNG 17	April 16-19, 2013	Houston, USA
LNG 18	2016	Perth, Australia



The History of the IGRCs

By Mark Blacklock
and Robert Doets

The IGU Research Conference (IGRC) is the premiere global forum devoted to presentation and discussion of gas R&D. Originally known as the International Gas Research Conference, the event was launched in 1980 and the next one will be held in Copenhagen in 2014.

The IGRC was conceived by the Gas Research Institute (GRI) with IGU, the American Gas Association (AGA) and the US Department of Energy (DOE) as co-sponsors. Initially there was a difference of opinion between GRI and IGU about the event's frequency. IGU felt that it would be best to have a conference once every three years, while GRI favoured a higher frequency. As a result the second and fourth IGRCs were organised without formal IGU involvement. But from 1986 the triennial cycle was introduced with IGU as a permanent co-sponsor and GRI hosting the IGRC secretariat.

In 2000, GRI merged with the Institute of Gas Technology to form the Gas Technology Institute, which assumed the responsibility as secretariat host for the 2001 and 2004 conferences but indicated that it could not do so in the longer term. Following negotiations

the IGRC was brought into the IGU fold in 2005, when it was decided to hold the event in the year before each World Gas Conference, rather than the year after, so that the highlights could be presented during the WGC. This meant that there was an interval of four years between the 11th IGRC in 2004 and the 12th in 2008, whereupon the triennial cycle resumed.

With effect from the 2012-2015 Triennium the IGRC has been fully integrated into IGU's structure by the creation of a permanent Programme Committee for R&D activities.

The IGRCs from 1980 to 2004

The first IGRC was held in Chicago, June 9-12, 1980 at a time of energy crisis. The Iranian Revolution of 1979 had led to a surge in the oil price (which would increase even more when Iraq invaded Iran later that year) and importing countries were desperately looking for ways to reduce their oil dependence. Could the gas industry help? The 500 delegates from 17 countries believed it could, and the conference's key message was that policymakers were underestimating the potential of gas.

The conference was structured so that gas R&D issues were presented during morning plenary sessions, with specific research results given in afternoon technical sessions. The latter were devoted to coal gasification, unconventional natural gas, improved efficiency in natural gas utilisation, solar, biomass and R&D planning. The plenary sessions addressed issues of gas supply and conservation.

GRI President Henry Linden chaired the Steering Committee and 56 papers were presented in addition to the opening and closing addresses, one of which was given by the then IEA Director Ulf Lantzke.

GRI went on to organise a second conference in Los Angeles, September 28-October 1, 1981, with the AGA and DOE as co-sponsors. There were 557 delegates from 18 countries and 166 papers were presented.

IGU was back on board for the next IGRC in London, June 13-16, 1983, when the President, Christoph Brecht declared, "R&D is indispensable for the very existence and growth of the gas industry".

The third IGRC was attended by 535 delegates from 25 countries and 100 papers were



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The CEOs' roundtable was introduced for IGRC 2008.

From left to right:

Gérard Mestrallet, Chairman & CEO of GDF SUEZ;
 Tadaaki Maeda, Executive Vice President of Tokyo Gas;
 Mark Dodson, CEO of Northwest Natural;
 Bob Catell, then Chairman of National Grid (US); and
 Bernhard Reutersberg, Chairman of the Board of Management E.ON Ruhrgas.



▶ ▼
George Verberg, IGU President 2003-06 (RIGHT) at the opening ceremony of IGRC 2004 which was held in Vancouver (BELOW RIGHT).

presented in six groups: distribution & transmission; substitute natural gas; residential & commercial utilisation; industrial utilisation; thermophysical properties & processes; and general technical. To aid discussions, preprints

of all papers were made available to registered delegates before the conference. Christoph Brecht chaired the Policy Committee (PC) and GRI's William Staats chaired the Programme & Papers Committee.

IGU passed on the fourth IGRC which was held in Washington DC, September 10-13, 1984. This was attended by 454 delegates and included a poster session for the first time. Overall, 70 papers and 33 posters were presented.

From the fifth IGRC in Toronto, September 8-11, 1986, IGU was on board permanently, with the President, John Kean declaring in his opening address, "I have seen the advantages of the interchange of technical and scientific information and what that exchange can do to benefit the rest of the world".

For this event, which was attended by 472 delegates from 24 countries, the Canadian Ministry of Energy, Mines & Resources and the Ontario Ministry of Energy joined GRI, IGU, AGA and DOE as co-sponsors. John Kean chaired the PC and Dr John Laurmann took the helm of what was now known as the Technical Programme Committee (TPC). The environment made its first appearance as a subject area and six papers looked at indoor air quality and emission controls. Overall, there were 76 oral and 52 poster presentations grouped into nine subject areas: gas distribution; gas



transmission; thermophysical properties; residential & commercial utilisation; industrial utilisation; gas supply; gas properties & combustion; environment; and general studies.

The sixth IGRC was held in Tokyo, November 6-9, 1989, with the Japan Gas Association joining GRI, IGU, AGA and DOE as a co-sponsor. A record 902 delegates from 32 countries attended and there were 72 oral and 120 poster presentations in nine groups: gas distribution; gas transmission; gas storage; residential & commercial utilisation; industrial utilisation; gas supply & treatment; environment; gas properties; and general studies. The PC was chaired by IGU's Herbert Richter and the TPC by Jörg Becker of Ruhrgas.

The conference was marked by a focus on environmental issues related to global warming. Stephen Schneider of the US National Center for Atmospheric Research set the scene with a presentation to the opening plenary session on the state of the science regarding the greenhouse effect.

The next IGRC was held five months after the Rio Earth Summit and IGU's President, Luigi Meanti continued the environmental theme when he addressed delegates. "To guarantee sustainable development," he declared, "ever greater emphasis is needed on the efficient use of energy and compatibility with the environment."

IGRC 7 was held in Orlando, November 16-19, 1992. While attendance fell to 678 delegates from 31 countries, the programme was bigger. It was also rationalised under five headings: exploration & production; transmission & storage; distribution; residential & commercial utilisation; and industrial utilisation. There were 90 oral and 171 poster presentations, and 18 (compared to three in 1989) were the work of authors from more than one country illustrating the increasing importance of international cooperation in R&D. The PC was chaired by Luigi Meanti and the TPC by Tsunenori Tokumoto.

The programme structure was maintained for the eighth IGRC, which was held in Cannes,



One of the exhibitors at IGRC 2008 briefs a delegate.

November 6-9, 1995. There were 675 delegates from 31 countries and 90 oral and 205 poster presentations. Noting the accelerating trends of privatisation and deregulation of energy markets, IGU's President Hans Jørgen Rasmusen told delegates, "It will be a challenge to find ways to share the cost of R&D ... IGU is in a very good position to help the gas industry meet these challenges". He chaired the PC and Bernard Lee chaired the TPC.

The move to market liberalisation or full deregulation in many countries involved the break-up of former monopoly gas enterprises with their traditional strength in R&D into several companies and an increased focus on cutting overheads. This put pressure on R&D budgets and in turn affected IGRC participation for a number of years. However, the unbundling of gas companies would create new demands for R&D, particularly in terms of measuring, metering and interoperability, while focusing on the bottom line created a new driver for R&D into more effective maintenance and the upgrading of installations.

The ninth IGRC was held in San Diego, November 8-11, 1998. Attendance was similar to the previous conference, with 672 delegates

from 34 countries, and there were 97 oral and 230 poster presentations. IGU's Claude Détourné chaired the PC and Francis Dewerdts chaired the TPC. The programme structure was maintained with a slight revision by renaming the fifth category industrial utilisation & power generation.

Innovations for the 10th IGRC included a reduced fee for students and the publishing of the conference proceedings on CD-Rom supple-

The dates and venues of the IGRCs

<i>Date</i>	<i>Location</i>
June 9-12, 1980	Chicago, USA
September 28-October 1, 1981	Los Angeles, USA
June 13-16, 1983	London, UK
September 10-13, 1984	Washington DC, USA
September 8-11, 1986	Toronto, Canada
November 6-9, 1989	Tokyo, Japan
November 16-19, 1992	Orlando, USA
November 6-9, 1995	Cannes, France
November 8-11, 1998	San Diego, USA
November 5-8, 2001	Amsterdam, The Netherlands
November 1-4, 2004	Vancouver, Canada
October 8-10, 2008	Paris, France
October 19-21, 2011	Seoul, Korea
September 17-19, 2014	Copenhagen, Denmark



▶ Kang Soo Choo, President & CEO of Kogas and Chairman of the Korea Gas Union addresses delegates during the opening ceremony of IGRC 2011 in Seoul.

▼ The ceremonial opening of the exhibition at IGRC 2011.

mented by an abstract book. The conference was held in Amsterdam, November 5-8, 2001, just two months after the tragic events of September 11 when some companies had business travel restrictions in place. There were 492 delegates. The programme structure was maintained with 291 papers and posters presented. IGU's Hiroshi Urano chaired the PC and Dr Robert Harris of Advantica Technologies chaired the TPC.

An associated exhibition was organised for the first time at the 11th IGRC, which was held in Vancouver, November 1-4, 2004, and attended by 372 delegates from 34 countries. A best paper award worth €10,000 was also inaugurated in honour of the late Dan A. Dolenc of GRI who had helped organise the conferences for some years and headed the IGRC secretariat for the 1998 conference. The winners were Vinod Chauhan of Advantica and

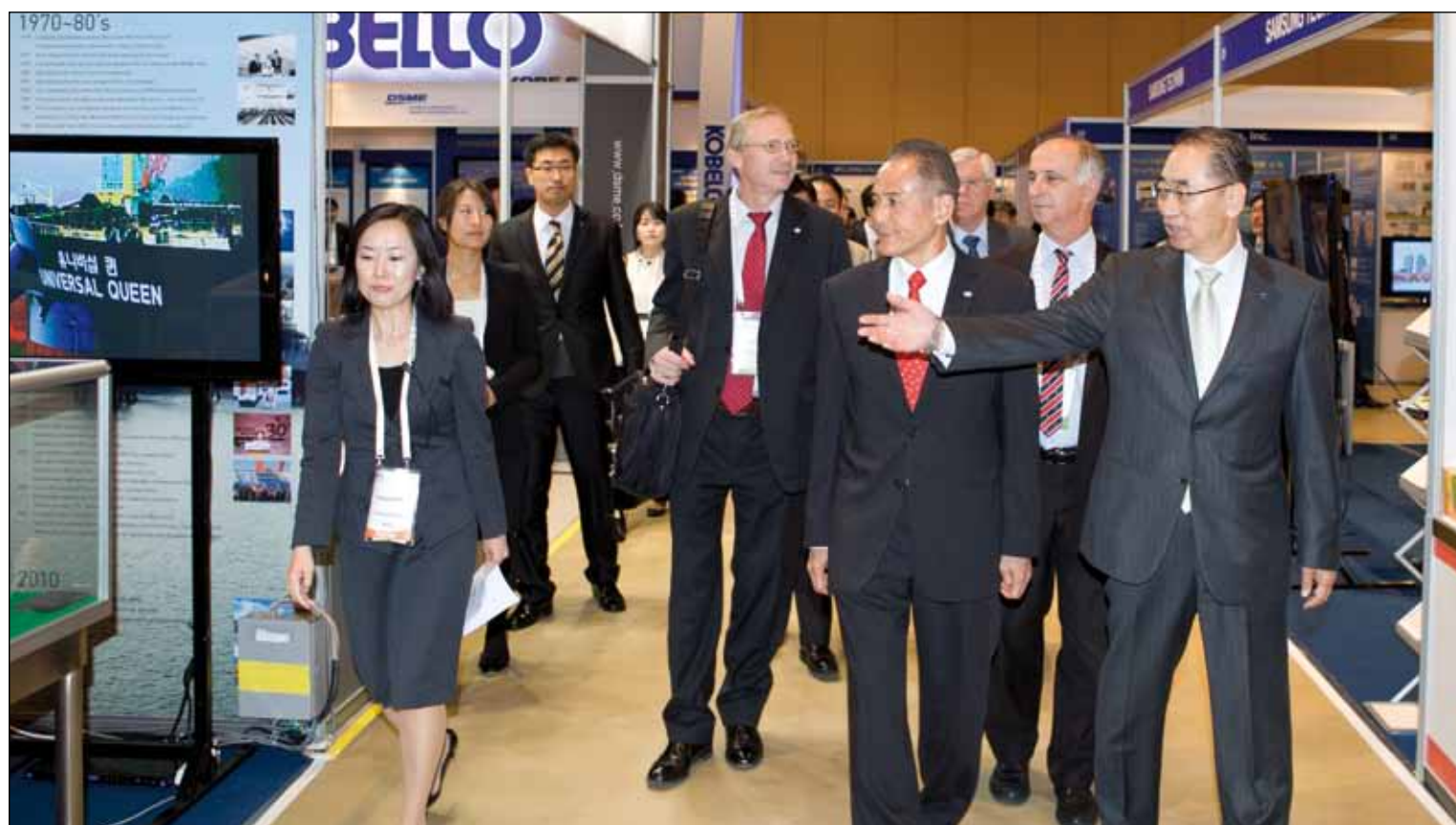
co-author Wytze Sloterdijk of NV Nederlandse Gasunie, for their paper "Advances in Interaction Rules for Corrosion Defects in Pipelines". The award was presented by Mrs Jean-Marie Dolenc during the closing ceremony of the conference.

The programme structure was amended with the five categories entitled: gas resources, production & processing; transmission; distribution; residential & commercial utilisation; and industrial utilisation. In total, 76 oral papers and 152 posters were presented. The PC was chaired by IGU's George Verberg and the TPC by Peter Hinstrup of the Danish Gas Technology Centre.

The IGRCs in 2008 and 2011

For the next two conferences secretarial support was provided to the PC by the IGU Secretariat and to the TPC by the Foundation IGRC, which was established by the Dutch gas





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Kang Soo Choo escorts
Datuk Abdul Rahim
Hashim, IGU President
2009-12, and other
members of the PC around
the exhibition at IGRC 2011.

industry on the basis of a foundation created to help organise the 2001 event.

Participation in the 12th IGRC bounced back with an impressive 811 delegates from 41 countries leading George Verberg to conclude that, “the involvement of companies in research and development has made a u-turn compared to previous years”. The event was held in Paris, October 8-10, 2008.

George Verberg chaired the PC for the second time and Christian Beckervordersandforth chaired the TPC. There were 42 oral papers, three keynotes and 270 poster presentations, while innovations included a roundtable with five CEOs and four workshops.

The Dan A. Dolenc Award was given to two papers with the winners sharing the prize: Dominique Gueugnaut from GDF SUEZ did fundamental work on the permeability of methane hydrogen mixtures in polyethylene gas pipes used in gas distribution networks; Takahide Haneda from Tokyo Gas developed a

gasification system for sewage sludge and proved in practice with a full-scale plant that the expected contribution to a reduction in greenhouse gases was realistic.

The most recent IGRC was held in Seoul, October 19-21, 2011, and was attended by over 500 delegates from 39 countries, consolidating IGRC as the leading global conference dealing with R&D throughout the gas chain. Some 260 papers and posters were presented and there were 40 exhibitors. IGU’s Ernesto López Anadón chaired the PC and Marc Florette of GDF SUEZ chaired the TPC.

A new €3,000 prize was launched for a paper presented by a young researcher (born after October 18, 1982) and Cyril Vuillecard of GDF SUEZ won for his work on a bottom-up model for local gas and electricity interactions with hybrid technologies. The Dan Dolenc Award for the best paper overall went to Dr Marius Adelt of E.ON Ruhrgas for “The Life Cycle Assessment of Biomethane”. The CEOs’ roundtable was mod-

erated by Bob Catell, Chairman of Advanced Energy, and brought together: Thijs Aarten, CEO of Kema GCS; Seongho Hong, Chief Researcher of Kogas; Matthias Bichsel, Projects & Technology Director of Shell; J. Wason, Executive Director Marketing of GAIL; and Dr Colin Wong, Vice President, Technology & Engineering of Petronas.

The new IGRC structure

In April 2011, the IGU Executive Committee approved the creation of a new Programme Committee (PGC) with effect from the 2012-15 Triennium. PGC F covers R&D activities and takes over the tasks of the TPC, while those of the PC have been divided between PGC F and the Executive Committee. The first Chairman of PGC F is Jack Lewnard and the next IGRC will be held in Copenhagen, September 17-19, 2014.

Mark Blacklock is the Editor-in-Chief of International Systems & Communications. Robert Doets is the Secretary of the Foundation IGRC.



Today and Tomorrow

This section starts with an overview of the development of the gas industry in Malaysia, which holds the current Presidency of IGU and is hosting the 25th World Gas Conference in Kuala Lumpur, June 4-8, 2012. The following chapters look at important recent initiatives of IGU to step up involvement in the annual UN Climate Change Conferences, set up a Ministerial Forum jointly with the International Energy Forum (IEF) and launch a gas advocacy programme. Then there is a chapter looking at the future prospects of the global gas industry. The section rounds off with details of the publications available from IGU and the acknowledgements.

The Development of Malaysia's Natural Gas Industry, Host Country of the 25th World Gas Conference

By Mohd Seth Haron
and Hazlina Hussein

Until the mid-1980s, Malaysia was just another developing country whose economy was largely agricultural and mineral based. Equally important was the electronics sector, but its operations were mainly limited to the assembly of products and the companies were mostly foreign-owned. Since then, the expansion of Malaysia's petroleum industry has helped transform the country's economic and business landscape.

The contribution from the oil and gas sector to the national economy has been significant and far reaching, from household consumers, to the transport and power sectors. The availability of natural gas has also helped foster the development of an important petrochemical industry. Today, Malaysia is poised to join the league of the world's developed and industrial countries.

Malaysia's spectacular rise to become a significant player in the world's oil and gas industry has been largely due to the diligent and prudent management of the national oil corporation, PETRONAS. Despite only being incorporated in 1974, PETRONAS has since established itself amongst the ranks of the world's oil majors. One very important and notable success of PETRONAS

has been its ability to maintain a reasonably high level of oil and gas reserves for the country. Even though Malaysia has been producing oil at a self-imposed quota of 600,000 barrels/day (b/d) since 1990, the country's proven oil and gas reserves have continued to grow. They currently stand at about 5.9 billion barrels and 90.0 trillion cubic feet, (2.5 trillion cubic metres), respectively, making Malaysia the world's 15th largest holder of gas reserves and 21st of oil reserves.

This article looks at the important role played by PETRONAS in the successful development of Malaysia's petroleum industry, and provides a brief history and overview of the country's natural gas industry.

Historical background

Malaysia's oil and gas industry had its humble beginnings in a small village, located in the remote north-west of the island of Borneo, where oil seeped to the surface. The local people used this "earth oil", or "minyak tanah" as it is called in Malay, as medicine, and later for lighting lamps as well as to make a resin mixture for caulking boats. Although this

practice was longstanding, the first recorded use of oil dates back to July 1882 in the Miri area, which is located in the state of Sarawak.

The first recorded commercial exploitation of the "earth oil" began in 1905, when the British Borneo Exploration Company was granted the concession to explore for oil in the state of Sabah. However, it was the Anglo Saxon Petroleum Company, now known as Sarawak Shell, which in 1909 won the concession to explore for oil in Sarawak, which enjoyed greater success. In August 1910, the concessionaire successfully struck oil from its first onshore well in Miri. From an initial production flow of 80 b/d, the Miri field subsequently reached a peak of 15,000 b/d in 1929.

Encouraged by its initial success, and with more sophisticated technology made available, Sarawak Shell subsequently ventured offshore, and conducted Malaysia's first offshore seismic survey in 1954. This move paid dividends when the Patricia and Temana oil fields were discovered in 1962.

The discoveries in Sarawak encouraged foreign oil companies to explore for oil in



Malaysia is well endowed with oil and gas resources.

Peninsular Malaysia. In April 1968, Esso and Conoco were awarded concessions by the government to explore for oil off the east coast of the peninsula, while in January 1971, Mobil was granted a concession to explore in the Straits of Melaka, off the coast of Kedah and Perak.

Beginning of a new era – incorporation of PETRONAS and the Petroleum Development Act 1974

The Arab-Israeli War in 1973, and the ensuing world oil crisis which led to a severe shortage of petroleum products across the globe, led the Malaysian Government to consider taking greater control of the country's petroleum resources. A state-owned entity was subsequently created to ensure that the nation's hydrocarbon resources would be managed professionally to obtain the maximum commer-

cial return and benefits for the country. On August 17, 1974, Malaysia's national oil corporation, Petroliam Nasional Berhad (PETRONAS) was incorporated under the Companies Act 1965.

To give PETRONAS full control of the country's oil and gas resources, the Malaysian Parliament passed the Petroleum Development Act 1974 (PDA) in November 1974. The PDA endowed upon PETRONAS the ownership of Malaysia's oil and gas resources, thereby giving it full control of the upstream exploration and production sector. More importantly, PETRONAS was able to develop the oil and gas industry in an integrated and structured manner; thereby ensuring maximum benefits and returns to the nation. However, in the downstream marketing and distribution sector PETRONAS does not enjoy any special privileges.

PETRONAS – the “Game Changer” for Malaysia's petroleum industry

Realising that Malaysia lacked oil and gas experience, the Malaysian Government gave its mandate and full support to PETRONAS to manage the industry. This autonomy proved to be one of the most important elements in the successful development of Malaysia's petroleum industry. PETRONAS was allowed to focus on its operations, but in return, and as a measure of its performance by its owners, is expected to pay dividends to the Government at the end of each financial year.

Although still in its infancy, PETRONAS took on the challenge of replacing each concession agreement with a production sharing contract (PSC). Getting the oil companies to accept the PSCs was initially a daunting task. However, after protracted negotiations and a short stand-



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 PETRONAS has worked with international oil companies to develop Malaysia's oil and gas resources. The Angsi field (ABOVE) offshore Peninsular Malaysia is a joint venture with ExxonMobil. The E11 hub integrated gas project (ABOVE RIGHT) offshore Sarawak is a joint venture with Shell.



off, Shell and Esso signed their PSCs with PETRONAS at the end of 1976.

Having the flexibility of a private company, but possessing regulatory powers, PETRONAS has been able to shape the oil and gas industry to obtain the maximum commercial benefits possible, whilst ensuring that the Government's policies are being carried out.

Malaysia's relatively high oil and gas reserves today are largely due to the success of PETRONAS in getting international oil companies to continue to invest and explore in the country. Although Malaysia does not have a big acreage to offer, the country's relatively high success ratio, coupled with the ability of PETRONAS to creatively tweak the terms and conditions of the PSC, have ensured a steady level of exploration activities. In recent years, the success of PETRONAS in attracting international oil companies to drill in "recycled blocks" in the deepwater areas of the South China Sea has led to significant new discoveries of almost 1 billion barrels of oil and about 10 trillion cubic feet (280 billion cubic metres) of natural gas.

The dual role assumed by PETRONAS has also proven to be important in persuading oil

companies to develop their fields, especially gas, particularly when crude oil prices were at low levels. In one instance, in the late 1980s, PETRONAS succeeded in convincing one of its production sharing contractors to develop a gas field by allowing them to recover their investments through higher crude oil production entitlement from one of their fields; a move which helped to improve the project's overall economics. The timely development of the field was critical to enable PETRONAS to meet gas demand for the power sector in the peninsula. The ability of PETRONAS to develop the winning formula was primarily due to its own experience as a PSC operator, through its upstream subsidiary PETRONAS Carigali.

An equally important PETRONAS achievement has been its successful implementation of the local participation and Malaysianisation strategy in Malaysia's oil and gas industry. Thanks to a strong and persistent stand, Malaysians today hold most of the key positions in the local PSC operators, such as Shell and ExxonMobil, as well as service providers. Similarly, local companies and contractors enjoy a large share of the contracts awarded in

Malaysia's upstream sector. Compared to the other oil producing developing countries, Malaysia has enjoyed a much higher degree of success in ensuring local participation in the petroleum industry.

Although PETRONAS is currently the country's largest retailer of petroleum products, ironically, its entry into the domestic market was not planned. In 1979, Malaysia was impacted by the second global oil crisis, which resulted in an acute shortage of petroleum products in the domestic market. Since the international oil companies could not mitigate the shortage, the Government directed PETRONAS to set up "skid tank stations" (temporary modular units) across the country to alleviate the situation. Subsequently, PETRONAS established its downstream arm, PETRONAS Dagangan Sendirian Berhad (PDSB), and most of the skid tank stations were later developed into full-fledged service stations. The success of PDSB, now known as PETRONAS Dagangan Berhad (PDB) following its listing on the Kuala Lumpur Stock Exchange, has enabled PETRONAS to venture into downstream activities in Sudan and South Africa.

The professional, transparent and business-like approach of PETRONAS has been an important factor in helping the company to grow and earn the respect and trust of the international business community. It has long been listed as a Fortune Global 500 company.

The birth of Malaysia's natural gas industry

Although Malaysia's first natural gas field was discovered offshore Sarawak in 1969, it was only in 1978 that serious efforts were taken to monetise the gas reserves. From its experience in neighbouring Brunei, Shell triggered the proposal to build a liquefied natural gas (LNG) plant. Subsequently, in June 1978, a joint venture company, called Malaysia LNG, was incorporated, with the initial shareholders being PETRONAS, Shell and Japan's Mitsubishi Corporation. The consortium was joined by the Sarawak State Government in 1985.

Realising that developing and monetising the nation's natural gas resources was more complex and requires a very large capital outlay as well as a relatively long lead time, PETRONAS commissioned a Gas Masterplan Study in 1981. This document subsequently proved to be very important since it sets the stage and roadmap for the development of natural gas in Malaysia.

A key recommendation of the study was that since the high demand from the power and non-power sectors in Peninsular Malaysia provided a ready market, the gas reserves off the east coast should be developed to satisfy this need. For Sarawak and Sabah, since local demand was relatively small, the bulk of their reserves offshore should be developed for export in the form of LNG.

The study also recommended that PETRONAS adopt a multi-phase gas utilisation programme. Amongst other projects, the national oil company should construct a pipeline grid across the peninsula to supply natural gas to the major power stations, and also to export gas to Singapore. The study further recommended that gas liquids, namely ethane, propane and butane, should be extracted to enable the development of a local petrochemical industry.

The Gas Masterplan provided the Malaysian Government with an added option to improve the resilience of the country's energy strategy. In 1981, Malaysia's three fuel energy policy was replaced with a four fuel strategy, namely: oil, hydro, coal and natural gas. The availability of gas proved to be crucial in helping the Government keep the price of domestic power below

that in many other Asian countries. In fact, natural gas provided an invaluable "cushion" during the Asian financial crisis in 1997, when the Ringgit dipped to almost 5 Ringgit to the US dollar. Unlike most of its neighbours, Malaysia was sheltered from the full impact of the sharp foreign exchange swings, because most of its power needs were met by locally sourced natural gas.

Natural gas provided the Malaysian Government with another asset to help the nation in its drive to achieve the status of an industrialised country, as embodied in *Vision 2020*. The availability of a cheaper source of energy, and competitively priced gas-based feedstock, such as resin and fertiliser, created numerous new business opportunities for local companies. It also attracted major investments from leading foreign petrochemical companies.

Meanwhile, in the upstream sector, although it was not intended, Malaysia's gas utilisation roadmap helped improve the attractiveness of exploring for oil in Malaysia, vis-à-vis other countries in the Asian region, especially during the 1980s. Instead of exploring only for oil in Malaysia, oil companies were also exploring for natural gas. The ready outlets and proposed infrastructure outlined in the study also made it

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PDB has a retail network of over 900 stations throughout Malaysia.





easier for production sharing contractors to develop plans to monetise the natural gas discovered, as required by their PSCs.

The Peninsular Gas Utilisation project

Constructing a pipeline grid across Peninsular Malaysia was an important recommendation of the Gas Masterplan Study, and PETRONAS started the Peninsular Gas Utilisation (PGU) project in 1982. It was implemented in three stages, with the final stage being completed in 2001. The grid is owned by a

PETRONAS subsidiary called PETRONAS Gas Berhad (PGB).

Today, more than 2,500km of PGU pipeline system have been laid, linking the grid with Singapore to the south, Thailand to the north and Indonesia's West Natuna field through an offshore pipeline east of the peninsula. Also, there are six gas processing plants with a combined sales gas capacity of 2,060 million cubic feet/day (58 million cubic metres/day) located in Kerteh, in the state of Terengganu. The PGU project has since achieved its objectives of providing natural gas to the major power plants in the peninsula, to make gas an alternative source of energy, to boost foreign earnings through export gas sales to Singapore, and to spur the development of a petrochemical industry by ensuring a secure and stable supply of gas-based feedstock.

The completion of Phase 2 of the PGU in 1991 signified a major milestone as it helped spur further downstream development of Malaysia's gas industry. The supply of natural gas to the high demand areas in the central region and south of the peninsula enabled the implementation of the natural gas distribution

system which makes gas available to the retail and non-power sector grid, the natural gas for vehicles (NGV) project and the gas district cooling (GDC) project. This was followed by the completion of PGU Phase 3 in 2001, under which the grid was extended to the northern region of the peninsula.

The availability of natural gas in the major cities on the west coast of the peninsula has enabled PETRONAS to step up its campaign to promote the use of NGVs. Today, some 55,000 cars and buses run on compressed natural gas (CNG). Nevertheless, this figure is well below the target set by PETRONAS, and represents only about 1% of the transportation sector, despite the price of CNG being heavily subsidised so it is less than half the price of diesel. Greater penetration of natural gas in the transportation sector will help to reduce pollution and greenhouse gas emissions (GHG), thus enhancing environmental quality and supporting sustainable development.

Lower GHG together with a high operating efficiency of around 90% are key benefits of the GDC project, and PETRONAS has been promoting the implementation of such plants in energy

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The PGU system transports gas to customers throughout Peninsular Malaysia including this centralised utility facility in Kerteh.

▶▶
Malaysia has around 55,000 cars and buses running on CNG.



intensive industrial and commercial areas. The GDC plants utilise the cogeneration system, where heat generated during power generation is harnessed to fire boilers and produce steam, which in turn is used to produce chilled water for air-conditioning purposes. This distributed generation enabled by the GDC plant also helps to reduce stress on the national power transmission grid, and contributes towards reducing peak load demand. GDC has been implemented at the Kuala Lumpur City Centre (KLCC) development area, Kuala Lumpur International Airport, Putrajaya and the University Teknologi PETRONAS (UTP). The Federal Government Administrative Centre in Putrajaya is a “Model Green City” where all the chilled water needed to cool the office buildings is supplied by two nearby GDC plants. Meanwhile, UTP is the only university in the region with facilities to generate its own power requirements and chilled water for air conditioning.

Driven by the Government’s vision to be amongst the Asian pioneers in establishing a gas-based petrochemical industry, PETRONAS successfully attracted major foreign petrochemical companies to invest and set up their manufacturing facilities in Malaysia. Construction of the PETRONAS Petroleum Industrial Complex (PPIC) in Kerteh started in the mid-1990s. Today, the PPIC consists of world-class ethylene, polyethylene, LDPE and HDPE, and aromatics plants. It also boasts a centralised utility facility (CUF) which provides electricity, steam and industrial water to the petrochemical plants. The CUF has been successful in attracting investors since it helps to reduce the cost of setting up plants in the vicinity, as the plants there do not have to invest in boilers and back-up generators.

The implementation of Phase 3 of the PGU project enabled Malaysia to increase its self-sufficiency in food, primarily rice and palm oil. The ammonia-urea plant in Gurun, Kedah, helped supply much needed fertiliser to the region, which is also known as the “Rice Bowl”

of Malaysia. It also helped foster the growth of a high-tech industrial park in Kedah, a state which once used to rely purely on agriculture.

The PGU project has helped to broaden Malaysia’s manufacturing base, thereby enhancing the Government’s drive to promote higher value-added industries and products within the national economy as outlined in the Second Industrial Master Plan. As part of its contribution to assist the Government to successfully implement its Economic Transformation Programme, PETRONAS has embarked on a massive refinery and petrochemicals project called RAPID, or Refinery and Petrochemical Integrated Development. The RAPID project will be implemented in Tanjung Pengerang, Johor, and the various plants are due to be completed between 2015 and 2017. Amongst others, they include a 300,000 b/d oil refinery and a state-of-the-art petrochemical plant.

Malaysia’s LNG business

Until 1981, Bintulu was a quiet and unknown remote fishing village located midway along the coast of Sarawak. Since then, the village has been transformed into a busy and bustling

industrial centre housing several mega plants and hundreds of thousands of new residents.

The Malaysia LNG complex in Bintulu today ranks as Malaysia’s largest single development project. Since commencing operations in 1983 with a capacity of about 8 million tonnes per year (mtpa), the complex has been gradually expanded. Today, there are eight trains which belong to three joint ventures, all majority-owned by PETRONAS. Their combined production capacity in 2011 of some 24 mtpa makes Malaysia the world’s second largest LNG exporter, after Qatar.

With almost 30 years’ experience, Malaysia is regarded as a highly reliable and dependable supplier of LNG by its customers in Japan, South Korea, Taiwan and China. To further reinforce reliability of its delivery, PETRONAS acquired a majority-stake in Malaysia International Shipping Corporation Bhd (MISC), whose fleet includes 27 LNG tankers. MISC continues to strengthen its global market position as a major owner and operator of LNG tankers.

Gas made available by the LNG project also helped spur the development of the local gas industry in Sarawak and Sabah. In Bintulu, other

▼
PETRONAS staff checking samples in a laboratory at Malaysia LNG.





▶ The LNG complex at Bintulu, Sarawak has a capacity of more than 24 mtpa.

major gas-based projects which have been implemented include the ammonia-urea plant owned by ASEAN Bintulu Fertilizer (ABF) and the gas-to-liquids Shell Middle Distillate Synthesis (SMDS) plant. Natural gas is also being supplied to Sarawak Electricity Supply Corporation's (SESCO) power plant, Sarawak Energy Berhad (SEB) and the Sarawak Gas Distribution (SGD) grid which supplies natural gas to industrial consumers in Bintulu.

In Sabah, gas is being supplied to the methanol plant owned by PETRONAS Methanol Labuan, Sabah Electricity Sdn Bhd (SESB), Sabah Energy Corporation (SEC) and a few independent power producers. Other projects being implemented include the Kimanis power plant, which is expected to come on-stream by the end of 2013, and the Sabah Ammonia-Urea (SAMUR) plant in Sipitang, which is expected to commence operations in 2014. Additionally, PETRONAS is now undertaking a project to lay a 500km pipeline to bring gas from offshore Sabah to the LNG complex in Bintulu. The Sabah-Sarawak Gas Pipeline (SSGP) is scheduled to be completed by the end of 2013.

Emerging challenges and harnessing opportunities

Moving forward, meeting the country's large appetite for natural gas ranks as the biggest challenge for the Malaysian Government and PETRONAS. The Government's strategy of keeping domestic energy prices low so that local companies can compete with their peers in neighbouring countries has led to a very strong 14% annual growth in Malaysia's natural gas demand for the last three decades. However, the downside of keeping gas prices below the market rate is that there is no incentive to invest to increase the country's supply capacity. Realising that the subsidy has cost the country billions of Ringgit, the Government recently announced that the price of natural gas to the power sector and industrial users would be increased gradually to attain market parity by 2015.

In response, PETRONAS has embarked on a project to construct an LNG receiving and regasification terminal in Melaka. Located next to the Melaka refinery, the terminal, which will be inaugurated during the 25th World Gas Conference in June 2012, will be linked to the

existing PGU gas grid near the refinery. This move by PETRONAS will partially alleviate the prevailing tight gas supply now faced by Malaysia. Assuming that gas prices reach market parity soon, PETRONAS plans to build another LNG receiving and regasification terminal in Tanjung Pengerang, next to the RAPID project. To help alleviate the current tight power supply situation on the east coast of Sabah, PETRONAS and its partners will also be building a similar terminal in Lahad Datu, Sabah, to be completed by 2015. This terminal will enable LNG to be supplied to a new power plant there.

The higher gas prices will also improve the economics of developing new gas fields, mostly located in the deepwater areas offshore Sabah and Sarawak. These deepwater fields are technically more challenging, because they are more acidic, with higher carbon dioxide content ranging from 12% to 40%, and are located in the difficult and complex environment of high pressure and higher temperature. As such, the cost of developing such fields is much higher than the earlier fields.

Separately, the Government and PETRONAS are working on reforms to ensure an efficient



and sustainable domestic gas market. The initiative covers four main areas of interest: gas infrastructure, pricing, the policy and regulatory framework and supply management.

With regards to supply management, Malaysia plans to sustain supply volume from its neighbours, namely from Indonesia's West Natuna B and the Malaysia-Thailand Joint Development Area.

Malaysia as the host of the 25th World Gas Conference

In 2005, Malaysia was elected to assume the IGU Presidency for 2009-12. This was the second time in the Union's history that an Asian country had been chosen, following the Japanese Presidency for 2000-03. Malaysia's election recognised the world-class qualities of the country's gas industry reflected through the Malaysian Gas Association as a Charter Member of IGU.

The 2009-12 Triennium culminates in the 25th World Gas Conference and Exhibition, which will be held Kuala Lumpur, June 4-8. It is timely that the triennial event is being hosted in Asia, given the region's growing

significance as a demand centre for gas arising from its robust economic growth and rapid pace of urbanisation.

Going forward

The success of Malaysia's natural gas industry has been largely due to the remarkable leadership and important role played by the national oil corporation, PETRONAS. Under the guidance of PETRONAS, Malaysia's gas industry has experienced a meteoric rise and has now emerged as a significant player in the global natural gas market. The Presidency of IGU is testament of the recognition accorded by the international gas community to the contributions made by Malaysia to the industry in general.

Due to its profound impact and widespread contribution to the Malaysian economy, natural gas will continue to play an important role in nation building and thereby help the Malaysian Government to realise the objectives of the country's Economic Transformation Programme.

Even after the gas market has been liberalised, PETRONAS is expected to be relied upon to ensure enough supply of natural gas to



meet domestic demand. However, to facilitate the much needed growth in supply capacity, the Government has to act decisively to ensure that the domestic price of natural gas will be at market parity by 2015. An unsubsidised natural gas price will ensure more efficient use of the resource, as well as eliminate unnecessary wastage.

This article was written by Mohd Seth Haron and Hazlina Hussein, in collaboration with the Malaysian Gas Association and the Gas and Power Business of PETRONAS.

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MISC's fleet of LNG tankers includes the *Seri Alam*.



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The gas-to-liquids plant in Bintulu.

IGU Engages with International Policymakers

An important finding of the task force reviewing IGU's future at the start of the new millennium was that the Union needed to broaden its work and move from a focus on technical issues to get more involved in economic, regulatory and social policy issues. Apart from the internal impact on IGU's work programme, this entailed much greater external engagement with stakeholders and policymakers. Two important outreach initiatives have been the stepping up of IGU's involvement in the annual United Nations Climate Change Conferences, and launching a Ministerial Gas Forum in conjunction with the International Energy Forum (IEF).

UN Climate Change Conferences

The first Conference of the Parties (COP) to the United Nations Framework Convention on Climate Change (UNFCCC) took place in 1995. IGU has held NGO status from COP 1, and was initially represented by the chairman of the task force on gas and the environment, Frank Shephard.

For COP 5 in 1999, IGU joined forces with Eurogas to have a stand and organise a seminar

themed "Natural gas – part of the solution to global climate change". IGU also participated in meetings with subsidiary bodies at COP 5, which prepared the conference's plenary studies and discussed technical issues.

It was at COP 6 that IGU took its involvement to another level, achieving the rare honour of addressing the official plenary of Environment Ministers. Only four slots were available to NGOs and IGU was granted one to give a brief presentation. As COP 6 was being held in The Hague, it was considered most appropriate for the Dutch Vice President, George Verberg to speak.

In addition, IGU hosted a special event at COP 6, looking at "Natural gas perspectives and transfer of technology". The main speaker was Professor Nebojša Nakićenović, from the International Institute for Applied Systems Analysis and a lead author in the Intergovernmental Panel for Climate Change (IPCC). A panel discussion was held which included the President of IGU, Hiroshi Urano, the Secretary General, Peter Storm, and IGU colleagues from Argentina, Australia and Canada.

IGU also joined forces with six other gas-related organisations, accredited to the UNFCCC, to present an information stand on the benefits of gas. This was outside the plenary hall of the conference; there was another stand in an adjoining technology exhibition with some of the gas organisations.

From COP 7 to 14

In 2001, COP 7 was held in Marrakech. Here, IGU had an information stand and held a special event where IGU representatives gave presentations on issues related to the natural gas industry and sustainable development.

COP 8 was held in New Delhi in 2002. This time, IGU had a stand in the exhibition to promote its views on sustainable development and climate change. IGU also collaborated with the Indian Charter Member, Gas Authority of India (GAIL), and the Federation of Indian Chambers of Commerce and Industry (FICCI) to organise a special event. This promoted gas with special emphasis on a project on sustainable urban system design being coordinated by the Japanese Charter Member, the Japan Gas Association.



IGU's then-Vice President, George Verberg addressed the official plenary of Environment Ministers at COP 6 – the sack contained coal, the dirty fuel he was urging should be supplanted by clean-burning natural gas (LEFT). COP 6 was held in The Hague in November 2000 (BELOW).

In addition to its usual exhibition stand at COP 9 in Milan in 2003, IGU organised two special events with the theme of “Natural gas, also the better choice in transport”. Speakers were brought in from Argentina, India and Italy to promote gas taking into account the special transport theme chosen by the UNFCCC Secretariat for COP 9.

At its special event during COP 10 in Buenos Aires in 2004, IGU presented the first draft of a vision paper themed “The future role of natural gas and the strategic impact for IGU”. (The final version would be presented at the 23rd World Gas Conference in 2006.) Transport was again a topic of discussion with IGU bringing in speakers from The Netherlands and the President of the International Association for Natural Gas Vehicles (NGV Global) to promote NGVs as a sustainable future transport solution.



The Kyoto Protocol entered into force in 2005, setting binding targets for 37 industrialised countries and the European Union for reducing greenhouse gas emissions. These amounted to an average of 5% against 1990 levels over the five-year period 2008-2012. The major distinction between the Protocol and the UNFCCC was that while the Convention encouraged industrialised countries to stabilise emissions, the Protocol committed them to do so.

The parties to the Kyoto Protocol met for the first time at COP 11 in Montreal to agree on tools to facilitate the work towards mitigating climate change and what should be done after 2012 when the Protocol was due to expire. IGU had its usual stand at COP 11 but did not organise a special event and followed this policy for the next three COPs.



▲ The parties to the Kyoto Protocol met for the first time at COP 11 in Montreal.

▼ COP 13 took place in Bali, Indonesia, in 2007. IGU was represented by the Secretary General and members of Programme Committee A on sustainable development.

Members of Programme Committee A on sustainable development joined the team representing IGU for COP 12 in Nairobi and again for COP 13 in Bali. At COP 14 in Poznań, IGU joined forces with NGV Global to promote natural gas vehicles. IGU also distributed material focusing on sustainability and gas as the fuel of choice during the conference. Representatives of IGU at COP 14 included the

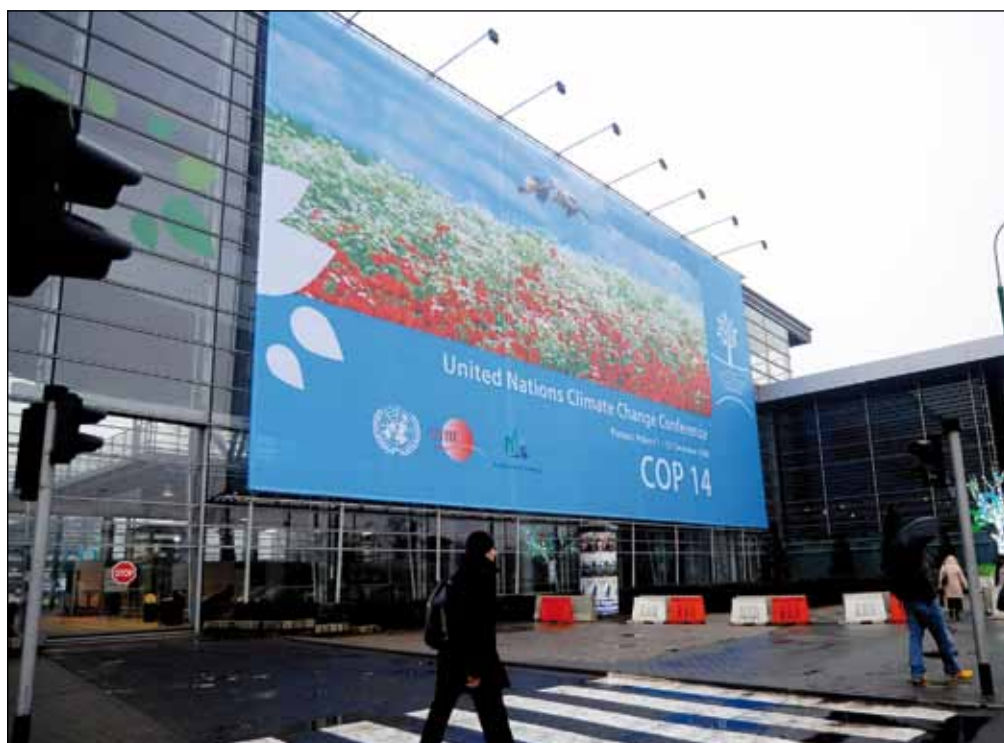
Secretary General Torstein Indrebø, his advisor Erik Gonder and assistant Florijana Dedović, as well as Hyo Sun-Kim from Korea, a member of Programme Committee A.

New gas event launched

IGU chose COP 15 in Copenhagen in 2009 to launch a special gas event under the banner of “The role of natural gas in a sustainable energy

future”. The aim was to inform COP 15 delegates, press, civil servants, NGOs and industry about the environmental benefits of natural gas. IGU members and partners provided speakers and financial assistance for the event, including IEA, the European Commission, DONG Energy, Statoil, Petoro, BG Group, the American Gas Association, TOTAL, E.ON Ruhrgas and Indraprastha Gas.





For COP 16 in Cancún in 2010, IGU teamed up with the Worldwatch Institute to organise a gas symposium. This was held under the theme “The role of natural gas in a low-carbon economy”. Delegates from COP 16, NGOs and other stakeholders attended the event which

addressed issues relating to natural gas and climate change. Again, IGU enjoyed the support of many members and partners, including UNIDO, IEA, the European Commission, United Nations Foundation, the US Departments of State and Energy, the National Reform and

Development Commission of China, Statoil, TOTAL, E.ON Ruhrgas, Shell, ACORE, NGV Global and Det Norske Veritas.

Most recently, IGU organised a natural gas symposium during COP 17, which was held in Durban in 2011. “Natural gas: Powering the

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Seen at the IGU stand at COP 14 are (from left to right): Torstein Indrebø, Florijana Dedović and Erik Gonder from the Secretariat.



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Torstein Indrebø, IGU Secretary General (left), Datuk Abdul Rahim Hashim, IGU President (centre), and Ho Sook Wah, Chairman of the Coordination Committee at COP 15

▲▲
UN Secretary General, Ban-ki Moon addresses COP 15.



▲
Panellists at the IGU gas event during COP 15.

low-carbon economy and facilitating access to energy” was the theme of the symposium, which was supported by the South African Department of Energy and sponsored by E.ON Ruhrgas and Statoil.

The symposium, moderated by IGU’s President, Datuk Abdul Rahim Hashim, was divided into two parts: “Facilitating access to energy” and “Mitigating climate change”. Lively discussion

took place after each session. IGU Secretary General, Torstein Indrebø opened proceedings with an overview of IGU’s work and highlighted the important role natural gas can play in mitigating climate change, forging a low carbon economy and improving access to energy.

The first part of the symposium featured a range of speakers including Dr Pradeep Monga,

Director of Energy and Climate Change Branch, UN Industrial Development Organisation (UNIDO), who spoke about access to energy. Muzi Mkhize, Chief Director for Hydrocarbons, Department of Energy, South Africa, spoke about how natural gas contributes to clean access to energy and outlined some of the major issues in exploiting natural gas resources. Professor Jiang Kejun, Director of the Energy

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Statoil’s Senior Vice President for Climate, Hege Marie Norheim was one of the speakers at the IGU-Worldwatch gas symposium during COP 16.

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IGU President Datuk Abdul Rahim Hashim (*left*) talks to Nobuo Tanaka, then IEA’s Executive Director (*centre*) and UNIDO’s Director General, Dr Kandeh Yumkella, during the COP 16 symposium.





◀ COP 17 was held in Durban, November 28-December 9, 2011 under the presidency of South Africa's Foreign Minister, Maite Nkoana-Mashabane (centre).

Research Institute of China's National Reform and Development Commission, discussed the situation in China with high coal prices and plans to expand the use of gas. Ho Sook Wah, Chairman of the IGU Coordination Committee, rounded off the first session with a presentation on how natural gas can play an important role in providing easy access to meet the global energy challenges.

Ambassador Richard H. Jones, Deputy Executive Director of IEA, started the second session with a presentation on natural gas in a 450ppm energy system. Saya Kitasei, Sustainable Energy Fellow with Worldwatch Institute, gave a presentation on the potential of natural gas in conjunction with renewable energy sources. Hege Marie Norheim, Statoil's Senior Vice President, Climate, led the industry speakers on climate change with a presentation on the case for natural gas and its versatility. Dr Achim Hilgenstock, Vice President, Technical Cooperation Projects, E.ON Ruhrgas, offered the German industry perspective, operating in a political climate of clear target-setting for

reducing CO₂ emissions. Gérard Moutet, Total's Vice President, Climate and Energy, spoke about natural gas being an important fuel source for the future, especially as a partner for renewables in the global bid to mitigate the worst effects of climate change.

The symposium concluded with an address from HE Elizabeth Dipuo Peters, South Africa's Minister of Energy. Focusing on the African experience with developing the gas industry, Ms Peters said that it was essential to consult with communities and involve them in the development process so that "buy-in" would be achieved and natural gas infrastructure development would be seen as "a blessing, not a curse".

The Secretariat is planning a similar symposium during COP 18 in Doha in December 2012.

IEF-IGU Ministerial Gas Forums

In 2008, IEF and IGU joined forces to hold the 1st IEF-IGU Ministerial Gas Forum in Vienna, Austria. A second forum was held in 2010 in

Doha, Qatar and the next is planned for Paris, France later in 2012. The purpose of these forums is to enhance the dialogue between governments, organisations and companies involved in the global gas industry.

▶ IGU's stand at COP 17 in Durban with (from left to right) Carolin Oebel, Sjur Bøyum, Ho Sook Wah and Torstein Indrebø.





▶ Dr Pradeep Monga, Director of Energy and Climate Change Branch, UNIDO opened the first part of IGU's symposium at COP 17.

At the roundtables, the participants focused on the changing dynamics of gas markets, principally driven by the growth of LNG trading, and the major challenges that faced the natural gas industry at the time. The global financial crisis was in its early stages and the main challenge discussed was funding investment to meet future demand in a period of economic turmoil.

In particular, participants noted the growing interdependence of exporting and importing countries and considered the balance between security of supply and security of demand. They stressed that, subject to adequate and timely investment, natural gas reserves would be sufficient to meet future demand in the coming decades. Participants also discussed the role for natural gas in a "low-carbon emissions" energy-mix scenario and noted that they expected natural gas demand to continue growing in the future, mainly driven by power generation.

It was noted that while natural gas reserves are amply available, timely and accurate

1st IEF-IGU Ministerial Gas Forum

Held in Vienna on November 24, 2008, the 1st IEF-IGU Ministerial Gas Forum was, according to then-IGU President Ernesto López Anadón, an opportunity "to enhance dialogue among all parties on matters relating to natural gas".

The participants included ministers and delegates from gas producing and consuming countries, top industry executives and senior officials from international organisations.

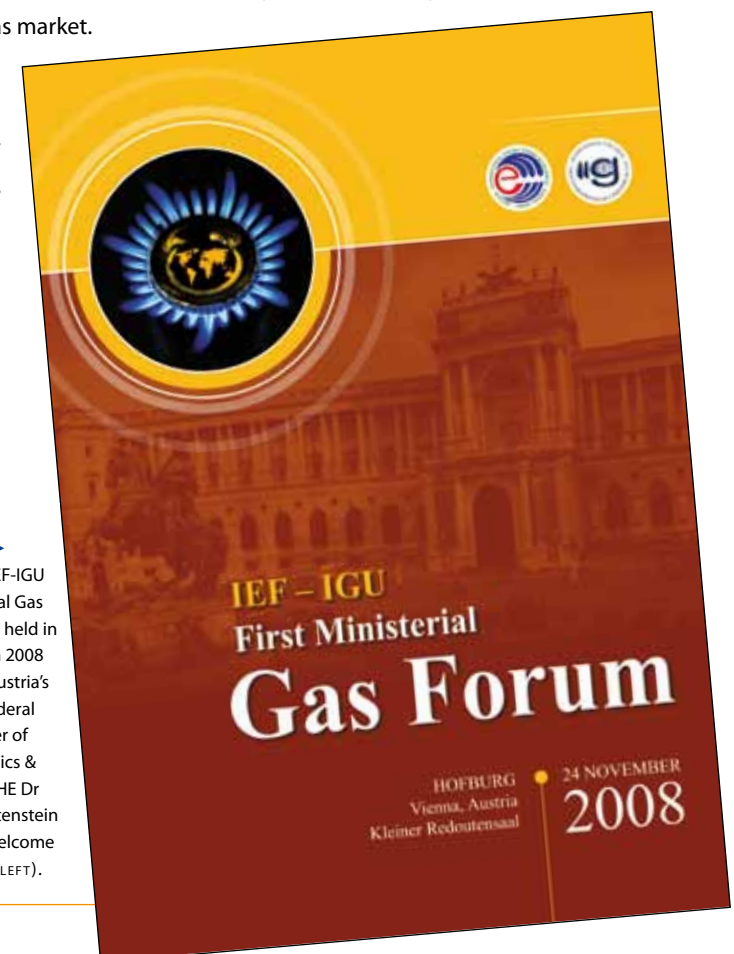
The theme of the first forum was "The world gas market going from regional to global" and it was organised as two roundtable discussions under the Chatham House Rule. The morning session discussed gas market globalisation; while the afternoon session focused on partnership and cooperation in a global gas market.

Each roundtable had nine eminent panellists and was moderated by Tim Eggar, a longstanding member of IGU's Wise Persons Group, who is now Chairman of Cape plc.

▼ The symposium concluded with an address from HE Elizabeth Dipuo Peters, South Africa's Minister of Energy.



◀ The 1st IEF-IGU Ministerial Gas Forum was held in Vienna in 2008 (RIGHT). Austria's then Federal Minister of Economics & Labour, HE Dr Martin Bartenstein giving a welcome address (LEFT).





HE Dr Chakib Khelil, then Algeria's Minister of Energy & Mines and OPEC President (left) and moderator Tim Eggar (centre) listen as Helge Lund, CEO of StatoilHydro (now Statoil) makes a point.

investments would be needed to deliver gas to the markets, despite the economic situation and volatile oil prices of 2008. The importance of investment was emphasised as a means of preventing bottlenecks, particularly in capital-intensive LNG projects. The participants were correct in predicting troubled economic times ahead and impediments to investment were discussed, underlining the need for a frank and open dialogue between producing and consuming countries.

Globalisation of the gas markets was another topic that attracted wide-ranging discussion. It was observed that interregional gas trade would most likely increase significantly with the Middle East emerging as a major exporting region alongside Russia and Central Asia.

LNG was cited as the major growth area and it was noted that it had evolved from a straight-line-chain model to a multiple-destination or flexible network model. The impact of LNG trade increasingly linking the regional gas markets was discussed with a focus on the possibility of increased convergence of prices between regions.

Growing interdependence between producing and consuming countries was noted and the participants agreed that all stakeholders

should find ways to translate this higher interdependence into cooperation and action-oriented dialogue through IEF. It was envisaged that this cooperation include cross-investment. Examples were given of gas exporters entering ventures in consuming countries such as receiving terminals and distribution networks, and of gas importers getting involved in upstream gas field development, natural gas transportation and liquefaction plants.

On the issue of gas transport and the role of transit countries, participants noted that the



Ernesto López Anadón, IGU President 2006-09, addresses participants.

development of transport and transit infrastructures would enhance interdependence between producing, transit and consuming countries, and called for regional agreements and a better coordination between governments and companies to reduce uncertainties and thus encourage investment.

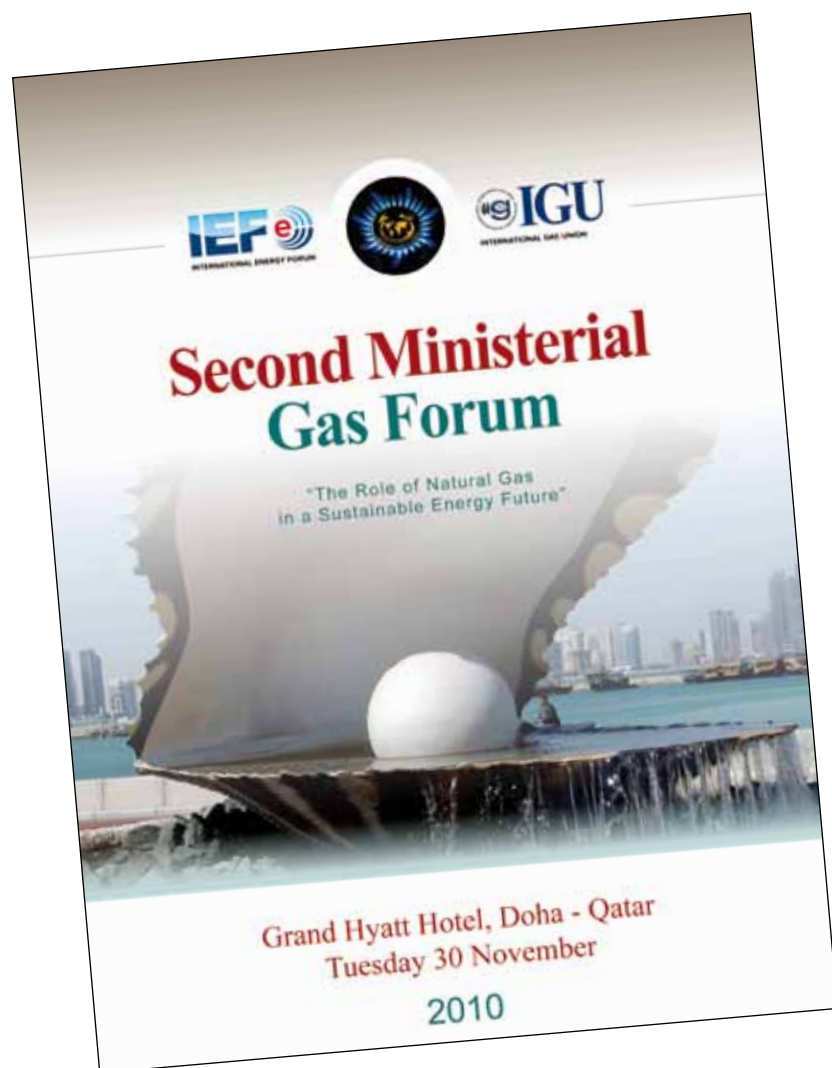
Participants affirmed that human resources and technology are the main drivers for energy security, and encouraged national and international oil companies to cooperate in the improvement of human resources, R&D and cost savings through technological advances.

The need to improve energy efficiency and energy conservation across the board in gas consuming and producing countries to curb global CO₂ emissions and increase export potential of gas producing countries was also emphasised.

Improving transparency of oil and gas markets was discussed with participants recognising that investment decisions can be facilitated by transparent economic, fiscal, legal and regulatory frameworks. Practical ways to improve transparency were advocated. One such example was the Joint Oil Data Initiative (JODI) which aims to improve transparency on gas market information such as prices and



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The 2nd IEF-IGU Ministerial Gas Forum was held in Doha in 2010.



flows. This contributes to the reduction of uncertainties, improves predictability and project planning and leads to better allocation of gas resources across the globe. The idea of adding natural gas data to JODI was flagged at the roundtable. This has since been achieved with JODI now rebranded as the Joint Organisations Data Initiative to cover natural gas data.

The importance of a sustained and enhanced global dialogue was affirmed by the ministers and industry leaders; and the 1st IEF-IGU Ministerial Gas Forum was seen an important step forward in promoting and strengthening a global dialogue between natural gas producing and consuming countries.

2nd IEF-IGU Ministerial Gas Forum

The 2nd IEF-IGU Ministerial Gas Forum was held in Doha, Qatar, on November 30, 2010. This time, the theme was “The Role of Natural Gas in a Sustainable Energy Future”.

HE Abdullah Bin Hamad Al-Attiyah, Qatar’s Deputy Prime Minister, who was also Minister of Energy & Industry at the time, hosted the forum. It was again organised under the Chatham

House Rule and there were two panel sessions, each followed by roundtable discussions involving all participants.

The morning session discussed developments in global gas markets and the role of natural gas in a sustainable energy future, while the afternoon session looked at the industry’s response to new opportunities for natural gas. Both sessions were moderated by Tim Eggar.

Leaders of IGU and IEF addressed the forum. IGU President, Datuk Rahim Hashim, underlined the necessity of enhanced dialogue among all gas stakeholders. He pointed to the importance of “improved alignment of business strategies and energy policies to meet the global energy challenge of bringing clean and reliable supplies to a growing population, and at the same time ensure sustainable economic growth”.

Torstein Indrebø, IGU Secretary General, told participants that “given its availability, environmental qualities and advances in technology, natural gas is an essential part of the global solution to climate change, in particular as a substitute fuel in the power sector”. He high-

lighted the role of natural gas in a sustainable energy future as an “enabling” or “dual” fuel to back up intermittent renewable energy sources. “Natural gas is more than a bridge, it’s a destination fuel,” he said.

IEF Secretary General, Noé van Hulst, called on the industry to take a long-term view and continue to invest in the gas value chain despite uncertainties surrounding the global economic downturn, a gas glut and relatively low prices.

IEF and IGU noted that projected expansion and lengthening of gas supply chains gives impetus to a growing need for focus on global energy dialogue to help ensure robust, secure markets to benefit all stakeholders. The important role to be played by the evolving cooperative relationship between NOCs and IOCs was also emphasised.

Climate change was high on the agenda at the second forum. Government representatives and industry leaders discussed the major challenges facing the natural gas industry and how it can help develop a sustainable response to climate change. They stressed the need to create predictable rules and regulations in order for the industry to act efficiently in terms of operations and investments, for a sustainable use of resources and a sound use of available human capital. The discussion focused on gas markets, natural gas, the importance of investment and transparency.

The forum participants examined how the market had changed with demand levelling off in many traditional markets but increased demand expected in emerging markets, especially in Asia and the Middle East, which is emerging as a supplier and consumer of gas. However, the participants also agreed that demand would increase in all markets in the coming years and decades.

Uncertainty over how shale gas can be developed outside of the US was also discussed, along with how the development of unconventional gas resources in the US had changed the global market. This development had

reduced US imports of LNG with an impact on global markets, and the participants speculated whether this would be temporary or permanent.

Ramping up energy efficiency, particularly in developing countries and tackling the issue of phasing out unsustainable fossil fuel subsidies, was discussed along with the widening gap between gas prices in long-term oil-indexed contracts and spot gas prices. It was agreed that long-term oil-indexed contracts would remain predominant as they underpin huge upstream and infrastructure investments.

The forum emphasised the role of natural gas as part of a sustainable future energy mix, especially in the power generation sector and in emerging and developing countries. It was agreed that the role of natural gas as a positive contributor to climate change mitigation and CO₂ emissions reduction should be highlighted more vigorously in international forums and debates.

The importance of communication and cooperation between policymakers and the gas industry to reach common goals of a sustainable energy future was acknowledged. Reduc-

tion of gas flaring was also underlined as an issue for the industry to address.

It was acknowledged that worldwide, gas resources were more than sufficient to meet projected demand for the next decades, as long as adequate investments are made in what is a very capital-intensive industry. The forum also acknowledged that the industry needs to take a long-term view and continue to invest in the gas value chain despite economic uncertainties.

Improved dialogue, with a view towards boosting long-term cooperation between gas producers, gas consumers and transit countries, was highlighted at the forum. Multilateral agreements and intergovernmental solutions were put forward as ways to support or bring forward new infrastructure, to jointly explore and exploit new gas reserves, and to help establish robust, secure markets for the benefit of all stakeholders.

3rd IEF-IGU Ministerial Gas Forum

The next IEF-IGU Ministerial Gas Forum will be held in Paris, France on November 16, 2012. The focus of the third forum will be on sustainable energy policies and improved cooperation for enhancing the role of natural gas.



HE Abdullah Bin Hamad Al-Attayah, Qatar’s Deputy Prime Minister (*left*) greets Datuk Abdul Rahim Hashim, IGU President (*centre*) and Torstein Indrebø, IGU Secretary General.

IGU's Gas Advocacy Initiative

In 2010, during the Malaysian Presidency, a major gas advocacy initiative was launched. It is part of IGU's broad strategy to give the natural gas industry a stronger voice and to help the industry send out a coherent message about the importance of gas in a low-carbon future.

Education is an important part of this initiative – while natural gas has significant advantages as a preferred fuel in a low-carbon economy, in the past its attributes and benefits have not been well understood or appreciated among policymakers and regulators, NGOs and the general public.

The project is an important part of making sure the special benefits of gas are understood – the world's energy needs continue to grow and IGU is committed to promoting natural gas as an important fuel for mitigating the effects of climate change by, for example, replacing more polluting fuels.

"The advocacy initiative has so far been very successful in improving awareness and recognition about the role of gas in the future energy mix," says IGU President, Datuk Abdul Rahim Hashim.

IGU's Secretary General, Torstein Indrebø explains the role of the gas advocacy initiative as follows: "We decided that the International Gas Union should make a new effort to reach stakeholders outside the industry. We needed clear messages about natural gas and what the industry can do to satisfy growing energy demand in a world concerned about climate change and obtaining secure energy supplies."

The online Gas Advocacy toolkit

The centrepiece of the gas advocacy project is the gas advocacy toolkit, which is available free of charge via the IGU website. This toolkit allows IGU members to be more effective advocates for the natural gas industry on a global level.

There are different presentations and reports on the website. They can all be downloaded and tailored to suit different audiences and circumstances provided IGU is credited whenever the material is used.

Advocacy messages for the natural gas sector

IGU's presentation focusing specifically on Gas Advocacy messages is a 27-page PowerPoint

document that was created with the support of PFC in November 2010. It explains why natural gas "CARES for the world" (by being a Clean, Affordable, Reliable, Efficient and Secure energy source) pointing to the environmental benefits, economic benefits and the versatility of gas as a partner and destination fuel.

There is information in this presentation on the promotion of sustainable transport with examples of the penetration of natural gas vehicles (NGVs) in different countries. A case study on Argentina's use of natural gas in the transport sector is included, describing how state support was the initial driver of expansion in NGV use, but that over time the private sector took over.

The advantages of natural gas over coal, oil and nuclear power are also outlined as well as forecasts for global gas production by region up until 2030. A map shows the areas where unconventional gas resources (coal-bed methane, shale gas and tight gas) have been found and the estimated quantities. There is also information comparing the safety of natural gas to other types of fuel.

Natural Gas CARES

C**Clean****A****Affordable****R****Reliable****Natural Gas is clean.**

Natural gas produces less nitrogen oxide than coal, and more than 50% less CO₂. Gas produces no sulphur and no solid waste

Natural gas promotes sustainable transport.

Natural gas vehicles can improve air quality and energy efficiency in large cities.

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 does not require subsidies.

Unlike heavily subsidized renewable technologies, natural gas use allows countries to affordably reduce their emissions.

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 realised immediately.

Natural gas is versatile.

Gas can serve as a flexible partner in power generation for intermittent energy sources like wind and solar, facilitating the phase-in of renewables.

for the World

E**Efficient****S****Secure****Natural gas is efficient.**

Modern gas-fired power plants are 40% more efficient than coal plants.

Natural gas saves time.

Gas-fired plants require less construction time than nuclear or coal plants.

Natural gas is abundant.

Global production will increase over the next 20 years, with growing supplies from both conventional and unconventional resources.

Natural gas is safe.

The natural gas sector has the best safety record in the industry.

It is time to act. It is time to choose Natural Gas.

The broader economic benefits of gas are discussed with examples of employment generation and economic stimulus from Canada and the USA. There is a UK case study on the growth of demand for gas and the subsequent growth of the industry with the support of government. South Korea is cited as a case study for the benefits of natural gas in the residential sector as part of the nation's plan to reduce its dependency on oil and coal in the total energy mix.

Facts and figures

Also in the form of a PowerPoint presentation in the online Gas Advocacy toolkit, "Natural Gas Facts and Figures" is an extremely comprehensive 98-page document. This has been prepared

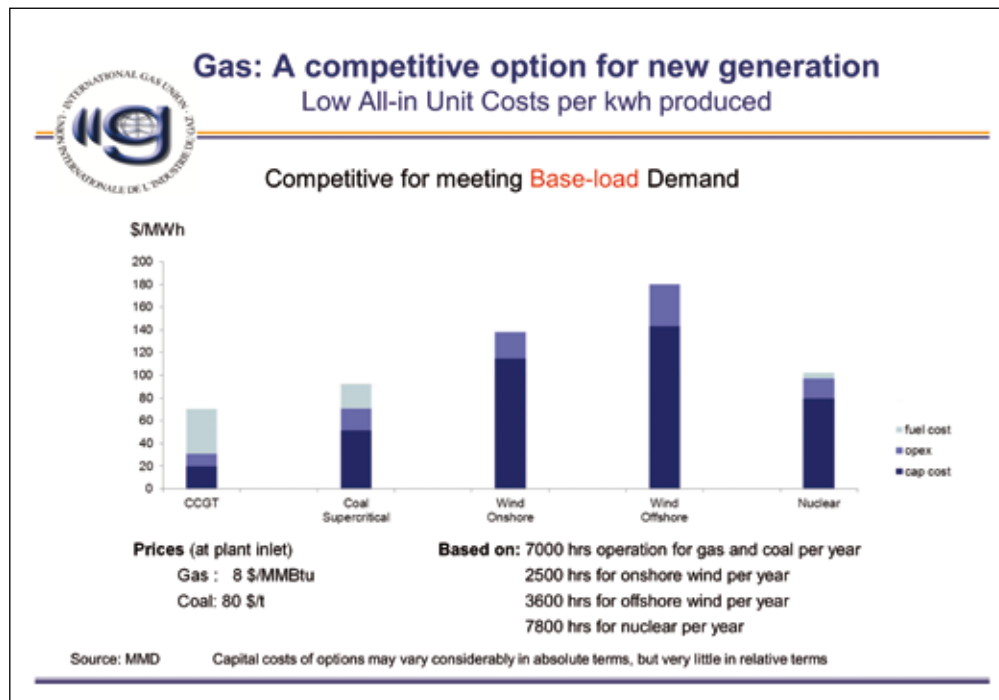


with the help of Bert Panman and Dick de Jong from The Netherlands and Terence H. Thorn from the USA, who have served on IGU's technical committees. It is divided into four sections. The first section covers markets for gas including power generation, transportation, as a chemical feedstock and for industrial and residential use. The second section covers natural gas resources, supply and transport, the third section examines the environmental impact of natural gas and its role as a partner to renewable and intermittent fuels in the energy mix; and the concluding section looks at the prospects for developing further technology for the advancement of the gas industry.

An extensive range of source material has been used in this presentation including data

IGU launched the gas advocacy initiative in 2010 (ABOVE). Presentations and information are available from the website, www.igu.org (BELOW).

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Power generation is one of the markets for gas covered in the “Natural Gas Facts and Figures” presentation (RIGHT). Power plants using combined-cycle gas turbines such as this one in Valladolid, Mexico (BELOW RIGHT) are highly efficient.



from IGU, the Mott MacDonald report of June 2010 for the UK Department of Energy and Climate Change and the International Energy Agency (IEA), amongst other sources. There are also international case studies throughout the presentation. This includes the US example of the Interstate Clean Transportation Corridor, an award-winning partnership between public and



private stakeholders to expand heavy-duty NGV use and access to refuelling stations throughout the western United States. LNG and CNG vehicle use in the UK, China, as well as German automaker Volkswagen’s plans to branch out into NGV manufacturing are featured. A residential cogeneration system from Osaka Gas in Japan is cited as an example of an efficient use of natural gas for residential purposes.

Other features of this presentation include information on unconventional gas, its challenges and its potential, a map of world gas resources, the role of natural gas in producing electricity and statistics on the environmental impact of natural gas, especially in comparison to other fossil fuels, demonstrating that gas is the cleaner alternative. The broad nature of this particular presentation makes it easy for IGU members to tailor it to their needs and focus on whatever areas of the natural gas industry are most relevant.

Report on gas and climate change mitigation

A report on gas and its role in climate change mitigation prepared by Comgás of Brazil is also available as part of the Gas Advocacy online

toolkit. This comes in PDF form and it is a comprehensive 29-page document. As well as input from IGU, the report takes information from a range of diverse sources: BP, Greenpeace, IEA, the International Panel on Climate Change (IPCC), the Natural Gas Supply Association (NGSA), Renewable Energy World International Magazine and Statkraft.

This report addresses the many ways natural gas can be used to mitigate climate change, examines global trends in energy-related CO₂ emissions and national targets for greenhouse gas emissions (GHG) and outlines existing practices, opportunities for improvement and ways in which natural gas plays a positive role in mitigating climate change. The report covers examples of natural gas use and policymaking from a wide range of countries.

In order to cater to many different stakeholders and industries, the report outlines the clean, green benefits of using gas in a wide range of applications. These include gas to power, transportation, office and household use, industry and as a complementary fuel alongside intermittent renewables, such as solar power.

There is analysis of the impact of technological innovation and climate change as well as government policies and geopolitics. The effects of carbon pricing on the gas industry and the challenges ahead in exploiting gas resources in a safe, environmentally friendly way are also examined. This document concludes with a series of recommendations on how the world can get the most out of natural gas through investment, liberalisation policies and developing smart new technologies for exploration and production.

Environmental issues associated with shale gas development

A report on the environmental issues associated with shale gas development has also been provided as part of the Gas Advocacy toolkit. The exploitation of shale gas reserves has

proven to be controversial in regards to the potential environmental impacts associated with the drilling, extraction and processing of this resource. The document aims to clarify many of the environmental issues and challenges as well as the status of the various private and public efforts to develop industry standards and government regulations to minimise the environmental impact.

“Environmental Issues Surrounding Shale Gas Production: The US Experience. A Primer” was written by Terence H. Thorn, a well-known veteran of the energy industry. Mr Thorn has held senior roles in major companies, including Enron, where he was the company’s first Chief Environmental Officer, and Transwestern Pipeline, where he was President and CEO. After retiring in 2000, Mr Thorn set up JKM Consulting, an energy, environmental and business development consultancy.

Mr Thorn’s study of shale gas and environmental issues runs for 62 pages and documents the history of the shale gas industry in the United States, the technologies involved in exploration and extraction and examines the recent revisions in potential reserves in the US, including the US Geological Report released in August 2011.



The study then goes on to discuss all the environmental concerns about shale gas extraction, including water use, waste water disposal, the risk of groundwater contamination, methane emissions, other air emissions and the risk of minor earthquakes surrounding waste water injection wells.

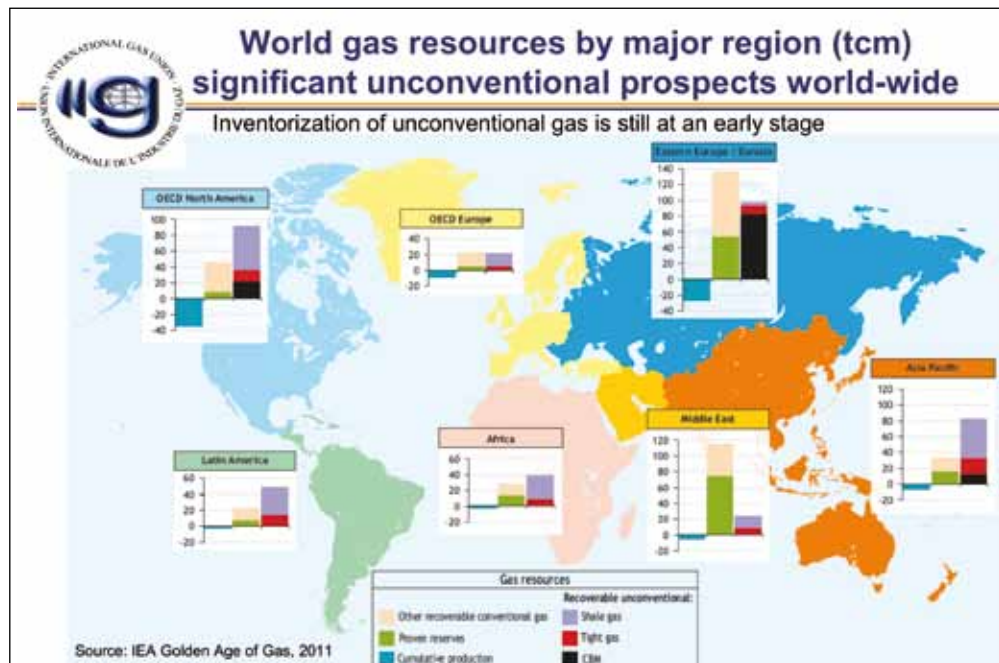
The hydraulic fracturing method used to produce natural gas in shale formations has proven especially contentious. Mr Thorn provides an objective look at regulatory

initiatives by the US and state governments including studies underway by the Environmental Protection Agency, the Department of Interior, and the recommendations by the US Secretary of Energy’s Advisory Board.

Other studies, such as a Carnegie Mellon study, the Cathles study from Cornell University and one from the University of Maryland’s School of Public Policy, which deal with the GHG footprint of shale gas production are

Another important market is transportation where greater use of NGVs can improve air quality. (LEFT) An LNG refuelling station for heavy-duty trucks in Carson, USA; (BELOW LEFT) one of a fleet of buses running on CNG in Zagreb, Croatia; and (BELOW RIGHT) the *Bit Viking*, a Norwegian ship converted to run on LNG.





▶ One of the aims of the advocacy initiative is to highlight that the world's gas resources are abundant.

▼ ▲ ▲
 The industry is investing in technology and human capital throughout the gas chain. (ABOVE RIGHT) A floating production, storage and offloading vessel serving Brazil's offshore Tupi field. (BELOW) The Pluto LNG project in Australia started exports in April 2012. (OPPOSITE TOP LEFT) Yemen LNG staff being trained.

examined. Throughout the report, Mr Thorn catalogues an industry committed to continuous improvement and best operating practices, and regulators challenged to protect the environment, public health and safety while realising the full economic and environmental benefits of expanded shale gas development.

Overview of the shale gas industry

The final document currently available in the online Gas Advocacy toolkit is an easy-to-read seven-page overview of the shale gas industry.

Also in PDF form, Carolin Oebel, Advisor to the IGU Secretary General, has compiled an industry overview based on the US experience. The document offers basic explanatory information about shale gas as well as a summary of the environmental concerns.

Ms Oebel's overview starts with a definition of conventional and unconventional gas and then differentiates between specific types of unconventional gas, including shale gas, coal-bed methane and tight gas. There is a glossary of terms relating to the exploration, extraction

and production of shale gas and a comparison of the old and new technologies used.

The environmental concerns have been broken down to include water depletion, hydraulic fracturing fluids, waste water, ground water, flaming faucets, greenhouse gas emissions and landscape impact. With each environmental concern, Ms Oebel has outlined the relevant facts and statistics with additional comments on behalf of the IGU to offer a gas industry perspective on how these issues are being addressed.





◀ ▶
 The exploitation of shale gas has been a game changer for the US gas industry but there are a number of environmental issues such as water use (LEFT drilling in the Permian Basin in New Mexico) which need to be carefully addressed. IGU's reports (BELOW) give the background.

Sources for this document include the IEA, the US Environmental Protection Agency, the US Geological Survey and reports from Pennsylvania state regulators, Worldwatch Institute, the FracFocus chemical disclosure registry and the extremely detailed report from Terence H. Thorn which is also available as part of the Gas Advocacy toolkit.

The future of gas advocacy

In a report launched in October 2011 to coincide with the meetings of the Council and

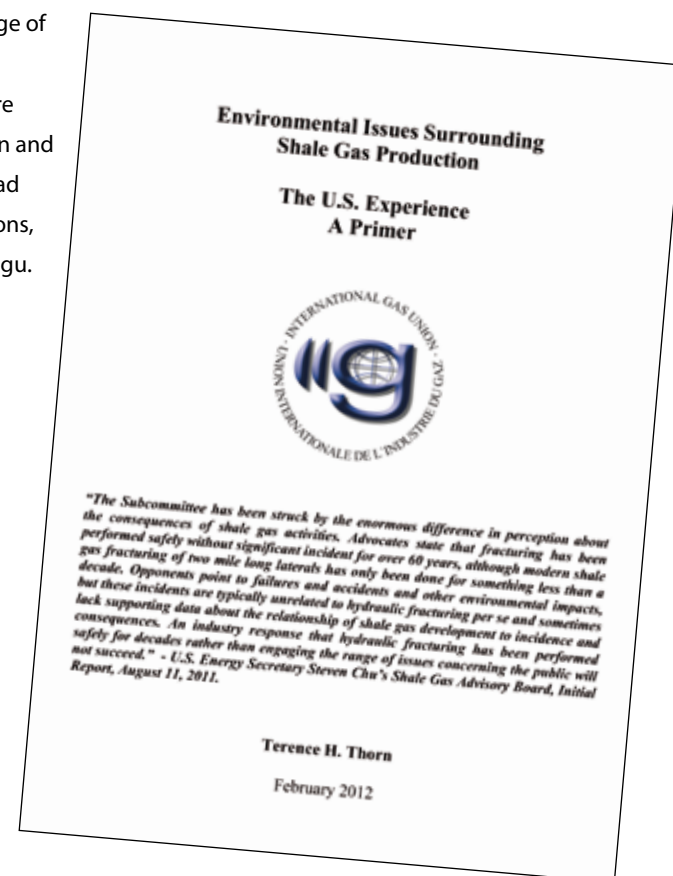
Coordination Committee in Dubrovnik, Croatia, a joint gas advocacy programme was outlined. Aimed at fostering cooperation towards the *European Energy Roadmap 2050*, the programme's goals are to create recognition amongst policymakers of the benefits of natural gas, increase awareness amongst NGOs and environmental organisations and to build new contacts and alliances. Along with IGU, the other six organisations spearheading this programme are Eurogas, Gas Infrastructure Europe (GIE), the International Group of LNG Importers (GIIGNL), Marcogaz, the International Association of Oil and Gas Producers (OGP) and the European Gas Research Group (GERG).

At the IGU Executive Committee Meeting in Houston, Texas, in March 2012, a global vision for gas as the pathway to a sustainable energy future was discussed for presentation at the 25th World Gas Conference in Kuala Lumpur in June 2012.

With IGU undertaking the major initiative to act as advocate for the natural gas industry in April 2010, the first phase was to provide online resources to help members promote understanding and awareness about natural gas to decision-makers. The next phase is to establish

a global vision and roadmap for natural gas. This aims to clearly define the pathway natural gas would take as part of the world's low carbon energy future until 2050 and beyond, and build confidence in the future demand for gas across a wide range of sectors.

For more information and to download presentations, visit www.igu.org/gas-advocacy.



A New Age Dawns for Natural Gas

By Alex Forbes

When the natural gas industry gathered for the 24th World Gas Conference in Buenos Aires in October 2009, delegates came away with a strong sense that the future trajectory of the industry was shifting in fundamental ways. The combination of the unconventional gas revolution in North America, the rapid growth of the LNG industry and growing concerns over climate change promised a much brighter future for gas than many had previously assumed. The tectonic shifts under way were nicely summed up by Daniel Yergin, Chairman of IHS CERA and a member of IGU's Wise Persons Group, when he said it would take years for their impact to be fully understood.

Three years on, as the industry prepares to gather in Kuala Lumpur for the 25th World Gas Conference, the gas industry has evolved in significant ways.

The unconventional gas revolution in North America has given a long-term boost to the industry there, and is spreading to other regions of the world. The propensity of the LNG industry to spring surprises has again been demonstrated by the new project boom in Australia – on track

to become a bigger producer than Qatar by 2018 – and the likelihood that the United States and Canada will soon become net LNG exporters. Climate change has slipped down the political agenda since 2009 due to economic concerns, particularly in OECD countries; but the issue has not gone away – and the role that gas can play in de-carbonising electricity generation is better understood by policy-makers now than it was back then, thanks partly to IGU's gas advocacy initiative.

These trends, and others, were captured and analysed in a landmark publication launched by the International Energy Agency (IEA) in June 2011, intriguingly entitled "Are We Entering a Golden Age of Gas?". The Agency saw good reasons to believe that we are, and that view has been reinforced by subsequent events.

"Since June 2011, we've seen much more data on consumption, investments and supply," says the IEA's Chief Economist, Fatih Birol, "and I can now say that, yes, we are most probably entering a golden age of gas. The new data includes consumption and shale gas figures from China, and data on investments

being made in Australia, the United States and Canada."

A golden age needs "golden rules"

Asked how important a role he sees gas playing over the coming 25 years in meeting global energy needs, Birol replies: "Gas will be much more important than today, but how much more important will depend on the gas producers.

"Unconventional gas production has significant challenges in terms of local environmental problems. We have analysed this and we see that existing technologies can be used to solve these problems. That will increase the cost of production by 10-15% in some cases, but it will still be a profitable investment. If the gas producers want to see a golden age of gas, they will have to apply golden rules to their extraction technologies."

The major oil and gas companies share the IEA's optimism about the long-term prospects for natural gas. This is abundantly clear from what the leaders of these companies have been saying in their recent speeches and interviews.



◀
With abundant reserves and strong demand the long-term prospects for clean-burning natural gas are bright.

However, given that actions speak louder than words, the really powerful message is the scale of the investments they are making in natural gas – from projects in challenging environments such as Russia’s Shtokman field in the Arctic or the pre-salt plays offshore Brazil to a range of conventional and unconventional LNG projects in Australia – whose capital costs are estimated in the tens of billions of dollars. These investments would not be going ahead if their sponsors were not comfortable that the output from these projects could be sold at prices promising a good return.

“On the cusp of dynamic growth”

One of the trail-blazers in the massive expansion of LNG capacity in Australia is Chevron,

which not only leads the 15 mtpa Gorgon project, where construction is in full swing, but which also reached final investment decision, along with its partners, on the 8.6 mtpa Wheatstone project in 2011.

“I believe we’re on the cusp of some truly dynamic growth decades for natural gas,” says John Gass, who until recently led the company’s global gas business. “Some observers may be deterred by the passing showers – the depressed gas prices and supply fluctuations that may be giving pause to some. We see it differently. We take the long view. We dismiss the scepticism, we acknowledge the challenges, and we recognise the amazing opportunities opening up to natural gas in the future. We’re backing up that optimism with some

bullish bets – the largest capital investments in our history.”

Looking forward to trends over the next couple of decades, Gass highlights the minor share that gas currently has in the energy markets of China and India and the growing importance of LNG: “Any resulting shift to a larger share for gas in the vast energy markets of China and India and the gas growth phenomenon goes up another notch.”

Another international oil and gas major that sees a bright future for LNG, as global demand for natural gas grows, is Total. The company’s CEO, Christophe de Margerie, recently highlighted two projects in Australia as essential components of the company’s



▶ Experience from the Sakhalin II project, which includes Russia's first LNG plant, will stand the country in good stead when developing Shtokman in the challenging environment of the Arctic.

▶ The gas-to-liquids sector is growing – Escravos GTL in Nigeria is due to start production in 2013.



future growth: "Since the beginning of 2011, seven new projects have been launched, including two major gas liquefaction projects in Australia: Gladstone and Ichthys. These launches and ... recent discoveries will ensure the growth of the group in the coming years."

The Gladstone project is of particular interest as it is one of several projects in eastern Australia that will take their gas supply from coal-bed methane (CBM), combining unconventional gas production with liquefaction. Total is also pursuing new natural gas investments in Europe, Russia and the United States. It is one of several major energy companies whose hydrocarbon production balance is shifting from being dominated by oil, with natural gas having an increasing share.



Australia is set to become the world's largest LNG exporter by 2018. The North West Shelf venture, Darwin LNG (LEFT) and Pluto LNG will be joined by a range of conventional and unconventional projects. (BELOW) Australia is already a world-leader in CBM production – the Fairview field in Queensland.

Energy access for all

Future demand for natural gas can be analysed on two levels: the first being how overall global demand for energy is expected to grow; the second being how the share of natural gas is likely to evolve in comparison to the other major primary fuels, such as oil, coal, nuclear and renewables.

On the first level there is widespread agreement that, despite the short-term issues raised by the world's economic difficulties, over the long term energy demand will continue to grow as population increases and as people strive to improve their economic wellbeing. It also remains true, unfortunately, that even in the 21st century some 1.3 billion people still lack access to electricity, while 2.7 billion lack clean cooking facilities – and the pressure is on to



correct this imbalance. Providing energy access for all by 2030 is a key goal of the United Nations.

“Now more than ever, the world needs to ensure that the benefits of modern energy are available to all and that energy is provided as cleanly and efficiently as possible,” says Dr Kandeh Yumkella, Director General of the UN Industrial Development Organisation and a member of IGU’s Wise Persons Group.

Commenting recently on the announcement by the UN that the world’s population had passed the 7 billion mark in October 2011 and is expected to reach 8.7 billion by 2040, the CEO of ExxonMobil, Rex Tillerson, said:

“In looking out to 2040 we see the next major evolution in energy use. Oil will remain the most widely used fuel, but we expect natural gas will grow fast enough to overtake coal for the number two position. Demand for natural gas will rise by more than 60% over the next 30 years. The single biggest driver of demand will be the need to generate power.”

The role of gas in electricity generation will indeed be crucial. The role gas can play in mitigating climate change was the theme of one of several publications that IGU launched

at the 24th WGC: a report entitled “Natural Gas Unlocking the Low-Carbon Future”. Of its many facts and figures, this is one of the most memorable:

“If by magic we could switch all the world’s coal-fired power plants to modern natural gas-fired combined cycle plants, we would experience a reduction of emissions of over 5 billion tonnes of carbon dioxide per year – one-fifth of global CO₂ emissions.”

While thermodynamic efficiency would play a role in this, the key factor is that, per kWh of electricity generated, gas generates around 30% less carbon dioxide than oil, and 40-60% less than coal. Moreover, gas-fired electricity generation does not have the problem of intermittency that is an inevitable feature of renewables such as wind and solar power. It therefore has a key role in complementing renewable energy sources by providing backup power when the wind doesn’t blow and the sun doesn’t shine.

All this helps to explain why, when it comes to how natural gas is likely to fare in the primary energy mix, the IEA report concludes that: “Recent developments have created consider-

able opportunities for greater future use of natural gas globally, depending on the interaction between economic and environmental factors and policy interventions in the market.”

Drivers for a golden age

Every year, in November, the IEA publishes its World Energy Outlook (WEO), a set of long-term projections widely regarded as the “bible” of the energy industry. The Agency is always careful to stress that the various scenarios it constructs are projections rather than forecasts. They show how the future could look under carefully considered combinations of assumptions about population growth, economic growth, energy prices, technology advances and – most important of all – future government policy.

The WEO published in November 2011 presented three scenarios:

- The most pessimistic, the Current Policies Scenario, assumes no new energy or climate policies beyond mid-2011. It projects average energy demand growth of 1.6% per year between 2008 and 2035.
- The most optimistic, the 450 Scenario, assumes that governments strenuously pursue policies to restrict global warming to within 2°C of pre-industrial levels – as agreed in the Copenhagen Accord of December 2009. In this case energy use grows by only 0.8% per year.
- The central case is the New Policies Scenario (NPS). It “incorporates the broad policy commitments and plans that have been announced by countries around the world to tackle energy insecurity, climate change and local pollution, and other pressing energy-related challenges, even where the specific measures to implement these commitments have yet to be announced”. It projects average energy consumption growth to 2035 of 1.3% per year. In June 2011, the IEA took the unprecedented step of releasing a separate scenario for

▼
Unconventional gas now accounts for around half of US production – drilling in the Marcellus Shale.



IEA gas price assumptions (2009 \$/mmbtu)

	GAS Scenario					NPS WEP-2010			
	2009	2015	2020	2025	2035	2015	2020	2025	2035
Continental Europe	4.1	5.6	6.1	6.4	8.0	7.0	8.1	9.1	10.4
Japan	7.4	9.0	9.5	9.7	10.9	10.6	11.6	12.3	13.3
China	9.4	11.5	11.7	11.9	12.9	12.2	13.4	14.2	15.3

The IEA does not try to forecast future gas price trends in its models. Instead price assumptions are built into the Agency's models. Gas price assumptions are markedly different in the GAS and New Policies scenarios, reflecting more optimistic assumptions about future gas supply in the GAS scenario.

natural gas in its "Are We Entering a Golden Age of Gas?" report. Launching the report, the Agency's then Executive Director, Nobuo Tanaka, said: "There is strong potential for gas to take on a larger role, but also for the global gas market to become more diversified and therefore improve energy security." Speaking later that year at an IEA-IGU roundtable in Paris, his successor, Maria van der Hoeven, added: "Industry and policymakers need to cooperate to make the Golden Age happen, and I think IGU is well positioned to play a leading role in this effort."

The IEA's Golden Age of Gas (GAS) scenario builds on the base-case New Policies Scenario (NPS) in the November 2010 WEO (WEO-2010), but adopts four major new assumptions:

- **More ambitious use of natural gas in China:** In March 2011, the Chinese government presented its 12th five-year plan, for 2011-15, with ambitious policies to expand the use of natural gas. China's gas demand is also influenced by the assumption of lower gas prices, helping to make gas more competitive versus coal, and of slower growth in nuclear capacity.
- **Changing supply and demand fundamentals:** The GAS scenario has more optimistic assumptions about future gas supply – thanks mainly to the boom in unconventional gas – and consequently lower gas price assumptions, as shown in *Table 1*. Prices are assumed to be \$1.5-2.5/MMBtu lower than in the WEO-2010 NPS and

around \$1-1.5/MMBtu lower than in the WEO-2011 NPS.

- **Greater use of gas for transportation:** The GAS scenario assumes that in some countries governments act "vigorously" to encourage the use of natural gas vehicles (NGVs). The use of NGVs is also encouraged by a favourable price differential between oil and gas.
- **Slower growth of nuclear power capacity:** Following the nuclear accident at Fukushima in Japan in March 2011, the GAS scenario assumes that the licences of fewer plants are extended and that fewer plants are built.

What all this means for gas

Figure 1 shows what all this means for the future demand trajectories of the main primary energy sources. Natural gas demand grows by almost 2% per year to overtake coal before 2030. By 2035, it reaches 5.1 tcm, an increase of 62% on 2008 and 600 bcm higher than in the WEO-2010 NPS.

The regional trends are shown in *Figure 2*. Natural gas demand grows in all regions in the GAS scenario. China alone accounts for 30% of world gas demand growth to 2035. Within the OECD, the United States sees the largest change compared with the NPS, with demand reaching 790 bcm in 2035.

The IEA cautions, however, that the GAS scenario does not lead to the meeting of climate mitigation targets agreed in Copenhagen at the UN climate talks in December 2009, where an

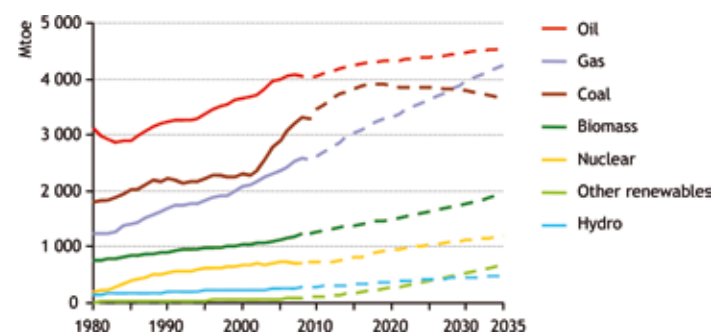
upper limit of a 2°C increase in global warming above pre-industrial levels was decided. It estimates that the GAS scenario would lead to a 3.5°C temperature increase over the long term. Development of economic carbon capture and storage (CCS) technology for gas-fired electricity generation would be needed for the 2°C increase to be met.

From a supply perspective, the IEA maintains that even with higher gas demand projections in its GAS scenario, global gas resources "can comfortably meet demand in the GAS scenario through to 2035 and beyond". However, it adds: "As always, the key question is whether investment in production will keep pace with demand at the prices assumed. Although there are important differences between regions, we judge that the costs of production, especially for unconventional gas, will decline at least commensurately with the assumed decline in

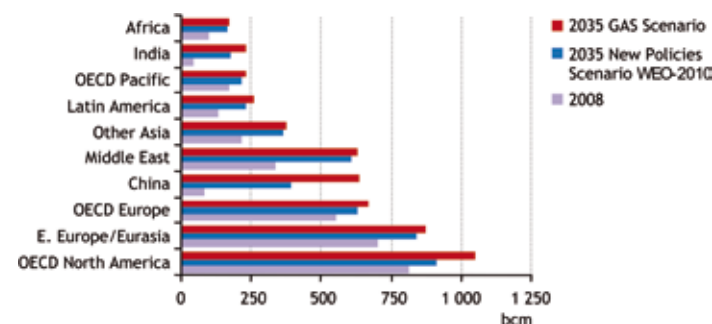
Table 1.

Figure 1.
Figure 2.

World primary energy demand by fuel in the IEA's gas scenario (mtoe)



Primary natural gas demand by region in the IEA scenarios (bcm)



Natural gas production by region in the IEA's gas scenario (bcm)

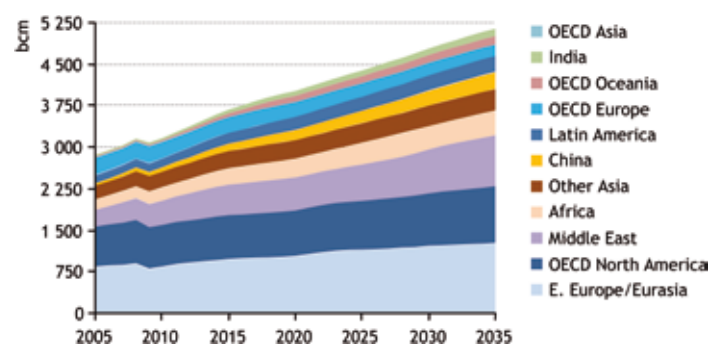


Figure 3.

Natural gas production by type in the gas scenario

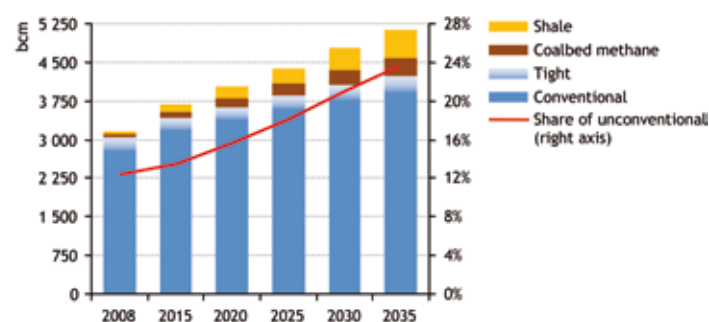


Figure 4.



the average price. This is due to the North American experience spreading more rapidly and resource-holding countries adopting policies to encourage higher investment, primarily to reduce their imports.”

As global gas production grows from 3.2 tcm in 2010 to 5.1 tcm by 2035, production comes increasingly from unconventional sources, with their share of output rising from 12% in 2008 to nearly 25% in 2035. *Figures 3 and 4* show gas production by region and by type in the GAS scenario.

A bigger role for LNG

The expected strong growth of gas demand in the GAS scenario will require a major expansion of inter-regional gas trade, to get gas from resources to markets. With the new wave of LNG supply expected in Australia over the coming decade, LNG will play an increasingly important role in trade, with the advantage that it is inherently more flexible than pipeline gas.

In the GAS scenario, the volume of gas traded between regions more than doubles over the outlook period, reaching more than 1 tcm by 2035, compared with around 940 bcm in the NPS. By 2035, inter-regional trade accounts for around a fifth of total gas consumption. LNG holds a 50% share of overall trade by 2035. Net gas trade by region and scenario is shown in *Figure 5*.

As inter-regional trade evolves, so will pricing mechanisms, believes the IEA, “to better balance the needs of consumers in different sectors and regions”. The current role of oil-linked pricing will weaken, especially in the electricity sector, “where pricing mechanisms based on competing sources of generation (potentially including carbon pricing) are likely to play a greater role”.

Greater trade could lead to a convergence of prices across regional markets but the GAS scenario does not see the emergence of a truly globalised market during the outlook period.

Game-changing technologies

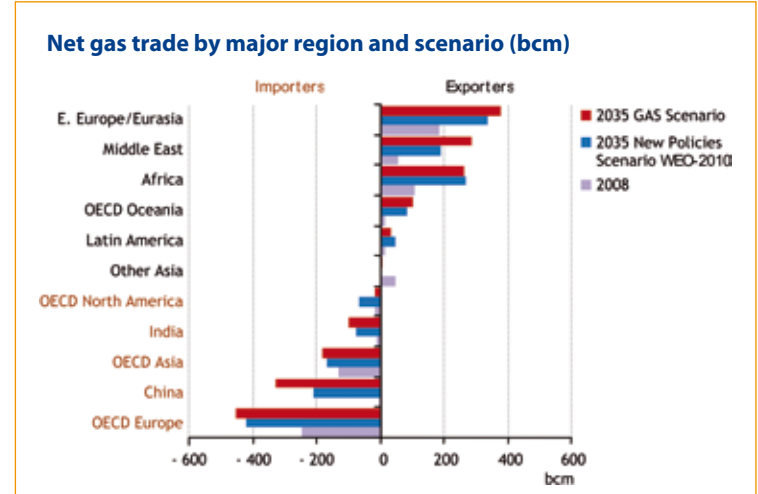
Projecting long-term energy trends is a process fraught with uncertainties, not the least of which is the evolution of technology. No-one making projections a decade ago would have foreseen the role that the unconventional gas production boom, especially from shale, would have on North American gas market dynamics. Indeed, even now it is impossible to say with certainty how the growth of production from shale, CBM and tight gas will develop around the world.

There is little doubt about the sustainability of the shale gas revolution in North America, says ExxonMobil’s Rex Tillerson. “In North America people throw numbers around of 100-plus years of supply for gas from shale. We would not disagree with that kind of an assessment.”

However, he cautions that it is still too early to assess the global potential of unconventional gas. “North America, where this all began, is where we have the longest history,” he says. “It’s also where we have the greatest understanding of the potential of the shale gas basins. Globally, we’re really just beginning to test the feasibility of shale resources in different basins. Any basin in the world that’s been producing oil and natural gas has shale source rocks associated with it. So those will have to be tested.

“Shale rocks are not all the same. They’re highly variable, even across North America. So you can’t generalise in trying to assess the global potential yet. Until you get some technical data and drill a few test wells it’s very difficult to predict – with just surface information – those basins that are going to be commercial and those that are not.”

But developments are already under way outside North America. “We have taken the North American experience into China,” says Shell CEO Peter Voser. “We are going through the exploration phase there and we’re analysing what potential is available. We’re doing this in other places as well.”



Bringing gas to market: OPPOSITE BOTTOM Angle grinding a new section of pipeline. BELOW The west-east gas pipeline in China. LEFT The offshore Adriatic LNG regasification terminal receiving a cargo from Qatar.

Figure 5.

Commenting on the environmental issues surrounding unconventional gas, Voser says: “Shell – and for that matter ExxonMobil – coming in a big way into shale gas operations will drive the standards up. For the longer term we need communication and discussions with the regulators but also with the communities. That is where bigger players – like Shell, like ExxonMobil – can drive the sustainability of the development of these resources in a better way. You see some of that already happening in North America, and these learnings are being taken into other countries.”

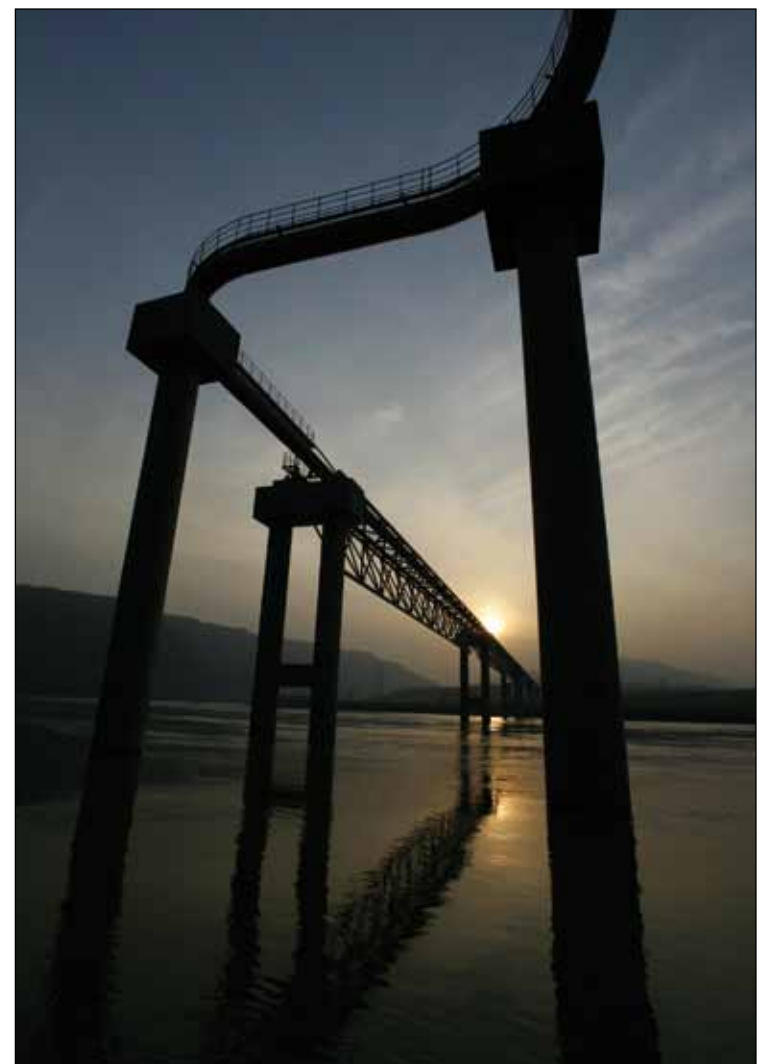
Looking even further into the future, the gas picture could once again be transformed if technology were to be developed for the exploitation of methane hydrates, ice-like solids formed from a mixture of water and natural gas in cold northern regions or in deep-water offshore sediments. According to the IEA, “in-place resources are thought to be huge, with some studies estimating a total worldwide resource of between 1,000 and 5,000 tcm”. The agency does not, however, believe that exploitation on any significant scale will occur before 2035.

IGU's role will grow with the industry

The next quarter of a century will see tremendous growth in the gas industry making IGU's role even more important. The rotating Presidency, which in the 20th century was held exclusively by European and North American countries, now reflects the global nature of the business.

As IGU's membership and workload increase, so are the numbers of gas industry experts volunteering to serve on the technical committees and task forces, while the Secretariat is expanding to support a wider range of responsibilities. The Union's growth is based on a firm foundation with only nine people having served as Secretary General since IGU was set up. This continuity of administration, combined with the professionalism and dedication that all the IGU officers have shown, has served and will continue to serve the Union well.

Alex Forbes is an independent journalist and consultant who has been reporting on energy developments and analysing trends for three decades. The author gratefully acknowledges the work of the IEA.



Publications and Documents Available from IGU

As a non-commercial organisation promoting technical and economic progress in the gas industry worldwide, IGU offers its publications free of charge.

You are invited to download the publications currently available from the IGU website www.igu.org or to order hard copies from the Secretariat.

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- IGU Organisation Chart
- Triennial Work Programme 2012-15
- IGU Gas Efficiency Award 2008/2009 & IGU Social Gas Award

- IGU Guiding Principles for Sustainable Development
- Natural Gas – Part of the Solution to Global Climate Change
- Natural Gas as a Transportation Fuel
- Natural Gas Unlocking the Low-Carbon Future
- World LNG Report 2010
- Wholesale Gas Price Formation – A Global Review of Drivers and Regional Trends

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- Nurturing the Future Generations for the Oil and Gas Industry
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- Natural Gas Industry Study to 2030: An Update on Supply, Demand and Trade
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Special IGU publications for WGC2012

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- Vision for Gas: The Pathway towards a Sustainable Energy Future
- IGU Natural Gas Conversion Guide
- IGU Natural Gas Conversion Pocketbook
- Shale Gas: Environmental Concerns vs Reality
- International Gas Union 1931-2012

Publications from WGC2009

- Natural Gas Industry Study to 2030
- IGU Energy Efficiency Indicators
- IGU Proposed Guidelines for Gas Market Integration
- Best Practices Initiative
- Proceedings of the 24th World Gas Conference, Buenos Aires 2009

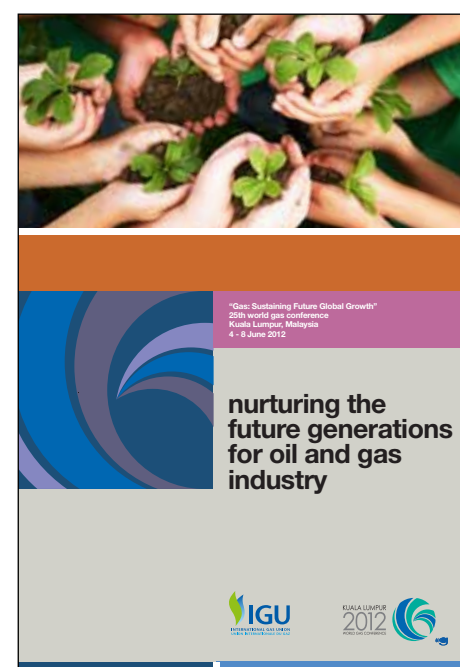
Joint publications with other organisations

- The Role of Natural Gas in a Sustainable Energy Market (with Eurogas)
- Guidebook to Gas Interchangeability and Gas Quality 2011 (with BP)



Scientific and technical papers and documentation

- Proceedings of the 23rd World Gas Conference, Amsterdam 2006, (CD-ROM)
- Sustainable Development and the Role of Gas (2006)
- Gas to Power Global Outlook, (2006)
- The Art of Regulation, (2006)
- Proceedings of the 22nd World Gas Conference, Tokyo 2003
- Proceedings of the 17th, 18th 19th, 20th and 21st World Gas Conferences, (CD-ROM)
- International Gas, ISC, all issues of the bi-annual IGU Magazine from 2004
Please check the IGU website for other (older) publications which are still available from the IGU Secretariat.



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Let There Be Light: National Grid Archives.

The Foundation and Early Years of IGU: IGEM (23 upper, 24 upper & lower), AFEGAZ (23 lower & 27 upper), Eduard Spelterini (25), Roger Violette/Rex Features (26 upper), AFG (26 lower & 27 lower).

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