

Message from the **Secretary General**

Dear Reader

It is with great pleasure mixed with some sadness that I address you for the eighth time in the IGU Magazine.

With pleasure because the magazine, which we started in 2004, has turned out to be a very successful means of communication which, both



Peter K. Storm, Secretary General.

within and outside IGU, is accepted and praised by readers as well as by those many companies advertising in it; but it is also with some sadness because this will be the last time that I address you in his column.

I am very grateful to ISC, represented by Nigel Ruddin, Robert Miskin and their staff, and not least to the Editor, Mark Blacklock. From the start they have done a tremendous job in publishing the magazine twice a year to a high standard and having about 6000 copies of each issue distributed around the world.

After close to 15 years of involvement with IGU over five World Gas Conferences, I will be resigning as Secretary General at the Council meeting in St Petersburg in October. Moreover, in accordance with IGU tradition and as reported elsewhere in this issue of the magazine, the Secretariat will move on to take up residence with a new host, this time with StatoilHydro in Oslo, Norway.

Fortunately these changes do not mean that this is the end of the magazine; quite the contrary. With the first eight issues we have seen a steady increase in interest from readers and advertisers and a steady improvement in quality, and that will be maintained. It has been agreed that ISC will continue to serve IGU with a new contract to produce and distribute the magazine bi-annually in close liaison with the Presidency and the Secretariat.

This means that over the coming years you will be able to carry on receiving a printed copy of the magazine or to download it from the IGU website in order to learn about the latest news from IGU and the affiliated organisations, upcoming events, how the many studies under the Triennial Work Programme are advancing and the plans for the next World Gas Conference.

We should not forget the traditional third part of the magazine, which features articles about the gas industry and future developments from IGU Committees and third-party authors.





RIGHT, BELOW RIGHT AND BOTTOM RIGHT Peter Storm's involvement with IGU has taken him around the world

(RIGHT) He is seen at WGC2003 in Tokyo with from left: His Imperial Highness, the Crown Prince of Japan, Claude Détourné, IGU President for 1997-2000, George Verberg, IGU President for 2003-2006 and Hiroshi Urano, IGU President for 2000-2003.

(BELOW RIGHT) He is seen at the 2005 Council meeting in Tianjin, China, with Zhou Chang Xi, President of the China Gas Association (to the left) and Cao Kai Lang, President of the China City Gas Society (to the right).

(BOTTOM RIGHT) He is seen in Belgrade in June at the Second International Conference on Development in the Gas Industry of South and East European Countries in Transition with Dr Vojislav Vuletić, Secretary General of the Serbian Gas Association, on the left and Prof. Dr Nenad Dajić, President of the Scientific Committee of the Conference, in the middle.



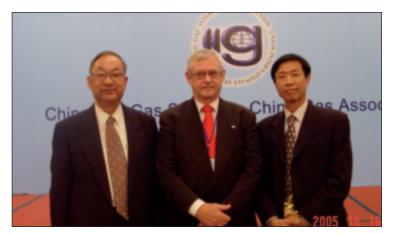
In the last decade the world of energy has seen substantial changes and faced many challenges, and clearly there will be more of these in the future. During the period of my involvement in IGU, natural gas has gone from being considered a by-product to become by far the most popular fossil fuel, with great prospects but now also a number of challenges.

I consider myself lucky to have served IGU during this period of change; it has been an enormous pleasure to work with all the colleagues I have met both within and outside the Union, and I take this opportunity to thank you all for the support and positive attitudes which I have encountered over all these years.

Enjoy your reading.

Mar

Peter K. Storm







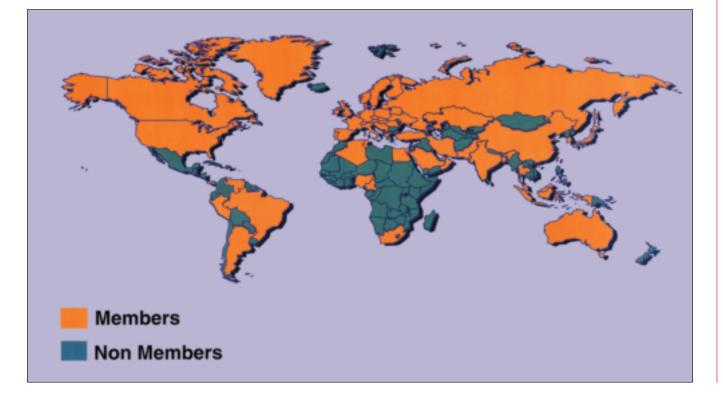
Countries Represented in IGU October 2007

Algeria Argentina Australia Austria Bangladesh Belarus, Republic of Belgium Bosnia and Herzegovina Brazil Brunei Cameroon Canada China, People's Republic of Croatia Czech Republic Denmark Egypt

Estonia Finland France Germany Greece Hong Kong, China Hungary India Indonesia Iran Ireland Israel Italy Japan Kazakhstan Korea, Republic of Latvia

Lithuania Malaysia Monaco Netherlands, The Nigeria Norway Oman, Sultanate of Pakistan Peru Poland Portugal Qatar Romania Russia, Federation of Saudi Arabia Serbia Singapore

Slovak Republic Slovenia South Africa Spain Sweden Switzerland Taiwan, China Thailand Trinidad and Tobago Tunisia Turkey Ukraine United Arab Emirates United Kingdom United States of America Venezuela







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Argentina Instituto Argentino del Petróleo y del Gas

Australia Australian Gas Industry Trust c/o Energy Networks Association

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

Bangladesh Petrobangla (Bangladesh Oil, Gas & Mineral Corporation)

Belarus, Republic of Beltransgas

Belgium Association Royale des Gaziers Belges

Bosnia and Herzegovina Gas Association of Bosnia and Herzegovina

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

Brunei Brunei Energy Association

Cameroon Société Nationale des Hydrocarbures

Canada Canadian Gas Association

China, People's Republic of China City Gas Society

Croatia Croatian Gas Association c/o INA-Naftaplin Czech Republic Czech Gas Association

Denmark Dansk Gas Forening – Danish Gas Association

Egypt Egyptian Gas Association

Estonia

Estonian Gas Association

Eurogas

Finland The Finnish Natural Gas Association

France Association Française du Gaz (AFG)

Germany Deutsche Vereinigung des Gasund Wasserfaches e.V. (DVGW)

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

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

Hungary Association of Gas Distribution Companies

India

Gas Authority of India Ltd (GAIL) Indonesia

Indonesian Gas Association (IGA)

National Iranian Gas Company (NIGC)

Ireland Irish Gas Association – Bord Gais Eireann

Israel The Israel Institute of Petroleum &

Energy

Italy Comitato Italiano Gas (CIG)

Japan The Japan Gas Association

Kazakhstan KazTransGas

Korea, Republic of Korea Gas Union

Latvia JSC Latvijas Gāze

Lithuania Lithuanian Gas Association

Malaysia Malaysian Gas Association c/o Petronas

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

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

Nigeria Nigerian Gas Association c/o Nigeria LNG Ltd

Norway Norwegian Petroleum Society (NPF) – Norwegian Gas Association

Oman, Sultanate of Oman LNG L.L.C.

Pakistan Petroleum Institute of Pakistan

Peru Perúpetro S.A.

Poland Polskie Zrzeszenie Inżynierów i Techników Sanitarnych (PZITS) – Polish Gas Association

Portugal GDP – Gás de Portugal, SGPS, S.A.

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Serbia Gas Association of Serbia

Singapore Power Gas Ltd

Slovak Republic Slovak Gas & Oil Association

Slovenia Geoplin

South Africa CEF Ltd

Spain Spanish Gas Association -Asociación Española del Gas (SEDIGAS)

Sweden Svenska Gasföreningen – Swedish Gas Association

Switzerland Schweizerische Aktiengesellschaft für Erdgas (SWISSGAS)

Taiwan, China The Gas Association of the Republic of China, Taipei

Thailand PTT Public Company Ltd -Petroleum Authority of Thailand

Trinidad and Tobago The National Gas Company of Trinidad and Tobago Ltd

Tunisia Association Tunisienne du Pétrole et du Gaz (ATPG) c/o ETAP

Turkey BOTAŞ

Ukraine Naftogaz of Ukraine NJSC

United Arab Emirates Abu Dhabi Liquefaction Company Ltd (ADGAS)

United Kingdom The Institution of Gas Engineers and Managers

United States of America American Gas Association

Venezuela Petróleos de Venezuela S.A. (PDVSA)

BP Gas, Power & Renewables (United Kingdom)	NV Nederlandse Gasunie (The Netherlands)
Bursagaz (Turkey)	NV NUON Asset Management (The Netherlands)
Cheniere Energy Inc. (USA)	PetroChina (People's Republic of China)
Chevron Corp. (USA)	Petróleo Brasileiro S.A. – Petrobras (Brazil)
ConocoPhillips Company (USA)	Russian Gas Society (Russia)
DanaGas (UAE)	RWE Gas AG/RWE Energy (Germany)
E.ON Ruhrgas AG (Germany)	Shell Gas & Power International B.V. (The Netherlands)
GAZBİR – Natural Gas Distributors Association	S.N.G.N. Romgaz S.A. (Romania)
(Turkey)	Société Suisse de l'Industrie du Gaz et des Eaux – SSIGE/SVGW (Switzerland)
Gaz de France (France)	
IGDAŞ – Istanbul Gas Distribution Co. (Turkey)	Suez S.A. (Belgium)
Indian Oil Corporation Ltd (India)	TBG – Transportadora Brasileira Gasoduto Bolívia- Brasil S/A (Brazil) TOTAL S.A. (France)
Instituto Brasileiro de Petróleo e Gás (Brazil)	
Izgaz – Izmit Gaz Dagitim San. Ve Tic A.Ş. (Turkey)	
	Unión Fenosa Gas (Spain)
Naturgas Fyn A/S (Denmark)	Union of Independent Gas Producers (Russia)



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Today, we are the second largest supplier of gas to liquefaction plants and participate in five major LNG production centres, including the new Tangguh facility under construction in Indonesia. We also have access to multiple markets – in Japan; South Korea; the UK, the US and, most recently, China where we are the only international company to participate in the country's first LNG import and re-gasification project, at Guangdong.

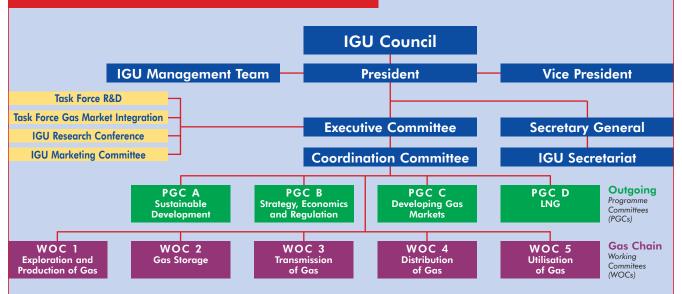
It's what, we believe, makes BP a natural gas partner in the rapidly changing world of LNG.



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IGU Organisation





From left to right in this photograph taken at the Executive Committee meeting in Montreux, Switzerland, in May 2007 are: Otto Musilek, Wan Zulkiflee Wan Ariffin, David N. Parker, Datuk Abdul Rahim Haji Hashim, Robert J. Harris, Yves Tournié, Chawki M Rahal, Hans Riddervold, Ieda Correia Gomes, Ernesto López Anadón, Peter K. Storm (who attended as Secretary General and is not a member of the Executive Committee), Klaus Homann, Peter I. Hinstrup, Kunihiro Mori, Hae-jung Oh, Daniel Paccoud, Roberto D. Brandt, Alexander I. Lipatov and Ho Sook Wah. George H. B. Verberg, Tomás Tichý, Antoni Peris Mingot, João Carlos de Luca and Domenico Dispenza could not attend.

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IGU MANAGEMENT TEAM



Mr Ernesto López Anadón, IGU President (Chairman) (Argentina)



Mr Roberto D. Brandt, Chairman of IGU Coordination Committee (Argentina)



Datuk Abdul Rahim Haji Hashim, IGU Vice President (Malaysia)



Mr Ho Sook Wah, Vice Chairman of IGU Coordination Committee (Malaysia)



Mr George H. B. Verberg, Immediate Past President (The Netherlands)



Mr Peter K. Storm, Secretary General

IGU EXECUTIVE COMMITTEE 2006-2009 TRIENNIUM

Dr Chawki Mohamed Rahal	Mr Fra	
Algeria Mr Ernesto López Anadón Argentina	Dr- Ge Mr Ital	
Mr Roberto D. Brandt		
Argentina Mr Otto Musilek	Mr Jap	
Austria	Mr	
Mr Tomás Tichý Czech Republic	Rep Da Ha Ma	
Mr Peter I. Hinstrup Denmark		

Mr Daniel Paccoud France
Dr-Ing. Klaus Homann Germany
Mr Domenico Dispenza Italy
Mr Kunihiro Mori Japan
Mr Hae-jung Oh Republic of Korea
Datuk Abdul Rahim Haji Hashim Malaysia

Mr Ho Sook Wah Malaysia
Mr Wan Zulkiflee Wan Ariffin Malaysia
Mr George H. B. Verberg The Netherlands
Mr Hans Riddervold Norway
Mr Alexander I. Lipatov Russia
Mr Antoni Peris Mingot Spain

Dr Robert J. Harris United Kingdom

Mr David N. Parker United States of America Ms leda Correia Gomes BP Gas, Power & Renewables, Associate Member Mr João Carlos de Luca

Instituto Brasileiro de Petróleo e Gás, Associate Member

Mr Yves Tournié Total, Associate Member

Dana Gas

Dana Gas (PJSC) is the first regional private-sector natural gas company in the Middle East, established with over 300 reputable founder shareholders from across the GCC region, and some 425,000 investors from over 100 nationalities worldwide who submitted applications of over US\$78 billion over 10 days in the company's regional IPO in late 2005.

Headquartered in Sharjah in the UAE and listed on the Abu Dhabi Stock Market (ADSM), Dana Gas already possesses a network of offices in Saudi Arabia, Egypt, the UK and Canada, with further offices opening throughout the Middle East. Dana Gas currently has assets and projects in gas exploration and production, processing, transportation and marketing in several countries, and aims to play a major role in the rapidlygrowing natural gas business throughout the Middle East North Africa (MENA) Region across the entire gas value chain.

In addition to its current projects, Dana Gas will be expanding its activities in all elements of the natural gas value-chain, including upstream exploration and production; through the midstream transmission and distribution of gas including LNG trading; and downstream into gas-related industries and petrochemicals.

In 2005, Dana Gas was born as a new concept, with a vision to be the first private-sector regional gas company in the Middle East. In the short period



offices in Canada, the UK, Egypt, Saudi Arabia, and soon Iraq, and with business activities across the wider Middle East region, including North Africa and South Asia, and in all aspects of the growing natural gas sector, from exploration and production of gas, through its processing and transportation, to its marketing and utilisation as a feedstock of industry.

Highlights

Among the highlights of the Company's first year activities are the successful completion of construction and interconnection of facilities of the UAE Gas Project in preparation for processing and transmission of imported gas supplies from NIOC later this year; the US\$1 billion acquisition of Centurion Energy International which launched Dana Gas into the exploration and production business as the 6th largest gas producer in Egypt; acquiring a majority shareholding of an important Bahraini gas company leading a project to develop the Gulf of Suez Gas Liquids Plant in Egypt in partnership with the Egyptian National Gas Company; partnering with Emarat in the UAE to build and operate the region's first common user gas pipeline with capacity of 1 billion cubic feet per day; partnering with a leading international energy technology company to build a network of regional gas terminals, starting in Pakistan; successfully securing rights to develop two of Iraq's major gas fields in the Northern

since its formation, the Company has achieved many important milestones: Dana Gas has grown from a small team in Sharjah to an international energy company with the services of over 300 professional staff,



Kurdistan Region; and launching the Company's first "Gas City" development in the Region. Dana Gas

recorded a net profit of AED 812 million for the period ending December 31, 2006.





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The Middle East's first regional and private-sector natural gas company



From the IGU Secretariat



Peter K. Storm, Secretary General.



Lotta Hållén-Kragh, Assistant to the Secretary General and Webmaster.



Barbara Anette Schmid, Assistant to the Secretary General.

These pages feature news items and information from the Secretary General (PKS), his Assistant and Webmaster (LHK), his Assistant (BAS) and the Editor (MWB). However, comments and suggestions of general interest from members or other organisations may also be displayed here. When submitting contributions to the Secretariat please ensure that any electronic pictures are supplied in a high resolution - 300dpi is the minimum required for print reproduction.

• The IGU Secretariat is moving to Norway

As of November 1, 2007 the IGU Secretariat, which since July 2000 has been hosted by Dong Energy A/S outside of Copenhagen, Denmark, will be hosted by StatoilHydro in offices on the outskirts of the Norwegian capital, Oslo.

Following the resignation for personal reasons of Petter Nore as Deputy Secretary General, the Norwegian host has presented its new candidate for the post of Secretary General. His name is Torstein Indrebø and he will be up for election at the Council meeting in St Petersburg on October 24. You will find a special interview with Torstein following these news pages.

PKS

Subscription fee for 2007

Over the last few years members have been generally prompt in paying their dues to IGU, but I am afraid that we cannot boast of the same good track record for this year. By July 1, we still had outstanding payments from around 30 members. Hopefully quite a few of those will have paid their subscription fee by the time this issue reaches you, but since a sound financial basis for the Union is important I urge those in doubt to check whether their Association or company has paid for 2007,



The IGU Secretariat is moving to Oslo.





and if not to get the payment processed as soon as possible.

PKS

Secondment to IEA and IGU

IGU continues to work closely with the International Energy Agency (IEA) in Paris, and a few members responded to my encouragement to second a young employee for a limited period to IEA. The results have been very positive as has our own experience with the secondment of Barbara A. Schmid from RWE Transportnetz Gas GmbH to the IGU Secretariat.

Both possibilities remain open to IGU members and recently in letters to Charter and Associate Members I encouraged them to consider this possibility as part of an educational programme for their younger employees.

This time we have also included the possibility of a mixed secondment such as one year in IEA followed by one year in the Secretariat. We believe this could be very beneficial not only for the employee involved and his/her employer but also for the two organisations, not least by strengthening the cooperation between IGU and IEA.

Members who are interested in these possibilities should contact the IGU Secretariat.

PKS

Interactive Maps – all about gas

IGU has collated and combined many of the respected and thorough sources of information on the gas industry and added information from our own membership to create the IGU Interactive Maps.

In line with other IGU research the world is divided into eight regions with information given on a regional summarised level as well as nationally. On the national level the website also contains details of local gas-related projects, provided by IGU members.

The idea behind the IGU Interactive Maps is to provide additional value to IGU members and the





From the global Interactive Map (TOP) you can click on one of eight regions and then on an individual country such as Argentina (ABOVE).

gas world through updated knowledge about the gas industry in a comparable and easy-to-read format.

Find the IGU Interactive Maps via a link on the IGU home page or by going directly to: www.igu.org/html/iguinfo.

LHK

Knowledge Centre

Members and website users can send questions (regarding technical data, contact persons, energy events and other issues) to the IGU Secretariat. If they cannot be answered by the Secretariat itself,





they are dealt with by one of the Committees or Task Forces if possible.

Now the setting up of a pool of new cooperating members has broadened this service. We are happy to announce that the research centres of two Associate Members, BP and Total, will support the Knowledge Centre during this Triennium. We would like to extend our particular thanks to Mrs Ieda Gomes (BP Gas Marketing Limited) and Mr Yves Tournié (Total S. A.) for being the pioneer supporters of this project. It is our intention to increase the number of cooperating research centres. If you are interested in joining this pool and supporting IGU in providing this service, please contact the Secretariat to obtain more information.

BAS

• Award for Secretary General

The Secretary General, Peter Storm, was honoured at the UK's 2007 Gas Industry Awards, which were made at a ceremony in May in London. He



IGU will soon start planning for the next Triennium, which will culminate with the 25th WGC in Kuala Lumpur, Malaysia.

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received the Gas Industry Leadership Award "in recognition of his outstanding contribution to the development of the International Gas Union as an influential and effective independent organisation, serving as spokesman for the gas industry worldwide", according to the citation.

The awards are organised annually by IGU's UK Charter Member, the Institution of Gas Engineers and Managers, and SBGI, a trade association representing all sectors of the British onshore gas industry.

MWB



LNG-16 will take place in Algiers, April 18-21, 2010.

Another organisation affiliated to IGU

The Russian National Gas Vehicle Association (NGVRUS) has joined the group of organisations within the gas sector which are affiliated to IGU.

NGVRUS mainly deals with professional issues in the fields of use of compressed and/or liquid gases as transportation fuels for on- and off-road vehicles, rail-road engines, boats and aircraft.

Being affiliated means closer cooperation with IGU, in some cases the outsourcing of tasks, space in the IGU Magazine, mutual promotion and participation in the annual meetings.

The other affiliated organisations are: the European Gas Research Group (GERG), Gas Infrastructure Europe (GIE), the International Association for Natural Gas Vehicles (IANGV) including its regional associations ANGVA and ENGVA, the IGRC Foundation, the Technical Association of the European Gas Industry (Marcogaz) and Pipeline Research Council, Inc. (PRCI) in the USA.

PKS

Planning ahead

We are only in the second year of what promises to be a very successful Argentine Presidency leading up to the 24th World Gas Conference in Buenos Aires in October 2009.

However, if we want the activities of IGU to continue with full power after this big event we have to start preparations well in advance. The next Presidency needs to have chairs and vice-chairs of the Committees in place, a Triennial Work Programme for 2009-2012 needs to be developed and all members need to nominate representatives to the Committees.

This is why members of IGU will start to receive letters about the next Triennium in the course of 2008, which is only a few months away now.

PKS

LNG continues to storm ahead

IGU is one of the main sponsors behind the so-called LNG-X Conferences, and LNG-15 took



relentless consistency 50% willingness to change 50%

We know what it takes to be a Tiger.

While all embrace the idea of continuous improvement, high performers are the ones who actually practice it, often viewing change itself as a core competency. So says Accenture's ongoing research on more than 500 of the world's most successful companies. For information on our Utilities industry group and experience helping utility companies achieve high performance, visit accenture.com/utilities1

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CGA marked its centenary in June with a special conference. Participating in a panel discussion from left are: Ged Davis, World Economic Forum; André Caillé, World Energy Council; Thomas O'Connor, Duke Energy Corporation; and IGU President, Ernesto López Anadón.

place in Barcelona, Spain, at the end of April with a record high of 3000 delegates plus accompanying persons, press and exhibitors. The Spanish Charter Member of IGU, Sedigas, was highly commended for the way it organised and ran LNG-15, and you can read more in a special report elsewhere in this issue of the magazine.

The LNG-X conferences are about to get as big as the World Gas Conferences, highlighting the fact that LNG is increasing its share of the total gas market in spite of the rising costs and other challenges which the LNG industry is facing. By linking regional markets LNG is helping to create a global gas market.

The President of IGU, Ernesto López Anadón, has taken over the chairmanship of the Steering Committee for LNG-16, which will take place in Algeria in April 2010, and it has recently been decided that the USA will host LNG-17 in 2013. **PKS**

• Recent representations: from Ottawa....

The Canadian Gas Association (CGA), which has been a Charter Member of IGU since 1933, celebrated its 100th Anniversary in June and the event was marked by an exclusive conference on energy solutions for the future. This was organised together with other Canadian energy organisations and held in Ottawa, June 6-7.

The successful conference brought together leading figures in the gas world including IGU's President, Ernesto López Anadón, who participated in a Panel Discussion on natural gas in a sustainable energy future.

• ... to Belgrade

Also in June IGU assisted the Serbian Charter Member in organising the Second International Conference on Development in the Gas Industry of South and East European Countries in Transition.

IGU brought in a number of keynote speakers both from the ranks of the Union and from other organisations such as UNECE in Geneva and from the Turkish Energy Market Regulatory Authority (EPDK).

In addition we handed out small awards to the three best young authors at the conference as part of the general policy to encourage young people to join the gas industry.

PKS

less is more. but when you can move more clean natural gas



Natural gas is one of the world's cleanest fuels, so it's in high demand. To ship natural gas across vast oceans, it's cooled to a liquid. Now we've developed a new generation of ships with 80% greater capacity to safely move more natural gas to where it's needed most. So meeting the need for cleaner, more efficient energy isn't a pipe dream. It's a reality.



Taking on the world's toughest energy challenges."



• First JCM of this Triennium

There was an unusual venue for the first Joint Committee Meeting (JCM) of the 2006-2009 Triennium, which dealt with CO₂ sequestration and storage. Delegates joined the Crown of Scandinavia in Copenhagen on May 7 and used the ship's conference centre to hold the first part of the JCM while they journeyed to Oslo, where work continued on May 8. The discussions involving representatives of five Committees were extremely fruitful and represent the start of a joint project on carbon capture under the lead of PGC A's Chairman Knut Barland. With keen public interest in the subject, the presentation of this project's findings at the next WGC is likely to be a high profile event.

• Trinidad is only a "click" away

For the IGU Council meeting in St Petersburg the Secretariat took a leap into the electronic era, at least when it comes to registrations for the IGU meetings and sessions. For the first time an on-line registration system was used to keep track of all the registrations, activities and social functions of the IGU members attending.

The Committee meeting organisers have also been given the opportunity to use the system for their meetings, and quite a few have taken IGU up on this offer.

Before the end of 2007 you will be able to register on-line for the forthcoming Executive Committee meeting in Trinidad & Tobago, scheduled for March 26-28, 2008.



LHK



Trinidad & Tobago, host of the March 2008 EXC, is a major LNG exporter. It ranked 7th in the world in 2006 with 16.25 bcm sold by Atlantic LNG.



Energy and Environment – The 2050 Solution

By Michael Cleland, President and CEO, Canadian Gas ASsociation

Canadians are debating how their energy system can be transformed between now and 2050 – reducing GHG and air contaminant emissions by 60 or 80 percent or more.

The focus has been on large industrial sources of emissions which account for around half of the emissions. Now, we need to start thinking more about the other half to achieve the kind of transformation implied by 60 and 80 percent overall reductions. That means changing how energy is delivered and used in our communities.

According to Statistics Canada, Canada's population is expected to grow from 33 million people today to around 43 million in 2050 – and virtually all of this growth in or on the suburban fringes of Canada's larger cities. To be a leader at the climate change table and improve our urban air quality we need to improve how energy is delivered and used and build much more efficient cities. And this needs to be done while respecting core values, such as freedom of choice for individual citizens, and building on the enormously productive free market economy that is the basis of our prosperity.

This is no small challenge, but it might be made easier if we start with some basic ideas.

First, in 2006, the Canadian Gas Association along with Natural Resources Canada and the Canadian Electricity Association sponsored a study that analyzed the economic potential for stationary (excluding transportation) energy efficiency in Canada. The study concluded that economically viable measures could reduce the expected growth in energy use by half. Some observers regarded that as a very large challenge; others thought it to be insufficiently ambitious. But everyone agrees that energy efficiency is where we have to start.

Another basic idea is that we need to look at the efficiency of the system as a whole, not only individual buildings. For example, using electricity for space and water heating is one of the least efficient and least environmentally friendly options a homeowner can choose. According to Natural Resources Canada data, Canada uses about 90,000 gigawatt hours of electricity for space and water heating in our buildings.

By replacing just half of this with high efficiency natural gas equipment, we estimate that North America's greenhouse gas emissions would drop by about 12 million tonnes. Quebec, Canada's leading hydro-electric province, has recognized the environmental and economic opportunity from using its electricity more wisely. The Quebec Energy Strategy, released in 2006, states: "In the case of Québec, the electricity made available by a switch to natural gas heating could be exported to Ontario or certain US states that use more environmentally detrimental means to generate their electricity."

The third idea is to look at how we can make even bigger gains in efficiency and environmental performance through better energy delivery systems. Some of those better systems will be based on local renewable energy sources such as ground source heat, solar or energy from waste. Others such as small scale combined heat and power systems or district energy will use natural gas. Most of these new systems will involve hybrid combinations of renewable sources, natural gas and grid based electricity. Increasingly, energy delivery systems will involve multiple buildings and houses and they will be tied to the transportation system through technologies such as home refueling and plug in electric hybrid vehicles.

Which brings us to the last idea - changing our approach to community-development. It means both decentralized and centralized sources of energy increasingly tied together in two way networks. It means more densely populated, mixed land use communities leading to greater opportunities for public transit and urban integrated energy systems. It means making the best use of all available forms of energy to provide the optimal energy service to Canadians, from economic, environmental and social aspects.

The basic structure of the communities we live in today was established 50 years ago or more. If we want to fundamentally transform our community energy systems by 2050 we need to start now.

The Canadian Gas Association is located in Ottawa. Visit www.cga.ca for more information.

