



IGU's Gas Efficiency Award and Social Gas Award

By **Florijana Đedović**

Under the motto "Conservation and efficiency are the cheapest forms of new energy", IGU launched the Gas Efficiency Award in 2008 to call for new ideas and projects aimed at obtaining greater efficiency in the use of gas.

IGU considers energy efficiency to be one of the more important ways of achieving a more sustainable future and enhancing security of supply. By organising the Award IGU seeks to:

- Act as a socially responsible organisation in generating ideas and proposals for improved energy efficiency;
- Make good use of its assets and thereby promote the Union to the general public; and
- Strengthen its ties with the academic world and the industry.

● **The 2008 Award**

All IGU members were invited to nominate projects and 40 were submitted covering all parts of the gas chain. They were considered by an Evaluation Committee comprising the President, the Secretary General and the Coordination Committee Chairman of IGU, the Executive Director of the International Energy Agency, Nobuo Tanaka, and Prof. Dr-Ing. Rainer Reimert of the Engler-Bunte-Institut, Universität Karlsruhe, Germany.

The projects submitted involved a broad range of technologies and techniques; some of these were already in use and others were proposals or ideas. The gas savings achieved or forecast ranged from a few thousand cubic metres a year to many millions, while the investments necessary to achieve the savings varied correspondingly.

"With such a broad range of projects the decision-making process was very difficult," said Professor Reimert, "and selecting two winners does

not necessarily mean that the others were without value. Indeed, I was very impressed by the ingenious work carried out by the engineers and scientists of our gas industry and learned a lot from it."

However, Professor Reimert added that there were some shortcomings. On the technical front these concerned submissions which did not properly count gas savings or overestimated them, those with only a single application and those which basically only described the state of the art. Shortcomings in terms of presentation included submissions where the description was insufficient and difficult to understand, where the authors did not compare their proposals with the state of the art and where the text had not been proof read. Competitors for the 2009 Award should bear these points in mind.

After careful consideration, the Evaluation Committee chose a Dutch-German project entitled "A new generation of gas-fired heat pumps", and a Japanese project entitled "An economical thermal network cogeneration system for apartment buildings (neighbouring cogeneration system)" as offering the most substantial improvements in gas efficiency. Each project won a prize of €10,000 and the authors have written the following short profiles.

A new generation of gas-fired heat pumps

Author: Paul Vloon, Manager of the Group Gas-fired Heat Pumps of Bosch Thermotechnik

The efficiency of gas-fired boilers is limited at 110% (lower calorific value – LCV) and the condensing boiler market is starting to approach its maturity. One possibility of achieving higher efficiency is to develop the gas-fired heat pump as a successor.

The diffusion absorption principle is interesting for residential use as it makes no noise, has no moving parts and is well-known from refrigerators. The efficiency can go up to approximately 170%. Initially, in 2004, we configured it as a bivalent system with a 4kW heat pump and a condensing boiler in parallel, to deliver the peak load and domestic hot water. The appliance worked well but we had a dual system with many components

meaning that the consumer price was too high compared to the price of the condensing boiler.

The next step was to develop a monovalent system in which the heat pump takes over the functions of the condensing boiler. This necessitated a redesign to allow for modulating, delivering a peak load and for working with higher supply temperatures to produce domestic hot water. We found the solution by adding an extra condenser to the diffusion absorption cycle which works in parallel with the generator, the so-called bypass condenser. This bypass condenser returns some of the NH_3 to the input side of the generator. This delivers the peak load and makes it possible to work at higher supply temperatures.

Up to 6kW the system behaves like a heat pump, and when the bypass condenser is switched on (> 6kW), it behaves like a boiler with a heat pump in parallel. It also makes the production of domestic hot water possible at much higher efficiencies than the condensing boiler.

The advantages compared to the previous bivalent system are:

- No need for a peak-load boiler;
- Higher savings, especially on domestic hot water;
- Lower investment and higher savings, so a quicker pay-back time;
- Smooth change-over from the heat pump alone to the heat pump + peak load; and
- Smaller dimensions and volume (-20%).

The process layout is shown in Figure 1 (the bypass condenser is the new element). We have completed the feasibility phase and are working towards market introduction, tentatively in 2010.

An economical thermal network cogeneration system for apartment buildings (neighbouring cogeneration system)

Author: Hideki Yamaguchi, Energy Utilisation Technology Team, and Co-author: Yoshinori Hisazumi, Senior Engineer, both of Energy Technology Laboratories, Osaka Gas

In order to stimulate wider use of economically

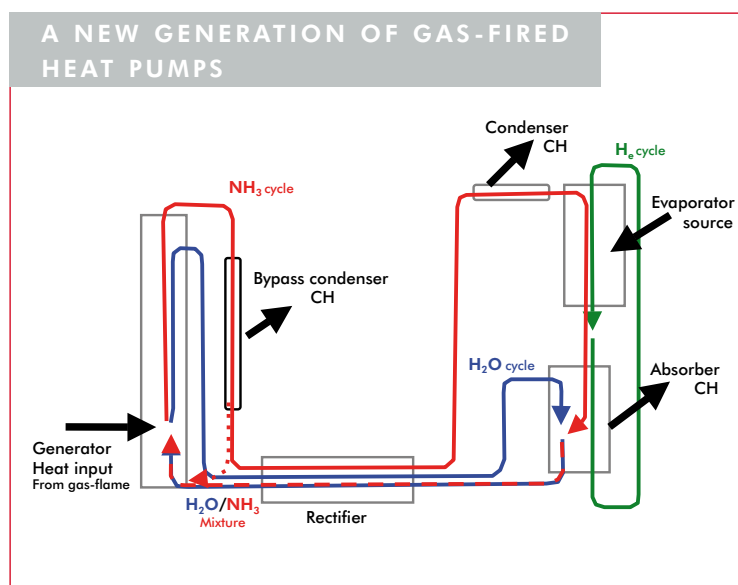
viable distributed generation systems, it is essential to develop an energy-efficient and low-cost heat supply system. We have been developing a new centralised cogeneration system for apartment buildings (neighbouring cogeneration – NCG).

The key concept of this system is to install a heat storage unit equipped with a hot water supply and a space heating function in each household and to connect heat storage units by a single loop of hot water piping. As a result, time levelling of the heat supply becomes possible. Thus, the costs of the piping and heat source equipment decrease. Furthermore, because of the large capacity of accumulation of the system, the cogeneration can generate according to the electricity demand. Thus, a high operating rate of the cogeneration can be achieved.

When compared to a system with a boiler in each household, NCG can reduce the primary energy consumption by 14.9% over the course of a year.

In this study, we developed a new heat storage unit and installed an NCG system for seven households in NEXT21, an experimental condominium in Osaka. It was confirmed that this system could supply heat stably throughout the year.

BELOW
Figure 1.





The NEXT21 experimental housing project in Osaka.

● The 2009 Award

Entries for this year's competition should be sent to the IGU Secretariat by the end of April. Gas efficiency projects with any technical or economic background are eligible provided they are new ideas. The projects may already have been realised but not earlier than one year before sending them to the IGU Secretariat. For those not yet operating the submission must detail how and when the project will be implemented. Submissions should give a full description of the project in no more than five A4 pages, including a half-page non-technical abstract, and elaborate on:

- The idea (what is the "new" element);
- The benefit/savings of gas which will be realised by the project;
- The current project phase; and
- Project realisation.

A one-page CV of the project author should also be included.

In the case of a large number of entries, the IGU President may ask two academics of his choice to screen them in order to limit the number going forward to the Evaluation Committee, which will have the same members as last year.

Once again two prizes of €10,000 will be awarded, and then the best of the four winning projects from 2008 and 2009 will be chosen. The IGU Secretariat will inform the winners in August and the overall winner will be invited, expenses paid, to present

the project at the 24th World Gas Conference in Buenos Aires in October. The 2009 winning projects will also be published on the IGU website and profiled in the April 2010 issue of the IGU Magazine.

● Social Gas Award

New for 2009, the IGU Social Gas Award calls for ideas and projects aimed at getting people to use gas more efficiently. All kinds of projects stimulating gas-efficient behaviour are eligible, including training programmes, public regulations and product labelling, and entries are invited from organisations in the public and private sectors such as authorities, educational institutions, social bodies, professional associations and companies.

The deadline for sending entries to the IGU Secretariat is the end of April. Projects may already have been realised but not earlier than one year before sending them to the IGU Secretariat. For those not yet operating the submission must detail how and when the project will be implemented. Submissions should give a full description of the project in no more than five A4 pages, including a half-page non-technical abstract, and elaborate on:

- The idea;
- The educational method;
- The results obtained or expected; and
- Project realisation.

A one-page CV of the project author or description of the sponsoring organisation should also be included.

Projects will be considered by the same Evaluation Committee that judges IGU's Gas Efficiency Award. There will be one non-monetary award each year and the winner for 2009 will be informed in August.

The winning project will be announced at the 24th WGC as well as being featured in the IGU Magazine and on the IGU website.

Florijana Đedović is the Assistant to the Secretary General. For more information please contact her: fde@statoilhydro.com.

Contributing to our future

Imagine if discovering gas and developing its production became a priority to satisfy global energy demand



Worldwide demand for natural gas is growing at a greater pace than for any other fossil fuel. As a forerunner in the chain of LNG specialists, Total is pursuing developments in natural gas around the world by setting up new projects in Australia, Norway, Qatar, Yemen and Nigeria, because satisfying the planet's energy needs is our priority. www.total.com

TOTAL

- ▶ *Major gas producer – Sixth in the world, third in Europe*
- ▶ *Leading LNG player – Among the top three in the world*
- ▶ *Growing gas distributor – Second in Great Britain and France for the I&C market*
- ▶ *Benchmark power expertise – Cogeneration*

▶ Natural Gas

Natural gas is expected to post one of the strongest growths of all fossil fuels over the next decade with an average of around 3% per year driven by demand from the power generation segment.

Leveraging more than 60 years' experience in natural gas, Total is a leading global operator with recognised expertise all along the gas chain from exploration and production, liquefaction and regasification, and transportation to storage, trading, marketing and power generation.

In an environment of gas and electricity market deregulation, Total is pursuing a strategy on its natural gas reserves – which account for more than 42% of its hydrocarbons reserves – and identifying markets for new potential resources. In line with this, the Gas & Power branch is strengthening its positions at all stages of the chain and especially in the LNG business.

▶ LNG

Total helped to pioneer the LNG industry in the 1960s and is today a solid partner in liquefaction plants, which account for almost 40% of global capacity.

More than a quarter of its gas is produced as LNG, aiming for growth of 10% per year by 2010. Total is starting the Yemen LNG plant production and has new projects in Angola, Russia, Iran, Nigeria and Australia as well as plant extensions in Nigeria and Qatar.

Total has acquired interests in four regasification terminals in consumer markets and holds capacity in a fifth one, bringing supply from the Middle East, the Gulf of Guinea and Northern Europe.

▶ Hazira in India and Altamira in Mexico are currently in operation.

▶ In 2009, three of the terminals should begin operating for Total : Fos Cavaou in France, Sabine Pass in the US Gulf (access to capacity) and South Hook in the United Kingdom.

By 2010, Total should have a regasification capacity of about 20 Mtpa and a balanced spread between Asia-Pacific and the Atlantic Basin. Total is also a partner for the Adria LNG (Croatia) pre-project.

Total's portfolio of long term contracts is one of the biggest and most diversified compared to the other oil and gas majors. The Group also buys spot cargoes for trading all over the world.

Total has contracted a long term charter: the Arctic Lady, a 147,000 cubic metre LNG carrier.

▶ Pipelines

Total has contributed significantly to developing a Western European gas pipeline network to carry its North Sea production. It now has interests in 12,000 kilometres of high-pressure pipeline in Europe and TIGF, a fully owned subsidiary, operates close to 5,000 kilometres of pipeline in France.

In South America, the Group is a shareholder in gas transportation companies in Argentina, Chile and Brazil operating a total of 9,000 kilometres of pipeline, transporting gas from producing basins in Bolivia and Argentina to consumer markets.

▶ Storage Natural Gas

TIGF owns and operates two underground storage facilities in France, with a working capacity of 2.4

Gm3 (85 bcf), approximately 20% of the total natural gas storage capacity in France.

By developing underground storage facilities in France, Total helps create major gas hubs, guaranteeing market fluidity and boosting growth by making natural gas more competitive in Europe.

Total also has a stake in Géostock, an engineering company specialising in the design and construction of underground storage facilities.

Liquefied Petroleum Gas

Total has now acquired broad experience in LPG storage. Jointly with Hindustan Petroleum Company Ltd, India's third-largest refiner, the Group has built an LPG import and storage terminal in the port of Visakhapatnam.

Inaugurated in January 2008, the facility has a capacity of 60,000 metric tons, and can accommodate the 40,000 ton LPG carriers.

▶ Marketing & Trading

▶ **In the United Kingdom**, Total is one of the I&C market leaders, with over 50,000 gas customer sites.

As deregulation advances, the Group is capitalising on this experience to expand its presence in continental Europe, especially Spain and France. A key asset here is comprehensive expertise that is adapted to consumer's needs.

▶ **In France**, Total was the first to gain a foothold in the eligible customer market before the I&C market was fully deregulated and its target is to double the market share.

▶ **In the US**, sales reached 45.5 Gm3 (1.606 tcf) in 2007 and the Group has set up an organisation in South America to market gas from Argentina and Bolivia across the Southern Cone.

Total boasts an experienced gas-trading team in London, Houston, Geneva, Hong Kong and Jakarta. It optimises flow management on a global

scale, the leverage of production and outlets, and secure margins thanks to hedging in markets.

▶ Power Generation

Total is a partner in several gas-fired power projects in Asia, Africa and the Middle East, while also operating smaller cogeneration plants at Group refineries in Europe and the US.

▶ **In Abu Dhabi**, the Taweelah A1 facility rated at 1430 MW and with a seawater desalination capacity of around 385,000 cubic metres per day, is one of the largest cogeneration plants in the world, and is 35% more efficient than a conventional power plant. The Group recently approved a capacity expansion to 1600 MW

▶ **In Thailand**, Total has a 28% stake in EPEC, which commissioned the 350 MW Bang Bo combined-cycle power plants in March 2003.

▶ **In Nigeria**, alongside Shell, Total is a 10% partner in the gas-fired combined cycle power project AFAM Together with NNPC. The Group is also building a new 400 MW combined cycle power plant near Obite.

In addition, Total has signed a partnership agreement with Suez and Areva to propose a nuclear power plant project to the United Arab Emirates.

▶ Enhancing R&D in Gas and Power

Total created an R&D department within the Gas & Power branch, to prepare its growth and future by anticipating changes and developing new technologies. R&D focuses on 3 principal axes in which the Group has existing expertise and abundant resources namely coal-to-liquid, solar energy and biomass. Partnerships have since been signed with companies, research centres (CNES in France) and universities (Ecole Polytechnique in France).

Total is also involved in DME projects and is the only international gas player among a consortium of nine Japanese partners.



News from Organisations Affiliated to IGU

In this issue we have contributions from Gas Infrastructure Europe, the International Pipeline and Offshore Contractors Association and the International Association for Natural Gas Vehicles.

● Gas Infrastructure Europe (GIE)

By Mylène Poitou

GIE represents the interests of infrastructure operators in the natural gas business covering transmission systems, storage systems and LNG terminals. GIE currently has 63 members in 27 European countries and has three sections: Gas Transmission Europe (GTE), Gas Storage Europe (GSE) and Gas LNG Europe (GLE).

Members and main objectives

One of the objectives of GIE is to give voice to the views of its members vis-à-vis European policy makers and institutions, the regulators and other stakeholders. Its mission is to actively contribute to the construction of a single, competitive gas market in Europe underpinned by a stable and predictable regulatory framework.

A sound investment climate and increased transparency are among the main areas of focus for GIE as prerequisites for a fully operational gas market in Europe. GIE is a key stakeholder in the European Gas Regulatory Forum, the so-called "Madrid Forum", which addresses the key issues relating to the creation of an internal market for energy in the European Union.

Update from the GIE sections

Gas Transmission Europe

Currently, the main challenge for GTE consists of demonstrating progress towards the single European gas market by preparing for the establishment of a new body – the European Network of Transmission

System Operators for Gas (ENTSOG), as proposed in the Third Energy Package put forward by the European Commission in September 2007. The foundation for the future ENTSOG has been laid by the creation, in November 2007, of a transitory structure, GTE+, as an initial step before the adoption of the Third Package.

The work programme of GTE+, and later ENTSOG, envisages enhanced interaction with regulators and stakeholders, thereby involving them in the work towards the completion of the single European gas market. GTE+ has already demonstrated its commitment by taking various steps towards establishing ENTSOG. These include, inter alia, the consultation of all stakeholders on the GTE+ work programme, in particular by organising a workshop in June 2008, as well as the launching of the GTE+ Transparency Platform in November 2008.

The ongoing work within GTE+ in other areas, such as investment and capacity, will involve continuous close cooperation and interaction with stakeholders and regulators, including the staging of various workshops and bilateral meetings. Moreover, the first GTE+ Capacity Development report was published at the end of November 2008. The report constitutes the first step towards the Ten Year Capacity Development plan, as foreseen in the Third Package. The first GTE+ Ten Year Capacity Development plan is to be published by the end of 2009. It should present an overview of the ability of the European gas transmission network to meet the requirements of the European gas market.

Gas Storage Europe

The focus of GSE lies on the promotion of a stable and predictable regulatory framework to ensure the proper climate that is conducive to investment in storage. GSE is cooperating and conducting an ongoing dialogue with other stakeholders as well as with regulators and policy makers with a view to establishing and reinforcing positive solutions on storage-related issues for the benefit of the market as a whole.

Being committed to facilitating the development of the European storage market, GSE undertakes various initiatives aimed at increasing the level of information provision. The GSE Aggregated Stock Inventory and GSE Investment Database, both launched online in 2007 and subsequently improved or updated, are the perfect examples. They illustrate the will and readiness of the European storage system operators gathered in GSE to pursue improvement and progress. GSE's objective will remain that of seeking more enhancements in the market, for example, by contributing to the ongoing legislative processes aimed at the completion of the internal energy market.

Gas LNG Europe

With the increasing importance of LNG in the European gas market as a significant contributor to security and diversification of supply, GLE is continuing efforts to promote recognition for LNG infrastructure activities at European level as well as the proper legislative and regulatory framework for the LNG industry in Europe. While doing so GLE seeks to ensure that LNG business specificities, such as those related to investment needs, existing commitments or technical constraints, are taken into account in any future EU regulatory developments.

Moreover, recognising the important role that transparency plays in market development, GLE

launched in November 2008 an online-based GLE LNG Investment Database providing information on the projected LNG regasification capacity in Europe. Also in November 2008, as part of its regular cooperation with other stakeholders, GLE became a co-signatory of the "Protocol for the coordination of activities and the exchange of information among LNG organisations" thus joining the group of other organisations having an interest in the LNG sector (including IGU) which seek to share useful information and coordinate their activities so as to create synergies and avoid overlaps.

Annual Conference

On October 23-24, 2008, GIE organised its Annual Conference, this time hosted in Bucharest by Transgas, the Romanian transmission system operator. The conference was a remarkable success with more than 240 delegates representing energy industry stakeholders, regulators and EU policy makers. It featured many interesting speeches and presentations on various topics, such as, *inter alia*, the Third Energy Package, security of gas supply, gas storage and LNG. All materials presented are available on the GIE website at www.gie.eu.

The 2009 GIE Annual Conference will be held on May 6 and 7 in Groningen, The Netherlands, and will be hosted by Gasunie, in the context of the 50th anniversary of gas production in Groningen.



GIE's 2008 Annual Conference was held in Bucharest.



Cooperation with IGU

IGU and GIE started working together nearly three years ago with the signing of the cooperation agreement between the two organisations in June 2006 during the 23rd World Gas Conference. GIE is looking forward to developing the relationship further.

Mylène Poitou is the Executive Secretary of Gas Infrastructure Europe (www.gie.eu).

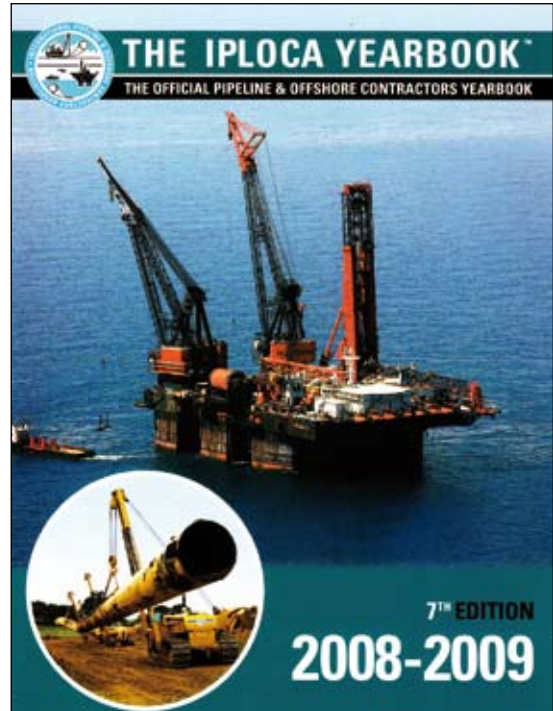
● International Pipeline and Offshore Contractors Association (IPLOCA)

By Juan Arzuaga

Formed in 1966 and headquartered in Geneva, Switzerland, IPLOCA's mission is to provide value to members through a forum for sharing ideas, engaging the industry and its stakeholders, facilitating business opportunities and promoting the highest standards in the pipeline industry.

Among the Association's key objectives for 2008-2009 are the following:

- Value to members and recognition of IPLOCA by key oil and gas stakeholders;
- Health, safety and the environment: to promote the common interest of members and foster a high-level safety culture across the industry;
- New technologies: to stimulate industry-wide



Copies of IPLOCA's useful yearbook can be downloaded from www.iploca-yearbook.com.

technology, processes and contractual relationships for pipeline projects;

- One-on-one engagement of members around the world through increased number of local and regional meetings in local languages;
- Increased involvement with training and professional organisations to facilitate and publicise careers in pipeline construction.

Members and leadership

IPLOCA brings together the world's major international onshore and offshore contractors and has some 230 members from 35 countries. Over recent years IPLOCA has been instrumental in developing a cooperative research programme involving contractors, owner/developers and others to reduce the cost of pipeline construction. Given the challenges faced in the development of remote gas resources around the world, this is an important initiative between owners and contractors that will benefit the entire supply chain.



IPLOCA's current Board of Directors – the President, Bruno de la Roussière, is the fourth from the left in the front row.



Gasum is a Finnish gas transmission company responsible for natural gas imports from Russia, transmission and selling of natural gas to customers in gross market. During 2008 Gasum will commission a new, 3rd generation gas receiving station in Imatra, located at Finland – Russia border, which is utilizing modern ultrasonic flow metering.

The company's goal is to be a strong player in developing the natural gas business – an active pioneer, now and in the future.



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www.gasum.fi



The main objective pursued by the **Czech Gas Association** is to provide high-quality technical and managerial support for the reliable and effective development of the gas industry in the Czech Republic



To achieve this objective,

1. CGA supports activities enhancing the image of natural gas as an energy-efficient and environmentally-friendly fuel;
2. CGA supports the transfer of latest information from all over the world to the Czech Republic;
3. CGA has represented the Czech Republic in the IGU since 1932, and takes an active part in its activities; it also co-operates with other European and global non-governmental organisations;
4. CGA represents the Czech gas industry in respect of the development of legal and technical regulations, particularly their alignment with the relevant EU legislation;
5. CGA is a publisher of the „PLYN“ (Gas) journal, the only gas industry periodical in the Czech Republic (published since 1921, circulation 3,000) monitored by worldwide Chemical Abstracts.



The Board of Directors of IPLOCA is made up of senior executives from major international pipeline construction companies. The 2008-2009 President is Bruno de la Roussière, Executive Vice President Pipelines and M & A, Entrepouse Contracting, France.

Committees and Annual Convention

The technical committees are focused on onshore and offshore pipelines and their construction, on training and on topics relating to new technologies, safety and the environment.

The 2008 Convention was held in Athens, September 29-October 3, and included the leading global players in pipeline construction: IPLOCA members, associate members and guests. The 2009 event will take place in San Francisco, USA, September 14-18.

Juan Arzuaga is the Executive Secretary of IPLOCA (www.iploca.com).

● The Harmonisation of International NGV Standards

By Dr Garth Harris and Dr Jeffrey Seisler

One of the most important activities undertaken by the International Association for Natural Gas Vehicles (IANGV) in recent years has been the promotion of the harmonisation of international standards for the NGV industry.

At the heart of this process is harmonising the regulations of the United Nations Economic Commission for Europe (UNECE) with the standards of the International Organisation for Standardisation (ISO). This is because for the many countries that are signatories to the appropriate UNECE treaty (for motor vehicle regulations which are promulgated by UNECE) they become mandatory regulations in those countries. Unfortunately, there are a large number of discrepancies between the UN regulations and the corresponding ISO standards.

For NGVs the differences are between UNECE Regulation 110* and ISO Standards 15500 (Fuel System Components) and 15501 Road Vehicles –

Compressed Natural Gas (CNG) Fuelling Systems, which deal with the equipment and installation of CNG in vehicles.

After about two years of preparation, the world-wide harmonisation activity was inaugurated with the ISO Roundtable on Global Harmonisation of Regulations, Codes and Standards for Gaseous Fuels and Vehicles, which was held in Geneva in January 2007 and reported on in the IGU Magazine (October 2007 issue, pages 44-46). The roundtable produced a report of actions and priorities for both NGVs and hydrogen vehicles (H2Vs) that are needed to bring about harmonisation. This report was considered by the Technical Management Board of ISO which, in turn, produced a report on the actions that are needed to be undertaken by the technical committees of ISO.

The proposal to bring about harmonisation is that the UNECE regulation should reference the ISO standard rather than amend a particular topic in the regulation clause by clause. An additional benefit is that when an ISO standard is reviewed, normally every five years, any changes made to the standard will automatically, by reference, become part of the UNECE regulation.

At present, the ISO standards relating to CNG vehicle equipment and installation are being reviewed. It has been agreed that at the end of the review process, the ISO working group will write a report to the appropriate group within UNECE indicating the changes that have been made. The UNECE group will, after discussion, then adopt the particular ISO standard. This process should remove most of the harmonisation issues and solve problems associated with two different sets of international standards and regulations. The key areas are detailed below:

LNG standards

International standards are required for vehicle components, the LNG tank and the refuelling connector. These are now in various stages of preparation by the ISO technical committees TC220

*ECE 110: Uniform Provisions Concerning the Approval of: I. Specific Components of Motor Vehicles Using CNG in their Propulsion System: and II. Vehicles with Regard to the Installation of Specific Components of an Approved Type for the Use of CNG in their Propulsion System.



A World Of Energy

TAQA is committed to offer its industrial, commercial and residential customers, cost effective and reliable energy infrastructure.



(Cryogenic Vessels) and TC22 (Road Vehicles). There is also some on-going work in TC220 regarding periodic inspection of the LNG tanks.

Dual fuel standards

The roundtable recommended that standards for dual fuel natural gas/diesel engines be written for vehicle components and fuel. Subsequently, an industry consensus was developed and it was decided that the existing standards for CNG and diesel are adequate, at least for the present.

Natural gas/hydrogen mixtures standards

The roundtable said that standards are needed for specifying the quality of natural gas/hydrogen mixtures and for vehicle components. These issues are still being discussed by the appropriate technical committees, TC197 (Hydrogen Vehicles), TC193 (Natural Gas), TC22/SC25 (Road Vehicles Using Gaseous Fuels).

Units

There is a need for harmonisation of pressure units and temperature references for filling CNG cylinders. This is under consideration by TC193.

Fuel quality and vehicle safety standards

There are existing ISO standards for natural gas and LNG. For hydrogen used in fuel cells, an existing standard is available. For mixtures of hydrogen and natural gas, TC193 and TC197 have this under consideration.

Material compatibility for hydrogen operation

While an existing standard is available, TC58 (Gas Cylinders) has decided to undertake some further investigations to determine whether or not further standards work is needed.

Refuelling station standards

A draft standard on CNG refuelling stations has been drawn up by the European Committee for Standardisation (CEN) and is at the review stage.

Under what is known as the Vienna agreement, developed to avoid duplication of work between CEN and ISO, it is possible that the European standard could become the international standard. This issue is being considered by TC193.

Cylinder standards

The CNG cylinder standard is being reviewed as part of the normal ISO five-year review process.

Biofuel quality safety standard

This matter is being reviewed by TC28 (Petroleum Products and Lubricants).

● Conclusion

One outcome of this process is that IANGV has become, or is becoming, a "Category A" liaison organisation with the various ISO technical committees mentioned above. This will facilitate the exchange of information between the NGV industry and the groups preparing the standards. This is particularly important in relation to the countries outside Europe with major NGV sectors. Because both ISO and the UNECE are based in Europe (in Geneva), it is natural that Europeans are very active in the standards work. It is the role of IANGV to ensure that there is a global perspective.

This exercise on harmonisation of standards and regulations is, by its international nature, a challenging, laborious and time-consuming effort. It is clear that the harmonisation objective will take some years to be achieved. The benefits to the NGV industry are, however, potentially so important that it is necessary for IANGV to continue to advocate for the issues and activities that were identified at the roundtable. In the two years that have passed, significant progress has been made and it can be expected that the NGV industry will start to see the results and benefits in the very near future.

Dr Garth Harris was formerly Secretary General of IANGV (www.iangv.org). Dr Jeffrey Seisler is CEO of Clean Fuels Consulting (www.cleanfuelsconsulting.org).



**We're not going to start thinking we are
the best thing on earth.**

We're going to carry on respecting it.



For seven years running, we have featured in the socially responsible investment indices. For the third year now, we have appeared on the DJSI World index and have once again been included on the FTSE4Good sustainability index. Although this is unquestionably a source of great satisfaction for us, it will nonetheless not cause us to relax. We shall continue working so that millions of people worldwide can enjoy natural well-being and efficient, environmentally friendly energy.



www.gasnatural.com

A Great Success for the International Gas Union Research Conference

By George H. B. Verberg

If you were at IGRC 2008 in Paris it is unnecessary to tell you that the conference exceeded all expectations. For those who did not visit I am sorry to say you really should not have missed it. With over 800 registered participants, the event was a unique opportunity for exchanges and networking between researchers, experts and business people. We can conclude from the CEOs' roundtable – an innovation for this IGRC – that the involvement of companies in research and development has made a U-turn compared to previous years.

When asked about their opinion on the conference organisation and the content, delegates' reactions were overwhelmingly positive which confirmed that, in the oral sessions and the workshops, a clear picture was painted of the business dimensions of technologies.

Some notable conclusions drawn from the sessions should be mentioned:

- Pipelines continue to age which will give rise to maintenance costs to keep safety and reliability records at least at current levels and, since companies and governments logically strive for a decrease in incidents, the need for inspection and surveillance will grow and, consequently, costs will rise further; regulators should acknowledge this as well;
- There is a common understanding that *electricity generation with gas* will decentralise with the application of micro CHP; CHP technology will develop towards very small gas turbines of a few kW of generating power for large customers and towards fuel cells for domestic applications; however it should not be underestimated that the introduction of these appliances, which are appealing from the technical perspective, requires a lot of marketing to convince customers;
- *The residential market* is facing a shift from a captive market to a non-captive market due to competition from electricity; a solution could be to improve customer satisfaction, paying more attention to comfort and ease of appliance operation;
- *LNG, gas-to-liquids and CO₂ capture, transport and storage* are being intensively researched and there are many opportunities in these market segments, from a technical, marketing and also legal point of view.

The innovation exhibit proved to be a valuable addition to the conference content with 40 companies and entrepreneurs showing their new concepts. The emphasis was on small CHP units, smart metering, LNG systems, gas detection and pipeline protection, leak detection and inspection devices. These new innovative products and technologies are ready for application by asset managers.

The Dan Dolenc Prize for Best Paper was granted this time exceptionally to two papers. The winners had to share the €10,000: Dominique



The CEOs' roundtable (OPPOSITE) and the innovation exhibit (ABOVE) proved to be valuable additions to the IGRC.





SOME IGRC 2008 STATISTICS

- 811 registered delegates from 41 countries
- 42 speakers in parallel oral sessions
- 3 keynote speakers in plenary sessions and a roundtable with the CEOs of 5 gas companies
- 4 workshops
- 40 innovation exhibits
- 270 posters presented

The presentations of the speakers are available on the website www.igrc2008.com.

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.

As Chairman of the Policy Committee, I thank the members of my Committee and of the Technical Programme Committee chaired by the indefatigable Christian Beckervordersandforth for their fine efforts in arriving at a "to the point" conference programme that convinced so many people this IGRC was worth participating in.

Furthermore, the IGRC is grateful to the French Gas Association AFG and the French National Organising Committee with Daniel Paccoud and Marc Florette assisted by their dedicated staff, who achieved all the practical work like registration and furnishing the venue on time. Finally, our gratitude goes to the numerous companies that sponsored the IGRC. Their support provided the indispensable financial backbone that a massive conference like this needs to get off the ground.

● Join us again next time

The next IGRC is in Seoul, Korea, October 19-21, 2011. As more than 100 gas professionals from Asia visited Paris and presented many high quality papers, while keeping in mind that the gas industry in Asia is growing at a relentless pace, we expect many more intriguing innovations from Asian scientists in 2011. It will be a challenge for the Americas and Europe to take on this competition and to contribute to the same degree, but that can only be good for our industry. Competition with oil and electricity brought excitement to the industry in the past; liberalisation brought us new visions with regard to marketing and infrastructure. So, as a world market for gas is coming of age due to the LNG trade levelling global gas prices, let intercontinental exchange of technical developments give another boost to the gas industry and exploit the efficiency and environmental advantages of the best fossil fuel.

George H. B. Verberg is the Chairman of the IGRC Policy Committee. For more information on the next IGRC see www.igrc2011.com.

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Countdown to the 24th World Gas Conference

By Eduardo Ojea Quintana



Eduardo Ojea Quintana.

From October 5-9, 2009, Argentina will be hosting the most important global event for the gas industry in Buenos Aires. To register for the 24th World Gas Conference, and for detailed information on the Conference Programme, Keynote Speakers, Luncheon Addresses, Strategic Panels, Exhibition, Accommodation, Tours and Technical Visits, visit our newly-updated website – www.wgc2009.com.

Please go to the Conference Registration section of the website to book your place. The deadline for

online delegate registration is September 11, and due to limited capacity at the Conference venue we recommend that you sign up as soon as possible. Every participant, including accompanying persons, must be registered in order to attend the Conference.

Registration for regular delegates includes admission to all Conference sessions; Conference documentation and a delegate pack; entry to the Opening Ceremony and Gala Dinner; entry to the Closing Ceremony and Farewell Party; admission to the Exhibition; coffee breaks; Internet access; and a city tour of Buenos Aires on either Saturday October 3, Sunday 4, Monday 5 or Tuesday 6.

● Submission of Complete Papers

In March, every author that presented an abstract received notification if their paper had been accepted. Those that were successful are now working with the relevant Committees.

Authors of accepted abstracts should go to the Call for Papers section of the website for full

SPEAKERS

Among the main speakers already confirmed are:

- Antonio Brufau, Chairman and CEO, Repsol YPF and Vice President Gas Natural Group
- Faisal Al-Suwaidi, Chairman and CEO, Qatargas Operating Company
- Alexey B. Miller, Deputy Chairman of the Board of Directors and Chairman of the Management Committee, Gazprom
- Bernhard Reutersberg, CEO, E.ON Ruhrgas
- Maria das Graças Silva Foster, Director of Gas and Energy, Petrobras
- Akio Nomura, Chairman, Japan Gas Association
- George Kirkland, Executive Vice President, Global Upstream and Gas, Chevron Corporation
- Jean-François Cirelli, Vice Chairman and President, GDF SUEZ
- Christophe de Margerie, Chairman and CEO, Total
- Tan Sri Dato Seri Mohd Hassan Marican, President and CEO, Petronas
- Tony Hayward, Group Chief Executive, BP
- Thomas E. Skains, Chairman, President and CEO, American Gas Association
- Azizollah Ramezani, Deputy Minister and Managing Director, National Iranian Gas Company
- Marcel P. Kramer, Chairman of the Executive Board and CEO, N.V. Nederlandse Gasunie

submission instructions:
[www.wgc2009.com/
CallIntroduction.asp](http://www.wgc2009.com/CallIntroduction.asp).

The Submission Deadline is
July 15.

The IGU Technical Committee
will appoint successful abstracts
for either oral or poster presenta-
tion, and all authors shall be
duly notified.

These papers are the culmi-
nation of three years of studies
and investigations by leading
experts of the industry, and
Argentina is proud to have
presided over this productive
Triennium.

The 24th World Gas
Conference will be the ideal
environment for key decision-makers to meet and
discuss the current challenges facing the sector,
and to make important decisions about the future
steps that we need to take.

All facets of the world's gas and energy
industries will be represented, from the key
energy companies to the most influential politi-
cians and regulators; the conference will there-
fore offer the ideal opportunity to debate the



TOP, ABOVE
AND LEFT
Vibrant
Buenos Aires
will host the
24th WGC.



BELOW, BELOW MIDDLE AN BELOW BOTTOM

Pre- and post-Conference tours are available to allow delegates to visit famous sights in Argentina such as the Iguazú Falls (BELOW), the Perito Moreno Glaciar (BELOW MIDDLE) and Bariloche (BELOW BOTTOM).



current strategies and technological advances of the industry. With all the many changes that the industry has seen in the past few years, this event will provide the perfect forum for understanding what these changes actually mean for the energy sector.

All of us on the National Organising Committee look forward to welcoming you to Argentina.

Eduardo Ojea Quintana is the Chairman of the National Organising Committee for the 24th WGC.

**CALL FOR PHOTOS:
INTERNATIONAL PHOTOGRAPHY
CONTEST**

It is a pleasure to announce the inaugural International Photography Contest "Views on Gas Worldwide". The Contest's aim is to showcase inspiring images of the natural gas industry interacting with people and the environment, and also to underscore the major significance of this fuel for human life.

Winners will receive a state-of-the-art digital camera. The first-, second- and third-placed prize-winners will also be invited to the Conference in Buenos Aires and will receive complimentary flights, accommodation and full delegate registration. Finally, they will be officially presented with their prizes on the last day of the event.

You do not have to be registered for the World Gas Conference to submit your photograph. Applicants may be professional or amateur photographers. All employees from organisations affiliated to any IGU Charter Member, as well as employees of IGU Associate Members, are welcome to participate.

For full details about the Contest and information on how to enter, please go to our website:

www.wgc2009.com/Photography.asp.

The deadline has now been extended to April 30.



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COORDINATION COMMITTEE PROGRESS REPORT

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Among available energy resources, natural gas, whose usage areas and goals are quite extensive, is quickly becoming widespread in our country. Parallel to environmental concerns across the world, there is also a tendency toward the use of clean energy resources in our country. Natural gas has increased its strategic importance in respect of know-how, technical infrastructure and reserves compared with other clean energy resources which are still in the development stage.

It is very important to secure supply and demand within the natural gas chain, which extends from resource to final user, to increase the use of new technologies and R&D investment, develop pricing policies resulting from international discussions and legal regulations focused on creating liberal markets within countries. In the same manner, operating an intercity natural gas distribution network is an activity which aims at maximising security, technical knowledge, qualified personnel and customer satisfaction, and requires a 24 hour a day uninterrupted service. While performing the operational activities, capability for using logistical support like appropriate materials and equipment, coordination, communication, mapping, statistical data analysis in the most efficient way and having a flexible network structure are the most important elements of an uninterrupted and safe service. This process is also related to the economy, trade, business administration and law.

Management of such a complicated system requires a profound natural gas experience and established institutional culture. The natural gas distribution sector, which has been developing in

recent years in both our country and in the international arena, needs to exchange knowledge, to cooperate in areas such as increasing educational facilities, to look for solutions for common problems, to follow technological developments closely and to perform alongside natural gas exploration and production companies. INGAS International Natural Gas Symposium, which we organized in 2005 and 2007, has been a big step toward closing a gap in this area. The third INGAS International Natural Gas Symposium, which we will organise in 2009 will make important contributions to the sector's common demands and will shed light on the investments and projects of the natural gas in the future too. I am very proud and happy to invite valuable sector representatives like you to this symposium.

Bilal ASLAN

İGDAŞ General Manager

Main Topics For Ingas2009 Symposium

- ▶ Alternative Uses of Natural Gas and New Technologies
- ▶ The Legislative Framework in the Natural Gas Sector, Market Liberalisation, European and Turkish Gas Directives
- ▶ Supply-Demand Security and Pricing Policies
- ▶ Asset Management and Gas Quality
- ▶ Environment and Societal Impacts of Natural Gas
- ▶ **PANEL:** Current Situation and Development Prospects of the Natural Gas Sector in Turkey



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Introduction and Key Developments

By Roberto Brandt and Andrés Kidd

The following Progress Report provides an overview of the status of the projects embarked upon by the five Working Committees (WOC), four Programme Committees (PGC) and two Task Forces (TF) of IGU, in preparation for the 24th World Gas Conference (WGC) which will take place in Buenos Aires, Argentina, October 5-9.

The report also details the status of the Special Projects engaged in for this Triennium, developed thanks to additional efforts from the Technical Committees mentioned above, and support from experts specialising in specific topics.

● Technical Committees: Main highlights

As expected, there has been no significant development in the membership of the Technical



CC Chairman Roberto Brandt (RIGHT) and Andrés Kidd, CC Secretary.

Committees since our last report, which was published in the October 2008 issue of the magazine and noted that a record total of 751 experts from all over the world had been reached. *Figure 1* shows the membership evolution from the beginning of this Triennium and *Figure 2* shows the



The fifth Coordination Committee meeting was held in the historical city of Gyeongju, Korea.

TECHNICAL COMMITTEE MEMBERS as at December 2008

WOC 1 – Exploration and Production	50
WOC 2 – Underground Gas Storage	61
WOC 3 – Transmission	95
WOC 4 – Distribution	89
WOC 5 – Utilisation	104
PGC A – Sustainable Development	57
PGC B – Strategy, Economics and Regulation	114
PGC C – Developing Gas Markets	46
PGC D – LNG	102
Task Force Research & Development	23
Task Force Gas Market Integration	10
Total	751

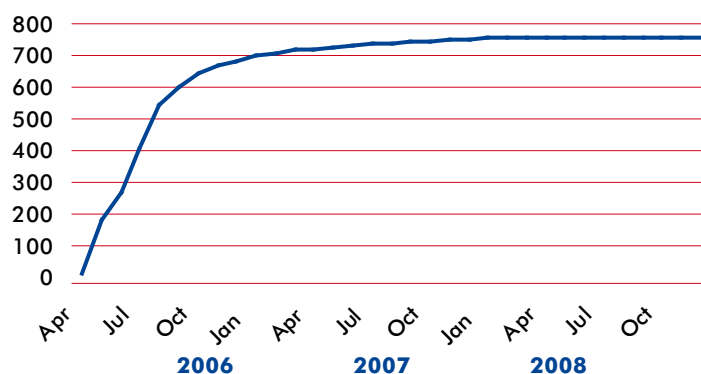
wide global coverage, which has provided the studies with an enriching contribution in terms of diverse regional perspectives. Finally, *Table 1* details the distribution of the members in the Technical Committees.

For a quick reference, we have detailed in *Table 2 (over)* the Study Groups into which the Technical Committees have been divided, listing the respective topics which are being developed, as established in the 2006-2009 Triennial Work Programme (TWP). The full version of this document is available on the IGU website.

Our fifth Coordination Committee (CC) meeting was held on September 23, 2008, in the historical city of Gyeongju, Korea, where the representatives from each Technical Committee provided a report on the progress of their technical work, which is summed up in the sections that follow.

The meeting centred mostly on the programme content and activities planned for the 24th WGC, both for the Committee Sessions and for the Expert Fora. Furthermore, we also held a constructive exchange with some of the Committees

EVOLUTION OF COMMITTEE MEMBERSHIP as at December 2008



related to the Strategic Panels defined for the Conference.

● Progress on Special Projects

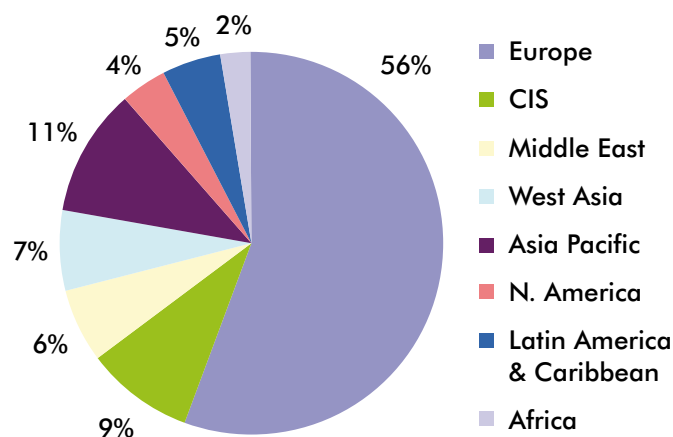
The *2030 Natural Gas Industry Outlook* study, which will address the key issues for a strategic analysis of the global natural gas industry for the next 25 years, is right on schedule. Following the compilation of the input from the Technical Committees, a detailed “backbone report” of the work was prepared and submitted to the Steering

ABOVE LEFT
Table 1.

ABOVE RIGHT
Figure 1.

BELOW
Figure 2.

GLOBAL COVERAGE





RIGHT
Table 2.

STUDY GROUPS AND TOPICS FOR THE 2006-2009 TRIENNIUM		
Committee	Study Group	Topic
WOC 1	SG 1.1	Remaining conventional world gas resources and technological challenges for their development.
WOC 1	SG 1.2	Difficult reservoirs and unconventional natural gas resources.
WOC 2	SG 2.1	UGS database.
WOC 2	SG 2.2	UGS technology improvements.
WOC 2	SG 2.3	Intelligent UGS (iUGS).
WOC 3	SG 3.1	Impact of regulation on gas transmission, safety and security of supply.
WOC 3	SG 3.2	Review of new technologies in pipeline and construction monitoring.
WOC 3	SG 3.3	Contribution of gas transmission to climate protection and sustainable development.
WOC 4	SG 4.1	Review of asset management strategies and practices.
WOC 4	SG 4.2	Review of leakage reduction strategies and practices.
WOC 4	SG 4.3	Development of best practices for the prevention of third party interference damage to distribution assets.
WOC 5	SG 5.1	Industrial utilisation: distributed energy and other specific issues (fuel switching, technical research, regulatory aspects, H ₂). Efficiency indicators.
WOC 5	SG 5.2	Domestic and commercial utilisation: distributed energy and other specific issues (new appliances, home fuelling, air cooling, combination with renewables, tariff/regulation). Efficiency indicators.
WOC 5	SG 5.3	Natural gas vehicles (NGVs): continuation of current project.
PGC A	SG A.1	Evolution, expansion and promotion of IGU's Guiding Principles on Sustainable Development and Climate Change.
PGC A	SG A.2	Gas industry response to climate change: studies on the reduction of greenhouse gases.
PGC A	SG A.3	Post-Kyoto concept.
PGC B	SG B.1	Supply and demand to 2030.*
PGC B	SG B.2	Gas price formations and trends.*
PGC B	SG B.3	Regulation and future industry structure.
PGC C	SG C.1	Developing gas markets in South West and Central Asia: India, Pakistan, Iran, Turkmenistan and Azerbaijan.
PGC C	SG C.2	Developing gas markets in South America.
PGC C	SG C.3	Developing gas markets in south-eastern Europe.
PGC D	SG D.1	LNG quality and interchangeability.
PGC D	SG D.2	LNG contract clauses for more flexible global LNG markets.
PGC D	SG D.3	Creative solutions for new LNG facilities.
TF R&D	Objective 1	Role and structure of R&D within the gas industry.
TF R&D	Objective 2	Focal point of IGRC.
TF GMI	Objective 1	Harmonising the structures of the energy and gas business for regional integration.
TF GMI	Objective 2	Governmental and corporate players, partners for success.

* Study Group outputs will be used as partial inputs for a 2030 Natural Gas Industry Outlook study, which will be coordinated by PGC B (and the CC Chairmanship) with support from all other Committees.



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Committee (SC) – composed of well-known industry experts – during a meeting held in Vienna, Austria, last November. Several of the key messages were identified, together with a number of considerations for the preparation of the first draft of the report scheduled for April. The last SC meeting is programmed for June in London, right after the Executive Committee meeting, where the final version will be defined, together with the planning of the 24th WGC Strategic Panel where the main highlights of the work will be debated.

The CO₂ Mitigation project, which involves WOC 1 (Exploration and Production), WOC 2 (Underground Gas Storage), WOC 3 (Transmission), WOC 5 (Utilisation), and is led by PGC A (Sustainable Development), counts also on the support of experts on the topic. The group has completed a first draft of the report, which is

currently being fine-tuned into the final deliverable for the 24th WGC, while the Strategic Panel that will address this topic is also being defined.

The *Initiative on Best Practices Ideas and Proposals*, led by Task Force R&D, was launched through direct invitation to all the membership of the Technical Committees, and also by means of a special feature in the Call for Papers. We hope the input received will render a useful compilation of best practices that encompasses the whole chain of the gas industry.

Following this Triennium's policy on the promotion of energy efficiency as one of the cornerstones of sustainable development, WOC 5 (Utilisation) completed the first model of the IGU Energy Efficiency Indicators (IEEI), which was presented to the IGU membership during the last Council meeting in Korea. This reference tool will be launched during the 24th WGC.

To conclude, the Task Force on Gas Market Integration – which has been contributing actively in the last few issues of the IGU magazine with case studies on this theme – completed the draft of the first set of IGU's "Guiding Principles for Gas Market Integration". This topic will be debated extensively in both a Committee Session and in one of the Strategic Panels during the 24th WGC.

● **"Roadmap" towards the 24th WGC:
Technical paper submission**

IGU's 2006-2009 Triennium will end at the 24th WGC, to be held in Buenos Aires, October 5-9.

As planned, the Call for Papers was launched last year on June 1 with a deadline for the abstract submission of February 15. Following the selection process in April, the Full Papers must be delivered by the established deadline of July 15.

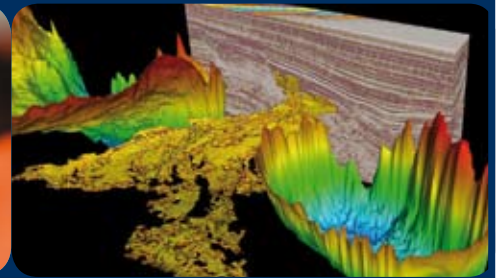
Roberto Brandt is the Chairman of the Coordination Committee and Andrés Kidd is the Committee's Secretary. Readers requiring further information are invited to contact Andrés Kidd at andrew@ifisa.com or to visit IGU's website at www.igu.org.



CO₂ mitigation is one of this Triennium's Special Projects – the picture shows Norway's Mongstad refinery where a modernisation project will see a staged reduction of its CO₂ emissions.

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