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The Executive Committee met in the afternoon under President George Verberg and held an initial private business session followed by a public session looking at the role of LNG in the global gas market. (BELOW RIGHT) Mr Hamad Al-Baker, Manager Administration of Qatargas, addresses the LNG session.



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Meeting the Challenge of a Transition to a Global Gas Industry

*By P.J. Dingle, President, ExxonMobil Gas & Power Marketing Company
Excerpted remarks from a presentation made at the Baker Institute for Public Policy, Houston, Texas (May 26, 2004)*

For years, the natural gas industry was a regional business. Gas was consumed where it was produced, and regions were generally capable of meeting their own demand requirements. But this regional model is quickly evolving into a global market. Natural gas is the world's fastest-growing energy source, and demand has outgrown domestic resources in the major consuming regions.

Although supply has tightened in mature markets, new technology has greatly reduced the cost of converting remote sources of natural gas to LNG – allowing for gas to be economically transported to consumers in distant markets. As a result, resource-rich countries are now positioned to be reliable suppliers of economical natural gas to markets around the world.

Other new technologies, such as high-strength steel, have made it possible to build more efficient pipelines. Still other advances have helped find more gas at lower costs, allowing our industry to develop gas resources that, until recently, were beyond our economic reach. These technologies, coupled with the growing demand, are enabling this global natural gas market to emerge.

The International Energy Agency predicts the world will need nearly 270 billion cubic metres of new natural gas production capacity every year – an amount equal to the current capacity of western Europe. This new capacity will be needed to meet a near doubling of demand and to compensate for the natural decline of mature fields. The implication is clear – there is a greater need for cooperation between exporting and importing countries. Governments, along with industry, will need to work together to establish a climate that can attract the large sums of capital required to meet future development and infrastructure requirements.

To meet the growing demand, our industry will have to invest more than US\$3 trillion during the next 25 years. More than 55% will be for exploration and development; the rest will be required for pipelines, ships and other infrastructure. Companies like

ExxonMobil have the necessary technology and the financial capability to make these large investments, but they need assurance of long-term project viability.

While our industry already has considerable experience working in developing countries, we've also faced many challenges. Various projects have been delayed – sometimes for years – because of political instability, regional differences, or difficulties in negotiating mutually agreeable terms. This type of uncertainty requires us to bear an increasing burden of risk to advance complex, costly projects. Therefore, host governments need to play a critical role in reducing risk by establishing laws that encourage resource investment and development.

A stable legislative and regulatory framework has always been important for successful resource development in producing countries. What makes our industry unique, however, is that resource investments in developing countries also depend on a level business and regulatory climate in the consuming countries, because the value chain for gas is more integrated and tightly linked from well to market. Governments in both resource and consuming countries must work cooperatively to minimise investment risk.

A final challenge to meeting the future demand for natural gas is twofold: licensing of facilities and access to resources. Many high-potential areas are closed to development and the time required for licensing new facilities is often long.

ExxonMobil believes that supply security is enhanced by supply diversity. However, access to critical resources is often restrained. We encourage host governments to recognise that policy objectives can be balanced with the need for responsible resource development.

I am confident that forward-looking governments, working with the gas industry, can foster an environment that will benefit us all. Our industry's challenges are highly complex – both technically and politically – and cooperation is the only way we can move forward successfully.

LE SYNDICAT PROFESSIONNEL DU GAZ EN FRANCE

- L'AFG est le syndicat professionnel de l'ensemble des acteurs de la filière gazière (Gaz Naturel et GPL).
- L'AFG rassemble l'ensemble des entreprises, industriels, professionnels et associations professionnelles intervenant sur le marché français.
- L'AFG est le lien entre tous les acteurs de ce secteur d'activité et contribue à sa promotion.
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- L'AFG représente l'industrie gazière française au sein de l'Union Internationale de l'Industrie du Gaz (UIIG).
- L'AFG est membre de Marcogaz (Association Technique de l'Industrie Européenne du Gaz Naturel) et d'EASEE – gas (Association Européenne pour la Rationalisation des Echanges d'Énergie – gas). Elle est ainsi en mesure de mettre en valeur, de promouvoir et de défendre l'industrie française au niveau européen et, plus largement à l'international.

THE GAS TRADE ASSOCIATION IN FRANCE

- The AFG is the trade association for all those involved in the gas sector (Natural Gas and LPG).
- It includes all businesses, manufacturers, companies and trade associations operating on the French market.
- The AFG is the link between all participants in this business sector and contributes to promoting it.
- Being a member of the AFG means being represented in all fields of the gas industry.
- The AFG represents the French gas industry in the International Gas Union (IGU).
- The AFG is a member of Marcogaz (Technical Association of the European Natural Gas Industry) and EASEE – gas (European Association for the streamlining of Energy Exchange – gas). It is thus able to enhance, promote and defend the French industry in Europe and, more broadly internationally.

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Introduction and Key Developments

The purpose of the Coordination Committee progress report is to provide all Charter and Associate Members of IGU, and members of the Council, Executive Committee, Coordination Committee, Programme and Working Committees, Task Forces and Special Projects as well as other interested parties with information about the progress of the work as described in the Triennial Work Programme (TWP). The progress report consists of contributions from all parties involved. It is published as part of the IGU Magazine as well as on the IGU Collaboration Portal. The report is edited by the Coordination Committee (CC) Secretariat under the responsibility of the CC Chairman. The account of key developments below is based mainly on the monthly CC progress reports.

As far as the content of the work of the Committees, Task Forces and Special Projects is con-

cerned, this second report in the Dutch Triennium concentrates on the first six months of 2004.

● General

The Coordination Committee held its second formal meeting in Doha, Qatar on March 26. It was organised following the LNG-14 Conference and along the same lines as our first CC meeting. Organisational matters were discussed for one hour followed by 2.5 hours of content delivered by the respective Chairmen and Chairwoman of the Committees, Task Forces and Special Projects in the presence of IGU Executive Committee members. The minutes of the meeting and the respective presentations are published on the IGU website and the portal.

During the meeting the Secretary General Peter Storm commemorated Mr Yannick Guerinni who passed away earlier this year. Yannick was attached to the Gas Group of the United Nations Economic Commission for Europe in Geneva, Switzerland, and apart from his membership of our Committees represented IGU on many occasions. IGU is very grateful for his valuable contributions and those who knew him will remember him always as a good colleague and active IGU participant.

The CC meeting was followed by a meeting of the Executive Committee (EXC), which included a special session looking at the role of LNG in the global gas market. This session was addressed by the Chairman of PGC D (LNG), Chawki Rahal, who presented the progress and viewpoints of IGU with respect to LNG.

For various reasons not all the formal delegates were able to attend, but the alternates of those who could not travel to Doha did an excellent job in their place. Overall, the meetings went very smoothly and we would like to thank our Qatari hosts for their excellent organisation and hospitality.

The Secretariat of WOC 1 has been taken over by Ms Rebecca Hyde from Ms Gillian

BELOW
Table 1.

SUMMARY OF NOMINATIONS FOR COMMITTEES

WOC PGC	Leadership	Members	Associate Members	Total
1	3	34	5	42
2	3	43	6	52
3	3	54	1	58
4	3	54	1	58
5	3	76	1	80
A	3	16	1	20
B	3	54	2	59
C	3	41	3	47
D	3	58	3	64
All	27	430	23	480



Hutton, whom we would like to thank for her efforts during the very busy start-up period of the Committee.

As reported in the last progress report, the Executive Committee meeting in Cape Town on October 28, 2003 approved the TWP. The printed version has been sent to all IGU Members. An errata page was printed which included the new IGU Member Bolivia.

● Member nominations of delegates to Committees

The total number of Committee delegates, alternates and Study Group members seems to have levelled off at around 500 (see Table 1). We would like this number to rise and seek to increase the level of representation in IGU in order to have as many views and experiences contributing to our views as possible. You will find a complete list of all the delegates on the Collaboration Portal.

Some 46 (55%) Charter and Associate Members have now appointed delegates to the Committees and Study Groups. The Coordination Committee will continue to encourage the remaining members to nominate their delegates until at least 65% (the target for this Triennium) of the Members have done so.

The spread over the continents per committee on average is: North America (one), South America (one), Africa (one), Europe (17), Australia (one) and Asia (seven).

PGC A, PGC B, PGC C and WOC 1 and 2 asked for specific action to increase their numbers of delegates. Actions were taken by the Secretary General and the CC Chairman and were partly successful. There are still some specific wishes, for instance for PGC C with regard to delegates from China.

● Meetings of Committees and Task Forces

All the Committees and Task Forces have held their second meetings (see Table 2) and report on their work in the next chapter.

● Joint meeting

Preceding the Oslo Council meeting in September a joint meeting has been organised in which WOC 1, WOC 2, PGC A and TF ICT will participate. This will take place in the facilities of DONG in Hørsholm, Denmark, where delegates will hold their regular Committee and Study Group meetings and then come together for a joint workshop. If the joint meeting is a success we will organise a second one for other Committees next year. For planning purposes the dates for the joint meeting in 2005 have already been chosen as April 11, 12 and 13 in Europe, preceding the Warsaw CC and EXC meetings of April 14 and 15. The precise venue is to be decided later.

BELOW Table 2.

COMMITTEE MEETINGS DATES AND VENUES SPRING 2004		
Committee	Spring 2004	Attended from IGU Management by
WOC 1	March 10-11, Paris, France	Storm
WOC 2	March 1-3, Milan, Italy	Panman
WOC 3	March 16-17, Buenos Aires, Argentina	
WOC 4	April 1-2, Washington, USA	Aptroot
WOC 5	January 29-30, Barcelona, Spain	
PGC A	March 11-12, Amsterdam, The Netherlands	Panman, Aptroot
PGC B	January 19-20, Munich, Germany	Panman
PGC C	March 4-5, Kuala Lumpur, Malaysia	
PGC D	March 19, Doha, Qatar	
CC	March 26, Doha, Qatar	All
TF R&D	February 7, Breckenridge, Colorado, USA	
TF ICT	February 16, Seoul, Korea	Storm



● Other meetings and visits

The CC Chairman attended the PGC B meeting in Munich on January 19 and 20.

A meeting was held on January 28 in Groningen between IGU and Marcogaz, with respect to Marcogaz becoming an affiliated organisation to IGU.

The Chairman and Secretary of the CC held a coordination meeting on January 28 with the President and the Secretary General of IGU and the Chairman of the Dutch National Organising Committee for WGC2006. The main items discussed were the preparation of the Executive Meeting in Doha. The session on LNG was discussed and the necessary decisions for its organisation were made.

On February 11 a meeting was held with the World Energy Council (WEC) in London. The meeting focussed on possible cooperation especially with respect to the issues of gas to power and regulation.

The CC Chairman attended the WOC 2 meeting and a workshop in Milan on March 1 and 2.

The CC Chairman and Secretary then attended the PGC A meeting held between March 10 and 12 in Amsterdam. The Leader of the Sustainability Special Project, Ulco Vermeulen, also attended and gave a presentation on his ideas of the work in the Special Project and possible cooperation with PGC A.

On March 17, Mr Pierce Riemer, Director General of the World Petroleum Congress (WPC), visited the CC Chairman, the main subject being the IGU contribution to the 18th World Petroleum Congress in 2005 in Johannesburg. The opportunity was taken to inform Mr Riemer about the IGU Special Projects and to introduce him to their Leaders.

Three Meetings were held and more are planned with the International Union of Technical Associations and Organisations (UATI) in preparation of a two-day seminar "Energies for the Future" to be held in Paris on March 10 and 11, 2005.

The CC Secretary attended the WOC 4 meeting, which was held in the offices of the American Gas Association in Washington DC, USA between April 1 and 3. The possibilities of the Collaboration Portal were explained in the respective Study Group meetings as well as in the plenary Committee meeting.

Later that month on April 29, the CC Secretary met with Jeff Seisler of the European Natural Gas Vehicle Association (ENGVA) in Groningen to discuss among other things the NGV presence at WGC2006 in Amsterdam. It is proposed that for NGVs there will be a special exhibition in the RAI Centre (presumably hall 7). In the conference programme a two-hour slot has been reserved in the auditorium for Friday June 9, 2006.

Intergas Marketing (IGM) and IGU are now affiliated organisations and when the 93rd IGM Session was held in Helsinki, Finland, on May 16 and 17, the CC Secretary attended to inform IGM members about the work of IGU. IGM has decided to take over for IGU the project "What can the gas industry do and develop in order to be seen as a corporate responsible citizen?" and the project leader will be Ben Warner of Gasunie (The Netherlands). During WGC2006, IGM will give its presentations on Wednesday June 7, 2006 in the auditorium in a two-hour morning session.

On May 17 to 19 the Gas and Power Fair was held in Toronto, Canada. The CC Chairman, Bert Panman, and Dick de Jong, Leader of the Gas to Power Special Project, presented the IGU vision on gas to power for North America. (The presentation is published on the Collaboration Portal, in the library of the CC's section).

During May 24 and 25 the International Association for Natural Gas Vehicles (IANGV) held its annual meeting in Graz, Austria. CC Chairman (and IANGV Vice Chairman) Bert Panman attended this meeting and also took part as moderator in the session "NGV Strategies: Focus on the Customer".

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Progress Reports from the Committees

This chapter contains news and information from IGU's Working and Programme Committees. As this issue of the IGU Magazine contains a focus on Working Committee 1 Exploration and Production (see pages 98-104), we start here with WOC 2. Subsequent issues of the magazine will focus on other Committees.

● Working Committee 2 Storage

WOC 2 has 52 members with 33 from Europe, 12 from Asia, three from Africa, two from North America and one each from Australia and South America. The second meeting was held in Milan, Italy, between March 1 and 3, and was attended by 22 people. During the meeting a workshop on UGS deliverability maintenance was held and 11 presentations were made (Italy – five, Germany – two, Russia – two, France – one and USA – one). The reports are being translated into Russian and will be published by Gazprom's publicity and information centre. Delegates were also given a tour of a local UGS facility.

The studies of the Committee were originally divided into three main topics covering basic activities, benchmarking and environmentally-compatible storage operations, but during the meeting it was proposed to combine the latter two into one Study Group. The final decision was set to be made during the September joint meeting in Hørsholm. The current and proposed Study Groups are:

SG 2.1 Basic UGS activities

Leader: Mr Joachim Wallbrecht (BEB, Germany)

Members: 13

Meetings and results so far: Meetings were held in Hanover on January 15 and in Paris on April 26. A glossary of relevant storage terms has been

prepared. The definitions will form the basis for a questionnaire, which will be discussed at the joint meeting in September.

SG 2.2 UGS benchmarking

Leader: Dr Sergei Khan (Gazprom, Russia)

Members: 10

Results so far: It was proposed to collect information on best practices and to study advanced technological applications. The original leader, Dr A. Grigoriev, was unable to take up his duties and the WOC 2 Chairman has stood in.

SG 2.3 Environmentally-compatible storage operations (this name is amended compared to that published in the last progress report)

Leader: Dr Gretta Akopova (VNIIGAZ, Russia)

Members: 12

Results so far: Dr Akopova could not attend the second WOC 2 meeting due to illness. Dr Nadezhda Vlasenko (VNIIGAZ, Russia) substituted for her and proposed two research topics: analyses of national environmental protection standards; and obtaining information on the best examples of technique and technologies for reducing environmental impact.

Proposed new SG 2.2 UGS – Achievements and trends in the field of safety, technical efficiency and environmental impact

Proposed programme: The main goal will be compiling a list of the technologies which enhance the efficiency and reliability of efforts to reduce environmental impact.

All the necessary information for WOC 2's work (minutes, papers, presentations and photographs) is published on the Collaboration Portal and particular thanks are due to Joachim Wallbrecht, Fred Metzger, Vanni Damiani, Jacque Grappe and Elena Sushilina for their contribution to the success of the Committee's meetings.



● **Working Committee 3 Transmission**

The composition of WOC 3's membership has changed slightly and efforts to encourage North American participation have resulted in one Study Group member from Canada. There are 58 members, 37 of them participating as delegates, 20 as alternates and one as a representative of an Associate Member. The geographical breakdown is Europe (41), Asia (10), South America (three), Africa (two), Australia (one) and North America (one).

There are four Study Groups in WOC 3 and SG 3.3 is sub-divided into onshore and offshore categories. Mr Tanguy from Gas de Sud-Ouest had been appointed by Mr Michel Bosch (the French delegate to WOC 3) as Leader of SG 3.3 for the onshore infrastructure. Unfortunately Mr Bosch left WOC 3 in January owing to a change of position in his company and Mr Tanguy had to resign due to pressure of work. Actions are being taken by the WOC 3 Chairman to find a substitute. The current status of the Study Groups is as follows:

SG 3.1 Global review of third party access and network codes

Leader: Mr Francesco Caria (Snam Rete Gas, Italy)
Members: Seven and one observer

SG 3.2 Increased service life in the design, construction, operation and maintenance of a gas pipeline

Leader: Mr Jorge Bonetto (Transportadora de Gas del Sur, Argentina)
Members: 11

SG 3.3 Address increasing difficulties to create infrastructure

Leaders: Offshore – Mr Alfred Oijord (Statoil, Norway), Onshore – to be nominated
Members: six

SG 3.4 A guideline for using or creating incident databases for natural gas transmission pipelines

Leader: Mr Rein Bolt (Gasunie, The Netherlands)
Members: nine



One of WOC 3's aims is to increase use of the Collaboration Portal.

WOC 3's second meeting took place on March 16 and 17 in Buenos Aires, Argentina, and 27 members participated. The Study Group Leaders reported on the work done to date and presented draft plans for the rest of the Triennium.

For SG 3.1 Mr Francesco Caria presented the results from the first questionnaire. More questionnaires will be sent to members in order to review the global evolution of third party access in 2004 and 2005.

For SG 3.2 Mr Jorge Bonetto reported that the Study Group's first meeting had taken place in Buenos Aires on 15 March, just before the WOC 3 meeting, and that his proposal to focus on stress corrosion cracking as it is a problem that concerns many countries had been accepted. This was in turn accepted by the members of the Working Committee.

For SG 3.3 Mr Ulzurrun as WOC 3 Chairman explained that the search for a new leader to cover onshore infrastructure was still underway. Then Mr Sigurd Hamre, on behalf of the Leader covering offshore infrastructure (Mr Alfred Oijord), proposed a work programme for the sub-group explaining that its focus was on the evaluation of high-capacity deepwater pipelines.



For SG 3.4 Mr Bolt reported that the first meeting had taken place in Groningen on January 13 and 14. He presented a work programme and then proposed changing the name of the Study Group from "An IGU proposal to promote and to facilitate safe transmission of gas by pipeline systems" to the current one.

The following action list was proposed in the meeting to be accomplished as soon as possible:

WOC 3 Chairmanship

- To communicate to all the WOC 3 members a draft schedule for the World Gas Conference and master schedule for the work of the Study Groups.
- To resolve the leadership of SG 3.3 onshore.
- To encourage active participation of members in the Study Groups and Collaboration Portal. Use of the latter is currently limited and the aim is to increase it by regularly introducing points to create discussion, posting special items and uploading questionnaires.

Leaders of the Study Groups

- To establish a calendar and deliverables for the work of the Study Groups according to the master schedule approved in Qatar by the CC.

WOC 3 Secretariat

- To publish the minutes of the Buenos Aires meeting.

WOC 3 members

- To answer the questionnaires circulated by the Study Groups.
- To make suggestions for keynote speakers and special addresses.

WOC 3's next meetings will be held in Helsinki, Finland on September 16 and 17, in Russia in spring 2005 and in Norway in September 2005.

● Working Committee 4 Distribution

WOC 4 held its second meeting of the new Triennium in the Washington DC area on April 1 and

2. It was hosted by the Chairman, Peter Cistaro, and the American Gas Association (AGA), and was attended by 29 people representing 17 countries and four continents.

Peter Cistaro gave a report on the US gas industry and other special reports were presented by Svend Bomholt on liberalisation of the Danish gas industry, by Jorge Doumanian on NGVs in Argentina and by John Frantz on the underground utility verification process in the US.

Immediately prior to the meeting on March 31, CC Secretary Rob Aptroot visited each Study Group to brief members in detail about use of the Collaboration Portal. He stressed its value when carrying out surveys. At the meeting itself Secretary Aptroot gave an overview of plans and facilities being considered for WGC2006 in Amsterdam. He also gave some proposed dates for the call for papers and other key deadlines. These items should be confirmed at the next CC meeting.

The Committee is organised into three Study Groups as follows:

SG 4.1 Pipeline integrity (linkages with SG 4.3, WOC 3 and WOC 5)

Coordinator: Mel Ydreos (Canada)

Vice Coordinator: Jeremy Bending (UK)

Main areas of study:

- Integrity policies/approaches
- Integrity practices
- Integrity enablers
- Integrity external influences

Status: George Mosinskis of the AGA gave a special report on pipeline integrity in the US. The first draft of the report structure has been completed and is being reviewed. Assignments have been made for data gathering and next steps.

SG 4.2 Best practices (linkage with SG 4.3)

Coordinator: Jorge Doumanian (Argentina)

Vice Coordinator: Fergal Geoghegan (Ireland)

Main areas of study to determine leading practices in:

- Main and service pipe construction

CAMEROON: Making Strides towards Gas Development

Both associated and non-associated gas have been discovered on and offshore Cameroon since the early days of the country's hydrocarbons industry. It is estimated that some 5.5 trillion cubic feet of recoverable non-associated gas has been discovered in Cameroon to date, accumulated in pools ranging in size from 25 to 400 billion cubic feet. The exception is the Sanaga Sud field, which contains recoverable volumes of around 800 billion cubic feet. About 80% of these discovered volumes are currently considered economically recoverable.

Cameroon is under-explored in terms of gas and substantial scope exists for the discovery of additional volumes.

In view of the foregoing, and considering the fast expanding national and sub-regional economy, options of gas commercialisation are being considered. All the fundamental issues pertaining to gas monetisation have been looked at for Cameroon in the Masterplan for the Development of National Gas Resources. A number of gas development options have been identified. But a

large, integrated gas development will provide the long-term platform for the delivery of cost-competitive gas for power generation in Cameroon, which appears to be the more pressing need for gas development in Cameroon.

The implementation of recommendations of the said Masterplan will be supported by Our Gas the Gas Code enacted on December 30, 2002, which institutes a favourable legal and contractual framework, and provides for incentives to gas investors, in a country renowned for its political stability as well as highly qualified and competent human resources.

Cameroon's recent dual admission into the International Gas Union (IGU) and the World Bank-sponsored Global Gas Flaring Reduction Partnership (GFRP) is an encouraging recognition of the country's sustained efforts to promote natural gas.

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Status: A special report on financial benchmarking data collected by the AGA was given by Bruce McDowell of AGA Policy Analysis. Questionnaire 1 on "Best practices in gas distribution" has been completed and posted on the SG 4.2 site for completion. A message was sent to all members of WOC 4 requesting them to visit the site and respond to the SG Chair by June 30.

SG 4.3 Distribution research & development – requested name change to "Role of R&D and technology in gas distribution" – (linkages with R&D Task Force, SG 4.1 and SG 4.2)

Coordinator: Juan Puertas (Spain)

Vice Coordinator: Alessandro Soresina (Italy)

Main areas of study:

- Define the R&D and technology programmes of common interest to address the needs of stakeholders in several selected areas
- Evaluate the results of various market scenarios
- Benchmark approaches to R&D
- Present best practices conclusions
- Analyse approaches to developing required funding

Status: A general questionnaire on R&D has been drafted and sent to members of WOC 4 for completion by August 31.

Future meetings

The next WOC 4 meeting will be held in Milan, Italy, between October 5 and 8. The meeting after that is proposed as a joint meeting with WOC 3 in Moscow in spring 2005. Then there will be meetings in Barcelona, Spain, in autumn 2005,

Bratislava, Slovakia, in spring 2006 and at WGC2006 in Amsterdam in June 2006. The three Study Groups are to meet at the same location one day before each WOC meeting.

● **Working Committee 5 Utilisation**

WOC 5 has 80 members from 38 countries. Its second meeting was held in Barcelona, Spain, on January 29 and 30 and was attended by 42 delegates. The next meeting will be held in Vancouver, Canada, on November 4 and 5 to coincide with the International Gas Research Conference. Thereafter meetings are scheduled for May 2 and 3, 2005 in Croatia, for October 13 and 14, 2005 in Italy (although this is to be confirmed) and for April 20 and 21, 2006 in Russia. The four Study Groups have additional meetings planned during the forthcoming months.

SG 5.1 Industrial utilisation – Howard Levinsky

Industrial end users are faced with substantial challenges arising from the drive towards sustainable development. They have to strive for higher energy efficiency to reduce CO₂ emissions and the consumption of primary energy resources. They need to reduce pollutant emissions to lessen the impact of industrial activities on the environment. And they need to improve the quality, flexibility and reliability of their production processes to limit the consumption of raw materials.

SG 5.1 will report on the improvements concerning:

- New combustion technologies like flameless combustion that are able to provide a substantial contribution to energy savings (25-55% in several industrial furnaces) in high temperature process furnaces and gasifiers, with a substantial reduction of NO_x emissions.
- New devices for gas quality measurements/control. The interoperability of networks results in a greater concern for the effects of gas quality on the performance of equipment.
- Gas turbines, which still require improvements



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and development, in particular for the combustor. Moreover, catalytic combustion and flameless oxidation of lean fuel gases are potentially attractive. Connections with SG 5.4 will be recommended for this topic.

- Use of hydrogen, in a medium-to-long-term vision towards the zero emission goals. Apart from fuel cells, combustion of pure H₂ and of H₂-rich blends causes problems that require investigation, because flame properties change significantly.

SG 5.2 Domestic and commercial utilisation – Jean Schweitzer

The utilisation of gas for domestic and commercial markets represents about 10% of the total gross energy consumption worldwide and this share is growing. The development of the gas market is today one of the most effective solutions for saving energy and reducing CO₂ emissions.

The work of the Study Group will be a continuation of the work carried out in the previous Triennium under SG 6.1. While the previous work was done at a very general level, SG 5.2 operates in more detail, possibly by means of case studies with manufacturers that would agree to collaborate. The work of the Study Group will be influenced by the changes that are seen every day in the new energy market: the appliances of tomorrow will be multi-energy and most of the gas companies will also sell electricity or other forms of energy.

In practice the following targets are suggested:

- In continuation of the work previously done, to study the impact of the new gas technologies in the domestic and commercial sector. The work will concentrate on the most important points identified during the previous Triennium and include the aspects and countries that have not been covered sufficiently or for which data have not been very accurate. Thus the first objective is to complete the previous report.
- An assessment of the potential of gas-powered air conditioning (with the possibility of a case study).

- A reflection on the future of the market for gas appliances in a world where the energy market is changing very quickly to see how best to combine different forms of energies for the benefit of society, consumers and gas industry (with the possibility of case studies).
- To establish a permanent database of installed domestic appliances in coordination with Marcogaz, the European Gas Research Group (Groupe Européen de Recherches Gazières – GERG) and possibly other organisations that have data and that can share their market knowledge. The database already exists as a result of the work of the previous SG 6.1, but needs to be completed and verified/tuned. The database would be useful for IGU studies and also for the other organisations. The database will avoid the duplication of work and questionnaires in IGU and other organisations.

It is probably too ambitious to consider that the Study Group can work properly on all of the above points especially considering its limited number of experts. The coordinator alone cannot do the work and the main question will be to find motivated and relevant expertise for each of the topics selected. If the relevant expertise cannot be found some of the topics will have to be dropped from the list and the points selected will be structured so that the whole work has a certain coherence.

During the last Triennium attempts to work closer with industry were not very successful, probably because the Study Group was asking for data and proposing nothing in exchange. This time the aim is to make closer contact with some manufacturers that are willing to collaborate, for example in the form of case studies.

SG 5.3 Natural gas for vehicles (NGV) – Davor Matic

The objective of the project called “Global opportunities for natural gas as a transportation fuel for today and tomorrow” is to demonstrate long-term key factors for the development of natural gas as a



transportation fuel. It will also highlight the implications and risks for the gas industry of future development and investment programmes in NGVs. Targeted ways of CH₄ utilisation that will be observed more closely are: compressed natural gas (CNG), liquefied natural gas (LNG), biogas and hydrogen produced from natural gas.

The final report should provide:

- An overview of the existing fuels and technologies and analysis of future development;
- Country reports;
- Overviews of existing technologies used in respective countries;
- Trend analysis;
- A strength, weakness, opportunity, challenge (SWOC) analysis; and
- A scenario matrix (recommended actions and strategy along development path)

The Chairman of SG 5.3 is Mr Davor Matic from Energy Institute Hrvoje Pozar in Zagreb, Croatia, and the Vice Chairman is Björn Ahlnäs from GASUM in Helsinki, Finland. Dr Garth Harris, Secretary General of the IANGV, and Jeffrey Seisler, past president of the IANGV and Executive Director of ENGVA, will be acting as consulting partners to provide guidance, participation and information to this project.

The initial core team of eight people from Europe, North Africa and South America has been expanded with 15 new active members. Country representatives and experts have been recruited, among others, from large and important NGV markets like Italy, Russia, Iran and India, together with the representatives of some characteristic NGV markets such as Sweden and Switzerland (biogas) or the UK (LNG).

A meeting of SG 5.3 was hosted by ÖMV in Graz, Austria, on May 24 and was attended by 19 delegates. The first chapter of the final report ("Overview of the existing fuels and technologies and analysis of future development") was discussed as was a fine-tuning of the case study template

(questionnaire) for the country reports. These will be used to collect information for the overview of technologies used in respective countries and the trend and SWOC analyses.

The next step will be the distribution of the questionnaire to SG 5.3 members and country representatives together with the preparation of the final report's first chapter. Mr Juan Carlos Fracchia, Head of the Latin America NGV Association, kindly offered to host the next meeting in Buenos Aires.

SG 5.4 Distributed energies: from CHP to micro-generation – Samuel Bernstein

Distributed power generation, including in most cases combined heat and power (CHP), is one of the most efficient gas technologies. It has been well developed in Europe, Japan and North America and yet still represents a major strategic issue for gas development. CHP research and development is focused on two main issues: improving technologies and installation rules for medium and small-scale cogeneration, and downsizing to micro-cogeneration.

Medium and small-scale CHP certainly has to face some difficulties in entering the market and developing sales. The investment, operation and maintenance costs are too high for commercial or small industrial plants. New technologies, such as micro turbines, or technology improvements, such as new engine designs, catalysts and regulation systems, could improve the competitiveness of the technology. Packaging will also be a very relevant topic. Standard rules for installation, and especially electrical connection to the grid, must be established. Last but not least, incentives should be provided in order to reduce the barriers to distributed power generation in each region.

Downsizing by using emerging technologies may enhance micro-cogeneration penetration into the residential market. To analyse that trend and share answers, Study Group members will study distributed generation plants in their own countries from the technical, economic and legal points of



view. The plan is to share sources of information, develop some databases on sources of information and present papers in international meetings.

SG 5.4's activities involve ongoing discussions and the exchange of know-how regarding approaches to distributed generation in member countries, site visits, a database on information sources, the presentation of papers and the preparation for a round table at WGC2006. Most recently, papers were presented at the Micro-cogeneration Conference in London on April 29 and at the Second International Conference on Industrial Gas Turbine Technologies in Bled, Slovenia, on April 29 and 30.

● Programme Committee A Sustainable Development

PGC A held its second meeting in Amsterdam on March 11 and 12, which was kindly hosted by Gasunie. CC Chairman Bert Panman opened the first plenary session and Ulco Vermeulen of Gasunie made a presentation on the Special

Projects. Following that, the Chairman of PGC A gave a brief review of the first Committee meeting in Buenos Aires in October 2003, which was the initial step for furthering the Committee's projects and setting out the necessary actions for the Study Groups.

After two half-day sessions by each Study Group, all attending members agreed on actions, responsible parties, targets and leadership. Each Study Group agreed to follow up their actions prior to the next meeting in Hørsholm, Denmark, on September 16 and 17.

SG A.1 Life cycle analysis (LCA) of the natural gas chain

The Coordinator of SG A.1 is Knut Barland, Statoil (Norway). The other participants in the meeting were: Jin Yongsheng, XinAo Gas Holding (China), Kenjiro Hirayama, Osaka Gas (Japan), Hyo-sun Kim, Kogas (Korea), Sasa Ilic, Nis-GAS (Serbia and Montenegro), Louis Gorospe, Repsol YPF (Spain) and Tjerk Veenstra, Gasunie (The Netherlands).

RIGHT
Table 1.

		People		Planet		Profit	
		Developing	Developed	Developing	Developed	Developing	Developed
1	NGV	+	+	+	+	-	0/-
2	(Micro) CHP	0	0	+	+	+	0
3	Fuel cell (from NG)	0	0	+	+	-	-
4	Condensing boiler	0	0	+	+	+	+
5	NG & renewable	+	+	+	+	-	-
6	New odorants	+	+	+	+	-	-
7	Software for optimisation	0	0	+	+	+	+
8	Hydrogen (from NG)	0	0	-	-	-	-
9	Security of supplies (Methane hydrates, CBM)	+	+	+	+	-	-
10	New technologies (biomass)	+	+	+	+	-	-

(+) Positive impact (-) Negative impact (0) Neutral



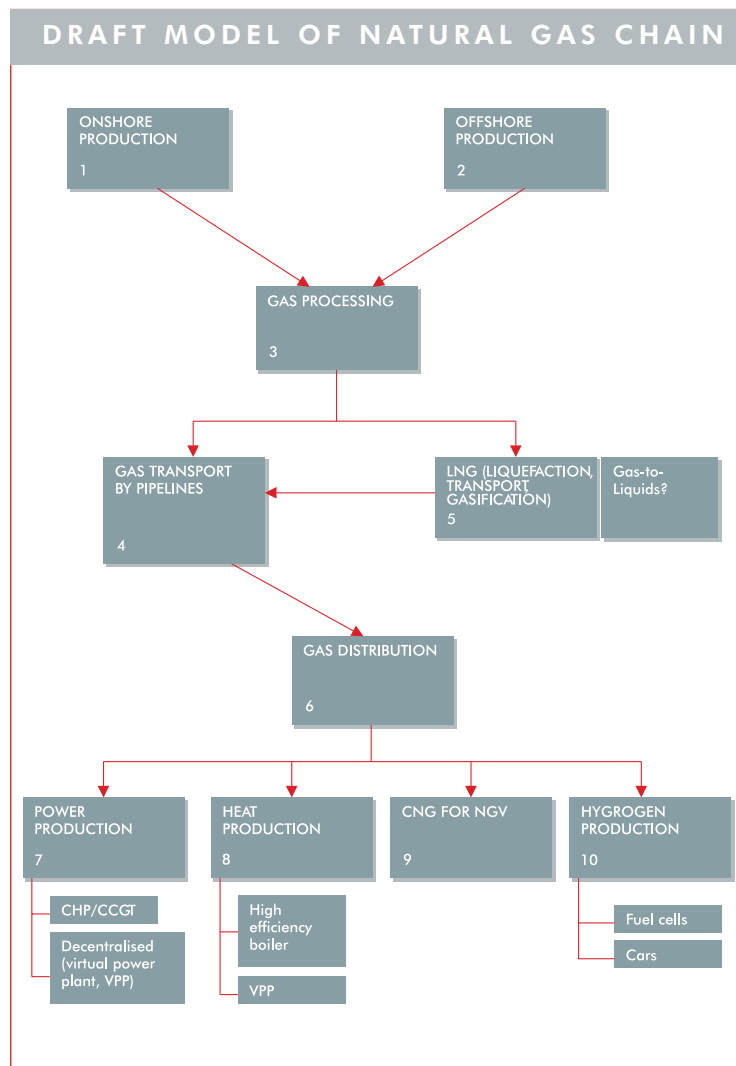
Angelo Riva, SNAM (Italy), David Moorcroft, BP (UK) and Sofiane Boussoualem, Sonatrach (Algeria) were unable to attend.

It was decided in the plenary meeting that the goal of SG A.1 should be to make a life cycle analysis (LCA) of the whole gas chain. A high quality LCA study could be the backbone in IGU of all data and the source of all the arguments that IGU uses to show and prove the benefits of natural gas. It was decided to focus on natural gas and not to make a comparative study with other fuels except for the end-use stage.

In a brainstorming session the following questions were raised and need to be answered:

- In which area of the world should it take place (Europe, Asia, America, Middle East)?
- What does the chain look like?
- What end-use should be considered (power generation, NGV, H₂, fuel cells)?
- What kind of emission factor should be taken (Best Available Techniques or typical technique or a range)?
- Which environmental indicators should be selected (CO₂, CH₄, NO_x, SO₂, energy use, more)?
- Should the indicators be translated to costs for society or benefits to the market?
- How to deal with efficiency and conservation of limited resources of natural gas?

A draft model of the natural gas chain is shown in Figure 1, based on a study Gasunie made in 1992. Although needing to be worked out in more detail, it was a basis for further discussion in the Study Group.



LEFT Figure 1.

A short inventory was made on where to get information from and which country has activities in the areas mentioned in the boxes 1 to 10:

1. Russia, Netherlands, Algeria, China.
2. Norway, UK, Netherlands, USA, Indonesia.
3. Same as 1 and 2.
4. Russia, Norway, Netherlands, Germany.
5. Algeria, Indonesia, Malaysia, Norway, Qatar, Japan.
6. Spain, France, Italy.
7. to 10: All countries and members.

Based on the above inventory, a coordinator was nominated to collect information for each box.



Other members were asked to help in collecting information and data and it was agreed that contact should be made with other Committees, which might have relevant information. The coordinators are:

- Onshore production: Tjerk Veenstra;
- Offshore production: Knut Barland (plus Jin Yongsheng);
- Processing: David Moorcroft (plus Knut Barland);
- Pipelines: Sasa Ilic (plus Tjerk Veenstra);
- LNG: Sofiane Boussoualem (plus Kenjiro Hirayama);
- Distribution: Louis Gorospe (plus Angelo Riva);
- End use: Kenjiro Hirayama (plus WOC 5, all members).

BELOW
Table 2.

Performance data will be collected on:

- Global warming potential (GWP): CO₂ and CH₄;
- Acidification potential (AP): NO_x and SO₂; and
- Energy use.

But data will only be collected on operational aspects, and the impacts during construction and the use of materials (steel fabrication, transport of material etc.) will not be included. However, the Study Group will try to get some general information on construction impacts.

The coordinators for the chain elements submitted their input to all members of SG A.1 at the beginning of June. In addition, all members

collected relevant LCA studies and circulated them through the Committee Secretary. This raw material was due to be pre-analysed by Knut Barland and Tjerk Veenstra and the results submitted to the members by August 15, allowing members to prepare themselves for the September meeting.

SG A.2 Sustainable aspects for natural gas industry

The Coordinator of SG A.2 is Daniël Arias, Pan American Energy (Argentina). The other participants are: Jens Hald Mortensen, DONG (Denmark), Jürgen Vorgant, Ruhrgas (Germany), Bertus Postmus, Gasunie (The Netherlands), Yongsung Yun, IAE (Korea), Alexander Solovianov (Russia) and Patricia Yurgel, Pan American Energy (Argentina).

Communications take place by email and/or telephone, as convenient. Information was collected and

SG A.2 WORK ALLOCATION

	Key Remarks	Responsible
1 NGVs	Urban pollution Fuel diversification Competitive fuels	Daniël Arias
2 (Micro) CHP	High efficiency Existing infrastructure	Bertus Postmus
3 Fuel cells (from NG)	High efficiency High costs New technologies and developing stage	Jens Hald Mortensen
4 Condensing boilers	Efficiency Proven technology Existing infrastructure Attractive pricing	Jens Hald Mortensen
5 NG & renewables	Bridging fossil fuels Synergy	Bertus Postmus
6 New odorants	Desulphurisation	Jürgen Vorgant
7 Software for optimisation	Energy saving	Jürgen Vorgant
8 Hydrogen (from NG)	Energy losses	Yongsung Yun
9 Security of supplies (Methane hydrates, CBM)	Great potential Technical development	Yongsung Yun
10 New technologies (biomass)	Existing grids New sources Availability Competition	Daniël Arias



060104Petro/IGU/O Brian

Cleaner fuels, cleaner environment.



PetroSA enjoys pioneering status in the GTL conversion technology. We are the biggest and one of only three plants worldwide operating GTL technology commercially to produce transformation fuels. Our conversion process produces cleaner, more efficient and environmentally friendly fuels, petro-chemicals and alcohols. Our high quality products are sought-after in international markets such as Europe, the USA and Asia. In growing economies, we are the leading light in the increasing conversion from crude and coal towards a more reliable and efficient energy resource, natural gas. PetroSA not only leads the way in shaping sustainable solutions in the energy sector, but is also a partner in the energy sector's unrelenting efforts to meet the growing consumer demand for cleaner, reliable and efficient energy solutions. PetroSA is a proud "host sponsor" of the 18th World Petroleum Congress to be held in South Africa in September 2005.





commented on during April and May. The Study Group is looking at the following areas (see also *Tables 1 and 2*):

- Environmentally-friendly odorants (Jürgen Vorgant);
- Software (Jürgen Vorgant);
- New technologies, fuel cells, high efficient boiler systems (Bertus Postmus);
- Combination of natural gas and renewable energies (Bertus Postmus/Yongsung Yun);
- Natural gas vehicles, Argentina (Daniël Arias); and
- Population health after natural gas conversion (Alexander Solovianov).

The issues to be considered are:

- Obstacles, current situation, how can the use of natural gas be increased;
- Lessons learned from different countries to share with developing countries or rural areas – gas distribution is a problem;
- Financial institutions could provide resources for fuel replacement – present all the benefits of natural gas;
- Useful for authorities;
- Examples from SG A.1 countries;
- Finding a less expensive way;
- Air pollution in main cities, replacing open fires, using more natural gas;
- Denmark case study: coal plenty of reserves and inexpensive, see how to get less expensive gas;
- Natural gas is the fuel of choice, list the technologies, PPP: people, planet, profit;
- Logo: PPP (different colours);
- Gas can be taken anywhere; and
- Natural gas: explain where it is good and where it is not.

● **Programme Committee B Strategy, Economics and Regulation**

In the tradition of its predecessor, WOC 9, PGC B will only have one plenary meeting per year. However, intermediate meetings of the Committee's management team, consisting of the Chairman, Vice

Chairman, Secretary, Leaders and Deputy Leaders of the three Study Groups will be organised.

After the issue of the first progress report, the PGC B meeting schedule was modified so the plenary meeting planned for late January was postponed. Instead the management team met in Munich on January 19 and 20 and the CC Chairman also attended. Two more meetings of the management team are envisaged this year (one in summer, one in autumn), although they have yet to be finalised.

The major part of the workload is taken up by the three Study Groups.

SG B.1 Regulatory framework of the gas industry

SG B.1 had its second meeting in Brussels, Belgium, on May 17 and 18. It is the only Study Group within PGC B to elaborate a questionnaire because the subject of its interest has not been examined in depth by IGU before. An initial draft of the questionnaire was developed as result of the first meeting, and subsequently discussed and refined in Brussels. As the subject is relatively new to the IGU, the questionnaire needs to be formulated very carefully to enable the recipients to reveal significant data in the extremely sensitive field of regulatory regimes and the way companies handle them. The questionnaire will cover the following subjects:

- Is the regulatory framework effective and efficient in supporting competition, security and the environment?
- Real results in the market; and
- Major mistakes and lessons.

Study Group B.2 Main streams and challenges on the supply side

SG B.2 had its second meeting in Stavanger, Norway, on June 10 and 11. Interest in the work of this Study Group has risen significantly with membership increasing from 12 before the first meeting to 30. At the second meeting the action points identified as a result of the first meeting



FUTURE BELONGS TO NATURAL GAS

IRAN; THE BRIDGE OF ENERGY

40 years experience in gas business

The Islamic Republic of Iran holding 26.6 TCM about 17 percent of world gas reserves stands second in the world.

National Iranian Gas Company (N.I.G.C) which was established 40 years ago is responsible for receiving (domestic production or imports) treatment, transportation and distribution of natural gas to consumers across the country or abroad. As mother company, NIGC governs 33 affiliated companies which are under deregulation and privatization stage.

As the gas infrastructure is getting more developed, the natural gas trade and export have been more focused in recent years.

Iranian gas delivery to Turkey started in 2001 opened a new prospect for exporting gas from Iran to European countries.

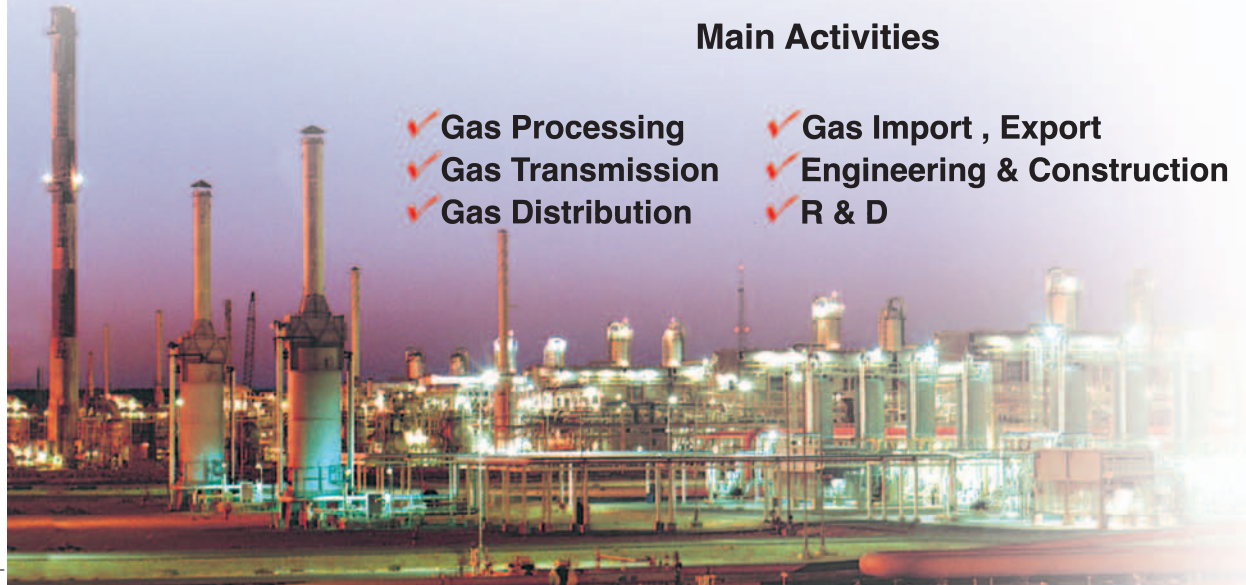
Huge gas reserves of Iran can also attract the global attention for future gas trade and investment.

NIGC Key Data (2002)

Transmission Lines	16500 Km
Treatment Capacity	288 MMCMD
Employees	19,000
Customers	8 Millions
Delivered Natural Gas	81 BCM
Export to	Turkey

Main Activities

- ✓ Gas Processing
- ✓ Gas Transmission
- ✓ Gas Distribution
- ✓ Gas Import, Export
- ✓ Engineering & Construction
- ✓ R & D



www.nigc.org



were discussed in more depth with the aim of forming small teams to deal with specific action points such as:

- Supply and reserve analysis (comparison of the results from the last Triennium with analysis from other organisations with qualitative evaluation);
- Challenges facing producing countries (the recent shifts of the supply/demand structure in the oil business and its effects on oil products has made this a hot issue);
- The geopolitics of gas (which links to the previous issue). There will be a focus on the role of the Middle East in supplying gas, but the challenges for all supply regions will also be examined. Some of the members have already produced papers on the issue.

SG B.3 Major trends in demand

SG B.3 had its second meeting on May 17 and 18 in Buenos Aires, Argentina. The following items were subject to discussion:

- Expected trends in energy and gas demand – the first papers with a global approach were presented and discussed;
- Gas to power – this subject was presented and discussed on a regional basis, with several presentations each examining a particular gas region (western Europe, eastern Europe, Africa and Latin America);
- Convergence of electricity and gas – the Study Group's Deputy Leader, Mr Ohsaki (Japan), takes special care of this subject and presented the first ideas for a framework of guidelines, containing eight case studies;
- Impact of emission trading – a global review with an in-depth evaluation of the situation in Europe was presented.

Liaison with other Committees

The relevant Study Groups of PGC B have or will develop links with WOC 1, WOC 3, PGC A, PGC C and PGC D.

● Programme Committee C Developing Gas Markets

The Committee held its second meeting in Kuala Lumpur on March 4 and 5 with 20 members from 16 countries participating. The minutes of the meeting were published on the PGC C section of the Collaboration Portal.

The main topics addressed during the meeting were the four case studies PGC C had previously decided to develop. These cover China; Egypt and the Mediterranean Basin; Brazil; and further market developments in Europe. For each case study the terms of reference were approved and a common approach was agreed, including the identification of the data to be collected and the relevant sources, the key elements of analysis and the kind of conclusions and recommendations expected. Each Study Group was tasked with further elaboration and consolidation of the above issues by July.

The Committee also decided to carry out an analysis of the latest projects concerning trans-African pipelines.

PGC C has 47 members from Europe (27), Asia (12), Africa (four), South America (two), Australia (one) and the World Bank (one). The above composition is being completed with delegates from some countries directly interested in the case studies. The relevant countries' gas industries have been contacted and the nomination procedure is at an advanced stage.

PGC C's next meeting is scheduled for November 9-10 in Cairo, Egypt.

IGU meetings

The Chairman and Secretary of PGC C met the CC Chairman on December 5, 2003.

On February 23, the PGC C Chairman and Secretary met the Leader of the Special Project on Gas to Power and the CC Secretary to analyse possible areas of cooperation.

Preliminary contacts have been made with PGC B and the Special Project on Regulation.



S.N.G.N. ROMGAZ S.A.'s scope of activity consists of: reservoir exploitation and production of natural gas, as well as natural gas underground storage.

Related activities to support the main ones are:

- natural gas conditioning;
- natural gas compression for reservoir exploitation and natural gas production as well as for natural gas underground storage;
- exploration and geological research to discover new natural gas resources-reserves;
- special operations;
- workover, transportation, maintenance;
- natural gas import;
- trading of natural gas from the domestic production and imports.

Romgaz has a share of the natural gas market of about 60% out of which 30% is commercialised on the open market of eligible consumers, and 70% on the regulated market.

Our slogan is: "Making Romania's warmth matter".

**SOCIETATEA NATIONALA DE GAZE NATURALE ROMGAZ S.A.
(The National Gas Company Romgaz)**

Share capital: 3,822,703,200 thousand lei; Unique registration code: R14056826

Serial no. RC: J32/392/2001;

Medias 551025, Str.Unirii nr.4, jud.Sibiu, ROMANIA

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Website: www.romgaz.ro

POTENTIAL UNDERGROUND GAS STORAGES IN LATVIA - FUTURE EUROPEAN GAS HUB?



Joint Stock Company "Latvijas Gāze"

Activities: natural gas purchase, transmission, distribution and sales in the whole territory of Latvia.

Shareholders: Ruhrgas 47%, Gazprom 25%, Itera Latvia 25%

Annual sales: 1.65 BCM (USD 196 million)

Number of customers: 426 thousand

Extensive program of seismic investigations was carried out in Latvia in 50s and 60s of the last century, and structures well suited for development of 11 natural aquifer type underground gas storages were discovered with total potential up to **50 BCM**, further confirmed by later studies.

Incukalns Underground Gas Storage started to operate in 1968, and currently Incukalns UGS with the total capacity of 4.4 BCM is used not only for seasonal regulation of gas supply for Latvian customers, but also for NW Russia and for urgent needs of Estonian consumers. There are certain plans on further storage expansion till total volume of 5 BCM with the aim to offer gas storage services to the clients in other countries.

Furthermore, development of new gas storage facilities in Latvia is possible, and after inevitable incorporation of Latvian gas supply system into Russian-European gas grid, utilization of vast potential of underground gas storages in Latvia would considerably increase gas supply security in the states of Baltic Sea region.

POTENTIAL UNDERGROUND GAS STORAGE

Underground Gas Storage	Area km ²	Volume BMC
1. Snēpeles	75	17.5
2. Aizputes	95	16.0
3. Dobeles	47	10.0
4. Z-Bīdienes	47	9.0
5. Līči	65	2.5
6. Līpājas	39	2.5
7. Degoles	46	3.5
8. Līgas	40	2.5
9. Z-Līgatnes	3x8	2.5
10. Amatas	5x5	2.0
11. Valmieras	3x10	2.5

LEGEND:

- Interstate Gas Metering Stations
- Incukalns UGS
- Existing Gas Transmission Pipelines
- Planned Gas Transmission Pipelines
- Potential Underground Gas Storages



Gas transmission network of Baltic countries





Contributions to conferences and workshops

The PGC C Chairman participated in the workshop on gas to power in South America, which was organised by IGU and held in Rio de Janeiro on April 29.

The Chairman then gave a paper on "Developing gas markets in countries in transition towards a liberalised economy" at the International Conference on Development in the Gas Industry of South and East European Countries in Transition, which was held in Belgrade, June 14-17.

PGC C also participated in the workshop looking at the future of gas for power generation on a global level, which was jointly organised by IEA and IGU on June 14 in Paris.

The Committee may contribute to other events on gas to power organised by IGU.

● **Programme Committee D LNG**

Following the first PGC D meeting held in London last September and which approved the summary of a report giving an overview of the LNG industry and marketing from 2002 to 2004, the PGC D Steering Committee met in Doha on March 19. The report is the responsibility of the PGC D Vice Chairman and a schedule for preparing it was presented. The meeting was hosted by Qatargas and any PGC D delegates attending LNG-14 were also invited.

PGC D now has 64 members including newly-nominated delegates from Indonesia and Pakistan. Detailed statistics concerning the membership are given in *Tables 3 and 4*. All members have been asked to join Study Groups and have been briefed on the Collaboration Portal. The latest status of the Study Groups is as follows:

SG D.1: Standardisation of LNG qualities

SG D.1 is led by Mr Robert Klein Nagelvoort (The Netherlands) and has 17 members from the following countries: The Netherlands (three members); Algeria, Italy and Qatar (two members

each); Belgium, Finland, France, Iran, Japan, Norway, the UK and the USA (one member each). Its first meeting was hosted by Shell in The Hague on March 3.

SG D.2: Safety and technology developments in LNG terminals and vessels

SG D.2 is led by Mr Bruno Larsen (Norway) and has 18 members from the following countries: Algeria, Italy, Korea, Norway and the UK (two members each); China, France, Iran, Japan, The Netherlands, Qatar, Spain and the USA (one member each). Its first meeting was hosted by Qatargas in Doha on March 19 and its second was held in London on June 24.

SG D.3: The future of LNG spot market

SG D.3 is led by Dr Bo-Young Kim (Korea) and has 15 members from the following countries: Algeria, Iran and Korea (two members each); Argentina, Finland, Germany, Italy, Japan, Norway, Pakistan, Ukraine and the USA (one member each). Its first meeting was hosted by Qatargas in Doha on March 19.

LNG conferences

This Study Group is led by the Chairman of PGC D and has three members (one each from Algeria, The Netherlands and the USA) to liaise with three conferences.

LNG organisations

This Study Group is also led by the Chairman of PGC D and has nine members (one each from Algeria, France, Germany, Italy, Korea, The Netherlands, Norway, the UK and the USA) to liaise with 12 organisations. Some contacts have been already made with the European Association for the Streamlining of Energy Exchange (EASEE-gas), the LNG conferences and the International Group of LNG Importers (Groupe Internationale des Importateurs de Gaz Naturel Liquéfié – GIIGNL).

Our commitment to sustainable development: Putting words into action.

Being involved in the management of one of the planet's great natural resources – natural gas – Gaz de France is bound by five commitments:

Developing forms of energy which are respectful of the environment.

Out of all fossil fuels, natural gas is the cleanest. Making full use of the assets of this natural resource, Gaz de France minimizes the environmental impacts linked to its production, transport and use. It is also developing new forms of environment-friendly energy: being the leading French operator of heating networks using geothermy, Gaz de France also supports the use of renewable sources of energy by working on the complementarity between solar energy and natural gas. To prepare for the future, the Group is conducting research on biogas and hydrogen, particularly through fuel cells.

Developing clean technologies.

Today's development must not be done to the detriment of future generations. Between now and 2007, Gaz de France will significantly reduce the volume of its direct emissions of greenhouse gases in comparison with the level reached in 1990.

It is striving to control its impact on the environment: in the countryside, straight after the laying of a new gas line, the landscape recovers its former

aspect; in urban areas, Gaz de France is developing clean modes of transport using NGV and is involved in industrial ecology.

Its research programmes always include stringent objectives in terms of environmental safety and protection.

Saving energy.

Energy needs worldwide are set to increase faster than available resources. Gaz de France is firmly committed to controlling energy consumption.

Over the past 30 years, the average consumption of a household heating with gas has dropped 40%.

Gaz de France wants to go even further by encouraging its customers to consume more efficiently, through greater concern for the preservation of the environment.

Developing solidarity.

Acting as a responsible company also means contributing to the building of a more cohesive world.

This is the philosophy which guides the Group in its daily relations with its 35,000 employees: Gaz de France promotes social dialogue, training and access to employment for everyone, including the most vulnerable, such as handicapped people. The same

requirement of solidarity applies to the Group's relationship with its most deprived customers.

Sharing a vision.

Gaz de France is currently involved in partnerships of conviction.

This is how it joined Global Compact, an organisation created in 2000 under the initiative of the United Nations to bring together companies worldwide on the basis of social and environmental commitments. Last year, the Group also joined the World Business Council for Sustainable Development, the international industry leader on sustainable development.

Through its industrial project, Gaz de France is asserting its will to grow on the European energy market. This project only makes sense if it contributes to better integration of social and environmental equilibria.

The Group has therefore committed itself to a long-term programme in favour of sustainable development.





PGC D MEMBERSHIP BY AREA

ITEM	N. America		S. America		Africa		Europe		Australia		Asia		TOTAL	
	P*	N*	P*	N*	P*	N*	P*	N*	P*	N*	P*	N*	P*	N*
Number of countries	2	1	5	1	5	1	33	15	1	1	19	10	65	29
Number of Gas Associations	2	1	5	1	5	1	33	14	1	1	19	10	65	28
Number of Associated Members	1		1				8	3					10	3
Number of PGC D Members		1		1	4		31		1		26		64	
Members		1			1		20		1		15		38	
Alternate Members					1		7				10		18	
Corresponding Members				1			1						2	
Associated Members Representatives							3						3	
PGC D Staff (C+VC+S)					2						1		3	

P* = Potential N* = Nominated

RIGHT
Table 3.

New actors

This Study Group is led by Mr Jean-Marc Hosanski (France) and members have been nominated by China, Indonesia, Malaysia, Qatar, Taiwan and the UAE. Contacts have been made with several gas associations and companies representative of importing and exporting LNG countries asking them to nominate

additional members. In particular, contacts have been made with Brunei, India, Nigeria, Oman and Trinidad and Tobago.

Cooperation within IGU

This Study Group is led by the Chairman of PGC D. Mr Lopez-Zurita (Spain) is responsible for PGC D coordination with the R&D Task Force, Mr Ingrain (France) coordinates with WOC 5 and Mr Ebels (The Netherlands) coordinates with PGC B.

Future meetings

The next PGC D meeting will be held at Arzew on September 27. It will be hosted by the Algerian Gas Association and Sonatrach and will offer Committee members the opportunity of participating in the 40th anniversary celebrations of the first industrial LNG plant (GL4Z ex-CAMEL).

This will be followed by meetings in February and June 2005. An invitation from the Russian Gas Association to host the former has been received, while the latter will take place in Norway.

BELOW
Table 4.

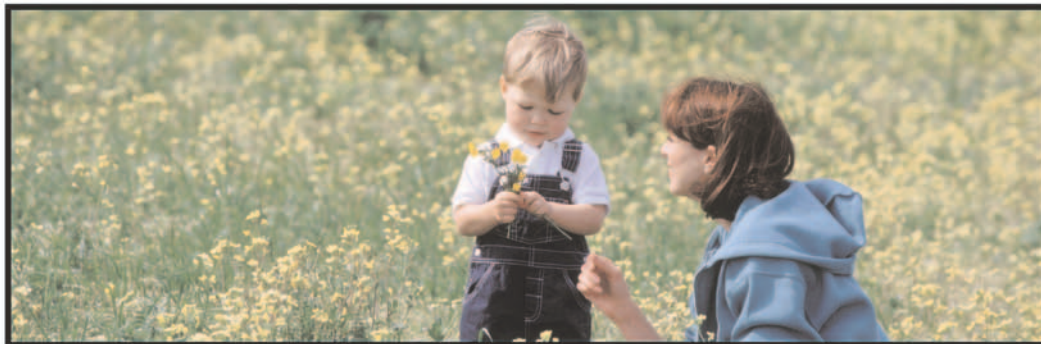
PGC D REPRESENTATION OF COUNTRIES IN THE LNG BUSINESS

ITEM	Number	IGU Member		PGC D Nominated	
		num-ber	(%)	num-ber	(%)
LNG import countries	11	10	91%	8	73%
LNG export countries	12	11	92%	7	58%
New LNG importing countries in 2007/8	5	4	80%	3	60%
New LNG exporting countries in 2007/8	7	4	57%	2	29%

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Progress Reports from the Task Forces and Special Projects

This chapter contains news and information from IGU's two Task Forces and three Special Projects.

● Task Force Research and Development

The second meeting of the R&D Task Force took place on February 7 in Breckenridge, Colorado, USA. Chairman Roy Bilbé commenced proceedings with a progress report on the activities of the Task Force. Then, all members gave a short presentation on the situation of R&D in the gas chain in their country. Extensive contributions are now available on the R&D situation in Denmark, France, Japan, The Netherlands, UK and USA. These contributions are posted on the Collaboration Portal in the Task Force's section. Contributions from other countries, representatives of which were also approached (China, India and Russia), have not yet been received.

The Chairman has analysed the situation in R&D in the gas chain in a paper based on the contributions mentioned above. This paper was due to be presented to the 19th World Energy Congress in Sydney, September 5-9. In the paper, the following conclusion has been drawn: "From the analysis performed so far a number of trends are identified that are common or at least similar in all countries. Security of energy supply, safety and integrity and environmental protection are issues that must be dealt with by the whole gas sector. Governments and policy makers have ambitious goals, so they must create a favourable environment for development of dedicated technology. The gas industry must also take its responsibility. R&D in the gas chain has played a key role in the transition of the energy infrastructure and contributed substantially to worldwide expansion of the gas business. Meaningful R&D can additionally strengthen the gas sector and can also provide incentives for further penetration of natural

gas. Moreover, liberalisation leads to changes of the gas market to which the gas companies have to adapt. The market will become truly global and competitive. Liberalisation should not be seen as a threat but as an opportunity. R&D on a corporate level provides the companies with comparative advantage as it can lead to, for example, considerable cost reduction, better management of risk, increased safety and proper prioritisation of investments, to name just a few. Indeed, in a competitive environment only those players remain leaders that possess the means to control the market through, for example, dedicated R&D. There are thus enough incentives on both governmental and corporate levels not to make R&D in the gas sector a victim of liberalisation and short-term financial goals."

Following the analysis of specific countries, the Task Force will extend this study to cover all members of IGU and beyond. To this end, a questionnaire for IGU Members is being prepared in collaboration with a number of other Working Committees. In addition, a benchmark study was carried out that addresses R&D in the gas chain and compares it to other industrial sectors. This benchmark study was carried out by a student at Gasunie Research within the framework of his Master thesis. It is now being reviewed by a reading committee and is thus not yet available to the public.

The Chairman of the R&D Task Force is in active contact with other international organisations. For example, on March 30 he spoke at the Eurogas Spring Conference in Brussels, where he addressed the issues of strategic business challenges and their connection with R&D.

The third meeting of the R&D Task Force will take place on November 1 in Vancouver, Canada, in connection with the International Gas Research Conference.

● Task Force Information and Communication Technology

Led by Chairwoman Véronique Durand-Charlot, the ICT Task Force has 11 members from Asia



(four), Europe (four), the Middle East (one), North America (one) and the World Energy Council (one).

The first meeting of the ICT Task Force was held on February 16 in Seoul, Korea. The target audience and the main ideas and topics for the 7th Global Congress on Information and Communication Technology in Energy (ICT 2005) were discussed. There was also a presentation on the venue and an initial discussion about the logistics. The Congress will be held in Busan, Korea, May 23-25, 2005 and Task Force member Dr Seung-Hwan Lee is the Chairman of the National Organising Committee.

A second meeting on April 6 in Paris, France, followed to define the concept and content of ICT 2005 and prepare the call for papers. It will be targeted at company chairmen, directors and senior IT executives with the overall theme "Value creation with ICT in energy companies" and the aim is to create an open discussion about real problems and solutions. The Congress will be structured in streams (up and mid-stream, downstream, corporate and support-stream), have three main themes (reducing costs and improving performance, managing risks, competing in a

deregulated environment), and have two paths focused on Asia-Pacific and trading.

A "Second Announcement" document for ICT 2005 has been produced and was first distributed at Gasex in Singapore (May 31-June 3) and the call for papers was made at the end of May. The papers will be selected at the Task Force's next meeting in Hørsholm, Denmark on September 15-17.

Second Announcement of ICT 2005

ICT 2005 will be the world's most comprehensive ICT forum for the energy industry. This 7th Congress will be the first one to address all energy sources and it will be held in cooperation with the World Energy Council and World Petroleum Congress. The ICT2005 Congress will be an excellent opportunity for energy and IT experts and business-people to network and discuss technologies.

The programme has been designed for top executives, managers and ICT experts. Senior executives can learn how their peers at the world's leading energy companies are creating value with ICT, from developing completely new business to optimising IT budgets. CIOs and business managers can explore the latest solutions in the

ICT2005 Global Congress
The 7th Global Congress on Information and Communication Technology in Energy
May 23~25, 2005 in Busan, Korea

The information and communications technology in energy industries is now facing dramatic changes. Technological innovation and convergence are breaking down all the barriers between industries, and the global market is invoking new business models. In the spirit of the theme, ICT 2005 will give you opportunities found nowhere else to discuss, exchange, and share ideas on the information and communications technology of energy industry with professionals from various fields and regions in the world.

- Welcome to ICT2005
- General Information
- ICT2005 Program
- Social Program & Tours
- Venue Information
- Hotel Accommodation
- Call for Papers & Posters
- Call for Sponsors
- Registration

What's New

- ICT2005 Booth at the LNG14 Exhibition in Qatar
- The 2nd ICT Task Force Meeting
- ICT2005 Promotion Booth at GASEX 2004
- The 1st ICT Task Force Meeting

For more information on ICT 2005 check the website at www.ict2005.com.



energy industry. Consultants and ICT companies can meet their customers and display their know-how in the energy business.

ICT 2005 will give participants the opportunity to:

- Have a general overview of where the gas and electricity industries are in the utilisation of ICT;
- Understand the impact of deregulation on ICT systems;
- Make the most of opportunities to create new business with ICT; and
- Create value with ICT in the gas and electricity industries.

● **Special Project Gas to Power**

The Special Project team has embarked on a process to bring together the three main stakeholder groups for the use of gas in power generation, namely the gas industry, the power industry and governmental organisations in the various regional gas markets. In a series of workshops an inventory of the potential for, and the obstacles to, the use of gas in power generation is being made. Possible solutions to overcome the obstacles are also being worked out. Emphasis is laid on assessing the perceptions and positions of the different stakeholder groups and the consequences hereof for the future of gas in power generation.

A first successful workshop was held in Rio de Janeiro on April 29 and was attended by representatives of the gas and electricity industries. An IGU-commissioned background paper formed the starting point for the workshop, which highlighted the obstacles for further use of gas-fired power generation in South America in a constructive dialogue.

The following month a presentation was given during the Gas Power Fair in Toronto, Canada, May 17-19. Then a workshop organised jointly with IEA was held on June 14 in Paris to assess the topic from a global point of view.

An IGU workshop in Brussels in the autumn will focus on the specific opportunities and obstacles in the European gas and electricity markets. As in Rio,

an IGU-commissioned background paper will form the starting point for this workshop.

● **Special Project Regulation**

A study will be carried out about the different forms of regulation that will support the future growth of the worldwide gas market.

The necessary regulatory framework to support Gas to Power and Sustainable Development will be discussed in the other Special Projects. The outcome of their work will be used to support the report of the Special Project on Regulation.

On specific issues studies will be outsourced. The Institute Clingendael has been contracted, via the Energy Delta Institute in The Netherlands, to conduct a literature study on the impact of regulation on gas market growth.

● **Special Project Sustainability**

This Special Project will deliver three main items:

- A vision paper on gas and sustainability and the role and responsibility of IGU, for which the University of Groningen will be contracted in cooperation with the Energy Delta Institute. The vision paper will be prepared in cooperation with PGC A.
- Projects on:
 - Sustainable Urban System Design, involving pathways with a 30-year horizon, on innovative applications of (natural) gas. A first phase contract has been let to the Sheltair Group in Vancouver (www.sheltair.com) and Sebastian Moffatt is leading it. It is envisaged that between four and six urban regions will be involved. (A more detailed progress report is given below.)
 - Analyses of the business conditions for a successful growth of the market for natural gas vehicles (NGVs) in different regions and phases in development in the world.
 - Possibilities for the introduction of a virtual power plant based on distributed power as a more sustainable and effective alternative for centralised large-scale power generation.



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- Establish an infrastructure for the dissemination of knowledge on (natural) gas in relation to sustainable energy development. This item will be addressed based on the results of the above mentioned items and could result in tools or means for education on sustainable development.

2a Project on Sustainable Urban System Design (SUSD) – Bridging to the Future

This is a follow-up to the SUSD competition of the Japanese Triennium and the team sees scope for a third initiative in the 2006-2009 Triennium.

Whereas the project in the Japanese Triennium was set up as a competition, the current project is designed to have different countries collaborating. There is growing excitement and interest in the Bridging to the Future project and it seems clear that it will evolve into an international network of cities sharing their experiments and learning on energy pathways with each other and the world. This raises the need for a secretariat, a technical “advisory board”, and it raises some questions about who will be participating in this project (a selected few or anyone that wishes to).

Building from the process strengths of the Canadian team in the SUSD competition, we are drafting a pathway story that will help guide the participating cities through a standard process with identified milestone points where teams share information and results with the other participants. The process builds on the Adaptive Management Framework used by the cities PLUS team in the winning SUSD submission. The process outlines four broad steps and identifies some questions participants might need to consider. It further proposes a few standard tools (visual and analytical) and provides some common resources. The common process and tools will allow participating cities to compare results easily and learn from one another. It will also provide the basis for showcasing the project outcomes at major events such as the World Urban Forum and the World Gas Conference.

There are a number of aspects that make the Bridging to the Future project unique. It is:

- International – engaging city teams from all over the world, including the north and south, and from very different climates and cultures;
- Industry sponsored – initiated by the gas industry, working in collaboration with local utilities and energy associations, cities, academic institutions and civil organisations;
- Visionary and pragmatic – from long-term visioning to practical demonstrations, through the “Three Triennium Initiative”; and
- Long term and sustainable.

With regard to the latter, the pathways are intended to reflect the key paradigms or themes that have emerged as part of a 100-year vision and the SUSD. These are the long view, resiliency, integration and collaborative planning.

To adopt the long view, the pathways will:

- Align with a well-articulated 100-year vision, including long-term “end-state” goals (conforming to “system conditions” and other constraints);
- Extend to 30 years, with a major emphasis on managing the transitions (staging) in ways that fit the solution space (satisfying the critical path, without moving too fast); and
- Use natural gas and other scarce resources in their best use, facilitating the “bridging” to renewable and sustainable energy systems.

To increase resiliency, the pathways will:

- Become part of an Adaptive Management Framework (with emphasis on feedback and re-alignment) in order to achieve flexibility, continuous learning and improvement, and a long life; and
- Accommodate very different scenarios for fuel availability and energy demand, in order to survive well in very different futures.

To achieve integration across scales and systems, the pathways will:

- Balance the energy planning and urban planning, throughout the process, from project