

NIGC at a Glance

Strategically located along the Persian Gulf, Islamic Republic of Iran can play an important role in the global gas supply; acting as a bridge between the huge Middle-Eastern gas reserves and major demand centers in Europe and Asia. Iran holds the world's second largest natural gas resources with proven reserves of 28 tcm, half of which lies in the off-shore South Pars field in the Persian Gulf waters.

National Iranian Gas Company, NIGC, which was established 40 years ago, is responsible for treating, transmission and distribution of natural gas to consumers across the country as well as contributing in import & export policy making. NIGC now covers 37 sub-companies which are under deregulation and privatization.

• NIGC Highlights

At the end of the year 2005, NIGC has completed almost 22 thousand km of high pressure pipelines and over 118 thousand km of natural gas distribution network with over 8.4 million connections, covering 11.6 million households (49.4 million population).

• Exploration

NIGC receives natural gas from National Iranian Oil Company, NIOC. A minor share of natural gas consumption is supplied by import from Turkmenistan. In 2005, the total received and imported gas has been 106.4 and 5.2 bcm, respectively. Natural gas for domestic consumption and exports is generally supplied from independent gas fields while the associated gas is basically allocated for gas injection projects.

• Treating

NIGC treating and dehydration capacity during the period of 1997-2005 with average annual growth of 13.2 % has increased from 142.2 mcm/d in 1996 to 383 mcm/d in 2005.

• Transmission

More than 11673 km of high pressure pipelines have been constructed by NIGC during the period of 1997-2005, with an average annual rate of 1,460 km. At the end of the year 2005, the total trunklines exceeded 22,000 km.

• Distribution

NIGC has built over 77,000 km domestic gas distribution network during 1997-2005. At the end of 2005, with an average annual growth rate of 13.2%, the total length of country's gas network reached the figure of 118,000 km.

• Export

The contract of gas export to Turkey was signed in 1996, for a volume of 10 bcm/y. To realize this project, a 40 inch pipeline with a length of 253 km was constructed through the city of Tabriz towards the border of Bazargan. Gas export to Turkey has commenced since December 2001, and the export rate in 2005 has risen up to 4.7 bcm. Furthermore, a number of gas export pipeline projects are under negotiation with regional and international investors.

• South Pars Gas Field

South Pars near *Assaluyeh* with more than 13 tcm of content is a gigantic off-shore gas field with extremely competitive upstream development costs.

• Research at NIGC

In the year 2003, the organization of NIGC was revised to form an independent Research and Technology Division in order to promote research activities in gas industries throughout the country. This division also coordinates IGU programs in Iran, including participating in working committees (WOC's) and/or program committees (PGC's) of IGU.



NIGC Developing Plans

Gas Treating Plants

- Parsian
 - Ilam
 - Bid Boland II
 - Masjed Suleyman
- Total Capacity: 114 mcm/day

Transmission Lines

- Iranian Gas Trunklines :
IGAT-IV, V, VI, VII, VIII
 - 2nd North-Eastern Trunkline
- Total Length: 4,000 km
Total Capacity: 366 mcm/day

Underground Storage

- Yortshay
 - Sarajeh
- Total Capacity: 2, 650 (mcm/year)
Total Production: 26 (mcm/day)

Nation-Wide Dispatching

- One Main Center
- 12 Operating Centers
- 24 Gas Delivery Centers
- 400 Remote Control and Measurement Terminals

NIGC Strategies and Prospects

- pipeline gas trade
- Improving tariffs and regulations towards customer satisfaction and a better sustainability
- Granting authority to sub-companies in order to achieve a higher profitability
- Leaving the projects open to private sector
- Increasing gas supply confidence level for domestic consumers and exports
- Relying on consulting capacities and domestic vendors
- Increasing Productivity in various levels

NIGC Key Data (2005)

Natural Gas Reserves	28 tcm
Treatment Capacity	383 mcm/d
Transmission Lines	22000 km
Distribution Lines	118000 km
Delivered Natural Gas	106.4 bcm
Number of Customers	11.6 millions
Export (to Turkey)	4.71 bcm





PetroChina Company Limited

PetroChina Company Limited (PetroChina) was established as a joint stock company with limited liability under the Company Law of the People's Republic of China (the PRC) on 5 November 1999 as part of the restructuring of China National Petroleum Corporation (CNPC).

PetroChina, a large integrated petroleum company comprising of upstream and downstream businesses, import and export, production and sales, is engaged in a broad range of oil and gas related activities, including:

- * Exploration, development, production and distribution of crude oil and natural gas;
- * Refining, transportation, storage and marketing of crude oil and refined products (including import and export);
- * Production and marketing of basic chemicals, derivative chemicals and other chemical products; and
- * Transmission of natural gas and crude oil, as well as marketing of natural gas.

PetroChina divides the above businesses into four segments: exploration and production, refining and marketing, chemicals and marketing, and natural gas and pipeline.

The American Depository Shares (ADRs) and H shares of PetroChina were listed on The New York Stock Exchange and The Stock Exchange of Hong Kong on 6 and 7 April 2000, respectively.

PetroChina recorded outstanding financial performance in the past two years. Its net profit reached RMB69.6 billion in 2003, and RMB102.9 billion in 2004, which is a record high since its IPO.



* The West-East Pipeline is designed for a length of 4,000 kilometers and the annual transmission capacity of 12 billion cubic meters. The pipeline carries natural gas sourced from Tarim basin to the Eastern China region catering consumers along its route including that in Shanghai. In 2004, the pipeline was put into full commercial operation with a transmission volume reaching 1.34 billion cubic meters.

WGC2006

This special section commemorates the 23rd World Gas Conference, which was held June 5-9 in Amsterdam. Some 3874 people registered for the conference, consisting of 3127 delegates, 356 accompanying persons, 191 VIPs and 200 press representatives.

We start with overviews from the Chairman of the National Organising Committee and the editor, before publishing the official report prepared by the outgoing Dutch Presidency.

WGC2006 – A Great Success for Delegates and Exhibitors	40	The Art of Regulation	80
		Other Fuels	82
		Gas R&D	83
Some Impressions of WGC2006 in Amsterdam	44	Committee Sessions	94
Final Report of WGC2006 – Introduction	48	Working Committee 1 Exploration and Production	94
Outline of the programme	48	Working Committee 2 Storage	102
Award winners	49	Working Committee 3 Transmission	104
Keynote addresses	54	Working Committee 4 Distribution	110
Midday addresses	58	Working Committee 5 Utilisation	113
Ministerial panel	60	Programme Committee A Sustainable Development	120
Strategic Panels	64	Programme Committee B Strategy, Economics and Regulation	124
Gas to Power – A cloudy mid-term outlook	64	Programme Committee C Developing Gas Markets	128
Natural Gas Vehicles	70	Programme Committee D LNG	132
Capital for Gas: Sufficient and Transparent?	73	Presentation of TWP 2006-2009	136
Sustainable Development: It's Up to Gas	76		

LNG Inspection Services

Intertek Caleb Brett provides LNG cargo inspection capabilities on a global scale to match the requirements of the LNG world market. Intertek services are strategically placed to serve LNG export and import trading, located in countries producing, shipping and receiving liquefied natural gas.

Demand for imported LNG is growing, resulting in an expansion of the global LNG industry. Intertek Caleb Brett are well placed to support this growth with expertise in LNG inspection, testing and calibration services, having embarked on a strategic program of LNG training and recruitment in key locations.

Intertek maintains a global network of skilled LNG services personnel by sharing training, best practices and experiences between offices and laboratories. This approach is highly effective in establishing professional LNG cargo inspection services in new LNG service locations. In addition, years of experience gained in key LNG markets such as Algeria and Korea

have enabled Intertek Caleb Brett to transfer and maintain a high level of safety awareness.

► Recent Intertek LNG Milestones:

Intertek began providing inspection services to Oman LNG in 2000. Intertek LNG services include loading inspections, witnessing LNG dome sampling procedure and analysis at the terminal lab. Intertek inspectors carry out surveys of NGL export shipments by-product at the terminal and witness correlation tests done in presence of buyer as well as seller representatives at the terminal lab once a year. Oman LNG has extended the LNG services agreement with Intertek to 2008.

Qalhat LNG (SAOC) started their first shipment in January 2006. Intertek provides LNG inspection services for Qalhat LNG and Mitsubishi. Intertek Spain performs LNG inspection services at the discharge port.

Intertek Caleb Brett attended Nigeria LNG's first CIF delivery into Lake Charles in the USA in 2006. This cargo was the first delivered from Train 4 in the Nigeria LNG Bonny Terminal, another milestone in the development of what will finally be a liquefaction plant running a total 6 Trains and producing 22 million tons of LNG per year.

Intertek is preparing for the arrival LNG cargos delivered into Altamira LNG regasification terminal, expected some time in the second half of the year. This will be subject to final completion and commissioning of the Altamira Terminal in Mexico.

Intertek has deep roots in Algerian LNG, conducting LNG inspection services in Algeria since the 1980s. Intertek services clients in Skikda, Arzew and Bethioua. Intertek Algeria is a centre of expertise for the industry with significant experience in LNG metrology, calibration, engineering and marine-related technologies and services.

To learn more about Intertek Caleb Brett's global LNG services, capabilities and expertise visit our website at www.intertek-cb.com, or contact us at: testingservices@intertek.com.

Intertek Caleb Brett provides LNG inspection, testing and calibration services in the following locations

Algeria	Skikda, Arzew, Bethioua
Egypt	Damietta
Spain	Cartagena, Bilbao, Barcelona, Huelva and Sagunto
France	Montoya
Portugal	Sines
Belgium	Zebrugge
Turkey	Marmara Ereğlisi
Qatar	Ras Laffan
Oman	Qalhat
Nigeria	Bonny
Korea	Incheon, Pyeongtaek, Tongyoung
USA	Lake Charles, Elba Island, Everett and Cove Point
Puerto Rico	Penuelas Bay
Mexico	Altamira (Opening in 2006)



Intertek reduces LNG Cargo Trading Risk



LNG services provided by Intertek significantly reduce the risk of loss exposure to the trading parties involved. The risk of financial loss occurs during critical LNG transportation, custody transfer and storage operations. By providing world-class independent inspection, analysis and testing services, Intertek protects the quantity and quality of our client's high value LNG cargo shipments.

Intertek inspectors and laboratory technicians provide a range of LNG ship and shore services including:

- LNG cargo custody transfer measurement
- determination of LNG volume
- LNG tank calibration and custody transfer system
- LNG sampling
- determination of calorific value
- laboratory LNG compositional analysis
- determination of energy transferred (btu)



Intertek services and expertise are located in key areas for the global LNG industry. LNG testing and inspection services are available in virtually all LNG production and transportation centres in the world. Intertek Caleb Brett is a division of Intertek Group PLC., a global company providing testing, inspection and certification services to a wide range of industries, markets and institutions.

Contact Intertek for LNG inspection, calibration and testing services:

Asia Pacific:	tel: +65 6515 4510
	email: asiapacenquiries@intertek.com
Europe, Africa, Middle East	tel: +44 1708.680.248
	email: eamlabs@intertek.com
Americas:	tel: 713.844.3263
	email: cbwnalabs@intertek.com



Intertek Caleb Brett website: www.intertek-cb.com



WGC2006 – A Great Success for Delegates and Exhibitors

By Robert C. A. Doets

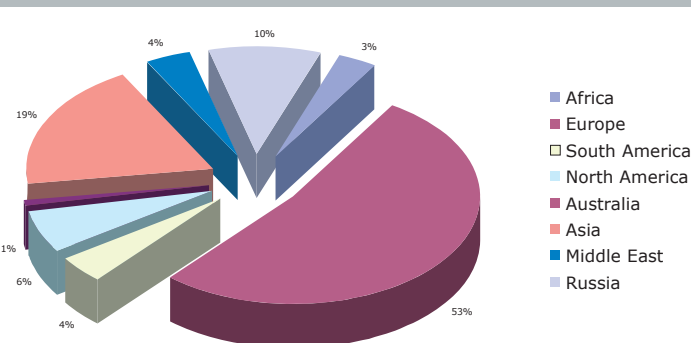
From Monday June 5 to Friday June 9 the 23rd World Gas Conference took place in the Amsterdam RAI Exhibition and Congress Centre. Representatives of the energy sector from all over the world (see Table 1) came to The Netherlands to participate in this high-level event. Among them were Ministers, CEOs and other major players in the global energy market. Some examples of speakers who gave keynote addresses and participated in strategic panels are given in Table 2. More information about the WGC2006 programme, including the committee sessions and expert forums can be found in the full report starting on page 48.

● Special on-line communication features for delegates

The WGC organisation provided delegates with ample opportunities to keep in touch with the home front. Each delegate was able to use the intranet message system, which offered the opportunity to easily find other participants present in Amsterdam. Via their personal email addresses they were also able to receive messages from all over the world during WGC2006.

BELOW Table 1.

REGIONAL BREAKDOWN OF WGC2006 DELEGATES



In three different Internet cafés and four different hotspots throughout the Amsterdam RAI, delegates were able to enter the WGC2006 information system, either via their own laptop or via the computers provided. The system offered participants the opportunity to design their personal conference programme and find information about Amsterdam, the exhibitors and a lot more. Please be informed that this information is still available via www.wgc2006.nl.

● Press attendance

In total 200 press delegates attended the World Gas Conference. Numerous newspaper articles were published and interviews were broadcast live around the world. Every day different press conferences were held and a fully equipped press room operated throughout the week.

● Security

Special security measures were taken to ensure the safety of delegates, exhibitors, visitors and staff. No person could enter the Amsterdam RAI Centre without a special WGC2006 badge and all baggage was screened every day.

● Partner programme and excursions

About 400 partners attended the partner programme that was organised in conjunction with the World Gas Conference. On Tuesday June 6 the

WGC2006 IN A NUTSHELL

- 15,000 square metres of net exhibition space
- over 10,000 visitors to the exhibition
- 50 shipping containers with exhibition material
- more than 230 stands from 40 countries
- just under 4000 conference participants from 88 different countries
- more than 1000 members of staff



The WGC2006 hotspots helped delegates keep in touch.

official partner programme started in the Amsterdam RAI with a workshop on table decoration, followed by a lunch and ending with a free choice of different Amsterdam city tours. During the rest of the week excursions were made to many different places in The Netherlands



The 23rd World Gas Conference took place in the Amsterdam RAI Exhibition and Congress Centre.

SOME EXAMPLES OF SPEAKERS

Faisal M. Al-Suwaidi, Chairman & CEO, Qatargas
 Kunio Anzai, Chairman, Tokyo Gas, and Chairman, Japan Gas Association
 Proshanto Banerjee, Chairman & Managing Director, GAIL (India) Ltd
 Burckhard Bergmann, Chairman of the Executive Board, E.ON Ruhrgas
 Laurens Jan Brinkhorst, Minister of Economic Affairs of The Netherlands, Deputy Prime Minister
 Frank Chapman, CEO, BG Group plc
 Jean-François Cirelli, Chairman & CEO, Gaz de France
 Job Cohen, Mayor of Amsterdam
 Vivienne Cox, Chief Executive – Gas, Power & Renewables, BP plc
 Thierry Desmarest, Chairman & CEO, Total S.A.
 José Sérgio Gabrielli de Azevedo, CEO Petrobras

Pierre Gadonneix, Chairman & CEO, Electricité de France
 Minister V. Khristenko, Minister of Energy of the Russian Federation, in his capacity as Chairman of the Ministers of Energy of the G8
 Tan Sri Dato Sri Mohd Hassan Marican, President & CEO, Petronas
 Alexei Miller, Chairman of the Management Committee, OAO Gazprom
 Andris Piebalgs, Energy Commissioner, European Union
 David O'Reilly, Chairman & CEO, Chevron Corporation
 Paolo Scaroni, CEO, Eni S.p.A.
 Jeroen van der Veer, CEO, Royal Dutch Shell plc
 George H. B. Verberg, IGU President
 Daniel Yergin, Chairman, Cambridge Energy Research Associates (CERA)

LEFT
Table 2.



including The Hague, Haarlem and the flower auction in Aalsmeer.

● **Exhibition**

Some 15,000 square metres of space was reserved for the WGC2006 exhibition, which was opened by the Mayor of Amsterdam, Job Cohen, on June 6. Please visit the list of exhibitors via www.wgc2006.nl if you would like to know which companies were present.

● **WGC2006 Sponsors**

On behalf of the National Organising Committee, I would like to thank the following WGC2006 sponsors for their contribution: Shell, ING, Chevron, Essent, ConocoPhillips, Ernst & Young, Total, Qatargas, Eni, Petrobras, Accenture, BP, Deloitte, Energy Delta Institute, Fluxys, McKinsey & Company and PriceWaterhouseCoopers.

I look forward to seeing you at WGC2009 in Argentina!



Robert C. A. Doets is the Secretary General of the Royal Dutch Gas Association (KVGn) and served as the Chairman of the National Organising Committee WGC2006.



Amsterdam's Mayor, Job Cohen (TOP RIGHT), was the guest of honour at the exhibition opening ceremony (ABOVE).

Shell knows which way to go when it comes to LNG



It has been leading the way for over forty years

Shell is a pioneer in the LNG industry with more than 40 years experience in LNG technology, production, shipping and marketing. Brunei LNG, in which Shell owns a 22.5% interest, has been producing LNG for some of the world's biggest markets since 1973 and has seen a capacity increase of 40% through innovative debottlenecking activities over its lifetime.

Today, Shell is the leading IOC with interests in LNG plants in Australia, Brunei, Oman, Malaysia and Nigeria that together produced approximately one-third (50 million tonnes/year) of the world's LNG production in 2004.

Shell Global Solutions, provider of technology and technical services to a number of Shell joint venture operations, has a 100% record in meeting design capacity with its LNG technology, while delivering a low unit cost

LNG. LNG plants where Shell Global Solutions is technical advisor set the industry benchmark in reduced CO₂ emissions.

Shell offers a portfolio of LNG plant designs in a range of 2 to 10 mtpa, tailored to specific needs of Major Resource Holders and JV partners, delivering average plant utilisation of 95%, which is 10% higher than the 85% industry average (without Shell).

To meet increasing global demand, Shell and its partners are developing new plants and terminals in a further nine countries. In 2005 alone, Shell announced significant new LNG ventures in Qatar, Libya and Nigeria.

Experience and expertise in integrating the full LNG value chain sees Shell playing a leading role in all aspects of the LNG chain – from supply and liquefaction to trading, shipping, regasification and delivery to our customers.





Some Impressions of WGC2006 in Amsterdam

By Mark Blacklock

With 3874 participants, keynote addresses by leading industry figures and a myriad of work sessions, as well as an exhibition and a range of side events, the 23rd World Gas Conference was a valuable forum for the exchange of information and views on gas developments. Delegates from



The gas world came to Amsterdam in June – delegates registering.

around the world debated in public and negotiated in private. Sometimes they agreed; sometimes they disagreed. But from the wide-ranging discussions one overriding message was clear: the need for long-term partnerships to realise the full potential of the global gas industry.

“Governments worldwide will have to be a reliable partner for business,” declared Laurens Jan Brinkhorst, the Dutch Minister of Economic Affairs, while Viktor Khristenko, the Russian Minister of Energy and Chairman of the G8 energy ministers, called for greater risk-sharing and cross-shareholdings between producers and consumers. Speaking at the opening ceremony on June 5, both ministers expanded on the partnership theme by taking a firm stand against national protectionism and in favour of international market integration. They also stressed the need for greater transparency in energy policies and market structures, issues taken up over the following days by many of the keynote speakers.

“We need to pool our knowledge in strong partnerships,” said Jeroen van der Veer, Chief Executive of Royal Dutch Shell. “Openness to foreign investment is so important, and arbitrary barriers are so damaging.”

“Only long-term contracts can guarantee the financing for the implementation of capital-intensive and long-term gas production and transport projects,” said Alexei Miller, Chairman of the Management Committee of Gazprom, a point amplified by BG Group’s CEO Frank Chapman, “successful long-term trade needs suppliers and customers on both sides of the transaction to be satisfied”.

Chapman was one of many speakers pointing out that the current high level of prices risked “demand destruction” and a consequent slowing down in the growth of gas demand, particularly in the gas-to-power sector. High gas prices make alternatives such as nuclear, clean coal and renewables more attractive. They also reinforce the need to improve the way we use gas. “Energy

efficiency is the lowest cost form of new energy we have," declared David O'Reilly, Chairman and CEO of Chevron.

Pierre Gadonneix, Chairman and CEO of Electricité de France, foresaw that the electricity generation sector would see decreasing use of gas after 2030 and a lesser reliance on thermal plants once other technologies have gained ground. "There is no doubt that gas will remain a key element of the European energy mix, and even the leading primary energy in the electricity mix, during the first quarter of the century. Nonetheless, gas will over time increasingly be used directly," he said.

In Japan, declared Kunio Anzai, Chairman of the Japan Gas Association (JGA), "gas demand for conventional large-scale centralised power generation of the incumbent power utility companies shows some signs of saturation". The JGA is promoting distributed power generation which it expects to exceed a 20% market share by 2030. Anzai said that the world's first commercial residential polymer electrolyte fuel cell (PEFC) cogeneration system had been installed in the Prime Minister's official residence in Tokyo in April 2005, and that there are now around 500 units in Japan.

News of the official inauguration of the Oryx GTL plant in Ras Laffan, Qatar, on the second day of the conference animated discussion of the prospects for gas-to-liquids, but there was widespread concern on the investment front about the demands of a healthy global economy pushing up commodity and labour costs. The Oryx joint venture of Qatar Petroleum and Sasol was built under a fixed price contract agreed in 2003; new plants face higher costs. "We will keep up R&D work on GTL," said Total's Chairman and CEO, Thierry Desmarest, "but the netback is higher on LNG".

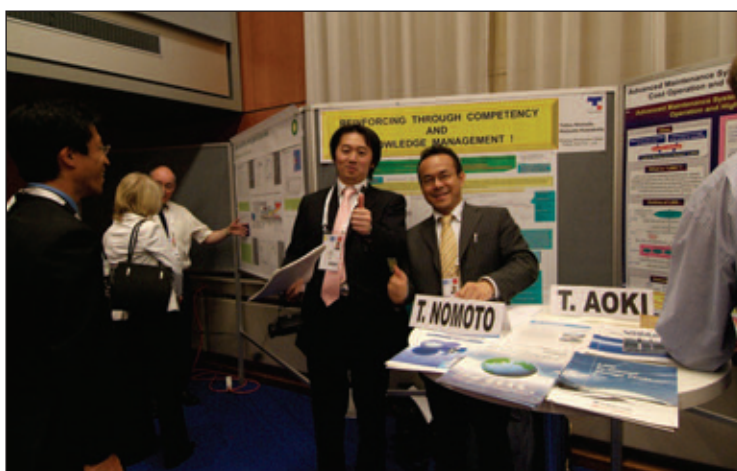
Not that LNG projects are immune to cost increases. Jean-François Cirelli, Chairman of Gaz de France, pointed out that while the cost of constructing LNG terminals and tankers fell consistently in the four decades following the start



Bert Panman makes a point.

of commercial deliveries in October 1964, recently there has been a worrying increase. Addressing the concern, Faisal Al-Suwaidi, Chairman and CEO of Qatargas, said his company had reacted by going for a step-change in LNG tanker capacity to 266,000 cubic metres. A new fleet of "Q-Max" ships is due to enter service in 2008.

Al-Suwaidi also stressed that a "long-term stable regulatory environment is critical to the future of LNG", a point with which the EU Energy Commissioner, Andris Piebalgs, was in full agreement. "We need regulatory stability to attract investment," he said, adding that the EU was



Thumbs up for the poster sessions.



Qatar made a strong showing in the exhibition.

working towards a liberalised, single energy market covering not just the Union, but also neighbouring countries in the Balkans and possibly Turkey through the Southeast European Energy Community: “One of its goals is to enhance investment in energy infrastructure in this region.”

Investment in human resources is as important as developing infrastructure. Tan Sri Dato Sri Mohd Hassan Marican, President and CEO of Petronas, sounded a warning note about a looming shortage of qualified staff which “could have implications for safety”. Chevron’s O’Reilly urged a recruitment campaign, “we have to promote our industry as a great place to work”, while Shell’s van der Veer declared that future success was dependent on “attracting, developing, motivating and deploying people with the expertise and judgement to face up to the challenges”.

There was no such consensus on pricing structures. Here there was a clear dichotomy between those who foresaw a de-coupling of the gas-oil price link as a true global gas market develops, such as Minister Brinkhorst, and those who felt that indexation would continue, such as

Proshanto Banerjee, Chairman and Managing Director of GAIL India.

● **Work sessions and busy exhibition**

While the dignitaries and strategy makers grabbed the headlines, those on the operational front line of the industry got on with their work in the committee and project sessions.

Business also went on – in public on the stands and in private in the upstairs meeting rooms – at the exhibition, which was the biggest yet to accompany a World Gas Conference with 250 exhibitors and 10,000 visitors. Its talking point was the enormous Qatar stand in the form of an LNG tanker that accommodated individual booths for the various Qatar Petroleum subsidiaries. Colombia’s National Hydrocarbons Agency (ANH) also sent a strong message by taking a prominent stand, which could presage the country rejoining IGU by the time the next World Gas Conference takes place in Buenos Aires in October 2009.

Mark Blacklock is the Editor-in-Chief of International Systems and Communications.



Growing your LNG business? So are we.

BP is one of the world's leading LNG companies – and we're growing. We participate in projects that provide around 30 percent of total world supply – in Abu Dhabi, Australia, Indonesia and Trinidad – with new ones underway. We are the largest producer of gas for liquefaction for the US. And we supply and source LNG for our customers, often at short notice, using some of the newest LNG ships from our merchant fleet. We also have access to great LNG markets founded on relationships developed over many years in Europe, South Korea, Japan, Taiwan, the US and China where we are the only foreign participant in the country's first LNG import terminal. It's a portfolio that helps us ensure the right resources target the right markets at the right time. And it's a portfolio that can help add value for our partners and customers as well. If you would like to find out more, why not call us or visit our website: www.bp.com/lng



beyond petroleum™

Final Report of WGC2006 – Introduction

● Outline of the programme

The conference started in the afternoon of Monday June 5 with a formal opening ceremony that included addresses by His Excellency Laurens Jan Brinkhorst, Deputy Prime Minister and Minister of Economic Affairs of The Netherlands, His Excellency Viktor Khristenko, Chairman of the Energy Ministers of the G8 and Minister of Energy of the Russian Federation, and George Verberg, IGU President. Their Excellencies called for closer cooperation between gas-producing and consuming countries in their speeches, and then performed the official opening. This was followed by a dance and music performance of great beauty and elegance by the Dutch National Ballet. Called “Who Cares?”, the performance was based on the choreography of George Balanchine with music by George Gershwin. A brass band then led delegates to the gala dinner.



On the following three days, Tuesday, Wednesday and Thursday, presentations were given in 10 conference rooms varying in audience capacity between 70 and 1700 people. Each morning and afternoon started with plenary keynote addresses in the auditorium, followed by high quality presentations and discussions in several parallel sessions.

In a series of strategic panels, the results of the Special Projects of the Dutch Presidency on Gas to Power, Sustainable Development and Regulation were reported, as well as the findings of the IGU Task Force on R&D. Subjects of strategic importance were also covered with panels on: NGVs, LNG, capital for gas, marketing, ICT and other fuels (dimethyl ether, GTL, biogas, hydrogen). In parallel, the IGU Committees presented their reports and held their sessions with presentations and posters that resulted from the call for papers.

On Friday June 9, the last day of the conference, only plenary sessions were held. The first looked at natural gas and geopolitics. This was followed by a session during which ministers of several countries set the scene by giving their views



Ministers Laurens Jan Brinkhorst (LEFT) and Viktor Khristenko (ABOVE) addressed delegates during the opening ceremony, and the Dutch National Ballet performed “Who Cares?” (OPPOSITE PAGE).



on the global energy situation, complemented by the views of two CEOs and of two international energy organisations. Marking the end of the Dutch Triennium and the beginning of the Argentine Triennium, the afternoon session of Friday focused on the new Triennial Work Programme for 2006-2009.

The conference ended with a closing ceremony during which a globe was handed to the new President to symbolise his task of keeping the IGU world on track. The ceremony also included the award of prizes and a cultural performance entitled "We Do Care", expressing the dedication of the gas business to the environment and the future of our children. The ceremony was followed by the farewell party which illustrated the multicultural family IGU has become, thereby ensuring good relations and business networks all over the world.

● Award winners

IGU prizes

The gas organisations of three countries nominated the winners of their national gas industry competitions for the two IGU Thesis Prizes 2006. The prizes, each of €10,000, were sponsored by IGU and the Energy Delta Institute of The Netherlands.

The prize in the category Social Responsibility was awarded to Ms Line Friis Lindner Madsen for her thesis "EU-Russian energy relations – A stepping stone for further cooperation?". Ms Lindner Madsen, who is from Denmark, is currently studying for a Master of Arts in European Interdisciplinary Studies at the Natolin Campus in Poland of the College of Europe.

The prize in the category Technology and Sustainable Development was awarded to Mr Ir. W.J.S. Ramaekers from Eindhoven University of Technology, The Netherlands, for his thesis "The application of flamelet generated manifolds in modelling of turbulent partially-premixed flames".

Additionally, each of the organisers of the national competitions was given a free voucher to be used by a promising student or employee in the gas business for a course at the Energy Delta Institute. The national organiser of The Netherlands (KVGN) donated its voucher to the Algerian Gas Association and thus the three countries using the vouchers will be Algeria, Denmark and the Slovak Republic. Representatives of IGU Charter Members l'Association Algérienne de l'Industrie du Gaz, the Danish Gas Association and the Slovak Gas and Oil Association received the vouchers during the closing ceremony.



Each morning and afternoon started with plenary keynote addresses in the auditorium.

Award-winning contributions to WGC2006

Each IGU Committee could nominate two candidates for the best paper/best poster selection process and four awards were given for contributions to WGC2006.



WGC2006 was the culmination of the Dutch Presidency under George Verberg.

Ben Hollins of Wood Mackenzie Ltd (United Kingdom) was chosen for his paper “Assessing the future of the global gas market”, which was presented in the session of PGC B (Strategy, Economics and Regulation) on Wednesday morning, June 7. This was an excellent paper and very well presented, drawing attention to the need for large future investments in LNG and gas pipeline infrastructure.

Another award went to Hernando Gutiérrez de Pineros of Promigas (Colombia) for his paper “The massive use of natural gas in Colombia: A successful experience”, which was presented in the session of PGC C (Developing Gas Markets) on Thursday morning, June 8. It addressed from an unusual angle the role gas market development can play in the economic growth of the region and the positive social effects for the people in that region.

Laura A. Hardiman of Total E&P UK plc received an award for her paper “Elgin/Franklin: five years on”, which was presented in the session of WOC 1 (Exploration and Production) on Wednesday morning June 7. It represented an excellent

Fuelling the Future



A new dawn is casting its light on the Sultanate of Oman.

At Oman LNG, the power to realise aspirations and build lives is our prime objective. From Oman, we have embarked on providing the world with a new source of energy, a cleaner alternative to fuel, a brighter future.

Established by a Royal Decree in February 1994, Oman LNG is the fastest LNG project ever developed. With one of the most technologically advanced LNG plants in the world, it is the largest investment project undertaken in the Sultanate of Oman. Most importantly, it heralds a new chapter in Oman's development and diversification of the national economy.

Oman LNG. Giving people, communities and nations the energy to move forward, to grow and progress.

Oman LNG's Competitive Advantages: Strong global shareholding formation • Geographical advantage coupled with political, economic and financial stability • Safe harbour • Substantial gas reserves • Reliable state-of-the-art technology • Over 500 cargoes delivered, giving Oman LNG a track record of reliability • ISO certified • Unprecedented international credit ratings of A3/A-



الشركة العمانية للغاز الطبيعي المسال ش.م.ع.

Oman LNG L.L.C.

P.O. Box 560, Mina Al-Fahal, P.C. 116, Sultanate of Oman. Head Office - Tel.: (+968) 24609999, Fax: (+968) 24609900.
Qalhat Site Office - Tel.: (+968) 25547777, Fax.: (+968) 25547700. Website: www.omanlng.com



We Do Care!

example of one of the major goals in IGU: to exchange information on vital experiences regarding the gas business – in this case the upstream side.

Joachim Wallbrecht of BEB GmbH (Germany) was recognised for his work as leader of the WOC

2 (Storage) Study Group covering basic UGS activities. This Study Group was in charge of maintaining and updating, for two consecutive Triennia (2000-2003 and 2003-2006) the very useful database published on the proceedings CD-Rom under Committee Reports WOC 2.



The farewell party had a distinctive Amsterdam atmosphere.



NAM - A reliable source

Nederlandse Aardolie Maatschappij (NAM) B.V., a joint venture of Shell and ExxonMobil, is the largest natural gas producer in the Netherlands. Founded as an oil exploration and production company in 1947, real growth came after NAM discovered the Groningen gas field in 1959.

Since 1963, production from this giant gas field, with original producible gas reserves of 2,700 billion m³, laid the foundation for the Dutch and European gas markets. Due to prudent implementation of the Dutch government's Small Fields Policy - developing smaller fields first and keeping the Groningen gas field as much as possible as reserve - after more than 40 years of production, some 1,100 billion m³ still remains. To enhance production from this field, a large compression and renovation programme was started in 1996, lasting 15 years and requiring an investment of some \$2 billion.

The discovery of the Groningen field also opened the door for offshore gas exploration and production, and in 1961 NAM was the first company in Western Europe to drill for gas in the North Sea. NAM now operates some 30 offshore production platforms.

NAM's annual natural gas production exceeds 50 billion m³. A little more than half of this gas originates from the Groningen field and the rest from various smaller fields elsewhere on the mainland and in the North Sea. NAM gas meets about 75% of the Dutch demand. NAM also continues to produce oil, approximately 0.45 million m³ a year. NAM accounts for about 25% of the oil produced in the Netherlands.

NAM anticipates future needs. For example, in 1997 NAM constructed underground gas storage facilities at Langelo and Grijpskerk that enable us to meet energy demands on even the coldest days. In order to bring smaller gas fields on stream in an economically viable way, smarter exploration methods and smaller production units are being developed and put into operation.

Meanwhile, NAM continues to search for new gas fields in the Netherlands - both onshore and offshore.



NAM A reliable source

Schepersmaat 2, 9405 TA Assen, P.O. Box 28000, 9400 HH Assen, The Netherlands
Telephone: + 31 592 369 111, telefax: +31 592 362 200, internet: www.nam.nl





The IGU Thesis Prizes 2006 of €10,000 each were awarded to Line Friis Lindner Madsen (LEFT) and W.J.S. Ramaekers (ABOVE).

● **Keynote addresses**

There were 12 keynote addresses as listed below with sample extracts.

The Future is Gas?

Jeroen van der Veer (Chief Executive, Royal Dutch Shell plc, The Netherlands)

“While the role of natural gas is poised to grow very strongly, we face significant challenges in bringing this about.”

Energy for the Planet

Alexei Miller (Chairman of the Management Committee, OAO Gazprom, Russian Federation)

“Long-term contracts are still the foundation of the gas business for pipeline deliveries..... No

formula for energy security can be viable unless it provides an incentive to produce that energy.”

A Changing World of Energy – New Opportunities for the Natural Gas Industry

Kunio Anzai (Chairman, The Japan Gas Association, Japan)

“It is essential for natural gas sellers and buyers to review matters with a long-term perspective of 20-30 years.”

The Right Mix

Pierre Gadonneix (Chairman and CEO, Electricité de France, France)

“Gas will be a key ingredient of the ‘right’ energy mix..... During the first quarter of the century it will



There were also bouquets for the hard work put in to making the 2003-2006 Triennium culminating in WGC2006 a success.



Jeroen van der Veer (ABOVE LEFT) and Alexei Miller (ABOVE RIGHT) started the series of keynote addresses on the morning of Tuesday, June 6.

even be a vital source for electricity generation, until other technologies have gained ground.”

Gas in the Energy Mix – How to Maximise Gas Growth

Frank Chapman (Chief Executive, BG Group plc, United Kingdom)

“The industry needs to get off the back foot and make the case [for gas] more forcefully.”

Gas within a Sustainable Future

Thierry Desmarest (Chairman & CEO, Total S.A., France)

“There are large reserves, but the capacity to raise production is a real challenge.”

Natural Gas: A Key to Global Energy Security

David O’Reilly (Chairman and CEO, Chevron Corporation, USA)

“Open markets, sound government policies, robust technology, energy efficiency and responsible leadership. Taken together, they form a pragmatic and powerful framework for global energy security.”

Gas Sustainability: A Perspective from Petronas

Tan Sri Dato Sri Mohd Hassan Marican (President & CEO, Petronas, Malaysia)

“Gas trade will continue to be based on long-term contracts built on relationships that are

mutually beneficial to all stakeholders, but geopolitics and political trade-offs will influence its future direction.”

What Does LNG Tell Us about the Main Issues of the Gas Industry?

Jean-François Cirelli (Chairman and CEO, Gaz de France, France)

“LNG can guarantee security and flexibility for each of the three continental markets and can help draw those three markets closer together. But this favourable outlook remains conditional due to real concerns about price levels.”



On Tuesday afternoon Kunio Anzai (CENTRE) and Pierre Gadonneix (RIGHT) addressed delegates. The session was chaired by IGU President George Verberg (LEFT).



Frank Chapman (ABOVE LEFT) and Thierry Desmarest (ABOVE RIGHT) gave the keynote addresses on the morning of Wednesday, June 7.



On Wednesday afternoon it was the turn of David O'Reilly (ABOVE LEFT) and Tan Sri Dato Sri Mohd Hassan Marican (ABOVE RIGHT).



COMMERCIAL & TRADE SECTOR

Is within vertically integrated oil and energy company INA, part of Naftaplin - Exploration and Production Division. Commercial and Trade Sector is engaged in the domestic and import gas supply business as well in wholesale of natural gas to all consumers in the Croatian energy market. Our Vision is to maintain our position as a leader in the Croatian wholesale natural gas market and to expand our activities to become a significant player in the region. Our Mission is to promote the use of natural gas aiming at environmental protection, to provide excellent and reliable service to meet our customers needs and expectations so to earn their permanent trust.

beauty and the energy belong together





Proshanto Banerjee (CENTRE) and Jean-François Cirelli (RIGHT) gave the keynote addresses on the morning of Thursday, June 8. The session was chaired by IGU Honorary President John Kean Sr (LEFT).

India: A Key Destination for LNG

Proshanto Banerjee (Chairman & Managing Director, GAIL (India) Limited, India)

India could become one of the world’s three largest economies in 30 years. Growth in energy supplies is critical for India’s economic growth. The share of natural gas is growing at 7% annually.

The Changing US Natural Gas Market

Stephen Ewing (Chairman, American Gas Association, USA)

“Growing demand, but price forecast and market growth depend on public policy outcomes.”

Qatar: Leading the Global LNG Challenges

Faisal M. Al-Suwaidi (Chairman & CEO, Qatargas Operating Company Limited, Qatar)

Qatar has responded to, and will continue to respond to, global demand for LNG and will meet the challenge of security of supply.

● **Midday addresses**

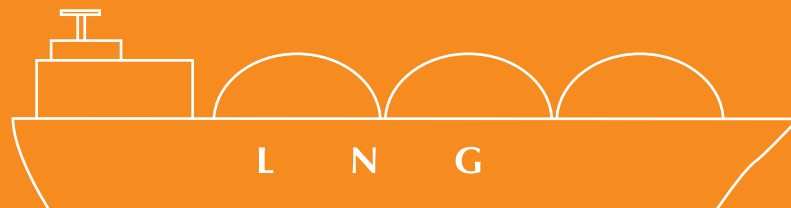
Five speakers gave midday addresses during the luncheon service in Hall 9, three on the Tuesday and one each on the Wednesday and Thursday.

Opening the Gate: How Zeebrugge Boosts its Role as the Centre of Cross Border Flows and Trade in Western Europe

Vincent Wittebolle (CEO, Fluxys NV, Belgium)



Stephen Ewing (ABOVE LEFT) and Faisal M. Al-Suwaidi (ABOVE RIGHT) gave the final keynote addresses on Thursday afternoon.



Journeying ahead and fulfilling our commitments to those who are counting on us

In our pursuit of our goal, to be the world's leading LNG supplier, we measure our progress by the customer satisfaction we achieve and the standards we maintain.





Rapt listeners for the midday address.



George Verberg talks to members of the ministerial panel. From left to right: Daniel Yergin, Andris Piebalgs, Khaled Mahfood Abdulla Bahah, Faisal M. Al-Suwaidi, Ahmed Mukhtar and Justin R. Swift.



The second part of the ministerial session was opened up to Arne Walther, Paolo Scaroni, José Sérgio Gabrielli de Azevedo (all pictured with George Verberg) and Noê van Hulst.

Europe's Gas Infrastructure: Monopoly and Competition

Marcel Kramer (Chairman & CEO, NV Nederlandse Gasunie, The Netherlands)

"Competition brings innovation, brings a natural incentive to optimise our products and services, and brings growth for those who do their job best."

Underground Gas Storage and the Groningen System: Securing Gas Supply

Roelf Venhuizen (Managing Director, Nederlandse Aardolie Maatschappij b.v., The Netherlands)

Basic demand is provided by the numerous small gas fields balanced by the Groningen system and the underground storage facilities.

Sustainability and Gas – A Strong Tandem

Burckhard Bergmann (Chairman of the Executive Board, E.ON Ruhrgas AG, Germany)

"The role played by gas in energy supply will therefore only be sustainable if we can give consumers long-term volume and price security."

Agents of Change: Preparing for a World where Carbon Has a Price

Vivienne Cox (Chief Executive for Gas, Power & Renewables, BP plc, United Kingdom)

Gas is not just a building block of the low-carbon future but arguably its cornerstone. Investing in new low-carbon technologies is hampered if regulation continues to favour high-carbon technologies or only a limited selection of lower-carbon ones. This generation of business leaders needs to bring about the greening of the energy industry.

● **Ministerial panel**

The panel was chaired by Mr George Verberg IGU President 2003-2006. Mr Daniel Yergin, Chairman of the Boston-based consultancy Cambridge Energy Research Associates, took the role of



moderator and gave an overall summary, raising points to stimulate debate among the speakers.

First up was the European Union Commissioner for Energy, Mr Andris Piebalgs, who was followed by Mr Faisal M. Al-Suwaidi, representing the State of Qatar.

The Republic of Yemen is a relative newcomer to the international LNG scene and Mr Khaled Mahfood Abdulla Bahah, Minister of Oil and Minerals, gave a presentation on gas developments in his country.

From Pakistan, Mr Ahmed Mukhtar, Advisor to the Prime Minister on Energy, gave an overview of his country's planned gas imports that will boost gas use three-fold in the next 20 years. He expressed his confidence in the realisation of a project that would see Iran exporting gas to South Asia.

Finally, Mr Justin R. Swift, Deputy Assistant Secretary for International Affairs in the Office of Fossil Energy, US Department of Energy commented on the previous presentations from an American point of view.

After the break the panel was opened to industry leaders and international organisations. From Brazil, Mr José Sérgio Gabrielli de Azevedo, President and CEO of Petrobras, made particular reference to the gas price of the Bolivian contract, while from Italy, Mr Paolo Scaroni, CEO of Eni S.p.a., addressed the possible future shortages of gas in Europe. Representing the international organisations were Mr Noë van Hulst, Director Policy Analysis Office at the International Energy Agency and Mr Arne Walther, Secretary General of the International Energy Forum, who wound up with a call to improve the dialogue between oil and gas producing and consuming nations.



MAIN AREAS OF THE COMPANY'S OPERATION

- Natural gas purchasing, storage, transmission, distribution and sales;
- Export and import operations with natural gas;
- Natural gas metering and quality control.

JSC Latvijas Gāze
Aristida Briana Str. 6
LV-1001 Rīga, Latvia
Tel: +371 7369132
Fax: +371 7517340
e-mail: latvijas.gaze@lg.lv
www.lg.lv

Chart Energy & Chemicals



Energy & Chemicals

Chart Energy & Chemicals Inc.'s roots in the hydrocarbon and petrochemical industries go back more than 50 years. Throughout this time Chart's technology and innovation has proven to be the driving force behind its growth and success. The company has aspired from a very diverse and creditable background of highly technology leveraged organisations and has transformed itself to service much more than the traditional brazed aluminium heat exchanger (BAHX) markets which it is probably best known for. Chart is arguably the world leader in thermal heat transfer technology with an unrivalled pedigree.

Although the individual names of the companies that now form Chart Energy & Chemicals Inc. have gone, the experience and desire to continually improve has not. Chart prides itself on its knowledge of its customer and its customer's applications and strives to use its proven leading edge engineering and manufacturing know-how to provide value added, flexible solutions to the markets and customers it serves. Chart is without doubt one of the most diverse providers of thermal heat transfer and petrochemical processing technology in the world.

Headquartered in The Woodlands, Texas, Chart Energy & Chemicals serves markets ranging from air separation for the industrial gas market, the complex processing of ethylene and the liquefaction of LNG in the furthest reaches of the world. The most recent development in the history of Chart has seen the company purchased by one of the elite private equity investors in the Energy business, First Reserve. First Reserve is the leading private equity firm specialising in



Chart's brazed aluminium heat exchanger core.

the energy industry with \$4.7 billion under management in four funds. Throughout its 25-year history, First Reserve has developed a strong franchise of investing exclusively in the energy industry, utilising its broad base of specialised industry knowledge. The acquisition provides Chart Energy & Chemicals with a sound financial platform for further growth.

► Matching processes with equipment design

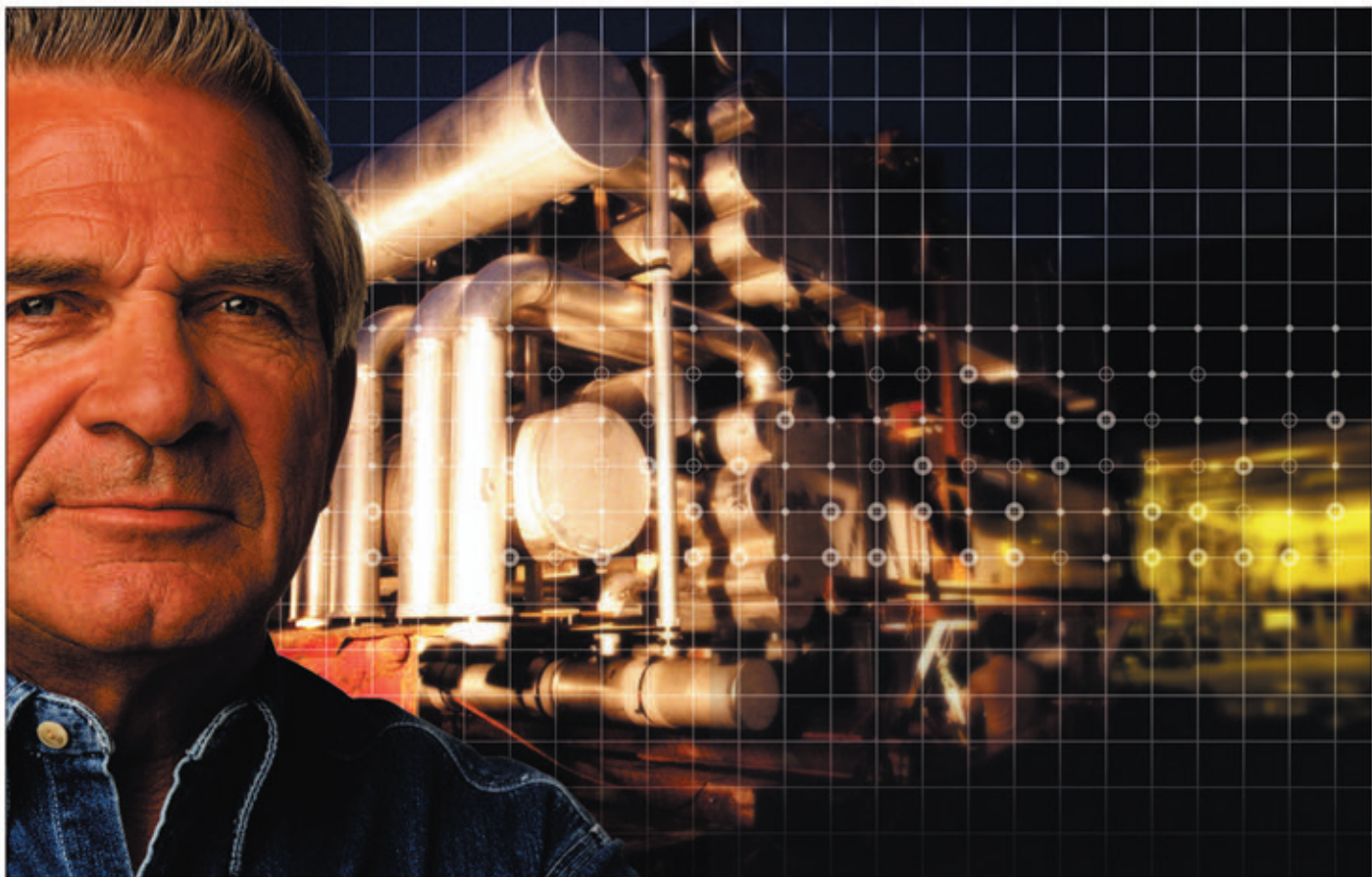
Chart is uniquely positioned to provide its customers with optimised custom designed cryogenic process equipment and thereby optimise the process in which its equipment is used. With unsurpassed experience and knowledge of process equipment design, Chart's experienced engineers are capable of matching equipment and processes to produce the lowest overall cost solutions and balance investment costs with operating costs.

Chart's pedigree covers a wide range of cryogenic processes related to the production of ethylene, LNG, industrial gases, natural gas liquids, nitrogen rejection units (NRU), and many others. Chart highly recommends that its customers contact them as early as possible in the design of a new process plant in order for Chart's engineers to evaluate, analyse and recommend improvements that can result in equilibrium between the process and equipment design.

Chart serves customers' cryogenic process equipment needs from the study phase right through to the modularisation of the equipment at the point of shipment. Project management of large scale equipment is indeed Chart's forte with Chart providing transparent project execution for the sophisticated needs of a process plant. Customers benefit from economies of scale with a single source supply of equipment, reduced procurement and optimised project resources.

Chart is capable of providing the engineering and equipment needed in LNG applications such as base load LNG liquefaction/export terminals, LNG import terminals and small-scale LNG liquefaction plants. The BAHX, vessels, piping and cold boxes can be purchased under a single contract. Chart's team of engineers is capable of providing the most efficient, economical solution to our customers' process equipment requirements.

www.chartenergyandchemicals.com



Fulfill Your LNG Processing Needs

Vacuum Insulated Pipe (VIP)

- Reduces overall installed transfer piping cost and installation time
- Perfect for use in LNG ship to shore piping installations and tank risers

Brazed Aluminum and Core-in-Kettle Heat Exchangers

- Reduces overall cost of processing LNG through tight approach temperature in heat transfer systems
- Achieves excellent performance throughout the cryogenic LNG refrigeration system

Cold Boxes and Engineered Solutions

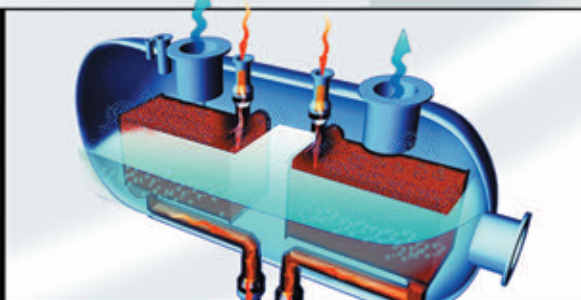
- End-to-end process and mechanical engineering to deliver an optimized LNG solution
- One stop shop for insulated cryogenic cold boxes saves time and cost

Call today 281-364-8700.

www.chartenergyandchemicals.com



Energy & Chemicals





Strategic Panels

● Gas to Power – A cloudy mid-term outlook

Five sessions at WGC2006 on June 6 were dedicated to Gas to Power, with first a global and then regional outlooks. The global outlook was addressed in a Strategic Panel moderated by James Ball, President of Gas Strategies Consulting, UK, and experts noted that the atmosphere since the last WGC had changed. In Tokyo in 2003, the outlook for gas for power generation was much better than it is today. In ensuing discussions, panellists pointed out that it is mainly the expectation of gas prices remaining high, whether caused by market fundamentals or through linkage with high oil prices, that worsens the competitive

position of natural gas as a fuel for power generation. The increasing complexity and financial risk of bringing gas to markets has led to lagging investments in gas supply throughout the chain. In the future, emerging alternative uses for gas, such as in transport (gas-to-liquids – GTL, compressed natural gas – CNG), might offer better returns to gas producers than sales to the power sector, thus putting pressure on gas supplies to power companies.

Nevertheless, the promises of Tokyo have been delivered: the growth in electricity demand over the past three years has largely been met by gas-fired power generation. Power generators around the world still value gas as a clean and flexible fuel and find it easier, especially in liberalised markets, to construct combined-cycle gas turbines (CCGT) than power plants requiring different fuels. In some



Power generators around the world still value gas as a clean and flexible fuel.

OECD Member States in particular, opposition by local interest groups and reservations in the general public's opinion with respect to nuclear energy and coal as well as the perspective of carbon-reducing policies, make natural gas-fired power plants look like the only viable option for new generation capacity. According to IEA data, 80% of new-build power plants between 2000 and 2010 will be fuelled by gas.

Throughout the day, some experts warned about a possible over-reliance on natural gas and advocated a more balanced fuel mix, especially in those countries without indigenous gas resources. Nevertheless, alternatives are not readily available in the short term. It takes significantly longer to construct a nuclear or coal-fired power plant, and both these technologies have their own issues in terms of environmental and capital costs.

A change is being observed in the way gas is used for power generation. Depending on availability, it seems that increasingly gas is used for mid-merit and peak-load electricity generation. This suits the more flexible gas supply, and matches its usage to the cost structure, with rather low investment and high operating costs. This development requires different attitudes, new risk management tools and new contract structures, both on the supply and on the demand side. As the importance of gas in the fuel mix for power generation has been growing, the gas and power markets are becoming intertwined and this needs to be understood by all actors.

Asia

The Strategic Panel looking at Gas to Power in Asia was moderated by Datuk Abdul Rahim Hj Hashim. Setting the scene, it was noted that the economic profiles of the Asian countries vary throughout the region, with their common denominator being strong economic growth and a consequent growing demand for energy in general, and for natural gas in particular. The gas reserves in the area are significant, but it is becoming more expensive to

develop projects. Reasons for rising costs include a shortage of skilled labour and in some countries regulatory uncertainties. Generally, gas has to compete with coal in Asia but this does not mean that the gas price is capped by the coal price. Gas offers significant environmental advantages and flexibility, which is valued at a premium. The appreciation of these advantages may differ from place to place.

One of the most interesting proposals made was to create a regional spot market for LNG to secure supply. Various industry representatives pointed out that it is unlikely for LNG projects to go ahead without long-term supply contracts, and that the Asian market in particular seems less flexible than other markets. For a spot market to function properly, it is essential that final customers can adapt to price signals as well.

Japanese representatives stressed their devotion to distributed power systems such as (domestic) combined heat and power systems. These systems make it possible to make optimal use of the energy content of natural gas by using the heat generated during the generation process for domestic purposes.

Europe and Russia

The Strategic Panel looking at Gas to Power in Europe and the Russian Federation was moderated by Clare Spottiswoode, formerly in charge of gas industry regulation in the UK, and now Chair of Gas Strategies Group. The initial observation was made that high gas prices form the largest obstacle to increasing use of natural gas in European power generation. Panel participants pointed out that current price levels make new CCGTs less economical than new coal-fired power plants, even when allowing for the cost of CO₂ emissions. However, there is uncertainty about the future costs associated with CO₂ emissions and this is seen as a complicating factor for any new investment in power generation. While there appears to be general agreement that certainty about emission



The industry in Europe appears to be striving for a balanced generation portfolio.

prices will be hard to achieve, it has been suggested that governments could commit now to certain conditions determining how they will proceed with the emission trading system. For instance, the system of allocation – grandfathering against auctioning, application of a benchmark or not – could be fixed today without fixing emission ceilings. There is also a need to establish standard emission permit allocation rules across the EU; the current lack of a “level playing field” means that choices for new investment vary according to the Member State.

Electricity producers would like to obtain more gas supply contracts where prices are indexed against electricity or coal prices. Given that gas producers prefer supply contracts which are indexed to oil (product) prices, gas merchants are unable to offer substantial amounts of gas supplies accordingly, as this would create a large risk position.

The gas and power industries in Europe are converging. On the one hand, there are power companies who strive for more efficient procurement of natural gas for their power plants by integration with gas undertakings, on the other hand combining gas and electricity activities offers opportunities for co-selling and economies of scope.

Many uncertainties remain in the European power market with respect to fuel price developments, the evolution of an emission trading system or the future impact of nuclear energy. However, against the backdrop of aging existing capacity and rising demand, decisions for new investment need to be taken today and the industry’s answer appears to be striving for a balanced generation portfolio that will employ a variety of primary fuels. Such an approach might not be feasible in some EU Member States in which permitting procedures, public opinion and emission



EXPLORING THE WORLD FOR GAS



TO WARM YOUR WINTER

Meeting energy needs means relying more and more on natural gas. A pioneer in the gas industry and a world player in this field today, Total is present every step of the way, from exploring for reserves and bringing them into production, to delivering them to the customers.

HARRISON & VOLT

OUR ENERGY IS YOUR ENERGY



TOTAL



More than 90% of new generation capacity built in the United States over the last decade has been gas fired.

limitations make the construction of coal and nuclear power plants virtually impossible.

Russia currently strongly relies on natural gas for power generation. Regulated fossil fuel prices, making coal more expensive in absolute terms than natural gas have contributed to this situation. Gas prices in Russia will be gradually increased over time, shifting the economic balance in favour of coal; concurrently existing gas-fired power plants will be modernised and upgraded with CCGT technology. Although economic growth will require more electricity generation, it is expected that rising gas prices and increased efficiency of gas-fired power generation will limit the increase in gas use for power generation in Russia and thus create more room for gas to be used for other purposes.

North America

The Strategic Panel looking at Gas to Power in North America was moderated by David McClanahan, President and CEO of CenterPoint Energy, USA. The session started by noting that more than 90% of new generation capacity built in the United States over the last decade has been gas fired. Gas prices were rather low, achievable and prospected margins were good and it was quick and easy to build a CCGT plant. This led to

a considerable over-build of generation capacity with many gas-fired power plants currently running far below capacity or standing idle. The positive outlook for gas has changed in view of increased gas prices and concerns about the future availability of domestic supplies and imports, both in the form of pipeline gas and LNG. It is expected that power generators will strive for a more balanced generation portfolio, including more coal-based generation and nuclear energy. Panellists noted with concern that a number of politicians appear to be willing to interfere directly with the fuel mix in power generation, aiming at restricting the use of natural gas.

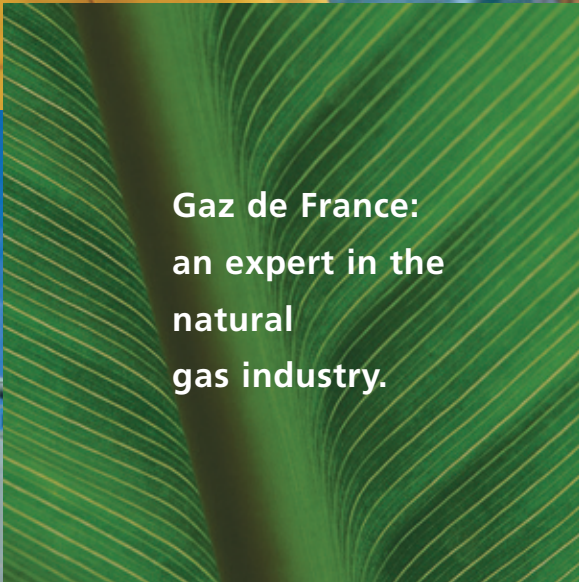
Individual states grant regulated utilities the opportunity to engage in cost of service power generation. Panellists expected that this would favour coal-fired power generation above natural gas.

However, there remains substantial scope for increased use of natural gas in power generation. Coal faces environmental restrictions with respect to a variety of emissions (NO_x, SO₂, mercury), which can make coal-fired power generation an expensive option in some regions. Moreover, coal transportation infrastructure, mainly in the form of railway lines, is increasingly congested. If natural gas prices should decline again, capital-intensive generation technologies such as coal-based generation and nuclear power plants will have a hard time competing. Finally, the large fleet of under-utilised gas-fired power generation is likely to be utilised before new investments in any power generation will come about. But the under-utilised capacity is not spread evenly throughout the country and, therefore, incremental gas demand from higher dispatch rates might increase more slowly than some observers expect.

Panellists disagreed with respect to their expectations about the future of carbon policies in the US. While some expect that CO₂ emissions will be penalised sooner or later and aim at preparing their new investments in coal-fired power gener-

Energy supply and services, transmission/storage and distribution of natural gas: such have been the daily activities of Gaz de France for over 50 years. Involved in all segments of the natural gas chain, the Gaz de France Group is deploying its know-how internationally, placing sustainable development at the heart of its growth strategy. www.gazdefrance.com

australie - © Médiathèque Gaz de France / X. Renauld / F. Dunouau / P.-F. Grosjean / P. Delavie / A. Kéler - Getty Images/Digital Vision



Gaz de France:
an expert in the
natural
gas industry.



Bringing energy to you. For today. For tomorrow.