Exxon is a preferred partner for QP because of its expertise, its vertical integration across the value chain and the fact that it is a US player with US government backing. Specifically, Exxon holds several advantages for QP and Qatar in general: it has a strong cash flow and pristine balance sheet, which enable it to make opportunistic deals, giving Exxon excellent financial flexibility and the best possible credit rating. For QP, this comes in handy, attracting further capital to its projects at low capital costs. Exxon has a proven track record in terms of overall efficiency gains through its global functional organisation. It is one of the most recognised and trusted companies in the oil and gas industry, its brand associated with vast and diverse experience as well as technological leadership. With a global presence in over 200 countries and integrated operations, Exxon is well positioned to benefit from new opportunities in the evolving power industry. For QP, this can only mean security of access to markets while offering Exxon ample incentives to invest in upstream projects and their development. In return, Exxon also offers security and stability in Qatar itself through its strong ties to the US government. Qatar's investment policy, its political ties, secure borders and open doors policy, and its Trade and Investment Framework Agreement (TIFA) interact with the security Exxon offers as well as its technological leadership.

Ownership structure upstream

Both Exxon and QP prefer strategic mega projects which offer economies of scale and swing capacity both in terms of costs as well as access to different markets, and ultimately, spot volume development. QP takes the largest share by far in any of its upstream liquefaction projects, allowing foreign partners, mostly buyers with little or no reserves, to act as both developers and owners of the projects in question. Shell, for example, has been awarded 30% in Qatargas 4 and ConocoPhillips has been awarded a similar share in Qatargas 3 while Total owns 10% in Qatargas 1 (trains 1 through 3) and 16.7% in Qatargas 2, train 2. Japanese and Korean buyers, who have a high base load requirement for LNG, own parts of Qatargas 1 and 3 as well as of RasGas 1. The Pacific buyers obviously go to great lengths to secure volumes as far upstream as possible. Exxon is by far the largest of all foreign shareholders in Qatar, since it owns up to 30% in all but two projects.

The ownership structure of the re-gasification and liquefaction terminals for both QP and Exxon reflects the interests both parties have across the value chain as well as the fact that QP sees Exxon as its preferred partner. The ultimate goal of this structure is partially to maximise the value of increasingly flexible LNG flows, but primarily to ensure access to different markets on a long-term basis, since most if not all LNG contracts involving Qatar are long-term in nature. The intention, however, is to create increased room for short-term spot volumes, which is linked to Qatar's IMEX plans. These spot volumes will become crucial as marginal supplies to different markets, flowing to whichever market offers the highest price. The primary objectives of QP are to maximise the value of its resources, in support of Qatari state objectives for development goals. Typical of NOCs is their desire to maximise the value of their resources over the longer run, as opposed to short-run value maximisation associated mainly with the IOCs. This is due to their overall objectives and the role they play in the domestic economies of producer countries.

Production and downstream marketing strategy in the value chain

Coming back to the ownership structure upstream, Exxon owns, as mentioned above, major shares in most Qatari liquefaction projects. The RasGas 3 project, with its two trains is projected to produce 15.6 mtpa (21.5 bcm) from 2008-2009 onwards, making it by far the largest project in the pipeline, and the standard 70/30 ownership percentage rule

applies here as well to QP and Exxon. The RasGas 2 project already produces some 14.1 mtpa (19.4 bcm) and, again, Exxon owns 30% in each train. *Table 1* also provides an overview of production for existing and slated liquefaction projects.

Qatar is keen on securing stakes along the entire LNG chain to enable it to take full advantage of its geographical position and resource base.[8] QP is also involved in gas-to-liquids (GTL) projects and the massive North Field has a high liquids content. Qatar placed a moratorium on new development of the field in 2006 in order to assess whether the reservoir is being developed too quickly, which could damage its health and long-term export potential. This means Qatar will not invest in new projects until the end of the current investment period, at the earliest.[9]

Qatar's involvement along the entire LNG chain includes a 45% stake in Italy's new offshore regasification terminal, Adriatic LNG, which is seen here being fitted out and is due to start operations by the end of 2008.

QP owns 45%, 67.5% and 70% in three re-gasification terminals in Italy, the UK and the US, respectively, which are to start up in the second half of 2008 and in 2009. Simultaneously, Exxon owns 45% and 24.15% in the two first re-gasification terminals. In late 2007, Exxon announced plans to invest $1 billion to set up an offshore floating re-gasification terminal 32 kilometres off the coast of New Jersey (the first re-gasification terminal built in 30 years on the Eastern US coast).[10] This will further add to its downstream re-gasification capabilities and fits the overall pattern of vertical integration. Re-gasification in the Pacific Basin is mostly owned by either Japanese or Korean downstream buyers, and simultaneously the Atlantic Basin is becoming more of a swing market for LNG.

The Atlantic Basin target markets are thus the US and north-west and southern Europe as far as Exxon and QP joint projects are concerned. The goals of both companies coincide, aiming to seize a sizeable chunk of market share in each major market. Overall, Qatar has long-term contracts with off-takers in Spain, Japan, Korea, India, the US, the UK, Belgium, Italy and Taiwan, China. *Figure 1* (over) provides an overview of Qatar's projected LNG export by market.

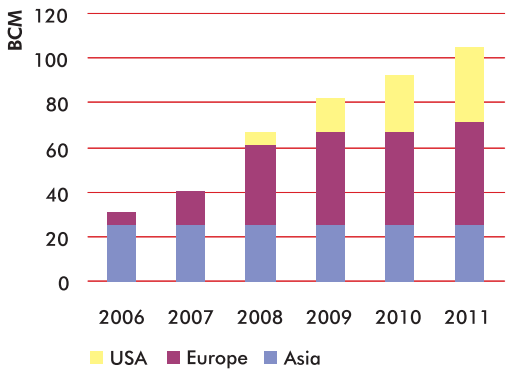
Examining the ownership structure in the re-gasification terminals available to Exxon and QP, it becomes clear that, when taking into account the upstream Qatari stakes they have, both parties aim to cooperate and leverage their positions up- and downstream together in a large strategic alliance which will allow them to re-gasify on either side of the Atlantic Basin. The stakes each party has in the re-gasification terminals thus allow them to lock-in the best possible profits depending on arbitrage

8 Global Insight, *Global LNG Outlook 2007*, p. 15.

9 IEA, *Natural Gas Market Review 2007*, p. 50.

10 *Wall Street Journal*, 'Exxon plans LNG terminal off US East Coast,' December 13, 2007.

QATAR'S EXPORTS AND PROJECTED EXPORTS BY MARKET, TO 2011



Source: Energy Tribune.

RIGHT
Figure 1.

possibilities between Henry Hub and, increasingly in the future NBP (the UK's National Balancing Point) as well as IMEX. The cooperative setting QP and Exxon have committed to is clearly a long-term strategy that is aimed at taking full advantage of each other's dominant positions, enabling them to reap the benefits of unique IOC-NOC synergies.

Together, QP and Exxon form a powerful duo in the Atlantic Basin especially (while QP already has a strong position in the Pacific Basin), with low cost resources upstream and ample re-gasification possibilities on the downstream side. With short-term trade and increased flexibility on the rise, both giants will be able to leverage Qatar's unique position and advantages in order to maximise arbitrage gains as well as long-run security of demand and market share in three different markets. The above demonstrates the potential and the success of IOC-NOC cooperation on a large scale.

Some contractual issues

On a global scale, the issue of security of demand is crucial for LNG producers. Major up-front investments have to be made, with further incremental investments in tailor-made vessels, liquefaction and re-gasification plants which have to be constructed for operations. Before a single cubic metre of gas can be sold, security of income is a major initial concern.

The successful cooperation between QP and Exxon, which occurs on a global scale, is a leading force in the global energy trade. In order to secure a stable income, QP divides various upstream production volumes into flexible cargoes, to be allocated to the Asian, US and/or European markets. In doing so, the average income is stabilised over time whist maintaining the ability to tap into any LNG market worldwide, avoiding the disadvantages of being captive to any single, regional market. Furthermore, the supplier is also able to optimise and arbitrage on a global scale, between the LNG markets in Asia, US and/or Europe. Any price opportunity occurring can be captured by the supplier.

QP's cooperation with Exxon is set into this framework, where Exxon is the global marketer, owning and operating LNG re-gasification terminals. Thus while QP is focused on the upstream side, Exxon has the focus on the downstream side. By doing so, the partnership installed "market or pay" clauses in the contractual framework, where the gas marketer, Exxon, is responsible to market certain Qatari LNG volumes over agreed regional markets (Asia, US or Europe), ensuring QP's security of demand while arbitraging between different markets when price differentials permit sufficient additional gains. This combination of strengths and sharing of risks and benefits underscores the uniqueness of Exxon's win-win partnership with QP.

This paper was prepared by Timothy Boon von Ochssée in cooperation with GasTerra and Petronas Task Force members for IGU's Gas Market Integration Task Force. Mr Boon von Ochssée worked on the paper while a guest researcher with the Clingendael International Energy Programme (www.clingendael.nl), and is currently studying for a PhD at the University of Groningen.

A leading LNG plant designer and EPC contractor

With 45 years of unbroken experience, the Technip group is established as a world leader in the conceptual design, engineering and construction of facilities for gas production, processing, liquefaction, regasification, storage and handling.

Key components for an evolution in marine LNG transfer

- Qualified and project ready - Large bore cryogenic flexibles and straight-line Pipe-in-Pipe

Green LNG terminals fitting the most demanding sites

World's largest and most energy efficient LNG trains

- Pre-FEED
- FEED
- Detailed engineering and construction

What Are the Prospects for a Gas OPEC?

By Obindah Wagbara

With the emergence of LNG as a globally traded commodity and the establishment of a Gas Exporting Countries Forum (GECF), there has been much debate about the prospects for GECF evolving into a gas cartel.

The key differences between the oil and gas markets, notably the prevalence of long-term gas contracts, have led many observers to conclude that a gas OPEC or "OGEC" is untenable. But a common misconception is that a gas exporters' cartel would want to operate like OPEC or needs a global gas market like oil. In the light of on-going developments, this article gives a brief overview of GECF and then examines some aspects of the "gas cartel" discourse.

The Forum

GECF had its inaugural session in May 2001 in Tehran, and has 14 members – Algeria, Bolivia, Brunei, Egypt, Indonesia, Iran, Libya, Malaysia, Nigeria, Qatar, Russia, Trinidad & Tobago, the UAE and Venezuela – with Equatorial Guinea and Norway as observers. It has worked so far without a formal Charter but one is now being finalised for adoption at the next ministerial meeting.

The Forum normally holds annual ministerials although the sixth, scheduled for Venezuela in 2006, was postponed until April 2007 and hosted by Qatar. The seventh session is due to be held in Moscow in November.

The ministerials are backed up by more frequent expert meetings and a liaison office in Doha, Qatar. The liaison office is responsible for carrying out research, maintaining a database of market statistics, models and ongoing studies, and ensuring the smooth exchange of information among members. When a formal Charter is approved a permanent Secretariat will be set up.

Some key outcomes of past ministerials are worth highlighting. At the April 2005 meeting, Algeria was chosen to spearhead the development of a gas supply and demand model. The model is used in the liaison office for market analysis.

Delegates pose for a "family portrait" during GECF's fifth ministerial meeting, which was held in April 2005 in Port of Spain, Trinidad & Tobago.

Meanwhile, Egypt had proposed a new pricing formula to aid producers in planning ahead, save consumers from price fluctuations and ensure stable cash-flows. Last April, the ministers set up a panel of experts chaired by Russia to study how to strengthen GECF by looking at issues such as gas pricing, infrastructure, the relationship between producers and their relationships with consumers.

Does this mean that the Forum aims to or could fix gas prices? A "yes" or "no" may be too simplistic but it is clear that developments in the LNG trade do give further impetus to exporters in this regard. What then are the prospects for collective action to determine price?

Qatar hosted the sixth GECF ministerial meeting in April 2007. At centre is the country's Prime Minister and Foreign Minister, HE Sheikh Hamad bin Jassim bin Jaber Al-Thani. He is flanked by the energy ministers of Qatar, Abdullah bin Hamad Al-Attiyah (left), and Trinidad & Tobago, Dr Lenny Saith (right).

● Factors favouring cooperation by exporters

Demand

Despite the rise in energy prices and the global credit crunch, demand for gas (especially LNG) continues to rise. Gas consumption is expected to increase annually by 1.9% to 2030 as global energy demand expands by almost 57%, and more countries are joining the ranks of LNG importers.

Arguably, this implies that importing gas is more important to consumers than selling is to exporters. Given demand, price fixing is conceivable (and feasible) if exporting countries agree to exploit the substitution cost of end users rather than competing to be least cost producers.

While some experts have argued that high gas prices are a disincentive for cooperation by exporters, high gas prices could, in fact, be an incentive for exporters to collude and reap extra margin. This is clearly evident, in the LNG industry, from the unusually persistent sellers' market over the last three years which has given rise to strong diversion rights for sellers and reduced take-or-pay make-up rights for buyers.

With substantial new LNG capacity set to come online, the market cycle would be expected to swing back in favour of buyers. A vital question, though, is whether exporters are indifferent about the market power which they currently possess. In other words, is it likely that exporters would allow the return to a buyers' market or rather collude to sustain the current situation? It is probable that the urge to maintain control over the market and influence price or rent sharing could significantly motivate a collective supply-side action.

The LNG industry is at an infant stage for a supply-side cartel, but GECF could give exporters more leverage in negotiating higher prices as existing contracts come up for renewal. This is due to the fact that while LNG sellers want a price which does not represent an unacceptable divergence from prices obtainable in other LNG import markets, importers want a price which maintains competitiveness in their downstream markets. In 2006, for instance, China changed its domestic gas pricing policy to enable LNG imports at higher price levels due to global competition for the commodity and the persistence of exporters.

The Russian factor, GECF's overall market share and reserves

Russia is both the world's largest producer and reserves holder of gas. It has 25.2% of global proven gas reserves followed by Iran with 15.7% and Qatar with 14.4%. Russia's market share and geographic position are significant, but up to now it

Russia is joining the ranks of LNG exporters with exports from Sakhalin II.

has not been an LNG exporting country (although Sakhalin II is about to start LNG production). Some observers have argued, therefore, that Russian pipeline gas has been competing in certain European markets with LNG exporters. However, cooperation could provide the opportunity for Qatar and Russia to be price leaders or swing producers for LNG and pipeline gas respectively, depending on the influence mechanism chosen.

The potential for GECF to exercise more power in the gas trade is underpinned by the fact that GECF members collectively account for 84.5% of global LNG exports and 41.8% of gas production as against OPEC's 42% for oil. (*See table* – the GECF share increases slightly if the two observer countries are included.) GECF members hold 73.1% of global gas reserves compared to OPEC members which hold 75% of oil reserves.

Policy inclination and common misconceptions

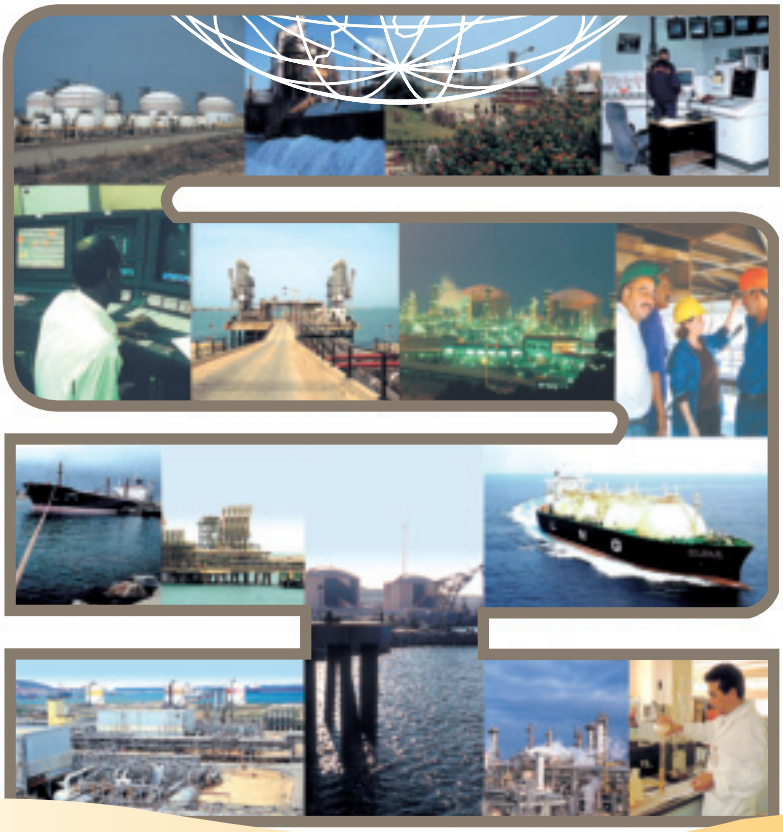
GECF includes seven OPEC members and an OPEC-friendly country (Russia). In addition, most of them are developing countries with similar socio-economic challenges and revenue needs. Because they all rely on petroleum resources as the main revenue earner (like OPEC), the need to sustain or maximise political and economic benefits from gas represents a common objective. Although these countries have other varying interests, the above issues are sufficiently fundamental and strategic for them to agree on.

This line of argument is often overlooked because many analysts focus on the divergent interests of gas exporters and the fact that gas is traded differently. They seem to forget that the members of most international organisations have divergent interests. Moreover, why expect an OPEC-style gas cartel in a market that is unlike oil and may never be as liquid as the oil market? Yes, OPEC's approach is one option, which may not be feasible for gas exporters today, but it is not the only option and neither is price determination the only objective for creating a cartel. Rather than wait for the emergence of a global gas market, exporters could proactively aim to develop a future for gas trade in the Middle East. There is plenty of scope, for example, for GECF to have a strong influence on determining gas trading terms to the benefit of its members. Another point worth emphasising is that, while the peculiarities of gas exploitation may not

Sonatrach

An LNG pioneer

A world clean energy player



Sonatrach has been exporting gas since 1964 and is today, the third largest natural gas exporter in the world, the second in LNG and the first gas company in the Mediterranean.

Our assets :

- A geo-strategic situation close to the growing European Union Market and opened to the world;
- A significant reserve base;
- An extensible and flexible exportation facilities;
- A technological know-how in all gas chain segments;
- A fleet of 9 LNG carriers of different size;
- 4 LNG plants with a combined capacity of 21 million tons per annum (MTPA);
- A reliable partner in NG and LNG exports.

سوناطراك

sonatrach

Sonatrach Headquarters : Djenane El Malik - Hydra - Algiers - Algeria. Tel. : (213) (0 21) 54 70 00 - Fax : (213) (0 21) 54 77 00
E-mail : sonatrach@sonatrach. dz Web site : www.sonatrach-dz.com

permit GECF to operate like OPEC, the Forum could still learn a lot from OPEC's experiences.

Changes in LNG pricing

LNG trade now transmits price signals across regional gas markets due to the tight supply situation in the Atlantic and Pacific Basins. Spot LNG trade is increasing and creating the need for transparent reference prices through auctions. The persistence of various pricing regimes generates significant market imbalances and volatility. While the trading of spot or futures contracts for LNG on

RIGHT
Table 1.

OPEC-IGU-GECF MEMBERSHIP

Country	*GECF Member*	*OPEC Member*	*IGU Member*	*Share of global proven gas reserves (2007)*	*Share of global gas production (2007)*	*Share of global LNG exports (2007)*
Algeria	Yes	Yes	Yes	2.5%	2.8%	10.9%
Angola	-	Yes	-	0.1%	*	-
Bolivia	Yes	-	-	0.4%	0.5%	-
Brunei	Yes	-	Yes	0.2%	0.4%	4.13%
Ecuador	-	Yes	-	*	*	-
Egypt	Yes	-	Yes	1.2%	1.6%	6.01%
E. Guinea	Observer	-	-	0.1%	0.15%	0.63%
Indonesia	Yes	-	Yes	1.7%	2.3%	12.25%
Iran	Yes	Yes	Yes	15.7%	3.8%	-
Iraq	-	Yes	-	1.8%	N/A	-
Kuwait	-	Yes	-	1%	0.4%	-
Libya	Yes	Yes	-	0.8%	0.5%	0.34%
Malaysia	Yes		Yes	1.4%	2.1%	13.16%
Nigeria	Yes	Yes	Yes	3%	1.2%	9.35%
Norway	Observer	-	Yes	1.7%	3%	0.06%
Oman	-	-	Yes	0.4%	0.8%	5.38%
Qatar	Yes	Yes	Yes	14.4%	2%	17%
Russia	Yes	-	Yes	25.2%	20.6%	-
Saudi Arabia	-	Yes	Yes	4%	2.6%	-
Trinidad & Tobago	Yes	-	Yes	0.3%	1.3%	8.02%
UAE	Yes	Yes	Yes	3.4%	1.7%	3.34%
Venezuela	Yes	Yes	Yes	2.9%	1%	-
GECF members' share				73.1%	41.8%	84.5%

* Less than 0.05%
Source: BP Statistical Review of World Energy 2008.

When Brunei LNG made its first LNG shipment to Japan in 1972, it marked the first major long-distance ocean operation of its kind in the world. It also marked the start of a long but an extraordinary success story.

Since then, BLNG has established a solid reputation as a world leader and a reliable supplier of LNG, successfully servicing the gas markets of Japan and Korea and delivered well over 5,000 cargoes of LNG, more shipments than any other LNG project in the world, positioning BLNG as a supplier of first choice.

Our exeptional partnership between stakeholders across the BLNG value chain has ensured that we are ready to deliver our promise for the future, whilst continuing to set remarkable standards of reliability and operational excellence today.

BRUNEI LNG SENDIRIAN BERHAD
LUMUT KC 2935, BRUNEI DARUSSALAM
PHONE : +673-2326901 TO 912 FAX : +673-2326892
EMAIL : gp-external-affairs@bruneilng.com
WEBSITE : www.blng.com.bn

international exchanges may enhance liquidity, exporters are eager to know what the rent or risk implications would be.

Moreover, the agreement between the European Commission and Algeria about profit splitting mechanisms (PSMs) and destination restriction clauses is prompting more questions from other exporters. The point is that the agreement actually gives more power and profits to consumers when they resell gas bought under long-term contracts. So the agreement has not resolved the issues but has driven more risks upstream and rent downstream to the detriment of exporters. Exporters are, therefore, not only interested in the past or present but also observing the price-changing trend in the expanding LNG industry. These concerns could be motivating exporters to approach issues collectively, as a risk avoidance mechanism. A typical example is the GECF committee set up to review gas pricing.

Constraints to cooperation

Viable influence mechanism

A gas cartel would require a mechanism for determining the market. Such a scheme could be market based but non-destructive to demand. Arguably, exporters could restrict upstream access to tighten supply, uniformly adopt a new price regime or apply fiscal measures to determine the market. For instance, rather than build and hold spare capacity, gas exporters are being cautious about new projects and applying new reserve management policies. Whatever approach they choose (uniform pricing or volume restriction) could generate other consequences that would require a balancing act for trade to be transparent. Furthermore, a rationale for profit-sharing would have to be determined.

Rent sharing formula and concentration of membership

Why should an exporting country that is optimally pricing its pipeline or liquefied gas sales join others to fix prices? Even with the necessary enforcement mechanism, such a country would only collude if it is certain to earn significantly more from price fixing than it currently does. Would profits be reaped on the basis of quotas or shared equally or by a combination of both? In other words, how would the benefits (rent) of price fixing or volume control be shared equitably? Irrespective of the market approach adopted, the distribution of cartel gains among members would be very complex. The answer to this question would determine the influence mechanism to be adopted, as well as each country's willingness to adhere to the rules of the chosen influence mechanism.

The number of GECF members could complicate its ability to answer the above questions or hinder its success. Sharing of and access to vital market information are key elements for the establishment of a cartel and maintenance of control. Suspicion among member countries and withholding of information could lead to cheating. OPEC is still unable to detect and deter cheating due to these reasons. Besides, given the Forum's size, the reconciliation of interests would be more complex and time consuming.

This is especially so because many gas (especially LNG) transactions are cloaked in secrecy. Furthermore, exporters do business in different import markets and their domestic gas industries are at varying stages of development. Such divergence in circumstances could affect policy consensus. Given that this factor has not hindered OPEC, one may assert that the Forum's large and diverse membership is actually advantageous rather than a constraint. This probably explains why the Forum has created a gas markets database, maintained by the liaison office and accessible to all members. The scheme acquires and analyses market information at both regional and global levels for a better understanding of the industry.

Climate change and alternative fuels

The widespread clamour for renewable and environmentally friendly fuels could constrain gas trade and the emergence of a gas cartel. In view of

the high price of crude oil, competition from alternative energy sources could make gas relatively more expensive and decrease demand. Considering the available alternatives, especially nuclear and coal, gas exporting countries might be cautious about disrupting the market through a cartel. Meanwhile, to what extent would importers be willing to tolerate the continued rise in LNG/pipeline gas prices, in a cartel scenario?

At certain price levels, domestic gas production (especially in the US) becomes more viable than importing. Moreover, proven gas reserves are widely distributed globally and non-GECF supply exists. Furthermore, a large proportion of the forecasted increase in gas demand would be in developing countries (especially gas exporting countries). Increased domestic demand is already a challenge in some gas exporting countries. Others are, however, taking steps to increase production capacity or diversify electricity generation. This explains Iran's efforts to develop nuclear power generation. It is, therefore, conceivable that the Forum would hold back until gas becomes the main energy commodity globally.

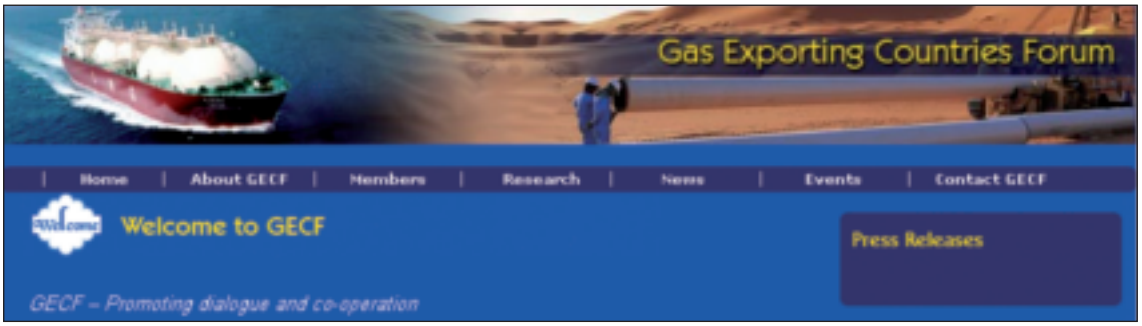
Conclusion

At the moment, the Forum seems a gathering of gas producers for the purpose of consultations to improve the commodity's potential as an energy source. Although there are obstacles to the emergence of a gas cartel, it is by no means inconceivable. The fact is that there is great potential for cooperation by exporters through GECF and they are making some strides in this regard.

A rational step is for GECF to adopt a policy which enhances LNG trade. Given the constraints to direct intervention, it may be useful for gas exporting countries to chart a more subtle course. For instance, by jointly embracing spot LNG cargo auctions, a more competitive reference price could result. Such competitive pricing could run parallel to negotiated pricing (as in long-term contracts) and still be open to exporters' control through the management of uncontracted liquefaction capacity. In this scenario, exporting countries would be encouraging international oil and gas companies to participate in the International Mercantile Exchange (IMEX) based in Qatar. Alternatively, exporters could uniformly adopt a pricing portfolio that efficiently captures the short-term profitability interest of industry players and the long-term effect of oil-price indexation.

The modus operandi of GECF may be difficult to foretell with precision, but its likely shape in the future is getting clearer. Gas exporting countries may be dissatisfied with the existing pricing (rent allocating) regimes, but they do not want to derail the gas train. In the run-up to the next GECF ministerial meeting, the global energy industry will be watching and hoping that whatever happens, the benefits to both gas producers and consumers are optimised.

Obindah Wagbara is a tutor and PhD candidate at the Centre for Energy, Petroleum and Mineral Law and Policy, University of Dundee, UK.



Among its other responsibilities the GECF's liaision office maintains a website (www.gecforum.org).

WE'RE IN THE BUSINESS OF

Natural Gas

Since August 1975, The National Gas Company of Trinidad and Tobago Limited (NGC) has played a key role in the development of the natural gas industry. NGC's core business is the purchase, transmission, distribution and sale of natural gas. NGC owns and operates the country's 800 km/ 4.4 bcf/d pipeline network which comprises both offshore and onshore segments.

As a diversified group of companies NGC's operations span the entire gas value chain with involvement and investments in upstream gas and oil production, industrial site, port and marine infrastructure development and services, NGLs and LNG production and shipping. A key NGC subsidiary, National Energy Corporation of Trinidad and Tobago (NEC), is responsible for natural gas-based investment promotion and facilitation.

After 32 years, in 2007, NGC's group assets are over US$3 billion with operating revenues of over US$1.5 billion. With the projection that natural gas will continue to play a vital role in world energy requirements, Trinidad and Tobago's natural gas sector will remain a key economic sector for development.

THE NATIONAL GAS COMPANY OF TRINIDAD AND TOBAGO LIMITED

Website: www.ngc.co.tt

Publications and Documents Available from IGU

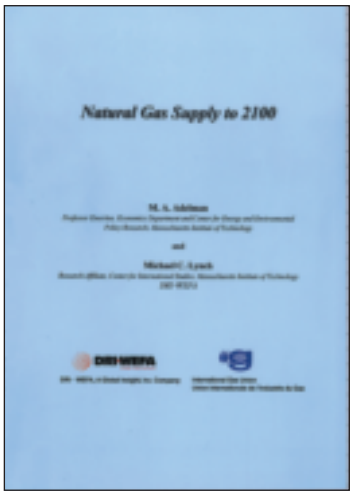
As a non-commercial organisation promoting technical and economic progress in the gas industry worldwide, IGU offers its publications free of charge and you are invited to order the IGU publications currently available from the Secretariat. (All documents are A4 format unless stated otherwise and those that can be downloaded from the IGU website are indicated.)

Ms Floriana Dedović
IGU Secretariat
c/o StatoilHydro ASA
0246 Oslo
Norway

Tel: + 47 2297 2000
Fax: + 47 2253 6318
Email: secrigu@statoilhydro.com

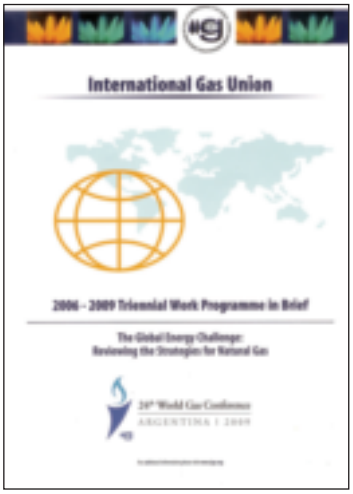
2006-2009 Programme

- Strategic Guidelines 2006-2009.
- Triennial Work Programme in Brief.
- Triennial Work Programme.



Scientific and techical papers and documentation

- Natural Gas Supply to 2100, M. A. Adelman and Michael C. Lynch, DRI-WEFA, IGU, October 2002, (51 pages 18 x 25.7 cm). This booklet outlines the authors' assessment of a long-term supply curve for natural gas.
- Seven Decades with IGU, ISC 2003, (186 pages). IGU's 70th anniversary fell in 2001 and at the next World Gas Conference in 2003 this book was launched containing articles on the organisation's history and on contemporary issues facing the international gas industry.
- Proceedings of the 20th World Gas Conference, Copenhagen 1997, (CD-ROM).
- Proceedings of the 21st World Gas Conference, Nice 2000, (CD-ROM).



- Proceedings of the 22nd World Gas Conference, Tokyo 2003, (available on www.igu.org).
- Proceedings of the 23rd World Gas Conference, Amsterdam 2006, (CD-ROM).

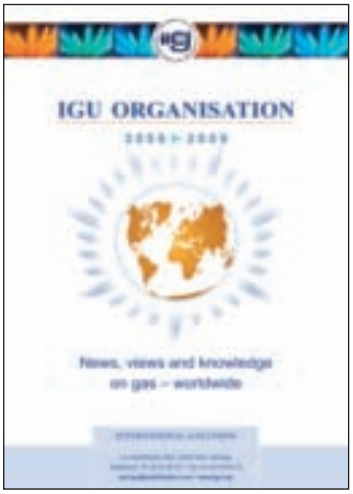
- Worldwide Underground Storage (UGS) database, (available on www.igu.org).
- Gas to Power Global Outlook, (brochure, 12 pages).
- Sustainable Development and the Role of Gas, (brochure, 12 pages).
- The Art of Regulation, (brochure, 8 pages).
- International Gas, ISC, April 2008, (192 pages). The ninth issue of the IGU Magazine.

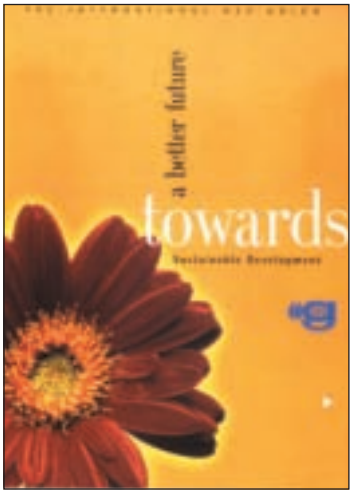
IGU organisational information

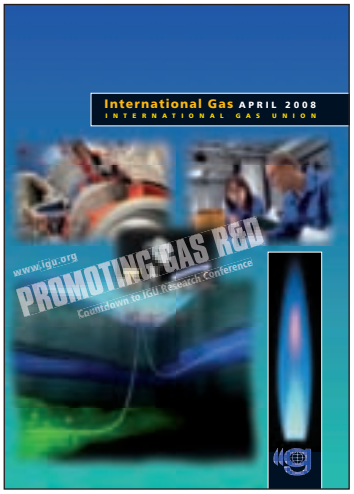
- IGU Articles of Association, (A5, 28 pages).
- IGU Guiding Principles for Sustainable Development, October 2003, (A5, 12 pages).
- News, Views and Knowledge on Gas – worldwide, (3 pages). This general brochure gives a concise introduction to the organisation together with its Vision and Mission.
- A Better Future Towards Sustainable Development, (5 pages). This brochure highlights IGU's position in promoting natural gas as a part of the solution to climate change.
- IGU Organisation Chart 2006-2009, updated June 2008, (4 pages).

Individual publications from WGC 2006

- Gas to Power Africa
- Gas to Power China
- Gas to Power Europe
- Gas to Power India
- Gas to Power Japan
- Gas to Power Korea
- Gas to Power North America
- Gas to Power North East Asia – Taiwan, China
- Gas to Power Russia
- Gas to Power South America
- Gas to Power South East Asia and Australasia
- Report Regulation
- Report Sustainability
- The Paradigm Change in International Natural Gas Markets and the Impact on Regulation
- Micro CHP in Perspective







Empowering pressure

SNGN ROMGAZ SA

National Gas Company Romgaz S.A. is a joint-stock company, the main shareholder being the Romanian state through the Ministry of Economy and Finances.
SNGN Romgaz SA is the most important natural gas producer and supplier in Romania with an annual production of about 6 billion and a market share of approximately 40%.

Main activities

- Geological research for hydrocarbon discoveries;
- Natural gas and condensate production and supply;
- Natural gas underground storage in depleted reservoirs;
- Natural gas import;
- Natural gas marketing;
- Well special services and operations;
- Research, reservoir engineering and technological engineering.

Strategic goals

- Strengthening its position on the Romanian gas market through increased competitiveness under competition conditions generated by the diversification of the natural gas sources;
- Increasing the gas resources and reserves portfolio through an enhanced geological research activity;
- Ensuring the security, continuity and flexibility of natural gas supplying by means of developing the capacities and diversifying the underground storage services;
- Reducing the environmental impact of the performed activities.

Organization
SNGN ROMGAZ SA headquarters
551025 Medias, 4 Unirii Street, Sibiu County, Romania,
Tel. 004-0269-201020, Fax 004-0269-846901,
E-mail secretariat@romgaz.ro, www.romgaz.ro

and 5 subsidiaries:

- **MEDIAS Production Subsidiary**
- **MURES Production Subsidiary**
- **PLOIESTI Natural Gas Storage Subsidiary**
- **SIRCOSS - Well Interventions, Workover and Special Operations Subsidiary**
- **STTM - Maintenance and Technological Transport Subsidiary**

ROMGAZ

IGU Events and IGU-related Events 2008-2009

2008

October 8-10
IGU Research Conference 2008
Paris, France

November 24
First IEF-IGU Ministerial Gas Forum
Vienna, Austria

December 1-12
14th session of the Conference of the Parties to the UNFCCC (COP 14)
Poznan, Poland

December 5
Eurogas General Assembly
Brussels, Belgium

2009

May 14-16
Eurogas General Assembly
Turkey, exact venue to be announced

June 3-5
IGU Executive Committee
London, UK

October 5
IGU Council Meeting
Buenos Aires, Argentina

October 5-9
24th World Gas Conference
Buenos Aires, Argentina

October 27-29
3rd Biennial Conference and Exhibition of the Asia-Pacific NGV Association (ANGVA 2009)
Donghae, Korea

November 30-December 11
15th session of the Conference of the Parties to the UNFCCC (COP 15)
Copenhagen, Denmark

You can find links to many of the above events by visiting www.igu.org and clicking on "Events". Under "Energy-related Events" in the side menu you can also find a link to the WEC Events Calendar displaying a multitude of energy-related events.

For the IGU Secretariat
Secretary General: Torstein Indrebø
Senior Advisor: Hans Riddervold
Advisor and Webmaster: Erik Gonder
Advisor to the Secretary General: Barbara Anette Schmid
Assistant to the Secretary General: Florijana Dedović
Administration Assistant: Åse Nicolaysen

For ISC
Editor-in-Chief: Mark Blacklock
Copy & Picture Editor: Adrian Giddings
Publisher: Nigel Ruddin
Publications Director: Robert Miskin
Special Projects Director: Barry J. Smith
Finance Director: Yvonne O'Donnell
Finance Assistants: Maria Picardo, Anita d'Souza
Senior Consultants: Derek Armandias, Jeffrey Fearnside, Karin Hawksley, David Penn, Jeremy Sargent
Research Executive: Harold Green
Liaison Officer: Leda Schiltz

Art and Design Director: Michael Morey

Printed by: Times Offset (M) Sdn Bhd

IGU and ISC would like to express their thanks to all those who helped in the preparation of this publication. Thanks are also due to the following companies, people and organisations for providing pictures. The credits are listed by article. Where the pictures for an article came from a variety of sources, the appropriate page numbers are given in brackets after each source.

Cover: flame – David Parker/Science Photo Library; LNG tanker – Daewoo Shipbuilding & Marine Engineering; woman with fuel cell components + gas turbine – Siemens AG; black powder cleaning pig – Rosen; GTL car – www.energypicturesonline.com.

Messages: IAPG (13), IGU (16 & 17).

IGU Members and Organisation: StatoilHydro (24), IGU (28), IAPG (President and CC Chairman, 29), Petronas (Vice President and CC Vice Chairman, 29), Barelds & Reese (George Verberg, 29), IGU (Secretary General, 29).

From the IGU Secretariat: Trond Isaksen (32), IGU (33, 36 & 38).

IGM: IGU.

News from Organisations Affiliated to IGU: EDI (44, 45 & 46), IBP (50 & 51).

24th WGC: IAPG (54 left), La Rural (54 right).

Progress Report: IAPG (60 upper), Ministry of Trade and Industry, Trinidad & Tobago (60 lower), IGU (66, 67, 72, 78, 81, 88, 90 upper & 96) Wingas (70), GHD Consulting (76), www.energypicturesonline.com (80), FLUXYS Imagebank/Patrick Hendrickx Fotografie (90 lower), Amélie Dupont/Paris Tourist Office (94).

Korea – Playing a Leading Role in the World Gas Industry: KGU (106), KOGAS (107, 108, 109 & 111), KNOC (110), KIGAM (112).

LNG Shipping Enters New Era of Global Expansion: Cheniere LNG (114), Daewoo Shipbuilding & Marine Engineering (115), Samsung Heavy Industries (118), Gaz de France (120).

Acknowledgements

Developments in the Asia-Pacific LNG Trade: Guangdong Dapeng LNG Company Ltd (124/5), ConocoPhillips Corporate Archives (125 upper), Photographic Services, Shell International Ltd (126), KOGAS (130), Woodside Petroleum (132), Petronas (135).

Gas Pipelines: Rosen (146), HAPP Technology (148), Claudio Camerini, Jean Pierre von der Weid, Miguel Freitas and Thiago Salcedo/ Presentation to Rio Pipeline Conference (149).

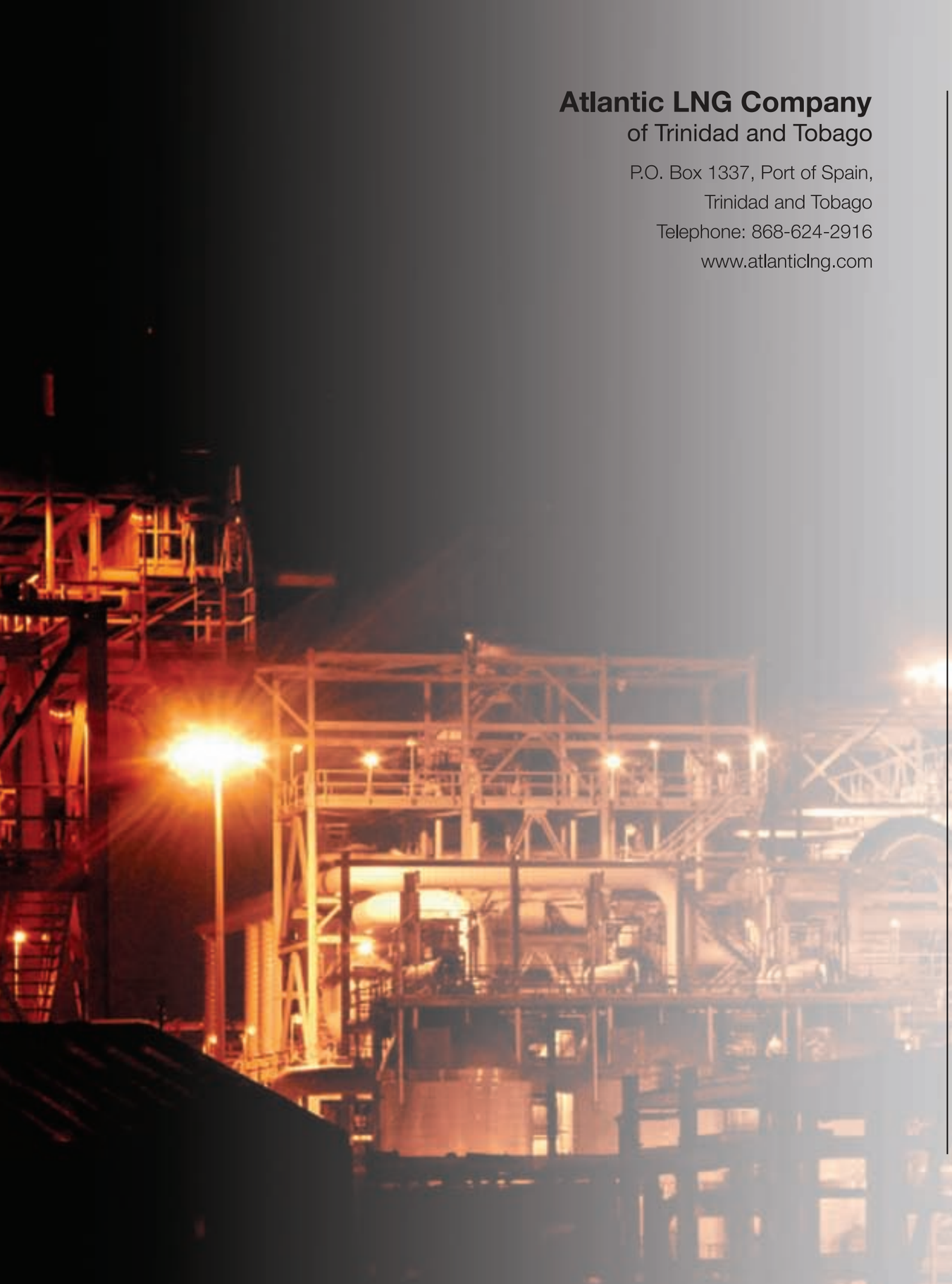
Toward New Technologies for the Gas Market: www.energypicturesonline.com.

Significant Potential for Biomethane: Volvo Buses (168), Lasse Hejdenberg/Svensk Biogas i Linköping AB (169), QuestAir (170), Prometheus Energy (171), Gasrec (172).

GTL Finally Heads for the Runway: SasolChevron (174 & 176), Petro SA (175), Royal Dutch Shell (178), Rolls-Royce plc 2008 (180).

ExxonMobil and Qatar Petroleum: Qatargas Operating Company Limited (184), RasGas Company Limited (185 & 186), ExxonMobil (191).

What Are the Prospects for a Gas OPEC?: Ministry of Energy and Energy Industries, Trinidad & Tobago (194), Qatar Petroleum (195), Sakhalin Energy Investment Company Ltd (196), GECF (201).



Atlantic LNG Company
of Trinidad and Tobago

P.O. Box 1337, Port of Spain,
Trinidad and Tobago
Telephone: 868-624-2916
www.atlanticlng.com

A part of society
Atlantic LNG

Atlantic LNG is the 5th largest LNG producer in the world, and the largest producer of LNG imported into the USA. We are a liquefied natural gas (LNG) operating company generating value for and fostering positive relationships with our shareholders, employees and the community in which we operate. We remain focused on attaining excellence as a reliable and efficient supplier of LNG to our customers.

Atlantic LNG is ISO 114001 certified for environment management. The company's Environmental Management Plan sets out how to effectively manage environmental matters, which includes sampling and monitoring to ensure that all discharges from the plant are within approved limits. Striving for a safe working environment at all times remains the backbone of our company.

Being a part of society, that is, a corporate entity in Point Fortin, we believe we have a corporate social responsibility to our wider community. This is evidenced by our continuing commitment towards the development of our surrounding community, its people and the economy, and the society that we are a part of.

Atlantic LNG has been developing programmes in the area of cricket and football for the young people in the area. Our annual Bursary programme and motivational vacation camp also support students and help secure a brighter future for Point Fortin. Already Atlantic LNG has contributed over $86 million and is estimated to contribute an additional $110 million over the next twenty years, to various educational programs for the benefit of the citizens of Trinidad and Tobago.

With the development of Community recreational centers the people of the community are able to foster stronger ties with each other and their community. Throughout the years we have instituted programmes that have focused on people and the environment, education, sport and the general well-being of our larger community.

From our co-sponsored "Saving Sight Foundation®" that provides free visual testing for all the children in the Point Fortin community to improving the Techier Village Park, Atlantic LNG remains dedicated towards working and improving the society of which they are a part.

ATLANTIC LNG
COMPANY OF TRINIDAD AND TOBAGO

CHEETAHS AND GTL

SUPERIOR PERFORMANCE NATURALLY

Sasol Chevron's business is GTL diesel – the cleanest high-performance diesel in the world.

Fuelled by GTL diesel, the De Wildt Cheetah and Wildlife Trust conservation programme can track cheetahs across South Africa with lower vehicle emissions. Using natural gas and not crude oil, GTL is one of the most advanced fuel technologies in the energy business and success demands a blend of expertise, experience and partnerships.

A cheetah race is a new one for us but, when international rugby star and De Wildt supporter Bryan Habana offered to race our sponsored cheetah, Cetane, to raise awareness for cheetah conservation, De Wildt turned to Sasol Chevron to plan and manage a safe event.

Using and adapting our corporate expertise, we helped De Wildt and Bryan make headlines around the world.

SASOL CHEVRON – GTL IS OUR BUSINESS, QUALITY IS OUR STYLE

Sasol Chevron

www.sasolchevron.com

www.dewildt.org.za/Tracker.htm