The Pricing of Internationally Traded Gas

The Gas Exporting Countries' Forum: Global or Regional Cartelization?

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INTRODUCTION

Jonathan Stern

This is the first academic book in any language to be entirely devoted to the pricing of internationally traded gas. The majority of books on gas are notably silent on the issue of pricing.¹ Given the sizeable amount of research dealing with international oil prices, this is extremely surprising and would alone be sufficient justification for this work, but there are additional reasons for believing that such a volume is long overdue. First, the growing importance of natural gas in energy balances worldwide, which is partly a function of the expansion of international gas trade. Second the rise to prominence and importance of natural gas issues – and especially pricing issues – in energy and political relations between countries. The best known example of this was a dispute over gas pricing between Russia and Ukraine, which sparked the January 2009 crisis, when Europe lost around 20 per cent of its gas supplies for a period of two weeks. In North America, a surplus of gas in the early 2010s drove prices down to very low levels, creating the possibility of large-scale LNG exports and also a debate as to the impact of exports on domestic prices. In Europe and Asia, the main debate centres on the extent to which the price of imported gas should remain linked to oil products and crude oil (respectively).

This introduction focuses on some specific issues which have arisen during the preparation of the book, in relation to concepts and terminology, with the aim of explaining why natural gas pricing is such a difficult subject to research.

Defining Regions and Trade

All natural gas literature refers to trade within and between geographical regions, and this book is no exception. However, defining regions in relation to natural gas trade and pricing is analytically problematic.

¹ Exceptions are Julius and Mashayekhi (1990), Chapter 10 which dealt mostly with domestic gas pricing; IEA (1998) which focused mainly on early liberalization experience; and ECT (2007), Chapter 4 which includes a major analysis of domestic and international pricing in Europe, North America, and for LNG.

Arguably North America – defined as the USA, Canada, and Mexico – is the best example of a coherent region in relation to pricing, possibly due to the very substantial physical inter-linkages between countries. From the early 1990s to the late 2000s, there was reasonable coherence in continental Europe, with the UK having a different price mechanism. But in the early 2010s, significant gas pricing differences have developed between different parts of the continent of Europe. It is doubtful whether South America can be considered as one gas region, or if it should be divided between the Southern Cone, Brazil and Bolivia, and Colombia and Venezuela. Moreover it is unclear whether the Caribbean should be considered part of North America, South America, or as a separate region, or as a region at all.

Similar problems are encountered elsewhere. The main reason we refer to the 'CIS region' is because the countries in this region used to be part of the Soviet Union. But Central Asia (Kazakhstan, Uzbekistan, and Turkmenistan), the Caucasus (Azerbaijan, Georgia, and Armenia), the western CIS (Ukraine, Belarus, and Moldova), and the Russian Federation could all be considered different gas regions, and some countries within those groupings sit uneasily together. The Middle East and North Africa tend to be spoken of as a single region, but in relation to gas, the differences between countries in the Gulf and the Maghreb are very substantial; although not perhaps as great as the differences between North and sub-Saharan Africa. But probably Asia is the most problematic gas region to define, with the established LNG markets – Japan, Korea, and Taiwan – having little in common with China, India, and the countries of south-east Asia (some of which have been LNG exporters but in the 2000s are becoming importers).

But without individual analysis of each country (and sometimes of regions within a country) there is no way to avoid regional generalizations, despite the fact that geographic, economic, or political shorthand may have little relevance to gas trade or pricing. Attention is drawn in the chapters to the differences between countries, and between groups of countries within regions, but readers should be aware of the analytical problems of approaching the subject in this way.

An extension to this problem is that even the concept of 'trade' is difficult to define in relation to gas. While this book treats all gas which crosses a border as 'internationally traded', there are important distinctions between bilateral pipeline trade between neighbouring countries, and trade involving a number of different states as buyers or transit countries. Nor can this be defined in terms of distance: Canadian gas travels very long distances to the USA, much further than Algerian gas to Spain and Italy. But should the former be deemed 'regional' and the latter 'international' (or inter-regional).² Likewise should Russian deliveries to Ukraine be considered regional, but its exports to EU countries international, and if so why? All LNG trade is generally classified as international, although North African deliveries to southern Europe travel a fraction of the distance involved in the majority of Atlantic and Pacific LNG trade, with the exception of Sakhalin exports to Japan which could reasonably be considered 'regional'. The conclusion is that geographical classifications of international gas trade are impressionistic rather than precise. But definitional problems notwithstanding, the regional approach still manages to capture the major issues in relation to the ongoing transition of natural gas from local to international or global energy commodity.

Long-term contracts

The focus of this book is *pricing* not contracts, but inevitably the role of long-term contracts is an integral part of the pricing story.³ With OECD gas markets increasingly determined (or at least influenced) by hub/spot prices reflecting short-term market conditions, it is easy to lose sight of the fact that most international trade (outside North America and the UK) is still conducted on the basis of long-term contracts with complex price clauses.⁴ The most important pricing elements of those clauses are: the base price (Po), the index (on the basis of which the base price is adjusted), the frequency of adjustment, the opportunities (if any) to reset the base price and/or the index, any other provisions such as minimum (floor) or maximum (ceiling) price levels. Related to pricing is the take-or-pay clause present in the majority of long-term contracts, which requires the buyer to pay for a specified minimum quantity of the annual contract quantity of gas at the contract price, whether or not that volume of gas has been taken. Long-term contracts - with a duration of 15-30 years - between exporters and importing national or regional utilities provided the basis for the establishment and initial decades of the gas industry's growth.⁵

² The International Energy Agency's *World Energy Outlook* defines gas trade as 'regional' or 'inter-regional' using its own regional classifications. IEA (2011, 31–5).

³ Conversely, pricing is an integral – but not necessarily the most important – part of a long-term contract.

⁴ For an encyclopaedic source on long-term gas contracts see ESMAP (1993), which also contains many of the different pricing provisions.

⁵ Importing utilities traditionally had contracts with large industrial customers

Ownership structures and liberalization

In the majority of exporting countries, national producing/exporting companies were government-owned, but international oil and gas companies also played an important role.⁶ In the majority of, but not all, importing countries, the national/regional/municipal utility buyers were owned by the corresponding level of government.⁷ These utilities had a de facto (and in some cases a de jure) monopoly of the customers in their service areas (which in some cases meant the entire country) and consequently governments were responsible for the regulation and pricing of gas to different classes of customer. This determined the structure for the successful development of an industry which depended on very large fixed capital investments in production, pipeline networks, and LNG (liquefaction and regasification) terminals and ships. This structure, and the ownership of the industry, came to be questioned from the mid 1980s onwards, with the privatization of utilities, and the liberalization (demonopolization) of energy markets, first in North America and Britain, and subsequently more widely in Europe and elsewhere.⁸

Government involvement and commercial risk

The ownership structure of the industry, the size of projects and

(including power generators) and municipal distribution companies, although not usually of such long duration.

- 6 Soviet, Algerian, and (initially) Norwegian exporters were governmentowned companies but IOCs played a significant role in Norway; in the Netherlands, IOCs (principally Shell and Exxon) were major producers and part owners of Gasunie with the Dutch state. Some of the LNG suppliers to Japan were state-owned companies but export projects in the USA, Abu Dhabi, and Brunei were owned and operated by IOCs. In North America, all gas was imported and exported by private companies with the exception of Pemex in Mexico, but heavily regulated by federal authorities in the USA and Canada.
- 7 But in North America investor-owned utilities were the norm although the industry was regulated by national (federal) and regional (state) authorities; in Japan, gas and electricity utilities were also privately owned, and in Germany regional utilities were mainly privately owned. In most of the rest of the industry utilities were government-owned until privatizations started in the 1980s.
- 8 Liberalization and competition happened first in North America, where the industry was already privately owned; Great Britain saw the first privatization of a large gas utility, which was then followed by market liberalization.

investment requirements, and political sensitivity of gas pricing in exporting and importing countries, meant that governments were often intimately involved in major international pricing decisions. In virtually every country governments reserved for themselves (or their regulatory authorities) the right to accept, change, or reject agreements arrived at in negotiations between the commercial parties. Thus, although in theory gas pricing should be decided by commercial parties, in reality most contractual and pricing decisions are at least approved (and in many cases decided) by energy ministers – if not prime ministers and presidents – in importing and exporting countries.

International contracts, which allowed gas industries to develop and expand beyond their indigenous resource base, needed to be long enough for investments to be recovered in exporting and importing countries, and to provide a guaranteed cash flow, thereby assisting the financing of these investments. The logic of the division of risk inherent in these contracts was that:

- the exporter assumed the price risk, in other words, the risk that the price, however determined, would be sufficient to remunerate the investment in production and transportation of gas to the border of the importing country;
- the importer assumed the volume risk (via the take-or-pay provision), namely, that sufficient market would be developed in order to honour the volume terms of the contract. But in countries where imported gas became a large share of total demand, domestic gas prices needed to have an increasingly close relationship to international prices.

In both cases, the implicit assumption was that transactions entered into by both parties (whether state or privately owned) were financially guaranteed by their governments; an assumption which, from the importing side, became increasingly questionable during the 2000s.

Confidentiality and lack of transparency

An important reason why no book on this subject has previously been attempted is the lack of publicly available information, and the reluctance of a relatively small group of international gas stakeholders to disclose such information. This is summed up by Peebles, a well-known industry practitioner who, having described numerous gas contracts in his 1980 study (Peebles, 1980), observed:

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Not unreasonably ... contractual details, in particular pricing arrangements, are confidential matters as between buyers and sellers ... The main exception to this generality is in the case of [LNG] projects directed at North America where full contractual details, including prices, have to be filed with the appropriate regulatory bodies and as such become matters of public record.⁹

It might reasonably be asked, since North Americans had no problems in disclosing relatively full details of gas contracts and prices governing volumes - mainly comprising Canadian exports to the USA, but subsequently pipeline trade with Mexico, and LNG exports and imports - which accounted for more than 50 per cent of global gas trade in 1970, and remained well over 10 per cent in 2009, why absolute confidentiality was considered normal practice elsewhere. Despite the plethora of trade journals and price reporting services, near-total lack of transparency of pricing and other commercial contractual terms, remains common practice in long-term international (and many domestic) gas contracts. Many long-term contracts have confidentiality clauses stating that none of the commercial details may be disclosed, although this has become decreasingly tenable during the 2000s as price reporting services expanded, via electronic media, making their quotations (irrespective of accuracy) available to a global audience. However, for this reason, the comprehensiveness of sources in many chapters is less than would be expected in an academic book.

Price Formation in International and Domestic Gas Pricing: classifications and terminology

This book is about international, not domestic, gas pricing. A work on pricing in domestic gas markets would run to several volumes. But domestic pricing has a significant impact on international pricing and vice versa, and for this reason plays an important part in the narrative of many chapters in this book. Looking around the world, there are clearly very different methods of pricing gas, and significant differences in terminology for describing them. The International Gas Union (IGU) created a Task Force which carried out four surveys over the period 2005–10 and developed a classification system for gas prices which is reproduced in Box 1. While the focus of, and terminology used in, this book are different, the IGU data are extremely valuable because they cover the entire gas world and provide a database by price formation <u>mechanism and</u> region using a consistent methodology.

9 Peebles (1980, 31 and 201).

Box 1: IGU Price Formation Classifications

Oil price escalation (OPE): price linked, usually through a base price and an escalation clause, to competing fuels, typically crude oil, gas oil, and/ or fuel oil. In some cases coal prices can be used.*

Gas-on-gas competition (GOG): the price is determined by the interplay of supply and demand – gas-on-gas competition – and is traded over a variety of different periods (daily, monthly, annually or longer). Trading takes place at physical hubs (for example Henry Hub in the USA) or notional hubs (such as NBP in the UK). If there are longer term contracts these will use gas price indices to determine the price. Spot LNG is also included in this category.**

Bilateral monopoly (BIM): The price is determined by bilateral discussions and agreements between a large seller and a large buyer, with the price being fixed for a period of time – typically this would be one year. There may be a written contract in place but often the arrangement is at the government or state-owned company level.

Netback from final product (NET): The price received by the gas supplier is a function of the price received by the buyer for the final product the buyer produces. This may occur where the gas is used as a feedstock in chemical plants, such as ammonia or methanol, and is the major variable cost in producing the product.

Regulation cost of service (RCS): The price is determined, or approved, by a regulatory authority, or possibly a Ministry, but the level is set to cover the 'cost of service', including the recovery of investment and a reasonable rate of return.

Regulation social and political (RSP): The price is set, on an irregular basis, probably by a Ministry, on a political/social basis, in response to the need to cover increasing costs, or possibly as a revenue raising exercise.

Regulation below cost (RBC): The price is knowingly set below the average cost of producing and transporting the gas, often as a form of state subsidy to its population.

No Price (NP): The gas produced is either flared, or provided free to the population and industry, possibly as a feedstock for chemical and fertilizer plants. The gas produced may be associated with oil and/or liquids and treated as a by-product.

Notes:

- * referred to throughout this book as oil-linked or oil-indexed pricing
- ** referred to throughout this book as hub-based, spot or market pricing.

Source: IGU (2012, 7).

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The first two categories – OPE and GOG – are referred to throughout this book as oil-linked or oil-indexed pricing; and hub-based, spot, or market pricing. These are the two main price formation mechanisms in international gas trade and dominate much of the discussion in this book. The other categories are mainly relevant for domestic gas pricing, but a few international contracts are still priced according to BIM and (in rare cases) RSP. There are some difficulties disentangling the RSP and RBC classifications because of lack of precise definition of, and empirical data on, costs.

Pricing and the subsidy issue

As noted above, the RBC (and potentially also the RSP) category in Box 1 raises the additional conceptual question of whether markets where domestic prices do not reflect international prices are subsidizing consumers. This book uses the term 'subsidy' to denote a situation in which the price paid by consumers does not cover the cost of production and delivery to their premises. However, other literature uses the term to denote prices which are below those in international trade.¹⁰ Using gas domestically, when it could be could be exported, involves a major opportunity cost subsidy, equivalent to the difference between potential export revenues and actual revenues from domestic sales.¹¹ For importers, it involves governments or state-owned utility companies contributing the difference between the price which needs to be paid for imports, and the revenue which is received from domestic sales. The situation of the exporter is a choice of revenues foregone, which may not be an efficient use of resources, but is one which can be maintained over a long period of time.

Structure of the book

The book is comprised of 14 chapters. Chapter 1 deals with general analytical issues involved in gas pricing. This is followed by a historical chapter covering pricing developments up to the year 2000. Regional

¹⁰ For extended discussion of these issues see Chapters 1 and 6, and also Fattouh and El-Katiri (2012a) and (2012b).

¹¹ In many gas exporting countries, gas is being used in the domestic energy market to substitute for oil which is being exported. In those countries, therefore, it can be argued that the correct comparison is not between domestic and exported prices but between export prices for gas and export prices for oil. For a specific discussion of this in an Egyptian context see Darbouche and Mabro (2011).

and national pricing is then dealt with in eight chapters covering: North America, Europe, CIS, Middle East and Africa, Latin America and the Caribbean, south-east Asia, India, and China, with a further chapter dealing with the future of Pacific LNG. These chapters cover pricing developments in the 2000s with a look forward to 2020, and they are followed by two thematic chapters, one on the Gas Exporting Countries Forum and the prospects for cartelization, and the other on the globalization of gas pricing and connections between the three major trading markets. Finally conclusions are offered as to whether the future of international gas pricing in the 2000s is likely to involve globalization, cartelization, or a continuation of regional pricing.

CHAPTER 13

THE GAS EXPORTING COUNTRIES FORUM: GLOBAL OR REGIONAL CARTELIZATION?

Laura El-Katiri and Anouk Honoré*

Introduction

When in 2001 a handful of gas exporting countries' ministers met in Teheran to create a regular forum for exchanges between global gas producers, many observers were questioning the real nature such a forum would take: would it be yet another 'talking shop' for energy market dialogue; or would it instead turn out to be a cartel for natural gas that would resemble OPEC in the oil market, with the power to influence natural gas prices and/or export volumes? More than ten years have passed since its first meeting, which allows preliminary conclusions about the role and relevance of the Gas Exporting Countries Forum (GECF) for global gas pricing debates.

Following this introduction, the section entitled 'Historical Development and Institutional Dynamics' provides a brief overview of the GECF's ten year history, including its slow evolution during its first five years, the striking 'Gas-OPEC' debate that surrounded the group particularly from 2007 onwards, and the Forum's most recent achievements in terms of institutional reformation and internal dynamics. The section Likelihood of Cartelization Developments up to 2025' then examines the likelihood of a gas cartel developing in the 2010s, considering market evolution in terms of commercial framework, market dynamics, diverging interests of the Forum members, and considering scenarios on supply and demand balances in importing and exporting regions.

Historical Development and Institutional Dynamics

A Brief history of the GECF

The Early years: cartelization nowhere in sight

The GECF was launched at a meeting of energy ministers in Teheran in May 2001, by the governments of Algeria, Brunei, Indonesia, Iran, Malaysia, Oman, Qatar, Russia, and Turkmenistan. The organization describes itself as 'a gathering of the world's leading gas producers aimed at representing and promoting their mutual interests' with the objective of increasing 'the level of coordination and [to] strengthen the collaboration between member countries.'¹

For the gas market observer, the move may not have been particularly surprising; gas producers and exporters had begun to face increasingly complex conditions for marketing their gas, including the liberalization of the key European gas market at the end of the 1990s.² The second European Gas Directive, initiated in the late 1990s, has been associated by some³ with those immediate causes that prompted the initiation of the GECF in 2001. One typical quote in this context was that of Algerian energy minister Chakib Khelil in 2002, when he publically lamented that:

 \dots those who have an impact on the market, that is the European institutions, should be aware of our issues. When they passed their legislation, they never consulted us. They never thought of talking to the gas-exporting countries before passing their laws.⁴

But the market had also provided another context for the creation of a producers' forum, most importantly during the 1990s, when the rapidly increasing role of LNG opened up a potential window for more flexible trade, including trade to previously unthinkable destinations outside producers' regions, and at generally more flexible contract terms.⁵ A question which may have lingered in the back of many producers' minds at the time may well have been: if natural gas markets become more global, are gas producers ready? Like oil exporters, gas producers face market uncertainties, including uncertain seasonal and longer-term demand on the consumer side, and long-term investment challenges on the suppliers' side. The oil market already has own exporters' interest groups, most importantly the Organization of Petroleum Exporting Countries (OPEC), created in 1960. The existence of a buyers' market for spot market sales of LNG throughout much of the 1990s and early 2000s arguably added momentum to the idea of a producers' forum.

Setting out as a very informal gathering of energy ministers, the Forum's activities initially evolved around annual Ministerial conferences in combination, since 2004, with biannual working group meetings whose analysis feeds back into the Ministerials. During the first few years, there was recurring media speculation in consuming countries regarding the intent of member countries to turn the GECF into a producers' gas cartel, but this proved entirely wrong. The Forum was clearly in a very early phase of organizing itself, with little concrete debate around pricing policies or other long-term objectives for the forum. A first attempt made by Egypt in 2003 to propose a common gas pricing framework to GECF member states fell entirely on deaf ears. Egypt proposed the de-coupling of long-term contract prices from oil prices, arguing the link had become redundant in view of the decreasing competition between oil and gas in key consumer markets.⁶ In the same year, another proposal by Egypt for a single GECF pricing formula, to be introduced to level the playing field between different gas exporters, was widely dismissed, reflecting the divergence of views and priorities of different members in relation to gas price mechanisms.⁷

By 2005, the Forum had, in the eyes of some observers, reached the status of an 'evidently troubled organization' following a conference in Trinidad which was attended by only four energy ministers.⁸ The Forum was publically criticized by its own members, the most vocal of whom soon (and not for the last time) proved to be Algeria's energy minister, Chakib Khelil. Markedly absent from the GECF Ministerial in Port of Spain and supposedly held back for 'urgent business', Khelil slammed the forum at the time of the meeting at a speech in New York in front of university students with the words:

We have not succeeded in respect to GECF ... In fact, it's becoming more bureaucratic, and people are not sharing information. So it's useless to talk about it, and we don't have time to waste attending a conference like that.⁹

Another, unidentified conference participant was quoted later in the press as saying:

In OPEC, we're both competitors and partners [while in the GECF] we're only competitors, not yet partners.¹⁰

Host country Trinidad itself was similarly quoted lamenting the apparent lack of member countries' willingness to cooperate and to share information.¹¹ Following the experience of 2005, no Ministerial meeting took place in 2006, at which stage the Forum seemed, for a time, almost written-off.

The 2007 'Gas-OPEC' debate and its aftermath

The perception of the GECF in the public eye turned around remarkably by 2007. A Ministerial conference in Doha was successfully organized by Qatar in April, but was overshadowed by comments made prior to the meeting by core members Russia and Iran. In January, Iranian head of state Ayatollah Ali Khamenei called for the creation of a gas market cartel through the GECF, a 'Gas-OPEC' to control and manage gas export prices. Khamenei's outburst was taken up a week later by Russia's President Vladimir Putin, who seemed to add further fuel to the fire at an infamous press conference at which he was quoted saying that the creation of a Gas-OPEC was:

... an interesting idea [that he would] think about¹² [arguing that] We have no plans to create some kind of cartel, but I think it would be a good idea to coordinate our activities, especially in the contract of achieving our main aim of ensuring certain and reliable supply of energy resources for our main consumers.¹³

While triggering a considerable media storm surrounding the forum in 2007 and 2008,¹⁴ the quote was in every case remarkable; Russia had previously shown little interest in the forum despite being one of its founding members. At the 2005 Trinidad meeting, when Russia only sent its ambassador, rumours had circulated that Russia was intending to drop out of the forum. Later in January 2007, the press excitedly picked up a supposed reconfirmation of Putin's sudden support for the formation of a gas cartel during a journey to the Middle East, where he responded to a question:

We do not reject the idea of creating a gas cartel ... Energy consumers coordinate their activities, including through international organizations such as the International Energy Agency ... Why should the producers not also coordinate their work? I do not think that such activity is aimed at undermining energy security – quite the opposite.¹⁵

The possible formation of a gas cartel via the GECF had been a scenario discussed by a number of observers right after the formation of the group in 2001, and had only ebbed away during the crisis years of 2005/6. Consuming countries' worries regarding the formation of a gas cartel relate to what many see as an organization with a theoretically very strong resemblance to OPEC: the fact that it is a producers-only forum, with no representation of consumer countries; the GECF's repeated call for 'coordination' among its members, is a key term also used in OPEC's operational vocabulary;¹⁶ the members' immense share of the world's natural gas reserves and production (see below, Table 13.3), and the fact that it includes only non-OECD countries as full member states, supply from which is widely held to be key to most new additions to global gas production in the coming two decades.¹⁷

The GECF members themselves, at each Ministerial,¹⁸ have consistently denied any intention of forming a cartel. As early as in 2001 Iranian Oil Minister Bijan Zanganeh's felt compelled to reassure the assembled press that 'There is no such thing as a gas cartel – this is just an open session to exchange views,' adding 'We are not discussing quotas.¹⁹ At the 2007 Ministerial in April, the same position was taken, including by the Russian and Iranian delegations.²⁰

However, the OPEC-speculation surrounding the GECF has become self-perpetuating. Several subsequent bilateral business talks between GECF members Algeria, Iran, Oatar, and Russia held independently of the Forum attracted considerable attention both among the media. as well as from some political figures in consuming countries. For instance, a business trip by Russia's Energy Minister Viktor Khristenko to Algeria in February 2007 to discuss joint projects to develop energy infrastructure and resources with business heads of Sonatrach prompted the EU energy commissioner to express concern over the possible cooperation of Europe's two main gas suppliers.²¹ Similar reactions followed talks about potential gas swaps between Russia and Qatar in the same year, and in November 2010.22 In October 2008, the controversy was again fuelled by a high-level meeting between Russia, Iran, and Oatar - since then occasionally referred to as the 'Gas Troika' - to 'discuss and coordinate' (undefined) new exploration and production projects.²³ Iran's Oil Minister Gholamhossein Nozari claimed after the meeting that the three states had reached consensus to set up a 'Gas-OPEC' and had made 'major decisions.'24 The initiative arguably came at a handy time for Teheran, whose conflict with several Western countries over its nuclear programme was, at the time, reaching new heights. The meetings of the Troika briefly became sufficiently controversial to be followed by public reactions from US and EU officials.²⁵ though it disappeared relatively soon from the Iranian, Oatari, and Russian policy agendas, and has never been heard of since.

Gas pricing discussions (2007-11)

The official GECF Ministerial meetings in 2007, 2008, and 2009 attracted comparably little attention. The Doha meeting of 2007 became a platform for expression of the discontent shared by many gas exporters in relation to the rising gap between oil-indexed and spot gas prices. Algerian energy minister Chakib Khelil proposed a target spot price of \$10/MMBtu at an oil price of \$60/bl, slightly above crude oil parity. This proposal was noted by delegates and a study commissioned to explore future gas pricing options.²⁶

The GECF's April meeting in Oran, Algeria in 2010 led to renewed controversy within the Forum. Khelil's proposals to restrict gas supply from the GECF member states in an attempt to stabilize the then-plummeting spot prices was met with general disapproval by other members.²⁷ Media reporting picked up mainly the inability of the Forum's members to agree on concrete policies – but also noted the recurring proposition by one member to reduce gas output, seen by some as giving a first taste of what might one day be achieved if agreement between members grew stronger.²⁸

Notably since the Oran meeting, there has been a common position among the GECF member states regarding the preferred pricing mechanism for the majority of future gas trade. The Oran meeting concluded with a joint ministerial statement in which member states pledged to 'continue to support the linking of gas to oil parity.²⁹ This statement became the basis of the GECF's position on gas pricing at meetings in 2010 and in 2011.³⁰ GECF Secretary General Leonid Bokhanovsky reinforced this message in February 2011 in a rare press interview, suggested that:

... oil-linked long-term contracts will undoubtedly constitute the optimal choice of the consumer, since it offers stable and guaranteed supply volumes at a predictable cost without the possibility of manipulation by the supplier.³¹

He further insisted, regarding the continued cartelization debate:

The Forum is not engaged in the regulation of gas production. The GECF will only recommend solutions.

GECF institutional dynamics

As of 2012, and despite the controversy around its alleged aims to become a cartel, the GECF remained, as an organization, 'a work in progress'. Institutionally, the Forum had made some important progress since 2008, the resulting success of which will depend on how the member countries will use the existing institutional structures in the coming years. Other internal dynamics reveal the still-fractured nature of the GECF: an unstable membership; members states divided over the key objectives of the forum; and the subsequent lack of clarity about those objectives, exacerbated by the lack of institutional transparency. All these factors taken together show that the GECF as an institution, and collectively its members, are far from achieving the unity of purpose required from an organization intending to evolve as a cartel.

Institutionalization

Prior to 2008, the GECF existed as a merely informal group of countries whose primary activities centred on the annual Ministerial meetings attended by member states' energy ministers and/or relevant ministerial delegations. In the absence of any official documentation outlining the Forum's core objectives, its membership rules, and relevant institutional structures such as a secretariat, the GECF in its early years can be seen as little more than a conference platform. The Executive Bureau was created as early as 2004, but was mostly responsible for the organization of Ministerial and biannual working group meetings. The Liaison Office was created in 2005, with the main purpose of coordinating the contributions of the member countries to the Forum, specifically the (so far limited) exchange of natural gas statistical data among members.

In December 2008, the GECF made its first step towards a greater degree of institutionalization, with the adoption of a formal Statute, which outlines in broad terms the GECF's objectives as an organization, and the principles of membership and institutional funding.³² In January 2010, part of the previous structure (such as the Liaison Office) was dismantled and replaced by a new structure with a Permanent Secretariat, and the headquarters was established in Doha, Qatar (see Figure 13.1).

According to its Statute of 2008 the GECF comprises three governing bodies, the Ministerial Meeting, the Executive Board, and the Secretariat.

The GECF Ministerial Meeting is the supreme governing body of the GECF; it meets at least annually, and more frequently if deemed necessary. It comprises delegations representing member states typically,



Figure 13.1: Schematic structure of the GECF Secretariat, 2012 Source: GECF Website, March 2012.

but not necessarily, led by each country's respective energy minister. Each member state has one vote, and a quorum of two-thirds of present member states is necessary to hold a Ministerial. Decisions other than on procedural measures require a unanimous vote. The presidency rotates by meeting between member states. The Ministerial Meeting makes all major decisions within the GECF, including the appointment of the Secretary General and the staff of the Executive Board, the formulation of general policy, the direction of other institutional bodies such as the Executive Board, and decisions regarding the budget of the GECF.³³ The President of the Ministerial Meeting for 2012 is the Minister of Mines, Industry and Energy of the Republic of Equatorial Guinea, while the Alternate President is the Minister of Energy of the Russian Federation.

The Executive Board is composed of staff appointed by each member country for the duration of two years, confirmed by the Ministerial Meeting. The same voting rules apply as for the Ministerial Meeting, with meetings taking place at least twice per year. The Executive Board implements policy decisions made at the Ministerial Meeting, but also prepares and makes proposals and recommendations to Ministerials; it approves the work programme of the Secretariat; and draws up the annual budget for submission to the Ministerial Meeting. The Chairman of the Board is elected for one year under a rotating member country principle. In 2012, the Chairman of the Executive Board was Ilya Galkin, the Russian Executive Board member.³⁴

The Secretariat carries out the executive function of the GECF under the direction of the Executive Board. It comprises the Secretary General, appointed by the Ministerial Meeting, and a body of permanent administrative and research staff.³⁵ The Secretary General is legally authorized to represent the GECF,³⁶ and to direct the affairs of the GECF in accordance with the Executive Board and the Forum's statute. He is accountable both to the Executive Board and the Ministerial Meeting. The organization's first Secretary General, appointed in 2009, was Leonid Bokhanovsky, a former board member and first vice president of the Russian engineering-construction company Stroitransgaz.³⁷ Administrative and Research Divisions include officers for legal issues, public affairs, internal auditing, general administration, and finance; and analytical departments dealing with gas market analysis and statistics and gas modelling.

The existence of the Secretariat and a Secretary General has allowed the organization to communicate more effectively with other international organizations. Since taking office, the Secretary General has established the Forum's credentials by meeting with leading international organizations, for instance with the UN Secretary General in December 2010, and the US Energy Information Administration in January 2011.³⁸ In September 2010, the GECF registered its Statute with the UN, thus formally assuming the legal status of an intergovernmental organization.³⁹ In November 2011, the first GECF Summit of Heads of State was held in Doha, tasked with further debate around gas pricing policies.⁴⁰

Despite these institutional achievements, GECF internal decision making remains informal. New membership requests, for instance, are discussed and approved at the Ministerial meetings but there are no formal guidelines regarding membership, or conditions of membership, indeed there is no guidance relating to whether a country must be an exporter of natural gas. There is also a lack of clearly defined rights and duties of member states, perhaps most importantly regarding the size of members' financial contributions to the Forum. In practice, membership status is defined by the obligation of member countries to pay a contribution to the Forum decided annually, and the provision of both speaking and voting rights in the Forum. Observer countries, which attend all GECF meetings, pay a reduced contribution and have the right to speak but no voting rights. The organization's budget is decided on an ad hoc basis once a year at Ministerials, with no publically available accounts.

Membership

The GECF's membership has proven highly unstable over the past 10 years, a matter reflected in the forum's varying attendance levels at Ministerial meetings (see Appendix Table A13.1). Of the GECF's 11 founding members, only four have remained as members from the start: Algeria, Iran, Qatar, and Russia. Founding members Indonesia, Malaysia, and Brunei left the Forum, and have commented on various occasions that, since the GECF was unable to exercise any influence over global gas markets, they had no interest in remaining as members.⁴¹ Founding member Oman lost interest in the Forum shortly after its launch (owing to changed production priorities), but re-joined in late 2011. The United Arab Emirates attended a few meetings of the group, but became a net importer of gas in 2007 and subsequently withdrew.

In 2012, five of the 12 Forum members were African exporters: Algeria, Egypt, Libya, Nigeria, and Equatorial Guinea. Three were from the Gulf: Qatar, Iran, and (the newly returned) Oman. Three from Latin America and the Caribbean: Venezuela, Bolivia, and Trinidad and Tobago. This left Russia somewhat geographically isolated (aside Kazakhstan, which has observer status). The Forum had no Asian members, these all left some years ago.



Map 13.1: Map of the GECF member and observers countries and OECD regions in 2011

Note: Oman re-joined the GECF in late 2011.

Source: Authors.

Individual members' interests within the Forum differ substantially, reflecting the many differences in terms of industry size (including the influence of domestic gas companies on national gas policy, and their ownership structures), and the stage of development of their gas exports and export infrastructure. The GECF's four founding members Algeria, Iran, Qatar, and Russia represent the core of the group, in terms of their gas production (Algeria, Qatar, Russia) and in terms of their outspokenness within the forum (Algeria, Iran, Russia). Members include both substantial pipeline exporters (Russia and Algeria), with specific infrastructure linking them to particular export markets (Europe); and LNG exporters such as Qatar, Egypt, Equatorial Guinea, and Nigeria whose export markets are more flexible. There are elements of indirect competition between members, but Russian pipeline and Algerian pipeline and LNG exports are in direct competition in Italy and France, two of their largest markets.

Two of the GECF's 12 members can barely be said to be exporters of natural gas: Iran, which has been most vocal in supporting the idea of a gas cartel, has been a net importer of gas since 1997; as is Venezuela, which imports small amounts of gas from neighbouring Colombia. Relatively small and new entrants to LNG trade such as Egypt and Trinidad and Tobago may well see the Forum as an opportunity to intermingle with other exporters, and may have vested interests in participating in the architecture of future trading schemes, including new pricing mechanisms. In contrast, LNG giant Oatar has taken a perhaps surprisingly quiet stance in the Forum; the country has hosted nearly half of the Ministerial meetings up to 2012, and the Secretariat is located in Doha, but its representatives have so far not made any major statements within or about the Forum, suggesting that Qatar's interests lie primarily in monitoring other exporters' activities. Iran has arguably used the Forum for political ends, particularly as part of its ongoing nuclear dispute with the West. Russia's position vis-à-vis the GECF seems somewhat ambivalent; Europe's largest gas trading partner seemed at times indifferent, despite the fact that President Putin's infamous (mis-)quote in 2007 drew a great deal of attention to the Forum and its potential to become a cartel. The country arguably also has major interests in maintaining good relations with its European buyers, and in avoiding sending worrying messages to its main export market.

So far, no OECD countries – such as the large-scale producers USA, Canada, and Australia – are members of the GECF. Norway since the start, and the Netherlands since 2011, have held observer status, along with Kazakhstan, but have repeatedly declined offers to become full members. Their intention seems to be to monitor the Forum rather than to influence its actions.⁴² In parts, the cartelization debate surrounding the GECF may also have acted as a barrier for other potential members, which believe that membership could send the wrong signals to their customers. Some increasingly important gas exporters are notably not members of the Forum: Turkmenistan, Azerbaijan, and Myanmar, soon to become more substantial exporters, have so far not shown any interest in the Forum;⁴³ Peru and most existing and future Pacific exporters remain outside the forum.

The lack of appeal of the GECF to some key producers and exporters is not necessarily an obstacle to future cartelization. OPEC, being likewise an organization of producers and exporters, has not included key oil producers such as Russia, Norway, and the UK. But if the primary goal of the GECF is to provide a Forum for producers and exporters to share data and information, then the absence of key exporting countries necessarily limits the scope of action for the GECF – and raises the question whether more global organizations such as the International Energy Forum (IEF), or the International Gas Union (IGU), would be more effective in achieving at least some of these objectives.

Objectives

As a result of the evidently divergent aims of its members, the GECF has so far failed to establish itself as an organization with a clearly defined set of objectives. The Statute of 2008 reflects this, stating:

The objectives of the Forum shall be the support of sovereign rights of member countries over their natural gas resources and their abilities to independently plan and manage the sustainable, efficient and environmentally conscious development, use and conservation of natural gas resources for the benefit of their peoples.

This rather vague formulation is followed by a call to achieve these objectives via 'the exchange of experience, views, information, and coordination', in and around a broad range of policy areas including exploration and production trends, supply-demand balances, technology advances, and inter-fuel competition. In practice, this framework provides a vague set of goals for the Forum to seek to achieve. This is despite a number of different short- and long-term roles on natural gas markets which the Forum could specifically play. These include:

- an information and data sharing platform for exporting countries;
- a business forum for countries wishing to cooperate in areas such as shared infrastructure and gas swaps;
- a signalling 'task force' whose role is to guide price levels on short-term

markets by talking about them (similar to the way in which OPEC frequently acts as a signaller for crude oil prices);⁴⁴

• to become indeed a kind of gas market cartel, influencing a combination of export volumes and market prices.

With the partial exception of statistical data and information exchange, none of these four objectives has consistently been pursued by the Forum's members. Data and information sharing has clearly been the most realistic aim for the organization in the short term, given its significant potential benefits, and given that the administrative framework for data sharing is comparatively uncomplicated. The GECF has made some steps into this direction, most notably through the establishment of an internal data collection point within the Secretariat (previously in the Liaison Office), and by developing its own long-term supply and demand model, a key project within the organization's in-house research. The GECF's internal global gas market model is aimed to:

... help identify relevant patterns of production, transportation routes and prices that impact demand and supply in differing markets in differing economic scenarios [and to] identify strategies that aim at maximizing the present value of producer rents within a competitive framework or minimizing system-defined expenses to meet demand.⁴⁵

A separate question is whether or not the GECF would be willing to share this data publically, which would also contribute to greater market transparency. The GECF signed a Memorandum of Understanding with the International Energy Forum (IEF) for cooperation on the Joint Organizations Data Initiative (JODI) database, a high-profile project pursued by the IEF for a number of years, aimed at systematically collecting basic oil and, since the late 2000s, natural gas statistics (on imports/exports, supply and demand). The IEF explicitly recognized the GECF's engagement in this regard at its Conference in October 2010, stating that

... in recognition of the ongoing work of the Gas Exporting Countries Forum (GECF), in establishing a gas data collection mechanism that could result in GECF joining the inter-organizational efforts to enhance gas data transparency, the GECF was also invited to participate in this event.⁴⁶

In practice, however, the GECF lacks both information and data flows from its member countries. Separate meetings between Algeria, Iran, Qatar, and Russia since 2007, suggest key members prefer to discuss bi- and trilaterally rather than within the Forum, including at a company, rather than government, level. Having been unsuccessful so far in its most basic efforts to share data, there is a temptation to view the GECF as simply a 'talking shop' 47 whose relevance for gas markets is minimal. 48

Transparency

Another critical factor contributing to the GECF's so far limited impact, has been the distinct lack of transparency of the organization and its activities. With only a basic website online since 2005, which was upgraded only in 2011,⁴⁹ the GECF's communication with the public as well as consuming countries has so far been limited to occasional press releases after Ministerial Meetings, and occasional interviews with member countries' heads of state and energy ministers, of whom the most widely quoted have been the infamous media remarks by Vladimir Putin and Ali Khamenei (see above) regarding the supposed formation of a 'Gas-OPEC'. The GECF has not generally made public statements at the end of Ministerial Meetings. Similarly, there is no published list of its in-house research, no member countries' data submissions, no annual report, and no other official statements. This near-total lack of information is surprising, particularly in view of the GECF's supposed alter ego OPEC, which publishes a whole range of updates, member statements, reports, and analysis regularly, on a well-kept website.⁵⁰

The lack of transparency surrounding the GECF has been instrumental in generating a media image of the GECF as a generally opaque organization. This leads to two conclusions. Firstly, it is difficult for the GECF to establish any relevance for gas markets, other than media contributions by its member states about prospects for an evolving gas cartel. Secondly, the GECF deprives itself of an important instrument to make itself more relevant to gas markets, by not sharing information and not speaking with one voice – or arguably not speaking at all. Hence in 2012, the GECF remained a de facto muted Forum whose potential as an exporters' organization is misunderstood by governments and media in importing countries; in consequence, its relevance seems typically either under- or overestimated.

Likelihood of Cartelization Developments up to 2025

As noted above, the Forum ensures that it is not engaged in the active regulation of gas production.⁵¹ But as also noted, the Forum is often perceived in import-dependent countries as a potential future cartel for natural gas that would manipulate prices and/or volumes, and therefore threaten gas supply security. While the idea of a gas cartel has generally been met with some scepticism,⁵² the idea of a possible

'Gas-OPEC' tends to recur in press coverage. Extensive literature exists on cartels theory⁵³ and on parallels between the development of the OPEC cartel and the GECF.⁵⁴ Rather than repeating such analysis, this section revisits the debate about a possible future gas cartel in light of changes in commercial gas frameworks, and evaluates the likelihood of cartelization of gas markets in the 2010s.

Drivers for, and constraints on, cartelization in the gas industry

Because cartels tend to form when commodity prices are low,⁵⁵ discussions about a greater degree of coordination between exporters have been expected in the months/years that followed the 2008 recession.⁵⁶ The main arguments, both drivers and constraints, as to how a cartel could emerge in the gas market, and the difficulties which it could face, are summarized below.

Steps towards a more favourable market structure of the natural gas industry for cartelization

In Europe and Asia, which received two-thirds of internationally traded gas in 2010,⁵⁷ the vast majority of gas is still sold via traditional long-term bilateral contracts.⁵⁸ This structure gives producers little flexibility to vary export volumes delivered to the international market and influence prices. Because long-term contracts with prices based on competing fuels still represent the largest share of gas sold in continental Europe and Asia,⁵⁹ the range of actions for GECF members is limited mostly to regional markets such as North America and the UK, where gas prices are formed on the short-term markets – and consequently are principally determined by supply and demand.

The question arises as to whether the structure of the gas markets in continental Europe, Asia, and elsewhere will evolve towards that prevailing in North America and the UK. This leads to speculation as to whether greater flexibility in gas trade could develop, giving sellers the potential to divide the market among themselves, coordinate their export volumes and price offers, and eventually obtain higher prices, revenues, and market shares. But while the energy density and the non-specific costs of the oil business make it relatively easy to establish marketplaces and physical infrastructure for trading, in contrast, the natural gas industry is defined by high specific costs to move gas from production to consumption centres and by long investment cycles.⁶⁰ As a result, gas sellers have little incentive (compared to oil sellers) to restrict the use of their assets, and tend to fully utilize their capacity in order to recover their costs. Another factor that may constrain the development of flexibility is that international oil companies (IOCs) still play a significant role in the development of gas resources (such as in Egypt, Nigeria, Qatar, Equatorial Guinea, and Trinidad and Tobago).⁶¹ This structure means that a producing country may not have control over the whole chain of investments, which restricts its ability to unilaterally decide to limit production or exports.

Despite these constraints, the dominance of the traditional long-term rigid contract model has been questioned, with new supplies coming into the market in a more flexible form and sold to the highest bidder. One of the key elements has come from LNG volumes, where the proportion of short-term trading has been growing rapidly since the mid-2000s thanks to the elimination of destination clauses, and additional uncommitted LNG ships [see Figure 13.2].⁶²

With increasing short-term trading at market prices, gas exporters could influence prices by managing supply and demand balances, but if a move from oil-linked to hub-based prices leads to a revision of some continental European long-term contracts, their influence could possibly be even greater.⁶³

Uncertainties on future gas market dynamics

Developments away from traditional long-term contracts and towards hub prices can be seen as steps towards a structure which would be





Source: Cedigaz (2011, 150)

more amenable for the creation of a cartel of gas exporters. But in 2011, the GECF Members stressed the importance of 'long-term contracts and fair pricing for natural gas, at levels reflecting market fundamentals and parity with oil prices,'⁶⁴ a fair price level being defined as one which justifies new investments.⁶⁵ Gas exporters seem to be more confident that oil-indexation will produce generally higher (or 'fairer') price levels – and therefore revenues to their countries – in the long run.⁶⁶ The uncertainties about future global and regional gas supply/demand balances, are expected to limit, and further complicate, the range of action for GECF Members, which could explain their preference for long-term traditional contracts.

The principal concern for natural gas exporters is security of gas demand. Gas demand growth is expected to continue to slow in OECD countries due to energy savings and efficiency policies, but also due to environmental considerations. European countries in particular, but also those in other regions, have ambitious targets to reduce carbon dioxide emissions which, in the long run, are expected to curb gas demand growth.⁶⁷ Long-term contracts translate into a need for security of demand for exporting countries, despite the fact that at the same time, the traditional indexation of gas prices to crude oil or oil products may contribute to the erosion of such demand. However, even if prices moved to being hub-related, and provided that gas prices could actually be manipulated by a cartel, it would be difficult to find the equilibrium price without a deep knowledge of the downstream market. This is important because natural gas does not have a captive market, and as a result, high gas hub-related prices may also contribute to a - rapid - decline of consumption. Stocks of gas-using appliances creates some inelasticity⁶⁸ of demand in the short term, but gas can be substituted in most uses,⁶⁹ especially in the power sector where fuel switching can happen fairly easily within environmental and available capacity constraints.⁷⁰ In addition, any clear action taken to control the market could be seen as a threat to the security of supply, and strengthen the political will to focus on alternative (probably low carbon) energy. As a result, possibilities to raise prices by GECF Members will be limited. In any commodity market, strong demand is a condition for the emergence of a cartel, and this situation is not the one developing in the OECD region, especially in Europe.

The second major concern is the ability to exert market power, and as a consequence, the share of the GECF in total gas exports. Cartelization is more likely to be successful in markets where a small numbers of suppliers have a significant market share and the ability to block new entrants.⁷¹ The market power of a gas cartel would also be limited if export reductions by Members resulted in additional supply from non members. Losing market share in the mid- to long-term to indigenous shale developments, energy savings, or lower carbon alternatives, should encourage cartel members to be more open to cooperation. Although, as noted above, thus far cooperation does not seem to be moving towards traditional cartel behaviour but rather towards maintaining the long-term contract and oil-linked pricing structures, which paradoxically limit their actions on the short-term market.

Cartelization: complexities and possibilities

As noted in the section 'Historical Development and Institutional Dynamics' above, GECF members display a large diversity in their national situations: stage of gas market development, mode of exports, and target markets. Tables 13.1 and 13.2 present some of the major

(DCIII)						
	Total	Pipeline*	LNG*	Destination of LNG (%) Atlantic Basin Pacific Basin		
Bolivia	11.6	11.6	0.0	-	-	
Trinidad and Tobago	19.1	0.0	19.1	84.70%	15.30%	
Venezuela	0.0	0.0	0.0	-	-	
Russia	214.9	201.5	13.4	0%	100.00%	
Iran	8.1	8.1	0.0	-	-	
Qatar	96.7	19.3	77.4	52.80%	47.20%	
Algeria	56.7	37.9	18.8	99.10%	0.90%	
Egypt	15.3	6.2	9.1	69.30%	30.70%	
Libya	10.1	9.5	0.6	100%	0.00%	
Nigeria	23.6	0.1	23.5	83.30%	16.70%	
Eq. Guinea	4.2	0.0	4.2	0.00%	100.00%	
Total - GECF Membe	rs 460.3	294.2	166.1	61.50%	38.50%	
Kazakhstan	7.9	7.9	0.0	-	-	
Netherlands**	59.5	48.8	0.0	-	-	
Norway	102.8	98.3	4.5	96.60%	3.40%	
Total - GECF Membe and Observers	ers 630.5	449.2	170.6	62.40%	37.50%	

 Table 13.1: Exports from the GECF member and observer countries in 2010 (bcm)

* Real exports may have been higher than reported in these columns. This is due to flows of 'unspecified origin' in the IEA tables

** Exports from the Netherlands appeared too low, which is probably due to high levels of Dutch gas in the category 'unspecified origin'. The data used in this table comes from IEA (2011a, II.20)

Source: IEA (2011a, II.50-3) (pipeline); IEA (2011a, II.56-7) (LNG)

		·				
	OECD	Europe	OECD Asi	a Oceania	OECD A	Americas
	Pipeline	ĹŇG	Pipeline	LNG	Pipeline	LNG
Bolivia	0.0	-	0.0	-	0.0	-
Trinidad and Tobago	0.0	5.4	0.0	0.9	0.0	7.8
Venezuela	-	-	-	-	-	-
Russia	126.4	0.0	0.0	12.2	0.0	0.0
Iran	7.8	-	0.0	-	0.0	-
Qatar	0.0	36.9	0.0	20.5	0.0	2.9
Algeria	35.2	18.7	0.0	0.0	0.0	0.0
Egypt	0.0	4.1	2.1	1.7	0.0	2.2
Libya	9.5	0.6	0.0	0.0	0.0	0.0
Nigeria	0.0	15.5	0.0	2.2	0.0	3.2
Eq. Guinea	0.0	0.0	0.0	2.0	0.0	0.0
Total - GECF Members	178.9	81.2	2.1	39.5	0.0	16.1
Kazakhstan	0.0	-	0.0	-	0.0	-
Netherlands*	48.8	-	0.0	-	0.0	-
Norway	98.3	3.5	0.0	0.2	0.0	0.7
Total - GECF Members						
and Observers	326.0	84.7	2.1	39.7	0.0	16.8

 Table 13.2: Destination of exports from the GECF member and observer countries in 2010 (bcm)

Source: IEA (2011a, II.50-3) (pipeline); IEA (2011a, II.56-7) (LNG)

* Exports from the Netherlands appeared too low, which is probably due to high levels of Dutch gas in the category 'unspecified origin'. The data used in this table comes from IEA (2011a, II.20).

differences between the GECF members. Some countries are LNG exporters to the Atlantic Basin (Algeria, Nigeria, Libya, Egypt, Equatorial Guinea, and Trinidad and Tobago); some are pipeline exporters to Europe (Russia, Kazakhstan, Norway, and the Netherlands); some are pipeline and LNG exporters (Algeria, Egypt, Libya, Norway, and Russia). Even with pipeline to Europe and LNG to the Pacific, only Qatar can be a swing supplier of major volumes to both Basins due to its geographical location.⁷²

In 2011, the GECF already had 14 members and observers⁷³ and its objective was to expand by bringing in new countries.⁷⁴ However, the greater the number of members, the more difficult it could be to agree on various issues. Exchange of information, policy coordination, and common goals would also be more complicated and time-consuming. Are the common interests of the major players enough to allow for collective action to decide how, when, and even if, they want to cooperate with each other to control gas supplies and/or prices?

Allocating production or export quotas among members will be difficult because each member has different existing contractual commitments, ambitions, and market power. Attempting to control (existing and future) production would penalize countries unable to benefit in the short term from the potential revenues generated by developing their reserves. On the other hand, incremental exports are already in doubt due to moratoria in some countries such as Oatar, Trinidad and Tobago, Egypt, and the Netherlands; and questions about the size of the remaining reserves in Norway, Indonesia, Malaysia, and Brunei. In addition, a lack of investment - combined with difficulties in developing reserves - may also limit the flexibility to vary export levels, especially in Bolivia, Venezuela, Nigeria, and potentially Algeria, Egypt, and Libva. These differences make the establishment of a cartel amongst the GECF members very difficult to achieve. To have a substantial and immediate impact, the support of the major LNG exporters would be needed,⁷⁵ but there are also other options. Because there is no global natural gas market, any initiative to control the supply and price of natural gas may not succeed on a global level, but it could at a regional level. It might be possible for exporters with a sufficient market share to gain short-term rents by controlling the availability of supplies.⁷⁶ An agreement between Gazprom, Sonatrach, and Qatar Petroleum, for instance, with the tacit agreement of Statoil and GasTerra, could result in tighter supplies and higher market-based prices for gas in Europe.

Since 2008, the significant discount of spot prices to long-term contract prices has created some financial discomfort for gas exporters to Europe. However, there have not been any proactive efforts, or even a great degree of solidarity, between exporters attempting to improve their position. For instance, while in 2007 the GECF members were reported to be concerned by gas prices likely to 'fall in the mediumterm',⁷⁷ not much was done to coordinate export volumes to dissuade countries from further flooding the market. The anticipated surge of LNG supplies was only delayed by technical failures (new Qatari LNG trains) or domestic problems (high indigenous gas demand in Algeria and Egypt).78 Some attributed this to deliberate withholding of gas by exporters to support prices, but there is no proof or public declaration from the Forum or the exporting countries to substantiate this.⁷⁹ Similarly, some supply reductions were noted in 2010 following the former Algerian energy minister's call for production cuts to support prices⁸⁰ but no direct link between the two events was ever explicitly recognized. There was similar speculation in relation to Norwegian technical failures at fields and pipelines during 2009/10 and their impact on NBP prices, and again concerning reductions in Russian and Algerian deliveries

identified in the second half of 2010.⁸¹ In the same year, the reductions of Qatari exports due to technical problems with six out of 12 LNG trains led to speculation about deliberate withholding of gas from the market to support prices. Additional concerns of possible tight supply following the news that Qatargas planned maintenance on its facilities from September to October 2011 created a surge in European gas prices for a few days in late August of that year.⁸² All these events could be interpreted as attempts by members of the GECF to manipulate prices by withholding supply, but there is no evidence to even suggest this was the intention, let alone to demonstrate cartel-type action or exporters' collusion.

As the GECF itself explains, the Forum seeks not so much to influence the world market as to protect the interests of member countries.⁸³ But the Forum, or groups of member countries, could decide to have a different modus operandi in the different consuming regions, involving regional arrangements to allocate certain markets to certain suppliers, decide on price mechanisms in these markets, and coordinate supplies. Establishing a full cartel may be difficult, but cooperation between a limited number of cartel members in respect of a specific region may be feasible.

What if member countries adopt a common strategy on gas exports?

In 2010, the OECD region represented 48 per cent of global gas consumption but 78 per cent of global imports (up from 52 per cent in 1990). Dependence on imports is increasing in most OECD markets, and with it security of supply concerns. This section focuses on these markets and investigates the following questions:

- 1. What is the potential for the GECF or some of its member countries to either curtail their exports in order to force up prices; or to set an export price level below which they will refuse to export?
- 2. What would be the impact on different regional gas markets of such actions?

Setting the scene: gas trades in 2010

The importance of the GECF is traditionally considered in relation to its share of world natural gas resources and production. As Table 13.3 shows, in 2010, members held 66.5 per cent of the world proven gas reserves (63.8 per cent without the observers), with Russia holding 44.8

	Reserves Production			R/P	
	tcm	%	bcm	%	
Bolivia	0.3	0.2	14.4	0.5	20.8
Trinidad and Tobago	0.4	0.2	42.4	1.3	9.4
Venezuela	5.5	2.9	28.5	0.9	193.0
Russia	44.8	23.9	588.9	18.4	76.1
Iran	29.6	15.8	138.5	4.3	213.7
Qatar	25.3	13.5	116.7	3.7	216.8
Algeria	4.5	2.4	80.4	2.5	56.0
Egypt	2.2	1.2	61.3	1.9	35.9
Libya	1.5	0.8	15.8	0.5	94.9
Nigeria	5.3	2.8	33.6	1.1	157.7
Eq. Guinea	0.1	0.1	5.9	0.2	16.9
Kazakhstan	1.8	1.0	33.6	1.1	53.6
Netherlands	1.2	0.6	70.5	2.2	17.0
Norway	2.0	1.1	106.4	3.3	18.8
Total GECF	124.5	66.5	1336.9	41.9	93.1
Without observers	119.5	63.8	1126.4	35.3	106.1
Total NON GECF	62.6	33.5	1944.7	58.1	32.2
Total WORLD	187.1	100.0	3281.6	100.0	57.0

Table 13.3: Reserves and production from the GECF countries in 2010

Source: IEA (2011a, II.4–5, II.8–9)

tcm, Iran 29.6 tcm, and Qatar 25.3 tcm. However important, large reserves do not necessarily translate into large production. The same year, the GECF produced 41.9 per cent of the world total (35.3 per cent without the observers). Russia's share of total production was 18.4 per cent, while other members' individual shares were below 5 per cent. Similarly, production does not mean that the gas will be exported. As Table 13.4 shows, around 70 per cent of the gas produced in 2010 was consumed locally. To understand the market power of the GECF, it is essential to consider natural gas exports/trades rather than the share of reserves or production they represent.

In 2010, only about 30 per cent of the gas produced was exported (990.9 bcm).⁸⁴ As shown in Table 13.4, the GECF countries represented 63.6 per cent of the cross-border gas trades. Russia alone represented 21.7 per cent of the world gas exports, followed by Norway with a share of 10.4 per cent, Qatar at 9.8 per cent, the Netherlands at 6.0 per cent, and Algeria at 5.7 per cent. These five major exporters had a share of 53.7 per cent of world gas exports and 84.2 per cent of GECF exports.

	bcm	%	%
World gas consumption	3303.0	100	100
Gas consumed nationally	2312.1	70	
Gas traded (cross-border)	990.9	30	
Gas traded (cross-border)	990.9	100	
By Non-GECF countries	360.4	36.4	36.4
By GECF countries	630.5	63.6	
Gas traded (cross-border) by GECF countries	630.5	100	63.6
Russia	214.9	34.1	21.7
Norway	102.8	16.3	10.4
Qatar	96.7	15.3	9.8
Netherlands	59.5	9.4	6.0
Algeria	56.7	9.0	5.7
Total of these 5 countries	530.6	84.2	53.7

Table 13.4: Natural gas trades in 2010 and role of the GECF

Source: IEA (2011a, II.9, II.50-3) (pipeline); IEA (2011a II.56-7) (LNG)

Importing countries are becoming increasingly reliant on ever more concentrated and distant sources of natural gas. The feeling is that the OECD countries are increasingly vulnerable to strategic behaviour by gas suppliers, since it is difficult or impossible to redeploy energy infrastructure in the short term if gas supplies are interrupted. But the relative importance of the GECF exporters varies depending on the importing region, as shown in Table 13.5.

Out of 145.5 bcm of imports to the **OECD Americas**⁸⁵ (representing 17.2 per cent of the regional demand), only 12.9 per cent came from seven GECF countries (representing 2.2 per cent of the regional demand), while the rest came from regional cross-border gas trades. The gas from the GECF came in the form of LNG. Trinidad and Tobago represented 5.2 per cent of regional imports, Nigeria 2.2 per cent, Qatar 2.1 per cent, Egypt 1.7 per cent, and Equatorial Guinea 0.9 per cent. The influence of GECF countries on the OECD Americas region is limited, except perhaps for Chile, which is geographically separated from North America and is dependent on LNG imports to meet demand. Arguably, Chile could turn to other LNG exporters if the GECF countries decided to curtail its supply, as the country is still a fairly small market (about 5 bcm), or switch to fuel oil as it did when pipeline deliveries from Argentina declined in the mid-2000s, before LNG imports started in 2009.

Out of 472.6 bcm of imports to the **OECD Europe**⁸⁶ (representing

	Import origins	bcm	%	% of the OECD region demand
OECD Americas	Total imports	145.5	100.0	17.2
	Non-GECF	126.7	87.1	15.0
	GECF	18.8	12.9	2.2
	Trinidad and Tobago	7.6	5.2	0.9
	Nigeria	3.2	2.2	0.4
	Qatar	3.1	2.1	0.4
	Egypt	2.5	1.7	0.3
	Eq. Guinea	1.3	0.9	0.2
OECD Europe	Total imports	472.6	100.0	82.8
-	Non-GECF	62.4	13.2	10.9
	GECF	410.2	86.8	71.9
	GECF without observe	ers 311.9	66.0	54.6
	Russia	125.7	26.6	22.0
	Norway	101.6	21.5	17.8
	Algeria	53.9	11.4	9.4
	Netherlands	48.7	10.3	8.5
	Qatar	36.9	7.8	6.5
	Nigeria	15.6	3.3	2.7
	Libya	9.9	2.1	1.7
OECD Asia Ocenia	Total imports	149.7	100.0	78.5
	Non-GECF	107.8	72.0	56.5
	GECF	41.9	28.0	22.0
	Qatar	71.6	49.2	37.5
	Russia	42.6	29.3	22.4
	Egypt	13.5	9.3	7.1
	Nigeria	7.7	5.3	4.0
	Eq. Guinea	7.0	4.8	3.7
China + India	Total imports	28.9	100.0	16.7
	Non-GECF	14.7	50.7	8.5
	GECF	14.2	49.3	8.2
	Qatar	61.1	42	35.3

Table 13.5:	Natural	gas	imports i	into t	the	OECD	regions	(and	China-	⊦India)	in
	2010										

Source: IEA (2011a, II.9, II.50-3) (pipeline); IEA (2011a, II.56-7) (LNG).

82.8 per cent of regional demand in 2010), about 86.8 per cent came from 10 GECF countries (72 per cent of regional demand), including Norway and the Netherlands (the GECF share declines to 66 per cent without these two European observers). Norway represented 21.5 per cent of total imports to the region, the Netherlands 10.3 per cent and the rest of the indigenous production from the UK, Germany, France, and Denmark 5.1 per cent. Deliveries from the other GECF countries were made both via pipeline and LNG. Russia represented 26.6 per cent of total imports, Algeria 11.4 per cent, Qatar 7.8 per cent, Nigeria 3.3 per cent, and Libya 2.1 per cent. All deliveries from Russia were via pipeline, 35 per cent of Algerian supply came in the form of LNG and 65 per cent via pipeline to Spain and Italy. All deliveries from Qatar were LNG, of which around 40 per cent arrived in the UK. Thus the region is highly dependent on imports from GECF members. With declining indigenous production (including Norway and the Netherlands) and even with stagnating demand, non-European imports are bound to rise in the coming years. Although this does not necessarily mean that imports from GECF countries are bound to increase, the limited options for new supply may lead to this end.

Out of 149.7 bcm of imports to the **OECD Asia Oceania**⁸⁷ (representing 78.5 per cent of regional demand in 2010), about 28 per cent came from seven GECF countries (22 per cent of regional demand). The vast majority of the gas supplied came in the form of LNG to Japan and Taiwan. Of the GECF deliveries, Qatar represented 49.2 per cent, Russia 29.3 per cent, Egypt 9.3 per cent, Nigeria 5.3 per cent, and Equatorial Guinea 4.8 per cent. Japan and Taiwan will continue to rely on LNG imports to supply their demand, while Australia is set to emerge as a leading LNG supplier with an additional 40 bcm of liquefaction capacity scheduled to come on stream by 2016. These developments should help the region to alleviate its dependence on the GECF countries in the medium term, but potential action from Qatar or Russia (17 per cent of regional demand) could still create major problems for countries such as Japan and Korea.

China and India imported 28.9 bcm of gas (16.7 per cent of their combined demand) in 2010, of which 49.3 per cent (8.2 per cent of their consumption) came from GECF countries. The major share of imports from Forum countries came from Qatar which represented 42 per cent of all imports and 7.1 per cent of the demand in the two markets. The future possible range of action in these still relatively new gas markets will depend on the development of alternative supply, the increase of gas demand, and contractual constraints.

Gas import needs versus export availability by region 2010-25

Table 13.6 below shows the export and import potential by region between 2010 and 2025, calculated as the difference between indigenous demand and production. When the level of demand is higher than the level of production, natural gas will need to be imported from other parts of the world ('import needs') and when the level of demand is lower than the level of production, then the region will have a surplus of gas, or an 'export potential'. The calculations are based on the 'New Policy Scenarios' for gas demand and production published by the International Energy Agency in November 2011.⁸⁸

Scenarios of the gas import needs of **OECD Americas** (mostly North America) in the 2010s have been revised downwards as a result of the rapid development of unconventional (primarily shale) gas production in the USA.⁸⁹ Table 13.6 shows that import needs to the region will remain limited (demand rises by 6.3 per cent over the period but production will follow closely with 5.4 per cent). The USA will largely satisfy its import needs with imports from inside the region.

In OECD Europe, indigenous production (including the GECF

	2010	2015	2020	2025	
OECD Americas	26	38	37	35	
USA	71	75	70	60	
OECD Europe	273	325	368	404	
UK	38	63	71	81	
Germany	84	89	93	93	
Italy	75	79	83	90	
France	49	49	50	52	
Spain	36	48	50	48	
OECD Asia Oceana	130	114	77	68	
Japan	102	115	119	122	
Others	-405	-477	-482	-506	
E.Europe/Eurasia	-138	-211	-234	-306	
Atlantic Basin	-131	-170	-223	-249	
Africa	-106	-148	-191	-219	
Latin America	-25	-22	-32	-30	
Middle East	-105	-125	-130	-105	
Pacific basin	-31	29	105	154	
Asia incl (China & India)	-31	29	105	154	

 Table 13.6:
 Import needs and export potential (indigenous demand minus production) by region, 2010–25 (bcm)

Notes: When the level of demand is higher than the level of production, natural gas will need to be imported from other parts of the world. These 'import needs' are highlighted in black.

When the level of demand is lower than the level of production, then the region will have a surplus of gas, and could potentially export some volumes to other regions. This 'export potential' is highlighted in red.

Source: IEA (2011a, II.4, II.8) for 2010 data; and New Policies Scenarios: IEA (2011b, 159) for demand, and IEA (2011b, 165) for production.
observers Norway and the Netherlands) covers only about 37 per cent of consumption in 2025, down from 52 per cent in 2010. There could be some contribution from unconventional gas production, but not enough to offset the decline of indigenous production during the period.⁹⁰ Table 13.6 shows that regional imports will grow rapidly to 404 bcm in 2025 (demand increases by 12.9 per cent while production drops by 19.4 per cent). It is worth noting that Norway and the Netherlands, GECF observers, are members of the OECD Europe region and represent about 176 bcm of gas production in 2025.⁹¹

In **OECD Asia Oceania**, Japanese imports needs will continue to grow while at the regional level, import needs are going to decline due to a sharp increase in indigenous production by 122 per cent, especially from Australia (+167 per cent from 50 bcm in 2010 to 131 bcm in 2025) while consumption will grow by 10.4 per cent.

In other markets, the export availability from eastern Europe and Eurasia will more than double following a production increase of 29 per cent, while demand will grow more slowly at 10.6 per cent. In the Atlantic Basin, export availability will also increase from 131 bcm in 2010 to 249 bcm in 2025, thanks to production growth in the African region (+73 per cent). Despite the rise of national consumption by 39.1 per cent, the Middle East should remain an exporter of gas during the period thanks to increasing domestic output (30.3 per cent). Export availability will decline after 2020 due to rapid gas demand growth and slower production expansion.⁹² The Pacific region will move from exporting in 2010 to importing by 2015 as a result of fast increasing demand (+98.5 per cent) and slower production growth (+48.6 per cent).

Over the period, the OECD region will remain dependent on imports from non-OECD markets, especially Europe and to a lesser extent Asia. How vulnerable are these countries to potential collusion between suppliers, and in particular, GECF members?

Option 1: what if existing long-term contracts (with or without oil-indexation) continue?

The subsequent paragraphs investigate the consequences of collective action by the GECF, or by collusion between some of its members, on OECD importing countries. If existing long-term contracts continue, then exporters have the obligation to deliver the gas during the duration of the contract. These volumes cannot be reduced below minimum take-or-pay levels or stopped, and represent some security of supply for the importing countries and security of demand for exporting countries. The volumes contracted vary from one region to another, as shown in Table 13.7. The difference between the levels of import needs calculated in Table 13.6 and the volumes of imported gas already contracted represent the level of additional imports that will be needed to cover gas demand in a region. The higher the share of import needs covered by contracted volumes, the lower the exposure to potential cartelization.

Due to indigenous production of unconventional gas, the **OECD Americas** region appears to be over contracted [Table 13.7]. The region is in a position to re-export natural gas to other regions, especially the European market. In addition, North America is expected to start exporting natural gas produced locally in the form of LNG in the second part of the 2010s in the range of at least 20–30 bcm/ year, which will provide an additional non-GECF source of gas for the other importing countries, both in the Atlantic Basin and in the Pacific Basin.⁹³

OECD Europe seems to have enough contracted gas to cover its demand growth up to the middle of the 2010s if all the gas contracted is delivered, but by 2020, the region will need to secure more gas (70.7 bcm in 2020 and 171.2 bcm by 2025). The 37.8 bcm of LNG contracted to the Atlantic Basin in 2020 and 2025 will most probably end up in Europe as North America will not need these volumes. This leaves Europe with a deficit of about 32.9 bcm by the end of the decade and up to 133 bcm five years later, and as a consequence, offers some potential for cartelization of exporters by the end of the decade and later, especially if long-term contracts move significantly from oil-linked to hub-based prices.

Long-term contracts signed by Asian customers are not sufficient to cover anticipated rising gas demand.⁹⁴ In traditional Asian markets, even assuming the prolongation of long-term contracts expiring in the 2010s, the gap between committed supply and projected demand is significant. OECD Asia Oceania needs to import additional volumes of gas in addition to its contracted volumes for the whole period of about 35.6 bcm in 2015, 23.8 bcm in 2020 and 37.3 bcm in 2025. Although demand stabilizes between 2020 and 2025 and indigenous production increases, contracted volumes decline, which explains the worsening of the situation post 2020. Flexible contracted volumes that could be delivered to the Pacific or the Atlantic Basin that will be directed to Asia (namely Oman LNG) do not help much – at just about 1.1 bcm. Long-term contracts between Australia (part of OECD Asia Oceania) and other regions, especially non-OECD Asia will, however, worsen the situation for Japan and Korea. This situation could favour the actions of a cartel, or at least of a group of exporters acting together,

Table 13.7: Natural gas vo	lumes in long-term contracts to (and from) OECD regions (b	cm)			
Destination	Origin	2010	2015	2020	2025
OECD Americas	Atlantic Basin/Eurasia Middle Fast	27.6 96.3	25.1	22.8 96.3	20.3
	Pacific Basin	9.1	9.1 60 5	9.1	9.1 9.1
	Inport needs (calculated in table 13.6)	25.7	38.0	37.0	35.0
	Share of import needs covered by contracts $(\%)^{*}$	245.3	159.2	157.4	159.2
OECD Europe	Atlantic Basin/Eurasia	342.3	334.1	266.6	203.1
	Middle East	37.0	30.8	30.8	29.8
	Pacific Basin	0.0	0.0	0.0	0.0
	Total contracted volumes	379.3	364.8	297.3	232.8
	Import needs (calculated in table 13.6)	272.8	325.0	368.0	404.0
	Share of import needs covered by contracts (%)*	139.0	112.3	80.8	57.6
OECD Europe/Americas	Atlantic/Eurasia	21.9	37.8	37.8	37.8
٩	Total contracted volumes	21.9	37.8	37.8	37.8
OECD Asia Oceania	Atlantic Basin/Eurasia	7.9	8.6	8.6	8.6
	Middle East	34.0	34.0	28.3	8.4
	Pacific Basin	57.4	35.8	16.3	13.7
	Total contracted volumes	99.4	78.4	53.2	30.7
	Import needs (calculated in table 13.6)	129.7	114.0	77.0	68.0
	Share of import needs covered by contracts (%)*	76.6	68.7	69.1	45.1

The Pricing of Internationally Traded Gas

Table 13.7: continued					
Destination	Origin	2010	2015	2020	2025
OECD Asia/Americas	Pacific Basin Total contracted volumes	1.1 1.1	1.1 1.1	1.1 1.1	1.1 1.1
OECD region	OECD LNG exports	3.3 4 4	$3.3 \\ 9.4$	3.3 9.4	3.3
		1.6	0.0	0.0	0.0
		0.9	0.9	0.9	0.9
Non-OECD region		11.4	23.8	23.8	23.8
)		11.4	23.8	23.8	23.8
* 'Share of import needs calculated in Table 13.6 If the share is below 10 found.	covered by contracts' represents the share of the total contra 3. If the share is above 100 per cent, then all the import needs 00 per cent, contracted volumes only represent part of the imp	acted volume s (and more) a port needs an	s compared i ure covered b d additional	the impor of contracted supply will 1	t needs as l volumes. need to be
Note: Norway and the Ne	etherlands are considered part of OECD Europe in this table.	Production/	contracted v	olumes from	these two

countries are seen as indigenous gas.

Sources: Cedigaz (2010) and Cedigaz (2011a), GIIGNL (2010, 15-18), author's analysis

but while short-term purchases and imports from the Atlantic Basin in the short- and medium-term are expected to continue, Asian netback advantages and price premiums already offer high gas prices to the exporters, limiting the likelihood of cartel behaviour to increase prices.

Table 13.7 suggests that if long-term contracts with oil-linked prices continue, then nothing much will be different from the early 2010s situation, except possibly whenever Europe needs to secure additional gas to meet its demand, especially if a larger share of gas is indexed on the hubs. But what if existing long-term contracts break down?

Option 2: what if long-term contracts break down?

If traditional contractual structures change significantly, a gas cartel – or a group of countries acting together to manipulate prices – becomes more likely. Indeed, a major argument against abandoning oil-linked prices in Europe is that it could lead to price manipulation by a handful of major suppliers, specifically Gazprom and Sonatrach. Even gas prices at the NBP, the most liquid hub in the region, tend to react to perceived changes in supply or demand.⁹⁵ Influence on gas prices does not necessarily require the actual cut of gas deliveries, as the perception of a possible tight supply is sufficient to raise gas prices.

So, what if long-term contracts break down? Table 13.8 shows the export availability (difference between the gas produced locally and the national demand) of the GECF members in the period 2015–25. In Eurasia for instance, total available gas for export is expected to be 211 bcm in 2015. The available gas from Russia is seen as 212 bcm, which tells us that the gas will be exported both to other Eurasian countries and outside that region, giving the country a potentially important geographical influence, at least in the neighbouring markets.

Because natural gas transport is expensive, gas tends to be consumed by the closest market (although exceptions exist). Table 13.8 focuses on export availability from regions geographically relevant for the OECD regions with import needs.⁹⁶ In 2015, the GECF countries are expected to represent 81 per cent of the export availability in the four regions considered, and even 104 per cent with Norway and the Netherlands, the two European observers. These shares will be up to 105 per cent in 2025 (119 per cent with Norway and the Netherlands). This tells us that the gas will be exported both to neighbouring countries inside each region but also outside that region, giving the countries a potentially important geographical influence.

OECD Europe would be directly affected by supply from Eurasia, the Atlantic Basin, and the Middle East; while the OECD Asia Oceania region will be affected by supply from the Pacific Basin and the Middle

Table 13.8: Gas exp	ort availability of the GECF countries by region, in bcm	and %					
		20.	15	20	20	20.	25
		bcm	%	bcm	%	bcm	%
Eurasia	Total	211	100	234	100	306	100
	GECF	221	105	232	66	299	98
	Russia	212	100	214	91	284	93
	Kazakhstan	6	4	18	œ	15	5
Atlantic Basin	Total (minus Norway and the Netherlands)	170	100	223	100	249	100
	GECF (minus Norway and the Netherlands)	153	<u> 60</u>	189	85	220	88
	Trinidad and Tobago	20	12	20	6	20	00
	Venezuela	0	0	5	1	0	33
	Algeria	67	39	84	38	87	35
	Egypt	19	11	19	6	19	00
	Libya	10	9	10	4	14	9
	Nigeria	32	19	47	21	65	26
	Eq. Guinea	5	3	7	3	7	33
Atlantic Basin	Total (including Norway and the Netherlands)	312	100	354	100	372	100
	GECF (plus Norway and the Netherlands)	295	94	320	06	343	92
	Netherlands	39	13	21	9	8	7
	Norway	103	33	110	31	115	31
Pacific Basin	Total GECF	-29 0	100 0	-105 0	100 0	-154 0	100 0

		20	15	20.	20	20	25
		bcm	%	bcm	%	bcm	%
Middle East	Total	125	100	130	100	105	100
	GECF	130	104	136	105	141	75
	Iran	10	œ	0	0	0	0
	Qatar	120	96	136	105	141	134
Other GECF	Bolivia	12	•	14		16	•
Total of the 4 regions	(including Norway and the Netherlands) minus Bolivia	619	100	613	100	629	100
GECF		646	104	688	112	783	119
GECF minus Norway	minus Netherlands	504	81	557	16	660	105
Russia + Qatar + Alg	eria	399	64	434	71	512	81
Russia + Qatar + Alg	eria + Norway + Netherlands	541	87	565	92	635	101

regions during the period considered.

Source: Authors' assumptions

East. The individual shares of the GECF members in the export availability of these regions tells us the potential role these exporters could play in the importing regions.

Unless **OECD Americas** becomes a major importer, a development which was not expected in 2012, its situation would be largely unaffected by GECF actions, except to the extent that its exports could be more valuable in the event of price cartelization. Exports of 20–30 bcm/year of LNG will help the other OECD regions, but could not significantly reduce the potential impact of a cartel, at least in Europe.

OIES research suggests that by the second half of the 2010s, incremental gas supply choices for European markets may be limited, irrespective of fears of cartelization. In the 2010s, very limited additional gas should be expected from North Africa (Algeria, Egypt, and Libya)⁹⁷ and a maximum of 10 bcm from the Caspian region.⁹⁸ Considering the existing import capacity offered by LNG regasification terminals and those under construction, LNG deliveries could provide additional volumes and help supply diversification, although in 2010, nine out of 18 LNG exporters were GECF members, accounting for 57 per cent of LNG trades, and Table 13.8 suggests that diversification away from GECF countries will be difficult, as they are expected to provide a large share of the supply coming from Eurasia, the Atlantic Basin, and the Middle East. Isolated gas markets that are dependent on a limited number of non-European suppliers with little scope for alternatives (in terms of suppliers or substitute fuels) would be especially at risk. East European countries with their high dependence on Russian natural gas have long been a case in point, although the development of new infrastructure will help reduce risk. From an importer's point of view, there is little that can be done about the prospect of a gas exporting cartel, or the market power of a dominant supplier, apart from developing viable alternatives in order to restrict its influence. This could take the form of better interconnections (underway in eastern Europe), better liquidity at hubs, more supply flexibility via storage, alternative energy sources especially in the power sector, third party access, and the development of the single European market. Additionally, a contract price based on an average of day-ahead prices over a monthly period, for instance, could help alleviate short-term price volatility.

In the **OECD Asia Oceania** region, several producers have a surplus for export, such as Australia (expected to overtake Qatar to become the world's largest LNG producer by the end of this decade) and Indonesia and Malaysia (which are still substantial LNG exporters, but rising domestic demand has curtailed exports and both countries have plans to import LNG); none of these countries is a member of

the GECF. The lack of gas storage, other than in the form of LNG storage at regasification terminals, exposes the importing countries to the risk of even higher prices at times of tight supply and limited availability of LNG cargoes.

When markets are in surplus, the range of action is limited for exporting countries unless they are willing to risk a shift of supplies from cartel to non-cartel exporters, assuming the latter can replace volumes withheld by GECF members. Russia, Algeria, and Qatar have arguably dominant positions in the European market, but due to their long-term contracts, they also have limited opportunity to use this market power in time of over-supply due to the risk of losing their market share.⁹⁹ Because the gas industry evolves in cycles, it will be easier for the GECF members to take action at times of global and regional shortage rather than at times of surplus. The LNG market has shown signs of tightening in the early 2010s, and Rogers suggests that there could be 'a tightening of the system by 2012–13'.¹⁰⁰ As the market tightens, it will become easier for the GECF members to take actions. But when markets are in shortage, it may not be necessary for any action to be taken, because prices are likely to be high.

Conclusions

The GECF has made some important institutional progress since 2008, but the internal dynamics of the organization reveal the still fractured nature of the Forum, with an unstable membership, and divisions over the key objectives, exacerbated in turn by the lack of transparency. In 2012, the GECF remains an organization in progress, very far from a cartel-like institution, with the majority of members and the Forum itself, regularly refuting publicly any aspiration to become such an institution. Due to intrinsic differences of characteristics between oil and gas, which are different commodities traded in different ways, it is very doubtful that a gas cartel structured in the same way as OPEC will become a reality. Whether or not a gas cartel, or at least cartel behaviour by a limited group of countries, can and will materialize in the future, at least within regional gas markets, will be determined by contractual and market dynamics. Existing long-term contracts with prices based on, and indexed to, crude oil and oil products make any cartelization difficult.¹⁰¹ However, the development of short-term gas commodity markets in Europe, and to a lesser extent Asia, particularly if this began to cause the breakdown of long-term contracts, could facilitate cartelization actions by a group of large exporters.

Our scenarios of the OECD regional gas markets up to 2025 suggest that if long-term contracts with oil-linked prices continue in Europe and Asia, there will be little incentive for cartel behaviour until the late 2010s or early 2020s, when Europe will need to secure additional gas to meet demand. This situation could offer some favourable opportunities for cartel-like behaviour by European suppliers. If long-term contracts continue, but prices move towards gas-indexation, the incentive for cartel behaviour would increase, particularly in the event of a supply surplus which caused prices to fall. In a tight supply situation, gasindexed prices would be high, thus reducing the incentive for cartel behaviour to increase prices.

A major argument against abandoning long-term contracts, or even moving from oil-linked prices to spot prices in long-term contracts, is that it could lead to price manipulation by a handful of major suppliers. If the traditional contractual structure changes significantly, the possibility of a gas cartel – or a group of countries acting together to manipulate prices – increases. If long-term contracts break down and the regional gas markets move towards a North America/UK model based on short-term contracts at spot and futures prices, then this new structure would make cartelization easier. Our scenarios suggest that in OECD Europe, the GECF members and observers will have a dominant share of the supply located close to the region (Eurasia, Atlantic Basin, and the Middle East). On the other hand, available supply from Forum members will represent only a limited share of supply close to the Asian region, with significantly lower market power compared to its potential impact on Europe.

The GECF itself seeks not so much to influence the world market as to protect the interests of member countries. The Forum, or a subset of its member countries, could also decide to have a different modus operandi in different regional markets, or create regional arrangements to allocate certain markets to certain suppliers, decide on price mechanisms in these markets, and coordinate supplies. Therefore, it is likely to be wrong to see potential cartelization of gas markets in terms similar to OPEC actions in the oil market, and more realistic to consider the possibility of cooperation/cartelization in terms of a few countries (but not the same ones in each regional market) which may, or even may not, be members of the GECF.

Appen	dix Tabl	e A13.1:	List of a	ttendees	at the GE	ICF meet	ings, 200	1-12						
Meeting	1 Tehran, May 2001	2 Algiers, Feb.2002	3 Doha, Feb.2003	4 Cairo, Mar.2004	5 Port of Spain, Apr.2005	6 Doha, Apr.2007	7 Mascow, Dec.2008	8 Doha, June 2009	9 Doha, Dec.2009	10 Oran, Apr.2010	11 Doha, Dec.2010	12 Cairo, June 2011	13 Doha, Nov.2011	Official Members 2012 ²
Members	Algeria Brunci Indonesia Iran Malaysia Nigeria Oman Qatar Russia Turkmenista	Algeria Bolivia Brunei Egypt Indonesia Iran Libya Malaysia Nigeria n Oman Qatar Russia Venezuela	Mgeria Brunei Egypt Indonesia Irran Malaysia Nigeria Oman Oman Ogatar Russia T&T UAE Varezuela	Algeria Brunei Egypt Indonesia Irran Malaysia Nigeria Oman Oman Ogatar Russia T&T UAE Venezuela	Algeria Brunei Egypt E. Guinea Iran Malaysia Nigeria Qatar Russia T&T UAE Venezuela	Algeria Bolivia Egypt Indonesia Iran Malaysia Nigeria Qatar Russia T&T Vene zuela	Algeria Bolivia Egypt E.Guinea I.ran Nigeria Qatar Russia T&T Venezuela	Algeria Egypt E.Guinea Iran Libya Nigeria Qatar Russia T&T Venezuela	Algeria Bolivia Egypt F.Guinea Iran Libya Qatar Russia T&T Venezuela	Algeria Egypt E.Guinea Iran Libya Nigeria Qateria Venezuela	Algeria Egypt E.Guinea Liabya Qatar Russia Venezuela	Algeria Bolivia Egypt E.Guinea I.ran Russia Russia Yênezuela	Algeria Bolivia Egypt E.Guinea I.ran Nigeria Qatar Russia T&T Venezuela	Algeria Bolivia Egypt E.Guinca I.fran Nigeria Oman Qatar Russia T&T Venezuela
Observers	Notway		Norway	Norway	Norway	Norway	Norway Kazakhstan ⁴	Norway Kazakhstan ⁴	Netherlands ⁴ Norway UAE ⁴	Netherlands Norway Angola ⁴ Yemen ⁴	Netherlands Norway Kazakhstan	Netherlands Norway	Netherlands Norway Kazakhstan	Netherlands Norway Kazakhstan
l Aside	from 2012, t	his Table can	mot be regar	rded as a cor	rrect record c	of membersł	iip at any sp	ecific date b	ecause it is c	lear that at ti	imes some m	tembers did	not attend n	neetings, and

it is therefore possible that other countries which also did not attend meetings were registered as members.

Source: Authors

Note Oman included despite not yet being listed on the website, having been (re)accepted as member at the November 2011 meeting. T&T stans for Trinidad and Tobago. 2 Note On 3 T&T sta 4 Guest

Notes

- * The authors would like to thank friends and colleagues whose assistance contributed invaluably to this chapter. All remaining errors are our own.
- 1 Gas Exporting Countries (GECF) website, www.gecf.org, retrieved January 2011.
- 2 For a review, see Haase (2008).
- 3 Stern (2002).
- 4 BBC Monitoring Service, 2 February 2002.
- 5 See, e.g. Jensen (2004).
- 6 WGI (2003).
- 7 WGI (2003); WGI (2005a).
- 8 WGI (2005a); WGI (2005b).
- 9 WGI (2005b).
- 10 WGI (2005a).
- 11 WGI (2005b).
- 12 WGI (2007b).
- 13 Transcript of Press Conference with the Russian and Foreign Media, 1 February 2007, The Kremlin, Moscow, available at http://archive. kremlin.ru/eng/sdocs/speeches.shtml.
- 14 Press reactions in 2007 prior to and after the statements ranged from views that placed Russian and Iranian assertions of an imminent 'Gas-OPEC' into the fields of political gaming (e.g. 'Putin's hint at gas OPEC likely to rattle Europe: analysts', AFP (2007); to more observant views ('Russia, Iran Toy With Gas OPEC Idea', WGI (2007a); to near-hysteric views ('Be afraid, be very afraid', PE (2007)).
- 15 WGI (2007c)
- 16 The respective key objective of OPEC is formulated in the organization's Statute of 2008 in the following way: 'The principal aim of the Organization shall be the coordination and unification of the petroleum policies of Member Countries and the determination of the best means for safeguarding their interests, individually and collectively.' Art.2, OPEC (2008)
- 17 IEA (2011b)
- Dow Jones Newswire, 30 January 2002; WGI (2005a); WGI (2007b);
 WGI (2008c); WGI (2009); WGI (2010b)
- 19 Reuters (2001).
- 20 WGI (2007d).
- 21 E.g. EU Energy Commissioner at the time, Andris Piebalgs, was quoted in the press expressing concern over 'the development of the contacts between Russia and Algeria', which could 'create a kind of cartel'. IHT (2007); PON (2007).
- 22 PON (2007); WGI (2007e); LNGI (2010).
- 23 WGI (2008b)
- 24 WGI (2008b)

For example, in the US Government, Ileana Ros-Lehtinen, a member of the House Foreign Affairs Committee wrote in an open letter that the establishment of a Gas-OPEC would be a 'major and long-term threat to the world's energy supply' that the USA should 'vigorously oppose.' Cohen (2008). Similar views were expressed by US energy security commentators such as Ariel Cohen, who wrote in the same year in *Energy Security Journal* article: 'Steadily and stealthily, a natural gas cartel has emerged over the last seven years. On October 21 in Tehran, the Gas Exporting Countries' Forum (GECF) agreed to form a cartel.' (Ibid.) The British newspaper *The Times* (among many others) worried in October 2008 that 'a combination of leading gas exporters, no matter how tentative, could pose a serious economic threat to Europe.' Times (2008).

Jules Clemente foresaw two years later the supposedly sinister intentions by GECF members as: 'The main purpose of the 11-member Gas Exporting Countries Forum (GECF) has not been made overtly clear but the obvious conclusion is the formation of a natural gas cartel, modelled after the oil cartel OPEC, angled to manipulate global production and prices.' Clemente (2010, 63–8).

- 26 WGI (2007d); For a background on this position, see Darbouche (2011).
- 27 IGR (2010a).
- 28 E.g. see Financial Times (2010); Hulbert, M. (2010).
- 29 WGI (2010a).
- 30 The same view has been supported by GECF members at all subsequent Ministerials until the time of writing in September 2011. See APS (2010); IHS GIDA (2011).
- 31 Interfax (2011a).
- 32 The Statute has been kindly provided to the authors by the GECF Secretariat. At the time of writing, in 2012, the Statute was not a public document.
- 33 GECF Statute, Art. 9–14.
- 34 GECF Statute, Art. 15–22; Trinidad Guardian (2010).
- 35 GECF Statute, Art. 23–31; Trinidad Guardian (2010).
- 36 GECF Statute, Art. 25.
- 37 Peninsula (2009).
- 38 BED (2011).
- 39 Registration of the GECF Agreement and Statute, 2 September 2010, Registration Certificate N 59784.
- 40 The first GECF Summit mainly reiterated known positions, primarily an emphasis on the continuance/return to oil-linked long term gas contracts. Platts European (2011); IOD (2011).
- 41 E.g. WGI (2008b)
- 42 E.g. Norway repeatedly declared that it was 'not interested in taking part in something like a Gas-OPEC.' Reuters (2009).
- 43 Turkmenistan attended the first meeting in 2001.
- 44 Fattouh (2007).

- 45 Energy Chamber of Trinidad and Tobago (2010).
- 46 JODI Website news item, available at www.jodidata.org/events/eventdetails.aspx?eid=1.
- 47 WGI (2005a).
- 48 This perception can be summarized by Qatar's energy minister Attiyah's often-quoted statement in 2005 that: 'This is a forum for exchange; there are no decisions.' WGI (2005a).
- 49 Available at www.gecforum.org/ (retrieved March 2012).
- 50 OPEC's website is available at www.OPEC.org/OPEC_web/en/.
- 51 Interfax (2011a)
- 52 Stern (2009, 4).
- 53 For instance, see Grossman (2004), Baumol and Blinder (1994), Frank and Bernanke (2001).
- 54 For instance, see Ehrman (2006), part II, Hallouche (2006), Wagbara (2006).

A gas cartel may influence the market through pricing, contractual negotiations, and fiscal mechanisms, but market conditions could also determine the range of possible actions. See Alberu (2010, 34) for examples of market conditions that facilitate formation of cartels, focusing on the oil and gas markets.

- 55 Stern (2009, 5).
- 56 When lower market-based gas prices displaced volumes of long-term contracts sold on higher oil-indexed prices causing some financial discomfort for many exporting countries, and threatening profits and ability to cover short-run marginal costs from new production and exports. See Stern and Rogers (2011) for additional information
- 57 63% of world gas imports were supplied to OECD Europe and OECD Asia Oceania. Source: Table 7 IEA (2011a, II.16–17).
- 58 Traditional long-term contracts refer to periods of 20 years or longer. For more information on long-term gas contracts, see ESMAP (1993), especially 27–90; UNECE (1996).
- 59 See Chapters 2, 4, and 11
- 60 Long-term contracts help to hedge the risks associated with this highly capital-intensive industry. See IEA (1998, 16).
- 61 While the relationships between National Oil Companies (NOCs) and International Oil Companies (IOCs) have changed over the past 20 years and NOCs have increased their involvement in project development and operations, the IOCs still play a role in the development of gas resources. See Ledesma (2009).
- 62 See Zhuraleva (2009), Hallouche (2006). In 2010, 16 exporting countries (11 in 2005) and 22 importing countries (12 in 2005) were involved in LNG short-term trades. See IGU (2011), 22).
- 63 In Europe, the average oil-linked contract price exceeded the market price at NBP from 2009. By 2012, buyers had tried to renegotiate terms with sellers and it was believed that they generally succeeded in linking at

least some of the volumes they purchase in existing long-term contracts to market prices rather than oil products, and to have also achieved a relaxation of take-or-pay (TOP) provisions, which potentially opens the door for additional volumes to be bought on the short term market. As result, not only do supply and demand balances influence prices for new entrants who have sought to buy gas directly from the short-term market (pipeline or LNG), but they also influence the (growing) share of traditional contracts indexed on market prices. See Chapter 4 and also Stern and Rogers (2011).

- 64 Arab Republic of Egypt, Ministry of Petroleum (2011), Ministerial Meeting, Cairo, June 2011.
- 65 Interfax (2011a).
- 66 This could be seen as the GECF members appearing to have more confidence in the actions of OPEC than of their own organization (Venezuela, Iran, Qatar, Algeria, Libya, and Nigeria are members of both organizations).

It could also be seen as a possible confusion between the issues of price formation and price level. The impact of a possible change in the pricing mechanism, such as contractual price decoupling, would be a downward shift in prices levels but only for as long as supply surplus persists. The level of market prices would start to rise again when supply and demand are once again in balance, but this says nothing about the level of gas prices relative to oil. See Stern and Rogers (2011, 6–10).

- 67 See the EU energy roadmap 2050 targets. For example, in the high renewable scenario, gross inland gas consumption would be more than halved between 2010 and 2050. European Commission (2011).
- 68 'The elasticity of demand is a weighted average of the elasticity of aggregate demand and the elasticity of fringe supply where the weights are the inverse of the market share of the dominant firm and the ratio of outputs on fringe producers to that of the dominant firm respectively. Holding all else constant, pricing power of the cartel is enhanced the more inelastic the aggregate demand curve and the fringe supply and the larger its market share'. Source: Soligo (2004).
- 69 Industrial uses (oil products), in power generation (oil products, coal, renewables) and for space heating (oil products, renewable energy).
- 70 See Honoré (2010), Chapter 2
- 71 For more information, see Alberu (2010), Wagbara (2006), Alhajji and Huettner (2000, 1152).
- 72 Spare capacity (the difference between actual production and production capacity) is a key determinant of the producers' ability to control the market and enforce cartel discipline. The swing producer, played by Saudi Arabia in OPEC, would have to maintain excess production, export, and storage capacity, but given the fixed costs associated with gas projects, it would be much more costly than for oil.
- 73 Oman appears to have re-joined the Forum in late 2011, so the total

count at the beginning of 2012 was 15 members and observers. Source: Interfax, 14 November 2011

- 74 Interfax (2011b).
- 75 Stern (2009, 16).
- 76 Soligo (2004, 5).
- 77 WGI (2007e).
- 78 Stern and Rogers (2011, 8).
- 79 Ibid
- 80 Financial Times (2010).
- 81 Stern and Rogers (2011, 15).
- 82 Reuters (2011).
- 83 Interfax (2011a).
- 84 IEA (2011a, II.20)
- 85 OECD Americas includes Canada, Chile, Mexico, and the USA.
- 86 OECD Europe comprises Austria, Belgium, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Poland, Portugal, the Slovak Republic, Slovenia, Spain, Sweden, Switzerland, Turkey, and the United Kingdom.
- 87 OECD Asia Oceania includes Australia, Israel, Japan, Korea, and New Zealand.
- 88 See IEA (2011b), chapter 4: Natural gas market outlook: nothing but blue skies?,155–73 and Annex B for a definition of New Policy Scenario,617–27.
- 89 In its 2005 Annual Energy Outlook, the EIA LNG import expectations to the USA were around 70 bcm in 2010 and about 150 bcm in 2020 in order to meet demand and offset the drop in indigenous production. In the 2011 AEO, scenarios showed LNG imports below 20 bcm with no growth through 2020 (and even beyond). Source: International Gas Union (2011, 21).
- 90 See Gény (2010).
- 91 192 bcm in 2015 and 184 bcm in 2020. Source: Calculated from IEA (2011b),159 and 165
- 92 For detailed data, see IEA (2011b),165 for production scenarios and 543-615 for demand scenarios
- 93 The two most advanced projects are the Sabine Pass project in the USA with a capacity of 22 bcm/year and the Kitimat project in Canada with a capacity of 6.9 bcm/year.
- 94 Spot trades have so far been limited and used in times of tight supply following independent events such as the need to add gas-fired capacity when nuclear capacity was down (Japan, 2007 and 2011).
- 95 As for instance in 2009 during the Russia–Ukraine crisis which led to spot gas prices at the UK's NBP rising substantially for a few days despite the fact the no Russian supply was present on the UK market at the time, although the impact of the crisis was slightly difficult to separate from other factors such as cold weather and the loss of a major Norwegian

field during the same period. See Market and prices, IGR (2009).

- 96 Of course, at the global level, the scenarios for gas demand and for supply are equal.
- 97 See Fattouh and Stern (2011), Chapters 1, 3, and 4.
- 98 See Pirani (2009, 401–9).
- 99 In 2009/10, the market power of dominant suppliers was eroded. The gas glut combined with improvements in third party access enforced by a combination of EU and national regulations, and increased competition in Europe. As a result, suppliers who refused to supply gas at hub prices lost market shares. See Stern and Rogers (2011)
- 100 Figure 66, 73, and 80 in Rogers (2010).
- 101 See Algerian Oil Minister Chakib Khelil, quoted in WGI (2007b, 3).

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Chapter 14: Conclusions

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