

Johns Hopkins University

SAIS Bologna

Why is a natural gas OPEC not possible?

International and Domestic Considerations

5/17/2013

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Table of Contents

Abbreviations.....	2
Figures	3
Tables.....	3
1.0 Introduction.....	4
2.0 Literature Review.....	6
3.0 A four-dimensional look at a natural gas cartel.....	8
4.0 The international structure of the natural gas market	13
4.1 The LNG boom and price movements	15
4.2 Reserves.....	19
4.3 Structural constraints for a swing producer.....	21
4.4 Swing producer – Russia or Qatar?.....	23
5.0 The international political framework of a natural gas cartel.....	27
5.1 Historical overview.....	27
5.2 The Cartel Idea.....	29
5.3 Empirical results for collusion based on the World Gas Model	32
5.4 Divergent interests: regional analysis.....	32
5.4.1 The Qatar/Russia nexus.....	33
5.4.2 Iran-Russia: converging strategic interests amid energy competition.....	36
5.4.3 Relations with China and the great game in Central Asia.....	38
5.4.4 Fringe suppliers in the Western strategic architecture	40
6.0 The Domestic Level.....	43
6.1 Domestic Organization and the rise of neomercantilism in Russia.....	44
6.2 The economic constraints on the export potential.....	46
6.3 Fiscal and price distortions.....	49
6.4 Price liberalization.....	50
7.0 The Future of a natural gas OPEC.....	52
Bibliography and References	54

Abbreviations

Bcm	Billion Cubic Meters
Bcf	Billion Cubic Feet
BP	British Petroleum
CNPC	China National Petroleum Company
CM	Cubic Meters
EOR	Enhanced Oil Recovery
FSU	Former Soviet Union
GCC	Gulf Cooperation Council
GECF	Gas Exporting Countries Forum
HH	Henry Hub
IEA	International Energy Agency
EIA	Energy Information Administration
LNG	Liquefied Natural Gas
MENA	Middle East and North Africa
MMBtu	Million British Thermal Units
Mta	Million Tons per Annum
NATO	North Atlantic Treaty Organization
NBP	National Balancing Point
NGL	Natural Gas Liquids
NIE	New Institutional Economics
NOC	National Oil Companies
NOGC	National Oil and Gas Companies
OECD	Organization for Economic Cooperation and Development
OPEC	Organization of Petroleum Exporting Countries
OSCE	Organization for Security Cooperation in Europe
RWGTM	Rice World Gas Trade Model
ROR	Return on Investment
Tcm	Trillion Cubic Meters
UAE	United Arab Emirates

Figures

Figure 1 World Energy Demand by type of fuel, IEA Energy Outlook 2035	4
Figure 2 Theoretical Framework for the constraints for a global gas cartel	8
Figure 3 Regional Prices in the main gas markets around the world – 2013 Forecast	17
Figure 4 Share of LNG in the world gas market (2007-2011).....	18
Figure 5 Evolution of the share of gas reserves in the last decade	20
Figure 6 Framework of the political side of cooperation between gas producers	29
Figure 7 Different EU natural gas demand scenarios until 2030.....	35
Figure 8 Map of pipeline geopolitics in Eurasia.....	37
Figure 9 US gas imports dynamics 1990-2035.....	41
Figure 10 Natural gas balance in the GECF in 2011 (bcm per year).....	48

Tables

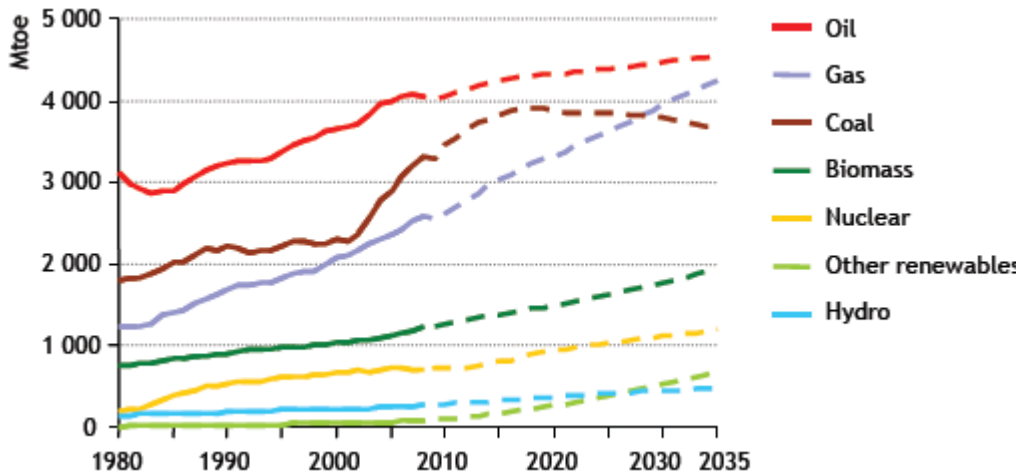
Table 1 LNG Demand by selected countries and regions.....	16
Table 2 Share of world trade of the members of the GECF (bcm).....	22
Table 3 Planned and operational LNG capacity - 2011	24
Table 4 Natural Gas investments in Russia up until 2030.....	46
Table 5 The role of energy subsidies in the fiscal balance of selected gas producers	49
Table 6 Domestic gas prices among the largest gas producers.....	51

1.0 Introduction

In 2012 the International Energy Agency (IEA) announced that we are entering a “Golden Age of Gas”. The natural gas molecule has come to be seen as the most efficient and at the same time the most environmentally friendly fossil fuel in nature. Hence, it is believed that natural gas will become the future number one energy source, as the share of natural gas in the world energy mix rises from 21% to 25%¹ in the next two decades. This would mean that by 2030, natural gas would surpass coal in importance for energy consumption, and would start to challenge even oil in the transportation sector.

The basis for the natural gas optimism is contained in the fundamentals of the energy supply/demand dynamics together with technological innovations and political developments. Based on estimates by the Energy Information Agency World Energy Outlook 2035, world energy consumption will increase by 49% in the observed period. The growth will be fueled mostly by rise in demand in the non-OECD countries, where consumption could increase by 84%. The growth of natural gas use is expected to be the steepest from 3.17 trillion cubic meters (tcm) in 2007 to 4.5 tcm in 2035 or a 42% increase. Fuel for this growth is to be detected again in the non-OECD world, especially Asia and the Middle East, where natural gas consumption more than doubles.

Figure 1 World Energy Demand by type of fuel, IEA Energy Outlook 2035



The reasons for the increase in natural gas demand include the proliferation of gas-powered electrical plants, the more rapid introduction of natural gas in the transportation

¹ International Energy Agency report – “The Golden Age of Gas”, IEA, 2011

sector and the relative decline of both coal and nuclear power in the energy mix of countries. These effects are to be observed most strongly in the U.S., China and the EU, which are all looking to decrease greenhouse gases in fulfillment of international environmental agreements. Moreover, if we assume that natural gas prices will remain more competitive than the price of renewables, in the situation of fiscal tightening in the next decade, we would expect governments to stimulate diversification based on natural gas.

At the same time, gas production will also be increasing, but at a slower pace than demand. The natural gas glut that we observe today caused by the continued economic crisis in the Euro-zone and the slow economic recovery in the US, should be eliminated by 2015.² Hence, the gas market will tighten as we move into the second decade of the 21st century. We could explain this trend to the declining natural gas production in the OECD countries with the exception of the US, and the slower pace of development of unconventional gas sources in Europe and non-OECD Eurasia. Production levels in the North Sea are set to sharply decline, while underinvestment in new gas fields in Russia, the Caspian and Iran could undermine the security of supply of the EU, currently the biggest importer of natural gas in the world.

The profound transformations of the natural gas market are slowly changing the status-quo. The advent of LNG transportation, especially after the significant increase in the capacity of LNG tankers, has put an enormous downward pressure on prices³. Traditional landlocked producers relying on pipeline transportation and fixed long-term contracts do not have a choice, but to start negotiating their agreements reflecting the new market realities. Traditional gas exporting countries in Eurasia including Russia have been severely distressed by the prospects of diminishing prices and new competition. Traditional export markets such as China, Japan and Western Europe might be disappearing as they no longer agree to the long-term contracts that benefit mainly producer-nations. Many of the upstream countries have been heavily dependent on their energy resources for revenue and political legitimacy, and dictatorships in Central Asia, the Middle East and the Caucasus will find it hard to diversify their economies.

In order to counter the transformation, Russia has suggested the creation of a Gas OPEC, in which the major natural gas exporting countries would gather to determine production quotas and cooperation on access to markets. Apart from the Forum of Gas Exporting Countries (GECF), which has been an informal attempt for some coordination, few producers are ready for a big move towards cartelization⁴. The reason is that countries like Qatar, Australia, Algeria and Nigeria benefit from the growth of their LNG

² U.S. Energy Information Administration – 2010 World Energy Outlook.

³ BP Statistical Review of Energy 2011

⁴ Wrede, Insa (2011). "Global 'gas cartel' is a long way off, experts say", Deutsche Welle, November 17, 2011

production, as they can very easily transport gas all over the world. The competition for the new emerging markets has prevented cooperation between these countries because with the current excess supply of gas, the buyers determine the price conditions and not the other way round. Also, after investing so extensively in LNG capabilities, those countries realize that they need to capture as many markets as possible pushing the price further down. Yet, a global cooperation on gas quantities and prices is possible if the market tightens and demand spirals. Until then, countries like Russia, Iran, Azerbaijan and Turkmenistan would need to promise other geopolitical goodies in the form of security or trade cooperation in order to secure their dwindling number of customers.

2.0 Literature Review

The discussion on the origins of energy cartels can be placed in three main academic branches: neoclassical economics, international politics and/or resource security. Economic studies often deal with the structure of energy markets using supply/demand dynamics in order to explain energy relations.⁵ Governments can do little to change the equilibrium output and price if they do not engage in some form of collusive agreement.⁶ Most of the studies on collusion address the functioning of the OPEC cartel, which authors admit has been ineffective and volatile in its decision-making.⁷ Most of the energy scholars conclude that OPEC has indeed had a lot of power, but especially after the mid-1980s, it has not acted as a typical price-setting cartel.⁸

The economic perspective on the formation of energy cartel presents only a limited perspective to our understanding of energy markets.⁹ When discussing economic sectors such as oil and gas with vital significance for the national security of a country, any observation has to reflect not only market-determined conditions, but also the political framework of state-to-state interactions.¹⁰ Simply using an economic framework to explain the outcome of deliberations between OPEC members does not address the security and political concerns of these countries, which depend often on the structure of the international system.¹¹ In the changing distribution of power in the structure, the rise of a

⁵ Adelman, M.A. *The World Petroleum Market. Published for Resources for the Future*. Baltimore: Johns Hopkins University Press

⁶ Wilson, E.J. "World Politics and International Energy Markets". *International Organization* (41)(1), 125-49

⁷ Adelman, M.A. "Politics, Economics, and World Oil". *The American Economic Review* (64) (2), 58-67

Kennedy, M. "An Economic Model of the World Oil Market". *Bell Journal of Economics and Management Science* (5), 540-77

⁸ Bohi, D.R., and Toman, M.A. *Oil and National Security: An Assessment of Externalities and Policies*. In S. Shojai (ed.) *The New Global Oil Market: Understanding Energy Issues in the World Economy*. Westport: Praeger, 203-2016

⁹ Wilson, Ibid

¹⁰ Claes, Dag Harald, *The Politics of Oil-Producer Cooperation*, Perseus, 2001, 8

¹¹ Moran, T.H. *Oil Prices and the Future of OPEC: the Political Economy of Tension and Stability in the Organization of Petroleum Exporting Countries*. Washington: Resources for the Future, 1978

powerful regime such as OPEC was a natural outcome.¹² OPEC members had the added incentive that if they cooperated on the distribution of output quotas in a set regime, they would be able to build trust among each other, and thus, maximize their absolute gains.¹³

The prospect for the creation of any energy cartel raises the specter of energy insecurity. It can be perceived from two different viewpoints – that of domestic producers looking to maximize their profits and at the same time enhance the economic development of their countries.¹⁴ For both consumers and producers energy policy becomes ingrained in their respective national strategies.¹⁵ Hence, energy alliances have become more pronounced especially in regions, where competing energy interests clash.¹⁶ The natural gas markets have been in the center of energy diplomacy and geopolitics in the past decade as their successful functioning depends on the close cooperation between producers, on the one hand, and consumers on the other.

The literature on the potential natural gas cartel is scarce, and includes mostly policy papers and a few econometric studies. The latter have been based on the Rice Baker Institute World Gas Trade Model (RWGTM) simulating the supply and demand dynamics of the international gas markets in the formation of prices and traded volumes.¹⁷ Several authors used the simulation results to apply them to a discussion of a possible natural gas cartel.¹⁸ Most of them conclude that there is very little potential for cartelization, especially in the context of the Qatari-led Gas Exporting Countries Forum (GECF) as reserves concentration and market share are not strong enough prerequisites for an effective gas cartel due to the structure of international gas markets. This paper will discuss the structural obstacles before a gas OPEC, but will expand the discussion by including a political perspective on energy relations between gas exporters. The paper will also attempt to show the intricate link between domestic energy policy and international market conditions.

¹² Nye, J. Energy and Security in the 1980s. *World Politics* (35) (1), 121-34

¹³ Keohane, Robert, *After Hegemony-Cooperation and Discord in the World Political Economy*, Princeton University Press, 1984

¹⁴ Yergin, Daniel, *The Prize-The Epic Quest for Oil, Money and Power*. London: Simon&Shuster, 1991

¹⁵ Bucknell, Howard. *Energy and the National Defense*. Lexington: University Press of Kentucky, 1981

Conant, Melvin, and Fern R. Gold. *The geopolitics of energy*. Boulder, Colo.: Westview Press, 1978

¹⁶ Klare, M.T. *Rising Powers, Shrinking Planet: The New Geopolitics of Energy*. New York: Metropolitan Books, 2008

¹⁷ "The Rice University World Gas Trade Model", Rice University: James Baker Institute for Public Policy, 2006

¹⁸ Victor, David G., Amy Jaffe, and Mark H. Hayes. "The Baker Institute World Gas Model." In *Natural gas and geopolitics: from 1970 to 2040*. Cambridge: Cambridge University Press, 2006, 358-406.

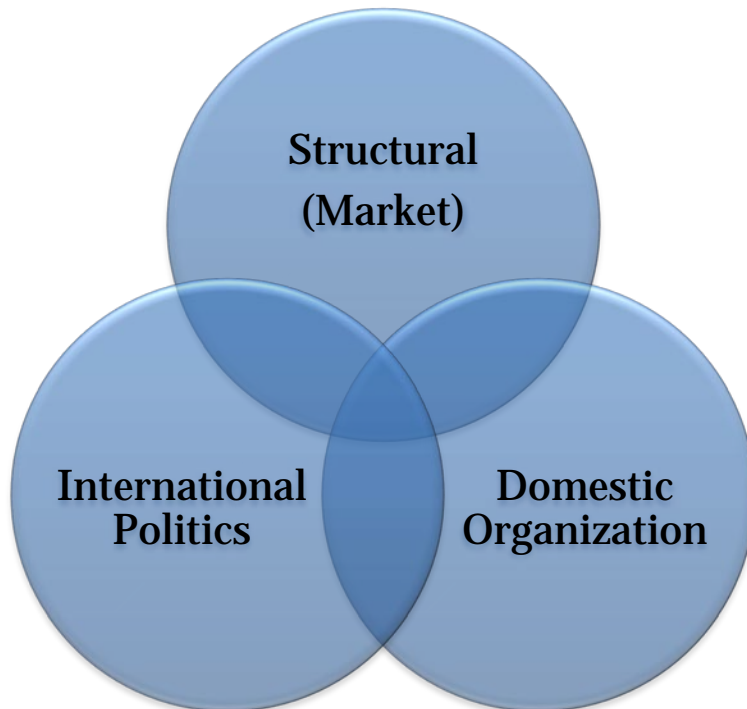
Gabriel, S.A., Rosendahl, K.E, Egging, Ruud, Avetisyan, H.G., Siddiqui, S., "Cartelization in gas markets: Studying the potential for a "Gas OPEC", *Energy Economics* 34 (2012) 137–152

Obindah N. Wagbara, How would the gas exporting countries forum influence gas trade?, *Energy Policy*, 35, 2007, 1224–1237

3.0 A four-dimensional look at a natural gas cartel

Scholars have persistently been arguing about the different causes for the creation of international energy cartels. Most see economics as the main driving force behind cartelization. The market structure and the predominant supply/demand conditions have determined the actions of companies and, later, states. Yet, as energy has played such an important role in the functioning of the state, analysts have placed politics side by side with the economic explanation of energy cartelization. This is only logical considering the immense importance of energy in the economic development of individual producer-states. Their position in the world has often been a function of the success of their energy sectors. For one thing, revenue from energy exports has fueled economic growth and redistribution of resources on a massive scale. Countries left in the pre-modern stage of development quickly industrialized on the back of energy abundance. With the surge in economic development, major producers and exporters found an appetite for expansion of political influence. Members of the OPEC cartel have used their oil abundance as leverage against foreign political pressure and as revenue for the purpose of security enhancement.

Figure 2 Theoretical Framework for the constraints for a global gas cartel



More recently Russia has taken advantage of its natural gas dominant position to pressure Central and Eastern European countries into politically disadvantageous decisions. Belarus, Ukraine, Hungary, Bulgaria, Moldova, Armenia and Georgia are cases in study. Russia has striving to expand this regional gas monopoly on a global scale, and

has thus been one of the proponents of a world natural gas cartel, which controls output and prices. 12 years after the creation of the Gas Exporting Countries Forum (GECF) uniting some of the largest gas producers in the world, they have not come close to cooperation on the international markets. On the contrary, competition, oversupply and falling prices have been prevalent in the past 4-5 years. New producers are appearing to challenge the dominance of the few reserve holders that formed the GECF. The wave of unconventional gas production, on the other hand, could easily destroy the notion that natural gas is a scarce resource. The prospects of a long-term gas glut and rapidly declining prices in the aftermaths of the economic crisis put natural gas producers under pressure to liberalize the market by moving to spot-based trading and the removal of oil-indexation.

Despite calls for more coordination of output policy among producers, the new market conditions have actually led to competitive underpricing and fierce competition especially in the LNG sector. This paper will try to explain why a global natural gas cartel is not yet an option and is unlikely to materialize anytime soon. A gas-OPEC should also be analyzed through the prism of the international political economy. This is to say that a purely economic explanation of the preconditions for a cartel is not enough. The political dimensions are equally important because natural gas is a strategic resource playing a vital role both in the domestic arena and in the foreign policy of states. The former refers to the nexus between state-owned energy companies and the respective government, while the latter raises the possibility of energy alliances based on common interests extending beyond the market.

The constraints hindering the creation of a natural gas OPEC are grouped in two main categories – economic and political. Each category is further divided in two subgroups, namely, domestic and international. The paper separates the different factors influencing the viability of a cartel because in this way we can expose the individual levels of decision-making for every state. The international constraints present a structural view on international relations between natural gas producers. They become a filter for every country limiting the actions it can pursue. On the economic side, international factors include the structure of the world gas market, characterized by the current supply condition, reserves concentration, market liquidity and elasticity of demand. All of these aspects of the international economic framework will be discussed individually in the paper.

On the political side, we have to examine the obstacles before successful cooperation between natural gas exporters. The paper will discuss how the structure of the international political system influences cooperation between natural gas exporters. In explaining their political relations, the concept of relative gains seems to offer the best explanation for lack

of cooperation.¹⁹ Since most of the gas-exporting countries are heavily dependent on oil and gas revenue for their economic development and stability, their national security is to a certain extent the function of their energy export success. For states like Russia, Saudi Arabia, Algeria, Iran, Qatar and to a lesser extent the UAE, Venezuela and Egypt, the maintenance of resource trade is crucial for their survival.²⁰ The natural gas market quickly becomes a zero-sum game, in which cooperation would put gas exporters at risk that the other members of the cartel will cheat and thus undermine the viability of their own economies. This is especially true in the natural gas market, which is dependent on enormous infrastructure and exploration investments. Maintaining excess capacity or cutting output could cause enormous losses if all actions are not coordinated.

In order to analyze how security concerns converge with energy interests, the paper will discuss energy relations from a regional perspective taking into account the three main areas, where the bulk of gas reserves are concentrated: the FSU (incl. the Black Sea area), MENA and North America. I will focus on certain geopolitical rivalries in the respective regions, more specifically these that pertain to members of the Gas Exporting Countries Forum (GECF), in an attempt to prove that political factors would be in the way of successful cooperation between the gas exporters.²¹

Liberal institutionalists often argue that cooperation between states is possible because they are rational maximizers and will try to increase their absolute gains in every transaction. According to Robert Keohane the problem with cheating mentioned above could be solved if viable institutions are built to create norms of behavior and a monitoring mechanism to eliminate transaction costs and impose punishment for cheating.²² Interdependence is, according to institutionalists, the most powerful automatic mechanism to assure consistency of action. Since the gas profit maximization of each country depends on everyone abiding by the quota rules, once there is transparency and mutual trust created by institutions, countries will cooperate effectively. As history has shown this assumption is misleading. The OPEC cartel has proven that it is unable to prevent members from cheating on their output quotas.²³ After the coordinated actions in the 1970s, the 1980s and 1990s saw the cartel losing its efficiency to control prices amid overproduction by the members.

¹⁹ Robert Powell, "Absolute and Relative Gains in International Relations Theory", *The American Political Science Review*, Vol. 85, No. 4 (Dec., 1991), 1303-1320

Waltz, Kenneth. *Theory of international politics*. Reading, Mass.: Addison-Wesley Pub. Co., 1979.

²⁰ Bucknell, Howard. *Energy and the National Defense*. Lexington: University Press of Kentucky, 1981

²¹ The Gas Exporting Countries Forum (GECF) currently includes 11 members:

Algeria, Bolivia, Egypt, Equatorial Guinea, Iran, Libya, Nigeria, Qatar, Russia, Trinidad and Tobago and Venezuela with two observers – Norway and Kazakhstan. GECF members together control over 70% of the world's natural gas reserves, 38% of the pipeline trade and 85% of the liquefied natural gas (LNG) production.

²² Keohane, Robert, *After Hegemony-Cooperation and Discord in the World Political Economy*, Princeton University Press, 1984

²³ Yergin, Daniel, *The Prize-The Epic Quest for Oil, Money and Power*. London: Simon&Shuster, 1991

In fact even if we assume that cooperation will be possible after a trust-building regime is created, due to the strategic nexus between political influence and energy revenue, gas exporters will still perceive each other as direct competitors. In this sense, they may be more interested in gaining an advantage in relative terms vis-à-vis gas rivals, instead of purely focusing on profit maximization. In a period of a gas glut revealing a shrinking market in Europe, the few exporters that supply the region become fierce competitors trying to survive despite price liberalization. Countries like Qatar, Russia, Algeria and Iran each aims to capture as much of the European demand as possible ignoring the possibility of dividing market share and, hence, profit enhancement.

Instead of institutions, cartels often depend on the existence of a swing producer that can maintain excess capacity in order to increase production when prices are too high or cut output when demand slumps. The swing producer could also punish cheaters by dumping oil on international markets, suppressing prices and taking away the excess profit generated by cheating. Saudi Arabia has continually been the swing producer in OPEC since at least the early 1990s as the only country in the cartel that has been able to maintain high levels of spare capacity (around 2 mbd in 2012). Recent history shows that Saudi Arabia has most of the time coordinated its output policy with international political developments preventing major swings in overall global production. Most recently in 2011 and 2012, the kingdom rapidly increased production to compensate for the loss of Libyan supply in the former and Iranian exports in the latter case.

The political leaning of the swing producer is crucial for the effectiveness of the cartel. Hence, energy relations within the cartel can often become a function of the state of the international political structure. The emergence of a unipolar world characterized by one major power, namely the US, has aided the consolidation of American influence in the Persian Gulf. The US has maintained a strong military presence in the region providing a de-facto security guaranty to all major Gulf oil exporters supplying large portion of their crude to the US and the EU. This has been done directly by the presence of the US fifth fleet in the Persian Gulf and indirectly by the sale of advanced military technology to all the allies from the Gulf Cooperation Council (GCC). Saudi Arabia has been one of the biggest beneficiaries of US military aid as it used to face militarized Iraq in the past and aggressive Iran at present. In exchange, Saudi Arabia has aimed to keep up high levels of production and to control a price hike when it appeared that it endangered the economic growth of the US and Europe.

On the domestic side, energy in producing countries is also often directly connected with internal security. The political legitimacy of regimes depends heavily on the extraction of vast oil rents that can be used for economic development. This serves to unite often polarized societies with blurred ethnic or religious borders. That is why many of the petroleum-exporting countries have nationalized their oil industries, which has brought enormous amounts of wealth to the state and has alleviated poverty by direct social

spending programs. As a result, regimes, often on shaky democratic grounds, have been consolidated.

Since OPEC has functioned on an intergovernmental level, the creation of national oil companies has been seen as a crucial ingredient to the creation of a new energy cartel. Based on the theory of New Institutional Economics (NIE), applied to the nature of the natural gas market, one cannot provide adequate answers to investment, production and resource allocation decisions using only the postulates of neoclassical economics.²⁴ In fact, a country which nationalizes its gas industry would most probably make suboptimal production and investment choices, but would tie its energy policy to other political and security issues, so that producer-consumer relations do not correspond to *pareto efficiency*. Cartelization is one aspect of such shift in policy, in that it attempts to maximize producer surplus at the expense of consumers. In addition, the interdependency between economic growth and energy revenue makes cartelization among national oil and gas companies (NOGCs) and not between private producers vital for successful cooperation.

While the existence of national oil and gas companies could foster a more rapid creation of gas cartel as domestic politics could be the driver of international cooperation, the deficiencies associated with centralized energy policy can have negative economic spillover effects. These include excessive energy intensity, rising energy consumption and natural gas price controls, which can all diminish the potential of a country to maximize its export output, expand its production capacity and invest in new infrastructure and technology. The wasteful management of the natural gas sector in many of the GECF members has created a paradox – the countries with the largest reserves face the conundrum of being gas importers or at most minor exporters.

The domestic economic constraints are factors often ignored in the discussion of a potential gas cartel. The increased dependence of the industrial development on natural gas has exposed weaknesses in the energy structure of the GECF. Energy shortages due to natural gas deficits have been prevalent especially across the MENA region in the last decade. Part of the problem lies in domestic pricing support mechanisms, which invites wasteful consumption and removes incentives for producers to develop new resources to fuel an export boom. The result is that the governments supply cheap natural gas to consumers and to the industry at the expense of lower excess capacity²⁵.

The main thesis of this section is that energy price reform is not only necessary to enhance allocative and energy efficiency, but also to remove one significant obstacle for future gas cartel to form a viable framework for cooperation. However, such a pricing

²⁴ Van der Meulen, Evert F., "Gas Supply and EU-Russia relations", *Europe-Asia Studies*, Vol. 61, No. 51, July 2009

Williamson, O.E., "The New Institutional Economics: Taking Stock, Looking Ahead", *Journal of Economic Literature*, 38, 3

²⁵ "Midterm Oil and Gas Markets", IEA, 2010

reform would be very hard to achieve because of the interdependence between energy subsidies and political stability in times of turmoil across undemocratic regimes.

4.0 The international structure of the natural gas market

Before we delve into the different economic obstacles to the successful creation of a global gas cartel, we have to first build an image of the current gas market. It is always useful to begin by saying that in effect there is still no world gas market. There are in general three regional markets including broadly the North American, European and Asian ones, which are very different in level of liquidity, transportation methods and demand patterns. This has resulted in wide variance in pricing at the different market hubs around the world. Part of the explanation has been that due to the modes of transportation of natural gas, i.e. via pipelines and LNG, consumers and producers require long-term oil-indexed contracts to facilitate the necessary upstream and midstream investments. In that sense it is not possible to have one unified global spot price as transportation and extraction costs would vary immensely from place to place.

The North American market is considered the most liquid gas market in the world. It maintains a developed gas transmission network made up of pipelines that crisscross the US, Canada and Mexico. The main trading and distribution center has become the Henry Hub in Erath, Louisiana linking with nine interstate pipelines. Prices at the Henry Hub are considered benchmark for the US and for most of the region. Until around 2006-2007, the American market was dominated by local conventional production, limited imports from Canada and LNG deliveries from Trinidad and the Gulf states. The advent of unconventional gas, though, has led to a revolution, not only transforming the US into the largest gas producer in the world, but potentially a gas exporter in the near future.²⁶ To illustrate the significant role shale gas has played in the American natural gas production in the past decade, one could point out that in 2000, shale gas provided merely one percent of US natural gas production.²⁷ In a startling reversal, by 2010, shale gas reached approximately 23 percent of US natural gas production. The US Energy Information

²⁶ The primary unconventional gas consists of deep underground gas (ultra-deep), gas from complex reservoirs (tight and shale gas) and contaminated gas (sour or sulfurous gas). By “tight” gas it is meant hydrocarbon producing formations with reservoir permeability on the scale of micro-Darcy. Tight resources are generally not economical to produce without additional stimulation such as hydraulic fracturing, which can add additional production costs. Shale gas is natural gas which is caught within shale rock formations. Additional stimulation is often required to produce from these reservoirs, such as hydraulic fracturing. Coal bed methane (CBM), also called coal seam gas, is a natural gas produced from coal seams or adjacent sandstones.

²⁷ *Annual Energy Outlook 2012*, U.S. Energy Information Administration, Early Release Overview (2012) Available at: [http://www.eia.gov/forecasts/aeo/er/pdf/0383er\(2012\).pdf](http://www.eia.gov/forecasts/aeo/er/pdf/0383er(2012).pdf)

Administration (EIA) predicts that by 2035, if current trends continue, shale gas production could comprise nearly half of all US natural gas production.²⁸

The transformation of the US into a gas exporter could significantly influence supply in the other regions pushing down prices in Europe and Asia. In addition, many regions outside of North America have concluded that it may be possible to replicate the U.S. shale gas revolution in their own jurisdictions. The EU (despite some member countries having qualms about the environmental implications of hydraulic fracturing), Latin America, India, Indonesia, Australia and China are currently evaluating unconventional gas production. Nevertheless, despite the current global interest, outside of the US, only Australia, which already produces some amounts of unconventional gas, and perhaps Asia, have more immediate prospects for rapid shale and other unconventional gas production.²⁹

Unlike North American markets, Europe and Asia face a very different supply/demand dynamic. The two are not only net gas importers, but also increasingly dependent on only a few producers. The EU production has been rapidly going down with the main output centers, the UK and Netherlands, providing for only one quarter of total gas consumption in 2011.³⁰ Despite a slowdown in gas consumption in the past two years, long-term demand projections point to an increasing dependence on natural gas with imports constituting more than 80% of EU gas consumption by 2030 up from 67% in 2011. Russia and Norway make up the largest share of gas imports. Each of them supplies roughly a third of total imports.

While LNG deliveries from Qatar, Nigeria and Algeria are rising, they are still able to influence only the UK, French and Spanish markets as the natural gas transmission system within Europe is not sufficiently developed to prevent supply bottlenecks and balanced flow of gas to demand locations. This has led to intra-continent price divergence between the prices on the biggest Western European gas hub, the UK National Balancing Point (NBP), and the German border distribution center. Meanwhile, overall prices have remained much higher than those in North America representing a severe strain on utilities and industry on the continent. Europe is the second largest natural gas market in the world but the issues facing its supply diversification, demand patterns and the development of the transmission system are symptomatic for the global failure to create a world gas market.

²⁸ Ibid

²⁹ For a detailed listing of the efforts of the listed countries to produce unconventional gas, please see: *Medium Oil and Gas Markets 2010*, International Energy Agency, 188-192; Stephen Holditch, "Global Unconventional Gas-It is There, But is it Profitable?", *Journal of Petroleum Technology*, December, 2010.

³⁰ *Natural Gas Balance Sheet, 2011*, Eurostat, 2012

Asia is by far the fastest growing natural gas market in the world and currently the third largest with 212 bcm in 2011.³¹ Most of the demand growth has come on the back of Chinese economic growth and the country's attempt to shift the structure of its energy market towards the cleaner and more efficient natural gas. After the Fukushima disaster and the closing of the majority of nuclear facilities, Japanese gas consumption also ballooned reaching more than 120bcm in 2012. With the exception of the unconventional gas potential in China, in-situ gas reserves in the major Asian demand centers are limited, which has meant that the region is also very dependent on gas imports, most of which will be coming in the form of LNG. The Asia-Pacific region imported 207 bcm of LNG in 2011, but unlike Europe has a much more diversified import base. Half of total imports including both pipeline and LNG are coming from within Asia (Indonesia, Malaysia, Australia, Brunei and Turkmenistan), and a third from the Middle East with Qatar being the single largest Asian gas supplier.³²

Despite the liquid nature of the Asian gas market, demand pressures have pushed the benchmark JCC LNG price to above \$16/MMBtu. At the same time, Asian gas prices do not reflect accurately actual supply/demand dynamics, but are still largely influenced by the oil price movements based on the structure of the import contracts. Oil-indexation has prevented Asia from developing a true market price, from which MENA and other LNG producers are taking advantage. As Europe is slowly emerging out of a strict oil-indexation of gas prices, Asia does not seem to change course as the maintenance of the economic growth does not allow the regional giants to risk their energy relations with producers for the sake of increasing their bargaining power.

Overall, import dependence in Europe and rigid pricing framework in Asia have presented formidable obstacles for the convergence of regional gas markets. It is yet to see whether the unconventional gas revolution in the US and the boom of LNG could do the trick. Yet until the fundamentals are missing, a world gas market in the medium-term will be a utopia. Although regional gas oligopolies in effect already exist, it will be difficult for natural gas exporters to create a viable global cartel as price arbitrage opportunities among regions will increase the incentives for cheating and overproduction.

4.1 The LNG boom and price movements

Since around the mid-2000s energy analysts began to circulate the notion that the nature of gas markets could change with the advent of liquefied natural gas (LNG). The idea was that once you can liquefy the gas and mount it on supertankers, transportation costs fall dramatically and producers no longer need long-term contracts to safeguard their investments. They would be able to ship the gas to wherever it is demanded, in turn creating additional liquidity. The ultimate outcome would have been the creation of a

³¹ *Natural Gas Medium-Term Market Report 2012*, IEA, 2012

³² Own calculations based on BP data from the *2012 World Statistical Review of Energy*

global gas market, in which supply/demand dynamics is reflected in prices all around the world. Despite the fact that LNG has turned into the preferred transportation method for most MENA and sub-Saharan Africa producers, LNG remains still only a third of total gas trade.³³ In 2012 LNG producers exported 313 billion cubic meters (bcm), while preliminary data for the total gas trade puts it at around 1.05 trillion cubic meters (tcm). It is true that the LNG trade has been growing by an average of 7.75% per year for the last decade, but it has not been able to replace pipeline transportation.

Table 1 LNG Demand by selected countries and regions

Country	2009	2010	2011	2012	2012/2011
EU and Turkey	69.02	87.75	90.67	68.76	-24.20%
US	12.8	12.23	10.01	5.03	-49.80%
China	7.63	12.8	16.62	20.1	20.90%
India	12.62	12.15	17.1	N/A	N/A
Japan	85.9	93.48	106.95	119.6	11.80%
S.Korea	34.33	44.44	49.31	48.67	-1.30%
Taiwan	11.79	14.9	16.31	N/A	N/A
S.America	3.27	9.22	10.94	N/A	N/A
Others	5.41	10.66	12.92	N/A	N/A
Total	242.77	297.63	330.83	328.7	-0.60%

Source: BP, IEA, domestic sources

One explanation is that LNG, like pipelines, is still largely dominated by long-term contracts.³⁴ Investment in LNG trade involves a complicated process, which includes the joint building of liquefaction plants, a regasification plant for imports and the supertankers themselves. In order to secure financing, gas exporting companies have to prove that they have found committed customers that would import certain amount of gas for a certain period before the loan is paid back.³⁵ These contracts last around 20 years and they usually contain a destination clause barring importers from shipping their gas to another destination when demand in the country drops. In addition, gas producers have repeatedly required oil-indexation as the basis for the price, so that they could achieve an adequate rate of return (ROE) justifying the initial investment. This has meant that spot pricing per se was only possible under limited conditions and usually when spare capacity in the producer-country emerges.

³³ Ibid

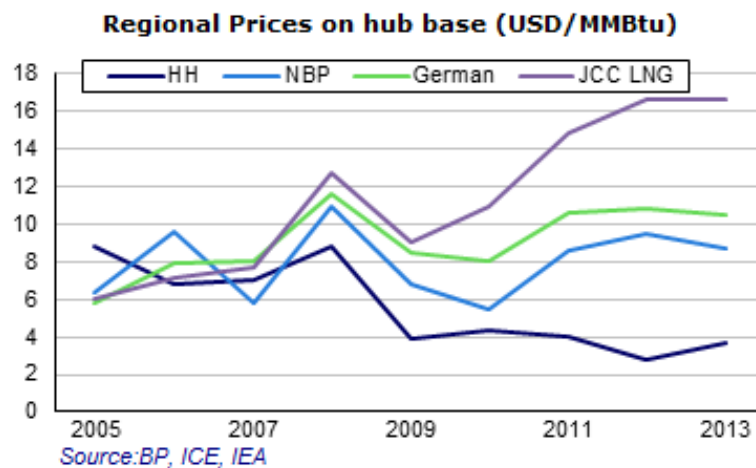
³⁴ Olivier Massol and Stéphane Tchong-Ming, “Cooperation among liquefied natural gas suppliers: Is rationalization the sole objective?”, *Energy Economics*, 32, 2010, 933-947

³⁵ Ibid

The above-mentioned pricing structure coupled with a gas glut has undermined LNG growth. Hence, the LNG sector stalled in 2012 amid falling gas demand in Europe and stagnating capacity among the big exporters. The decline comes on the back of overall drop in European gas consumption precipitated by high gas prices and rigid markets. LNG production dropped by 5.4% to 313bcm in 2012.³⁶ In addition, the largest LNG exporter Qatar has reduced LNG exports due to facility maintenance and the continued moratorium on the exploration of the vast North Field. Exporters were also wary of falling demand in the OECD including the US and the EU.

The new supply dynamics is spelling out the end of the price convergence myth that became popular shortly after the 2009 crisis. Regional prices have significantly diverged. While prices at the US Henry Hub plummeted to below \$2/MMBtu on the back of growing shale gas production, European prices stabilized above \$10/MMBtu and the Asian LNG edged up above \$16/MMBtu.

Figure 3 Regional Prices in the main gas markets around the world – 2013 Forecast



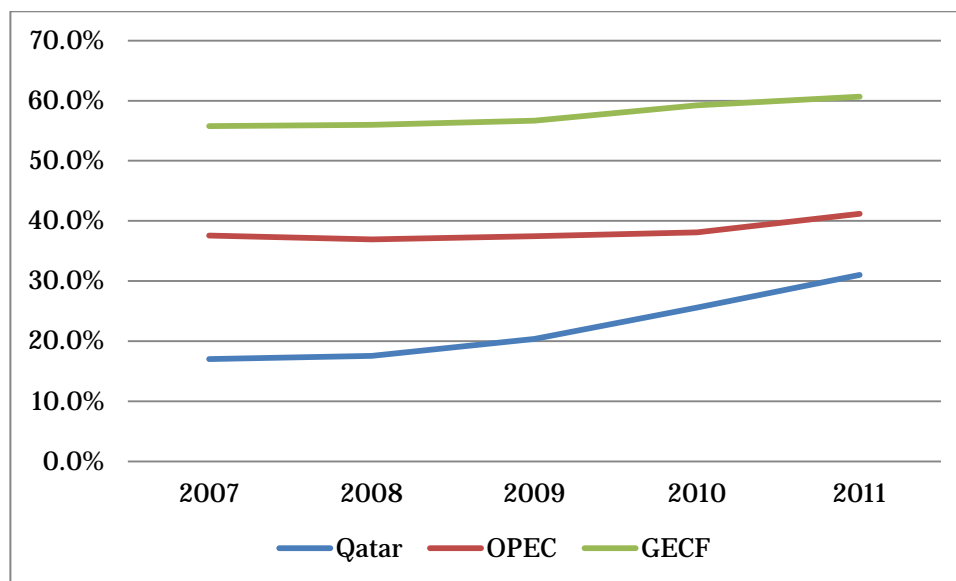
As can be seen from figure 3, after regional prices began to converge in the aftermath of the global economic crisis, the recovery led to a new phase of price decoupling. Convergence in the first place was not so much the product of a change in the contract structure, but the result of excess supply of gas, that led to expansion of LNG supply to North America and Western Europe lowering prices at the Henry Hub in the US and the National Balancing Point (NBP), the largest virtual exchange point in the EU. The rise of unconventional gas production diminished US demand for LNG imports. This freed up Qatari and other Middle-Eastern LNG for deliveries to Europe depressing prices in

³⁶ Own calculations based on statistics from the EIA, Eurostat, Chinese Customs Office and other national bureaus.

Spain, Britain and France.³⁷ European importers could take advantage of lower LNG prices to undermine the domination of Russian oil-linked contracts.

Not surprisingly, volumes of natural gas traded on European spot markets have been rising in the last three years as the flow of cheaper LNG and the increase of liquidity in Western Europe contributed to the divergence of oil-indexed and spot prices. Total traded volumes actually exceeded cumulative gas demand in 2011, which signaled expanding liquidity. Moreover, the gap between HH prices and European and JCC LNG widened to approximately \$5/MMBtu and \$12/MMBtu respectively as different contract structures in Europe and North America prevented convergence despite liquidity expansions.³⁸ Limited price convergence seems possible in the near future only on the European continent, while Asian and US prices drift further apart. A major transformation cannot become a reality unless the US starts to export LNG. Supply of cheap shale gas to the EU and Asia can put a downward pressure on prices. In addition, the simultaneous launching of new liquefaction facilities in Australia, Russia, Indonesia, Qatar and the US could flood the market starting in 2015-2017 with another 200 bcm/y allowing for more global competition and the destruction of regional market limitations.

Figure 4 Share of LNG in the world gas market (2007-2011)



Source: BP, IEA, EIA

³⁷ *Medium-term oil and gas markets*, IEA, 2010, 199

³⁸ *Natural Gas Medium-Term Market Report 2012*, IEA, 2012,

Price and transportation convergence via LNG could create the necessary conditions for a global gas market. Once it is fully established, gas exporters could try to develop a collusive agreement to prevent an oversupply and the plummeting of prices. Yet this depends on the dynamics of world gas demand, as well as on the ability of the major producers to maintain spare capacity. In a world with oversupply of gas, and an increase in the sheer number of gas producers, we can expect that a cartel may not be successful because there will be simply too many opportunities for pricing arbitrage. To decide whether a possible international cartel can come to fruition under a liquid market, we have to further analyze the sufficient market conditions for the creation of an energy cartel.

4.2 Reserves

Global economic cartels cannot be easily compared because they all have peculiarities, which distinguish the structure of the respective markets. However, most oligopolies share some similarities including: 1) output is concentrated in a small number of players; 2) sellers cut production or manipulate prices to maximize profits; 3) entry of new producers is limited; 4) cheating can be prevented by the existence of a swing producer with excess capacity.³⁹ The first requirement is probably most easily proven as it is enough to observe the data on market share or reserves as in most energy cartels. The natural gas market is no exception. Market share and reserves are highly concentrated in the hands of few producers located also in few geographic locations.

The paper will discuss a possible natural gas cartel in the framework of the Gas Exporting Countries Forum (GECF). Created in 2001 the organization includes 13 members: Algeria, Bolivia, Egypt, Equatorial Guinea, Iran, Libya, Nigeria, Qatar, Oman, Russia, Trinidad and Tobago, UAE and Venezuela with four observers – Iraq, Norway, Netherlands and Kazakhstan.⁴⁰ In its composition it resembles closely OPEC. In fact seven countries (Algeria, Libya, Nigeria, Venezuela, Iran, UAE and Qatar) are members of both organizations. This has prompted energy analysts to consider the likelihood of cartelization of the gas market following the example of OPEC. The political objectives and relations between the GECF members will be discussed in the following chapters. For now we will consider only the structural role the organization plays on international gas markets.

The members of the GECF jointly controlled 62.2% of total global gas reserves in 2011. For comparison OPEC holds 80% of proven oil reserves. Yet the three largest reserve holders (Russia, Iran and Qatar) have 49.3%, while the three richest states in oil contain only 33.9% of total reserves.⁴¹ Natural gas reserves, though, unlike oil reserves are

³⁹ Obindah N. Wagbara, How would the gas exporting countries forum influence gas trade?, Energy Policy, 35, 2007, 1224–1237

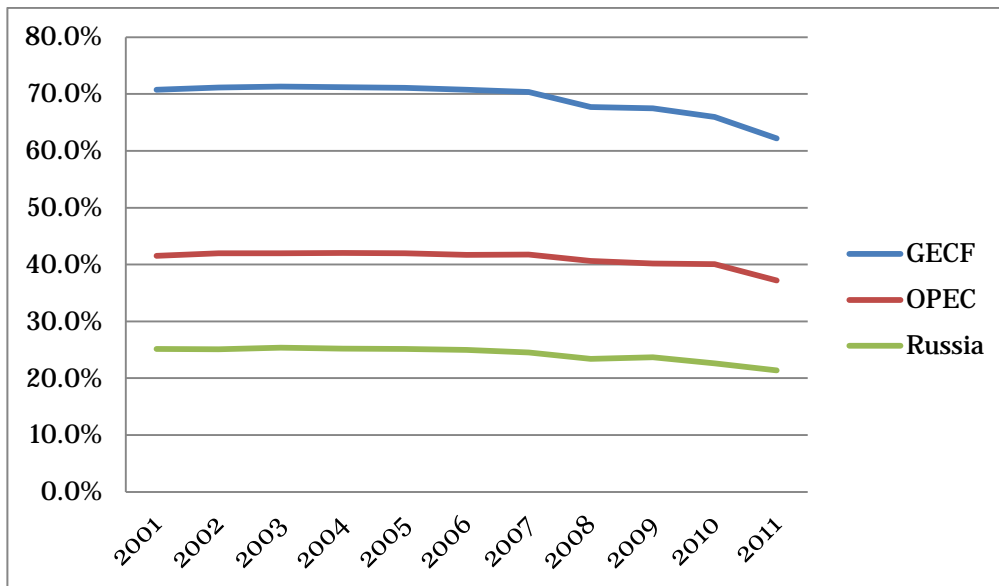
Alhajji, A.F., Huettner, D., 2000. OPEC & other commodity cartels: a comparison. Energy Policy, 28, 2000

⁴⁰ Official website of the GECF – www.gecf.org

⁴¹ Own calculations based on BP data.

not concentrated in just one region, i.e. the Middle East (62%), but encompass at least three major regions with almost equal importance for overall production. Both Eurasia (mostly Post-Soviet countries and Norway) and MENA hold around 38% of global proven reserves, thus jointly sharing $\frac{3}{4}$ of the global gas market.⁴²

Figure 5 Evolution of the share of gas reserves in the last decade



Source: BP, IEA, EIA

Contrary to expectations, the members of the GECF do not dominate as much the world gas trade. The member countries account for only 42.2% of pipeline and 56.9% of LNG exports. Part of the explanation is that many of the largest gas producers are also big gas consumers. Iran, Venezuela and the UAE for example are not producing enough to even satisfy domestic demand despite sitting on some of the largest conventional reserves. Hence, their export capacity is significantly undermined. Russia, which is the second largest producer of gas with 655 bcm/y only after the US, is also the second largest consumer of natural gas. This in fact has left many of the GECF members unable to maintain large spare capacity, while wasteful consumption and slow growth in exploration compromises the long-term viability of the countries' influence on gas markets.

The major exception to the reserves/export paradox is Qatar, which has been able to steadily expand its market share, as well as maintain spare capacity. Qatar produced 146.8 bcm in 2011 and was able to export 121.8 bcm. In fact, Qatari gas output has been increasing annually by 18.7% on average. Not surprisingly, Qatar controls 11.9% of global gas trade and 31% of LNG exports.⁴³ The growth of the LNG industry has been largely the

⁴² BP Statistical Review of Energy, 2011; MENA – Middle East and North Africa

⁴³ All data is based on author's calculations derived from BP and EIA data.

product of Qatar's gas boom and the small peninsula will also be the main driver of the sector in the following years.

Qatar has also tried to boost its spare capacity by cooling off its export boom. In 2005 the government imposed a moratorium on future exploration of the giant North Dome Field shared with Iran.⁴⁴ The field, which may contain 25.4 tcm will be able to supply Qatari gas exports for the next two centuries. Under the official statement, Qatar is only trying to assure sustainable use of its natural resources. However, it seems logical that falling prices and oversupply on international markets may have had an impact on Qatar's decision. By expanding production it would be imposing downward pressure on gas prices that could lead to the total collapse of the long-term oil-indexed contract basis. Although Qatar has benefited from the relative globalization of gas markets, it does not want its profits declining.

4.3 Structural constraints for a swing producer

To create a cartel is universally believed to be a game of coordinating the divergent interests of many parties at the same time. In the case-example of OPEC, this has proven to be almost impossible as the cartel members have divergent set of goals and face different export constraints.⁴⁵ The outcome is that there is an inherent conflict in the output decisions of OPEC members making the imposition of quotas hardly possible. The empirical results have shown that OPEC was successful as a price-setting cartel only in the 1970s, but became increasingly divided in the 1980s and 1990s when two sets of groups emerged within.⁴⁶ One, called "spenders" have aimed to maximize profits in order to receive the oil revenue immediately and, hence, facilitate fiscal or other type of spending. "Savers", meanwhile, have focused on shifting the power balance in their favor, so that they assure themselves control of output decisions in the long term.⁴⁷

Savers would naturally tend to abide by the output quotas assigned jointly by the cartel and spenders will cheat to try to produce as much as possible given higher prices. For the successful operation of a cartel there is a need for a kind of a "super saver" also known in the literature as a "swing producer", which maintains spare production capacity, which can be used to flood the market, and hence, drive down the price until it becomes unprofitable for the other members to cheat or for non-cartel producers to join the market.⁴⁸ The swing

⁴⁴ "Qatar To Maintain North Field Moratorium; Focus On Exploration: Energy Minister", Platts, March 6, 2013

⁴⁵ Aperjis, D., The Oil Market in the 1980s, OPEC Oil Policy and Economic Development. Ballinger Publishing Company, Cambridge, MA, 1982.

⁴⁶ Vincent Brémond, Emmanuel Hache and Valérie Mignon, "Does OPEC still exist as a cartel? An empirical investigation", Energy Economics, 34, 2012, 125–131

⁴⁷ For more discussion on the different aims of OPEC members see Hnyilicza, E., Pindyck, R.S., "Pricing policies for a two-part exhaustible resource cartel, the case of OPEC", European Economic Review 8, 1976, 139–154.

⁴⁸ Joan Edelman Spero and Jeffrey A. Hart. The Politics of International Economic Relations 7th edition. Wadsworth, 2010

producer can also prevent production capacity expansion to forestall future output growth of the member-countries. Saudi Arabia has successfully played the role of a swing producer, consecutively ramping up production in 1985-6 as competition from the Soviet Union endangered the dominant position of the Kingdom and meddled with the strategic interests of the US, 1997 to prevent Venezuela from following through with its plans for significant reserve exploration, and more recently in 2004 and 2011 when geopolitical turmoil in Iraq and Libya required Saudi Arabia to step in and calm markets.

Table 2 Share of world trade of the members of the GECF (bcm)

	Pipeline	LNG	Total	Share
Qatar	19.2	102.6	121.8	11.9%
Algeria	34.4	17.1	51.5	5.0%
UAE	-	7.96	8.0	0.8%
Egypt	1.8	8.58	10.4	1.0%
Nigeria	0.83	7.6	8.4	0.8%
Trinidad	-	18.9	18.9	1.8%
Bolivia	13.32	-	13.3	1.3%
Oman	-	10.92	10.9	1.1%
Equatorial Guinea	5.27	-	5.3	0.5%
Lybia	2.34	0.08	2.4	0.2%
Russia	207.0	14.4	221.4	21.6%
Iran	9.05	-	9.1	0.9%
Venezuela	-	-	0.0	0.0%
Total GECF	293.3	188.1	481.4	-
Total World	694.61	330.83	1025.4	100.0%
Share GECF	42.2%	56.9%	46.9%	

It is not clear who can play a similar role in a potential natural gas cartel. In the dominant firm model the success of the swing producer depends on the inelasticity of aggregate demand for oil/gas and the elasticity of the fringe supply (smaller members of the cartel and non-cartel firms).⁴⁹ The gas market faces both an elastic aggregate demand and increasingly elastic supply. The former is the result of consumer preferences. Despite the growing need for natural gas boosted by rising use of gas in power generation and industry, consumers unlike in the oil market have alternative fuels at hand to substitute natural gas. Gas competes with coal, nuclear and renewable energy, whose share in the world energy mix is constantly growing. An effective gas cartel would require a permanent shift towards natural gas on the part of industrial and electricity producers. The nuclear disaster at Fukushima in 2011 exposed the dangers of nuclear energy, and pushed the

⁴⁹ Amy M. Jaffe and Ronald Soligo, "Market Structure in the new gas economy: Is cartelization possible?", *Geopolitics of Natural Gas Study*, Stanford University and the James A. Baker III Institute for Public Policy of Rice University, May, 2004

agenda of increased natural gas use as a substitute. While this could affect countries like Japan and Germany, who are closing down many nuclear plants, it is unlikely that the world as a whole will eliminate nuclear capacity in the short term.

At the same time fringe supply is on the path of rapid expansion. While ten years ago, analysts viewed gas resources as essentially finite, the rapid growth of conventional and more importantly unconventional gas dwarfed these negative expectations.⁵⁰ According to a 2011 EIA report, the shale gas basins around the world hold more than 187.5 tcm of gas, which is slightly less the total amount of proven conventional gas reserves.⁵¹ The additional gas quantities are widely dispersed throughout the world, which can allow for the emergence of new large gas producers. Australia is one of them. Sitting on enormous amounts of coal-bed methane, the country plans to launch 166 bcm of LNG projects by the end of the decade.⁵² China, whose consumption has been growing by 17% annually for more than a decade now, may see domestic production increase significantly on the back of shale reserves of 36.1 tcm.⁵³ This would constrain much of the projected growth of LNG in the next two-three decades as Russia and Middle-Eastern exporters have been betting on China to absorb their excess capacity. That is not to say that technical difficulties do not exist before the expansion of shale gas takes global proportions as it is not as easily recoverable in Asia or the Middle East as on the North American continent. Yet in a buyer's market where domestic resources are abundant, it will be much harder for gas exporters to dictate prices on the global market.

4.4 Swing producer – Russia or Qatar?

If we speculate on the potential swing producer in a gas cartel, two countries immediately spring to mind – Russia and Qatar. Holding the first and the third largest conventional gas reserves in the world, as well as dominating the pipeline and LNG trade the two countries are positioned to be able to influence a global gas market. The choice of Russia and Qatar is related to their share of world gas exports. Market domination cannot be executed simply by output capacity because of the inexistence of a global gas market.⁵⁴ Countries trade gas on a regional basis with very weak links between the individual markets.

Qatar, which possesses 12% of global gas reserves or around 25 tcm, is in firm control of the LNG market. The country exported 102 bcm in 2011 or 31% of the global

⁵⁰ Liam Denning, "A Gas OPEC won't work", *Wall Street Journal*, November 16, 2011

⁵¹ World Shale Gas Resources: An Initial Assessment of 14 Regions Outside the United States, EIA, April 5, 2011

BP estimates conventional proven reserves at 208.4 tcm at the end of 2011

⁵² *Natural Gas Medium-Term Market Report 2012*, IEA, 2012, 113

⁵³ EIA, *Ibid*

⁵⁴ Amy M. Jaffe and Ronald Soligo, "Market Structure in the new gas economy: Is cartelization possible?", *Geopolitics of Natural Gas Study*, Stanford University and the James A. Baker III Institute for Public Policy of Rice University, May, 2004

LNG trade. Its LNG capacity is bound to increase throughout the decade as new LNG trains will be launched by 2015 increasing total capacity by another 16 bcm.⁵⁵ If we assume that the government will terminate the moratorium on exploration of the North Field, Qatar’s gas potential seems almost infinite. However, in order to dominate the natural gas market, Qatar will need to be able to prevent fringe exporters from entering the market. This can happen, though, only if Qatar has enough spare capacity to flood the market with cheap natural gas, and hence, suppress Asian prices. With the moratorium imposed, this is not an option. Also, we are entering a phase of a tight market with double digit demand growth in most of the Asian economies.⁵⁶ Demand-pull LNG growth is reflected in the spiraling price of the Japanese LNG benchmark. In such a context, there is a large incentive for new LNG exporters to enter the market.

Table 3 Planned and operational LNG capacity - 2011

Country	Operational	Under Construction	Planned
Australia	115	89	166
Indonesia	40	3	14
Malaysia	33	-	8
Iran	-	-	82
Oman	15	-	-
Qatar	105	-	16
Russia	13	-	100
Algeria	27	13	-
Egypt	16	-	5
US	2	-	71
Total	366	105	462

Source: IEA

As is evident from the Table 3, planned LNG capacity will more than double in the next 5-10 years with new players emerging strongly on the LNG market. Australia is by far the largest future competitor, bound to become the world largest LNG exporter by 2018 when it will launch additional 60 million tons per annum (mta).⁵⁷ Competition is to come also from African LNG producers including Mozambique and Angola, which are constructing their first LNG plants. Around 50 bcm of new LNG capacity is expected to come online by 2017 stemming from Africa. In addition, the US and Canada are planning to start LNG exports facilitated by the shale gas boom. The US has planned to construct 8

⁵⁵ IEA, Ibid

⁵⁶ “Analysis: Qatar can survive the global gas glut”, TradeArabia, Dubai, May 4, 2012

⁵⁷ Neil Hume, “Australia set to take its place on LNG stage”, Financial Times, April 24, 2012

LNG facilities with total capacity of 141.9 bcm, but seven are still waiting for approval from the Department of Energy (DOE), which is reluctant to grant card-blanche for LNG projects amid fears that domestic prices will increase. Yet, we can see 71 bcm of LNG exports starting from the US by 2017. In total, LNG export volumes from non-traditional players have been increasing steadily during the last 5 years from 25 bcm in 2007 to 65 bcm in 2011.⁵⁸

The effect on global trade will be profound. Most of the US LNG exports will end in Asia, which will create additional competition for existing LNG exporters to this market. The end result will be market loosening and the loss of bargaining power to traditional LNG exporters. Qatar can prevent a new gas glut starting in 2017 by rapidly increasing spare capacity, and thus, driving future competitors out of the market. As LNG construction costs, especially in Australia, have been increasing rapidly, LNG exporters will find their project economically unviable. Long-term oil-indexed contracts can hedge against a future gas glut but only if Asian buyers do not start insisting on the elimination of the oil link. In attempt to safeguard its Asian market share Qatar can suggest the gradual transition to a spot pricing framework, which means that once the demand patterns loosen, gas prices may plummet.

Russia is also trying to enter the LNG market. State-owned Gazprom launched its first LNG train, Sakhalin-2, in 2009 and since then has boosted its output to 15 bcm/y.⁵⁹ Gazprom has established its presence on the Japanese and Korean markets undermining the monopoly of Asian and Middle Eastern exporters. With the dwindling LNG import demand to the US, Russia seems to have abandoned its major Yamal liquefaction projects.⁶⁰ The partners in the Shtockman and Yamal LNG projects have delayed the final investment decision in what seems like Russia's "pivot to Asia". Neither European nor US demand can satisfy these gigantic projects. Meanwhile, competing for the Asian market seems like a viable goal for the Russian energy interests. Constructing a third LNG train at Sakhalin-2 and a new LNG facility at Vladivostok with total capacity of 20 bcm appears to be a more promising option.

Russia seems to be more suited than Qatar to act as a swing producer. Holding 44.6 tcm of proven conventional gas reserves, which is 21.4% of total conventional reserves, Russia is able to maintain large excess capacity to drive fringe suppliers out of the market. Russia is currently also the largest exporter with more than 221 bcm in 2011.⁶¹ With the expected launching of South Stream and the Vladivostok LNG by 2014-2015, Russia's exports can increase to more than 300 bcm.⁶² However, Russia depends

⁵⁸ Author's calculations based on LNG trade data from BP.

⁵⁹ "Russia: Sakhalin LNG Exports Climb 3 Percent YoY", LNG World News, February 12, 2013

⁶⁰ "Russia's Gazprom shelves Shtokman LNG project 'until better times'", ICIS, September 7, 2012

⁶¹ Author's calculations based on data from the BP Statistical Review of World Energy.

⁶² "Russia, Bulgaria sign final investment decision on South Stream gas pipeline", Platts, November 15, 2012

excessively on pipeline gas exports to the EU, Turkey and the CIS states. Gazprom exported around 140 bcm in 2012 to the EU and more than 200 bcm through its extensive pipeline network to the whole region.

Although total export volumes are rising, Gazprom is facing declining EU demand amid higher prices pushing utilities to substitute gas with coal and renewables. This has prompted Russia to begin massive price cuts to its main buyers including Germany, Italy, Turkey and Poland. In an unexpected turn of events, Russia can be losing its quasi-monopoly on the European market as it faces increasing competition with cheap LNG from Qatar and Algeria flooding Western European trading hubs. If Russia is to preserve its market share on the European market, it has to negotiate a deal with Qatar to limit its supply to Europe. Under a scenario of a tighter market in the next few years, this is unlikely to happen because Qatar will try to capture as many markets as possible before new competitors emerge.

One way to solve Russia's riddle is to aggressively enter the Asian market. Yet it faces two obstacles. First, Russia simply does not produce enough gas to satisfy both the European and Asian markets. Some spare capacity is available but excessive domestic consumption, gas flaring and low energy efficiency have contributed to lower-than-possible gas exports (the latter issues will be discussed in the later sections of the paper). Second, Russia cannot dominate the Asian market without capturing Chinese demand that will drive a large portion of the consumption growth in the next decade. China has been opposing a gas deal between the two countries for the last decade due to the high price offered by Gazprom. China insists on a price of around \$250/1000 cubic meters, while Gazprom is pushing for \$300.⁶³ The important position of the Chinese market in the overall Asian demand predisposes its strong bargaining power vis-à-vis any potential gas exporter. As mentioned above, Chinese shale gas reserves could, on the other hand, make long-term gas contracts obsolete as the country diminishes its import dependence.

Consequently, as we saw above Qatar and Russia cannot individually become swing producers in a global gas market. They do not possess enough spare capacity to drive fringe suppliers out of the market. For Qatar this is not possible if they maintain the moratorium on the North Field exploration. In a buyer's market it seems unreasonable for the small island to squander its reserves. But as the market tightens over the next 3-4 years, the pressure to increase gas exports will become more acute. Yet then it could be already late for Qatar to assume the dominant position as Australia among others undermines Qatari influence in Asia. Russia is also facing new market dynamics in Europe. Major customers are decreasing their gas demand, while new supplies flood the market. Russia

⁶³ Denis Pinchuk and Alexei Anishchuk, "Prospects for Russia-China gas deal dim during Xi visit", Reuters, March 15, 2013

needs to diversify away from its dependence on European exports but finds it hard to find sufficient spare capacity and willing buyers.

One way to remedy the situation is for Russia and Qatar to cooperate on a common global gas strategy. Together they possess enough resources to act as a common swing producer. They will not only be able to maintain the oil-indexed supply contracts, but can also prevent new players from breaking their monopoly. The future of political relations between gas producers will be discussed in the next section.

5.0 The international political framework of a natural gas cartel

After discussing the major structural issues preventing the formation of an international gas cartel, we should turn our analysis to its political dimensions. We will review the possibility of a cartel in the framework of the Gas Exporting Countries Forum (GECF). The organization, created in May 2001 as a gathering of the largest natural gas producers in the world, has aimed to coordinate gas policies and to foster dialogue between producers and consumers.⁶⁴ Despite being dubbed a potential gas-OPEC by some analysts, the GECF has so far failed to facilitate broader output coordination or price fixing. In the following section, we will try to understand why and what are the political underpinnings of failed international gas cooperation.

5.1 Historical overview

The idea for the creation of international organization governing natural gas relations between producers and consumers dates back to the 1980s and 1990s when Algeria was pushing for a forum to regulate the contractual framework of agreements with European consumers. The US was able to prevent the Algerian plan as the State Department viewed it as a precursor to a price-fixing cartel.⁶⁵ Algeria's main concern was the preservation of the "destination" clause stipulating fixed destination for the natural gas delivery, ensuring that buyers will not be able to resell the gas in search of price arbitrage.⁶⁶ The transition to gas market liberalization during the 1990s and early 2000s made destination clauses no longer legally consistent with internal market regulations. The EU's Second Gas Directive completely eliminated all destination clauses from the import contracts enabling the European gas market to become truly competitive.⁶⁷ The decision was implemented retroactively meaning that even previous long-term contracts had to be renegotiated to reflect the new common rules.

⁶⁴ *History of the GECF*, the official website of the organization, www.gecf.org

⁶⁵ Davis, J.D. *Blue Gold: The Political Economy of Natural Gas*. George Allen and Unwin, London, 1984, 264

⁶⁶ *Natural gas prices in Europe*. International Energy Outlook 2011, EIA, September, 2011

⁶⁷ Directive 2003/55/EC of the European Parliament and of the Council of 26 June 2003 concerning common rules for the internal market in natural gas and repealing Directive 98/30/EC, OJ L 176, 15 July 2003, 57–78.

Falling prices and the unsustainability of long-term oil-indexed contracts gave a common stimulus to gas exporters to convene to protect their interests. The first meeting of energy ministers was held in Tehran on May 19-20, 2001 attended by a delegation from Algeria, Brunei, Indonesia, Malaysia, Iran, Oman, Qatar, Russia and Turkmenistan with Norway as an observer. Since then the membership of the forum has changed significantly. Bolivia, Egypt, Equatorial Guinea, UAE, Libya, Nigeria, Trinidad and Tobago and Venezuela joined, while Turkmenistan, Indonesia, Brunei and Malaysia left the club. In addition, Kazakhstan, the Netherlands and Iraq followed Norway to become observers. In 2008 the current members adopted the establishment of the GECF as an international intergovernmental organization with headquarter in Doha, Qatar.⁶⁸

It is interesting that out of the 13 members of the Forum, there are three countries, which are not net exporters of natural gas including Iran, the UAE and Venezuela. The organization does not include major exporters such as Canada, Australia, Malaysia, Indonesia, Turkmenistan and Azerbaijan. The Forum mostly represents the countries with the largest proven reserves and largest production potential. Major exceptions are Russia, Qatar and Algeria, who have also been the drivers of a common policy in the organization.⁶⁹ This is not surprising because they are not only three of the largest gas exporters in the world, but also because they share a common interest on the European market. They need to preserve the oil-indexed take-or-pay gas contracts in order to prevent prices from falling and competition from other LNG exporters to increase.

The goals of the GECF appear similar to these of the oil cartel OPEC when it was first established in 1960s. OPEC was founded in response of a buyer's market, in which consuming countries in the West and more specifically major Western producers unilaterally cut the oil price to prevent new players from flooding the market with new supply.⁷⁰ OPEC's actions preserved the steady flow of oil revenue that aided the development of the countries' nascent economies. So the GECF has also aimed to halt efforts by consuming countries to take advantage of the market conditions and demand contract liberalization and price reductions. During the second meeting of the GECF in Algiers, Chakib Khelil, the Algerian energy minister, noted that the function of the forum will be to defend the interests of natural gas exporters in a globalizing market pointing out that the European Commission has not consulted with any of the gas sellers before implementing the internal market directive.⁷¹

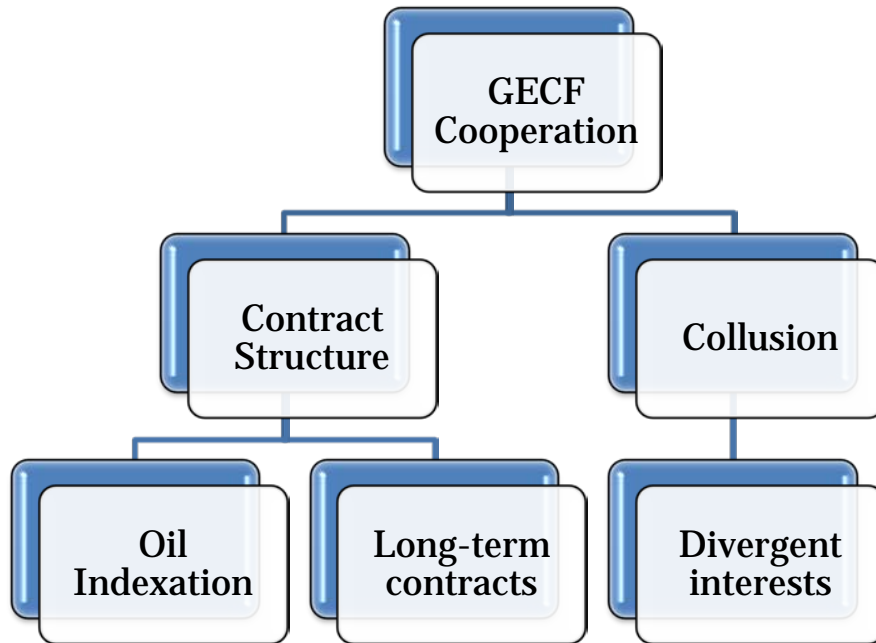
⁶⁸ *History of the GECF*, Ibid

⁶⁹ Norway and Canada are excluded because although they are the third and fourth largest natural gas exporter respectively, they have clearly stated that they are not interested in participating in a gas cartel.

⁷⁰ Yergin, Daniel. *The prize: the epic quest for oil, money, and power*. Simon & Shuster, New York, 1991, 523-4

⁷¹ "Algeria: Forum of gas exporting countries ends", BBC Monitoring International Reports, February 02, 2002

Figure 6 Framework of the political side of cooperation between gas producers



In its 12-year history the organization has, though, developed very slowly. After long negotiations, in December 2008, the countries were able to agree on the creation of a Secretariat and a statute for the establishment of a full-fledged international intergovernmental organization.⁷² The agreement included also the establishment of an expert team to develop a sophisticated supply/demand gas model to reflect market conditions and to engineer new ways to protect the interests of the gas exporters. The GECF was also recognized internationally in 2010 when it was officially registered with the United Nations.

5.2 The Cartel Idea

Russia, Algeria and Iran have been by far the most active members of the organization trying to prevent the gas glut that has severely undermined their profits in the past 5 years. Surplus LNG supply originally earmarked for the North American market has flooded the European market cutting Russian and Algerian influence there. Hence, during the 2010 forum's meeting Algerian and Russian representatives pushed for a coordinated effort to raise prices on the European market.⁷³ The proposal is not new, and it has continuously met with opposition from the main benefactor of the new market conditions, namely Qatar.⁷⁴ Capturing a large portion of the Asian and Western European demand,

⁷² *History of the GECF*, Ibid

⁷³ "Gas exporting countries consider gas price increase". Thai ASEAN news network, April 21, 2010

⁷⁴ "Gas Exporters May Face Division", Jakarta Post, March 20, 2007

Qatar is ready to sell larger quantities despite lower prices as long as it maintains market share.

Part of the explanation is that Qatar produces “wet gas” containing large quantities of gas liquids (NGL) sold at a very wide margin at world markets due to its low transportation costs and importance for the industry. NGL production in 2011 hit more than 1 million bbl/d.⁷⁵ Yet, the development of the NGL reserves depends to a large degree on the continued extraction of natural gas meaning that there is an inherent link between Qatar’s LNG exports and its profitable NGL trade. This circumstance allows Qatar to maintain an excess supply of LNG despite plummeting prices.

Until now, GECF members have generally ruled out the creation of a cartel. The biggest critics of the idea are Russia and Qatar, who are also the leading exporters.⁷⁶ They are afraid that their major buyers, i.e. the EU members and the Asian giants, will switch to an alternative source of energy to power the growth of electricity generation and the industrial sectors. In fact, we have observed how European natural gas demand has declined rapidly in 2011 and 2012 on the back of the high prices. LNG demand in the EU and Turkey decreased by 24.2% to 68.76bcm, while the share of European LNG imports in total LNG trade shrank from 27.4% to 20.9% in 2012.⁷⁷ The IEA forecasts European gas consumption to drop by 1.6% until 2017 as utilities on the continent replace more expensive natural gas with cheap imported coal from the US.⁷⁸

The major proponents of a natural gas cartel are Iran and Venezuela. The two countries need the higher prices in order to stimulate domestic production, and hence start exporting to the world markets. Iran has the potential to become one of the biggest if not the biggest natural gas producer in the world but lacks the necessary transport infrastructure or the capital to invest in the development of the giant South Pars field. Yet as long as sanctions persist, it will be impossible for major foreign investors to join the development of new projects. Otherwise Iran has officially a planned LNG capacity of 82 bcm, which could make the country the third largest LNG exporter by 2020.

Similarly, Venezuela has tried to turn into a large gas exporter as the country holds 5.52 tcm of gas reserves.⁷⁹ It uses, though, more than 50% of its production (mostly associated to oil production) for reinjection in maturing oil fields.⁸⁰ Plans for the development of non-associated reserves, as well as the construction of an LNG terminal have been continuously delayed.

⁷⁵ Qatar: Energy Brief, EIA, January, 2013

⁷⁶ “Gas Exporters rule out a cartel, but opt for joint efforts on pricing”, The Independent, April 10, 2007

⁷⁷ Author’s calculations based on BP data.

⁷⁸ “Growth of LNG sector stalls amid new demand trends”, CEE Market Watch, February 12, 2013

⁷⁹ Venezuela: Energy Brief, EIA, October, 2012

⁸⁰ Ibid

Overall, cartelization is politically not beneficial to the GECF members. The natural gas market is too volatile to allow for political instabilities that endanger the demand for the fuel. The main consumers of natural gas are the members of the OECD, which has already witnessed the dangerous power of an energy cartel in the 1970s. In response to the Arab oil embargo from 1973-4, the largest oil buyers created the International Energy Agency (IEA) to prevent supply bottlenecks and coordinate Western oil policy. The risk of supply disruptions led to the accumulation of emergency oil reserves. Member-countries of the IEA are required to hold oil stocks equivalent to 90 days of consumption.⁸¹ The reserve mechanism has successfully alleviated several oil crises including the Iranian revolution from 1978, hurricane Kathrina from 2005 and most recently the Libya war in 2011.⁸²

The members of the GECF cannot allow a similar mechanism to develop in the gas market. In fact, it will probably be easier for gas consumers to coordinate their energy policies, so that they are not hit by a supply disruption. The EU countries have already been active in promoting gas emergency coordination in response to two severe gas crisis when a price dispute between Russia and Ukraine left parts of Central and Eastern Europe without gas for several weeks.⁸³ In response, the EU has created the Gas Coordination Group in August 2011, whose goal is to devise a mechanism to improve the security of gas supply and prevent disruptions.⁸⁴

Already in 2009 the EU began to enforce new regulations on security of supply, which obliged member-countries to maintain normal gas supply for 60 days even when the import infrastructure in place does not function. They can use several measures to fulfill the requirement including the expansion of commercial gas storage facilities, the gas network capacity and the completion of reverse links with neighboring countries to prevent bottlenecks and allow for efficient crisis management.⁸⁵ The successful implementation of a common external gas policy in the EU depends largely on the creation of a functioning internal gas market, which seems to have stalled in the last two years. Yet, the EU has shown that it has the political will to develop supply security mechanisms that prevent Russia from acting as a bully. If the GECF steps up the talk about cartelization, this will likely trigger counteracting response in consumer countries. And unlike oil, which has a relatively inelastic demand, natural gas can be easily substituted with coal, nuclear or renewable energy as recent EU demand trends have shown.

⁸¹ *IEA Response System for oil supply Emergencies*, IEA, 2012, 3

⁸² *Ibid*

⁸³ Kramer, Andrew, "Russia cuts off Gas deliveries to Ukraine", 1st January, 2009

⁸⁴ Commission Decision (2011/C 236/09) establishing the composition and the operational provisions of the Gas Coordination Group and repealing Commission Decision 2006/791/EC

⁸⁵ Oliver Geden, "Effective Provisions for Emergency Prevention and Response in the Gas sector", German Institute for International and Security Affairs, August, 2009, 2

5.3 Empirical results for collusion based on the World Gas Model

If we assume that the GECF can act as a cartel, we should suppose that the individual members will cut production and prevent capacity expansion. To calculate the expected change in profits for the members of the GECF, this paper borrows the findings of an empirical article analyzing the economic benefits of gas cartelization.⁸⁶ The study is based on the large general-equilibrium World Gas Model developed by the University of Maryland and the Technical University of Dresden, which aims to simulate supply and demand dynamics in the natural gas market.

The paper first presents the economic results from a collusive agreement in the framework of the GECF. The collusion actually largely benefits non-GECF producers, which take advantage of the constraints on output in order to increase exports and to satisfy the emerging excess demand. Meanwhile, the GECF cumulative profits increase by 5% by 2020.⁸⁷ By 2030 joint profits actually decrease by 3% on the back of lower exports, output expansion in non-GECF countries and high initial investment costs. Some members like Algeria, Libya and Russia lose more from cartelization as they would have to cut proportionally a higher share of their exports to satisfy output quotas.

Stronger support for a gas cartel can be found if we include the Caspian region and the whole of the Middle East. Considering an expanded GECF membership including the Caspian states (Azerbaijan, Turkmenistan, Kazakhstan and Uzbekistan), a cut in output would lead to a significant price hike in Europe. Gas tariffs at European hubs could reach more than \$11/MMBtu by 2020 in the case of Middle Eastern producers such as Saudi Arabia join the cartel.⁸⁸ Yet this seems unlikely if we consider the domestic structural constraints and the international political framework of energy relations. By excluding some of the largest reserve centers, the GECF allows for fringe supply to develop disproportionately to the planned capacity currently in place in the context of market liberalization and elastic demand in Europe, as well as rising bargaining power of demand centers like China and Japan.

5.4 Divergent interests: regional analysis

The inability for gas policy coordination between GECF members is not limited only to the organizational structure or the market perceptions about the bargaining power of producers and consumers. What makes cooperation difficult is that despite the common interest of GECF members to preserve their market share, they are often also direct competitors.⁸⁹ As the natural gas market remains regional, the individual exporters are vying to capture market share at the expense of each other. The zero-sum game is

⁸⁶ Gabriel, S.A., Rosendahl, K.E, Egging, Ruud, Avetisyan, H.G., Siddiqui, S., “Cartelization in gas markets: Studying the potential for a “Gas OPEC”, *Energy Economics* 34, 2012, 137–152

⁸⁷ Ibid

⁸⁸ Ibid

⁸⁹ Hadi Hallouche, “The Gas Exporting Countries Forum: Is it really a Gas OPEC in the Making?”, Oxford Institute for Energy Studies, June 2006, 36

strengthened by the excess liquidity in the market. Low demand in the main consumption centers means that gas exporters are competing ever more aggressively to preserve their position. The concept of absolute versus relative gains becomes especially acute in the discussion of regional energy alliances.⁹⁰ The potential for an expansion of joint profits through cooperation is mired by diverging interests that often go beyond the energy sector.

Since most of the gas-exporting countries are heavily dependent on oil and gas revenue for their economic development and stability, their national security is to a certain extent the function of their energy export success. Hence, cooperation would put them at risk that the other members of the cartel will cheat and thus undermine the viability of their own economies.

While the market challenges could be overcome with the advance of technology or the change of demand perspectives, the development of trust between the GECF members will be much harder to achieve. In addition, even if we assume that a trust-building mechanism emerges from the structure of the GECF, the major gas producers are also important competitors in both the regional gas markets and in the security arena. Their dependence on energy revenue for economic development and internal stability can prompt them to view relative gains as more important than the absolute increase in profits. A second level of analysis reveals that obstacles to a natural gas cartel are also rooted in political relations between the exporting countries, on the one hand, and between sellers and buyers, on the other. Additionally, the structure of the international political system could act as a constraint for some countries to join an anti-market organization and on the other, geopolitical rivalries in the respected regions between GECF members undermines the process of trust-building.

5.4.1 The Qatar/Russia nexus

While the European gas market is rapidly changing, gas pricing is becoming increasingly competitive. The spot trade is gaining prominence in Western Europe imposing a downward pressure on oil-indexed prices still dominating most of continental Europe. Price convergence is already visible between the spot-market NBP hub in Great Britain and the German Border Price benchmark. However, as the market becomes more and more liquid on the back of LNG supply from Qatar, the oil-indexation formula can quickly crumble with disastrous consequences for Russia's export potential. Germany utilities' companies, for example, have started pressuring Gazprom to remove the oil indexation from their contracts as the Russian gas is simply not competitive with cheaper natural gas flowing from the Netherlands and Belgium, whose hubs are physically connected with NBP.

⁹⁰ Robert Powell, "Absolute and Relative Gains in International Relations Theory", *The American Political Science Review*, Vol. 85, No. 4 (Dec., 1991), 1303-1320

Russia has yielded to the pressure by significantly cutting export prices for some of its largest clients like E.ON Ruhrgas, RWE and Italian ENI. Meanwhile, Qatar has taken advantage of Russia's precarious situation and has continued to flood the European market with LNG. Qatari LNG made up 47.8% of total EU and Turkey LNG demand in 2011 and close to 10% of the overall European market.⁹¹ Qatar's share must have gone up in 2012 at the expense of declining demand for Russian gas. The spot pricing structure depends solely on the active involvement of Qatar. That is why it will be crucial for Russia to achieve some form of an agreement with the Gulf island on a global redistribution of market power.

This became even clearer during the 2011 GECF forum meeting in Doha when the Russian representative implied that Qatar is damaging the Russian gas interests in Europe and has to replace its European presence for Asia.⁹² Qatar has declined to strike a similar deal with Russia because although the Asian LNG price is much higher than the European one, the Qatari government wishes to have a diversified export portfolio in case regional market fundamentals change. Qatar realizes that sitting on a gas bonanza, it will be able to supply both markets in the medium-term. Destroying its strategic partnership with some of the European consumers seems illogical at this point. From an absolute gains perspective, cooperation between Russia and Qatar, in which the former occupies the European market and the latter satisfies the Asian demand will tighten the market fundamentals and allow for de-facto regional monopolies.

So what is Russia to do? In order to bring Qatar to its side, Russia cannot simply insist that the small kingdom shifts its export direction to the East. The spread between European and Asian prices is not big enough to justify the abandonment of the European market. Gazprom needs to present Qatar with significant economic and political goodies instead. These may include a lucrative share in some of Russia's major exploration projects on the Yamal Peninsula or the Eastern Siberian fields.⁹³

Qatar is not influenced only in expanding its energy assets or capturing new markets. The last few years have seen the country trying to influence international politics both as a mediator in conflicts in Eastern Africa and in terms of military aid to rebels in Libya and Syria.⁹⁴ Qatar together with Saudi Arabia and Turkey has joined a Sunni-led block to support Arab Spring movements in states with conflicting interests. In this struggle, Russia is a major opposition player that has until now backed the Syrian and Iranian regime. Putin's government may need to withdraw its military and diplomatic

⁹¹ Author's calculations based on BP data (2011)

⁹² Mathew Hulbert, "The Vital Relationship: Why Russia needs Qatar (and Qatar could use Russia)", *The European Energy Review*, January 19, 2012

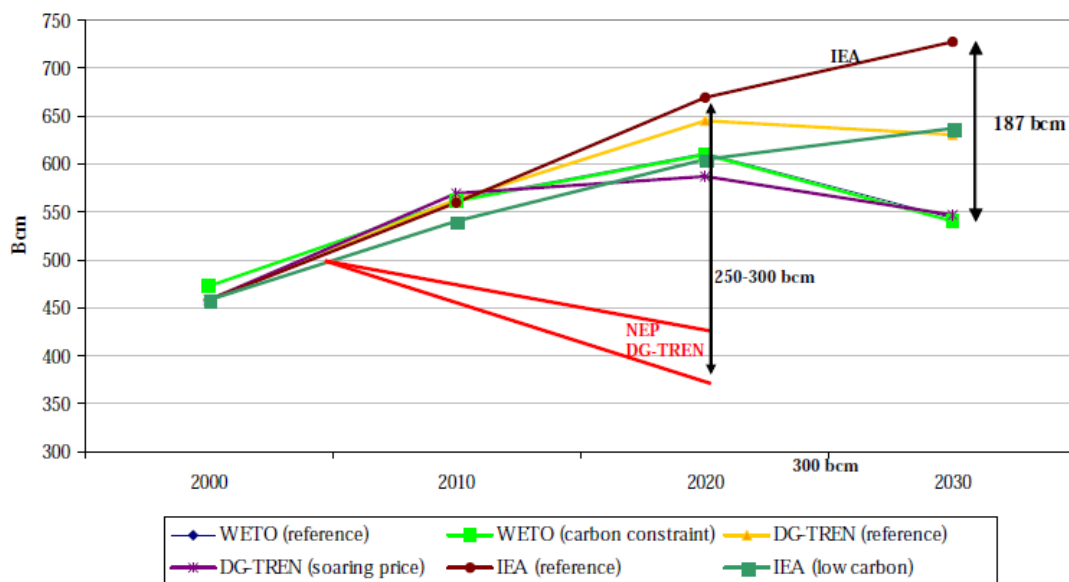
⁹³ *Ibid*

⁹⁴ C.J.Chivers and Eric Schmitt, "Arms Airlift to Syria Rebels Expands, With Aid From C.I.A.", *The New York Times*, March 24, 2013

support from the latter, if it is to achieve a geopolitical deal with Qatar on natural gas. However, it seems that Russia is not ready to back down from its Middle Eastern stance as it sees its regional influence endangered by American-backed regimes. Foreign policy strategy usually goes hand in hand with energy policy in Russia, but Russia still considers it possible to preserve the European market without any concessions to competitors.

The logic to Russia’s strategy is based on the belief that gas market fundamentals will tighten in the next few years. This is partially true. If we consider the IEA scenario for EU demand leading to 2030, we can observe that natural gas consumption increases by around 200bcm. (see Fig.7)

Figure 7 Different EU natural gas demand scenarios until 2030



Since most of indigenous European gas production will decline steeply over the next two decades, it is likely that the EU will be ever more dependent on Russian gas imports. Russia expects to export around 350bcm of natural gas per year to the EU in 2030.⁹⁵ However, these scenarios do not include policy constraints such as EU’s environmental agenda that aims to decrease carbon emissions by 20% by 2020 or the fact that an oil price hike has severely damaged the attractiveness of natural gas as the main fuel for electricity generation. In fact, if we include the price of oil, and we consider that

⁹⁵ Energy Dialogue EU-Russia, “The Tenth Progress Report”, Joint report by the European Commission and Russia’s Ministry of Energy, November 2009

the EU will follow through with its environmental objectives, natural gas demand will actually go down to around 375bcm by 2020.

The latter will not only compromise Russia's objective of maintaining its market share in Europe, but can actually dwarf Gazprom's long-term export potential. This means that even if Qatar concludes a strategic partnership with Russia, in which the latter provides political clout in international affairs, and the former focuses exclusively on Asia, Russia will still be a loser in the long term. Hence, Gazprom will eventually have to turn strongly towards Asia as a way to replace dwindling market in Europe. However, there it will face not only Qatar's competition but also a string of new players emerging on the international gas scene.

5.4.2 Iran-Russia: converging strategic interests amid energy competition

If we are to judge the potential of a natural gas OPEC on the basis of reserves, Russia and Iran easily pass the threshold. They jointly hold 37.3% of global conventional reserves, and are respectively the second and third largest producer in the world. Although Iran is a rather small exporter (and, depending on seasonal demand, a net importer), its gas potential is immense.⁹⁶ The EIA predicts that despite sanctions Iranian gas output is projected to increase to 308 bcm by 2020 up from around 160 bcm today.⁹⁷

The country's gas potential has motivated the government to diplomatically foster the dialogue on a closer market cooperation of the GECF members. The GECF has been Iran's chance to influence global gas policy without being a major exporter. Together with Russia and Algeria, it will benefit from the preservation of the oil-indexed contracts as currently this is also the policy it uses in its export contracts with Turkey. The latter is expected to swallow the largest portion of the new Iranian supply to come online in the next decade.

Iran and Russia have converging strategies in the Caspian basin as they both are trying to prevent the construction of a Trans-Caspian pipeline to link Turkmen reserves with European markets. That is why, despite its contrary position, Russia has responded mildly to Iran's claim that the Caspian basin should be a lake. If the Caspian is a lake, each of the littoral states will be given equal rights to the exploration of the basin allowing Iran to tap the Sardare Jangal undeveloped offshore gas field. It can hold, according to the EIA, up to 1.41 tcm of gas reserves but lack of legal delimitation has prevented exploration.⁹⁸

By supporting Iran, Russia achieves two goals. On the one hand, it counters Azeri and Kazakh attempts at luring American and European investors into the Caspian basin. If the legal status is not decided, Western companies would not have an incentive to put

⁹⁶ Only one gas field, the South Pars, holds approximately 8% of world conventional gas reserves.

⁹⁷ Iran: Country Brief, EIA, March 28, 2013

⁹⁸ Iran: Country Brief, EIA, March 28, 2013

money in exploration of oil and gas fields, which may prove useless as they may well belong to another party. On the other hand, Russia maintains an influence over Iran by defending its nuclear program and selling fuel for its reactors. Thus, it has discouraged Iran's attempt to get involved with *Nabucco*, and extended its sphere of influence in the Middle East. Until 2 years ago, Russia opposed Western economic sanctions against Iran. However, there has been a shift in Russian diplomacy. The negotiations over the START Treaty with the U.S. had led Russia to distance itself from Iran, including the cancellation of a delivery of S-300 air defense missiles.⁹⁹ The suspension of the arms deal was compensated for by the decision to complete the "Bushehr" nuclear power plant in Southern Iran.¹⁰⁰ In this way, Russia has carefully balanced its relations with Iran and the West, winning allies on both fronts and increasing Iran's dependence on Russia's future diplomatic support.

Figure 8 Map of pipeline geopolitics in Eurasia



The Caspian issue is not the only one where Russo-Iranian strategies meet. Iran is also a major player in the Nagorno-Karabakh issue, which has produced two competing regional camps in the Greater Black Sea area. At the regional level, Turkey and Azerbaijan converged in their strategic objective to shrink Russia's influence in Caucasian politics and to foster a pan-Turkic ideology spanning all of Central Asia from Istanbul to Ashgabat. On the other side of the barricade, the Armenian-Russian defense alliance and the presence of

⁹⁹ Glenn Kessler and Keith B. Richburg, "Russia halts sale of air defense missiles to Iran", The Washington Post, June 12, 2010

¹⁰⁰ "Iran launches Bushehr Nuclear Power Plant", RIA Novosti, September 12, 2012

Russian troops on Armenian ground give the country – otherwise surrounded by enemies - a breath of fresh air. To the regional axis of Moscow-Yerevan, one has to include Tehran. The Iranian strategic interest in the conflict stems from the nation's desire to secure its northern borders as well as to keep its substantial Azeri minority (close to 24%) peaceful.¹⁰¹ As a result, Iran has actively attempted to become a mediator for the OSCE but impartiality issues prevent the OSCE from involving Iran in the peace process. Over the past 20 years, Iran has developed strong relations with Armenia as can be seen through the bilateral treaty from 1992 promoting freedom and economic co-operation. A 140-kilometer gas pipeline bringing gas from Iran to Armenia was initiated in 2002. The energy route is a vital remedy for Armenia's constant energy shortage and large dependency on Azeri gas and oil supplies.

However, at the same time, Russia and Iran are competitors on the global oil and gas markets. If relations between Iran and the West warm up, Iran is poised to return as one of the largest oil and gas exporters in the world. Iran has the natural gas capacity to successfully challenge Russia for dominance on the European market, while the potential launching of LNG facilities can make the Islamic Republic a viable competitor to Qatar for the Asian demand. It is true that the two countries have agreed to cooperate on the development of hydrocarbon resources in the Caspian signing a treaty in 2008 but practically no joint energy project was accomplished ever since.¹⁰² In addition, the two governments signed "Road Map for Energy Cooperation", and yet again the major Russian oil companies including Lukoil have pulled out of Iran anxious not to be blacklisted by Western powers from potential projects in the US, Canada and the Middle-East.

5.4.3 Relations with China and the great game in Central Asia

Ultimately, Russia's natural gas strategy will depend on its relations with consuming countries. As mentioned above, even an understanding with Qatar may not be enough for Russia to preserve its market influence. Hence, a successful collusive agreement is constrained by the strong bargaining power of buyers. We already mentioned EU's attempts to release itself from its gas dependency, while at the same time diversifying existing options. A similar proposition can be made about the other potential giant consumer – China.¹⁰³ The IEA forecasts that Chinese gas demand will climb to 469bcm by 2030 or 2.6 times more than current consumption.¹⁰⁴ The increase in Chinese demand will dwarf any other demand growth center pointing to tightening of the market fundamentals in Asia.

¹⁰² Bulent Aliriza, Jon B. Alterman and Andrew Kuchins, "The Turkey, Russia, Iran Nexus: Driving Forces and Strategies", Center for Strategic and International Studies (CSIS), March, 2013

¹⁰³ The paper deliberately avoids the US market discussion because there is every indication that the US is becoming a net gas exporter.

¹⁰⁴ Michael Lelyveld, "China ups gas forecast", Radio Free Asia, November 12, 2012
BP data from the 2011 Statistical Review of World Energy

The growth of the Chinese economy depends largely on maintaining security of supply. As economic growth is crucial for the preservation of political stability in the country, the Chinese government has taken a proactive approach in taking every opportunity to diversify its supply options. It has not only signed agreements with a number of exporters including Central Asian republics and Australia, but has earmarked significant funds for exploration of domestic reserves including shale and other unconventional gas. Thus, China has until now avoided structural dependence on the two largest exporters, Russia and Qatar. The former provided just 0.33 bcm and the latter 3.17 bcm of gas to China in 2011.

Instead the Middle-Kingdom has exploited the declining Russian influence in Central Asia to conclude lucrative contracts for upstream development and for oil and gas supply. The inauguration of the Turkmenistan-China gas pipeline with a total throughput capacity of 40 bcm for the first time undermined Russia's virtual control over Turkmenistan's export outlets. Currently, it sells 14.5bcm to China under a 30-year agreement, but the gas supply will likely increase significantly in the next 5 years as the Chinese national company CNPC has tapped into the Darya/Bagtyiarlyk giant gas field that will bring additional 13 bcm to overall Chinese gas purchases. In addition, the development of the Galkynysh field (South Yolatan) is expected to raise gas exports to China above 40 bcm by 2017. The entering of new players such as the Central Asian states on the global gas market strengthens the bargaining power of buyers vis-à-vis Russia and Qatar squeezing the opportunity for market coordination.

In the fight for alternative gas supply, the EU has also tried to tap into the resources of the Caspian basin. In directly improving its energy security, the EU has sought to build the "Southern Corridor", which is a common term for all the pipeline projects stemming from the Caspian and Middle East region in direction Europe. Among them, EU's flagship project has been *Nabucco*, which is another challenge before the European Common Foreign Policy. Inability to complete the project may undermine EU strategy to promote energy market liberalization, independence from Russia, and democracy and stability in the Balkans, the Caucasus and Central Asia.

The goal of the pipeline is to transport natural gas from the newly found gas field *Shah Deniz* in the Caspian shelf of Azerbaijan, from gas-rich fields of Northern Iraq and possibly from the huge reserves of Turkmenistan. Nabucco's final destination will be the natural gas hub *Baumgarten* on the outskirts of Vienna. The pipeline will be 3300 km and will pass through Turkey, Bulgaria, Romania, Hungary and Austria. The first part from Baku to Erzurum (Turkey) is already operational. The full annual capacity of the pipeline was initially 31 billion cubic meters (bcm hereafter), but due to lack of enough gas sources, the project was significantly narrowed in scope. The new pipeline called *Nabucco-West* will also be built by a consortium, in which companies from the five transit countries plus Germany will participate: BOTAS (Turkey), Bulgargas (Bulgaria), Transgas (Romania),

MOL (Hungary), OMW (Austria) and RWE (Germany), will transport up to 16 bcm of natural gas with 6 bcm earmarked for Turkey's domestic market¹⁰⁵. Despite the ambitious goals of the project, the construction of the pipeline was delayed on a number of occasions. The decrease in the projected pipeline capacity means that Nabucco is no longer able to fulfill its strategic goal to diversify gas supply away from Russia and Algeria.

The pipeline could be expanded in the future on the back of supply from Turkmenistan. One of the reasons is that Turkmen gas reserves are believed to be in the range of 2.1 to 7 tcm (fourth largest in the world).¹⁰⁶ Another is that Turkmenistan itself is looking in all directions for new export options. However, the success of the upgrade hinges on the construction of a Transcaspian pipeline mired by geopolitical hurdles.¹⁰⁷ Turkmenistan has already committed most of its production to Russia via the Central Asia-Russia pipeline, to China and Iran. Even if the above-mentioned Galkynysh field begins producing on a major scale, most of the new quantities are still to be earmarked for China. Furthermore, a Trans-Caspian pipeline would be difficult to build because of the Caspian legal status. The issue depends on whether the Caspian basin is deemed a sea or a lake. If it is a sea, according to the International Law of the Seas, each country would have a 200 mile stretch off its coast to use for national exploitation. Until there is a multilateral resolution to the dispute, Russia and Iran will not allow any major pipeline to pass through the basin undermining their dominance as suppliers to the EU and Turkey respectively.

5.4.4 Fringe suppliers in the Western strategic architecture

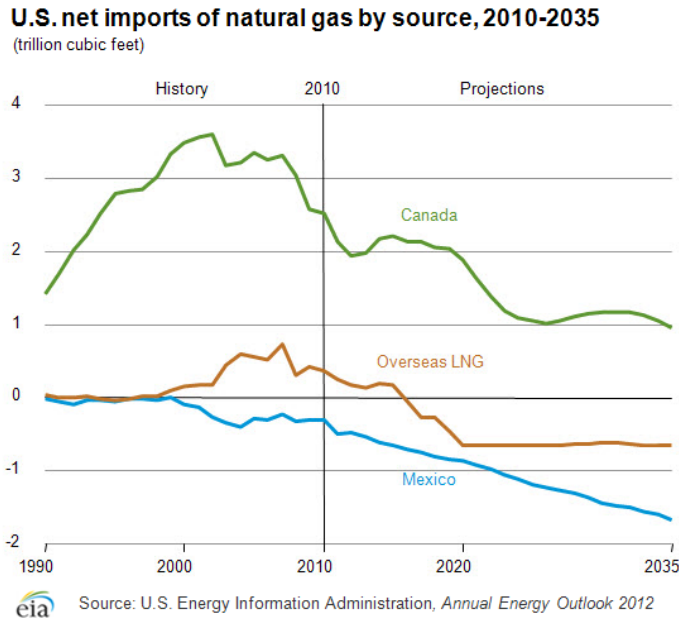
When discussing the political obstacles before a viable natural gas cartel, we cannot ignore the influence and the political alignments of major natural gas exporters outside the GECF. These include Canada, Australia, Norway, Indonesia and Malaysia. Over the years, Canada has been consistently the largest exporter to the US forming the pillars of a very liquid, competitive North American gas market. Pricing at the Henry-Hub (the largest gas distribution center in the Western Hemisphere) is based on gas-to-gas competition, where the crude oil price plays only a minor role. Before the advent of the shale gas revolution in the US, Canada had some bargaining power in the determination of supply contracts. However, Canada's exports are projected to fall steeply over the decade concurrently with the rise in US production (see Figure 9 on US import dynamics).

¹⁰⁵ Nabucco Pipeline official website - http://www.nabucco-pipeline.com/portal/page/portal/en/company_main/about_us

¹⁰⁶ Mangott, Gerhard and Westphal, Kirsten, "The Relevance of the Wider Black Sea Region to the EU and Russian Energy Issues", In *The Wider Black Sea Region: strategic, economic and energy perspectives*. Washington, D.C.: Center for Transatlantic Relations, Johns Hopkins University, 2008

¹⁰⁷ Umbach, Frank. "The Black Sea region and the Great Energy Game in Eurasia." In *The Eastern Partnership in the Black Sea Region: Towards a new synergy*. Warsaw: Centre for European Studies, 2011. 55-81

Figure 9 US gas imports dynamics 1990-2035



The independence of the North American market means that a potential cartelization of the European and Asian markets will not have a direct influence on Henry Hub prices. On the contrary, it seems more likely that Canada and the US (in the case it becomes a net LNG exporter) will reorient their supply to the EU and East Asia in attempt to capture price differentials. In addition, Canada is a strategic ally of the US that is usually accommodating its foreign policy with the prerogatives of Washington. The US has opposed the creation of natural gas cartel ever since the negotiations with Algeria in the early 1980s.

Similarly, Norway has shied away from any proposals for natural gas market coordination. Although the Scandinavian country supplied 19.5% of EU's total annual consumption and 26% of total gas imports, it has not tried to pressure European customers to accept the oil-indexation formula.¹⁰⁸ On the contrary it has accepted the spot market conditions dominating the Northern European hubs competing on par with British and Qatari LNG. Norway could potentially benefit from a collusive agreement with Russia and Algeria to maintain oil-indexation, and thus high prices in Europe. Yet Norway values its close political relations with the EU more than its purely commercial interests. Norway is a member of the European Economic Area (EEA) and currently applies EU's *acquis communautaire*, which includes all the European policies on competition. In that sense, Norway will aim to adopt all the measures of the internal gas market regulations, which over the last two decades have paved the way to full gas market liberalization. By aligning itself strategically with the policy of the EU, Norway preserves its most important trading

¹⁰⁸ Author's calculations based on data from EU's statistical agency – Eurostat and BP

partner accounting for 78% of the country's total exports and 95.8% of all natural gas trade.¹⁰⁹

The case of Australia and the two large Southeast-Asian LNG exporters is a bit different. They stand to lose a lot more from cartelization of gas markets than any other player. Their combined share of LNG exports in 2011 stood at close to 27%, and they were the single largest LNG exporters behind Qatar.¹¹⁰ Australia is poised to become the largest LNG exporter in the world by 2017 adding 166 bcm of liquefaction capacity.¹¹¹ Yet it will have to face increasing price competition not only from Qatar, but also from Indonesia, Malaysia and Papua New Guinea. The latter three are also trying to expand their LNG export capacity despite growing domestic gas demand.¹¹² Since cartelization would mean a cut in capacity growth and restricted output, these producers will avoid becoming members of any collusive agreement. On the contrary, they would try to dump their additional supply taking advantage of higher Asian prices. The demand has to stay substantially loose to allow Russia and Qatar to act as swing producers and drive out fringe suppliers with lower prices.¹¹³ In addition, as in the case of Canada and Norway, these Asian producers are part of the strategic architecture of the US. Australia is a part of the ANZUS (Australia-New Zealand-US) defense treaty and also is a key country in the American *Pivot to Asia*. Although the US does not have an official security treaty with Indonesia and Malaysia, strengthening of bilateral military cooperation and US increased involvement in Asian-Pacific affairs have de-facto spread US security umbrella over most of the region.¹¹⁴ Chinese expansionist posture in the South China sea and around the Strait of Malacca (one of the most important oil and LNG tanker chokepoints) have pushed many of the countries in the region to seek strong military ties with the US, which they perceive as the only power that can contain China. Global cartelization of natural gas, which is a crucial commodity in the economic development of the whole region, is against the security interests of the US.

¹⁰⁹ "Norway: EU Bilateral Trade and Trade with the world", European Commission, DG Trade report, November 29, 2012

¹¹⁰ Author's calculations based on data from BP, Ibid

¹¹¹ "Gas: Medium Term Market Report 2012", IEA, 2012, 14

Ibid, 114

¹¹² Ibid, 124

¹¹³ One concern about the Australian gas industry is skyrocketing development costs of the expensive coal-bed methane reserves, as well as high capital costs for liquefaction plants. Future Australian LNG projects rely on Asian LNG prices to remain as high as today, which is unlikely as most of the new LNG exports have been earmarked to Asia and because of potential Russian, Turkmen and Kazakh exports flowing to the biggest demand centers - China and Japan.

¹¹⁴ Jonas Parelló-Plesner, "What is Europe's Role in Asia-Pacific?", European Council on Foreign Relations, March 11, 2013

6.0 The Domestic Level

Explaining the domestic organization of the natural gas market is crucial if we want to analyze why a gas-OPEC could not exist at least in the short-term. While energy is very much related to security on the international level as producers may extend energy cooperation to security issues in order to counterbalance advances by a global hegemon (origins of OPEC) or to a regional threat, energy in producing countries is also often directly connected with internal security. The political legitimacy of regimes depends widely on the extraction of vast oil rents that can be used for economic development. This serves to unite often polarized societies with blurred ethnic or religious borders. That is why many of the petroleum-exporting countries have nationalized their oil industries, which has brought enormous amount of wealth to the state and has alleviated poverty by direct social spending programs. As a result, regimes, often on shaky democratic grounds, have been consolidated.

Since OPEC has functioned on an intergovernmental level, the creation of national oil companies has been seen as a crucial ingredient to the creation of a new energy cartel. Based on the theory of New Institutional Economics (NIE), applied to the nature of the natural gas market, one cannot provide adequate answers to investment, production and resource allocation decisions using only the postulates of neoclassical economics.¹¹⁵ In fact, a country, which nationalizes its gas industry would most probably make suboptimal production and investment choices, but would tie its energy policy to other political and security issues, so that producer-consumer relations do not correspond to *pareto efficiency*. Cartelization is one aspect of such shift in policy, in that it attempts to maximize producer surplus at the expense of consumers. In addition, the interdependency between economic growth and energy revenue makes cartelization among national oil and gas companies (NOGCs) and not between private producers vital for successful cooperation.

However, nationalization as a strategy for the domestic organization of the gas industry has simultaneously many drawbacks that ironically could compromise an effective cartel. Deficiencies in domestic energy policy and resource allocation have a direct impact on the sufficient market conditions for implementation of a global cartel. These include excessive energy intensity, rising energy consumption and natural gas price controls, which can all diminish the potential of a country to maximize its export output, expand its production capacity and invest in new infrastructure and technology.

¹¹⁵ Van der Meulen, Evert F., "Gas Supply and EU-Russia relations", *Europe-Asia Studies*, Vol. 61, No. 51, July 2009

Williamson, O.E., "The New Institutional Economics: Taking Stock, Looking Ahead", *Journal of Economic Literature*, 38, 3

6.1 Domestic Organization and the rise of neomercantilism in Russia

Similar to OPEC, the GECF is dominated by countries where the state owns a majority stake in the gas production capacity. There are only three exceptions: Nigeria, Equatorial Guinea and Trinidad and Tobago, which are though relatively small gas exporters selling around 62 bcm per year of LNG to world markets. The three largest gas exporters in the Forum, Russia, Qatar and Algeria are dominated by state-owned companies both in the upstream, transportation and downstream sectors.¹¹⁶ The dependence of the country's economies on energy revenue (incl. from natural gas) has meant that the government is using its political power in influencing the management of the natural gas sector.

It is important to consider Russia as a case in study because the country has the biggest potential of becoming a swing producer in a natural gas OPEC. Russia is also a clear example of the trends in the organization of the industry that take place in the majority of the natural gas producers part of the GECF. This includes the role of the national gas company in the domestic political life and its importance for the determination of the country's export policy.

When Vladimir Putin became President in 1999, energy markets began tightening, which meant that Russia was suddenly flooded with revenue. Putin decided that one of the conditions for Russia to escape the economic crisis of the 1990s is to nationalize the energy resources of the country. The takeovers of the largest private oil company, Yukos, and the gas giant, Gazprom, quickly followed. By 2005-2006, the Russian state had increased its share in the largest gas company, Gazprom, to 50.002% gaining the controlling package. Gazprom produces 84 % of Russia's natural gas output (509.54 bcm in 2010) and has become a financial giant that accounts for 25% of Russia's tax revenue.¹¹⁷ Gazprom serves as a monopoly that not only sets prices, but also has monopoly over the transit of gas to foreign destinations. The company is the sole owner of the whole transmission system under the subsidiary, Transneft. The other private gas companies such as Novatek, are not able to acquire any stake in the pipeline network making it practically impossible to negotiate export deals. This makes Gazprom extremely powerful for promoting Russia's economic and political goals abroad.

The consolidation of the gas industry in state's hands made Gazprom a political tool for the rise of Russia as an energy superpower. Gazprom's monopoly on supply to the CIS countries and most of Central Europe has been used by Russia as a political leverage. Under the chairmanship of Alexei Miller, close ally to Putin from their years in the St. Petersburg mayor's office, Gazprom has extended its influence in the post-Soviet states by

¹¹⁶ The companies are Gazprom, Qatar Petroleum and Sonatrach respectively.

¹¹⁷ Skuta, Alexander, "The European Vector of Russia's gas strategy", ECOM Publishers, 2008, 25-26

raising the traditionally subsidized gas prices in the region using that as a strategy for acquiring the gas transportation network abroad. The next step was the acquisition of the major gas companies in the CIS (Commonwealth of the Independent States). In the case of Armenia and Belarus, Gazprom threatened to increase prices by more than 100 % if they do not agree to transfer a substantial share of the states' gas companies to the Russian monopolist. In November 2011, Gazprom bought up the transit pipelines through Belarus worth \$2.5 billion in exchange for lowering prices to \$125 per 1000 cu/m.¹¹⁸ Even more worrying is the experience of Ukraine. On two occasions gas supplies were cut due to price disputes. In January 2009, the cut in the gas transport network caused enormous distress to the EU as most of the natural gas passes through Ukraine on its way to Western Europe. More recently after winning the Ukrainian presidential election in 2010, Victor Yanukovich struck a deal with Russia to lower the price of gas in exchange for leasing the Crimean military base at Sevastopol to Russia. The result was a political crisis and upheaval in parliament, where opposition was throwing eggs and tomatoes at the chairman of the Ukrainian *Rada*.¹¹⁹

Against this background, the Russian state has tried to increase the power of Gazprom in the international gas market by directly negotiating with Algeria, Iran, Venezuela and Qatar for the creation of a gas-OPEC. Opposition from Qatar and low export potential in Iran and Venezuela jeopardized Putin's efforts. His appeal that gas prices are too low and they do not reflect the relative bargaining position of producers vis-à-vis consumers has fallen on deaf ears. President Putin also unsuccessfully negotiated the formation of an energy alliance with the Central Asian producers to coordinate transportation policies.¹²⁰ Hence, Gazprom has gone on an individual crusade of monopolizing the European gas market. Its efforts, though, have bounced back. The company has lost its reputation as a reliable supplier and has pushed the European Commission to start legal proceedings against the company in all the member-states where Gazprom plays a dominant role. Effectively, Gazprom's shares have plummeted from as high as \$16 in 2008 to a little more than \$4 today.¹²¹

Paradoxically, state ownership of Gazprom has strengthened neither the domestic nor the external influence of the company. As domestic prices have remained artificially low (to be discussed in more detail in the next section), Gazprom has turned to the export markets to compensate its domestic losses. Yet as we mentioned before foreign markets have dried up recently on the back of substitution effects (based on high gas prices) but also due to Gazprom's negative reputation. Governments in Europe are simply wary of depending on only one supplier, whose relations with its neighbors, compromise energy security. Still

¹¹⁸ Kimball, Spencer, "Russia gains control of gas pipelines in Belarus", Deutsche Welle, November 25, 2011

¹¹⁹ Levy, Clifford, "Ukraine passes a deal under a hail of eggs", *The New York Times*, April 27, 2010

¹²⁰ Marshall Goldman, *Petrostate: Putin, Power, and the New Russia*, Oxford University Press, 2008, 164

¹²¹ "Russia's wounded giant", *Economist*, March 23, 2013

Gazprom has bet everything on the EU market. Its investment program to 2030, worth between \$560-590 billion aims to raise total gas output above 900 bcm, the majority of which is already earmarked for Europe.¹²²

Table 4 Natural Gas investments in Russia up until 2030

Project	Goals	Implementation	Investment (bn USD est)
Yamal	Compensation of decreasing volumes at maturing fields	2015-2030	150-170
Shtockman	LNG supply to EU/US	2017-2018	25-30
North Stream	Route Diversification - EU	2011-2012	12-14
South Stream	Route Diversification - EU	2013-2015	34-35
Eastern Gas Program	Gasification of Siberia/China export	2015-2030	80-90
Total			560-590

Source: Variety of sources

However, if the European demand does not tighten, it is hard to see where the additional output will go. It is also difficult to justify the construction of new pipeline routes to the EU if the Union is searching to diversify away from Russia. In addition, the development of the giant Shtockman and Yamal gas fields depends on foreign investment and technology. Low export prospects amid an international gas glut pushed Statoil and Total out of Shtockman, while the Yamal program has been at least temporarily halted.¹²³ Foreign mistrust in the intentions of the Russian state is another reason for the pull-out of foreign majors. The rise of Putin has undermined the security of foreign gas investments in the country. After successfully developing the gas reserves on the Sakhalin peninsula, Royal Dutch Shell was allegedly pressured to sell its controlling stake in the project to Gazprom under a dubious claim for environmental damage.¹²⁴ The more recent takeover by Rosneft of the BP share in the third largest oil producer TNK-BP has strengthened the infamy of Russia's business climate. Thus, contrary to the logic, centralization of the gas industry has slashed Gazprom's potential output, which in turn diminishes the prospects of Russia becoming a swing producer able to influence world prices by shifting output.

6.2 The economic constraints on the export potential

Most of the members of the GECF are also some of the largest oil producers in the world. Until the 1980s the production of natural gas was considered only a by-product of

¹²² Yulia Grama, "The Analysis of Russian Oil and Gas Reserves", International Journal of Energy Economics and Policy, Vol. 2, (2), 2012, 82-91

¹²³ Ibid

¹²⁴ Terry Macalister and Tom Parfitt, "\$20bn gas project seized by Russia", the Guardian, December 12, 2006

the oil production without major use outside the EOR reinjection technology.¹²⁵ However, the rise of environmental policy prompted the rise in natural gas demand for the power generation sector. Among the consumers, the biggest increase was in the European countries. Producers, on the other hand, also decided to switch from oil and coal to natural gas for the fuel of choice in the power plants. The goal has been to maximize oil output for exports. However, the fast pace of economic growth over the last 15 years has led to uncontrolled increase in energy consumption on the back of high energy intensity, low levels of efficiency and expanding industrial production especially in energy-related products.

Natural gas consumption in the GECF members has increased by 6.0% per year on average between 2001-2011 contributing in some countries like the UAE, Venezuela and Iran to massive shortages.¹²⁶ The largest increases in gas demand were visible in Qatar, Iran, Egypt, the UAE, Trinidad and Tobago and Venezuela. The Russian Federation has remained the second largest gas consumer in the world only trailing the US, even though the Russian economy is roughly 1/8 of the American. Russia's gas consumption grew annually by 1.7% between 2001-2011 reaching 424 bcm in 2011. Up until now, gas production has kept up with overall demand but low incentives to supply the domestic demand have exposed weaknesses in Russia's gas system. In the harsh winter of 2012, Gazprom suddenly decreased gas supply to Europe diverting larger volumes to its domestic consumers as shortages began to appear.¹²⁷ Part of the explanation is that natural gas constitutes more than 50% of Russia's total primary energy supply (TPES) on the back of rising gasification (62% in 2008) and gas use for electricity generation.¹²⁸ In its international energy outlook from 2010, the IEA projects Russia's gas consumption to be between 503 and 522 bcm by 2030, while the gap between consumption and production remains almost the same.¹²⁹ The consequence is that Russia will not be able to significantly raise its net exports in the next two decades undermining its ability to compete for market share of the growing Asian demand. The maintenance of spare capacity will remain almost impossible limiting Russia's market power.

¹²⁵ EOR reinjection refers to the process of reinjection of the natural gas associated with oil production in the oil fields to keep the pressure constant and prevent or delay the natural decline of the fields.

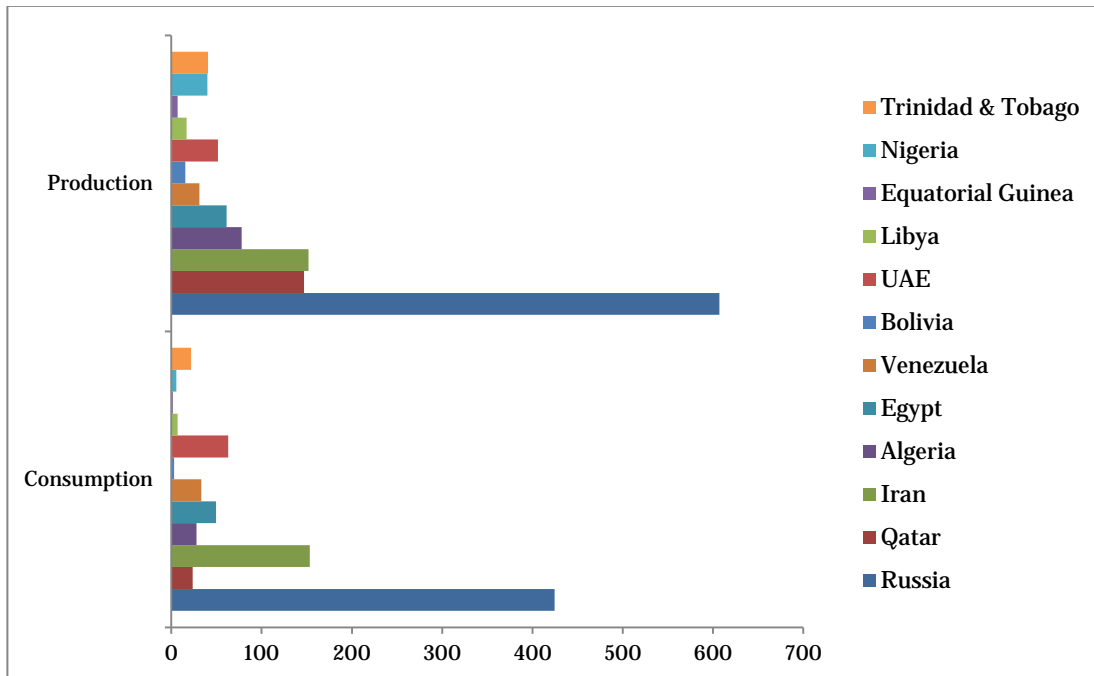
¹²⁶ The figure does not include Nigeria, Bolivia and Equatorial Guinea but their gas consumption is relatively low and has generally followed similar growth patterns.

¹²⁷ Guy Chazan, "Italy hit by shortage of Russian gas", Financial Times, February 6, 2012

¹²⁸ Sergey Paltsev, "Supplementary Paper SP 3.1: Russia's Natural Gas Export Potential up to 2050", Massachusetts Institute of Technology, Cambridge, 2011

¹²⁹ International Energy Outlook 2010, IEA, 2010

Figure 10 Natural gas balance in the GECF in 2011 (bcm per year).



Source: BP, IEA, EIA and domestic statistics

The problems with excessive natural gas consumption are even more pronounced among the MENA members of the GECF. The natural gas balance reveals that in all of the GECF with the exception of Qatar, Algeria and Nigeria, domestic natural gas consumption takes up a significant portion of the production decreasing the export capacity of that country. In fact, the UAE recorded an 11 bcm gas deficit in 2011 meaning that it had to actually import gas to satisfy its domestic consumption despite its position as an LNG exporter. Iran holding close to 16% of world's gas reserves is also regularly a net gas importer. Egypt, which more than doubled its gas output in the past 6-7 years on the back of new offshore reserves in the Mediterranean Sea saw its gas consumption grow by 8.8% on annual average since 2001 engulfing most of the country's export potential. Qatar and Algeria, which are respectively the second and third largest gas exporters in the Forum have also faced spiraling gas consumption but this has not compromised their export capacity until for now at least.

However, the future may present energy challenges even to these two producers. Qatar has imposed a moratorium on the exploration of the North Field and has only 16 bcm of additional LNG capacity planned until 2017. After climbing strongly in the 1990s, Algerian gas production plateaued in the 2000s and has actually started declining after the onset of the global economic crisis. The expected growth in economic activity and the

population bulge in the Maghreb are likely to sustain the increase in natural gas consumption over the next decade. For Algeria to continue to play the role of the third largest gas exporter to the EU, it would need to significantly boost its production potential.

6.3 Fiscal and price distortions

Some of the cases' wasteful natural gas consumption has been caused by a number of factors including economic and population growth, energy intensity, share of natural gas in the heating and power generation, industrial base, etc. However, an important factor has also been the role of the government in maintaining domestic gas prices artificially low. Gas pricing regimes in most GECF countries heavily subsidize residential and industrial prices to keep them close to cost-of-production levels without allowing for adequate returns on investment. As most natural gas in MENA, especially, is associated, once the capital infrastructure is in place, the production cost of each additional unit of gas is nearly zero. Therefore, there is no price support given in the provision of natural gas inputs to either the industrial or power generation sector as the average price, in the Gulf, for example, averages USD 1.50 per MMBtu. But as domestic demand rises, countries have to facilitate the discovery of new reserves, which requires additional investment with a concordant increase of production costs. These are not reflected in overall domestic gas prices across the region. Hence, non-associated gas production cannot start unless supply prices rise to USD 4-6 per MMBtu.

Table 5 The role of energy subsidies in the fiscal balance of selected gas producers

	Total energy subsidies	Share of gas	Total subsidies	Fiscal balance
	(USD bn)	(%)	(% of GDP)	(% of GDP)
Algeria	10.6	-	6.6	-1.1
Libya	4.2	4.2	5.7	8.7
Egypt	20.3	20.3	9.3	-8.1
Qatar	4.2	4.2	3.2	2.9
UAE	18.2	18.2	6	-1.1
Iran	80.8	80.8	22.6	1.7
Nigeria	2.9	N/A	1.3	-8.5
Russia	116	62.5	6.2	0.8
AVERAGE	32.2	31.7	7.6	-0.6

Source: IEA and IMF

Yet, regulated energy prices (natural gas inputs and power tariffs) in the MENA region have an important role to play, in the sense that there is a strong political logic that undergirds them, both in the social welfare sense as well as the broader macroeconomic sense. The objectives behind such policies are manifold. They range from extending energy access to rural and impoverished areas, stimulating economic diversification and industrialization, providing price and volatility protection to certain economic classes, as well as serving as a redistributive mechanism, an important part of the social contract.

However, energy price support mechanisms and governmental funding have a distortive impact on the economy. They not only remove the incentives to develop a new resource base, but also lead to wasteful consumption. Natural gas subsidies, in addition, constitute 31.7% of total energy support mechanisms. The latter, on the other hand, make up on average around 8.5% of the GDP of selected producers in the GECF. Only Russia and Iran spend close to \$200 bn on energy subsidies every year despite the attempt of both countries to fix the situation.

6.4 Price liberalization

The reform of the pricing structure is crucial if we are to see GECF members increase their production capacity, and thus export potential. In most countries, this means a return to an export netback parity pricing, in which national gas companies sell gas to their domestic consumers at a price equal to the export price.¹³⁰ In Russia like in most other gas-producing countries the attempt at price liberalization has usually been successful. While part of the explanation comes from the lack of political will to challenge the issue at the expense of lower popular support, it is important to know that there have also been structural factors preventing price increases including volatile oil prices and exchange rates.¹³¹ From 2006 to 2011, the Russian government increased domestic gas prices by 15-27% annually, but domestic gas prices are still 42% below the current netback target imposed by the Russian government.¹³²

¹³⁰ Henderson, James, "Domestic Gas Prices in Russia – Towards Export Netback?", The Oxford Institute for Energy Studies, November 2011

¹³¹ Ibid

¹³² Ibid

Table 6 Domestic gas prices among the largest gas producers

Country	Price (USD/MMBtu)
Saudi Arabia**	0.75
Qatar	1
UAE	1
Iran*	0.15
Algeria	0.6
Egypt	3
Russia	2.54

*Before the reform of 2010
 ** Saudi Arabia is a potential member of the GECF

Iran has also attempted a major price liberalization program since 2010. The scheme includes the raising of domestic gas prices to between 65-75% of the export price.¹³³ Indonesia, which used to be a member of the GECF, has also instituted a natural gas subsidy reform.¹³⁴ Indonesia, a country with a significant amount of poverty, was able to successfully institute reform by the creation of a compensatory policy of direct cash disbursements to poorer social strata. This Cash Assistance Program allowed Indonesian authorities to ease introduction of energy price reform and successfully countered social and political opposition.¹³⁵ Since then high gas consumption rates have been arrested, while natural gas production has been stimulated further expanding the export potential of the country.

Oman is another case example for a successful reform. The government approached the industrial users of natural gas and explained that the sales prices have to reach cost-of-production to sustain domestic consumption and to increase exports. Higher domestic prices, on the other hand, allow the development of unconventional gas reserves that can improve the gas balances of some of the largest gas producers. The UAE could benefit by tapping into its large sour gas reserves, while Algeria is heavily promoting its shale gas

¹³³ Darbouche, Hakim, “Issues in the pricing of domestic and internationally-traded gas in MENA and sub-Saharan Africa”, The Oxford Institute for Energy Studies, June 2012, 15

¹³⁴ Christopher Beaton and Lucky Lontoh, “Lessons Learned from Indonesia’s Attempts to Reform Fossil-Fuel

Subsidies”, International Institute of Sustainable Development, 2010, 11.

¹³⁵ Ibid.,23-27.

potential, which the EIA estimates at 7.08 tcm.¹³⁶ The Algerian NOC, Sonatrach, has realized that declining conventional gas output would compromise the country's position as the third largest gas exporter to Europe unless it finds viable substitution.

7.0 The Future of a natural gas OPEC

Natural gas is already becoming one of the most important fuels in the world energy mix. Its role is only bound to increase in the main demand centers of North America, Europe and Asia. The unconventional gas revolution has also undermined fears that we could be running out of sufficient resources to fulfill our future natural gas use. However, it will remain a fact that most of the gas reserves will be geographically isolated from the consumption centers. The concentration of natural gas in only few regions of the world would continue to create transportation dilemmas for exporters. Pipeline transportation will gradually lose its attractiveness due to high investment costs and inflexible contract terms. In exchange, liquefaction capacity is to grow by more than a third by 2018, most of which will likely be earmarked for export. The growth of LNG trade, though, will not necessarily solving the problems related to natural gas transportation. LNG and regasification facilities are still very expensive projects that require significant cooperation between producers and consumers.

In a period of unstable economic growth, divergent political objectives and environmental objectives the natural gas trade will face many obstacles. Hence, the emergence of an integrated global gas market in the medium-term is still questionable. In the absence of a world gas market, exporters will find it hard to coordinate output and trade policies, especially as they will try to secure long-term supply relationships for the additional capacities coming to the market. A gas cartel in the current form of the GECF is unlikely to come to existence because exporters fear the loss of their vital clients in the EU and Asia, and fringe suppliers enter the market more aggressively starting in 2015.

Potential swing producers like Qatar, Russia and in the distant future Iran and Venezuela will have to find a way to link regional markets under one unified pricing system. This could happen only if the demand elasticity of natural gas becomes fundamentally more inelastic making substitutability difficult and demand patterns more easily predictable. In a gas market with inelastic demand and few producers controlling the global trade, supply security will increasingly become the result of close coordination. The structural conditions for a collusive behavior will then emerge more clearly in the political arena.

¹³⁶ Benoit Faucon, "Algeria's New Hydrocarbons Law to Sweeten Terms For Non-Conventional Gas", Rigzone, August 2, 2012.

Meanwhile, an expanded version of the GECF including the largest gas exporters in the FSU and Saudi Arabia would provide a more substantial reserves and export base for output coordination. Saudi Arabia, for example, holds 3.9% of global conventional reserves with an additional enormous unconventional potential. The kingdom is also one of the largest gas producers in the world with total output reaching almost 100 bcm in 2011. However, as of now, the Gulf country consumes 100% of its gas in the power generation and EOR sectors. Saudi dependence on natural gas for the satisfaction of domestic energy needs has compromised the country's ability to export on the world market. If export potential is boosted, Saudi Arabia could easily become one of the main partners in a gas cartel similar to its role in OPEC.

Yet even if we have all the structural prerequisites in place, political relations can still come in the way of a successful gas cartel. Divergent political objectives between the major players could cause rifts in any form of cooperation, but even more so in the energy sector, which is so vital for the economic and political stability of the majority of gas producers. The intersection between strategic objectives, domestic stability and economic development creates the basis for intense competition.

The mistrust stemming from this dynamics debilitates the institutionalists' idea that regimes embodied in an international organization can eliminate common differences between nations and facilitate cooperation. The cheating problem is already visible in the inability of GECF members to coordinate their contract policies vis-à-vis consumers, even though there is an agreement in principle between exporters. Qatar, Nigeria, Egypt among others are happy to deliver LNG to Western Europe on a spot-pricing basis as long as they have their total gas supply earmarked for sale. Coordinated output decisions will be even harder to negotiate as potential losses for the largest exporters may put the whole industry at risk.

In the end we should not underestimate the ability of some gas producers to use their resources as a political leverage. With the rise of an integrated global gas market in the future, security of supply will become critical as shortage in natural gas could potentially have a disastrous effect on the world economy similarly to the effect of oil in the 1970s. The tightening of the market can motivate gas exporters to overcome differences in strategy and try to build a more manageable gas alliance. This would require a common position from the two potential swing producers – Russia and Qatar. A geopolitical shift away from a GCC-US alliance on the latter's part and strengthening of the domestic gas fundamentals of the former are only part of the vital prerequisites for successful cooperation. The result could be the transformation of the global gas market along the lines of a dominant firm structure.

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