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Introduction From The Conference Conveners

Dear colleagues,

It is our pleasure to release the proceedings of the second meeting of the Brookings Doha Energy Forum, a platform intended to foster debate, dialogue, and outcome-oriented research around some of the major geopolitical trends of the 21st century. In its inaugural meeting in 2012, the Brookings Doha Energy Forum focused on how new demand centers in South and East Asia and a leveling out of demand in the United States and Europe have tilted the global energy landscape eastwards, giving increasing market power to emerging economies. This year, the Forum focused specifically on the dramatic shifts underway in global natural gas markets.

Over the next decade, the international gas market is likely to see a large shift in both supply and demand as the shale-gas revolution in the United States reduces its exposure to international gas markets and as new and growing gas consumers in South and East Asia – and in the Middle East itself – continue to emerge. New discoveries of gas in Australia and East Africa promise to add to the global supply of liquefied natural gas (LNG), while the unconventional gas revolution in the United States looks likely to turn the world's largest consumer of gas into an exporter. Growing gas consumers such as China and India, which are seeking to replicate the United States' success in shale gas production themselves, will face increased global competition. Among those competitors are former LNG exporters Indonesia and Malaysia, now preparing to import LNG to meet growing domestic demand. Meanwhile, the Middle East – home to the world's largest producer of liquefied natural gas and a growing demand center itself – is poised to be at the center of the shift in global gas markets.

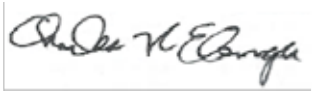
These systemic shifts are taking place against a backdrop of rapid and dramatic political change in the Middle East. The combination of global structural shifts and local political transitions has the potential to fundamentally transform the global politics of gas – and energy more broadly – as well as the role of the region. These shifts give rise to a number of critical questions:

- What will be the strategic and economic implications of the rise of unconventional gas?
- How are perceptions of natural gas evolving, especially in the Middle East?
- How are domestic subsidies driving gas supply and consumption, and how can these subsidy regimes be reformed?
- How will the evolving global gas market drive competition for energy investment?

The 2013 Doha Energy Forum convened prominent industry experts and policymakers from Asia, the Middle East, Europe, and the United States for an in-depth strategic dialogue on how these issues are changing the global energy landscape. The two-day meeting, which was opened by His Excellency Sheikh Hamad Bin Jassim Bin Jaber Al Thani, former Prime Minister and Minister of Foreign Affairs of Qatar, provided an opportunity for an open dialogue on the changing global natural gas landscape, the impact of a revolutionary Middle East on global energy markets, and the future of natural-gas related investments in the Middle East. The findings of the conference are reflected in this report.

The Brookings Doha Energy Forum relies on the expertise and support of stakeholders in the public and private sectors, both in the Middle East region and in the broader international community. We look forward to working together within Brookings and with our partners to ensure the continued success of this project.

Sincerely,



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The Changing Global Gas Landscape

CONTEXT

In 2011, the International Energy Agency (IEA) suggested the world was entering a "golden age of gas." Even before the widespread commercialization of technologies such as hydraulic fracturing and horizontal drilling that unlocked vast new quantities of shale gas, the global energy sector was anticipating a rise in the proportion of natural gas. In 2005, the IEA had forecasted that "gas will overtake coal by around 2020 as the world's second-largest primary energy source," with demand growth led by the emerging Asian economies.[1] In the wake of the unconventional gas revolution in the United States and the potential for a wider diffusion of unconventional production techniques; the discovery of large offshore deposits of gas in new regions; and the role of gas in putting the global economy on a lower-carbon development pathway, the prospects for the fuel look to be even brighter today. However, the geopolitical implications of the "golden age of gas," underpinned by these shifts in market characteristics, are still unclear. The uncertainties include the prospects for developing the new reserves around the world and the outlook for natural gas trade and pricing.

PRINCIPAL FINDINGS

The U.S. shale gas revolution has transformed the global gas market.

At the forefront of the change in international gas markets is the dramatic transformation in the U.S. natural gas sector. The United States had been expected throughout the 2000s to be a major importer of liquefied natural gas (LNG) to meet growing demand. Instead, it is now facing the prospect of being an LNG exporter as a result of the shale gas "revolution," which has seen the United States increase natural gas production by roughly 20 percent between 2008 and 2012.[2] This shift has not only been important for the United States, but also for European and Asian gas importers who now look to benefit from greater supply. These changes in new supplies – either displaced volumes from the United States or new supplies from conventional and unconventional sources – have altered the appeal of natural gas to consuming nations, many of which had already been planning on increasing the share of natural gas in their domestic energy mixes. The environmental benefits of natural gas have served to spur consumption even further.

New reserves of gas are being found around the world and are driving optimism about the fuel's future.

While the shale gas "revolution" in the United States has been the most prominent development in the sector in recent years, U.S. shale gas is estimated to account for around only ten percent of global reserves that could total as much as 6,622 trillion cubic feet (tcf).[3] According to many gas-sector analysts, the greatest potential lies in shale reserves elsewhere in the world – most notably China, which is estimated to have over 1,200 tcf of technically recoverable shale gas resources, the largest global reserves. Other nations

[1] "World Energy Outlook: 2005," International Energy Agency, 83.
[2] Data according to the U.S. Energy Information Administration.
[3] It is important to note that the EIA's study was not a global assessment and only looked at 14 regions outside the United States. See "World Shale Gas Resources: An Initial Assessment of 14 Regions Outside the United States," Energy Information Administration, U.S. Department of Energy, April 2011.

are also estimated to have significant shale gas potential, including Argentina (774 tcf), Mexico (681 tcf), and South Africa (485 tcf).[4] Smaller reserves found in a number of European countries have also received attention for their potential geopolitical implications. Countries like Poland (187 tcf) and Ukraine (42 tcf) have traditionally been dependent on Russia for supplies of natural gas, but successful development of domestic shale reserves could reduce the continent's gas-driven economic and political dependency on Russia.

Geopolitical considerations have also generated optimism for gas reserves found in the waters of the Eastern Mediterranean Sea. In March 2010, the United States Geological Survey assessed the gas potential of the Levant Basin – which includes the waters of Israel, Lebanon, and Syria – at 112 tcf.[5] Cyprus and Turkey also have the potential to become large producers.

East Africa is also seen as a new frontier: Mozambique and Tanzania could hold as much as 120 tcf in offshore recoverable natural gas reserves.[6] Numerous companies have arrived in recent years to exploit these resources with an eye to building LNG export facilities. U.S.-based Anadarko Petroleum, Italy's ENI, and Norway's Statoil are among the companies looking to develop liquefaction capacity in either Mozambique or Tanzania. Initial estimates suggest that the two countries could be exporting between three and four billion cubic feet per day (bcf/day) by 2025.[7]

Thus, the potential for shale gas reserves around the world, new conventional discoveries in locations like the Eastern Mediterranean and East Africa, and other opportunities – such as coalbed methane (CBM) in Australia or gas reserves in the Arctic – are all driving the discussion around the "golden age of gas." The supporters of natural gas as an up-and-coming fuel see a bright future ahead.

Despite the enthusiasm, there are considerable uncertainties regarding the scale of new resources and how fast they can be developed.

Despite this promising outlook, large uncertainties still exist at the logistical level: the economics of deepwater projects, the sustainability of U.S. shale production, and the replicability of the shale revolution elsewhere in the world are all open to question. The shape of the global gas market is also subject to policy measures that have yet to be determined. A range of policy decisions – from regulations on hydraulic fracturing in the United States, to decisions on the future of civil nuclear power in Japan, to negotiations on climate change measures – could have a significant impact.

The supporters of natural gas as an up-and-coming fuel see a bright future ahead.

A clear example of the economic uncertainty of some projects is demonstrated by the Shtokman natural gas project being developed by Gazprom of Russia and Total of France. Owing to high costs and dramatic changes in the global natural gas landscape, the project, which planned to export gas from the Shtokman field in Russia's Arctic waters both via pipeline and LNG, has seen delays to the final investment decision.[8]

[4] Ibid.
[5] "Assessment of Undiscovered Oil and Gas Resources of the Levant Basin Province, Eastern Mediterranean," United States Geological Survey, U.S. Department of Interior, March 2010.
[6] David Ledesma, "East Africa Gas – Potential for Export," Oxford Institute for Energy Studies, March 2013, <http://www.oxfordenergy.org/wpcms/wp-content/uploads/2013/03/NG-74.pdf>.
[7] According to Brookings analysis of company data and investor presentations.
[8] See Emily Gosden, "Gazprom Puts Giant Shtokman Russian Arctic Gas Project on Ice Over Costs," The Telegraph, August 29, 2012.

Concerns have also been raised regarding the timing of the development of East African gas. While the technical complexity of the projects is nowhere near that of Shtokman, policy and infrastructure constraints may delay production and eventual exports. The policy framework that governs oil and gas development in Mozambique is still nascent; in Tanzania, it is still under development.[9] As interest in both countries' reserves increases, so will domestic political pressure to extract rent from foreign firms looking primarily to export – such negotiations may create project delays. Moreover, the physical infrastructure to produce, process, and export the gas is lacking. Clear, consistent, and transparent regulatory and fiscal frameworks will need to be in place before these investments are made.[10]

Environmental policy in the United States is still in flux and may prevent America from emerging as a leading gas exporter.

The shale revolution in the United States also faces some uncertainties. While the reserves are large, some analysts cite concerns over the sustainability of production. Shale wells have very steep production decline curves, suggesting that a massive amount of wells will need to be drilled to maintain and increase production. Moreover, should the spread between natural gas and oil prices remain wide, rigs will continue to decline: the number of natural-gas-producing rigs in the United States is at its lowest level in more than a decade.[11] Offsetting these concerns, however, is the fact that new markets will develop for natural gas if the price spread between diesel and gas remains wide. Increased demand in transportation, railroad locomotives, and marine transportation will spur more drilling. Also, with one rig now able to drill many wells underground, the rig count is not always the best barometer of the actual amount of oil being discovered or produced.

The most notable concern over the rosy projections for gas consumption in the energy mix relates to the replicability of the U.S. shale revolution in other markets. A number of countries – from Poland and Ukraine to China and India – are keen on repeating the success of the United States in exploiting shale gas resources. A number of factors, however, stand to delay the near-term prospects for such developments: the diversity of geologic formations and the difficulty of obtaining geological data, as well as limited water availability; resistance to resource development in densely populated areas; and local regulatory frameworks that may not incentivize domestic production. Together, these factors suggest that while international optimism is in abundance, sober assessments are likely to be more accurate.

Finally, there exist a number of policy considerations in certain countries that will impact the natural gas supply and demand outlook. Environmental policy in the United States is still in flux and may prevent America from emerging as a leading gas exporter. Possible uniform standards for the fracking process may add to wellhead costs, reducing the economic case to export LNG. Stronger than expected regulations on the U.S. coal industry could accelerate the phase-out of old coal-fired power plants in favor of gas-fired generators. These plants are relatively

[9] Ledesma, "East Africa Gas," 31.
[10] See John Banks, "Could East African Gas Impact U.S. Liquified Natural Gas Exports?" Brookings Up Front blog, February 15, 2013, <http://www.brookings.edu/blogs/up-front/posts/2013/02/15-east-africa-liquified-natural-gas-banks>.
[11] "Crude oil and natural gas drilling activity," U.S. Energy Information Administration, May 31, 2013, <http://www.eia.gov/dnav/ng/ng_enr_drill_s1_m.htm>.

cheap and inexpensive to build and could act as another force against U.S. LNG exports. Internationally, the outlook for nuclear power – and its impact on gas demand – is still uncertain. This is especially the case in Japan, where the government is still considering the reintroduction of its fleet of nuclear power plants. Some analysts suggest that the difference between a full phase-out of nuclear power plants in Japan and the government adopting a policy of bringing back 60 percent of its nuclear capacity is about four bcf/day of LNG demand. Furthermore, there are now plans to phase out nuclear energy in Germany.

These lingering uncertainties may slow the rapid growth in demand for natural gas – particularly LNG. Over-zealous consumers could invest in infrastructure in expectation of a glutted natural gas market, only to discover that project delays have created a tight gas market.

Gas production and trade are likely to become more global in the coming years.

The unconventional gas revolution is not limited to the United States: Australia is rapidly pursuing development of its coalbed methane CBM resources, with China, India, and Indonesia not far behind. A number of other countries across Asia, Africa, Europe, and South America are also excited about the prospects for their own shale gas reserves. In Japan, the development of methane hydrates looms on the horizon. When coupled with large discoveries of conventional reserves in East Africa, the geographic dispersion of gas resources looks increasingly wide.

Another major trend is the forecasted growth in natural gas trade prompted, in part, by the discovery of these new conventional and unconventional resources. The IEA projects that between 2010 and 2035, international natural gas trade will grow by nearly 80 percent.[12] Perhaps more important is the changing nature of this trade: gas is traded increasingly via tanker in the form of LNG, unshackling many prospective consumers from dependence on neighbors for resources. LNG has grown to account for over 30 percent of total gas traded in 2011.[13]

Gas pricing regimes are evolving, led by Europe.

Much of the debate around natural gas markets and their prospects relates to possible changes to the pricing regimes that currently underpin global natural gas trade. The international gas market is currently defined by three distinct pricing regimes based on the major consumers of natural gas: North America, Continental Europe, and Asia. Prices in North America are determined at hubs and are traded at freely floating – or "spot" – rates. While the United Kingdom, through its National Balancing Point (NBP) trading hub, consumes natural gas at spot rates, Continental Europe employs a hybrid system, wherein natural gas is purchased both at the spot rates of a handful of European trading hubs and at prices tied to long-term contracts indexed to oil or oil products. Historically, the Asian market has been the least flexible market for natural gas imports, with the majority imports being tied to long-term oil-indexed contracts.

Gas consumers in both Europe and Asia are looking to move away from this rigid system. Since the 1980s, European consumers have argued that oil is not an appropriate commodity to which contracts should be indexed. While gas is an important fuel for power generation, many countries have diversified their electricity sector away from oil, owing to its cost and environmental footprint.

In Europe, an increasingly liquid natural gas market is putting added pressure on traditional oil-indexed arrangements. Stagnant economies and displaced LNG cargoes once destined for

[12] "World Energy Outlook: 2012," International Energy Agency, 146.
[13] "BP Statistical Review of World Energy: 2012," BP, June 24, 2012, <http://www.bp.com/content/dam/bp/pdf/Statistical-Review-2012/statistical_review_of_world_energy_2012.pdf>.

the United States have resulted in a gas glut in much of Europe. Eighty percent of all re-exported LNG cargoes – cargoes that were purchased by a country but not needed to meet domestic demand – came from Europe.[14] In addition to the availability of gas, low carbon prices have enabled coal to be a competitive fuel for power generation, further decreasing demand for natural gas (while increasing CO2 emissions).

As a result of this supply picture, European consumers are increasingly turning to the spot market for supplies of natural gas that are not covered under take-or-pay provisions (whereby the consumer has to either take delivery of the gas or pay for non-delivery). Consumers are then putting pressure on suppliers to abandon the oil-indexation terms of their take-or-pay commitments. Norway, which accounts for roughly one-third of Europe's natural gas imports, has already decided to revise the terms of its contracts to allow for greater exports of natural gas at spot rates.[15] Some analysts believe that gas purchased at spot rates will become the norm in European gas markets in the near future.[16]

A similar debate is developing in the Asian market. Technical and market realities, however, are not allowing for consumer leverage in pricing negotiations. Asian consumers are excited by, and have benefited from, growing natural gas production in the United States and an increasingly liquid LNG market. Japan's decision to shut down its nuclear power facilities in the wake of the nuclear accident at the Fukushima Daichi facility, however, has kept spot LNG cargoes well above prices seen in Europe. This shock occurred in an Asian market that lacks the pipeline options necessary to compete against the LNG market and that is seeing increasing demand from China and India.

Still, the entry of the United States as a potential exporter of LNG has many utilities seeking spot-market contracts from LNG suppliers. The two U.S. projects that have been approved to export LNG, the Sabine Pass and Freeport terminals, have signed many of their contracts on a Henry Hub-plus system. Henry Hub-plus pricing, whereby consumers pay a percentage over the gas' Henry Hub in addition to the costs of liquefaction and transportation, could undercut spot prices. Estimates suggest that LNG from Sabine Pass, which will start exporting in 2016, would arrive at Japan at between $11 and $12/MMBtu, slightly below the prevailing spot price of $15/MMBtu. Costs to India will be slightly higher owing to the additional transportation difference.

Consumers, particularly in Japan and India, are increasingly interested in the Henry Hub-plus model. However, many producers have questioned whether the economics of LNG projects allow for investment based on spot rate sales, citing the need for adequate revenue certainty before investing in multibillion dollar liquefaction facilities.

[14] "The LNG Industry in 2012," The International Group of Liquefied Natural Gas Importers (GIIGNL), April 2013, 9.
[15] William Powell, "Statoil Ditches the Theory, Beating Gazprom in Practice," Platts.com, February 18, 2013, <http://www.platts.com/newsfeature/2013/naturalgas/eu-gas/index>.
[16] Thierry Bros, "European Gas Outlook," Presentation to the EIA International Natural Gas Workshop, August 23, 2012.

CONTEXT

As the Middle East – and particularly the countries of the Gulf – experiences rapid demographic and industrial change, the provision of affordable, reliable sources of energy will be increasingly important in ensuring political stability and economic and environmental sustainability. As renewable energy applications continue to be developed, natural gas is the most practical near-to-medium-term alternative for power generation. However, many of the region's economies – including Kuwait, Saudi Arabia, and the UAE – are facing an acute shortage of gas. Despite the Gulf's vast endowment of natural gas, the distribution of those resources is uneven, and regional politics present an impediment to an efficient allocation of supply to demand: the region's largest reserves are held by Iran, whose relationship with the Gulf States is as fraught today as ever. With electricity demand rising at alarming rates, countries in the region are being forced to burn crude oil to meet it. The practice is costly in both environmental and economic terms, as oil revenue from international markets is foregone in favor of subsidized power production. Moreover, as Gulf states come to terms with this internal demand and its burden on their increasingly stretched fiscal budgets, questions about the viability of a social contract based on the rentier state will become ever more pertinent. Natural gas use is likely to play a large role in economic and political sustainability in the region. For it to do so, however, there will need to be reform in gas pricing in the region in order to attract the investments necessary for increased production.

Natural gas use is likely to play a large role in economic and political sustainability in the region.

PRINCIPAL FINDINGS

Demand for natural gas in the Gulf is outpacing domestic supply.

As home to the world's largest conventional natural gas field – the South Pars/North Field, which straddles the Qatar-Iran maritime border – and as a producer of large volumes of associated gas from its vast oil production facilities, the Gulf region is often regarded as being well supplied with natural gas. While it harbors over a quarter of the world's technically recoverable conventional natural gas reserves, however, the reality of gas supply and demand in the region is more complex.[17] With Iran unable to develop its energy resources because of strict international sanctions and Qatar content with its current levels of gas production for highly profitable export as LNG, additional production of the region's largest resource is unlikely in the near-to-medium term. While other neighboring countries have sizable endowments – Saudi Arabia is estimated to have 288 tcf of proven conventional reserves and the UAE is estimated to have around 215 tcf – these resources face economic, political, and technical obstacles to production.

According to the IEA, natural gas demand in the Middle East is projected to increase by more than 70 percent between 2010 and 2035.[18] While production is also projected to grow by the same proportion, around one third of that growth is expected to be from Qatar, which will export the vast majority of

[17] "World Energy Outlook: 2012," IEA, 134.
[18] Ibid.

it as LNG to customers outside the region. For countries within the GCC, the demand growth projections are even greater than those in the wider Middle East: according to Saudi Aramco, natural gas demand in Saudi Arabia is expected to almost double by 2030 from 2011 levels of 3.5 tcf per year.[19] Despite their huge reserves of natural gas, the UAE and Kuwait are already net importers.

Natural gas has long been used as an important component of oil production in the region through enhanced oil recovery (EOR). As conventional wells become increasingly depleted, the demand for gas to maintain production has increased over time. Simultaneously, as the region experiences rapid economic and demographic growth, natural gas is increasingly needed as both an industrial feedstock and as a source of power generation. The demand for natural gas in the latter sector is particularly acute: with electricity demand growth rates of around eight percent per year,[20] countries such as Saudi Arabia, the UAE, and Kuwait increasingly have to burn crude oil-based fuels for power generation at a huge opportunity cost.

Lack of development of the region's abundant natural gas resources has led to a situation in which several Gulf countries import LNG at global prices. There is even intra-regional LNG trade, with some Qatar-origin gas bought by Kuwait and Dubai. In the absence of new technological breakthroughs or policy incentives to develop their large gas reserves, the Gulf states face the prospect of scarcity in the midst of abundance with respect to natural gas.

There are significant obstacles to expanded production.

1. Historical Oil-Linkage and Perceptions of Natural Gas

For decades, major oil producers in the Gulf have either used natural gas as an input to industrial facilities co-located with oil production or simply flared it. According to the World Bank's latest data, Saudi Arabia was ranked ninth in the list of the top flaring countries between 2007 and 2011,[21] notwithstanding its desperate need for gas in the power sector. So long as countries in the region were able to meet their economic needs through rents from crude oil exports, natural gas was either an accessory to or a byproduct of the oil production sector. Moreover, with associated gas production directly linked to crude oil production, constraints on the latter – either in the form of physical limitations or OPEC quotas that limit the amount of associated gas that can be produced – put an upper bound on the amount of gas available. Now, with rapidly growing populations and a desire to diversify their economies away from raw material exports, the region's countries are now realizing the value of natural gas as a commodity in its own right. As the region enters a period of natural gas scarcity, new non-associated resources will have to be developed.

One of the principal challenges related to this new production is the perception of natural gas as a free byproduct of oil production. For many of the region's governments and national oil companies (NOCs), the concept of investing in capital-intensive upstream facilities and infrastructure for the dedicated

[19] "Saudi Arabia: Overview," U.S. Energy Information Administration, February 26, 2013, <http://www.eia.gov/countries/cab.cfm?fips=sa>.
[20] "Jeddah Needs Special Plan to Meet Electricity Demand," Arab News, March 25, 2013, <http://www.arabnews.com/news/445958>.
[21] "Estimated Flared Volumes from Satellite Data, 2007-2011," Global Gas Flaring Reduction, The World Bank, June 14, 2012, <http://web.worldbank.org/WBSITE/EXTERNAL/TOPICS/EXTOGMC/EXTGGFR/0,,contentMDK:22137498~menuPK:3077311~pagePK:64168445~piPK:64168309~theSitePK:578069,00.html>.

production and transportation of natural gas is a still a novelty. In the absence of investments in natural gas production and transportation, billions of dollars are being invested in other sources of power generation, including nuclear power in the UAE and solar power across the region.

2. Technical Complexity

As the pace of oil production growth in the region slows and existing oil and gas fields mature, countries in the Gulf are forced to look to non-associated gas resources. Much of this gas is difficult to produce due to its location (offshore) or its physical properties. A large amount of the UAE's undeveloped gas reserves, for example, are "sour," with high levels of sulfur. Saudi Arabia's efforts to augment its non-associated gas reserves have focused on offshore fields that are also thought to contain sour gas.[22] Kuwait Oil Company plans to use the development of its sour gas deposits to expand its production threefold by 2030.[23] Development of such resources requires large amounts of investment. In 2011, Saudi Aramco brought online the country's first non-associated gas field at Karan, a project that is estimated to have cost $8 billion. In the UAE, two major sour gas projects – the Shah and Bab fields – are being developed at a combined cost of around $20 billion. The complexity of the projects has also led the region's NOCs to open up the projects to participation from international oil companies (IOCs). (Occidental Petroleum partnered with the Abu Dhabi National Oil Company [ADNOC] on the Shah project, while Shell will participate as a minority partner in the Bab project.) This is a significant development, as IOCs have been traditionally excluded from the development of the region's upstream resources since the petroleum sector nationalizations of the second half of the 20th century.[24] The Bab agreement follows a 2010 "Enhanced Technical Service Agreement" that Shell signed with Kuwait Petroleum Corporation to provide technical as well as management assistance for the development of non-associated gas in the country.

In addition to the gradual relaxation of conditions for IOC participation in the conventional natural gas upstream sector, countries in the region are looking to international partners for the development of their unconventional resources. ADNOC has partnered with a number of IOCs, including BP, ExxonMobil, Shell, and Total in well tests to determine the effectiveness of hydraulic fracturing in the UAE. Oman's national oil company Petroleum Development Oman (PDO), meanwhile, has partnered with BP and Occidental to develop the country's light tight oil and shale resources. In Saudi Arabia, a number of oil service companies have established research centers to develop the technology needed to develop the Kingdom's own shale gas resources.

3. Subsidized Domestic Prices

In addition to the availability of gas and the perception of its value, the market conditions for investment in natural gas in the Gulf also inhibit its development. In all the GCC countries, electricity is subsidized for industrial and residential consumers. In the political systems of these states, subsidization of basic needs – including electricity and water – represents an integral part of the social contract; in the absence of a democratic system, it is

[22] "Saudi Arabia Analysis Brief," U.S. Energy Information Administration, February 26, 2013, <http://www.eia.gov/countries/analysisbriefs/Saudi_Arabia/saudi_arabia.pdf>.
[23] Wael Mahdi, "Saudi Arabia's Shale Plans May Be Slowed by Lack of Water," Bloomberg, March 3, 2013, <http://www.bloomberg.com/news/2013-03-12/saudi-arabia-s-shale-plans-may-be-slowed-by-lack-of-water.html>.
[24] While Saudi Arabia has entered into joint ventures with IOCs over the past 15 years, such arrangements were focused on exploration, rather than production of gas.

part of the governments' formula for legitimacy. With producers of natural gas unable to reap market prices for their product, there is reduced incentive to invest on the part of international investors. According to the IEA, gas prices in the region are often maintained at below-cost levels, "creating a vicious cycle with an artificially high demand without any driver to increase efficiency."[25]

The economic and job-creation effects of subsidized gas are open to question.

Natural gas is regarded as an important source of industrial competitiveness and job creation in the region. Several countries see the subsidization of natural gas to the industrial sector as a means of promoting higher value-added activities such as petrochemical production and energy-intensive manufacturing. In addition to its large LNG facilities, Qatar hosts the world's biggest gas-to-liquids plant. The UAE has invested heavily in the establishment of large aluminum and steel production facilities, which it continues to expand.[26] In Saudi Arabia, Saudi Aramco has partnered with Dow Chemical to build one of the world's largest petrochemical plants, which is scheduled to become operational in 2015. While low-cost natural gas is essential to the economics of such projects, the macroeconomic rationale for subsidizing natural gas – particularly in countries that face a shortage of the commodity – is questionable. By subsidizing gas that could be used to displace liquid fuels in the power generation sector (and free them up for sale on the global market), countries incur a large opportunity cost. Subsidized gas also leads to the crowding out of investment in other sectors of the economy.

A similar situation can be seen with regard to job creation. With rapidly growing populations and large amounts of young people entering the labor market, the countries of the GCC face an acute challenge in job creation. In the wake of the Arab Spring, governments in the region are acutely aware of the link between economic and political stability, and all of them have embarked on policies to diversify their economies away from overreliance on the export of raw hydrocarbons. However, the rationale behind the subsidization of natural gas as a means to create jobs through large, energy-intensive projects is subject to question. Such projects are generally capital – rather than labor – intensive. Instead of creating a large value chain requiring a skilled domestic labor force, the subsidization of natural gas tends to lead to rent-seeking in primary and secondary processes, which do not employ large amounts of labor.

Subsidy reform will be essential but difficult.

There is a widespread recognition that the energy subsidy regime in countries of the GCC and broader Middle East is unsustainable and in need of reform.

There is widespread recognition that the energy subsidy regime in the countries of the GCC and the broader Middle East is unsustainable and in need of reform. In the event that governments in the region decide to proceed with a subsidy reform program, there are many factors that determine the effectiveness of such policies. The first step in many cases is simply assigning a value to the subsidy. By comparing the subsidized price of natural gas with the price it would realize in the international market, governments can articulate the monetary cost of the subsidy regime. There is a widespread view that the implementation of subsidy reform should be preceded by a thorough communication strategy in which the

[25] "Medium Term Gas Market Report 2012," International Energy Agency, June 13, 2012.
[26] Stanley Carvalho, "UAE's Emal Plans Further Expansion to Meet Global Aluminum Demand – CEO," Reuters, May 7, 2013, <http://www.reuters.com/article/2013/05/07/emirates-aluminium-idUSL6N0DO20D20130507>.

timing and the scale of any changes are made explicit to the population. Other elements of best practice in a subsidy reform strategy include price increases that are phased-in over time; the improvement of efficiency in state-owned enterprises to reduce producer subsidies; and measures to protect the poor through targeted transfers.[27] However, while countries such as Jordan and Egypt have been forced to implement subsidy reform due to economic hardship, the Gulf countries have been able to defer addressing the issue in any meaningful way. Efforts to reform natural gas pricing in the region will be politically sensitive.

[27] For more information on best practice in subsidy reform, see the "Reforming Energy Subsidies – Summary Note," International Monetary Fund, <http://www.imf.org/external/np/fad/subsidies/pdf/note.pdf>.

Natural Gas and Investment in the Middle East Energy Infrastructure

CONTEXT

In order for the Middle East to develop its domestic gas resources and meet its economic and social needs, it will have to attract investment in complex fields and value-added downstream facilities and petrochemical production plants. The IEA estimates that between 2012 and 2035, the Middle East will need $469 billion in natural gas infrastructure (upstream, transmission, and distribution) investment.[28] In attracting this investment, the countries of the Middle East are not just competing against one another, but also against a number of other prospective upstream and downstream projects around the world. This region's competitiveness as an investment destination is challenged by the political uncertainty resulting from the Arab Awakening and by the newfound discovery of conventional and unconventional resources around the world.

PRINCIPAL FINDINGS

New technological and geological realities mean the Middle East will have to compete harder for investment.

Improved technology is allowing new, unconventional sources of hydrocarbons – especially natural gas – to be developed around the world. As a result, the energy producers of the Middle East may find themselves in increasing competition with less politically volatile regions for new investment both in the upstream natural gas production sector and in the higher-value-added downstream and petrochemical sectors. The relative unfamiliarity of new Asian investors with the erratic geopolitical contours of the Middle East may be particularly unnerving for some at a time when American dependence on the region's resources is diminishing.

Upstream fiscal terms and the concessions regime are essential to increased gas production.

To attract investment in the region's more complex natural gas projects – either technically complex conventional fields or unconventional natural gas resources – governments in the region should look to reform upstream fiscal terms and concession regimes to make them more competitive internationally. The first step is to create an investment regime tailored to the natural gas sector. Natural gas sector investments are capital-intensive and have longer-term paybacks when compared to those in the oil sector, hence the need for a specialized investment framework.

More broadly, efforts will need to be made by governments to liberalize domestic natural gas markets, not only with respect to pricing, but also regarding the role of each government's NOC in operating gas fields. While such liberalization measures are politically sensitive – NOCs are generally considered strategic pillars of governments that must be protected – they would likely enable investment in natural gas production. This is critical for the Middle East given the need to develop non-associated gas fields that are often either high in sulfur content or in geologically difficult structures, both of which require private sector expertise for successful production.

[28] "World Energy Outlook 2012," IEA, 124.

While the investment needs are significant, successful models for investment regimes already exist in the region. The governments of both Qatar and the UAE allow for joint ventures, both of which many analysts cite as positive examples for cooperation between the private sector and state-backed NOCs.

Countries in the Middle East need to adapt to the changing profile of investors.

The region should take advantage of the changing profile of the potential investors in new natural gas infrastructure. Part of this change is due to a displacement of the traditional investors in regional gas projects.

Many U.S. investors have been driven back to the United States, focusing on new shale resources; North America's newfound shale reserves have reinvigorated investment on the continent by its own banks and companies. As shale gas reserves have proven both abundant and cheap, companies and banks have been active in investing throughout the sector, from the upstream to the downstream. At the same time, prospective European investors are wrestling with increasing controls and obstacles to investment. In the wake of the financial crisis of 2008 and 2009, European investors are facing new financial regulations and more stringent capital requirements for banks. These two emergent trends must be considered in a geopolitical context: when considering investment in U.S. unconventional gas reserves, investors view the United States as a less risky investment politically than the recently tumultuous Middle East. This is also important for Asian investors. For example, since 2009 more than half of Chinese capital spent on overseas oil and gas assets has been in North America.[29] Nevertheless, there is a high level of interest among Chinese and Indian companies (both private and state-owned) in investing in energy infrastructure projects in the region.

Investors view the United States as a less risky investment politically than the recently tumultuous Middle East.

There is an opportunity for new investors and investment models in the region.

The flight of traditional U.S., European, and Asian investors has created an opportunity for small- and medium-sized investors. They will, however, require adequate incentives. New investors also provide the opportunity for more creative investment structures. Investments in natural gas are typically highly capital intensive and offer lower payback periods than investments in oil projects. They are also usually bound by the limitations of associated infrastructure such as pipelines and downstream end uses. Companies that recognize the structural challenges of natural gas development and put forward investment strategies that involve the entire value chain are more likely to be successful in winning new business than those focusing solely on exploration and production upstream.

[29] Erica Downs, "China-Middle East Energy Relations," Testimony to the U.S.-China Economic and Security Review Commission, June 6, 2013, <http://www.brookings.edu/research/testimony/2013/06/06-china-middle-east-energy-downs>.

Conclusion

Until just a few years ago, the United States was expected to import LNG to satisfy growing demand at home. Today, the country has the potential to become a key LNG exporter. The United States is emerging at the forefront of the shale gas "revolution," and other countries around the world are following closely behind as they discover their own new supplies of natural gas. Swift economic development in Asia and South America, coupled with what is now projected to be stagnant demand in Europe and the United States, has suppliers turning their focus away from traditional importers. Meanwhile, technological innovations in gas extraction, production, and transportation are enabling new countries to enter the supply market. The world is witnessing a fundamental change in the global gas market as the centers of demand and supplies thus begin to shift. Along with these shifts come new pressures on old regimes of investment and pricing of gas, as well as questions surrounding the lifetime of the "golden age of gas."

The world is witnessing a fundamental change in the global gas market as the centers of demand and supplies thus begin to shift.

While optimism on the future role of natural gas abounds from the United States to Asia, uncertainties related to the pace of its development and geopolitical effects dampen the excitement somewhat. As the United States looks to stabilize its energy trade balance with new shale gas reserves, many other countries are also eager to capitalize on the shifting dynamics of the global gas market. For some countries, this means aggressively pursuing new avenues toward energy independence; for others, it means breaking into the gas market as a nascent supplier. With the potential for shale gas development, some Eastern European countries see a new pathway to relieving their dependence on Russian imports. In other regions like East Africa, new discoveries of conventional gas reserves provide some countries with strategic leverage as a potential exporter. Yet underlying the realization of any major shifts are some circumstances that leave room for uncertainty. In more developed economies such as Russia, the technical complexity of deepwater projects has caused delays in investment and production. In less developed countries, including Mozambique and Tanzania, the physical infrastructure and policy frameworks necessary to govern oil and gas projects are underdeveloped. In the Middle East, political instability deters investments that would help the region build natural gas infrastructure and remain competitive in the changing global market. In the United States, where a mature oil and gas market as well as abundant infrastructure have paved the way for a domestic shale revolution, uncertainties exist over the sustainability of production and future policy decisions affecting hydraulic fracturing. Furthermore, there remain questions about how transferable the U.S. shale revolution is to other countries, ranging from China to Russia, which have considered a similar path.

The shifting balance of supply and demand across regions is complemented by the shifting interests of investors and consumers. In terms of pricing regimes, consumers – led by those in Europe – are increasingly purchasing spot market gas instead of entering long-term contracts linked to oil prices. This trend is placing significant pressure on traditional industry powers like Gazprom that, until recently, enjoyed monopoly power over oil-indexed contracts. The Asian gas market is

also expected to lean toward spot market rates as their sourcing options diversify. In terms of investment, prospects for new supplies from both conventional and unconventional sources have attracted growing interest in pipeline and LNG infrastructure development around the world. Yet in countries including Iran and Saudi Arabia, which might traditionally be thought of as natural gas hubs, economic and political obstacles hamper efforts to adopt new infrastructure. Furthermore, the traditional scheme of subsidized domestic energy prices in the Gulf region will become unsustainable, as it is likely to crowd out investment and job opportunities in other sectors. As Asia rises as an influential center of imports, growing economies in the region are producing new investors who could relieve the Middle East of roadblocks in meeting its own growing demand for energy. However, the new interest in shale gas resources in the U.S. and other parts of the world has pulled many potential investors out of the region, further complicating the outlook for investments to sustain Gulf gas production.

While debates continue over the long-term implications of the changing landscape of gas, these shifting trends show that transformational change is no doubt underway. Producer and consumer countries, both existing and future, must recognize these changing circumstances and pursue policy decisions accordingly. Gas pricing regimes, investment strategies, and trade routes that have traditionally defined the natural gas market will be redesigned, and those countries that fail to embrace the evolving landscape may be left with unforeseen domestic or regional unrest. The recent discoveries of new natural gas production potential and the large-scale brainstorming of revised market systems mark just the beginning of a new era of the global gas market.

Annex I: Conference Agenda

BROOKINGS

QUALITY, INDEPENDENCE, IMPACT.

The Brookings Doha Energy Forum 2013
Power Struggle: Implications of the Changing Global Gas Market for the Middle East and Asia

April 1 - 2
Four Seasons Hotel – Doha

APRIL 1

08:30 AM – 11:00 AM — **Registration -** Mirqab pre-function room
(Coffee and refreshments available)

11:30 AM – 11:40 AM — **Introduction and Welcome -** Mirqab Ballroom
Martin Indyk, *Vice President and Director of Foreign Policy, Brookings*
Salman Shaikh, *Director, Brookings Doha Center*

11:40 AM – 12:00 PM — **Keynote Address -** Mirqab Ballroom
H.E. Sheikh Hamad bin Jassim bin Jabor Al-Thani, *Prime Minister and Minister of Foreign Affairs, State of Qatar*

12:00 PM – 12:45 PM — **Opening Remarks -** Mirqab Ballroom
H.E. Dr. Mohammed bin Saleh Al Sada, *Minister of Energy and Industry, State of Qatar*
H.E. Eng. Ali bin Ibrahim Al Naimi, *Minister of Petroleum and Mineral Resources, KSA*
Andrew Swiger, *Senior Vice President, Exxon Mobil Corporation*

12:45 PM – 2:15 PM — **First Plenary: The Changing Global Gas Landscape** - Mirqab Ballroom

Moderator : Suzanne Maloney, *Senior Fellow, Saban Center for Middle East Policy, Brookings*
Panelists : Saad Sherida Al-Kaabi, *Director of Oil & Gas Ventures, Qatar Petroleum*
Toshikazu Masuyama, *General Director, METI Hokkaido; Former General Director, JOGMEC*
Tatiana Mitrova, *Head of Global Energy, Moscow School of Management*
Robert Ragis Smith, *Principal Consultant and Acting Managing Director, Facts Global Energy*
Michael Ratner, *Energy Policy Specialist, Congressional Research Service*

Over the next decade, the international gas market is likely to see a large shift in both supply and demand as the shale-gas revolution in the United States reduces its exposure to international gas markets and as new and growing gas consumers in South and East Asia – and in the Middle East itself – continue to emerge. As home to the world's largest producer of LNG, and as a growing demand center itself, the Middle East is poised to be at the center of this shift. What could these changes mean for the geopolitical balance around the Gulf? What impact might result from the West's approach toward (and sanctions against) Iran, the world's third largest producer of gas? What are the geopolitical ramifications, in both Asia and the Middle East, of the U.S. being a potential significant LNG exporter? This plenary session will address the implications of new sources of supply and demand in the global gas market for both Middle East producers and Asian consumers, including the their effects on pricing and contract structures.

2:15 PM – 3:30 PM — **Lunch -** Mirqab Tent

Introduction : Steven J. Bennett, *Vice President and Chief Operating Officer, Brookings*
Speaker : Ralph Langner, *Director, Langner Communications GmbH*
"Cyber Threats to the Oil and Gas Industry"

BROOKINGS

QUALITY, INDEPENDENCE, IMPACT.

APRIL 1 (CONTINUED)

3:45 PM – 5:30 PM	**Working Groups:** Session 1 Working Group 1 - Zubara meeting room Working Group 2 - Jnan meeting room Working Group 3 - Msaimeer meeting room
5:30 PM	**Coffee Break -** Al Daibel pre-function room
7:30 PM – 9:00 PM	**Dinner -** Garden Terrace
Introduction :	Steven J. Bennett, *Vice President and Chief Operating Officer, Brookings*
Speaker :	Ivan Rafael Sandrea, *Senior Strategy Advisor, Petra Energia; Senior Fellow, Oxford Institute for Energy Studies*

APRIL 2

08:30 AM – 10:00 AM	**Second Plenary: Natural Gas and the Regional Political Economy** - Al Daibel
Moderator :	Tamara Cofman Wittes, *Director, Saban Center for Middle East Policy, Brookings*
Panelists :	Bassam Fattouh, *Director, Oil and the Middle East, Oxford Institute for Energy Studies* Herman Franssen, *Executive Director, Energy Intelligence Group* Luay Al Khatteeb, *Executive Director, Iraq Energy Institute* Mohammed Al Sabban, *Former Senior Advisor to the Minister of Petroleum of KSA* Bijan Khajehpour Khoei, *Managing Partner, Atieh International*

As the Middle East – and particularly the countries of the Gulf – experience rapid demographic and industrial change, the provision of affordable, reliable sources of energy will be an increasingly important factor in ensuring political stability and economic and environmental sustainability. Despite the Gulf's vast endowment of natural gas, the distribution of gas resources is uneven, and regional politics present an impediment to an efficient allocation of supply to demand: the region's largest reserves are held by Iran, whose relationship with the Gulf States is as fraught today as ever. This plenary session will focus on the nexus of domestic natural gas use and economic and political sustainability in the region, including natural gas pricing in the region, the role of natural gas-based industries in providing economic stability and employment; prospects for greater regional gas market collaboration; and options for new sources of gas production in the Gulf and the broader Middle East.

10:00 AM – 10:15 AM	**Coffee Break -** Al Daibel pre-function room
10:15 AM – 11:45 AM	**Working Groups:** Session 2 Working Group 1 - Zubara meeting room Working Group 2 - Jnan meeting room Working Group 3 - Msaimeer meeting room

BROOKINGS

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APRIL 2 (CONTINUED)

12:00 PM – 1:00 PM	**Lunch -** Mirqab Tent
Speaker :	Simon Harrison, *Special Counsel, International Practice Energy and Natural Resources, Patton Boggs* **"LNG – Down Under"**
1:15 PM – 2:45 PM	**Third Plenary: Natural Gas and Investment in the Middle East Energy Infrastructure** Al Daibel
Moderator : **Panelists :**	Vikram Singh Mehta, *Chairman, Brookings India* Robin Mills, *Head of Consulting, Manaar Energy (Dubai)* Victor Zhikai Gao, *Director, China National Association of International Studies* Majid H. Jafar, *CEO, Crescent Petroleum; MD of the Board, Dana Gas* Olivier Mussat, *Principal Investment Officer, IFC - Global Oil & Gas*

As new sources of natural gas are developed around the world, the energy producers of the Middle East may find themselves in increasing competition with less politically volatile regions for new investment both in the upstream natural gas production sector and in the higher-value added downstream and petrochemical sectors. The relative unfamiliarity of new Asian investors with the erratic geopolitical contours of the Middle East may be particularly unnerving for some at a time when American dependence on the region's resources is diminishing. This session will address the prospects for continued investment in the region, and the ways in which it can attract the necessary capital to meet gas demand in the power and industrial sectors. It will look at the requirements for investments in the production of complex, non-associated gas resources in the region; the role of IOCs and Asian NOCs in upstream and downstream investment in the region's gas sector; and the role of political risk in investors' decision making.

3:00 PM – 4:30 PM	**Working Groups:** Session 3 Working Group 1 - Zubara meeting room Working Group 2 - Jnan meeting room Working Group 3 - Msaimeer meeting room
4:30 PM – 5:00 PM	**Coffee Break -** Al Daibel pre-function room
5:00 PM – 5:45 PM	**Presentations of Findings and Plenary Discussion -** Al Daibel
Presenter :	Kevin Massy, *Associate Director and Associate Fellow, Energy Security Initiative, Brookings*
5:45 PM – 6:00 PM	**Concluding Remarks and Farewell -** Al Daibel
6:00 PM – 7:00 PM	**Farewell Cocktail Reception -** Al Daibel pre-function room

Annex 2: List of Participants

Name	Title/Position	Company/Institution	Country
Khaled A'amar	PV Products Design, Research & Development Manager	Al Emadi Solar	Qatar
Abdul Jalil Abdul Basir	Director General, Policy and Promotion Department	Ministry of Mines	Afghanistan
Jocin James Abraham	Energy Advisor	Embassy of the Republic of Korea to Qatar	South Korea
Lewis Affleck	Managing Director	Maersk Oil Qatar	Qatar
Pravin Kumar Agarwal	Director	TERI (Energy and Resources Institute)	India
Gulfaraz Ahmed	Chief Executive Officer	Petroleum Exploration	Pakistan
Ali Aissaoui	Senior Consultant	Arab Petroleum Investment Corporation	UK
Sarah H. M. Akbar	Chief Executive Officer	Kuwait Energy	Kuwait
Abdulla Al Ansari	Security Advisor	Exxon Mobil Qatar	Qatar
Issam Abdulraheem Abdulazeez Al Chalabi	Consultant; former Iraqi Oil Minister; former head of Iraqi Oil Company (INOC)	Independent	Iraq
Nasser Al Dossary	Advisor to the Minister; OPEC & IEF National Representative	Ministry of Petroleum and Mineral Resources, KSA	KSA
Mohamed Nasser Al Hajri	Director, Downstream Ventures	Qatar Petroleum	Qatar
Abdulla Ahmad Al Hussaini	LNG Committee Secretary	Qatar Gas	Qatar
Saad S. A. Al Jandal	Ph.D.	The Energy Group KISR	Kuwait
Saad Sherida Al Kaabi	Director of Oil & Gas Ventures	Qatar Petroleum	Qatar
Fahad Sultan Al Kawari	Ambassador	Ministry of Foreign Affairs, State of Qatar	Qatar
Luay Al Khatteeb	Executive Director	Iraq Energy Institute	Iraq
Mubarak Abdulla Al Khualifi	PR Officer (non-QP Events), Public Relations & Communications	Qatar Petroleum	Qatar
Saad Al Kubaisi	Corporate HSE Manager	Qatar Petroleum	Qatar
Jassim Al Mansoori	Chairman of the Board	iHorizons	Qatar
Faisal Al Medaihki	Associate Communication Manager	Maersk Oil Qatar	Qatar
Ibrahim Al Muhanna	Advisor to the Minister	Ministry of Petroleum and Mineral Resources, KSA	KSA
Abdullatif Al Naemi	National Development Manager	Exxon Mobil Qatar	Qatar
H.E. Ali bin Ibrahim Al Naimi	Minister of Petroleum and Mineral Resources	Kingdom of Saudi Arabia	KSA
Saif Al Naimi	Director, Industrial Security	Qatar Petroleum	Qatar
Machaille Al Namei	Legal Counsel	Exxon Mobil Qatar	Qatar
Tofol Al Nasr	Deputy Manager, Government Affairs	Exxon Mobil Qatar	Qatar
Abdulrahman Al Obaidly	Manager, Public Relations and Communications	Qatar Petroleum	Qatar
Shakir Mahmoud Al Rifaiey	Office Manager, Minister of Petroleum and Mineral Resources	Ministry of Petroleum and Mineral Resources, KSA	KSA

Name	Title/Position	Company/Institution	Country
Mohammed Al Riyami	Energy and Gas Market Analysis Department	Gas Exporting Countries Forum	Qatar
Mohammad Al Sabban	Former Senior Economic Advisor to the Minister	Ministry of Petroleum and Mineral Resources, KSA	KSA
H.E. Mohammed bin Saleh Al Sada	Minister of Energy and Industry	The State of Qatar	Qatar
H.E. Sheikh Hamad bin Jassim bin Jabor Al Thani	Prime Minister and Minister of Foreign Affairs	The State of Qatar	Qatar
H.E. Sheikh Ahmed bin Mohammed bin Jabor Al Thani	Minister's Assistant for International Cooperation Affairs	Minister of Foreign Affairs	Qatar
Ali H. Al Tuwairqi	Director General	Minister of Petroleum and Mineral Resources' Special Office	KSA
Nawaf Al-Ajmi	Head of Staff	Kuwait Energy	Kuwait
Abdul Monsef Hafiz Albouri	Ambassador	Embassy of Libya in Qatar	Libya
Saleh Almana	Vice President, Government & Public Affairs	Exxon Mobil Qatar	Qatar
Matthew Arnold	Planning & Commercial Manager	Exxon Mobil Qatar	Qatar
Sanjiv Arora	Ambassador	Embassy of India in Qatar	India
Ed Austin	Planning Manager	Exxon Mobil Qatar	Qatar
Govinda Vinayak Avasarala	Senior Research Assistant, Energy Security Initiative	The Brookings Institution	USA
Mohammed Morsi Awad	Ambassador	Embassy of Egypt in Qatar	Egypt
Mohamad Awad	Business Planning Analyst	Qatar Petroleum	Qatar
Steven J. Bennett	Vice President and Chief Operating Officer	The Brookings Institution	USA
Leonid Bokhanovskiy	Secretary General	Gas Exporting Countries Forum	Qatar
Giorgio Bresciani	Head	McKinsey & Co.'s Global Gas Project	Italy
Bart Cahir	President & General Manager	Exxon Mobil Qatar	Qatar
Atul Chandra	Senior Advisor to Chairman	Reliance Industries Ltd (RIL)	India
Young Chul Choi	Deputy Director	Global Energy Corporation Center	South Korea
Anindya Chowdhury	General Manager - Gas	Shell India	India
Justin Christian Dargin	Energy Expert	University of Oxford	UK
Guido De Sanctis	Ambassador	Embassy of Italy in Qatar	Italy
Paul Thomas Ditchburn	Vice President, Planning & Portfolio Management	Kuwait Energy	Kuwait
Laura Luise El Katiri	Research Fellow	Oxford Institute for Energy Studies	UK
Alia El Moubayed	Director, Head of Research for MENA	BARCAP	UK
Jos Evens	Senior Vice President, Gas Marketing	Exxon Mobil Qatar	Qatar
Bassam Fattouh	Director, Oil & Middle East Programme	Oxford Institute for Energy Studies	UK
Adrienne Fleming	Communications Advisor	Exxon Mobil Qatar	Qatar

Name	Title/Position	Company/Institution	Country
Herman T. Franssen	Executive Director	Energy Intelligence Group	USA
Mark Freier	Senior Analyst	Statoil	Germany
Shinji Fujino	Director, General of Business Strategy Department and Oil & Gas Upstream Business Unit	JOGMEC	Japan
Victor Gao	Director	China National Association of International Studies	China
Carrie Giardino	Economic Officer	United States Embassy in Qatar	USA
Rajnish Goswami	Head of Asia, Middle East Gas and Power Consulting	Wood MacKenzie	UK
John Groffen	Ambassador	Embassy of Netherlands in Qatar	Netherlands
Alexey Gromov	Deputy General Director	Institute of Energy Strategy Moscow	Russia
Zoheir Hamedi	Assistant Researcher	Doha Institute	Qatar
Simon Harrison	Special Counsel	International Practice Energy and Natural Resources	Australia
Adel A. M. Hussain	Department Manager	Building & Energy Technologies	Kuwait
Martin Indyk	Vice President, Director of Foreign Policy	The Brookings Institution	USA
Shoichi Ito	Manager & Senior Analyst, Global Energy Group Two/Strategy Research Unit	The Institute of Energy Economics	Japan
Majid Jaafar	Chief Executive Officer	Crescent Petroleum	UAE
Subodh Kumar Jain	Director	SAGE (South Asia Gas Enterprise)	India
Bruce David Jones	Senior Fellow, Foreign Policy & Director, Managing Global Order	Center on International Cooperation, New York University	USA
Chung Keejong	Ambassador	Embassy of the Republic of Korea in Qatar	South Korea
Bijan Khajehpour Khoi	Managing Partner	Atieh International	Austria
Samir B. Khawaja	President	Quanta Services Middle East	Qatar
Ki Joong Kim	Director	Gas Policy Research Division	South Korea
Toshiaki Koizumi	General Manager Fuel Department	Tokyo Electric Power Company (TEPCO)	Japan
Hiroshi Kondo	Deputy General Manager, Paris Representative Office	Tokyo Gas	France
Frank Kretschmer	Manager, GPM Flowing Gas	Exxon Mobil Qatar	Qatar
Ralph Langner	Director	Langner Communications GmbH	Germany
Li Lanzhong	Country Manager	PetroChina Investment (Hong Kong) Limited	China
Hyun-Bock Lee	Researcher, Mineral Economics Team	Korea Institute Geoscience & Mineral Resources (KIGAM)	South Korea
Sun Ho Lee	Deputy General Manager	Samsung C&T Corporation	South Korea
Yao Li	Director & Chief Representative	PFC Energy	China
Tanvi Madan	Director, Brookings India Center; Fellow, Foreign Policy	The Brookings Institution	India
Patel Mahesh	Assistant Manager	Qatar Petroleum	Qatar

Name	Title/Position	Company/Institution	Country
Suzanne Maloney	Senior Fellow, Saban Center	The Brookings Institution	USA
Sabeur Mansar	Vice President, Commercial and NBD	Qatar Shell	Qatar
Khalil Mansouri	Managing Director	Jasia Holding	Morocco
Alexander Nicholas Martinos	Senior Analyst, Research & Advisor	Energy Intelligence	UK
Kevin James Massy	Associate Director & Associate Fellow, Energy Security Initiative	The Brookings Institution	USA
Toshikazu Masuyama	General Director	METI Hokkaido	Japan
Vikram Mehta	Chairman, Brookings India Center	The Brookings Institution	India
Stephane Michel	Managing Director	Total E&P Qatar	Qatar
Robin Mills	Head of Consulting	Manaar Energy	UK
Tatiana Mitrova	Head of Global Energy	Moscow School of Management SKOLKOVO	Russia
Kenjiro Monji	Ambassador	Embassy of Japan in Qatar	Japan
Yasser Mahdi Mufti	OPEC Governor	Ministry of Petroleum and Natural Resources, KSA	KSA
Olivier Mussat	Principal Investment Officer, Global Oil and Gas Division	International Finance Corporation (IFC)	USA
Siamak Namazi	General Manager	ACG Dubai	USA
Gholamreza Poshtchy Oskui	Enhanced/Improved Oil Recovery (EOR/IOR) Research Scientist	KERP - KISR	UK
Ioannis Pallikaris	Managing Director	ACM Iraq/Profitability Group Ltd	Greece
Vivek Pandit	Senior Director & Head - Energy	FICCI	India
Jean-Christophe Peaucelle	Ambassador	Embassy of France in Qatar	France
Samuel Plumbly	Senior Research Assistant, Brookings Doha Center	The Brookings Institution	Qatar
Jupiter Ramirez	Head of LNG Marketing QG3 Managing Department	QatarGas	Qatar
Michael Ratner	Specialist in Energy Policy	Congressional Research Service	USA
Jim Rigby	Development Manager	Exxon Mobil Qatar	Qatar
Alistair Routledge	Vice President	Exxon Mobil Qatar	Qatar
Elias Saber	Vice President Business Development, ME and Asia	Energy Intelligence	USA
Ivan Rafael Sandrea	Senior Strategy Advisor; Senior Fellow	Petra Energia; Oxford Institute for Energy Studies	UK
Yoshinori Satake	First Secretary	Embassy of Japan in Qatar	Japan
Heidi Schroeder	Executive Assistant	Quanta Services Middle East	Qatar
Radia Sedaoui	Statistics and Gas Modeling Department	Gas Exporting Countries Forum	Qatar
Jean Francois Seznec	Managing Director/Adjunct Professor	The Lafayette Group/Georgetown University	USA
Salman Shaikh	Director, Brookings Doha Center	The Brookings Institution	Qatar
Karim Shaikh	Independent	Independent	Qatar
Anthony Smith	General Counsel	Exxon Mobil Qatar	Qatar

Name	Title/Position	Company/Institution	Country
Robert Smith	Principal Consultant	FGE Dubai	UAE
Shirine Solh	Public & Government Affairs Manager	Exxon Mobil Qatar	Qatar
Dario Speranza	Vice President, Political and Institutional Scenarios Analysis	ENI	Italy
Lee Su-Ho	Consular	Embassy of the Republic of Korea in Qatar	South Korea
Andrew Swiger	Senior Vice President	Exxon Mobil Corporation	USA
Reiji Takeishi	Professor	School of International Relations TIU	Japan
Narendra Kumar Taneja	President	World Energy Policy Summit	India
Julie Taylor	International Policy Analyst	RAND Corporation	USA
Theodore Theodoropoulos	Chief Executive Officer & Managing Director	Qenergy (Global Energy Supply)	Qatar
Dmitry Trofimov	Minister Counsellor	Embassy of the Russian Federation in Qatar	Russia
Nikos Tsafos	Senior Manager	Global Gas Practice PFC Energy	USA
Nico Van Den Berg	Security Advisor, Europe and Middle East	Exxon Mobil Qatar	Qatar
He Wang	Contract Supervisor	CNOOC Middle East Limited	China
Haibin Wang	Research Manager	Sinochem	China
Tamara Wittes	Senior Fellow & Director, Saban Center	The Brookings Institution	USA
Guang Yang	Director-General, Institute of West Asian and African Studies	Chinese Academy of Social Sciences	China
Hongyuan Yu	Professor and Deputy Director, Institute for Comparative Politics	Shanghai Institutes for International Studies (SIIS)	China
William Weilliang Zhao	Hydrocarbons and Energy Strategy Manager, Corporate Strategy and Planning	Saudi Basic Industries Corporation (SABIC)	KSA
Hongtu Zhao	Deputy Director, Institute of World Economic Studies	China Institute of Contemporary International Relations	China
Susan L. Ziadeh	Ambassador	United States Embassy in Qatar	USA

About The Brookings Doha Center

Based in Qatar, the Brookings Doha Center is an initiative of the Brookings Institution in Washington, D.C., that advances high-quality, independent policy analysis and research on the Middle East. The Center maintains a reputation for policy impact and cutting-edge, field-oriented research on socioeconomic and geopolitical issues facing the broader Middle East, including relations with the United States.

The Brookings Doha Center International Advisory Council is co-chaired by H.E. Sheikh Hamad bin Jassim bin Jabr Al-Thani, former prime minister and minister of foreign affairs of the State of Qatar, and Brookings President Strobe Talbott. The Center was formally inaugurated by H.E. Sheikh Hamad bin Jassim bin Jabr Al-Thani on February 17, 2008. It is funded by the State of Qatar. Salman Shaikh serves as its director.

In pursuing its mission, the Brookings Doha Center undertakes research and programming that engages elements of business, government, civil society, the media, and academia on key public policy issues in the following four core areas:

(i) Democratization, political reform and public policy;
(ii) Middle East relations with emerging Asian nations, including on the geopolitics and economies of energy;
(iii) Conflict and peace processes in the region;
(iv) Educational, institutional, and political reform in the Gulf countries.

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