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Navigating Uncertainty: Qatar's Response to the Global Gas Boom

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**NAVIGATING UNCERTAINTY:
QATAR'S RESPONSE TO THE GLOBAL GAS BOOM**

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Naser al-Tamimi
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EXECUTIVE SUMMARY

Over the last decade, Qatar has emerged as the world's leading liquefied natural gas (LNG) exporter. However, the country faces formidable challenges and direct competition from the shale gas boom. First, a changing landscape in global gas markets—with more competitors entering the scene and the emergence of new LNG-exporting hubs—could lead Qatar to lose its position as the undisputed king of the LNG market. Second, the increase in supplies from countries such as the United States and Australia may lead to lower prices for years to come. Third, the availability of alternative supplies for Asian markets will allow the region's buyers to negotiate hard over any future deals. Most importantly, the new supplies will inevitably serve as the basis of a strong spot market, creating a larger, flexible, and more diverse global LNG market. Finally, Qatar may lose its status as the sole “swing producer,” a position that has given Doha strategic importance at the international level.

The outlook for the global LNG market has changed drastically and will continue to do so in the future. The International Energy Agency (IEA) projects unprecedented growth in LNG supply, with 150 billion cubic meters per year (bcm/y) of LNG capacity (equivalent to 40 percent of the current global total) either under construction or planned to start between 2015 and 2019. Australia's LNG export capacity is set to more than triple, reaching 106.6 bcm/y before the end of current decade, which would make the country the largest LNG exporter in the world.

If these projections turn out to be correct, they will have far-reaching repercussions on Qatar's position on the global gas map. Although the decision makers in Doha are fully aware of these rapid developments in the global gas markets, their options are still limited. Qatar's moratorium on increasing natural gas production from its Northfield remains in place, and apart from the \$10.3 billion Barzan gas project, which will largely feed growing domestic demand, no further gas projects have been sanctioned. Qatar also has not announced any plans to expand its LNG export capacity beyond its existing facilities. Consequently, Qatar's gas strategy will remain at a standstill, at least in the short term.

Qatar has, however, indicated that it may increase its LNG production by improving the efficiency of its LNG production plants. In the medium and long term, Qatar may also

expand its production capacity of gas-to-liquids (GTL) and LNG fuel for the shipping industry. Qatar has also pursued the option of “buying up the competition,” particularly through its joint venture with ExxonMobil at the Golden Pass LNG terminal in Texas, United States. This investment is expected to reach over \$10 billion with over 20 bcm in annual export capacity. Although the decline in oil, LNG, and piped gas prices make such projects look less attractive economically speaking, Qatar may press ahead with the project as the cornerstone of its long-term LNG strategy.

There are also emerging opportunities for LNG export in the Middle East and North Africa (MENA). The annual demand in MENA is projected to jump from 5.4 bcm in 2015 to 12.2 bcm by 2020 and 31.3 bcm by 2025. Most importantly, if Gulf Cooperation Council (GCC) states overcome their political differences and agree on a collective satisfactory price mechanism, Qatar could meet most, if not all, projected gas demand in the UAE, Oman, Kuwait, and possibly Saudi Arabia via the Dolphin pipeline. There is also significant room for increasing Doha’s LNG exports to the EU, especially if the European Commission goes ahead with its plan to reduce the union’s dependence on Russian gas. Nevertheless, Qatar must show more flexibility in signing new contracts.

In the long run, Qatari officials are optimistic that LNG demand will be strong and probably exceed the combined capacity of existing projects. Yet several factors could alter LNG market dynamics once again in the future. The rapid technological advances in energy exploration, drilling, and production could increase gas supplies in several countries. Though it is difficult to replicate the experience of the United States in shale development on a global scale, constantly improving technology shows that it is still possible. Secondly, there is a strong desire among many of the energy-consuming countries, especially in Asia, to reduce their dependence on Middle Eastern energy imports. Measures such as energy efficiency, promoting research and innovation, and increased investments in nuclear and alternative energy may limit any increase in future demand. Finally, U.S. policy in the Middle East is still evolving, so all possibilities could be on the table, including signing a final nuclear agreement with Iran, withdrawal from Afghanistan, and reaching a political solution in Iraq and Syria. Together, these factors could, in the long term, gradually erode the strategic importance of Qatar (and the Gulf in general) to the United States and its allies. As such, Qatar and the Gulf states urgently need a common strategy that takes into account all scenarios.

OVERVIEW

The State of Qatar on the Arabian Peninsula is regularly cited as one of the richest countries in the world on a per capita basis, with hydrocarbon revenues fueling an outsized presence on the world stage as well as rapid developments at home. The source of that wealth is the world's third largest gas reserves—24.7 trillion cubic meters (tcm), representing about 13.3 percent of global proven reserves.¹ In 2013, the country also ranked third in gas production (after the United States and Russia) with 161 bcm of output, and second in exports, shipping some 121 bcm abroad.²

Over 84 percent of Qatar's gas exports are in the form of liquefied natural gas (LNG) and 71.4 percent is shipped to Asia.³ Helped by rising global demand amid tight supply, Qatar has seen its LNG exports surge from 25.3 bcm in 2004 to over 104.7 bcm in 2013, representing more than a third of global supply in that year.⁴ Japan is Qatar's largest market, followed by South Korea, India, and China. These four countries together account for 62 percent of Qatar's total exports of LNG (see Table 6). Japan and South Korea are the world's dominant LNG importers, consuming more than half of LNG supplied to the market in 2014.⁵

Table 1: Top 5 countries by natural gas: reserves & production

World Ranking	Proved Reserves			Production			
	Country	Trillion cubic meters (Tcm)	Share	Ranking	Country	Trillion cubic meters (Tcm)	Share
1	Iran	33.8	18.2%	1	U.S.	689	19.8%
2	Russia	31.3	16.8%	2	Russia	671	19.3%
3	Qatar	24.7	13.3%	3	Qatar	161	4.6%
4	Turkmenistan	17.5	9.4%	4	Iran	159	4.6%
5	U.S.	9.3	5.0%	5	Canada	155	4.5%

Source: BP and IEA. Statistics are for 2013, the latest year available.

Globally, the construction of LNG plants could add around 159 bcm/y of capacity to the existing 396 bcm/y by 2018, according to data compiled by the International Gas Union (IGU).⁶ In 2013, the Middle East supplied 42 percent of the world's LNG or 134 bcm/y, with about 79 percent of that amount coming from Qatar. However, this

share is likely to shrink in the coming years because new Australian projects are expected to come on stream post-2015.⁷ Australia is expected to bring over 84 bcm/y of new capacity online before the end of this decade, thereby replacing Qatar as the world's largest exporter.⁸

Meanwhile, the United States could also emerge as an LNG-exporting hub by the end of this decade. Estimates of how much natural gas the United States could export vary considerably, however. IHS expects LNG export capacity in the United States to reach almost 68 bcm/y by 2020, which would make it the third largest LNG producer after Australia and Qatar.⁹ Canada and East Africa are also seen as new frontiers. Russia may also compete with Qatar in Europe if it goes ahead with Novatek's planned Yamal LNG project in the Russian Arctic. Russia already competes with Qatar by selling LNG to the Asia-Pacific market and plans to boost its output, with ambitions to produce over 68 bcm/y of additional liquefaction capacity by the early 2020s. Above all, if geopolitical circumstances change, exports from Iran could prove to be a competitor to Qatar's exports to countries in the Middle East and South Asia (India and Pakistan in particular).

In this context, Qatar faces formidable challenges. Firstly, a change in the landscape of global natural gas markets will see more competitors entering the scene. Secondly, the steady surge in U.S. exports (and possibly Iranian exports) could threaten Qatar's dominance in other markets such as condensate and liquefied petroleum gas (LPG). Thirdly, the rise in LNG supplies is leading to significant downward pressure on pricing, which will translate to huge losses in Qatar's export earnings. Finally, the availability of alternative supplies to the Asian market (Qatar's major market) will allow buyers there to negotiate aggressively over long-term supply contracts. This may challenge the standard Qatari model of tying long-term contracts to oil prices rather than natural gas prices. As a result, competition from new suppliers of LNG could hit Qatar's major source of revenue.

On the basis of these drastic developments in the global gas market, this paper seeks to answer the following questions:

- How might the global shale gas boom and direct LNG competition affect Qatar?
- Will Qatar shift its LNG marketing strategy in response to the advent of new LNG suppliers?
- What are Qatar's alternatives in dealing with the new developments?

These are important questions that must be answered in order to understand the profound change that is currently under way in the global LNG market. This paper will consist of four main sections. The first will map the changing landscape with regard to global

LNG supplies and identify the new competitors entering the scene. The second section will assess global demand and the emerging uncertainty regarding the demand from LNG importing countries. Then the third section will evaluate the wider implications for Qatar's LNG strategy. Finally, the last part will be a more focused evaluation of Qatar's strategy for dealing with the new developments in the global natural gas market.

INTERNATIONAL LNG SUPPLIES: NEW COMPETITORS

Following the Fukushima disaster in March 2011, Japan shuttered the nuclear power plants that provided around 30 percent of the country's generating capacity. The use of coal-and gas-fired power plants to fill the gap helped drive a spike in demand for natural gas, creating tight conditions in the global LNG market. However, the outlook for the market is changing drastically as both newcomers such as the United States and existing producers such as Russia and Australia provide global LNG markets with greater flexibility and liquidity. This in turn is projected to impact Qatar's position on the global gas map. Still, other developments might ultimately slow this growth or turn the whole picture upside down.

Last year, global LNG production increased by 6.8 bcm over 2013, reaching 339 bcm.¹⁰ This number is forecast to grow further to 350.88 bcm in 2015 as new Australian projects are completed.¹¹ Overall, more than 81.6 bcm of new LNG supply is expected to come on stream by the end of 2016.¹² This will lift global capacity by around 20 percent, to some 469 bcm/y.¹³

This year, despite a sharp decline in global oil and gas prices, there are several projects in the United States, Russia, Africa, and possibly Canada that are set to move forward.¹⁴ The IEA projects unprecedented growth in LNG supply, as 151 bcm/y of LNG production capacity, equivalent to 40 percent of the current global total, is either under construction or planned to start by 2019.¹⁵ This growth potential is supported by similar predictions from the IGU, which expects over 159 bcm/y of new capacity by 2019, and BP, whose annual energy outlook charts 7.8 percent annual growth, or 229.8 bcm/y in new capacity by 2020.¹⁶ Australia will lead the way, with nearly 85.6 bcm/y of new capacity expected online before the end of the current decade, with the country set to surpass Qatar as the world's largest exporter of LNG.¹⁷

Consequently, LNG production may outstrip demand by ten percent by 2020, resulting in a "multiyear bear market," according to Bank of America.¹⁸ For the long term, BP expects overall LNG supply to add ~508 bcm/y by 2035, with Australia and the United States each contributing around a third of that increase.¹⁹ As a result, Qatar's market share, which is currently the largest, is projected to fall to around 12 percent by 2035—putting it behind Australia (24 percent), Africa (21 percent), and the United States (18 percent).²⁰

AUSTRALIA: THE NEXT KING

Australia was the world's third largest LNG exporter (30.2 bcm) in 2013, with three LNG projects online.²¹ The country has another seven LNG projects worth \$200 billion under construction, more than 50 percent of new projects globally, with four of these due to start exporting by 2016.²² Consequently, Australia's installed liquefaction capacity (the ability to process raw natural gas into transportable LNG) will be the highest in the world at 117 bcm/y by 2018, while its export capacity will triple to 106.6 bcm/y.²³ As a result, Wood Mackenzie expects Australia to move ahead of Malaysia as the world's second largest LNG exporter in 2015, and ahead of Qatar by 2018.²⁴ By 2020, Australia is expected to account for 17 percent of the global liquefaction capacity, ahead of Qatar's projected 15 percent.²⁵

Australia exports LNG exclusively to Asian markets, with Japan purchasing about 80 percent of those exports in 2013; other key consumers include China (16 percent) and South Korea (3 percent).²⁶ Going forward, 91 percent of Australian LNG under development has already been assigned under long-term contracts, with the vast majority of it going to Asian countries.²⁷

Despite this optimistic outlook, Australia's LNG projects have not been without serious problems. Many have suffered considerable cost overruns due to a shortage of skilled labor, the high cost of labor and transporting materials, the appreciation of the Australian dollar to the U.S. dollar, stricter environmental regulations, and land rights issues.²⁸ McKinsey has estimated it costs 20-30 percent more to build projects in Australia than in the United States or East Africa.²⁹

Adding to these complications, the sharp decline of oil and LNG prices, coinciding with low demand in Asia (Asian LNG and oil prices have declined nearly 60 percent between June 2014 and February 2015), could make the situation even more worrisome for investors.³⁰ Some experts warn that a slowdown in global demand for LNG and lower oil prices is threatening to undermine investment in exploration and development.³¹ Shell has already ditched plans for a new \$20 billion-plus LNG project on Queensland's Curtis Island, which was to produce up to 24.5 bcm/y.³²

Despite these difficulties, though, nearly all Australia's impending LNG projects are almost complete, leaving the country well on its way to replacing Qatar as the world's top LNG exporter.

THE U.S. SHALE BOOM: CHALLENGING QATAR'S DOMINANCE

According to current U.S. law, companies must acquire approval from the U.S. Department of Energy (DOE) to export LNG to countries with which the United States does not

have a free trade agreement (FTA), as well a license from the Federal Energy Regulatory Commission (FERC) for the project, subject to environmental review. As of February 2015, despite more than 40 applications with the DOE to export almost 397 bcm/y of LNG, only 9 projects have been approved by the DOE, and only 4 have gone on to receive FERC approval.³³ These four export terminals combined will have a contractually obligated capacity of 56 bcm/y, with potential peak capacity of 69 bcm/y.³⁴ Cheniere is set to be the first company to export LNG this year, and it already has 21.7 bcm/y worth of purchase and sale agreements (PSA) on contract.³⁵

Table 2: Major Liquefaction Projects in the United States

Project name	Project sponsor	First Contract Start	Export Capacity (bcm/y)	Total Volume Contracted (bcm/y)	% Contracted
Sabine Pass LNG, 1&2	Cheniere Energy Partners	2015	28.2	27.8	98.6%
Cameron LNG	Sempra Energy	2017	17.4	17.4	100.0%
Cove Point LNG	Dominion Cove Point LNG	2018	8.4	8.3	98.8%
Corpus Christi LNG	Cheniere Energy Partners	2018	26	11.5	44.4%
Freeport LNG	Freeport LNG Development	2018	18.4	17.9	97.6%

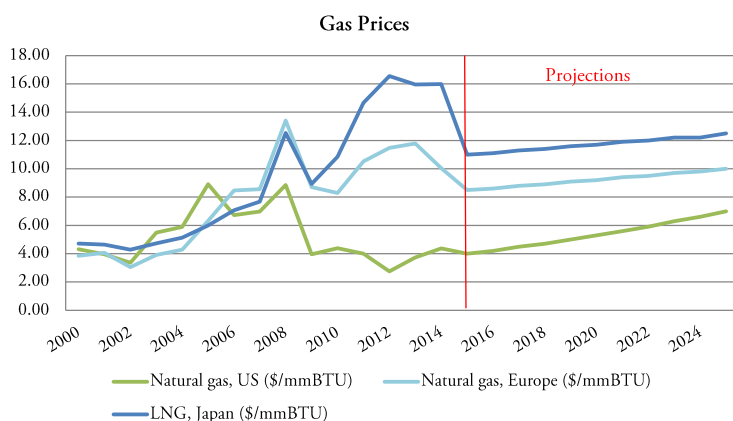
Source: Bloomberg, BMI

Final estimates of how much LNG the United States could export vary considerably, anywhere from Stratfor's 54.4 bcm/y prediction to as high as 108.8 bcm/y by 2020, according to Business Monitor International (BMI).³⁶ Credit Suisse and RBN Energy have put their figure at around 95.2 bcm/y while the IEA views volumes of 101.1 bcm/y as reachable.³⁷ Even with a more optimistic outlook though, the United States alone will not radically change LNG markets in short or medium term.

Still, U.S. LNG exports have been tied to domestic gas spot prices or signed based on the Henry Hub price (the main price set for the North American market), while projects under construction in Australia and Russia, as well as those proposed in Canada and some African countries, link their exports to oil prices or a combination of oil and gas indexes. Based on Henry Hub prices of \$3-4 per million British Thermal Units (mmBTU), a number of U.S. export terminals appear to be economically attractive.³⁸ With U.S. gas prices thus "de-linked" from oil prices, in addition to a "tolling-fee" model that ensures steady revenues from liquefaction stations and the absence of destination clauses from export contracts, U.S. LNG looks highly competitive as well as more flexible than competitors.³⁹ Most importantly, the Panama Canal is undergoing an expansion that will allow for the passage of even larger vessels, greatly facilitating LNG transport in the region.⁴⁰

However, the collapse in oil prices has shaken the LNG industry, as it brings down oil-indexed LNG prices.⁴¹ As a result, current LNG prices are eroding the competitive edge for U.S. LNG exports.⁴² Most of the U.S. LNG projects are competitive in Asia only if long-term Henry Hub gas prices are below \$4 mmBTU and oil is sold above \$80 a barrel.⁴³ Even the low U.S. gas prices that make several U.S. LNG projects competitive may not last forever. A recent EIA study concluded that a surge in LNG exports would cause domestic supply prices to rise 4-11 percent on average, between 2015 and 2040, depending on the volumes of LNG exports.⁴⁴ The World Bank projects that Henry Hub may reach \$5-6/mmBTU by 2020 (see Figure 1), while the French international association for gas, Cedigaz, predicts prices as high as \$7.10/mmBTU by 2035.⁴⁵

Figure 1: World Bank Gas Price Forecast (Nominal dollars, 2000-2025)



1. Natural Gas (Europe), average import border price, including UK
2. Natural Gas (U.S.), spot price at Henry Hub, Louisiana
3. Natural gas LNG (Japan), import price, cif, recent two months' averages are estimates

Source: World Bank Commodities Price Forecast, 22 January 2015

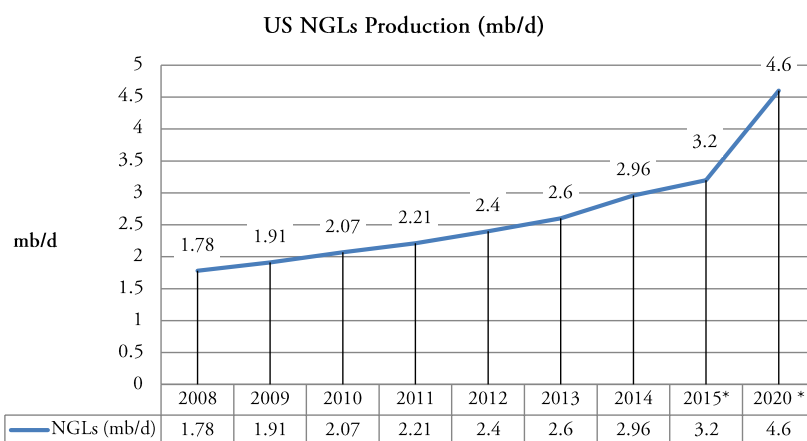
The prospect of lower LNG oil-indexed supplies to Asia has ignited debate over the economics of new LNG projects planned in Australia and the United States. Still, Asian customers, and especially Japan and South Korea, could view U.S. gas supplies as a key way to advance their own energy security, diversifying both energy sources and the associated shipping routes.

Condensates

The shale boom in the United States has also resulted in a significant increase in the production of petroleum products such as condensate, LPG, and other natural gas liquids (NGLs). The Obama administration recently opened the door to export certain ultra-light oil products such as condensate, LPG, and NGLs.⁴⁶ As a result, American companies are vying with Qatar (and Middle Eastern exporters) to win market shares, particularly in Asia. U.S. NGLs exports have increased significantly, jumping almost

sevenfold, from just over 71,000 barrels per day (b/d) in 2007 to nearly 0.47 million barrels per day (mb/d) in 2013.⁴⁷ More importantly, U.S. NGLs exports are predicted to grow from around 0.6 mb/d in 2014 to as much as 2.4 mb/d by 2020.⁴⁸ The sharp rise in U.S. NGLs exports is already having far-reaching implications globally: Middle East dominance of the condensate and LPG markets will fade, U.S. supplies are pressuring the existing global pricing mechanism, and feedstock costs for global petrochemicals are set to fall.

Figure 2: US NGLs Production (mb/d)



* Forecast

Source: EIA, Citibank

As a result, Qatar’s exports may face stiff competition on several fronts. Total crude oil, condensates, and NGL production in 2014 was around 2.0 mb/d, of which 0.709 mb/d was crude oil and the remainder condensates and NGLs.⁴⁹ The country is facing a decline in oil production from mature fields, though, with crude oil production falling from a peak annual average of 0.845 mb/d in 2007 to 0.73 mb/d in 2014.⁵⁰ Without pumping in billions of dollars to stabilize the situation, oil production may decline again in the future (see appendix 1).

Speaking in November 2014, Qatar’s Minister of Energy and Industry Muhammad bin Saleh al-Sada warned of serious challenges to GCC petrochemicals: “As oil prices reach their lowest levels in four years, downstream economists have to reevaluate their strategies. The impact of U.S. shale gas on the competitiveness of our region’s industry is putting downward pressure on gas prices in the region and the emergence of coal-based polyethylene in China shows that the country is looking at alternative feedstock to develop their downstream sector.”⁵¹

The first economic headache lies in condensate exports. Qatar is Asia’s largest supplier of condensate and makes up more than 30 percent of global waterborne condensate

trade.⁵² However, the United States is competing strongly to grab the lead in the global condensate market. The IEA estimates that global condensate production will reach 7.8 mb/d in 2015 and around 9 mb/d by 2020, with almost all of this increase coming from the United States.⁵³ Doha may lose its lead to the United States by 2017, and possibly earlier. U.S. condensate exports could surpass 1 mb/d by the end of this decade.⁵⁴

Table 3: Condensate production & exports (mb/d)

	2014 (Prov.)		2016 (Forecast)		2018 (Forecast)	
	Output	Export	Output	Export	Output	Export
US	1.6	192	2.2	402	2.7	636
Qatar	735	519	790	555	770	402
Russia	510	117	595	125	590	170

Source: Asia Pacific Energy Consulting (APEC)

Adding to these complications, Qatar’s state-run oil marketing company Tasweeq plans to cut condensate exports by 150,000 b/d over the next two years.⁵⁵ This is in line with Doha’s strategy to process larger volumes domestically, replacing condensate exports with naphtha and other higher-value products that it can market in Asia.⁵⁶ Qatar’s Ras Laffan refinery aims to double its capacity for processing condensate by the end of 2016, while targeting a 42 percent boost in naphtha production to raise exports by 4 bcm/y.⁵⁷

However, Qatar’s strategy has not been set in stone. The shift from condensate exports to naphtha will probably not yield lucrative gains due to a softening in global demand and downward pressure on prices. Deeper usage of ethane, propane, and butane as petrochemical feedstock for U.S. and European petrochemical plants (also known as crackers) will likely generate more unused naphtha, depressing prices even further. Naphtha, kerosene, and gasoil margins in Asia have shrunk, dragging down the value of condensate.⁵⁸ Already, Qatar’s Tasweeq has sold deodorized field condensate (DFC) for loading in the first quarter of 2015 at the largest discount in two years.⁵⁹

Compounding the problem, naphtha production from Middle East refineries will grow sharply—by 16.7 percent—during 2014-2018, especially in Saudi Arabia.⁶⁰ Three new super-refineries, two in Saudi Arabia and one in the UAE, are leading a new wave of regional refinery construction which could see regional capacity rise by as much as a third (around 3 mb/d) by 2019.⁶¹ According to the IEA, an overall Middle East crude processing capacity is slated to increase by nearly 40 percent, to 10.3 mb/d, against a global capacity surplus of more than 5 mb/d.⁶²

Furthermore, 500,000 b/d in new condensate splitter capacity is in the works for key Asian consumers such as China and South Korea, ultimately turning more condensates into naphtha which can be consumed locally over the next three years.⁶³ Additionally, as

noted, the widening of the Panama Canal will cut voyage times for U.S. exports to Asia almost in half, with massive effects on an already growing trade.⁶⁴

Together, these trends suggest that Asian markets will not remain a guaranteed outlet for Qatari exports for long, and that Doha’s dominance of the condensate market is set to fade. In this context, the logic behind Qatar’s decision to shelve both of its key petrochemical projects, totaling \$12.5 billion, becomes clearly understandable.⁶⁵

Liquid Petroleum Gas

Qatar’s LPG exports will also be exposed to a tough environment in the coming years. Global LPG production reached over 380 bcm in 2013, up by 2.3 percent from 2012, while LPG exports were around 128.7 bcm in 2013.⁶⁶ Total U.S. LPG exports have surged almost 800 percent since 2008 to around 23.1 bcm/y, surpassing Qatar’s estimated 15 bcm exports for 2014.⁶⁷ Meanwhile, Saudi Arabia’s LPG exports reached 9.2 bcm in 2014 and are expected to hold steady at around 9 bcm this year.⁶⁸

Though the United States only became a net exporter of LPG in 2012, its export capacity is projected to grow to 47.6 bcm/y by 2016, approximately 12 percent of global demand.⁶⁹ The United States will likely be exporting more LPGs than the entire Middle East before the end of the decade.⁷⁰ According to some estimates, Texas alone will have LPG export capacity equal to that of Qatar and Saudi Arabia combined by 2016, and possibly this year.⁷¹

Table 4: US exports of LPG

	2014*	2013	2012	2011	2010	2009	2008
LPG Exports (1000 b/d)**	534	332	196	148	132	100	67

* Primarily

** To convert barrels to tons (1 barrel = 0.086 ton, BP conversion calculator)

Source: EIA

In this context, it is clear that the United States has begun to break the monopoly of Middle East exporters. Japan, the world’s largest importer, sourced just under 75 percent (11 bcm) of LPG imports from the Middle East in 2014, down from 84 percent in 2005.⁷² Over the same period, the United States went from providing almost nothing to 1.9 bcm of Japanese imports, or 12.8 percent of the total. Japan’s imports of U.S. LPG are expected to rise further to around 1.4 bcm by 2017, making up about one quarter of total imports.⁷³ U.S. LPG exports will be further boosted by the expansion of the Panama Canal. This has led key Asian buyers such as Japan and South Korea to push for a new pricing system which takes into consideration both Saudi Aramco Contract Prices and the typically lower-priced U.S. Mont Belvieu benchmarks.⁷⁴

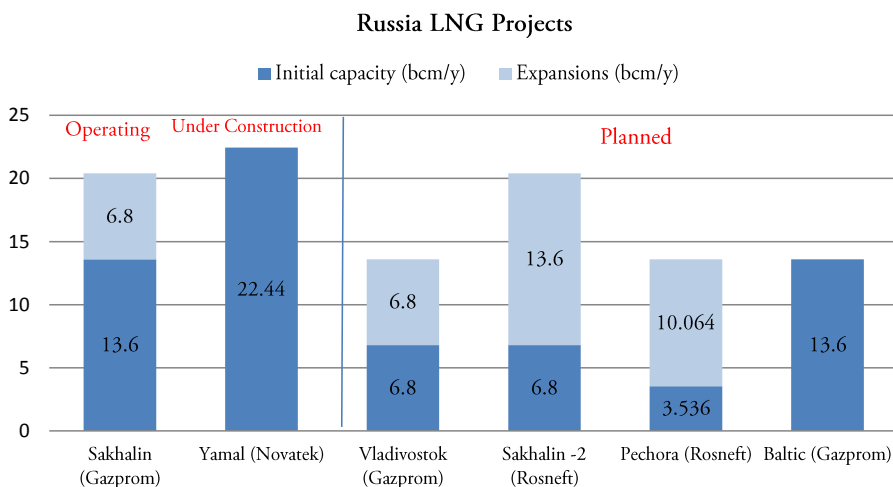
Finally, the U.S. petrochemicals sector continues to expand, driven by growth in ethane availability as a result of the shale gas boom.⁷⁵ Over 215 new chemical production projects (valued at over \$135 billion altogether) were announced in early-December 2014.⁷⁶ Looking forward, the American Chemistry Council projects that U.S. exports of chemicals (excluding pharmaceuticals) could double over the next five years to about \$78 billion by 2019.⁷⁷ Consequently, U.S. petrochemical products will compete directly with products from the Middle East, including Qatari exports. Qatari exports to the United States, like those of the Qatar Fertilizer Company (currently providing 12 percent of U.S. fertilizer requirements), will have a tough time in the next few years.⁷⁸

OTHER CONTENDERS

Russian LNG: Challenging Times

Russia has only one operating LNG plant, located at Sakhalin in the far east. The facility, operated by Gazprom with Royal Dutch Shell, exported almost 14 bcm of LNG in 2013, and was planning to increase capacity to 20 bcm/y.⁷⁹ Russia is looking at large scale LNG projects aimed at generating at least 68 bcm/y of additional liquefaction capacity by the early 2020s.⁸⁰ Additionally, Moscow has long-term ambitions to double its LNG market share by 2020 (currently at around 4.5 percent), and to hit 20 percent by the end of the next decade.⁸¹

Figure 3: Russia LNG development



Source: The Economist Intelligence Unit

The Kremlin has introduced incentives (including tax breaks, LNG export liberalization, and state investments into infrastructure) to encourage Russian companies to move forward with the LNG projects. Yamal LNG is already under construction and is

expected to produce 22.4 bcm/y of LNG by the end of 2017, while four other planned projects are waiting in the wings (see figure 3).⁸²

If all Russian LNG projects materialize, Russian exports will undoubtedly compete strongly with Qatar's LNG exports in European and Asian markets. However, in light of the present geopolitical climate, Russian companies may have a hard time moving forward with these projects. Though Russia's economy is heavily dependent on the export of hydrocarbons, the sharp decline in oil prices raises questions about the economic viability of many of these projects.⁸³ As IEA Executive Director Maria van der Hoeven bluntly put it, "Russia, facing a perfect storm of collapsing prices, international sanctions and currency depreciation, will likely emerge as the industry's top loser."⁸⁴

Russia's economy is projected by the IMF to contract by three percent over the course of this year and one percent in 2016.⁸⁵ Furthermore, the sanctions imposed by the United States and the European Union mean that virtually all Russian companies will have to seek alternative financing options for their ongoing LNG projects.⁸⁶ If the situation in Ukraine escalates further, more sanctions could ultimately lead to the delay, if not the cancellation, of at least some projects. For now, Yamal LNG is the only project under construction in Russia, though it will continue to receive strong financial support from the Russian government. As a result, buyers are unlikely to commit to Russian LNG in the current geopolitical climate. As a clear indicator of this, less than one-fifth of Russian LNG has been sold under firm contracts.⁸⁷

Canada: Still Dreaming

To date, over 30 LNG liquefaction facilities have been proposed to the Canadian National Energy Board (NEB), with the 9 approved having a total capacity of 170 bcm/y.⁸⁸ However, no Canadian projects had moved forward or were under construction as of March 2015. Most of them are still awaiting actual development plans or final investment decision (FIDs), if not both. Despite Canada's hopes of entering the global LNG market, several factors are likely to frustrate Canada's LNG ambitions this decade.

Infrastructure capacity remains a primary constraint on the country's ability to accelerate LNG projects, given that all Canadian projects are greenfield projects (to be developed from scratch) requiring huge infrastructure investments.⁸⁹ Development of export infrastructure has been repeatedly hampered by regulatory and environmental hurdles, while rising equipment and labor costs are ultimately challenging Canadian competitiveness.⁹⁰ As almost all Canadian projects are oil-indexed, plunging crude is undermining the economics of these projects. Even before the fall in oil prices, not a single planned Canadian LNG project had reached FIDs.⁹¹

This likely means the first Canadian LNG exports from a large project will be pushed beyond 2020. The British Colombian government believes the province remains on track to meet its goal of three LNG facilities in operation by 2020.⁹² However, BMI believes it is increasingly unlikely that many of these projects will come online before 2023.⁹³ The same prediction is shared by Sanford C. Bernstein & Co., which believes that Canada may miss that target altogether.⁹⁴ Delays in Canadian projects may be in favor of the current producers, including Qatar. It will be some time before Canada emerges as a strong competitor in the global gas markets, if ever.

Iran: Hidden Potential

Iran is a potential competitor to Qatar in the field of natural gas, though current sanctions restrict Iran's oil sales to about 1-1.1 mb/d.⁹⁵ Iran has the world's largest gas reserves of 33.8 tcm, representing about 18.2 percent of global proven reserves.⁹⁶ The country also produces 158.5 bcm/y, making Iran the world's fourth largest gas producer, after the United States, Russia, and Qatar (see Table 1).⁹⁷ Iran's largest gas field is South Pars, opposite to Qatar's North Field, which accounts for approximately 40 percent of the country's total gas reserves.⁹⁸

Iran currently exports small quantities of piped gas to Turkey and modest volumes to Armenia and Azerbaijan in a gas-for-power swap.⁹⁹ Iran also has two deals with Iraq and one memorandum of understanding with Oman to export 60 million cubic meters per day (mcm/d) and 30 mcm/d of natural gas, respectively.¹⁰⁰ Furthermore, Iranian media reported recently that the National Iranian Gas Export Company is currently engaged in talks with several GCC countries over Iran's gas exports.¹⁰¹ Additionally, Pakistani Commerce Minister Khurram Dastgir Khan recently held that Pakistan will pursue an Iran-Pakistan gas pipeline project once international sanctions are removed.¹⁰²

Iran has ambitions to export natural gas and LNG to European and Asian markets in the foreseeable future. However, poor infrastructure, difficulties procuring liquefaction technology, and geopolitical limitations will probably keep the Iranian gas from reaching these markets in the short to medium term. Western sanctions have had a crippling effect on its gas sector, restricting expansion in the short term.¹⁰³ Some industry experts say it would take at least five years to start exporting LNG to the European countries or Asian markets if sanctions were removed.¹⁰⁴ Having said that, if geopolitical issues are resolved, then pipeline exports from Iran could prove a competitor to Qatari exports to the Middle East and even South Asia.¹⁰⁵

Iran is also a significant producer of condensates and NGLs, but the country's ability to expand its output is severely restricted by sanctions along with the absence of advanced technology and foreign investments. NGLs accounted for round 200,000 b/d of

production, while South Pars, the field Iran shares with Qatar, currently yields about 500,000 b/d of condensate.¹⁰⁶ Still, the IEA estimates that exports of Iranian condensate production averaged about 190,000 b/d for 2014, nearly 105,000 b/d higher than the previous year.¹⁰⁷ Iranian condensate output and exports are set to increase in the next few years, with production possibly hitting over 1 mb/y by 2020.¹⁰⁸ As a result, Iran will eventually compete with Qatar's condensate exports in regional and global markets.

Table 5: Condensate splitter build-up (mb/d)

	2014		2017		2019	
	Total	Expansion	Total	Expansion	Total	Expansion
Middle East (Gulf)	1.095	0.212	1.307	894	2.201	
Qatar	0.200	0.143	0.343	-	0.343	
Saudi Arabia	0.225	69	0.294	-	0.294	
UAE	0.416	-	0.416	-	0.416	
Iran	0.254	-	0.254	894	1.148	
Asia Pacific	1.257	554	1.811	0.139	1.950	

Source: Asia Pacific Energy Consulting (APEC)

Elsewhere

The first LNG shipment from Papua New Guinea's LNG project (operated by ExxonMobil) took place in May 2014, ahead of schedule, and will reach its full annual capacity of 9.4 bcm this year.¹⁰⁹ Currently, there is great interest from Asian companies, especially Japanese ones, to expand production here due to the site's proximity to Asia and the low projected cost of supplies compared with those from Australia, Russia, and even the United States.

In East Africa, Mozambique and Tanzania are proposing LNG plants that could support 10-20 bcm of annual LNG exports.¹¹⁰ Both countries are of interest to buyers as a means of diversifying their global LNG portfolios. However, these projects are still at their infancy or planning stage, risking environmental or logistical delays.¹¹¹ As a result, LNG exports from both countries will likely be delayed until the next decade.¹¹²

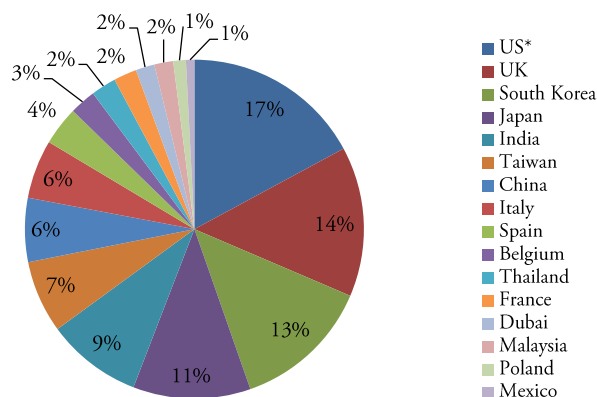
Still, if all of these plans ultimately materialize, they will undoubtedly play an important role in diversifying LNG supply sources and bringing more flexibility to markets. In the long term, they could compete with Qatar's exports in Europe, Asia, and even Latin America.

GLOBAL LNG DEMAND: UNCERTAIN MARKETS

Global LNG production reached 334.5 bcm in 2014, while LNG trade increased by 6.12 bcm to hit a record high of 331.3 bcm.¹¹³ This year, global LNG demand is set to increase by 9.8 percent to 364.5 bcm.¹¹⁴ Though predictions of future growth vary, most suggest annual demand of at least 476 bcm/y by 2020-2025. Bernstein expects annual demand to reach 482.8 bcm by 2020 and 598.4 bcm by 2025¹¹⁵; GDF Suez projects 40 percent growth, equating to 476 bcm by 2025; and BREE predicts 6.5 percent annual growth, bringing global demand to 505.9 bcm by 2020, followed by slower growth with demand reaching 560.3 bcm/y by 2030.¹¹⁶

Asia will be a key market for global LNG demand. BMI expects the region's net LNG import demand to increase to 386.8 bcm/y by 2023, while BP also expects Asia to remain the largest destination for LNG, with its share in global demand remaining above 70 percent.¹¹⁷ Last year, for the second year in a row, the world's five largest importers—Japan, South Korea, China, India, and Taiwan—were all located in Asia, accounting for 75 percent of total LNG imports.¹¹⁸ Total Asian LNG imports are forecast to grow to 255.7 bcm/y in 2015.¹¹⁹

Figure 4: 2014 Contracted LNG Supplies (%)

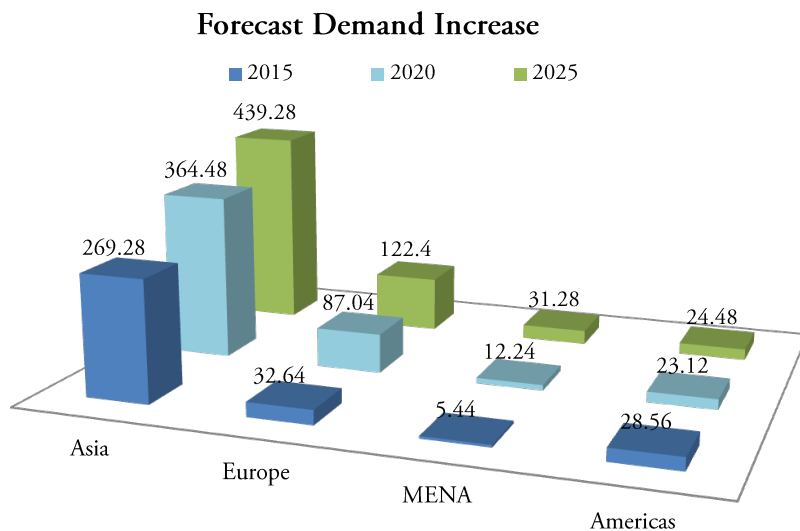


*US contracts are largely landed elsewhere due to a lack of demand.

Source: Bloomberg, BMI

Though Japan (36.7 percent of global LNG demand) and South Korea (15.5 percent) were the world's largest importers in 2014, China, India, and Southeast Asia will be the driving forces of growth in the next 10 years.¹²⁰ These countries accounted for 15.5 percent of global LNG demand in 2014, up from 12.2 percent in 2013.¹²¹ Chinese demand grew by 1.9 bcm—the third largest gain globally—but this was just 38 percent of its incremental growth in 2013.¹²² These countries are expected to import close to 150 bcm/y before the end of the current decade. Consequently, China could overtake South Korea as the world's second largest LNG importer as early as 2019.¹²³

Figure 5: Global LNG demand (2015 - 2025)



However, a number of uncertainties could send demand in any direction. The sharp decline in crude prices and uncertainty over the direction of oil prices are making the picture more complex for the LNG industry. Furthermore, it is still unclear how the resumption of nuclear power production will impact LNG imports in countries such as Japan and South Korea, or how Chinese shale gas production and competition from pipeline supplies will affect markets. Above all, the IEA estimates that cumulative projected spending on LNG amounts to \$736 billion, including \$640 billion on facilities and around \$90 billion on LNG tankers, yet it is far from clear whether all of these projects will ultimately deliver.¹²⁴

OIL PRICES: UNCERTAIN DIRECTION

The sharp decline of oil prices from June 2014, combined with greater supplies, will have serious repercussions for the LNG industry. The IEA has warned repeatedly that the rapid decline in oil prices will deter investment in the LNG sector needed to meet

future demand.¹²⁵ Wood Mackenzie estimates that over \$60 billion in 2015 cash flow will be affected due to the decline in oil prices.¹²⁶ Sustained lower prices are likely to put investments worth more than \$100 billion on hold.

Table 6: LNG imports from Qatar (bcm)

		2014	2013	2012	2011	2010	2009	2008
Japan	Qatar	21.9	21.8	21.3	16.1	10.4	10.5	11.2
	World	120.4	119.0	118.7	106.8	95.2	87.8	94.2
S. Korea	Qatar	17.5	18.2	14.0	11.1	10.1	9.5	11.9
	World	50.5	54.2	49.2	49.9	44.3	35.1	37.1
India	Qatar	16.6 (*)	15.3	14.7	13.2	10.4	9.4	8.3
	World	19.7 (*)	17.7	18.8	17.4	11.9	13.2	11.0
China	Qatar	9.2	9.2	6.8	3.2	1.6	0.5	0.0
	World	27.1	24.5	20.0	16.6	12.7	7.5	4.5

(*) Estimate

Sources: Compiled from UN COMTRADE, ICIS, Energy Intelligence

In this context, uncertainty with the future of oil prices is discouraging LNG buyers from signing long-term contracts. They are also pushing to end restrictions such as destination clauses and asking for price mechanisms to be more flexible.¹²⁷ The dramatic drop in global oil prices dragged down prices for many commodities and has prompted some end-users to switch from LNG to cheaper oil-based alternatives or coal.¹²⁸

In this climate of uncertainty, many proposed LNG export projects will be delayed—if not cancelled—as companies struggle with rising financial costs. In the longer term, a combination of delays and rising demand may push the market from its current surplus into deficit early in the next decade. Woodside Energy’s chief executive Peter Coleman recently summarized the situation: “Today’s newspaper headlines suggest an abundant supply of LNG going into the Asian market in the future. However, I actually see we are starting to build the conditions for a supply crunch.”¹²⁹

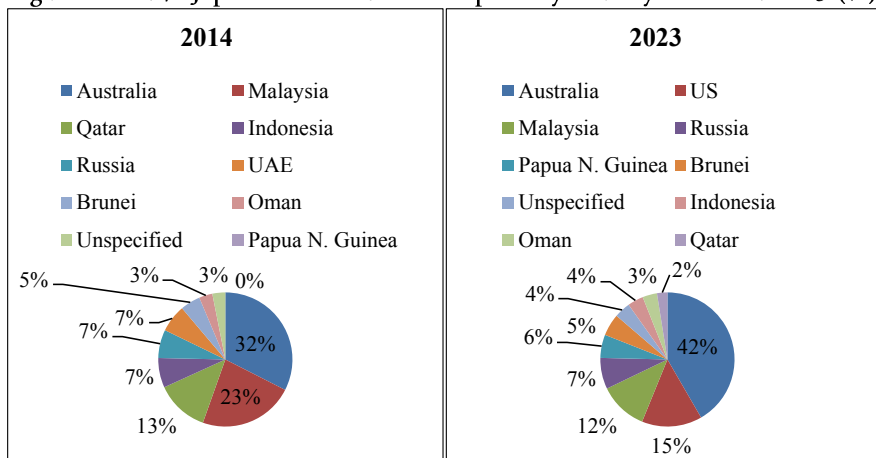
JAPAN AND SOUTH KOREA: NUCLEAR POWER VS. LNG

Prior to the Fukushima disaster, nuclear power accounted for almost one-third of Japan’s electricity generation.¹³⁰ Since 2011, though, the gap left by the shutdown of nuclear plants has been filled mainly by LNG imports. As a result, Japan’s overall LNG imports rose by over 26 percent between 2010 and 2014.¹³¹

However, nuclear reactor restarts were slated to begin as soon as May 2015. Two units in southwestern Japan received approval to restart from the Japan’s Nuclear Regulatory Agency and local authorities in November 2014.¹³² According to projections by Bloomberg New Energy Finance (BNEF), Japan will restart 25 of 48 reactors by 2018.¹³³ Logically, Japan is therefore less likely to increase LNG imports, and this in turn could

undermine prices in Asia in general.¹³⁴ The huge financial burden is also weighing on the minds of Japanese policymakers: Japan paid almost \$263 billion in 2014 for its energy imports, with over a quarter of the total bill going to LNG.¹³⁵

Figures 6 and 7: Japan contracted LNG imports by country 2014 and 2023 (%)



Unspecified = BP. Shell. Other Global LNG Portfolio.

Source: Bloomberg. BMI

This is bad news for Qatar. Despite having most LNG exports locked up in long-term deals, Qatar also remains the largest swing producer and has been key to covering increased demand in Japan since 2011. Qatar has increased its LNG exports to Japan by around 8.3 bcm above contracted quantities.¹³⁶ This trend is likely to continue this year and maybe in 2016, although newly contracted LNG supplies (mainly from Australia and Papua New Guinea) may cover Japanese demand.

As a result, Qatar may lose significant volumes of non-long-term contracts. Volumes of contracted LNG may decrease sharply from 2020 onwards, reflecting the increase of nuclear power generation and the expiration of some long-term contracts.¹³⁷ Qatar's position will increasingly come under pressure as projects in the United States, Australia, and Papua New Guinea will boost their respective export volumes. Japanese companies have been among the most active in signing up to U.S. Henry Hub-indexed deals. Altogether, Japanese companies have signed around 28.6 bcm in long-term contracts from new U.S. terminals and the first U.S. deliveries to Japan could start as early as 2017.¹³⁸ In addition, further LNG supplies could come from Russia, Canada, and East Africa, reducing Qatar's dominant position.¹³⁹

Neighboring South Korea is the world's second largest LNG buyer after Japan.¹⁴⁰ South Korea imported 50.5 bcm of LNG in 2014, down nearly 7 percent from 2013, as its overall gas demand declined due to rising power supply from other sources and slow

economic growth.¹⁴¹ South Korea boosted its coal use while seven out of eight nuclear power plants were returned to work earlier than expected.¹⁴² In the medium term, South Korea's LNG demand is expected to rise to over 53 bcm/y by 2019.¹⁴³ BMI noted in a recent report that "South Korea's dependence on LNG will weaken more significantly than in Japan. Unlike Japan, social and political resistance against nuclear is weaker and regulatory checks needed to restart plants are more quickly completed."¹⁴⁴

Qatar was South Korea's top supplier in 2014, with three long-term contracts for a total of 12.2 bcm/y (see Appendix 4). Qatar was the source of over 34.6 percent of South Korean total LNG imports last year (see Table 6). Qatar supplied South Korea with around 5.2 bcm on top of quantities for long-term contracts. With a flat outlook for LNG imports in South Korea, Qatar may lose some, if not all, of these quantities as Seoul could replace them with LNG imports from Australia, Papua New Guinea, or even the United States. In the long term, two Qatari contracts will expire by 2024 (for 6.7 bcm/y) and 2026 (2.9 bcm/y), at which point both deals will be exposed to stiff competition from other suppliers (see Appendix 4).

CHINA: A PUZZLE

China's LNG imports increased 10.3 percent to 27.1 bcm last year, a pace of growth that was less than half of what was recorded in 2013.¹⁴⁵ LNG imports rose by 22.72 percent from 2012 to 2013 and 20.26 percent between 2011 and 2012.¹⁴⁶ This year, China's implied natural gas consumption is expected to expand 9.3 percent to 200 bcm, while imports of piped gas and LNG are likely to rise by 10.2 percent to 65 bcm.¹⁴⁷

China's strategy has been to diversify its LNG sources in order to hedge against geopolitical and transportation risks.¹⁴⁸ To be sure, the country imported LNG from 17 countries in 2014, compared with 13 in 2013 and 12 in 2012. Qatar was by far the largest LNG exporter to China, but the volume declined slightly year-on-year. Qatar shipped 9.15 bcm in 2014, down from 9.19 bcm the year before (see Table 6).¹⁴⁹

As for the future, the outlook for China's LNG imports varies considerably as a result of uncertainty surrounding the country's future demands. BMI calculations, based on existing LNG import terminals, planned capacity expansion, and long-term supply contracts, projects Chinese LNG imports to be around 51.7 bcm/y by 2018.¹⁵⁰ Other estimates are more optimistic, suggesting imports will hit more than 81.6 bcm/y by 2020.¹⁵¹ As noted previously, China is slated to overtake South Korea as the world's second largest LNG importer after Japan within a few years.

Currently, Qatar is China's most important long-term supplier of LNG, with three contracts totaling 8.95 bcm/y.¹⁵² In 2014, Qatar was the source of almost 34 percent of China's total LNG imports (see Table 6). For Qatar, China is currently their fourth

largest market after Japan, South Korea, and India for exports, accounting for nearly 6.5 percent of its global exports and more than 9 percent of Doha's LNG total exports.¹⁵³ As for the future, even with the most conservative outlook for China's LNG imports, there is scope for Qatar to increase its LNG exports to the Chinese market. Unlike Japan and South Korea, China will continue in aggressively pursuing its diversification strategy. Also, Beijing does not want to rely heavily on Australian or even Russian LNG supplies.

Against this backdrop, there are many factors which could put downward pressure on China LNG imports. The main constraint on China's LNG import growth is the pipeline gas competition. The increase in pipeline supplies from Russia, Central Asia, and Myanmar will soften demand for LNG. The growth of domestic gas production (conventional and shale) and the introduction of cleaner coal technologies will also have a negative impact on LNG imports.¹⁵⁴

INDIA: GREAT POTENTIAL

India imported almost 19.7 bcm of LNG in 2014, and is the world's fourth largest importer.¹⁵⁵ India has great potential for growth in LNG imports, which may double by the end of the decade. According to BNEF, India's total LNG imports may increase by 7 percent to 20.4 bcm/y in 2015 and then 51.7 bcm/y in 2020.¹⁵⁶

Qatar's is India's sole long-term supplier of natural gas, with two contracts for a total of 10.2 bcm/y (see Appendix 4). In 2014, Qatar was the source of around 87 percent of India's total LNG imports. Last year, India imported 9.79 bcm of LNG (more than half of its total imports) through spot markets and short-term contracts.¹⁵⁷ Qatar supplied India with 65 percent of these supplies.¹⁵⁸

Yet the competition from other producers is looming. The importance of countries such as Australia and the United States is expected to increase in the coming years after Indian companies actively sought to diversify their LNG sources, signing several short- and long-term contracts with U.S., Australian, Russian, and global LNG suppliers such as BG, GDF Suez, and Gas Natural Fenosa in the past few years.¹⁵⁹ In the long term, Iranian and East African LNG supplies may also compete with Qatar's LNG exports to India.

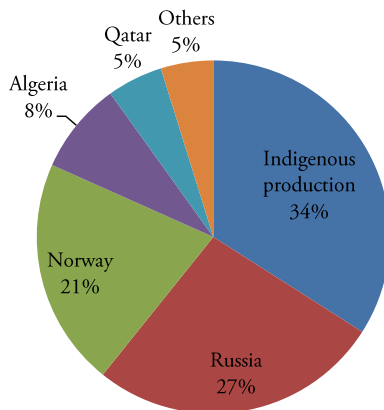
India still faces uncertainties similar to those of China regarding future indigenous gas production, both conventional and shale. Another major constraint for India's future imports is LNG regasification capacity. The country's present LNG import capacity is around 31.28 bcm/y, although the country is expecting LNG demand to increase by around 5-6 percent through 2020.¹⁶⁰ Above all, the biggest issue remains the regulated prices and the possibility of marketing gas downstream.¹⁶¹

EUROPE: OPPORTUNITIES STILL EXIST

The European Union is the world's largest energy importer, with imports supplying 53 percent of its energy needs.¹⁶² Europe's gas imports currently account for around half of its total gas demand.¹⁶³ Over 85 percent of these imports are transported via pipeline, mainly from Russia.¹⁶⁴ According to Erogas's "Statistical Report 2014," in 2013 Russia supplied the EU with 27 percent of its total gas imports, Norway supplied 21 percent, and Algeria supplied 8 percent.¹⁶⁵ The share of gas from Qatar decreased from six percent in 2012 to five percent in 2013.¹⁶⁶

Figure 8: Sources of EU gas imports in 2013

Breakdown of EU-28 gas (% of total, 2013)

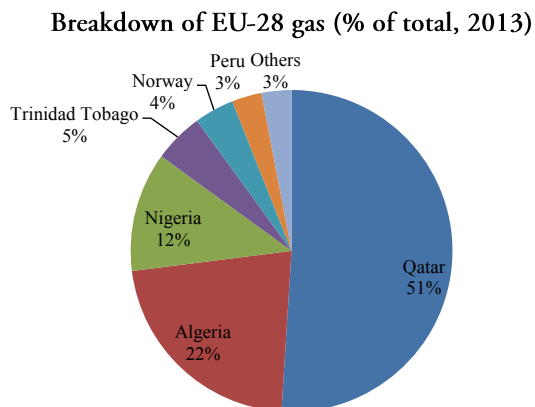


In 2013, 14 percent of the EU's net imports were made up of LNG, and Qatar supplied 51 percent of that amount as Europe's leading LNG provider.¹⁶⁷ In 2012, Europe imported around 30 percent of Qatar's LNG exports, yet this fell sharply in 2013 to almost 22 percent.¹⁶⁸ Factors such as cheaper pipeline gas supplies, high LNG prices in Asia, a mild winter in Europe, and weak economic growth led to a decrease in EU LNG imports in 2013.¹⁶⁹ The United Kingdom is the largest market in Europe for Qatar's LNG exports (36.8 percent), followed by Italy (23.6 percent) and Spain (14.3 percent).¹⁷⁰

During 2014, the crisis in Ukraine threatened gas supplies to Europe and brought the issue of energy security to the forefront, as roughly 15 percent of EU gas imports arrive through Ukraine.¹⁷¹ In response to the crisis, the European Commission adopted the "European Energy Security Strategy," which includes diversifying gas imports and building new LNG terminals.¹⁷² The European Commission even went further in early 2015, proposing a new "energy union package" plan based on five pillars: security of supply, integration of national markets, reducing energy demand, cutting carbon

dioxide emissions, and promoting research and innovation.¹⁷³ Regarding LNG imports, the European Commission stated that it “will prepare a comprehensive LNG strategy, which will also look into the necessary transport infrastructure linking LNG access points with the internal market.... The Commission will also work to remove obstacles to LNG imports from the United States and other LNG producers.”¹⁷⁴

Figure 9: Sources of EU LNG imports in 2013



In this context, the IEA argues that LNG remains the most credible diversification option, next to new gas supplies from Central Asia through the Southern gas corridor.¹⁷⁵ The IEA put it clearly: “LNG imports are essential for the European Union to ensure diversified gas supplies. By enhancing gas market integration, the European Union can ensure the efficient use of current LNG import capacities.”¹⁷⁶ Currently, Europe has enough LNG import capacity to meet over a third of its annual demand.¹⁷⁷ If new European plans go ahead, however, they could undoubtedly open the door for more Qatari LNG exports to European countries.

Looking ahead, the IEA forecasts that if Europe were to seek to re-balance its gas imports away from the pipelines, the EU would need an additional 68-82 bcm/y (at a minimum) of LNG imports by 2020.¹⁷⁸ In the long term, Cedigaz projects natural gas production in Europe to fall by two percent a year to 170 bcm/y by 2035, while demand is forecast to rise 0.6 percent over the same period.¹⁷⁹ As a result, Europe is expected to import 71 percent of its projected gas demand in 2035 compared with 47 percent in 2013, both via pipelines and LNG.¹⁸⁰ BP expects Europe’s share of global LNG imports to rise from 16 percent in 2013 to 19 percent over the next two decades, with an additional 104.7 bcm/y of LNG demand.¹⁸¹

The outlook for LNG demand in Europe remains uncertain though, and depends on a number of factors, including the renewal of the transit agreement between Russia and

Ukraine and LNG prices in Asia.¹⁸² Above all, Russia may still seek to make use of its cost advantage to keep competitors out of European markets. Société Générale pointed out in a recent report that Russia and Norway (together holding more than 50 percent market share for gas in Europe) could sell their gas as low as \$5/mmBTU, while their new competitors, such as piped gas from central Asia or U.S. LNG, need a price of \$9-10/mmBTU to be profitable.¹⁸³

GLOBAL LNG DEMAND: IMPLICATIONS FOR QATAR

The issues that have been discussed previously could have far-reaching repercussions on Qatar's position globally in the medium and long term. Although it is difficult to predict the status of the LNG industry a decade or two from now, initial indications underscore that Qatar will not be the only key player as competition in the LNG market intensifies on the back of strong growth in LNG supplies. Consequently, Qatar will be affected on several fronts. First, the price mechanisms favored by Doha will come under enormous pressure due to the concerns of LNG consumers. Meanwhile, Qatar's export revenues will shrink sharply due to depressed energy prices. Above all, Qatar may lose its status as a "swing producer," a position that has given Doha strategic importance at the global level.

QATAR'S PRICING MECHANISMS UNDER PRESSURE

The principal model for Qatar's long-term contracts is oil-linked pricing based on the JCC (Japanese Customs-cleared Crude or Japan Crude Cocktail) price. LNG is sold at a price which is a proportion of the JCC price—usually between 14 and 15 percent—on a sliding scale referred to as a slope. As LNG contract prices are typically based on the average of the preceding six to nine months, it will be mid-2015 before suppliers feel the full effects of the low oil prices on their LNG revenues.¹⁸⁴ Doha's logic behind its support for oil-indexed gas prices was spelled out recently by Minister al-Sada: "Qatar has always supported the view that long-term contracts based on oil indexation are a more predictable and reliable mechanism for all concerned in the industry. What the industry needs is a stable and fair price to justify the level of investment needed to meet future demand."¹⁸⁵

From 2011 to 2014, crude prices escalated to very high levels, and Qatar's oil-indexed contracts further skyrocketed compared to other prices, as shown in Table 7. This situation raised two main issues for buyers in Asia. On the one hand, oil-indexed gas prices became very expensive and their financial burden intolerable. On the other hand, the inflexibility of the contracts that support the LNG supply chain gives the buyers extra ammunition to criticize the oil-indexation model.¹⁸⁶ As a result, Asian LNG consumers have become increasingly forceful in demanding lower outright contract prices, a greater diversity of price indexation, and flexibility on final destination clauses

(restrictions on buyers' right to resell gas abroad).¹⁸⁷ Additionally, LNG buyers have been actively looking for cheaper alternatives for their gas supplies. Qatar has been facing mounting pressures to alter its pricing mechanism and elements of contracts in any upcoming negotiations.¹⁸⁸

Table 7: Qatar's average¹ price to Asian LNG major markets (\$/mmBTU)

	Japan				South Korea				China			
	Qatar Price (\$)	Japan Avg.	Total LNG bill (\$ bn), from:		Qatari Price (\$)	Korea Avg.	Total LNG bill (\$ bn), from:		Qatar Price (\$)	China Avg.	Total LNG bill (\$ bn), from:	
			World	Qatar			World	Qatar			World	Qatar
2014	16.77 ²	16.15 ²	74.2	14.04	17.78 ²	16.32 ²	31.42	11.86	17.84 ²	11.66 ²	12.18	-
2013	16.74	15.95	72.35	13.94	17.76	14.77	30.65	12.02	17.76	11.10	10.65	6.27
2012	17.28	16.56	75.22	14.08	18.69	14.64	27.36	9.69	18.69	10.68	8.28	4.87
2011	15.44	14.66	60.12	9.63	16.02	12.63	23.86	6.77	15.62	8.97	5.76	2.05

(1) Average January-December

(2) Average January-November

Source: Calculated by the author from UN COMTRADE and Energy Intelligence data

However, Qatar is not the only LNG producer that has linked LNG prices to oil; nearly 73 percent of the global LNG trade is based on oil indexation.¹⁸⁹ Ironically, the sharp fall in global crude prices that began in June 2014 could change these dynamics. With the prospect of weak oil prices in the short and medium term, the argument may work in the other direction, reducing the desire for Asian consumers to look for alternate mechanisms.¹⁹⁰

Regardless, the issue of pricing will not go away, and Qatar has to adapt to prolonged periods of moderate (if not low) prices and flexible indexation mechanisms, unless there is a major supply shock that pushes prices higher. Above all, final destination clauses on contracts for LNG supplies will soon be a thing of the past. As Jerome Ferrier, president of the IGU, noted: "It will be more and more difficult to maintain destination clauses, based on the recent experience with the reverse of the U.S. market."¹⁹¹

KING OF LNG? NOT ANYMORE

Since increasing its export capacity to over 104.6 bcm/y in 2011, Qatar has ruled the LNG market unchallenged for the past four years. Qatar derives much of its current power from its important role as the "swing producer" or "central bank" of the global LNG market. With this LNG superpower status comes the bargaining power that Doha enjoys in the international arena. In a recent report, the IMF acknowledged that "as the world's largest exporter of LNG, Qatar plays a systemic role in the global natural gas market. Qatar accounts for about 1/3 of global LNG trade and has become the key supplier for Japan, South Korea, India, China and the United Kingdom."¹⁹²

However, as mentioned earlier, Australia is on its way to overtaking Qatar in 2018, while the United States is expected to contest the top spot by 2020.¹⁹³ In the long

term, BP projects that Qatar will not only lose the “throne” of the LNG markets, but its importance may decline drastically as it expected to be the fourth LNG supplier after Australia, Africa, and the United States.¹⁹⁴ This, translated into geopolitical terms, means that the strategic importance of Qatar will be diminished gradually.

Nevertheless, it seems that Qatari officials are not worried about losing the top spot. Ibrahim Ibrahim, former economic adviser to the Emir of Qatar and architect of Qatar’s National Vision 2030, played down the importance of this issue: “We expect gas to remain important, and in this context it is therefore important for us to stay competitive.” He added that “fighting to maintain the position of number one exporter is a waste of time and energy: sometimes it has negative consequences to be at the top of the pile. What Qatar should aim for is the optimal exploitation of the gas that it has.”¹⁹⁵

QATAR’S FISCAL BALANCE: LOSING BILLIONS OF DOLLARS

The slump of energy prices is expected to lead to significant declines in Qatar’s fiscal balances. The country has run sizeable fiscal surpluses every year since 2000, but this year the current account balance will shrink drastically to 1 percent and 3.6 percent in 2016.¹⁹⁶ Qatar’s export revenues are shrinking on the back of depressed crude, NGLs, condensate, and LNG prices. IMF calculations project Qatari losses of around \$52 billion (around \$4.3 billion each month) in revenues from energy exports this year. Although the revenues are expected to rebound in 2016, this is forecast to be below peak revenues of 2013.

Figure 10: Qatar is expected to lose billions in revenues from oil and gas exports



Source: IMF

The outlook of energy markets remains uncertain in the coming years. However, gas prices are expected to stay low; European natural gas and Japanese LNG price benchmarks are projected to decline 15 and 35 percent, respectively, in 2015.¹⁹⁷ According to BNEF, LNG costs in Asia this year will average below \$10 mmBTU for the first time in four

years, as new terminals in Australia and the United States come on stream by 2016.¹⁹⁸ Over the medium term, both the World Bank and IMF have warned that the decline in oil prices could prove to be “persistent.”¹⁹⁹ Consequently, Qatar’s revenues from hydrocarbon exports will remain volatile.

If crude prices remain low for a prolonged period, there is no question that this may prove more problematic for Qatar. Low hydrocarbon prices combined with higher government spending, a fast expanding population, and growing domestic demand will result in mounting upward pressure on the Qatari government to prioritize its spending plans. The Economist Intelligence Unit noted in a recent report that “Qatar has the fiscal space to maintain large-scale spending and keep up a healthy pace of economic growth in the medium term. However, oil and gas prices look set to trend down steadily over the forecast horizon, suggesting that fiscal discipline will be needed over the long-term.” To be sure, Qatar’s fiscal breakeven point for oil prices will rise significantly; the IMF projects it will rise by 30 percent in 2016.

GEOPOLITICAL BENEFITS AT STAKE

To date, most LNG supplies are traded under long-term contracts. However, in the last few years the proportion of LNG traded on spot or short-term contracts has risen considerably, regardless of the definition used. According to the IGU, the non-long-term market refers to cargoes not supported by long-term (5+ years) Sales and Purchase Agreements (SPA). Meanwhile, the International Group of Liquefied Natural Gas Importers (GIIGNL) considers short-term deals as trades under contract with a duration of four years or less.

Data from IGU shows that non-long-term trade almost doubled between 2007 and 2013, and now accounts for 33 percent of total LNG trade.²⁰⁰ Qatar and Nigeria remained the dominant spot exporters, accounting for 44 percent of total non-long-term volumes.²⁰¹ GIIGNL figures furthermore indicate that spot and short-term imports jumped from only 5 percent in 2000 to 16.3 percent in 2009, hitting 88.4 bcm/y or 27.4 percent of total LNG trade at the end of 2013.²⁰² Qatar was the dominant exporter accounting for 38 percent of spot and short-term deals.²⁰³ This situation gives Qatar significant strategic advantages, which translate into political and economic benefits. A recent study by Harvard University noted that “Qatar gains geopolitical benefits from its broader LNG export customers.... Qatar’s global position is enhanced because of its capability to serve as a swing supplier to important industrialized countries.”²⁰⁴

Looking forward, the volumes of spot and short-term trade will grow steadily through the end of the current decade. In the United States, over 15 bcm/y from 5 terminals (Sabine Pass, Cameron, Cove Point, Corpus Christi, and Freeport) are still un-

contracted (see Table 2). This number may rise significantly in the coming years as new projects come on stream. By 2017, up to 6.8 bcm/y of LNG could be available for the spot market from Australia alone.²⁰⁵ Wood Mackenzie’s analysis suggests that by 2020, Malaysia has the potential to be one of the largest suppliers (if not the largest) of flexible LNG portfolio or un-contracted LNG to the global market.²⁰⁶ The supply capacity of Malaysia’s PetroliaM Nasional Berhad (Petronas) flexible LNG volume will grow from 3.4 bcm in 2013 to 35.36 bcm in 2022.²⁰⁷ This is all in addition to possible new supplies from Papua New Guinea, East Africa, Russia, and Canada.

Table 8: Qatar's LNG exports based on spot & short-term* volumes in 2013

Country	Quantities in bcm
Europe	1.6
Americas	2.2
Asia	28.4
Middle East	1.8
Total	34.1
	(Over 1/3 of Qatar's total LNG exports)

(*) Less than 4 years

Source: Compiled by the author from GIIGNL

Importantly, by 2020 Qatar’s spot and short-term volumes could increase to almost 42.2 bcm/y, according to GIIGNL statistics. Most of Qatar’s long-term contracts are due to expire between 2024 and 2035 (see appendixes 3 and 4), however, 6 contracts with a total export capacity of 17.1 bcm/y (in Japan and Europe) are expected to expire between 2018 and 2021, with renewal likely but not set in stone. Australia, Papua New Guinea, Russia, and even the United States are strong contenders to replace Qatar supplies in Japan, while Russian and American companies will compete with Qatar’s LNG exports in Europe.

As a result, U.S. supplies, combined with Qatari, Australian, Malaysian, and other producers’ exports, mean there could be a global glut of LNG by 2020, challenging Doha’s position as sole swing producer and pushing the already depressed LNG prices downward even further.²⁰⁸ This will increase supply options to buyers in Asia, Europe, and other LNG consumers. Most importantly, it will give them even more leverage in future negotiations with Qatar and other key LNG exporters. To underline the importance of U.S. supplies, Howard Rogers recently noted in a Qatari English-language daily that U.S. LNG export projects are “likely to become a major source of destination flexible LNG, able to arbitrage between Asian, European and South American markets....the US may well displace Qatar as the primary destination swing supplier.”²⁰⁹

Predicting the future is a risky business. Markets will be strongly dependent on new projects coming on stream and the rate of growth of LNG demand in Asia—China,

India, and Japan in particular. Above all, unforeseen factors may change the whole dynamic. The recent disaster in Japan and the surge in the country's LNG imports post-Fukushima demonstrate how volatile the LNG market can be. Or as Hamad Rashid al-Mohannadi, CEO of Qatar's RasGas, eloquently summarized it, "The greatest risks to ensuring timely supply of new LNG to meet growing global demand are the delay in development of new supply and the associated LNG value chain, escalating development costs and indecision or inability of customers and suppliers to agree mutually on acceptable contract terms."²¹⁰

CONCLUSION: THE DEVELOPING QATARI RESPONSE

Qatar has imposed a moratorium on increasing natural gas production from its North Field that will last through 2015.²¹¹ Apart from the \$10.3bn Barzan gas project (the last permitted North Field development under the current moratorium), which will largely feed growing domestic demand, no further gas projects have been sanctioned.²¹² Qatar has also not announced plans to expand its LNG export capacity beyond the existing facilities. Consequently, in the short and medium term, it is clear that Qatar's gas strategy will remain stagnant. Qatar's government says that the moratorium on new natural gas developments at the North Field, put in place in 2005, is vital to develop gas production without damaging the reservoir and to ensure the long-term efficient production.²¹³

Ibrahim Ibrahim explained Doha's logic behind implementing the moratorium: "Unlike other countries, which have their gas reserves located in multiple reservoirs across different geographies and geologies, Qatar has the vast majority of its gas in one large reservoir, which is an extremely high-risk situation.... Qatar's production could be seriously affected by rushed exploitation."²¹⁴ Even if the moratorium is lifted, it will take years and billions of dollars for new plants to be built.²¹⁵ However, Qatar has indicated that it may increase its LNG production by 13.6 bcm/y through improvements in the efficiency of its LNG production plants.²¹⁶

In the long term, Qatar may expand its production capacity of gas-to-liquids (GTL) and LNG fuel for the shipping industry. Qatar is an industry leader in GTL technologies, which produce liquid fuels such as low-sulfur diesel and naphtha from natural gas.²¹⁷ Qatar has two facilities to produce GTL: Pearl, the world's largest GTL plant with a capacity of 140,000 b/d, and ORYX GTL with a capacity of 32,000 b/d.²¹⁸ EIA forecasts Qatar's GTL production to double over the next decade.²¹⁹ Doha is also looking to lead the way in building a supply chain that uses LNG as marine fuel. Market outlook is encouraging as EU strategy aims to increase the use of LNG in marine fuel, with the shipping industry running its fleet on LNG from 2025.²²⁰ Lloyd's Register projects LNG's share of the marine fuel market could reach 7 percent by 2025 and jump to 11 percent by 2030.²²¹

Developments in world oil markets could also benefit Doha in the long term. With the

sharp fall in oil prices, several LNG projects may be delayed if not cancelled. However, even without these developments, Qatari officials are bullish about future gas demand. Qatargas's CEO, Sheikh Khalid Bin Khalifa Al Thani, forecasts that LNG demand in Asian markets will rise to well over 612 bcm by 2025: "Based on our projections, another 204 bcm of additional...LNG supply capacity is needed to meet global demand by 2025."²²²

Qatar has also pursued the option of buying up the competition. One of Qatar's strategic investments overseas is a joint venture with ExxonMobil: the Golden Pass LNG terminal in Texas. This investment is expected to reach over \$10 billion with an export capacity of 20.9 bcm/y. Qatar Petroleum International will have a 70 percent stake in the terminal, and is seeking final permission from the U.S. DOE to export LNG from U.S. to non-FTA countries.²²³ The company is expected to take the final investment decision for the project this year.

If the project gets the green light, the terminal will add almost 15 bcm/y of export capacity to Qatar's overall LNG portfolio. Although the decline in oil and LNG prices make the project look less economically attractive, Total's Senior LNG Advisor Guy Broggi recently told MEES that he thinks Qatar will go ahead with the project because of its strategic importance: "This project has a strategic importance and Qatar and ExxonMobil will go for it: short-term prices have no relevance when you talk strategy.... This future LNG could easily go to the UK and the west coast of Europe, while new markets like Pakistan, Bangladesh, Egypt and Jordan will be supplied by quantities diverted from the current UK or European contracts."²²⁴

There are also emerging LNG export opportunities in the MENA region. Demand in MENA is projected to jump from 5.44 bcm in 2015 to 12.2 bcm by 2020 and 31.2 bcm by 2025 (see figure 5). Additionally, planned regasification terminals in the UAE and Kuwait will be able to process 12.2 bcm/y and 15.2 bcm/y, respectively.²²⁵ Above all, if GCC states overcome their political differences and agree on a price mechanism that is satisfactory to everyone, Qatar, via the Dolphin pipeline, could meet most, if not all, projected gas demand in the UAE, Oman and Kuwait. BMI projects that these three countries will need to import almost 50 bcm/y of natural gas by 2020, with 75 percent of going to the UAE alone.²²⁶

The Dolphin pipeline could certainly see investment in new infrastructure to deliver additional exports, as it could theoretically carry about 33.2 bcm/y yet only delivers about 22.6 bcm/y.²²⁷ Under current plans, a new compression facility at Ras Laffan in Qatar would increase volumes in 2015.²²⁸ However, any additional quantities will likely be dependent upon the costs, as Qatar is unhappy with the current price which is below market prices. Indeed, gas is sold well below the market price, with customers

in the UAE and Oman reportedly paying just \$1.30/mmBTU, compared to the \$16-17/mmBTU Qatari gas prices in Asia (see Table 7).²²⁹ However, Qatar should work tirelessly to secure a considerable market share in the Gulf region and the Middle East in general.

Qatar has also started to show flexibility in signing new contracts. In 2013, Qatar signed three medium-term deals targeting European customers (Appendix 3); all of them are “ex-ship” contracts, with the seller responsible for transporting the goods to their destination. Centrica signed a \$7.1 billion gas agreement with Qatargas to import 4.1 bcm/y of LNG supplies from June 2014 to December 2018.²³⁰ The price quoted means an average of \$10/mmBTU and the contract is based on the U.K.’s National Balancing Point (NBP) prices.²³¹ Qatargas has also signed another 5-year, 1.6 bcm/y SPA with Malaysia’s Petronas starting in 2014. Petronas will import LNG from Qatargas into Britain’s Dragon terminal in Wales (where Petronas holds shares).²³²

The IEA noted that “these contracts are not a fundamental change in terms of pricing, as Qatar was already selling LNG to the United Kingdom at prices close to NBP prices.”²³³ However, Qatargas has also signed a 5-year flexible SPA with Germany’s E.ON for around 2 bcm/y of LNG. This deal broke with Qatar’s traditional oil-link contracts as it has a pricing mechanism based on continental European gas prices as the LNG will be delivered at the Dutch Gate terminal.²³⁴ In this regard, Qatar should continue to show more flexibility in the European markets. There is potential for significantly increasing Doha’s LNG exports, especially if the EU goes ahead with its plan to reduce its dependence on Russian gas.

Most importantly, Qatar, with its already established infrastructure, low production costs, and strategic location is in a much stronger position than its competitors.²³⁵ For example, the IEA estimates that Qatar’s development costs are well below \$1/mmBTU, whereas Russia’s are about \$2/mmBTU and Australia’s exceeds \$3/mmBTU.²³⁶ Qatar also has a fleet of 65 vessels, including 27 long-term chartered vessels, with a Q-Max vessel and a variety of conventional and Q-Flex vessels, representing some 20 percent of the world’s total LNG fleet.²³⁷ While it is not in the interest of Qatar to declare a price war, Doha should use these advantages in a smart way.

Above all, Qatar needs to continue its economic diversification strategy at home and abroad. Qatar should work hard to encourage and strengthen institutional joint action within the GCC. Although some might dismiss this as a wishful thinking, the future of GCC states lies in their collective policies and accelerating the process of reinforcing the union. If GCC leaders were to speak with one voice in any future economic negotiations with Asian countries or the European Union, Qatar along with the rest of the Gulf states would reap great benefits.

Against this strategic backdrop, the LNG market is heading toward profound changes which could eventually break Qatar's dominance. Doha has to learn from its own experience, with the shale boom as the obvious example. While Qatar was aiming to send 20-27 bcm/y of its LNG exports to the United States, the new drilling technologies of fracking changed the whole situation drastically. Within a few years the United States switched from a country which was expecting to import large quantities of natural gas to a potential exporter with great capabilities of becoming a major player in the LNG market, if not the top one.

While Qatar will remain a major player for the foreseeable future, there are developments that may occur in the long term which may again alter market dynamics. Firstly are the rapid technological advances in energy exploration, drilling, and production. Though it is difficult to replicate the experience of the United States on a global scale, constantly improving technology shows that major breakthroughs are still possible. The scope for innovation is unlimited. As energy historian Daniel Yergin eloquently put it, "When it comes to energy, the rule of the game is to expect the unexpected.... 10 years from now we may well see the next game changer."²³⁸

Secondly, there is a strong desire among many of the energy-consuming countries, especially in Asia, to reduce dependence on Middle Eastern energy imports. Measures such as energy efficiency, promoting research and innovation, and increased investments in alternative energy may limit the increase in future demand. Finally, U.S. policy in the Middle East is still evolving, so all possibilities could be on the table, including signing a final nuclear agreement with Iran, withdrawal from Afghanistan, and reaching a political solution in Iraq and Syria. Together, these factors could, over the long term, gradually erode the strategic importance of Qatar (and the Gulf in general) to the United States and its allies. As such, Qatar and the Gulf states need a common strategy that takes into account all scenarios.

APPENDIX I

OPEC Sustainable Crude Output Capacity, (mb/d)

	2014	2015	2016	2017	2018	2019	2020
Saudi Arabia	12.38	12.34	12.42	12.49	12.46	12.41	12.39
Iraq	3.66	3.90	4.10	4.22	4.33	4.52	4.73
Iran	3.60	3.60	3.60	3.60	3.60	3.60	3.60
UAE	2.90	2.94	2.98	3.03	3.10	3.15	3.21
Kuwait	2.86	2.82	2.84	2.84	2.83	2.80	2.76
Venezuela	2.56	2.49	2.45	2.40	2.45	2.51	2.56
Nigeria	1.98	1.92	1.91	1.90	1.89	1.89	1.89
Angola	1.77	1.80	1.80	1.84	1.86	1.86	1.86
Algeria	1.17	1.14	1.10	1.06	1.02	0.98	0.95
Libya	0.85	0.50	0.65	0.75	0.81	0.87	0.98
Qatar	0.73	0.70	0.70	0.71	0.72	0.73	0.73
Ecuador	0.57	0.57	0.57	0.58	0.59	0.59	0.59
OPEC	35.03	34.73	35.12	35.41	35.65	35.91	36.24

Source: IEA, medium-term oil market report 2015

APPENDIX 2

Qatar's Economic Indicators, (2000-2016)

	Projections					
	Average 2000-11	2012	2013	2014	2015	2016
Real GDP Growth, (Annual change; %)	12.8	6.0	6.3	6.2	7.1	6.6
Nominal GDP, (Billions of U.S. dollars)	66.9	190.3	203.2	208.7	179.4	202.9
Non-Oil Real GDP Growth, (Annual change; %)	14.6	10.0	11.0	11.6	10.6	9.5
Oil Real GDP Growth, (Annual change; %)	11.2	1.3	0.2	-2.1	1.0	1.0
Crude Oil Production, (mboe/d)	0.75	0.73	0.70	0.64	0.60	0.59
Natural Gas Production, (mboe/d)	1.43	3.89	4.00	4.00	4.12	4.24
Crude Oil Exports, (mb/d)	0.69	0.64	0.63	0.56	0.52	0.50
Natural Gas Exports, (mboe/d)	0.99	2.64	2.72	2.70	2.71	2.71
Fiscal Breakeven Oil Price (U.S. dollars per barrel) ¹	35.3	69.0	48.4	56.2	64.1	89.4
External Breakeven Oil Price ²	-	56.3	55.1	57.5	56.9	60.0
General Government Fiscal Balance (% of GDP)	8.2	9.5	14.4	9.2	-1.5	-5.3
General Government Total Revenue, Excluding Grants (% of GDP)	37.1	40.4	45.8	42.8	36.0	29.2
General Government Non-Oil Fiscal Balance (% of non-oil GDP)	-35.9	-35.8	-25.2	-23.0	-25.9	-31.4
General Government Non-Oil Revenue (% of non-oil GDP)	29.0	34.7	41.8	39.1	30.9	21.0
Total Government Gross Debt (% of GDP)	31.2	36.0	32.2	30.6	30.5	24.9
Total Government Net Debt (% of GDP)	25.2	27.5	17.5	17.1	17.0	12.3
Exports of Goods and Services (Billions of U.S. dollars)	42.1	142.9	148.1	139.5	87.7	98.1
Imports of Goods and Services (Billions of U.S. dollars)	19.0	54.7	59.0	63.1	64.0	68.5
Current Account Balance (Billions of U.S. dollars)	13.6	62.0	62.6	47.9	1.8	7.4
Current Account Balance (% of GDP)	20.1	32.6	30.8	23.0	1.0	3.6
Gross Official Reserves (\$ Billions)	8.9	33.1	42.2	46.9	33.1	32.9
Total Gross External Debt (% of GDP) ³	62.5	84.8	82.0	78.5	87.5	83.1

(1) The oil price at which the fiscal balance is zero.

(2) The oil price at which the current account balance is zero.

(3) Nominal GDP is converted to U.S. dollars using period average exchange rate.

Source: Compiled from IMF, Middle East Economic Outlook, 21 January 2015

APPENDIX 3

Qatar's Long, Medium, & Short Term Sales & Purchase Agreements (2006-2013)

	Purchaser	Import country	Amount (bcm/y)	Duration (Years)	Extra Years	Start	Delivery Format
CONTRACTS CONCLUDED IN 2013							
Long & medium term Sales & Purchase Agreements (> 4 yrs)	E.ON Global Commodities	Netherlands	2.0	5		2014	D.E.S
	Centrica	UK (Dragon)	1.5	5		2014	D.E.S
	Petronas LNG UK	UK (Isle of Grain)	4.1	4.5		2014	D.E.S
CONTRACTS CONCLUDED IN 2012							
Long & medium term Sales & Purchase Agreements	EDF Trading	Belgium	4.6	15		2012	D.E.S
	The Tokyo Electric Power Co.	Japan	1.4	10		2012	D.E.S
	Chubu Electric	Japan	1.4 (2013-2017) 1.0 (2018-2028)	15		2013	D.E.S
	Kansai Electric	Japan	0.7	15		2013	D.E.S
	KOGAS	South Korea	2.7	21		2012	D.E.S
	PTT	Thailand	2.7	20		2015	D.E.S
CONTRACTS CONCLUDED IN 2011							
Long & medium term Sales & Purchase Agreements	CHU BU ELECTRI C/SHI ZUOKA	Japan	0.4	6		2014	D.E.S
Short term contracts (< 4 yrs)	Centrica	UK	3.3	3		June 2011	D.E.S
Memorandum of understanding (M.O.U.)	ENARS A	Argentina	6.8	20		2014	
CONTRACTS CONCLUDED IN 2010							
Long & medium term Sales & Purchase Agreements	Repsol Energy Canada	Canada	> 2.7			Dec. 2010	D.E.S.
Short term contracts	Eni	U.S.A.	0-1.8	2+		June 2010	D.E.S.
CONTRACTS CONCLUDED IN 2009							
Short-term contracts	Sempra LNG Marketing	USA	0-4.8**	1.5		2009	
	Edison Spa	Italy	0.18	<1 year		2009	Ex-ship
	Statoil	USA	Up to 2.1	1.5 year		2009	
CONTRACTS CONCLUDED IN 2008							
Long & medium term Sales & Purchase Agreements	Shell	China	4.1	25			
	PetroChina	China	4.1	25			
	Shell	UAE					
	DUSUP	UAE					
CONTRACTS CONCLUDED IN 2007							
Long & medium term Sales & Purchase Agreements	Korea Gas Corporation	South Korea	2.9	20		2007	S.P.A
CONTRACTS CONCLUDED IN 2006							
Long & medium term Sales & Purchase Agreements	Total	UK, USA, France, Mexico	7.1	25		End 2008	

*10 cargoes

** Option agreement. None of the volumes are firm

Source: Compiled from GIIGNL

APPENDIX 4

Qatar's Long-term and Medium Term Contracts in Force in 2013 (*)

Export Country	Loading Point	Seller	Buyer	Nominal quantity ACQ bcm	Duration	Type of contract	Comments
Qatar	Ras Laffan	Qatargas I	Chubu Electric	5.4	1997/2021	D.E.S.	
			Tohoku Electric, Tokyo Gas, Osaka Gas, The Kansai Electric, The Tokyo Electric Power co., Toho Gas, The Chugoku Electric	2.7	1998/2021	D.E.S.	
			Gas Natural sdg	1.0	2005/2024	D.E.S.	
			Gas Natural sdg	1.0	2006/2025	F.O.B.	
			The Tokyo Electric Power co.	1.4	2012/2021	D.E.S.	
		Qatargas II T1	ExxonMobil	10.6	2009/2034	D.E.S.	
		Qatargas II T2	CNOOC	2.7	2009/2034	D.E.S.	
			Total	2.5	2009/2034	D.E.S.	
			Total	2.0	2009/2034	D.E.S.	
			Total	1.6	2009/2034	D.E.S.	
			Total	1.0	2009/2034	D.E.S.	
		ExxonMobil	0.8	2009/2033	D.E.S.		
		Qatargas III	ConocoPhillips	10.6	2010/2035	D.E.S.	
			Chubu Electric	1.4	2013/2028	D.E.S.	Nominal quantity (ACQ) 2013/2017 : 1 mmtpa; 2018/2028 : 0.7 mmtpa
			The Kansai Electric	0.7	2013/2027	D.E.S.	
		Qatargas IV	Shell	5.2	2011/2041	D.E.S.	
			PetroChina	4.1	2011/2036	D.E.S.	
			Marubeni	1.4	2011/2031	D.E.S.	
		RasGas I	KOGAS	6.7	1999/2024	F.O.B.	
		RasGas II T1	Petronet LNG	6.8	2004/2028	F.O.B.	
		RasGas II T2	Edison	6.3	2009/2034	D.E.S.	
			Endesa	1.0	2005/2025	D.E.S.	
		RasGas II T3	EDF Trading	4.6	2007/2012	D.E.S.	Extended to 2027
			CPC	4.2	2008/2032	F.O.B.	
			ENI	2.8	2007/2027	D.E.S.	Former Distrigas contract
		RasGas III T1	ExxonMobil	10.6	2009/2034	D.E.S.	
			Petronet LNG	3.4	2009/2029	F.O.B.	
			KOGAS	2.9	2007/2026	D.E.S.	
			KOGAS	2.7	2012/2032	D.E.S.	New LT contract
		RasGas III T2	ExxonMobil	10.6	2010/2035	D.E.S.	
		RasGas III	CPC	2.0	2013/2032	D.E.S.	

(*) Duration above four years

Source: Compiled from GIIGNL

APPENDIX 5

Qatar's Top 10 Export Partners in 2013 (\$ millions)

	2008	2009	2010	2011	2012	2013
Japan	23223.08	15473.47	21484.40	29867.86	36890.90	39923.22
S. Korea	13609.41	6891.87	12030.29	20135.85	24675.83	24550.67
India	3204.39	4036.05	6438.92	10851.63	14629.78	14303.21
China	770.21	923.17	2225.22	4494.95	6814.14	8864.57
Singapore	7352.37	3365.34	5818.92	8180.80	7037.95	6963.11
UAE	3366.01	2666.34	4278.95	4357.59	5957.99	5824.49
Taiwan	1075.57	515.68	1907.98	3702.01	5283.88	5754.13
UK	104.02	1337.25	3535.52	8008.17	4571.69	3855.69
Thailand	1971.37	1356.11	2174.87	2413.44	2630.34	3568.25
Italy	5.27	51.20	93.67	121.41	263.39	2641.58

Source: IMF, Direction of Trade Statistics (DOTS)

ENDNOTES

¹ BP, “BP Statistical Review 2014,” June 2014, <<http://www.bp.com/content/dam/bp/pdf/Energy-economics/statistical-review-2014/BP-statistical-review-of-world-energy-2014-full-report.pdf>>.

² For ease of comparison, all volumes in this study have been converted to bcm at the rate of one million metric tons to 1.36 bcm. International Energy Agency (IEA), “Key World Energy Statistics 2014,” September 2014, <<http://www.iea.org/publications/freepublications/publication/KeyWorld2014.pdf>>.

³ IGU, “World LNG Report - 2014 Edition,” April 2014, <http://www.igu.org/sites/default/files/node-page-field_file/IGU - World LNG Report - 2014 Edition.pdf>.

⁴ Abdullah bin Hamad Al Attiyah, “Qatar Plans to Increase Liquefied Natural Gas Exports to 60 Million Tonnes/Year by 2010,” *Opec Bulletin* 35, no. 2 (March 2004): 18-19, <http://www.opec.org/opec_web/static_files_project/media/downloads/publications/OB032004.pdf>; IGU, “World LNG Report - 2014.”

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