

# SHARING A POT OF GOLD:

## IRAN, QATAR AND THE PARS GAS FIELD

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Middle East Institute

Policy Focus Series

August 2016

*The North Dome/South Pars field, shared by Iran and Qatar, is the largest gas field in the world. Iran and Qatar are well aware of the wealth they control, but they differ in their approaches to monetize it. Further development of the field will be hampered by the prolongation of low gas prices, which is set to continue for the near future and have varied impacts on both states. Iran may be prompted to develop value-added industries based on natural gas, and explore piped gas options to neighboring countries. Qatar will find its large investments in L.N.G. much less profitable than in the past and, like Iran, may have to shift to piping gas to its neighbors and more value adding products based on natural gas. Nevertheless, it is in the world's interest to ensure stability over this vital gas field, and thus encourage Iran and Qatar to maintain warm relations and responsible dual management.*

### KEY POINTS

- ◆ Low gas prices may prompt Qatar and Iran to develop value-added industries based on natural gas, instead of pursuing the more expensive route of converting to L.N.G.
- ◆ If Iran is to expand its investment in the South Pars field, it should take note of Qatar's experience and challenges in developing L.N.G. before opting to pursue a similar road
- ◆ L.N.G. requires large investments and access to advanced technology only available from a limited number of Western companies, mainly American—access of which Iran has yet to obtain
- ◆ Piped gas to neighboring countries is another viable option to increase revenue, but would require a significant improvement in Iran-G.C.C. relations
- ◆ A military buildup in the area and a hardline security-focused approach could trigger conflict, which is not in the interest of either party

## INTRODUCTION

Iran is known to have the largest natural gas (N.G.) reserves in the world. 50 percent of these reserves come from the largest gas field in the world—Iran's share of the North Dome/South Pars field. The remainder of this field is the famous North Dome field owned by Qatar. The two named fields are really only part of the major offshore N.G. reserves delimited by the maritime boundary between the two countries. Iran and Qatar are well aware of the wealth they control and are approaching how to monetize it in two entirely different manners. Both countries have reserves for many generations to come. On the one hand, Qatar is extracting the N.G. from its reserves much faster than is Iran, through large joint ventures with Western energy companies, while the Islamic Republic, unable, as of yet, to strike deals with major global energy companies, has sought to develop the field on its own. Iranian policy is likely to change, however, with international sanctions lifted as part of the Joint Comprehensive Plan of Action signed with the United States and other world powers in July 2015. However, Iran will have to work extremely hard to reach the level of development presently witnessed on the Qatari side of the field.

The North Dome/South Pars field is not just a bilateral issue between Qatar and Iran. N.G. is regularly referred to as the main intermediate fuel in the eventual decarbonization of the world. It is often discussed as the fuel that is replacing coal and crude oil while the world moves to renewable energy sources such as wind, solar, biomass, and



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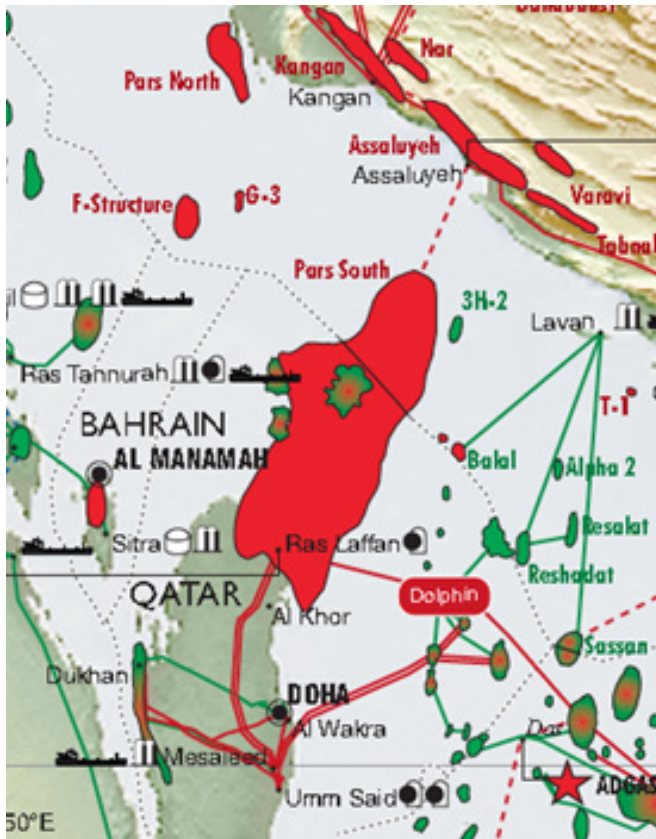
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other future technologies. Since the shared Iranian-Qatari field is so enormous, it is of importance to the world that flow is not hindered by unstable political issues or pernicious exploitation. At the same time, developments in Iran and Qatar are somewhat hampered by the low price of gas and the questionable wisdom behind compressing N.G. into liquid natural gas (L.N.G.) when a glut already exists and will be made worse by the ramping up of N.G. and L.N.G. production in Australia and the United States.

## THE NORTH DOME/SOUTH PARS FIELD

The whole field covers 9,700 km<sup>2</sup>, of which 3,700 km<sup>2</sup> are in Iranian waters.<sup>1</sup> According to Iranian sources, the field holds an estimated 51 trillion cubic meters (tcm) (approximately 1,800 trillion cubic feet) and 50 billion barrels of condensates. According to the same Iranian sites, South Pars alone holds 14 tcm and 18 billion barrels

of condensates, which represent about ½ of the total gas reserves of Iran.<sup>2</sup> However, one should be clear that these figures are not precise. BP’s statistical review, one of the more credible sources of information on oil and gas fields, estimates Qatar’s reserve at 24 tcm and Iran’s total at 35 tcm.<sup>3</sup>



SOURCE: WORLD ENERGY ATLAS, THE PETROLEUM ECONOMIST, LONDON 2012

## QATAR

If Iran is to expand its investment in the South Pars field, it should take note of Qatar’s experience and challenges in developing L.N.G. before opting to pursue a similar road. Today, Qatar extracts an extensive volume of N.G. from the North Dome. N.G. is produced from offshore platforms, before it

is transferred via numerous pipelines to Ras Laffan and Mesaieed. It is then distributed to the L.N.G. trains, gas-to-liquids (G.T.L.) plant, chemical and fertilizer plants as well as power generation and water desalination plants.<sup>4</sup>

Of course, Qatar could not possibly use more than a small fraction of its N.G. production for its own local use and decided over three decades ago to monetize its N.G. assets by exporting to the world. At the time, Qatar’s neighboring countries had plenty of N.G., so developing a pipeline infrastructure to ship N.G. to Saudi Arabia, Bahrain, Kuwait, or the U.A.E. was not a valid option. Hence, the only approach to monetize the N.G. was to establish L.N.G. plants, also called “trains”, and export this L.N.G. via maritime trade to the far reaches of the earth. The main export markets were Japan, Korea, China, and to a lesser degree Europe, mainly Spain and Britain.

## L.N.G. IS EXPENSIVE AND DIFFICULT TO PRODUCE

L.N.G. requires large investments and access to advanced technology only available from a limited number of Western companies, mainly American. The foreign companies—ExxonMobil, Shell, Total—provided the design, engineering, and construction, obtained substantial equity participations, and signed management contracts to operate the plants.<sup>5</sup> However, Qatar arranged for the entire portion of the financing.

L.N.G. is expensive and difficult to produce. Before shipping, the N.G. must be cleaned, refrigerated, and, finally, compressed to reduce its volume 600 times.<sup>6</sup> Qatar currently has a stated capacity of 77 million tons of L.N.G. per year, the largest in the world, and produces at, or close to, capacity. A major byproduct of L.N.G. production is the condensates removed from the N.G. prior to its liquefaction. Qatar produces today about 800,000 barrels per day (b/d) of condensates, which can be sold as is or transformed in a splitter into various refined products.<sup>7</sup> Condensates are another major source of income for the emirate.

The resulting L.N.G. is temporarily stored in both Mesaieed and Ras Laffan before being shipped overseas on advanced L.N.G. carrier vessels with capacities varying from 150,000 m<sup>3</sup> to 250,000 m<sup>3</sup>, which is equivalent to 600,000 to 1 million barrels of oil. Qatar invested heavily in a fleet of 67 L.N.G. and N.G. vessels, which comprise around 15 percent of world capacity.<sup>8</sup> This is the largest fleet in the world; owned and managed by Nakilat, a company owned by Qatar. The N.G. production facilities are managed by two Qatari state-owned companies—Qatargas and RasGas—with extensive input from the main Joint Venture (J.V.) partners, ExxonMobil and Shell.

In order to finance its 14 L.N.G. trains, located in Ras Laffan and Mesaieed, as well as its ships, Qatar borrowed up to \$100 billion

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through large banking syndications.<sup>9</sup> Loan repayments are based on the London interbank rate plus a margin for a period of usually 15 years. Whether or not interest rates are low, a fixed capital portion of the loan has to be repaid regularly. Since the price of L.N.G. is linked to that of crude oil, the cash flow from sales does not necessarily match the cash needed to repay the loans. This was an issue in the late 1990s, early in Qatar’s L.N.G. development, when many bankers were concerned about Qatar’s ability to make the payments. The sustained period of high oil and gas prices from 2000 to 2015 allayed those concerns, with Qatar repaying many of its loans and profiting considerably from L.N.G. revenues.

## LOW PRICES AND NEW GAS PRODUCERS

The major drop in oil prices, however, brought down prices. For example, the Japanese purchase prices for Qatari L.N.G., fell from \$16.5/mmBtu (one million British thermal units) to an average of \$6.7/mmBtu for the first five months of 2016.<sup>10</sup> These lower prices reduced the netback cash income of Qatar to between \$2 and

\$4/mmBtu. At \$3/mmBtu. Assuming that Qatar exports 100 percent of its capacity of 77 million tons of L.N.G. per year, this would give Qatar an actual cash return of about \$12 billion. This is vastly less than the \$56 billion budgeted expenses announced for 2016.<sup>11</sup> Fortunately, Qatar also produces about 800,000 b/d of condensates and 800,000 b/d of crude oil, which provide the state, at today's prices, with a further \$25 billion per year.

Until now, there was no single world reference price of N.G. The price in Japan had no relation to the price in the United States

**“The reference price for L.N.G. is increasingly influenced by the price of N.G. in the United States.”**

or in Europe. However, today, the major development of L.N.G. worldwide and the large increase in new production from Australia and the United States are beginning to push toward a de facto world price. American producers have started to export L.N.G. to Europe and are likely to start exporting to the Far East through the newly enlarged Panama Canal. The U.S. producers base their L.N.G. price on that of N.G. in the United States plus the cost of tolling (the cost of making the L.N.G. from N.G.) and the cost of transport. Hence, the reference price for L.N.G. is increasingly influenced by the price of N.G. in the United States.<sup>12</sup> The new L.N.G. suppliers are, thus,

forcing the price of L.N.G. to remain low, which means Qatar is likely to remain hampered by a low netback on its L.N.G. for a fairly long time.

There is little doubt that Qatar is extracting gas rapidly. The amount of gas taken by Qatar from its field, just for industrial ventures, could amount to as much as 600 million cubic meters per day or 236 billion cubic meters per year (bcm/y), which would give estimates of N.G. reserves lasting about 52 years on an assumption of 50 percent recovery.<sup>13</sup> Indeed, this has been a paramount issue for Qatar's leaders for some time. In

2004, Qatar issued a moratorium on all new projects, ensuring that the amount of N.G. extracted each year will not increase in the immediate future.

## IRAN

Total Iranian N.G. production is reported to be around 192.5 bcm/y, with reserves of 34 tcm.<sup>14</sup> Iran ambitiously plans to increase production to 265 bcm this year, 50 percent of which will come from the South Pars field alone.<sup>15</sup> The Islamic Republic has numerous other fields both on and offshore, but the actual total Iranian production capacity at this time remains unclear. On the South Pars field, Iran had foreign partners working until sanctions were imposed, thus more information is available for this field. The field's development was divided into 24

phases. Today, 15 of the phases have been undertaken or are about to be. According to the Middle East Economic Digest's compilations, 13 of the first 15 phases are producing 14.6 bcm, with phases 17 and 18 scheduled to go online in the second half of 2016.<sup>16</sup> It is not quite clear how the Iranians are transporting the gas from the field to the mainland, although it is known there is at least one operational pipeline between the field and Asaluyeh on the Iranian side of the Gulf.

Iran exports 7.6 bcm/y of N.G. by pipeline to Turkey.<sup>17</sup> This amount could be increased if the present dispute on pricing is resolved. Iran could also begin establishing a route for export of N.G. through Turkey to Europe, which would be a win-win situation for all the parties involved and would have a dramatic impact on Iranian access to N.G. demand.

Some observers have suggested one of Iran's main goals is to develop its L.N.G. industry in order to monetize its gas reserves, somewhat like Qatar.<sup>18</sup> However, it could be difficult for the Iranians to develop a green-field L.N.G. industry, in spite of their huge N.G. reserves. L.N.G. trains require fairly advanced technology and know-how from U.S. companies, which may not be readily available until all U.S. sanctions are lifted.

## N.G. MIGRATION FROM SOUTH PARS TO NORTH DOME

An issue that seems to occasionally resurface is the fear expressed in Iran that Qatar's extensive exploitation of its side of the field could somehow impair the Iranian side.<sup>19</sup> Certainly, Qatar uses at least twice as much gas out of the common field than does Iran. However, the geology of N.G. migration underground is not clear and is by no means scientifically determined. It seems

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likely that migration may take place over many decades or even centuries, likely not over a few years. Nevertheless, the notion of gas migration when mentioned can raise fears in the G.C.C. The memory of Saddam Hussein accusing Kuwait of stealing Iraqi oil from the Rumaila field, from a well that was divided by the borders of the two countries, is still clear in the minds of many in the Gulf. Hussein used this allegation as one of several justifications to invade Kuwait. With this in mind, the notion of increasing political tensions due to perceptions of gas migration is keenly felt in the region. In any event, the only solution to the gas migration

problem is for Iran to start extracting N.G. as quickly as the Qataris, and, thus, even out usage on both sides of the maritime border.

## DIFFERENCES IN POLICY

It is clear that Qatar and Iran both rely heavily on N.G. resources. Both need to access markets either by pipeline, through producing L.N.G., or by transforming their methane into easily transportable elements like ammonia and urea. They both have

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large surpluses of condensates, which are produced along with the extracted N.G.<sup>20</sup> The condensates, as is the case in Qatar, can be sold directly or transformed into various products used for fueling transportation or in the chemical industry.<sup>21</sup>

However, the size of each country has influenced how each looks at its long-term development. Qatar, which has a local population of about 278,000, does not have enough local personnel to develop its ample resources.<sup>22</sup> Therefore, it has had to rely on foreign J.V.s or on production-sharing agreements (P.S.A.s) to develop the North Dome. Qatar maintains close relations with

major Western firms, mainly ExxonMobil, Shell, and Total, for this reason.

Iran, for its part, has been able to take a more nationalist approach as it can rely on its large, well-educated population. In spite of the debilitating wars with Iraq, the drastic sanction regimes of the past 20 years, and the major brain drain Iran has suffered for the past 40 years, it has managed to keep production in the N.G. sector going.<sup>23</sup> Nevertheless, its ability to maintain the fields has been greatly hampered by a substantial

lack of capital and limited access to technology. Today, Iran is seeking to bring back foreign companies, not through P.S.A.s, but through technical servicing agreements (T.S.A.s), somewhat similar to those used by Iraq for the past five years, which allow the host country to retain ownership of the reserves and ultimately make more money for the country than is possible under most P.S.A.s

## FOREIGN INVESTMENT IN IRAN'S GAS FIELD

Most Western energy companies, as well as Chinese, Japanese, and Korean firms, are eager to sign deals with Iran. However, the exact terms of the T.S.A.s are not yet known, and no firm has actually started work on the ground. A major impediment for Iran has been the glut of N.G. and L.N.G. in the world, which is expected to continue for the near future. The oversupply has kept pric-

es low and limited the incentives for energy firms to negotiate.<sup>24</sup> On the other hand, L.N.G. demand is expected to keep growing at 5.5 percent per year, which, in due course, will absorb the new capacity being built in the United States, Australia, and elsewhere. Large energy companies invest on a ten-year horizon and know that a good deal today could pay off handsomely by 2030 or before.<sup>25</sup>

Nevertheless, deals with Iran seem to be slow in coming to fruition. A major problem for companies interested in developing Iranian N.G. fields is the reliance on American technology. U.S. firms are still restricted from dealing with any company related, directly or indirectly, to the Islamic Revolutionary Guards Corps (I.R.G.C.), which are reported to control 20 percent of the stock market capitalization and up to 36 percent of the Iranian underground economy.<sup>26</sup> By extension, large non-U.S. firms with substantial links to the United States, as most have, are also worried about potential ramifications in the United States. Therefore, firms are proceeding gingerly until they can be assured they can pursue business in Iran without consequences.

The doubts which foreign firms may have about I.R.G.C. involvement on the Iranian side and the low price of N.G. on the world market may be a blessing in disguise for Iran. As previously discussed, the actual netback for L.N.G. today is quite low. It is

unlikely, except for the Oman pipeline option mentioned above, that foreign firms will invest in Iranian N.G. with the idea to transform it into L.N.G. in the near future. This will force the Iranians to focus less on L.N.G. and will instead prompt Tehran to develop its own energy intensive N.G.-based industries and productions.

The main takeaway is that L.N.G. at present might not be a viable investment, and Iran may, in fact, benefit from this decreased interest. Indeed, Iran may not be able to build

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the L.N.G. plants it desires but can instead direct its N.G. production toward local use for electricity generation, chemicals, ammonia, urea, and other value-adding productions, which would serve the economy better than exporting raw L.N.G. This may also give Iran the much-needed incentive to finally develop the pipeline to India and Pakistan and increase pipeline sales through Turkey to Europe. There is also the glaring opportunity to build pipelines to neighboring G.C.C. states in need of N.G.<sup>27</sup>





SOURCE: [HTTP://PULSENEWS.CO.KR/VIEW.PHP?SC=30800021&YEAR=2016&NO=199020](http://pulsenews.co.kr/view.php?sc=30800021&year=2016&no=199020)

## POTENTIAL IRANIAN GAS CLIENTS IN THE G.C.C.

Iran could bypass the problems of producing L.N.G. and attracting the needed Western investment and technology by developing sales of piped gas to G.C.C. states. It is interesting to note that, should Iran's relations with Saudi Arabia improve, N.G. from the Iranian South Pars could easily be piped to the kingdom, which is less than 200 kilometers away and would represent a relatively low investment in fairly shallow waters. Such an arrangement would indeed be beneficial for both Iran and Saudi Arabia, the latter of which is short on new low-cost natural gas.

At present, however, the most likely G.C.C. recipient of piped Iranian gas is Oman, which has spare capacity in its existing three L.N.G. trains.<sup>28</sup> While not necessari-

ly simple, building a pipeline between Iran and Oman could be done, albeit at some expense. Hence, one of the priorities of the Iranian government is to build relations with Oman. All signs are that the Sultanate is quite receptive to this possibility.<sup>29</sup>

Another pipeline link could be with the U.A.E.—at Ras al-Khaimah. In fact a pipeline already exists from one of the Iranian fields, close to the maritime border with Ras al-Khaimah, and could easily connect to Ras al-Khaimah.<sup>30</sup> However, this project remains hostage to the political tensions between the G.C.C. and Iran.

The use of pipelines would create mutual obligations to ensure good relations between Iran and its neighbors, particularly the G.C.C., and would ultimately incentivize Iranian leaders to prioritize improved relations with the G.C.C.

## IMPLICATIONS FOR QATAR-IRAN RELATIONS

The sharing of the largest gas field in the world can either be a challenge for Iran and Qatar—and become a source of competition and tension—or an opportunity to cooperate.

### OPPORTUNITIES VS. TENSIONS

Both Qatar and Iran will be hampered by low prices for N.G. and L.N.G. in the near future. This will be particularly difficult for Qatar, which, as the largest L.N.G. supplier, is forced to produce to cover sunk costs, even if the net return is low. On the other hand, that Iran has been forced to delay the development of its L.N.G. production may prove to be an unexpected boon in that it may prompt Iran to develop industries based on N.G. rather than to expend many billions of dollars to build L.N.G. trains. This also has the added benefit of creating value within the country and increasing job opportunities for local labor.

Qatar has also considered further developing its non-L.N.G. productions from methane, like G.T.L., ammonia, and urea, which tax the reserves less substantially than does L.N.G. New projects, especially in value-adding production, could make great economic sense, but they would have to

be developed by replacing existing L.N.G. production. This may be a smart policy for Qatar, but a difficult one to implement. The Qatari leadership has invested a good deal of its reputation in being the largest L.N.G. producer in the world. The foreign partners invested in the plants, as well as the banks who rely on the L.N.G. trains' cash flow for loan repayments, would have to be satisfied.

Qatar may also want to refocus from L.N.G. to the export of piped gas to countries in the region that now need it, such as Saudi Arabia, Kuwait, or the U.A.E., if it could negotiate prices above the present netback of \$2 to \$3/mmBtu. This would imply major changes in how Qatar works with Saudi Arabia, which in the past vetoed a pipeline to Kuwait and made life difficult for the Dolphin pipeline to the U.A.E.

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In light of low prices for N.G. and L.N.G., it is possible that Qatar and Iran will want to focus less on developing, maintaining, and selling the basic commodity, whether in the form of N.G. by pipeline or L.N.G. by ship. Increasingly, consideration and focus is shifting to transforming their meth-

ane, ethane, and condensates into local, value-added products like advanced chemicals, fertilizers, or other energy intensive productions, such as steel or aluminum.

Ideally, Qatar could be able to switch away somewhat from L.N.G. and could sell N.G. to Saudi Arabia, which is presently developing substantial, but expensive, sources of N.G. at home. One could even imagine that,

defend itself and, thus, becomes more dependent on Saudi and U.S. protection.

Of course, the competition between Qatar and Iran on the North Dome/South Pars field is to be expected and certainly could escalate. However, both countries must be aware that a military buildup in the area and a hardline security-focused approach could trigger conflict, which is not in the interest of either party.

**“Qatar shares a land border with Saudi Arabia, as well as common religious roots, but it shares its wealth with Iran.”**

Fortunately, with the N.G. prices being so low, one can hope that Iran and Qatar will form an understanding that cooperation will lead to more benefits, while tensions can easily lead to substantial economic losses for both states.

in a better political atmosphere, and with some freed up capacity in its L.N.G. trains, Qatar could toll Iranian South Pars N.G. into L.N.G. for export worldwide, thereby freeing some of the N.G. from the North Dome for sale to Saudi Arabia, Kuwait, the U.A.E., and Oman. Additionally, Qatar could extensively develop its value-adding use of methane and ethane.

Unfortunately, the scenarios mentioned above, however common-sense they may appear, are unlikely to be implemented in the present climate of Iran-G.C.C. tensions. In fact, one fear is that Iran’s Revolutionary Guards may build up the defense of South Pars to protect its development. The same, of course, applies to Qatar with regards to the North Dome. Qatar is too small to de-

Naturally, the sharing of the field also puts Qatar in a bind with Saudi Arabia’s present anti-Iranian campaign. Qatar’s new leadership has been carefully improving its relations with the kingdom and is no longer taking an independent foreign policy line in opposition to Saudi goals and interests. Qatar shares a land border with Saudi Arabia, as well as common religious roots, but it shares its wealth with Iran. Hence, it must find a middle path between Iran and Saudi Arabia to preserve its fundamental natural advantage.

# APPENDICES

**TABLE 1. SOUTH PARS PHASE DEVELOPMENT**

PHASE	CAPACITY
1	0.88
2,3	1.77
4,5	1.77
6,7,8	3.67
9,10	1.77
12	2.75
15,16	1.99
OPERATIONAL	14.6
11	2
13	2
14	2
17,18	1.77
19	2
20,21	1.77
22,23,24	2
UNDER DEVELOPMENT	13.54

SOURCE: MEES: FRI, 15 JAN 2016 - VOLUME: 59 ISSUE: 02

(IN BCM. NB: 1 BCM = 35.3 BCFT)

**TABLE 2. L.N.G. TRAINS IN QATAR**

L.N.G. PROJECT	TRAIN #	CAPACITY MM TS/Y	START UP	PARTNER	PERCENT TO PARTNER
QATAR GAS I	1	3.2	NOV-96	EXXON, TOTAL, MITSUI-MARUBENI	10, 20, 7.5
QATAR GAS I	2	3.2	NOV-96	EXXON, TOTAL, MITSUI-MARUBENI	10, 20, 7.5
QATAR GAS I	3	3.2	NOV-96	EXXON, TOTAL, MITSUI-MARUBENI	10, 20, 7.5
QATAR GAS II	4	7.8	APR-09	EXXON	30
QATAR GAS II	5	7.8	SEP-09	EXXON	18.3
QATAR GAS III	6	7.8	DEC-10	COMOCO, MITSUI	30, 1.5
QATAR GAS IV	7	7.8	FEB-11	SHELL	30
RAS GAS	1	3.3	AUG-99	EXXON, KOGAS, L.N.G. JAPAN	25, 5, 3
RAS GAS	2	3.3	AUG-99	EXXON, KOGAS, L.N.G. JAPAN	25, 5, 3
RAS GAS	3	4.7	AUG-99	EXXON	30
RAS GAS	4	4.7	AUG-05	EXXON	30
RAS GAS	5	4.7	NOV-06	EXXON	30
RAS GAS	6	7.8	AUG-09	EXXON	30
RAS GAS	7	7.8	FEB-10	EXXON	30

SOURCE: REUTERS 8/28/2011 & EXXONMOBIL

# ENDNOTES

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10. "Qatar Downgrades Growth Forecast, But L.N.G. Revenue Projection Looks Bullish," *MEES*, June 24, 2016, accessed August 18, 2016, <http://archives.mees.com/issues/1642/articles/54005>.
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12. "L.N.G. Supply Glut to Depress Prices for Years to Come," *MEES*, June 17, 2016, accessed August 18, 2016, <http://archives.mees.com/issues/1641/articles/53978>.
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