

Importing Liquefied Natural Gas (LNG): A Policy

Analysis

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Introduction

Pakistan is in the midst of a severe energy crisis that largely stemmed from a mismanagement of natural resources in the country. Weak regulatory and pricing mechanisms in the natural gas sector have led to huge disparities between demand and supply.

At present, demand of natural gas is estimated at around 8 Billion Cubic Feet (BCF) against a total supply of 4 BCF, creating a shortfall of 4 BCF.¹

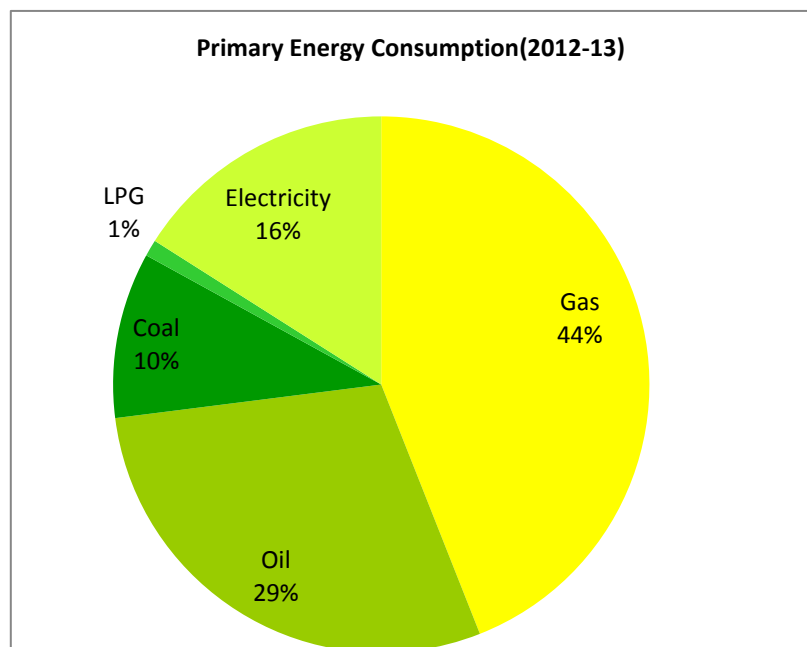


Figure 1: Primary Energy Consumption

¹ Total Gas Demand on System, 2013. Internal Documents of Ministry of Petroleum and Natural Resources. Islamabad, Pakistan

However, there is still a large dependency on natural gas in the primary energy consumption, with 44% of primary energy needs met through natural gas, as seen in Figure 1.

27.5% of total natural gas is consumed in the power sector, while the fertilizers, industries, transport and domestic sector also need natural gas. It is also estimated that gas accounts for 65% to 70% in the total fuel and energy component of textile sector's cost of production. The profit margins, which are already dwindling may be further squeezed and dent the profitability of the producers in the international market, and the purpose of granting duty free market access to the European Union under the Generalized System of Preference (GSP).

As domestic natural gas reserves continue to dwindle, and while Pakistan does have potential in Shale Gas², Pakistan has to meet its demand for natural gas. Although Pakistan was also looking into pipelines, with the Turkmenistan-Afghanistan-Pakistan-India (TAPI) and Iran-Pakistan (IP) pipelines on the table, in the short-run it seems that imported natural gas through Liquefied Natural Gas (LNG) may be a faster option. Yet, the regulatory mechanisms remain weak and this paper aims to explore and analyze LNG imports in Pakistan, and present policy recommendations on the way forward.

² Ernst & Young.(2013). Global LNG: Will New Demand and New Supply means New Pricing

Global Trends in LNG

Looking at the global gas market, the trend is that Liquefied Natural Gas (LNG) is increasingly becoming more competitive in comparison to pipelines³. The figure below shows major trade movements of LNG, and the volume of LNG movements, in billion cubic meters (bcm).

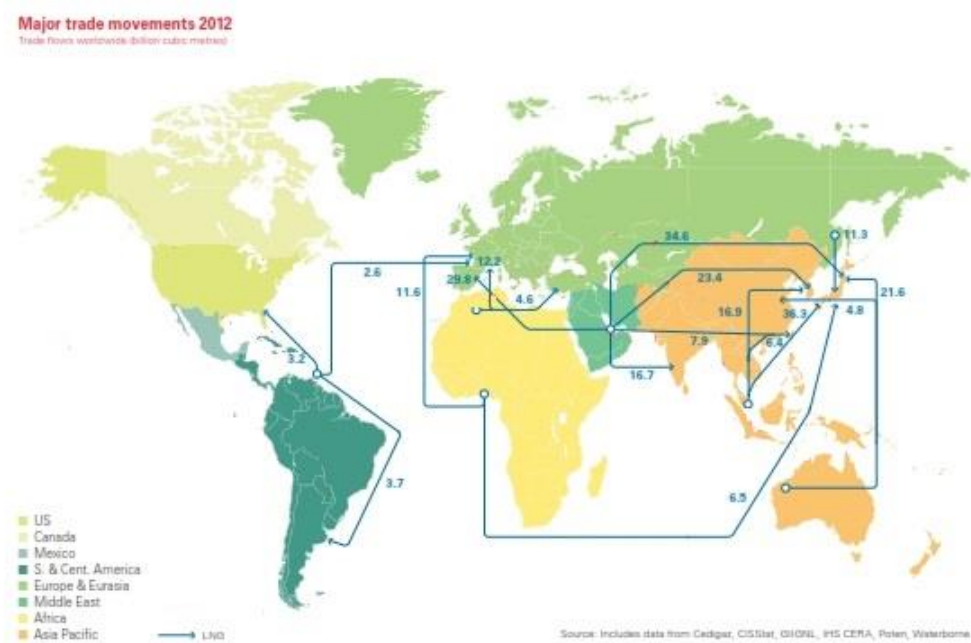


Figure 2: Global LNG Trade Movements (Source BP Statistical Review of World Energy 2013)

³ Hiroki, Okimi, O., 2003, Comparative Economy of LNG and Pipelines in Gas Transmission, Japan

Following this global trend, the Government of Pakistan is seeking LNG imports, but the question that remains is at what price? Pakistan was leaning towards Qatar to import 500 MMCFD⁴, and initial quotes of price were around \$17/mmbtu, excluding cost of regasification, shipping and other logistical concerns. The Ministry of Petroleum and Natural Resources (MPNR) aims to increase the volume imported by 2BCF/day in the next two years⁵. Pakistan seeks to import 2BCF/day, which would amount to about 730BCF/annum. This means that Pakistan would be the third highest consumer of LNG from Asia-as shown in table below:

Table 1: LNG Imports in Asia

LNG Import in Japan	South-Korea	Pakistan ⁷	India	China	Taiwan	Thailand	
Year 2012 ⁶							
BCF Annum	4194	1754.41	730	723.65	706	596.57	49.42

A pertinent fact to note in this context is that Asia makes 68% of the market share of LNG imports, and the share is continuing to increase. In the future, Asia must make the most of its significant market share and employ collective bargaining power towards creating a

⁴ Nation. (2013). *US Firms Set Conditions for LNG Import to Pakistan*. Pakistan

⁵ [2] Express Tribune \$ APP, 21 Jan 2014 (<http://tribune.com.pk/story/661196/moving-closer-qatar-agrees-to-slash-price-for-lng-export>)

⁶ BP-International LNG trade Statistics

⁷ By 2015, the volume will be increased up to 400 mmfcd, and then will import two billion cubic feet per day in the next two-and-a-half years. Express Tribune January 21, 2014, APP 16th of Jan 2014,

new natural gas pricing hub in Asia. Pakistan, with its rising natural gas demand and energy requirements must play a leadership role through skillful diplomacy and the use of acumen towards a natural gas pricing hub that reflects the realities of the global gas market.

However, although Asia makes up a significant share of the LNG, it has not been able to influence LNG pricing from Qatar significantly. Though it has varied from country to country, and the pricing mechanism is largely dependent on the prevailing market price in the region. The export-landing price of LNG from Qatar⁸ to various countries is shown in the table below, reflecting a precedent of low LNG price of long-term agreements:

Table 2: LNG Prices from Qatar (Source: Argus, 2013)

LNG Prices from Qatar	Jan-13	Feb-13	Mar-13	Apr-13	May-13	Jun-13	Jul-13
Taiwan	12.6	13.04	11.33	12.78	10.9	12.62	11.84
India	11.66	11.68	10.48	11.05	10.97	10.61	11.47

India's LNG price from Qatar between the time period of October 2012 to July 2013⁹, it has ranged between \$10-12/mmbtu, and the price that did not rise to more than \$11/mmbtu in 2013.

⁸Argus - Volume IX, Issue 12- December 2013 - Argus is a leading provider of price assessments, business intelligence and market data for LNG&LPG

⁹ Internal document of India

Although Qatari LNG prices remained high, there's a significantly low drop in prices with other sellers as indicated by the LNG landing price to China, as seen in the table below. Prices ranged from as low as \$3.2/mmbtu to \$9.81/mmbtu, depending on the time period and the seller.

Table 3: Argus - Volume IX, Issue 12 - December 2013 - Argus is a leading provider of price assessments, business intelligence and market data for LNG & LPG

LNG Price landing Price in China	Jan-13	Feb-13	Mar-13	Apr-13	May-13	Jun-13	Jul-13	Aug-13	Sep-13	Oct-13
Seller-Australia	3.32	3.25	3.25	3.32	3.56	3.95	3.49	3.22	3.37	3.2
Seller-Indonesia	4.13	4.11	4	4.03	3.89	3.91	4.02	3.89	3.9	3.88
Seller-Malaysia	7.84	7.7	8.23	8.17	8.02	7.96	8.02	7.92	9.81	8.83

Oil-indexed contracts, such as the proposed contract from Qatar linked to Brent-crude oil, will be subject to increases with rising oil prices. Even though the percentage was lowered and was negotiated to \$17.437 per million British thermal unit, considering that it is a percentage of oil prices, the former figure too will rise in the long-run, and therefore, this may turn out not to be a competitive deal (especially in the light of global gas spot prices in the Henry Hub). In fact, the natural gas market is seeing a [divorce of oil and gas prices¹⁰](#), with legal cases, such as Gazprom¹¹ being taken to the International Court of Arbitration for

¹⁰ Standard & Poor's, 2012, "Do Recent Rulings Herald the Divorce of Oil and Natural Gas Prices, and Who Will Benefit?"

¹¹ Russian Gas Export company

unfair prices under oil-indexation. What Pakistan should note is that there is a divorce between oil and gas prices, and new contracts reflect this pattern.

The Indian state-owned company GAIL's contract with the US company Cheniere departs from oil-linked prices, and instead it is indexed to the Henry Hub with a premium. One of the most significant precedents in the South Asia region was set by the company GAIL in India, setting a benchmark in pricing in this region at a landing price of LNG of 10.50/mmbtu¹² from the USA. In fact, data and reports from Argus and other sources now show the prices of long-term LNG contracts. Again, India imported LNG from Qatar at the rate of \$10-12/MMBTU in 2013¹³.

The biggest immediate challenge posed to LNG pricing is Shale Gas that has rapidly changed the natural gas pricing dynamics. Very recently, the biggest buyer of LNG in the world, Japan, has become frustrated with high LNG prices, and wants to reduce its post-Fukushima dependence on natural gas. In fact, it recently announced a new energy policy draft revealing Japan's decision to reinstate nuclear energy as one of the major base load power sources. Japan's economy, industry and trade ministry is expected to reduce the LNG imports, as the spot prices hovering around \$18-19/MMBTU are too expensive for the largest LNG importer¹⁴. Therefore, Japan, driven by the agenda of ensuring an uninterrupted and affordable supply of electricity in sustainable manner is planning to return to nuclear power, thus LNG market will soon lose the biggest buyer of LNG.

¹² GAIL, 2013 http://www.gail.nic.in/final_site/pdf/2013/GAIL-13-23July.pdf

¹³ Argus Global LNG: LNG Market Projects and Infrastructure.(2013).Vol. IX.no.12.

¹⁴ Argus Global LNG: LNG Market Projects and Infrastructure.(2013).Vol. IX.no.12.

A major challenge that Qatar faces vis-à-vis its natural gas market competitor is contending with Iran. Iran, with the world’s largest reserves of natural gas standing at 1187 TCF, is ambitious to become a major LNG exporter, in the wake of recent developments on the diplomatic front, after an ease out on prolonged sanctions which inhibited access to Western technology. Estimates suggest that Iran will complete two under-construction LNG projects, LNG Persian and Iran LNG, based on the reserves of the South Pars gas field. Iran has boasted that in a few years 90 billion cubic meters per year of LNG will be exported. Moreover, Canada’s Shale Gas production has surpassed 3.5 BCF, and may help it to transform into a major LNG competitor in the future.

Economic Analysis of LNG

The price of LNG may be the single biggest factor impacting economic activity in Pakistan. A look at the major gas fields of Pakistan (see table 1), constituting almost 85% of total production shows that domestic gas was no more than \$4.78/MMbtu.

Table 4: Major Gas Fields in Pakistan with Price in \$/MMBtu

Gas Field	Sui	Zamzam	Qadirpu	Mar	Bhi	Sawa	Uc	Manzal	Kandhk
	a	r	i	t	n	h	ai	ot	
MMCF/day	562	507	496	495	385	317	185	169	164
\$ per	2.0	4.36	2.80	0.74	4.7	4.45	3.9	2.87	2.11
MMBTU ¹⁵	2				8		2		

¹⁵ Pakistan Energy Book - 2012

In fact, Liquefied Natural Gas (LNG) would only be a viable option for Pakistan if it were to cost less than USD 12/MMBTU. However, media reports and statements from the Ministry suggest a price \$17 per MMBTU for Qatari LNG. Additional costs of re-gasification and charges of SSGPL & SNGPL and other taxes will likely push up its price to not less than USD 18 /MMBTU. The most compelling argument offered by the Ministry in favor of buying LNG has been that it is a cheaper fuel for electricity, but at anything more than USD 14/MMBTU, LNG loses its competitive advantage against oil, as illustrated by some basic calculations on LNG and Residual Fuel Oil (RFO) in the table below. It is in terms of the British thermal unit (Btu) which is a basic measure of thermal (heat) energy).

Table 5: LNG Price and Energy against Rupees

LNG Price \$/MMBTU	10	11	12	13	14	15	16	17	18	19	20
Energy Against one Rupee	952	866	794	733	680	635	595	560	529	501	476

It is established that Rs. 1 of Furnace Oil can release 630 units of energy (at a spot rate USD 606.50/Metric ton) compared to Rs. 1 of LNG, that will garner 529 units of energy (at a rate of \$ 18 /MMBTU), with an 84% energy content price gap. The main argument for importing LNG is its price competitiveness against oil, but that loses all validity in the light of the above data, as natural gas for price above \$14/mmbtu will lose its competitive edge on price against oil. A price in excess of \$14/mmbtu will present a significant burden on the national exchequer. If LNG is procured at \$11/mmbtu, it can be seen that Pakistan may be able to save up to \$7.11 billion per annum, if demand is taken as a constant at 2BCF/day:

Table 6: Comparison of Annual Savings

Reduction of Price from \$ 20/mmbtu (USD or \$)	7.00	8.00	9.00	10.00	11.00
Annual Saving in Billion USD	5.11	5.84	7.11	7.70	8.03

Bringing the LNG price down to a single unit would mean a saving of around \$ 8.03 billion annually.

Policy Recommendations:

All hope for energy and, subsequently, the economy rests on the import of LNG, and this is being projected as the panacea for all ills. The actual facts, however, are far more complicated, and call for a reform in the regulatory structures governing Pakistan’s natural gas sector. Efficiency of thermal power plants will be crucial if natural gas is to be utilized effectively.

One of the biggest considerations in LNG imports is pricing, and therefore negotiating a good price for LNG should remain a top priority for the GOP. As demonstrated above, LNG will only be a viable option if it is less than \$14/mmbtu. A good negotiating team, with a thorough knowledge of the dynamics of LNG and an understanding of Pakistan’s energy sector will be important. This paper includes an annex with a list of experts. Only credentialed and well-known experts may be able to negotiate a favorable deal for Pakistan with Qatar and other LNG exporting countries, which would ensure economic viability for industry and electricity generation. In fact an analysis of the economic impact of LNG is absolutely vital to make well-reasoned policy decisions. To avoid litigation in the future, it may be wiser if Pakistan renegotiates the prices in advance,

especially because base price and price index, once inked in the contract are subject to little or no change. Furthermore, there must be a price review clause in the agreement after every year.

Pakistan must take the changes in the global natural gas market into account. It is also worth bearing in mind that within the current global natural gas market, the Shale Gas revolution has changed the market dynamics, and the gas prices are lower in Europe and North America. The impact of Shale Gas Revolution is already making a discernible impact on LNG market of China; the landing prices at Chinese ports cited below are self-explanatory, thus proving to be another price bench-mark for Pakistan.

With a Shale Gas revolution underway in the global gas market, and with Shale being successfully exploited in USA, Canada, China, Poland etc., research is being conducted on Shale Gas prospects and viability in Pakistan. As Pakistan attempts to unlock its Shale Gas, with an estimated 586 TCF¹⁶ (technically recoverable 105 TCF) and 9.1 billion barrels of unconventional oil, Pakistan may in the future be able to meet its natural gas demand through indigenous resources. If Pakistan inks long-term LNG or pipeline contracts at prices that are too high and unaffordable, the country will face penalties under “Take or Pay” contracts.

Other than the negotiated price of LNG, other important considerations in price include the LNG supply chain, costs of development of an LNG terminal and regasification facilities. The total price of LNG may cover landing cost including (CIF), capital cost, LNG terminal charges, import levies, regasification , infrastructure charges of SNGPL and SSGPL. Risks of

¹⁶ EIA/ARI World Shale Gas and Shale Oil Resource Assessment

imported LNG may include reliability of natural gas supply, increasing costs of investment, fluctuations in global oil prices and its impact on LNG price, subject to the formula used.

Regulatory Mechanisms in the Natural Gas sector need to include demand-side conservation. Till date, nothing has been done to improve the efficiency of captive/thermal power plants, consuming high quantity of gas to generate a unit of electricity, which is contrary to the universal drive for maximum generation units of electricity using minimal gas. Adding further miseries to the power sector and the gas sector, the Ministry of Water and Power (MPNR) allocated unjustified gas quota to those industrial units possessing their own power plants (Small Power Producer – SPP), which have been selling electricity to the National Transmission and Distribution Company (NTDC). These SSPs barely have 18% level of efficiency; thus the rate of per unit electricity generation ends up costing 9.78¹⁷ rupees, whereas IPPs sell gas-based electricity at 4.27¹⁸ rupees per unit. This is not simply a matter of price; the excess gas allocated to SSP to produce electricity for sale to NDTC could have generated twice the units of electricity if it had been allocated, instead, to efficient thermal power plants.

Dependable Capacity of SPPs (Mixed)256.9 MW	Oct-13	Nov-13	Dec-13
Generation Million Units (GWh)	84.49	86.18	104.27
Cost of Energy Rupees/ Unit	8.94	9.76	9.79

Specifically regarding the deal with Qatar, Pakistan must ensure a strong bargaining position to negotiate an advantageous deal. Pakistan seeks to import gas from Qatar, and

¹⁷ No. NEPRA/R/TRF-100/MFPAP/ 1176- 1195, dated February 6, 2014

¹⁸ Source Wise Fuel Cost/Energy Purchase Price- Decision of the Authority in the matter of Fuel Charges Adjustment for the Month of December 2013 for XWDISCOs

the main source of gas is from the North Field, which is a part of South Pars. Pakistan has already signed a contract with Iran to import gas through a pipeline, which is also sourced at South Pars. With the price also under negotiation, Pakistan must take advantage of its strategic location, and geographic proximity to oil and gas rich nations, and negotiate a strong deal, as the source of gas to be imported is the same, namely the South Pars / North field located in the Persian Gulf. .

Moreover, Qatar is a brotherly nation, a Muslim country with which Pakistan enjoys good diplomatic relations. Additionally, it is an important trade partner ([USD 15802000](#) of Pakistani exports to Qatar for 2013-14), with Basmati rice and meat constituting some of Pakistan's major exports to Doha. Citing difficult economic conditions and extenuating circumstances, Pakistan must try to negotiate a deal similar to "[oil for goods](#)" barter deals that a number of countries have with Iran (under a sanctions regime). Although such barter deals deviate from the norm, such a deal may still be worth a shot in view of the country's serious energy crisis. The two countries may agree to such a barter deal for the first few months of the start-up period, until the LNG shows signs of healing the ailing gas sector.