

In the midst of political instability and an economic meltdown, an acute energy crisis is making the lives of the people of Pakistan even more difficult. Most of the medium sized industrial plants in major cities of the country remain closed for more than half a week, every week, forcing industry to relocate factories to other, energy rich, countries. The availability of natural gas to the compressed natural gas (CNG) sector is cutoff for up to three days a week causing hardships to commuters. Pakistan is one of the largest users of CNG as a transportation fuel in the world. Approximately 3.5 million vehicles in Pakistan including a large number of public transport vehicles use CNG and can also fuel switch to gasoline if necessary. Similarly, fertilizer producers which use large amounts of natural gas remain out of production for most of the year. Winters are marred by large scale public demonstrations against the non-availability of natural gas while summers witness even larger and fiercer protests due to rolling blackouts for more than half a day, every day.

The energy crisis is adversely affecting the economic growth of Pakistan. With a widening gap between natural gas supply and demand used for power generation the Pakistan's economy has been shrinking proportionately. As illustrated in Table 1 below, the Gross Domestic Product (GDP) growth of the country has remained dismal over the last five years. **Table 1: Pakistan GDP Growth Rate**

Year

GDP Growth

2007	6.8%
2008	3.7%
2009	1.7%
2010	3.8%
2011	2.4%

Source: IMF World Economic Outlook (April 2012) The marginal increase in the GDP between 2009-2010 was not due to any real increase in economic activity rather it reflected the impact of substantial increases in the international price of Pakistan's largest export item, textiles. Otherwise the impact of the economic crisis is clear and economic growth may continue to nose dive and may not stabilize unless a lasting solution to the energy crisis is found for the country's 180 million residents.

Apart from its impact upon Pakistan's economy, the energy crisis has destabilized the routine of every day life for the vast majority of Pakistanis. It affects their behavior and psychology due to their inability to carry out essential daily activities ranging from cooking to commuting to work.

This situation cannot be left unattended. Fuel availability must be expedited, particularly natural gas, in order to arrest the free fall of Pakistan's economy and to bring solace to its people. The indigenous production of natural gas cannot be increased overnight and the teetering economy coupled with an unstable regional geopolitical situation does not bode well for the success of cross border gas pipelines. Therefore, Pakistan must go for imports of LNG and on a fast track. If Pakistan is unable to bring LNG into the country over the next 3 to 4 years, the whole economic structure built around the natural gas industry will fall into ruins.

Today's unenviable situation was not created overnight rather it is the cumulative effect of

inconsistent and inept energy policies pursued for decades. Successive governments kept on discarding the policies of their predecessors on the basis of political expediency. On this account numerous promising projects have been shelved without looking into their merits. Two examples may suffice to help understand the impact that political rivalries have had on the economic development of the country. The government of the Pakistan (GoP) Muslim League led by Mian Muhammad Nawaz Sharif initiated the privatization of public sector companies including gas and electricity utilities in the early 1990s which was halted by the succeeding government of Benazir Bhutto's led Pakistan People Party.

One of the surprising initiatives taken by the Bhutto government was the introduction of Independent Power Producers (IPPs) in 1993 to overcome electricity shortages. This was surprising because the Buhtto government was largely skeptical of the role of the private sector yet she recognized the need for IPPs to fill Pakistan's electricity gap. Though the projects could not be thrown out unilaterally by the succeeding government of Nawaz Sharif due to internationally binding contracts he left no stone untouched to scare off future investors by making life difficult for the IPPs. They were dragged in the courts on the allegation that these power generation projects were unduly favorable to IPPs due to the corruption and favoritism of the outgoing government. (Of note is the fact that the GoP did not have sufficient evidence to prove corruption in the project agreements.)

One of the main reasons behind today's electricity crisis in Pakistan is the then hounding of the IPPs. Every martial law regime has brought its own economic vision of the country totally discarding the policies of the toppled civilian regimes. Throughout the 65 year history of Pakistan there have been military takeovers of the government four times in total. One of the common allegations against the toppled civilian government in each of the military takeovers has been the pursuit of failed and rather dangerous economic policies. Thus the first step of every martial law regime has been to discard all of the economic policies of the previous government and to introduce its own economic cycle afresh.

There has been no clear direction for increasing resource availability, and the efficient utilization of available resources. Myopic vision has kept policy makers blind of the creeping gap between the country's energy supply and demand profile. Pakistan's energy supply mix remains dominated by oil and gas with little contributions from hydroelectricity, coal, and nuclear energy while alternate fuel sources like wind, bio-gas and solar energy are glaringly absent. The composition of Pakistan's primary energy supply for 2010-11 is given in Table 2 below. **Table 2:**

Pakistan's Primary Energy Supply and Consumption

Supply (%)

Natural Gas	47.6
Oil	32
Hydro	11.8
Coal	6.7
Nuclear	1.3
LPG	0.5
Imported Power	0.1

Total
100

Source: Hydrocarbon Development Institute of Pakistan, Yearbook 2011

Pakistan had been blessed with an abundance of natural gas. However, it has not been utilized efficiently; instead it has been and continues to be consumed generously and rather mercilessly by the fertilizer, transport and residential sectors at subsidized prices. The percentage of Pakistan's gas consumption by sector of the economy over the last decade is provided in Table 3 below.

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Sector	2003/4	2004/5	2005/6	2006/7	2007/8	2008/9	2009/10	2010/11	2011/12	
Residential		16%						16%	15%	18%
Fertilizer		16%						15%	15%	13%
Industry		18%						20%	22%	18%
Power Generation										
42%		41%						38%	39%	37%
Transport (CNG)										
1%		2%						3%	4%	5%
Unaccounted Gas Loss										
7%		6%						6%	7%	7%

Data obtained from Oil and Gas Regulatory Authority (OGRA)' Annual Reports

Pakistan's gas and electricity sectors are completely regulated under the government's control. All of Pakistan's natural gas supply is locally sourced and there is no gas or LNG import infrastructure in place which could augment supply. The GoP has the first right to purchase all gas produced in-country which is then transported and distributed by two state owned gas utility companies. IPPs must purchase their gas from these gas utility companies.

Sui Northern Gas Pipelines Limited (SNGPL) supplies natural gas in the northern part of the country i.e. the provinces of Punjab, Khyber Pakhtunkhwa and State of the Azad Jammu and

Pakistan's Struggle for LNG

Written by Muhammad Umair Shah
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Kashmir while Sui Southern Gas Company Limited (SSGCL) caters to gas consumers in southern Pakistan i.e. the provinces of Sind and Baluchistan. The consumer price of gas is regulated and determined on the basis of a fixed rate of return on the assets of gas utility companies by the GoP. Prices are published and overseen by OGRA. Gas supplied to the residential and fertilizer sectors are heavily subsidized which is a burden to other gas consuming sectors of the economy such as the power and CNG sectors which pay proportionally higher prices to cross-subsidize the formerly mentioned fertilizer and residential sectors.

Pakistan is one of the most gas intensive countries in the world where natural gas makes up around 50% of its total energy supplies. It not only burns in the stoves of more than 20% of all households (around 6 million) but in tens of thousands of hotels and commercial units. It also plays a major role in industrial development and in the agricultural sector. The country's policy makers have not foreseen gas shortages and have kept expanding the country's domestic distribution network as a political tool to garner electoral votes at the expense of country's economic development. Gas demand has been expanding while there has not been a proportionate increase in indigenous supply. It was only in the year 2000 that Pakistan's leadership realized that the country was going to face significant gas shortages in near future. This apprehension came true in 2006-07 and the gap between gas demand and supply has only kept on widening since. Currently, estimated gas demand is 5.6 billion cubic feet per day (bcf/d) against an indigenous supply of around 3.8 BCFD with future projections given in Table 4 below.

Table 4: Pakistan's Natural Gas Demand and Indigenous Supply Projections

Year	Gas Demand	Indigenous Gas Supply	Shortfall (all figures in bcf/d)
2015-2016	6.2	4.5	1.7
2019-2020	6.8	3.1	3.7
2025-2026	7.7	1.2	6.5
2029-2030	8.7	0.7	8,0

Source: SSGCL and SNGPL

There has been much talk about the country's hydroelectric and coal potential as possible indigenous options to make up for gas shortages. However, this potential has never been realized. The two important water storage and electricity generation dams of Tarbela having electricity generation capacity of 3500 megawatts (MW) and Mangla 1000 (MW) were built with the assistance of the World Bank after resolution of a water dispute with neighboring India through the Indus Waters Treaty of 1960. Since then there have been the addition of only medium to small reservoirs like Chashma Barrage (184 MW) and Jinnah Barrage (96 MW) but not a single major dam has been constructed in the last 50 years. While the Kalabagh Dam (3600 MW) has been shelved due to the absence of political consensus among federating units, the Basha Dam (4500 MW) where construction work has recently been initiated will have to overcome the problems of a lack of funds and the pangs of a possible change in government in coming months.

The coal potential of the country has been identified but large scale production has not materialized. The major coal reserve Thar has a potential trillion of tons of coal but these reserves have been found to be of low quality and also difficult to explore due to a lack of technology. The development of wind power, solar energy and bio gas are at the experimental stage, and few pilot projects have been initiated. Though numerous projects are said to be in the pipeline as well as approved by the Alternate Energy Development Board (AEDB) of the GoP no substantial project has yet come on stream.

Successive governments have not taken any serious initiatives to develop and expand alternate energy supply sources; making the economy overly dependent upon natural gas and petroleum products. Further, high international oil prices inhibit oil imports with the result that the country's economic growth has come to a halt. The country cannot or appears unable to enhance gas production, switch over to hydroelectricity or coal-based power generation given the limited period of time available that could avoid imminent economic collapse.

Therefore over the short to medium term policy perspective, the energy woes of the country can only be minimized by importing natural gas through cross border pipelines as well as LNG. Yet establishment of a transnational gas import pipeline system is highly capital intensive and has a considerably long gestation period. Pakistan's potential to accomplish such a project remains shrouded in uncertainty due to the geopolitical situation of the region as well as due to the fragile economy of the country.

Although Pakistan is blessed to be in the proximity of some of the world's richest gas countries such as Iran, Turkmenistan, Russia and Qatar it has yet not been able to import a single molecule of gas. The plan to import gas from Iran under the Iran-Pakistan-India (IPI) gas import project faced initial setback when India withdrew from the project on the pretext of the high gas price being offered by Iran. But in fact, India had secured a better deal from the United States regarding its energy needs by concluding a Civil Nuclear Energy Agreement for the supply of nuclear energy for peaceful purposes from Nuclear Suppliers Group (NSG). Subsequently, a series of US sponsored economic sanctions against Iran over its suspected nuclear weapons program has inhibited progress of the Iran-Pakistan gas pipeline. Further Pakistan is not in a position to finance the construction of its part of pipeline from its own resources. Debt financing from international financial institutions is off the table due to a further tier of economic sanctions

against Iran. Russia and China have been non committal in providing necessary funding. While Iran has offered to finance pipeline construction on Pakistan's side of the border its capacity to arrange the required funding is questionable due to the sanctions imposed on it including on its Central Bank.

The Turkmenistan Afghanistan Pakistan India Pipeline (TAPI) remains a pipe dream due to the global war on terror and resulting political instability in Afghanistan despite all the moral and legal support of Western world as well as a promise of necessary funding from the Asian Development Bank (ADB) and other similar institutions. The key to the realization of TAPI is peace and stability in Afghanistan. Any clue to Afghanistan's future situation will only be available after ISAF stops its combat mission in 2014 and their promise and the extent of future commitments to the country become clearer. Solving the severe energy crisis in Pakistan cannot afford the luxury of waiting for the settlement of Afghan quagmire. Gas imports from Russia and Qatar through pipelines is a very expensive proposition due to long distances and the fact that some of these pipelines would have to pass through international waters.

Therefore, due to a lack of confidence in a timely completion of gas import pipeline project(s) the GoP began contemplating imports of LNG as far back as 2005. Pakistan's first LNG policy was introduced in 2006 which emphasized private sector LNG import projects to be undertaken on purely commercial grounds without the GoP's physical or financial support. The government committed to support the projects, if needed, to secure long term LNG supplies but no government guarantee was offered.

The private sector generally showed little enthusiasm for a highly capital intensive, risk prone and previously untested business model. Only one entity, Pakistan GasPort Limited (PGPL) emerged as flag bearer of LNG imports into Pakistan. However, they could not make progress at a requisite pace. As a result the government initiated its own parallel LNG import project albeit through SSGCL under the name Pakistan Mashal LNG Project (PMLP) in 2005-06. The initiation of Mashal LNG project by the GoP further dampened the keenness of private sector in LNG imports.

This project took a considerably long period of time for finalization in early 2010 only to be followed by considerable mismanagement. Initially a contract for an integrated LNG import project was awarded to 4Gas Asia, a Dutch firm, through a competitive bidding process and shortly thereafter the project was un-bundled; the contract for terminal development was awarded to 4GasAsia whereas GDF-Suez was handed over the LNG supply contract. Consequently, the matter immediately landed in the Supreme Court of Pakistan after publication of a news report of alleged non transparency and corruption to the tune of US \$1 billion in the awarding of the LNG supply contract. Thus the project came to a standstill even before its launch. However, the case was expeditiously adjudicated and disposed of by the Supreme Court on an undertaking by the GoP to re-initiate the project in a transparent way. Now the GoP considers the PMLP dead while 4Gas Asia considers it to be still in the field based upon different legal interpretations of the court decision by each party.

The setback to PMLP coupled with extreme gas shortages in 2011 again attracted the attention of the private sector in Pakistan's LNG import endeavors. LNG Policy 2011 was introduced with

minor changes in the policy of 2006 giving further incentives to the private sector short of the government's off take and payment guarantee. This policy has also provided some regulatory easing over the sector. The policy did not however change the overall structure of LNG import projects. While the regulator will have to determine the terminal and transportation tariffs, the final consumer price of re-gasified liquified natural gas (RLNG) will not be regulated for private sector to private sector sales; however, if the public sector gas utility companies buy RLNG, its price will be determined by OGRA. The offer of many incentives has been balanced out with the provision for furnishing a guarantee by the investor to fulfill its LNG supply commitment.

After introduction of the new policy, two more private parties have entered the arena of LNG imports into Pakistan with much fervor. In addition to PGPL, there came Engro Corporation Limited a company of Engro Group, one of the largest business groups in Pakistan and Turkish Global Energy Infrastructure Limited (GEIL). They obtained licenses from OGRA for construction of LNG terminals and also received an allocation of natural gas pipeline capacity to transport their RLNG from the terminal to end users. Subsequently, a Korean concern Daewoo Shipbuilding and Marine Engineering (DSME) also obtained a license and have entered the business as a terminal operator. Another local firm Fauji Oil Terminal Company Limited belonging to Fauji Foundation, a trust of the Pakistan Army, has also expressed its interest in the LNG import business in Pakistan.

As mentioned Pakistan's gas sector is totally regulated by the government. However, in the case of RLNG to be brought in by the private sector, the government has decided to make it a purely private commercial business wherein the LNG developers have to arrange their own buyers. The power generation sector has been considered a potential consumer of RLNG to replace more expensive liquid fuels. Indigenous gas is supplied to the power sector at a price four times lower than the expected price of RLNG. Nevertheless, the power generation sector cannot be supplied continuously with indigenous gas without depriving the fertilizer and industrial sector from their share of gas. Thus, to run power plants to capacity, the IPPs have to rely on imported furnace oil and diesel which are costlier than RLNG. Therefore, IPPs were approached by the LNG developers to off-take their RLNG. They expressed willingness to buy RLNG but no agreement has been reached on pricing. Moreover, their capacity and credibility to make timely payments ensuring continuity of cash flows for the project's proponents remains the biggest stumbling block.

The confidence of LNG developers in the payment capacity of IPPs has been shaken by the ever widening circular debt issue. Gas and oil vendors have receive payment from power producers whose revenue in turn is dependent on the GoP which has its own problems in collecting payment for electricity. To overcome the issue, companies want to have guaranteed advance payments for three month's of LNG supply (approximately US\$ 700 million) in the form of standby letter of credit backed by credible multilateral development banks. The IPPs are not in a position to arrange such a guarantee. Consequently, the LNG developers had no recourse except to approach the government and demand sovereign payment guarantee against RLNG purchases by the IPPs. Further more, they desired to sell their RLNG to public sector gas utility companies i.e. SSGCL and SNGPL

The prevailing policy does not permit the government to provide sovereign guarantees;

however, public sector gas companies can purchase RLNG from private LNG importers. The government can amend its policy to accommodate the request of LNG developers for a sovereign guarantee but such a step will again be questioned on the grounds of transparency and interpreted as favor to oblige a single or a few private parties involved in the projects.

In early 2012, the GoP resumed consideration of its own LNG import project. The government did some work for launching an integrated LNG import project as well as trolling Qatar, Algeria, Malaysia and South Korea for LNG supplies. To date a MoU has been signed between SSGCL and Qatar Gas for LNG. Recently the GoP initiated a proposal to establish a dedicated LNG import company in the public sector with shares from SSGCL and SNGPL and GoP's equity from the funds generated through Gas Infrastructure Development Cess (GIDC). This public sector LNG importing company will be given the sovereign guarantee backed by multilateral development banks to import LNG through international competitive bidding as an aggregator. It will supply the RLNG to public sector gas utility companies i.e. SSGCL and SNGPL.

The government's proposed LNG import scheme envisages a two phased approach; a quick fix, short term and small quantity project, and a longer term project. The short term project will be completed within 6 months of the approval of the concept and it will cater to LNG supplies for two years. An already existing LPG import terminal of SSGCL at Port Qasim, Karachi will be retrofitted to receive and re-gasify LNG. The second phase is the long term project and is intended to be accomplished within three years and cater to LNG imports for 20 to 30 years. The aggregator will have options to construct its LNG terminal as sole owner. It may also develop public-private partnerships. It can outsource terminal construction or even construct private sector terminals. LNG supplies will be obtained from international suppliers through a competitive bidding process for the longer period.

The GoP's proposed LNG import scheme seems to be a step in the right direction though a belated one. Establishment of a LNG import terminal by the government to attract investment in LNG imports has successful precedents in Singapore as well as in India. Yet Pakistan's proposed LNG import concept still has to overcome a few hurdles. Issues pertaining to the consumer price of RLNG, to the suitability of a short-term LNG terminal site and to the status of PMLP have to be resolved before execution of the project.

There are also apprehensions that 4Gas Asia may take the matter to the court and probably go to international arbitration if the GoP goes ahead with the new project without amicably resolving the controversy over the status of the MPLP. The suitability of the site selected for short term LNG supply is also under question being located in a main navigational channel which may affect the flow of marine traffic. However, these issues may take some time to resolve but should not inhibit the project's launch.

Despite all the hurdles and a multitude of various policy initiatives, imports of LNG are the only path towards Pakistani energy security. In the next 3 to 4 years, LNG must be available in a country of 180 million or the country may face economic dissolution which would be not only a regional but also on a global nightmare.

Pakistan's Struggle for LNG

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Post-script: Last month the GoP, on October 04, 2012 approved the import of 1000 million cubic feet per day (mmcf) of LNG for power generation. 200 mmcf of LNG will be purchased from the spot market and received at SSGCL's LPG import terminal which will be retrofitted to receive and re-gasify LNG. Simultaneously, international competitive bidding will be carried out for the construction of two LNG import terminals having a capacity of 400 mmcf each. In this case LNG will be purchased on long term contract bases (15 year contracts periods with a price review every 5 years).

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