An Immediate Solution To The Looming Gas Crisis

By

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ipi Islamabad Policy Institute

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FOREWORD

Pakistan is set to face another spell of severe shortage of natural gas in next few weeks. The impending scarcity of natural gas, which is the most used fuel in the country, will not only be critical for the national economy, but would also affect the lives of the ordinary citizens in a big way. Gas shortages are worst in winter, when the need for heating is greatest.

The shortage, as per conservative estimates, could increase from last year's 1.44 bcfd to about 2.0 bcfd this year.

It is important to note that unlike the oil crisis of June 2020, the natural gas shortage has been growing for years now. It is because we have been consuming more natural gas than we could have used. It has been the preferred fuel because of its low cost, and clean-burning quality.

However, as the consumption increased rapidly, warnings that supplies were diminishing, at a rate of 9 percent per annum and were soon likely to be outrun by demand, were conveniently ignored. Hence, we are now facing the inevitable and there are no signs of the situation improving any time soon.

Several proposals and ideas have been making the rounds for some time including the curtailment of demand by not adding more consumers on the supply network and introduction of gas conservation measures, LNG import, import of natural gas from Iran and Turkmenistan, and exploring new reserves. However, none of these planned actions can alleviate the immediate gas shortage or even address the problem in the next few years.

Therefore, I believe Mr Abdullah Yusuf and Dr. M. Ilyas Fazil's proposal for use of Furnace Oil for power generation would not only spare natural gas for uses in other sectors, especially for domestic consumption, but would also save foreign exchange being spent on import of petrol and diesel.

The proposal is particularly significant because it offers an immediate solution for the crisis at hand and can potentially take a lot of pressure off. The priority right now should be to deal with the emergency situation we are facing and adequately preparing for the winter, which is just around the corner.

I hope IPI Report will shed some light on how the gas shortage and its ill effects may be countered.

Syed Muhammad Sajjad Shabbir
Executive Director
Islamabad Policy Institute

BACKGROUND

The government has warned that shortage of natural gas in the upcoming winter would be more acute due to the widening demand – supply gap for the fuel.

Natural gas in predominantly the major energy source in Pakistan contributing for about 38 percent of the total primary energy supply mix of the country, according to Pakistan Economic Survey 2019-20.

Natural Gas is used in a wide range of sectors and by the end of FY2018-19 there were 9.8 million gas consumers in the country. The number of gas consumers has been growing by about 0.3 million per annum for the past five years.

In 2018-19, 4,319 MMCFD of gas was supplied to consumers against a total demand of 5,759 MMCFD. Therefore, there was a deficit of 1,440 MMCFD. This gap in expected to be much wider this year and because of the fuel's wide usage, the impact is going to be felt strongly as well.

The concern is real!

There are several reasons that have contributed to gas shortage in Pakistan, which was till 2005 considered as self-sufficient in gas. Firstly, there have been no major reserves found in the country for decades. The gas production has, meanwhile, been stagnant at an average of 4,000 MMCFD for last at least 15 years, which is depleting the gas reserves. Absence of alternative fuels and subsidies on gas have also contributed to increased demand for it.

The policy choices made over the past few decades especially that of substituting gas for oil in the shape of promoting the use of Compressed Natural Gas as a cheaper and environment friendly fuel since 1990s have also led us to the current state where we are now expecting a crisis like situation. It is indeed a problem of our own making.

The growth of CNG sector was because of price differential between CNG and gasoline/diesel, investor friendly policy and lax regulatory framework.

The foundation-stone of CNG program in Pakistan was laid by Hydrocarbon Development Institute of Pakistan (HDIP) through the establishment of CNG refilling stations at Karachi in 1982. Meanwhile, in 1992, Ministry of Petroleum and Natural Resources announced the CNG Rules of 1992, which commercialized CNG as a transportation fuel in the country. The program really picked up in 1998 when the government declared a two-year goal of establishing 150 CNG stations and conversion of 100,000 vehicles.

Benefitting from the favorable situation, CNG industry developed significantly at an unprecedented rate of around 52.5% per annum during the subsequent years. By 2012, of the 6.167 million registered vehicles in the country, a total of 3,100,167 (89%) vehicles were running on CNG, while the rest, which included buses, trucks, and two wheelers, three wheelers etc, were using gasoline and diesel. A minor fraction also used LPG.

The CNG policy clearly stated that it would replace imported transport fuel, which at the time was only HSD. Gasoline produced by the local refineries was then not deficit. But it ended up with even gasoline being imported at a considerable cost to the national exchequer.

CNG is, therefore, a clear case of lopsided policy decision making in the natural gas sector of Pakistan.

While we need to learn from our past mistakes we must, however, not get stuck in paralysis through analysis of the past, but should rather find the right future strategy.

THE WAY FORWARD

In view of the prevailing situation, it is necessary for the Government of Pakistan to determine the right Energy Mix for the Country and to maximize the rational use of its indigenous resources, with only the deficit being met through imported fuel.

Pakistan's indigenous sources of Energy are:

Oil
Gas
Hydel
Coal
Nuclear
Renewable (Solar, Wind)

Pakistan's Primary Energy Supplies in 2017-18, as per National Electric Power Regulatory Authority's State of Industry Report 2019, were

Oil	31.2%
Gas	34.6%
Hydel	12.7%
Coal	7.7%
Nuclear	2.7%
Renewable (Solar, Wind)	1.1%

Gas has witnessed a NEGATIVE Annual Compound Growth Rate (ACGR) of ~ 1%, i.e. Minus 1% over the last 6 years.

As on June 30, 2018

Recoverable Natural Gas (NG) Reserves were 57.44 Trillion Cubic Feet (TCF)

Cumulative Production	37.90 TCF
Balance Recoverable Reserves	19.54 TCF

In other words, we have already used up ~ 70% of our Natural Gas Reserves.

Power Sector accounts for	~ 37% of NG Use
General Industry	~ 19%
Fertilizer	~ 13%

The remaining is consumed by Cement, Commercial, Transport

Natural Gas, therefore, is a fast depleting resource and there are many takers.

A number of projects and investments are being touted in all the areas of energy supplies but most of them are either on the drawing board or have long gestation periods. Lack of clarity or government policy makes the situation further uncertain. The additional energy resources arising out of these projects cannot be a quick-fix for our problems as they would come to fruition in about 3-4 years at minimum from today.

Let us, therefore, look at how the impending crisis may be tackled right away.

1. Put an Embargo on CNG Stations

It is a no-brainer that CNG has been consuming a resource that is limited. In our opinion, CNG-driven vehicles have reached their saturation point. The NG thus saved can find better use in the Industry and Domestic sectors.

2. Lift the embargo on the use of Furnace Oil

The Country is importing higher and higher volumes of LNG at prohibitive costs due to non-utilization of locally produced Furnace Oil by the local Refineries.

Historical Sales of Furnace Oil have been as follows (M.Tons):

2014-15	9,262,531
2015-16	8,999,823
2016-17	9,599,254
2017-18	7,393,917
2018-19	3,536119

Notice the very sharp decline in 2018-19 which was almost equal to the local refineries' FO production (however, at an average 72% of Refinery capacity

utilization). The below- par capacity utilization was caused primarily by non-use of FO. When a Refinery operates, it must also produce FO. The volume produced is dependent upon the crude processed and the refinery's configuration. Imports of FO are net of local production and are shown below:

	Local Production	Imports	*Total
2014-15	2,928,140	6,243,226	9,171,366
2015-16	2,859,110	6,228,427	9,087,537
2016-17	3,014,330	6,593,614	9,607,944
2017-18	3,262,800	4,358,322	7,621,122
2018-19	2,873,745	552,239	3,425,984

* includes HSFO as well as LSFO

From 30+% share of FO in the Energy Mix for Power Generation, 2018-19 saw the share decline drastically to 8%. To reiterate, this was the primary cause of low refinery throughput and consequently lower production of PMG and HSD, higher imports of these transportation fuels at increasing cost to the National Exchequer.

During the same period, the Import of LNG grew from 472,503 TOE in 2014-15 to 7,492,597 TOE. Import cost of LNG in USD was 2,452 Million USD (2.5 Billion USD) in 2017-18.

With LNG, a number of problems are persisting, compromising its availability at a reasonable cost due to various factors including but not limited to the Qatar Gas Deal.

In the past, too, whenever the Government faced gas availability issues, it has always been Furnace Oil that came to the rescue. It is a locally available resource that the Refineries must produce when they operate. Its full disposal also helps the Refineries to maximize the full range of refined product, especially PMG, HSD and Jet Fuel (JP-1 for Commercial Airlines and JP-8 for the Air Force), thereby acting also to protect our National Energy Security.

In light of the above facts, the Government should ask the local Refineries to operate at maximum capacity and produce maximum Furnace Oil. Maximum production of transport fuels PMG and HSD will also be an obvious outcome.

The generation capacity of all Residual Furnace Oil RFO based plants is ~ 3,500 MW. This would require ~ 20,000 MTD of FO. The Refineries combined can produce ~ 3 Million Tons of RFO per year, or ~ 8,300 MTD.

Power plants based on RFO must be directed to operate so that maximum RFO based generation equivalent to the local FO production takes place to start with. We may need to put aside the environmental concerns for the time being. We are fighting for our survival here! If environmental concerns were such a big issue, then why was Coal promoted, which is even dirtier and a bigger contributor to the particulate matter than Furnace Oil.

This will tide us over during the winter season, saving ~ 115 BCF of Gas (~10 BCF per month) which would be used for supplies to the domestic consumer for heating and cooking.

The use of Furnace Oil in the manner proposed must continue even beyond the winter season so that the local refineries continue to operate at full capacity and produce additional volumes of Transportation fuels PMG and HSD, thereby saving precious foreign exchange.

Based on 2018 average prices,

Each MTon of locally produced PMG saves USD 622

Each MTon of locally produced HSD saves USD 553

Each Ton of Crude Oil Imported costs USD 475

Therefore, each Ton of local PMG would save USD 223 and each Ton of local HSD would save USD 259.

Do the Math! Maximum use of local FO saves NG for use other than Power and PMG and HSD to boot! A win-win for the Country!

Acknowledgements

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ABOUT THE AUTHOR

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Mr. Abdullah Yusuf is a Distinguished Fellow of Islamabad Policy Institute. A Chartered Accountant by profession (England and Wales), he has served in many distinguished and prestigious positions. He has been a partner of Burgess Hodgson & Co. in London. After returning to Pakistan, he worked with Riaz Ahmad & Co before becoming CFO and then MD Utility Stores Corporation. He has also served as MD Bait ul Maal, Secretary Privatization, Secretary BOI, Secretary Petroleum and Chairman FBR.

Dr. M. Ilyas Fazil

Dr M. Ilyas Fazil holds a PhD in Petroleum Refining. He is currently a distinguished fellow with Islamabad Policy Institute. He has previously served as Member (Oil) OGRA and CEO Oil Companies Advisory Council (OCAC). He can be reached at i_fazil@yahoo.com.

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