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PAKISTAN's GAS SECTOR

NAVIGATING CONSTRAINTS AND STRATEGIC WAY FORWARD

SITUATION BRIEF

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Background

Pakistan's gas sector is presently in a crisis mode. Characterized by growing demand and faltering domestic gas production– the country has quickly become a major Liquified Natural Gas (LNG) importer in the past six years. During winters, unmet demand exceeds 2 million cubic feet per day (MMcf/d) resulting in long hours of gas load shedding. Among other factors, LNG infrastructure bottlenecks has been at the root of the widening demand-supply gap. In parallel, gross underpricing of gas and subsidies has put the financial sustainability of large LNG imports in question—also now resulting in a growing Circular Debt in the gas sector. Based on the context reducing reliance on natural gas has become unavoidable and there is clearly a need for a coherent strategy on how to do this. The government has already a plan to phase-out gas gradually from power sector. The residential sector—second largest consumer of gas—could be an important sector to play a strong role in reducing reliance on gas. Overall, a timely tailored roadmap to reconfigure the traditional gas appliances and switching to renewable-based technologies for heating and cooking space is imperative.

Natural Gas plays a major role in energy matrix of Pakistan, a dominant fuel in several sectors

Pakistan is one of the most gas-intense countries globally. Contributing to nearly 40% of the country's primary energy supplies, it plays a major role in several sectors. Currently the power sector and residential sector are the largest consumers of gas.

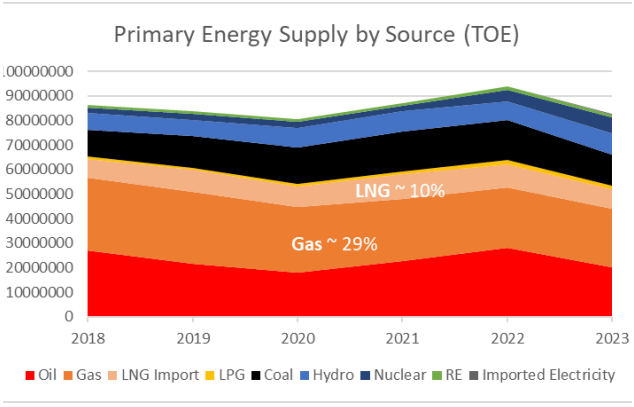

Fig. 1a: Primary Energy Supply. Source: Pakistan Energy Yearbook 2023

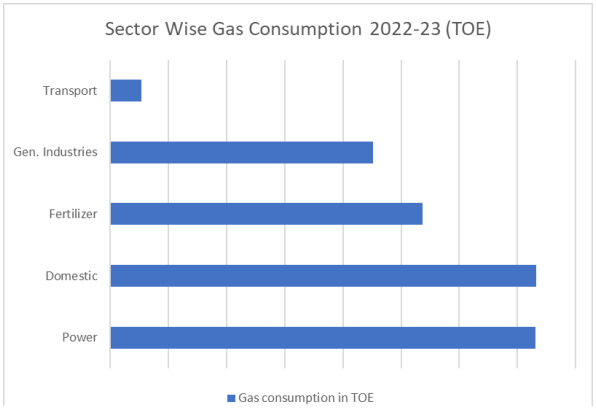

Fig. 1b: Sector wise Gas Consumption (TOE). Source Pakistan Energy Yearbook 2023

Till a decade back, Pakistan had sizeable reserves of Gas. Reliance on it therefore enjoyed broader policy support by the government. This explains the rapid expansion of the country's piped gas distribution networks, reaching a total length of roughly 200,000 kilometres and 10.3 million connections by 2020. Pakistan also has large Compressed Natural Gas (CNG) fleet[1]. In the 1990s, the government took active steps to promote CNG as an alternative fuel for automobiles. According to NGV Global, the country had more than 900,000 gas vehicles and 800 CNG refueling stations by 2016.

1. *https://www.finance.gov.pk/survey/chapter_22/PES14-ENERGY.pdf*

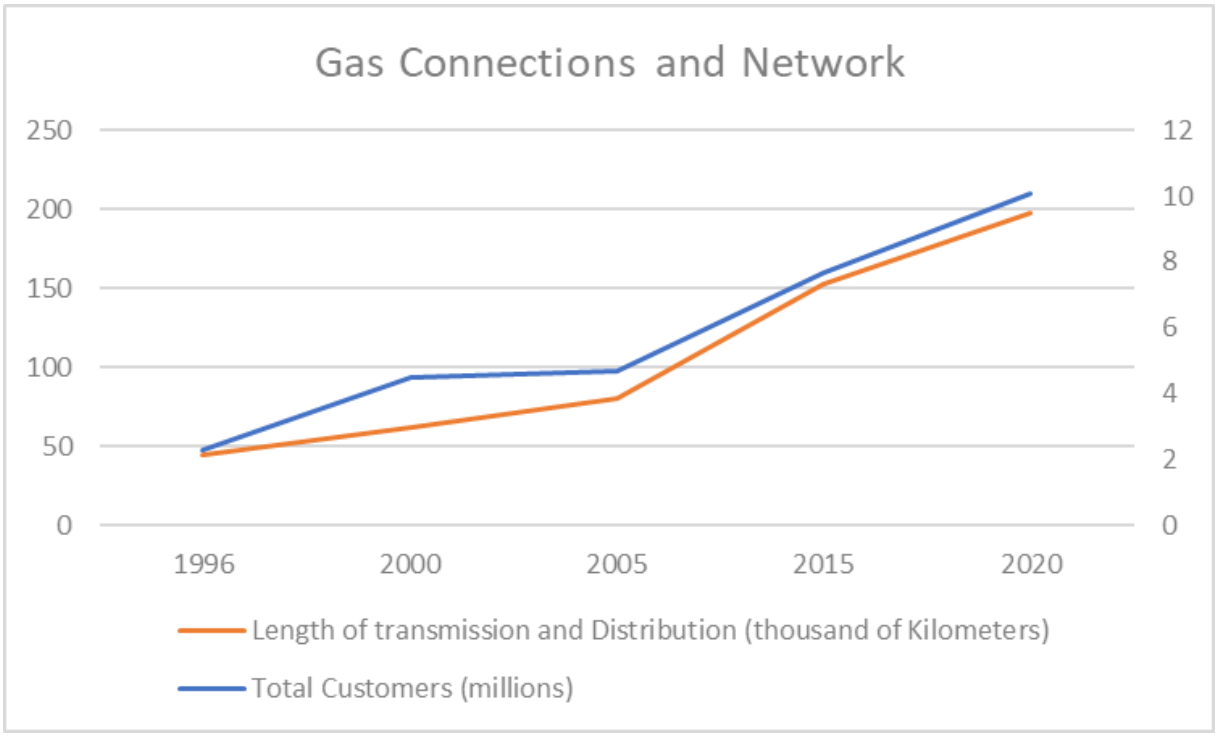

Fig. 2: LNG Imports. Source: Pakistan Energy Yearbook 2023

Shortage of gas has become severe in past few years

Pakistan was self-sufficient in gas till 2005. However indigenous gas production stagnated since 2008, and then started declining after 2015. This has led to a widening gap between supply and demand. The country's constrained demand for natural gas has reached roughly 6,000 MMcfd against a supply of 4,000 MMcfd—implying a shortage of about one-third. With faltering indigenous reserves and no large new discoveries in recent years, Pakistan has now become a major importer of LNG. Presently, 30% of the gas consumption is met through imported LNG. The gas shortfall is projected to increase substantially in the years ahead, stoking demand for further imports. The government projections show that the gap between supply and demand could triple to 6,000 MMcfd by 2030.

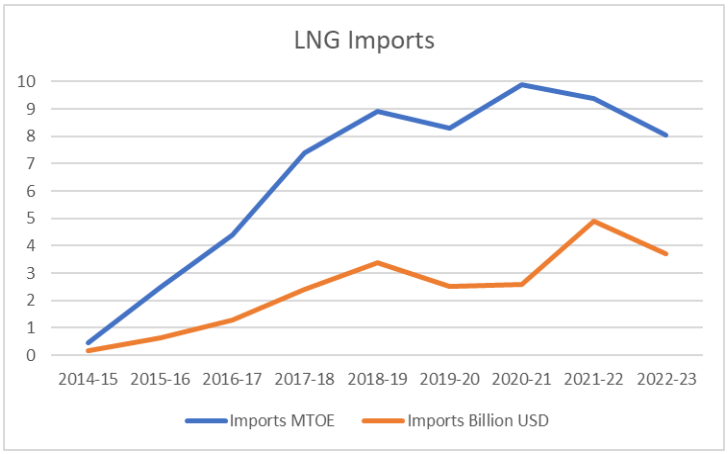

Fig.3a Gas Connections and Network. Source: MOE, 2000, 2010, 2015, 2020

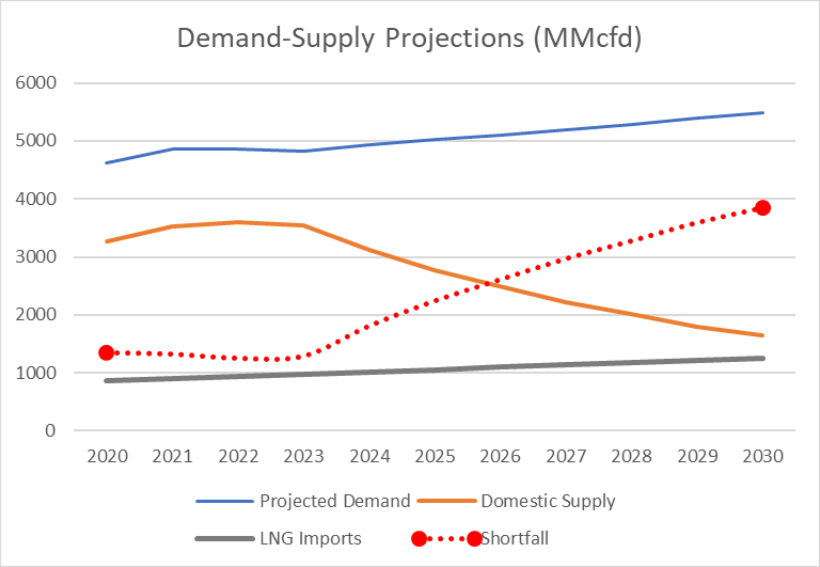

Fig. 3b: Demand Supply Projections. Source: OGRA, 2020

With LNG imports meeting only partial demand, the country continues to face chronic shortfall. Load-shedding of gas in the winter season—when demand peaks—has become a permanent feature since past few years. A gas allocation policy was also adopted in 2005 that gives lower priority to the power and transport sector—gas goes first to residential users and the fertilizer sector.

Under-pricing of gas and leakages has exposed government to significant budgetary risks

Pakistan is the 8th largest country when it comes to gas subsidies. The government charges a different price from each sector—with residential and fertilizer sector enjoying highest subsidies. The price of domestic gas is substantially below the imported LNG. While the subsidies insulate end-users from unfairly price volatility in global market, it has created significant financial sustainability challenges for the government[2].

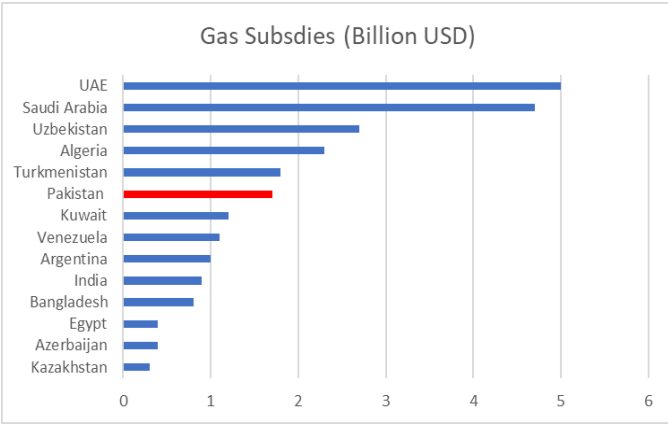

Fig. 4a: Gas Subsidies: Cross Country Comparison: IEA, 2021

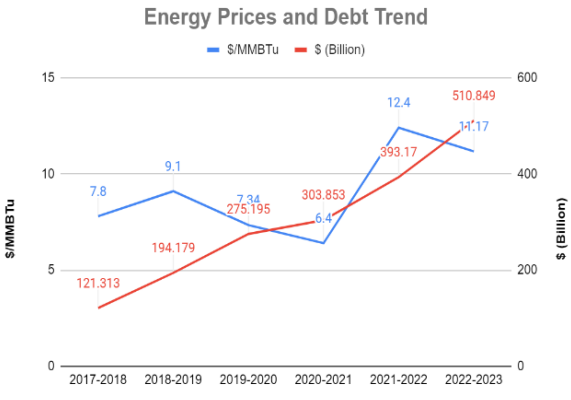

Fig. 4b: Energy Prices and debt trend, OGDCL[3]

2. https://www.hdip.com.pk/
3. https://ogdcl.com/sites/default/files/publication/OGDCL%20ANNUAL%20REPORT%202023_compressed-02.pdf

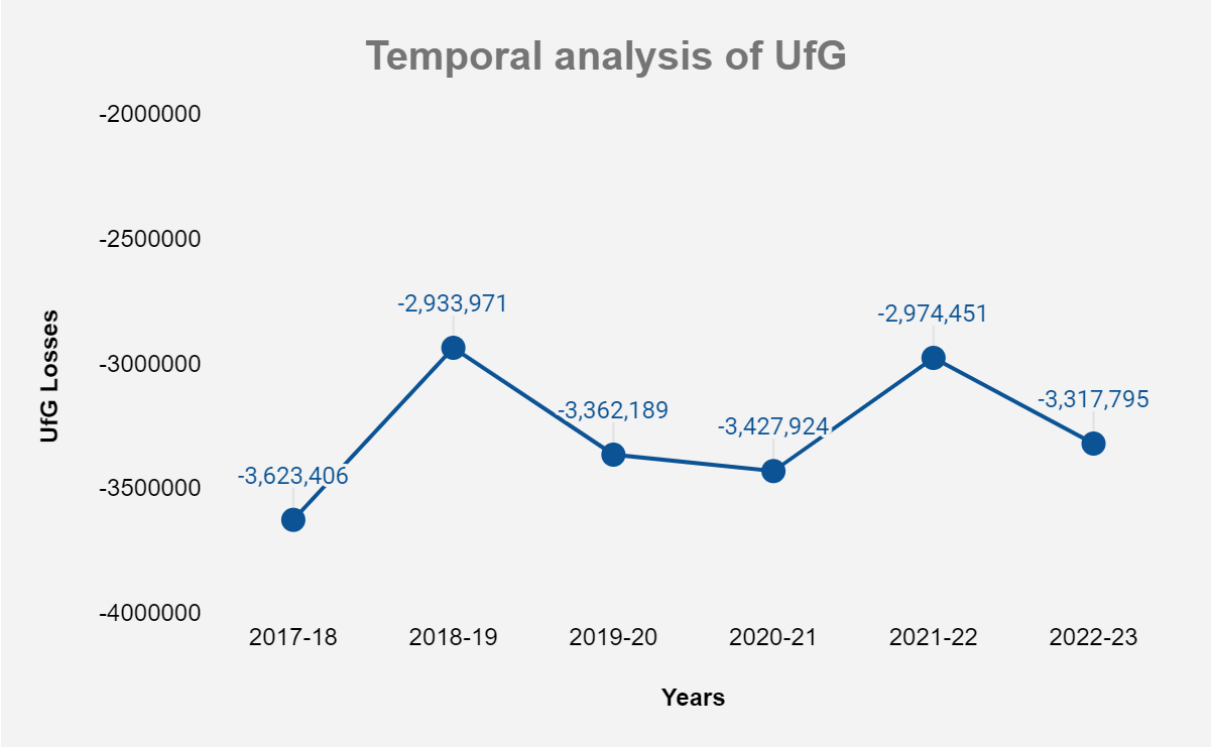

Fig. 5: UFG losses: Energy Yearbook, 2023

The gas sector also grapples with an escalating circular debt crisis, which has nearly doubled since 2018 due to unaccounted-for gas (UfG) losses, collection inefficiencies, and underfunded subsidies. High UfG losses stem from factors like the transition from bulk to retail gas supply, which increases complexity, theft, and technical losses across a larger distribution network[4]. Unauthorized consumption, leakages, poor law enforcement in some regions, and errors in billing practices exacerbate the situation. Additionally, the growing reliance on expensive LNG imports, coupled with delayed tariff adjustments, has kept gas prices low for consumers but failed to cover rising operational costs, pushing debt levels higher[5].

The Government has been working on a medium-to-long-term gas import strategy

Pakistan has signed several pipeline trade agreements to secure its gas supply. This includes Turkmenistan-Afghanistan-Pakistan-India (TAPI) Gas Pipeline; the Iran-Pakistan (I-P) Gas Pipeline; and the Pakistan Stream Gas Pipeline—most recently signed with Russia. All these projects have been facing delays due to geo-political conditions in the region. The latter one—which was signed only recently—is also shrouded in uncertainty due to the greater sanctions now imposed on Russia.

In addition to piped gas import strategy, Pakistan also started importing LNG in sizable quantities since 2015. Pakistan has been importing LNG from Qatar under a government-to-government 15-year agreement; as well as four other agreements with private suppliers in Italy on take-or-pay basis. To cater to demand in excess of the term contracts, LNG is also being sourced from spot markets.

4. *https://www.brecorder.com/news/40312514*
5. *https://pide.org.pk/research/challenges-and-reforms-in-pakistans-gas-sector/*

The government is also stepping up initiatives to develop LNG import facilities. A new entrant in LNG market—the basic LNG import terminal capacity and infrastructure is still evolving. Presently only two LNG terminals are operational, which are inadequate to process massive domestic gas demand. The government is looking up to build a third terminal soon, to help meet soaring demand.

Largely, the gas sector is constrained by regulatory and policy gaps that emphasize import reliance rather than fostering a sustainable, diversified energy strategy. Policies largely focus on securing external gas supplies through long-term LNG contracts, pipeline projects, and the development of import infrastructure—and lack robust provisions to manage the crisis[6]. There is minimal regulatory impetus toward promoting alternative energy sources or incentivizing efficiency within the sector. This narrow focus on imports, without comprehensive policies for demand management or transitioning to other energy solutions, deepens Pakistan's dependency on volatile and costly foreign energy supplies, leaving the sector vulnerable to economic and geopolitical pressures.

Electrification an effective solution to avoid supply shortfall

There is a compelling opportunity for Pakistan to shift from gas to electric appliances in the residential sector. This transition could reduce both the economic and environmental costs associated with fossil fuel reliance, while simultaneously fostering a more resilient energy framework. A 2023 World Bank study indicates that shifting gas consumption to electricity could yield efficiency gains exceeding Rs 250 billion annually[7].

The residential sector—second largest consumer of gas—could be an important sector to play a strong role in reducing reliance on gas. Switching from fossil gas to electricity offers a broad range of benefits for consumer energy bills and emissions that make it a highly attractive option for mitigating gas supply shortfalls.

With the residential sector primed for accelerated adoption of technologies like heat pumps and electric stoves, immediate, focused action toward electrification is crucial. A phased and carefully managed approach, starting with the residential sector, can pave the way for broader electrification across other areas, such as commercial and industrial sectors, over time. This could bring several benefits, and so immediate and concerted action is needed for faster electrification of current gas consumption. Overall, this needs timely tailored roadmap to reconfigure the traditional gas appliances and switching to renewable-based technologies.

Way Forward

Natural gas remains a dominant feature of Pakistan's residential buildings. Gas is used as a primary cooking fuel in household sector of Pakistan. It is also widely used for heating. The large-scale reliance on gas imports will not only lock Pakistan into an unstable market characterized by a suite of risks including commodity price fluctuations, exchange rate volatility, balance of payment risks—but also exacerbate the country's energy security challenges by making it increasingly vulnerable to external supply disruptions and geopolitical tensions. The current geopolitical instability has already exposed the cost and insecurity of relying on gas. Any further investments on expensive LNG infrastructure or piped-gas projects only threatens larger macro-economic stability making little economic sense. Whereas from an energy efficiency perspective, the country has some of the worst performing existing

6. https://www.pc.gov.pk/uploads/downloads/gas.pdf

7. https://www.dawn.com/news/1746875

buildings, while presently new-build housing has no effective plans to change. The ongoing gas crisis and dwindling indigenous reserves signifies the need for timely tailored roadmap to reconfigure the traditional gas appliances and switching to renewable-based technologies.

A strategic way forward for Pakistan's energy sector should prioritize a phased and timely transition from natural gas to electrification, starting with the residential sector. By gradually shifting households from gas-dependent heating, cooking, and water heating to electric solutions, Pakistan can reduce its reliance on imported gas and foster a more sustainable, resilient energy landscape. This initial focus on the residential sector would allow for targeted regulatory adjustments, infrastructure development, and consumer adaptation at a manageable scale. As electrification proves viable in households, the transition can then extend to other sectors, such as commercial and small-scale industrial users. Implementing this phased approach, underpinned by supportive policies and a regulatory framework that incentivizes efficiency and renewable integration, would enable Pakistan to build a robust, diversified energy system, reduce fiscal pressures from gas imports, and align with global sustainability goals. It is only essential to put measures in place which can drive the transition toward these emerging solutions.

A delay in implementing these changes risks exacerbating the existing energy crisis, deepening Pakistan's dependence on costly imports, and increasing exposure to volatile global markets. Without swift action, the country could face cost lock-ins and the stranding of gas-based assets, leading to financial losses and limited flexibility for energy reforms. There is an urgent need for putting in place regulatory reforms that drive electrification of different sectors. This would offer a pathway not only to reduce the country's carbon footprint but also support the transition to a more secure and sustained pathway. By embracing electrification now and adopting best practices from successful global examples, Pakistan can not only address its current energy crisis but also lay the foundation for a sustainable, resilient energy future.

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