LNG Terminals In Pakistan: Issues and Concerns

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1 INTRODUCTION

Owing to the rapid depletion of indigenous natural gas resource and the widening demand-supply gap, LNG has come as a life-saver to fill the shortfall, albeit at a high cost. The share of LNG has already increased in Pakistan's natural gas market after the government started importing Regasified Liquefied Natural Gas (RLNG), in 2015, for gas-fired power plants. With energy management one of the country's prime concerns, the share of the Liquefied Natural Gas (LNG) imports in the gas mix increased from 0% in 2014 to approximately 22% in 2019, to meet the growing demand. At present, the government has long term arrangements of LNG import with Qatar, ENI, and Gunvor, with total import quantities of 6.0 million tonne per annum (mtpa). In addition, LNG is also purchased from the spot market.

The first LNG terminal was built in 2015. At present two LNG terminals, Engro Elengy Terminal Limited (EETL) and Pakistan GasPort Consortium Limited (PGPCL), are functional, while four more are on the charts.

However, expanding the LNG infrastructure may not be a viable solution, especially for the long term energy needs of Pakistan. The LNG contracts in Pakistan, like in the rest of the world, cover the course of around two decades. However, the global decline in the prices of the renewables suggests that even before the expiry of the terms of these contracts, renewables are likely to become the cheapest form of energy. The price-sensitive market and non-availability of LNG on regular basis causes, among other things, under-utilisation or non-utilisation of gas-based power plants.

These projects have serious implications for climate change and renewable energy targets that the country has committed, both nationally and internationally, including in the Paris Agreement, the Nationally Determined Contributions 2021, and the Alternative and Renewable Energy Policy 2019. The LNG terminals at Port Qasim, Karachi pose a threat to the area's biodiversity, including mangroves and affect the fishing community's livelihoods and fishing rights.

According to the Indicative Generation Capacity Expansion Plan (IGCEP) 2021-30, a document that forecasts and calculates future electricity demand by the National Transmission and Dispatch Company (NTDC) and approved by the government, RLNG-based plants are envisaged to have a decreased share in the energy mix . The planned scaling down goes from 19% in 2021 to 1% in 2025 and then eventually falling nearly to 0% in 2030. In the backdrop of the ongoing installation and rapid expansion LNG, the stated vision in IGCEP has created confusion about the future of LNG terminals in Pakistan.

This briefing paper has been prepared in this backdrop to initiate a conversation within and among policy making circles, the civil society, media and other stakeholders around the LNG issue and suggest a course of action.

ENERGY AND GAS IN PAKISTAN

Gas consumption occupies the largest share in primary energy supply in Pakistan with approximately 53% share in 2018-19 annual consumption of 14,53,519 million cubic feet (mmcf). Out of this, power plants consumed 35%, household 21%, industry 17% and fertilizer plants 16%.[1] However, with the rapid depletion in oil and gas reserves, the state started importing LNG from 2015.[2]

[1] PAKISTAN ECONOMIC SURVEY 2019-20 data cited in "CO2 Emissions from Pakistan's Energy sector July 2021", CREA, available at https://energyandcleanair.org/wp/wp-content/uploads/2021/07/CO2-Emissions-from-Pakistans-Energy-sector_30_07_2021.pdf

[2] Siddiqui, S., 2021. Pakistan to auction oil, gas blocks by year-end. Express Tribune, [online] Available at: <https://tribune.com.pk/story/2313090/pakistan-to-auction-oil-gas-blocks-by-year-end> [Accessed 23 August 2021].

WHAT IS LNG?

Liquefied Natural Gas predominantly consists of methane or CH4, that is converted to liquid (by cooling it off to -260 degrees Fahrenheit) for ease in storage and transportation. LNG occupies only a fraction (1/600) of the volume of natural gas; it can therefore be stored in large quantities and is more economical to transport across longer routes.

LNG IMPORT

The depleting natural gas reserves in Pakistan resulted in a shift towards imported RLNG and coal. LNG was first imported in 2015[3] to meet the rising gas demand particularly for power plants. A total of four long-term supply contracts were signed with Qatar, ENI, and two with Gunvor, with total import quantities of 6.0 mtpa. Qatar stood as a major supplier followed by Gunvor and ENI. LNG imports have grown from 1.5 billion cubic meters in 2015 to 9.4 billion cubic meters in 2018.[4] In addition, LNG is imported on spot basis as and when required.

LNG IMPORT MANDATE

The import of LNG has been mandated by the Pakistan Government to the state-owned companies i.e., Pakistan State Oil (PSO) and Pakistan LNG Limited (PLL) on behalf of the state.[5]

2 LNG REGULATION/GOVERNANCE

OGRA AND LNG

The Oil & Gas Regulatory Authority (OGRA), the government agency responsible for regulating the oil and gas sector in Pakistan, performs its functions under the OGRA Ordinance 2002, and in accordance with the prevalent government policy and guidelines. In 2007, OGRA notified LNG Rules 2007, to bring the anticipated LNG related activities under a regulatory regime. The policy encourages prospective project developers to enter into the LNG market after going through the required formalities in keeping with the rules.

Once the operational licence is issued, the LNG Department in OGRA monitors compliance of the terms and conditions of the licence.[6]

Moreover, OGRA's functions[7] include granting licences for marketing and distribution of LNG and processing of licences to terminal owners/operators (TOs/Os) to construct and operate LNG-receiving terminals, for transportation, and filling. Furthermore, modification, extension, revocation, renewal of the licences, inspections/audit of LNG terminals is also dealt under the LNG Rules.[8]

There are two types of LNG projects:

1. Integrated where the terminal developer arranges LNG imports as well as its buyers and importers.
2. Unbundled where the terminal developer, importers and buyers are different.

Re-gasified Liquid Natural Gas (RLNG) Pricing

The RLNG pricing is organised under the Petroleum Products (Petroleum Levy) Ordinance, 1961 and the Petroleum Products (Petroleum Levy) Rules, 1967. The Federal Government has entrusted OGRA to determine the RLNG prices on a monthly basis, as is done with other petroleum products.[9] The price is then notified by the Pakistan State Oil, that along with the Pakistan LNG Limited is the designated LNG buyer for the Federal Government.

[3] Power Generation: An Overview by The Pakistan Credit Rating Agency at https://www.pacra.com/sector_research/Power%20Sector%20-%20PACRA%20Research%20-%20Jan'21_1611329371.pdf

[4] ADB Extended Annual Review Report, "Engro Elengy Terminal Private Limited Engro Fast-Track Liquefied Natural Gas Regasification Project" at https://www.adb.org/sites/default/files/project-documents/48307/48307-001-xarr-en.pdf, October 2019

[5] Oil and Gas Regulatory Authority, 2020. Annual Report 2019-2020. [online] Islamabad. Available at: <https://ogra.org.pk/ogra-annual-reports> [Accessed 23 August 2021].

[6] Ibid

[7] Ibid

[8] Ibid

[9] Ibid

LNG REGULATION/GOVERNANCE

At present two LNG terminals of the EETL and PGPCL are working, whereas, four more are planned. This section presents relevant details of the respective terminals, along with environmental impact concerns, where available. Table 1 presents a quick picture of the respective LNG terminal developers.

TABLE NO. 1

S/N	Name of Developer	Licence Description and Status	Licence Issuance Date
1	Engro Elengy Terminal Limited (EETL)	Unbundled Project Structure (Operation Licence of LNG-receiving terminal at Port Qasim, Karachi) Regasification capacity: 600-690 mmcfd.	*March 18, 2016*
2	Pakistan GasPort Consortium Limited (PGPCL)	Unbundled Project Structure (Operation Licence of LNG-receiving terminal at Port Qasim, Karachi). Regasification capacity: 600-750 mmcfd.	*April 03, 2018*
3	Global Energy Infrastructure Pakistan Limited & Global Energy Infrastructure Limited (GEIP/GEIL)	Integrated Project Structure (Extension in project completion timelines for construction licence granted for LNG Integrated Project at Port Qasim, Karachi. Port Qasim Authority approval to be updated for consideration of further extension).	*Review appeal decision dated May 02, 2019*
4	Pakistan GasPort Limited (PGPL)	Integrated Project Structure (provisional licence).	*June 25, 2018*
5	Tabeer Energy (Pvt.) Limited (TEPL)	Integrated Project Structure (provisional licence). Provisional licence timelines extended till August 16, 2020. The application for construction licence by TEPL is under examination.	*August 17, 2018*
6	Energas Terminal (Pvt.) Limited (ETPL)	Integrated Project Structure (provisional licence). Provisional licence timelines extended till April 02, 2020. The application for construction licence by TEPL is under examination.	*Apr 03, 2018*

Source: OGRA Annual Report 2019-20

**For abbreviations, please see Table 1*

1 Engro Elengy Terminal Limited (EETL)

The EETL established its LNG re-gasification terminal at Port Qasim, Karachi. The LNG is being imported by the government through Pakistan State Oil and the EETL is providing the re-gasification services at a tolling tariff. The Sui Southern Gas Company (SSGC) has also hired the regasification capacity of EETL's terminal.

2 Pakistan GasPort Consortium Limited (PGPCL)

The PGPCL established Pakistan's second LNG re-gasification terminal at Port Qasim, Karachi. The LNG is being imported by the government through Pakistan LNG Limited while PGPCL is providing the re-gasification services at a tolling tariff.

View of PGP Consortium's LNG Terminal at Port Qasim,
Source: OGRA Annual Report 2019-20

3 Pakistan GasPort Consortium Limited (PGPCL)

The Pakistan GasPort Limited (PGPL) is a subsidiary of the Associated Group (AG) which secured a non-objection certificate (NOC) from the government for import of LNG and establishment of a terminal in Kadiro Creek (that links to Karachi's Korangi Creek in the Port Qasim waters).[10] The LNG is being imported by the government through Pakistan Petroleum Limited and the PGPCL is providing the regasification services at a tolling tariff.[11]

An environmental social impact assessment (EIA)[12] carried out of the project identified the following physical, biological and socio-economic environmental risks:

1. Construction and transportation equipment (earth movers, graders, blasting, trucks, vessels, concrete batch plant, etc.) are likely to generate dust and emit combustion gases, including greenhouse gases (GHGs), primarily carbon dioxide.

2. Project operations, including LNG storage tanks, vaporisers used in regasification, demethanizer preheaters, marine vessels, and vehicle traffic will also generate fugitive emissions of natural gas, methane, particulate matter, combustion gases and GHGs (primarily carbon dioxide), and possibly small releases of natural gas (non-quantifiable).

[10] https://www3.opic.gov/environment/eia/pakistangasport/Chapter%201-Introduction.pdf

[11] EIA of Energes LNG Terminal Project, 2019, EMC Pakistan Limited

[12] ESIA of LNG Terminal, Jetty & Extraction Facility - Pakistan GasPort Limited, Chapter 7, Screening Of Anticipated Impacts and Proposed Mitigations available at https://www3.dfc.gov/environment/eia/pakistangasport/Chapter%207-Screening%20of%20Anticipated%20Impacts%20and%20Proposed%20Mitigation.pdf

3. The emissions of CO (carbon monoxide) due to incomplete combustion of LNG in fire condition will spread in the direction of wind, altering the quality of airshed of the region.
4. The volume of material to be dredged for the berthing pocket and temporary access canal is considerable. This is to be disposed in the designated area of tidal mud flat in the vicinity of the shore area for reclamation or disposal, as specified by the Port Qasim Authority.
5. To make way for the construction of sub-sea delivery pipeline and the jetty, mangroves will need to be removed.

4 Tabeer Energy (Pvt.) Limited (TEPL)

The Tabeer LNG project is an integrated supply project by the Tabeer Energy Private Limited (a subsidiary of Mitsubishi that seeks to build a terminal at Port Qasim, for the import and regasification LNG in Pakistan).

The terminal is to be set up within the dedicated LNG zone at Chara Creek, in the Port Qasim area. According to the project document, the terminal will uproot or affect up to 9.8 hectares of mangroves in the area.

Tabeer Energy Limited has been accused of working in a non transparent way by environment groups and clean energy advocates. The Environment Impact Assessment of the terminal has not been made public. Activists acquired the report using personal office. The anomalies in the report has been pointed out in a concerted engagement with Mitsubishi being pursued by the Alliance for Climate Justice and Clean Energy (ACJCE) established under the TARA Pakistan programme. It has been noted that the EIA misleadingly conceals the legal status of the mangroves propagating an erroneous assumption of non applicability under the land lease arrangement. The EIA also makes no explicit mention of the conditions under which the construction of the Tabeer terminal has been approved, thereby evading a civil society evaluation of the the restorative and mitigation plans. It has also been noted that the estimation of the impact of the terminal on mangroves has been under written. In addition, the EIA claims of a ten-kilometer zone without any human settlement has also been contested on the basis of an on-ground analysis conducted by ACJCE.

5 Energas Terminal (Pvt.) Limited (ETPL)

Energas Terminal (Pvt) Limited (ETPL) is a consortium of YB Pakistan Limited, Sapphire and Halmore Group formed to develop a private LNG terminal at Port Qasim. The project, which includes constructing and operating an LNG terminal in the north LNG zone of Chara creek, will also have ship berthing, import facilities, floating storage and regasification equipment. It will provide facilities for receiving supplies of LNG via an LNG carrier, for offloading, transfer and loading into a Floating Storage Regasification Unit vessel which will store and re-gasify the LNG and deliver the RLNG through a jetty, to the offshore pipeline and further to the onshore facilities to the gas network operated by SSGC.[13]

The EIA of the terminal identified the following environmental and social risks:

1. The increase in ship traffic will lead to increase in the accumulation of pollutants in the water and in the sediment, which in turn, will adversely affect biological communities.
2. The Geological Survey of Pakistan has defined the area of Port Qasim, where the site under study is located, to fall in a seismic zone, a consideration that needs to be factored in the design of the terminal.

[13] EIA of Energas LNG Terminal Project, 2019, EMC Pakistan Limited

3 ISSUES AND CONCERNS

1 LNG Projects in Environmental Sensitive Areas

The governance framework of environment in Sindh is led by the Environment Protection Act 2014. The Sindh Environmental Protection Agency (SEPA) has been created under the Sindh Environment Protection Act 2014. According to SEPA regulations, projects "located in environmentally sensitive areas" and those "likely to cause an adverse environmental effect" which include all LPG and LNG projects (including terminals and re-gasification units) require both the Initial Environmental Examination (IEE) and an EIA.[14]

All LNG terminal projects are located in the creeks that are rich in marine resources and mangroves. Because of this, these have been designated environmentally sensitive areas. While data and EIAs of all LNG projects were not accessible, the ones accessed suggest that majority of the LNG terminals do have implications for mangroves forests in and around Port Qasim. For example, Tabeer LNG project will uproot and affect 9.8 hectares of mangroves forest, according to the project document.[15]

Mangroves have immense ecological, climatic and social significance, being carbon sequestration powerhouses which can store up to four times more carbon than even the rainforests. Most of this carbon is stored in the soil beneath mangrove trees.[16] It is estimated that the average annual carbon sequestration rate of mangrove ecosystems averages between six and eight mg CO_2 e/ha (tonnes of CO_2 equivalent per hectare) (Murray et al. 2011). These rates are approximately twice or even four times higher than global rates observed in mature tropical forests and are considered one of the largest and productive pools of carbon (Nellemann et al. 2009a, 2009b).[17]

Moreover, mangroves provide a shield against strong gusty winds and cyclones with their roots that can break down the force of a storm surge.[18] Mangroves also reduce the height of wind and swell waves over short distances (less than 500 meters), contributing to coastal defence strategies.[19] In addition, they act as nurseries for fish breeding.

In the area of the Indus delta where the terminals are being proposed, mangroves have declined from 600,000 to a mere 82,000 acres.[20] Though some of the LNG project documents include a component of rehabilitation of the mangroves, the local communities complain that very few of the replantation initiatives have survived in the past.

Price-Sensitive LNG Market

LNG contracts are often linked to regional gas prices at the supply end. The recent spike in gas prices uncovered the inherent volatility of the LNG trade highlighting the risk of committing to gas as a long-term energy source.[21] Contract costs are often passed onto electricity consumers to provide an assured market for large, capital-intensive projects.[22] This is the reason that in 2021, the state-run Pakistan State Oil purchased a cargo of LNG at $20.055 per unit, the highest ever not only in the country but perhaps the second highest summer purchase in the world.[23] The resultant increase in gas prices weighs heavily on the consumers, particularly the household consumers.

[14] EIA of Energas LNG Terminal Project, 2019, EMC Pakistan Limited

[15] EIA of Energas LNG Terminal Project, 2019, EMC Pakistan Limited

[16] In the Matter of Public Comments - Application for Construction & Operation of LNG Terminal by Tabeer Energy (Pvt) Ltd Part II Dated April 06, 2021, https://ogra.org.pk/lng-department

[17] Erickson-Davis, M., 2018. New study finds mangroves may store way more carbon than we thought. Mongabay, [online] Available at: <https://news.mongabay.com/2018/05/new-study-finds-mangroves-may-store-way-more-carbon-than-we-thought/> [Accessed 23 August 2021].

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[19] Moolna, A., 2019. How mangroves protect people from increasingly frequent and powerful tropical storms. [online] Available at: <https://theconversation.com/how-mangroves-protect-people-from-increasingly-frequent-and-powerful-tropical-storms-118200> [Accessed 24 August 2021].

[20] McIvor, A., Möller, I., Spencer, T. and Spalding, M., 2022. Mangroves as a Sustainable Coastal Defence. In: 7th International Conference on Asian and Pacific Coasts. [online] Core. Available at: <https://core.ac.uk/download/pdf/25493015.pdf> [Accessed 25 August 2021].

[21] The News, Money Matters, 2015. The dying delta. [online] Available at: <https://www.thenews.com.pk/magazine/you/77318-the-dying-delta> [Accessed 25 August 2021].

[22] Asia Gas Fact Sheet 2, Oil Change International, 2021

[23] Kiani, K., 2021. Pakistan State Oil makes costliest purchase of LNG cargo. Dawn, [online] Available at: <https://www.dawn.com/news/1638435> [Accessed 25 August 2021].

2 Supply Chain Issues: Under-utilization or non-utilization of the power plants

Pakistan mostly buys LNG to operate gas-fired power plants.[24] The price sensitive market and non-availability of LNG on a regular basis causes, among other things, under-utilization or non-utilization of the power plants as was pointed out in the National Electric Power Regulatory Authority's recently released State of Industry Report.[25]

Besides the installation of newer, more efficient RLNG-based power plants, some of the existing gas-based power plants of generation companies have also been granted tariff on RLNG. Being an imported fuel, its availability can be ensured through better supply chain management. While the uncertainty of gas supply associated with depleting local gas remains, the risk of deficiency of RLNG is to be borne by the power producer itself.

3 Climate Change

This boom in the construction of LNG terminals threatens to lock in massive amounts of GHG emissions and negate any chance of limiting global warming to the 1.5°C tipping point identified by the Intergovernmental Panel on Climate Change (IPCC).[26]

Moreover, experts observe that the approach of using gas as a transition fuel to replace coal plants will not cut emissions by nearly enough.[27] The LNG process adds a significant amount to the full lifecycle emissions of producing and using gas. If methane leakage is not kept at very low levels, replacing coal with LNG will result in increased GHG emissions.[28] Notably, methane is a climate super-pollutant and is over 80 times more potent than CO_2.[29] In 2016, the authors of the IPCC's 2014 assessment concluded that methane's impact on global warming is about 25% higher than previously estimated.[30]

Investing billions of dollars into gas power plants, pipelines, and LNG terminals risks locking in gas use and new carbon emissions. There are adequate technologies available to make a shift from gas straight into clean energy.[31]

Pakistan is party to the Paris Agreement. The agreement requires reducing energy-related CO_2 emissions by more than 70% by 2050 compared to 2015 levels. The government recently launched Pakistan's updated NDCs 2021[32] which reinvigorates commitment to the reducing GHG emissions. Though Pakistan's contribution to these emissions is just 0.9%, the LNG infrastructure will contribute to an increase at the regional and global level.

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[24] Siddiqui, S., 2021. Pakistan books pricey LNG cargoes. Express Tribune, [online] Available at: <https://tribune.com.pk/story/2318656/pakistan-books-pricey-lng-cargoes> [Accessed 25 August 2021].

[25] National Electric Power Regulatory Authority, 2021. State of Industry Report 2020. [online] National Electric Power Regulatory Authority. Available at: <https://nepra.org.pk/publications/State%20of%20Industry%20Reports/State%20of%20Industry%20Report%202020.pdf> [Accessed 24 August 2021].

[26] Plante, L., Browning, J., Aitken, G., Inman, M. and Nace, T., 2020. Gas Bubble 2020: Tracking Global LNG Infrastructure. [online] Global Energy Monitor. Available at: <https://globalenergymonitor.org/wp-content/uploads/2020/07/GasBubble_2020_r3.pdf> [Accessed 18 August 2021].

[27] Asia Gas Factsheet 1, 2021. The Climate Case Against Gas Expansion. [online] Oil Change International. Available at: <http://priceofoil.org/content/uploads/2021/09/LNG_factsheet1fin_r1.pdf> [Accessed 17 August 2021].

[28] Oil Change International, Jordan Cove LNG and Pacific Connector Pipeline Greenhouse Gas Emissions Briefing, January 2018, quoted in Asia Gas Factsheet 1, 2021. The Climate Case Against Gas Expansion. [online] Oil Change International. Available at: <http://priceofoil.org/content/uploads/2021/09/LNG_factsheet1fin_r1.pdf> [Accessed 17 August 2021].

[29] Asia Gas Factsheet 1, 2021. The Climate Case Against Gas Expansion. [online] Oil Change International. Available at: <http://priceofoil.org/content/uploads/2021/09/LNG_factsheet1fin_r1.pdf> [Accessed 17 August 2021].

[30] Plante, L., Browning, J., Aitken, G., Inman, M. and Nace, T., 2020. Gas Bubble 2020: Tracking Global LNG Infrastructure. [online] Global Energy Monitor. Available at: <https://globalenergymonitor.org/wp-content/uploads/2020/07/GasBubble_2020_r3.pdf> [Accessed 18 August 2021].

[31] International Institute for Sustainable Development, Step Off the Gas: International Public Finance, Natural Gas, and Clean Alternatives in the Global South, June 20 quoted in Asia Gas Factsheet 1, 2021. The Climate Case Against Gas Expansion. [online] Oil Change International. Available at: <http://priceofoil.org/content/uploads/2021/09/LNG_factsheet1fin_r1.pdf> [Accessed 17 August 2021].

[32] Government of Pakistan, 2021. Pakistan Updated Nationally Determined Contributions. [online] Available at: <https://www4.unfccc.int/sites/ndcstaging/PublishedDocuments/Pakistan%20First/Pakistan%20Updated%20NDC%202021.pdf> [Accessed 26 August 2021].

4 Renewables

Pakistan aims to shift to 60% renewable energy (RE) and 30% electric vehicles by 2030 and place a complete ban on imported coal.[33] Internationally, Pakistan has signed the International Renewable Energy Agency (IRENA) Statute[34] and seeks to promote as well as adopt use of renewables for sustainable development.[35] But this can only be achieved with massive investment in RE along with energy efficiency.[36]

Currently, RE forms less than 3% of Pakistan's total power generation fuel mix. The country relies heavily on imported fuel such as oil, coal and LNG. Although the national power generation mix has been restructured in recent years to reduce reliance on imported oil, the new fuel mix leans heavily towards imported LNG[37]. This may jeopardise the RE aspirations of the country.

5 Uncertain Future of LNG Terminals

The future of LNG terminals in Pakistan is uncertain because of two reasons. First, as competition from renewables for power sector applications intensifies, the longer term outlook for LNG infrastructure continues to worsen. Hundreds of billions of dollars in sunken investments for LNG infrastructure face the risk of becoming underutilized or stranded assets long before their expiry in 30–40 years.[38]

Before the expiration of a typical 20-year LNG contract signed by Pakistan in recent years, electricity from a new solar plant is predicted to become the cheapest form of energy.[39] While renewable energy is getting cheaper[40] the cost of utility-scale wind and solar power generation has already fallen dramatically in the past decade.[41] In addition, solar and wind plants will soon produce electricity cheaper than existing gas and coal plants based on the running costs of those fossil fuel plants alone.[42]

Lastly, in the light of the recently approved IGCEP 2021-30 that envisages a decrease for RLNG in the energy mix from 19% in 2021 to 0% in 2030 a sword of uncertainty hangs over the future of LNG terminals in Pakistan.

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[33] Government of Pakistan, 2021. Pakistan Updated Nationally Determined Contributions. [online] Available at: <https://www4.unfccc.int/sites/ndcstaging/PublishedDocuments/Pakistan%20First/Pakistan%20Updated%20NDC%202021.pdf> [Accessed 26 August 2021].

[34] Statute of the International Renewable Energy Agency 2009 available at https://www.irena.org/-/media/Files/IRENA/Agency/About-IRENA/Statute/IRENA_FC_Statute_signed_in_Bonn_26_01_2009_incl_declaration_on_further_authentic_versions.pdf?la=en&hash=635C494208DD405EA8CD2BDB04414FECD40F55F1

[35] Power Generation: An Overview by The Pakistan Credit Rating Agency at https://www.pacra.com/sector_research/Power%20Sector%20-%20PACRA%20Research%20-%20Jan'21_1611329371.pdf

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[38] Plante, L., Browning, J., Aitken, G., Inman, M. and Nace, T., 2020. Gas Bubble 2020: Tracking Global LNG Infrastructure. [online] Global Energy Monitor. Available at: <https://globalenergymonitor.org/wp-content/uploads/2020/07/GasBubble_2020_r3.pdf> [Accessed 18 August 2021].

[39] "Asia Gas Factsheet 2: Gas Is a Bad Deal for Asia." Oil Change International, Nov. 2021 at https://priceofoil.org/content/uploads/2021/11/LNG_factsheet2_FIN_v2.pdf

[40] "Asia Gas Factsheet 2: Gas Is a Bad Deal for Asia." Oil Change International, Nov. 2021 at https://priceofoil.org/content/uploads/2021/11/LNG_factsheet2_FIN_v2.pdf

[41] "Asia Gas Factsheet 2: Gas Is a Bad Deal for Asia." Oil Change International, Nov. 2021 at https://priceofoil.org/content/uploads/2021/11/LNG_factsheet2_FIN_v2.pdf

[42] IEEFA, New power and energy master plan must be designed in Bangladesh's interest not Japan's, May 24, 2021, quoted in "Asia Gas Factsheet 2: Gas Is a Bad Deal for Asia." Oil Change International, Nov. 2021 at https://priceofoil.org/content/uploads/2021/11/LNG_factsheet2_FIN_v2.pdf

4 CONCLUSION

Expanding LNG infrastructure by the government is not a viable solution, especially in the long term, for energy needs and reduction in supply and demand gap of gas in Pakistan. The LNG contracts in Pakistan, as all around the world, are made on long term basis. The declining prices of renewables in the world suggests that even before the term of the current LNG contracts will expire in the next two decades, renewables will become the cheapest form of energy. Moreover, the price-sensitive market and non-availability of LNG on a regular basis causes, among other things, under-utilization or non-utilization of power plants.

Even the government in the IGCEP 2021-30 has stated that in the long run it sees a much decreased share in the overall energy mix. This has created much confusion about the future of LNG infrastructure in Pakistan.

Additionally, LNG projects have serious implications for renewable energy targets of the country committed both nationally and internationally through the Alternative and Renewable Energy Policy, the NDCs and the Paris Agreement. As for posing a threat to the environment and climate change, the terminals at Port Qasim threaten the area's biodiversity specially the mangroves and may trample upon the fishing communities' fishing rights.

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THE KNOWLEDGE FORUM

The Knowledge Forum is an independent organisation that seeks to produce knowledge-based resources to assist in interventions and advocacy for communities' rights. The initiative is rooted in the ideology that knowledge strengthens and guides the direction of actions aimed at advancing rights and social justice processes.

TKF's knowledge generation is driven by the community agenda, prioritising the inclusion of their voice and participation. Through high quality research and discourse curation, TKF aims to assist in the creation of a more informed perspective on complex themes that have a bearing on communities' access to rights and participation in political, democratic and development processes.

TKF has been founded by a group of human rights practitioners, development professionals, activists and legal experts.

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