

PITFALLS

of Restoring Energy Security with
Coal Power Plants in Pakistan



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CONTENTS

ACRONYMS	4
BACKGROUND	5
COAL-FIRED POWER PLANTS UNDER THE CPEC	6
FLUCTUATING EXCHANGE RATE AND ABILITY TO REPAY LOANS	8
PROS AND CONS OF COAL-FIRED POWER PLANTS	9
ADVERSE ENVIRONMENTAL AND HEALTH IMPACTS	10
RENEWABLE ALTERNATIVES TO COAL-FIRED POWER PLANTS	12
THE WAY FORWARD	13
REFERENCES	14
APPENDIX - 1	16

ACRONYMS

CPEC	China-Pakistan Economic Corridor
GoP	Government of Pakistan
SBP	State Bank of Pakistan
SSRL	Sino Sindh Resource Ltd.
HUBCO	Hub Power Company
IGCEP	Indicative Generation Capacity Expansion Plan
NTDC	National Transmission & Dispatch Company
NEPRA	National Electric Power Regulatory Authority
FCC	Fuel Cost Component
RFO	Residual Fuel Oil
HELE	High Efficiency Low Emission
CCUS	Carbon Capture and Utilization Storage
ADB	Asian Development Bank
COP26	Conference Of Parties – 26 – UN Climate Change Conference
IMF	International Monetary Fund
PKRS	Pakistan Rupees
GDP	Gross Domestic Product
USD	United States Dollar
US	United States of America
UN	United Nations
CO ₂	Carbon Dioxide
MW	Mega Watt
kWh	Kilowatt Per Hour



BACKGROUND

The China-Pakistan Economic Corridor (CPEC) is a significant measure towards enabling Pakistan to diversify its fuel mix and restoring energy security by expanding electricity generation. Pakistan's history of electricity woes and power outages is an important reason behind why power projects constitute a large portion of the CPEC projects. The bulk of the CPEC projects center on coal-fired power plants as a means to lowering the cost of electricity generation, because the generation cost was far lower than that of residual fuel oil-based electricity generation.¹ Consequently, the share of coal-fired power plants in electricity generation is likely to expand in the near future.

Pakistan's energy crisis dates back to the mid-1990s, when the government induced the private sector to meet the growing demand for electricity, as public sector sources were limited. A 1994 power policy provided incentives to private investors, including the authority to choose what fuels to use (GoP, 1994). This policy guided the majority of new power plants to rely on imported fuel oil as the fuel of choice due to low oil prices prevailing in the 1990s (Aziz and Ahmad, 2015). In contrast, when the price of imported fuels increased sharply in the 2000s, dependence on imported fuel oil for electricity generation led to a major electricity crisis. In 2012-2013 alone, around

a quarter of the demand for electricity was unmet due to shortages averaging 4,000 MW to 5,000 MW. It is estimated that Pakistan's power shortages and resulting blackouts have reduced the country's GDP by 2 percentage points per annum for past several years (World Bank, 2017).

It appears from the above that the goal of low-cost electricity and an end to power outages were the two main reasons behind Pakistan's reliance on coal-fired power plants. However, financial viability and sustainability of coal-fired power plants, urgency to tackle adverse environmental and health impacts, and renewable alternatives to coal-fired power plants are critical concerns that need to be examined.

This paper focuses on these questions because they are central to understanding the pitfalls of restoring energy security with coal-fired power plants. This paper tries to inform by providing an overview of all coal-fired power plants under the CPEC and then discuss how fluctuating exchange rates may affect Pakistan's ability to repay loans. The paper also discusses pros and cons of coal-fired power plants, their adverse environmental and health impacts, renewable alternatives to fossil fuels and the way forward on how to replace them with clean energy projects.

¹ Bangladesh is another developing country that planned an ambitious shift towards coal as a long-term electricity fuel source, aiming to fuel most of its electricity by coal, by 2030 (Dhaka Tribune, 2014).

COAL-FIRED POWER PLANTS UNDER THE CPEC



The CPEC commenced in 2013, at a time when Pakistan was vulnerable to an on-going energy crisis. Coal became the prime input for power plants for a couple of reasons (Downs, 2019). Pakistan needed cheap alternatives to fuel oil, the price of which had shot up internationally, and made electricity generation expensive. Given Pakistan's large coal reserves in the Thar region of Sindh, coal was seen as quick and cheap fix to its energy woes. Coal, so far, had been an untapped resource, with only 0.1% of the country's generation capacity based on it in 2014 (State Bank of Pakistan, 2015). This was coupled with fact that China wanted to find new markets for Chinese manufacturers of coal power equipment, because China had pledged itself to using greener fuels.

Table 1 provides an overview of all coal-fired power plants under the CPEC, including ones that have been completed as well as those under construction. These power plants are projected to generate 6930 MW of electricity. Coal-generated power is of the recent vintage, with almost all the generation capacity entering the system after 2017. Nearly 66% of the power generation is thermal, which provides baseload generation; furnace-oil based power generation has 19% of this share (Isaad, 2021). Coal-fired power plants are relatively new to the system, but they contribute 13% to the installed capacity of the power grid. However, coal's share in electricity generation is relatively higher as it supplied more than 30% of the energy provided to the national grid since 2019. In other words, there is high carbon lock-in within the national grid (Isaad, 2021).

TABLE 1: Coal-fired power plants under the CPEC

Power Plants	Capacity (MW)	Status
Sahiwal Coal-fired Power Plant	1320	Completed
Coal-fired Power Plant at Port Qasim, Karachi	1320	Completed
China Hub coal Power Project, Hub, Balochistan	1320	Completed
Engro Thar Coal Power Project	660	Completed
SSRL Thar Coal Block-1, 7.8 mtpa & Power Plant (Shanghai Electric)	1320	Under-construction
HUBCO Thar coal Power Project (Thar Energy)	330	Under-construction
HUBCO Thal Nova Thar Coal Power Plant	330	Under-construction
Coal-fired Power Project at Gwadar	300	Under-construction
Total	6930	--

Source: <http://cpec.gov.pk/energy>

Table 2 describes the plan for 36 new coal power plants projected to generate 23,760 MW of electricity. However, recent announcements by the government have poured cold water on these projections indicating that Pakistan has decided to

halt coal-fired power boom and pivot to renewables (Lo, 2020).² But, owing to state guarantees behind power purchase agreements, under construction coal plants cannot be easily de-commissioned without heavy financial penalties (Lo, 2020).

TABLE 2: Indicative Generation Capacity Expansion Plan (IGCEP)

Fiscal year	Units	Capacity (MW)
2032-33	4	2,640
2033-34	4	2,640
2034-35	3	1,980
2035-36	4	2,640
2036-37	6	3,960
2037-38	6	3,960
2038-39	2	1,320
2039-40	7	4,620
Total	36	23,760

Source: NTDC (2018).

The coal generation combines the use of both local and imported coal as their primary inputs. In 2021, the share of imported coal in Pakistan's electricity generation mix was 12% or 3,960 MW; this share is projected to decrease to 11% of generation mix in 2025. On the other hand, share of local coal in the generation mix was 2%, or 660 MW, and this is projected to increase to 8% by 2025 (NTDC, 2021). In the near future, however, with commissioning of more power plants, dependence on imported coal is bound to rise.

Debt-to-equity ratio for most of the coal-fired power plants is in the range of 75:25, except 80:20 ratio for Sahiwal Coal-fired Power Plant and Coal-fired Power Project at Gwadar. Debt servicing has also been factored into the NEPRA "Determination of Authority" for each of the CPEC coal-fired power plants. Debt servicing for first ten years of each project has been determined. The debt servicing schedule for most power plants ranges from PKR 1.61/kWh to 1.67/kWh over ten years.

² Pakistan signals coal power exit, in potential model for China's belt and road (climatechangenews.com)

FLUCTUATING EXCHANGE RATE AND ABILITY TO REPAY LOANS



One of the risks of the CPEC power plants is that they may add to Pakistan's sovereign debt burden because exchange rate fluctuations may increase debt and affect the ability to repay loans. Sovereign debt defaults are part and parcel of the history of emerging and developing economies where such a crisis is commonly accompanied by either a banking or a currency crisis. When loans are obtained in foreign currencies, and domestic currency depreciates over life of the loan, then repayment of such loans becomes more expensive. For a country with a high debt-to-GDP ratio, a depreciation of its currency might worsen government finances and trigger a debt crisis (for Pakistan's debt profile, see **Appendix-1**). But overwhelming evidence suggests a weak link between exchange rate fluctuations and debt crises (Jahjah and Montiel, 2003; Eijffinger and Karates, 2013). Nonetheless, the negative impact of exchange rate fluctuations is particularly intense for countries with high foreign currency denominated external debt as these countries are likely to be burdened with increasing external debt (Augustine, 2019; Fisera et al., 2021).

Pakistan's debt sustainability may be at risk of external shocks because the majority of loans for the CPEC projects from Chinese financial institutions are in foreign currencies, mostly in U.S. dollars (Downs, 2019). If external shocks were to result in devaluation of Pakistan's currency, this would make even well-performing power plants financially unviable. This is because if the value of the Pakistani rupee were to decrease against the USD, this would mean that more of the Pakistani currency would need to be paid in order to repay the amount of original loans in USD. There are reasons for some real reservations because in the past forty-four months, Pakistan's currency has devalued by 61%, falling from PKR 123 per USD in January 2018, to PKR 198 per USD on 1st June 2022.

In short, such devaluations put Pakistan in a difficult position as far as loan repayments are concerned, and, additionally, make Pakistan more vulnerable given the number of power plants where imported coal is used. For a country where economic growth is slow, it is important to take advantage of the cheapest sources of energy. Future devaluations may put Pakistan in an even more difficult position as far as loan repayments are considered.

PROS AND CONS OF COAL-FIRED POWER PLANTS



Estimates from Pakistan suggest that coal-based power generation is relatively cheaper than oil and gas. A recent study, which compared the average cost of coal-based electricity generation under the CPEC to the average cost of oil or natural gas-based electricity generation that became operational in the period 2010–2014, concludes that coal-based power generation was cheaper by PKR 5.60/kWh than electricity generated by oil or gas (Fatima and Nasim, 2019). The study compared associated private costs because external costs, such as cost of CO₂ emissions, were not covered. However, accounting for environmental costs reduced this margin to PKR 2.29/kWh. To offer a meaningful comparison in the study, weighted average tariffs were compared, and all the costs were indexed to June 2019.

This evidence is further corroborated by a report by NEPRA (2020), which shows that generation cost of coal-based power plants was lower than residual fuel oil-based electricity generation. For example, the Fuel Cost Component (FCC) of two coal-fired power plants namely, Port Qasim Electric Power and China Power Hub, is lower than that of Tapal Energy and Gul Ahmed Energy, which are Residual Fuel Oil (RFO)-based. Thus, increase in coal-based electricity generation has significantly lowered generation costs of electricity.³

Taking a closer look at the strengths and weaknesses of electricity generation by coal power plants, Abbasi et al. (2021) also observed that despite “lack of coherence between coal exploitation and climate change policy”, there are significant benefits to Pakistan. Due to low cost of fuel involved in coal plants and their steady state power, coal-fired power plants are considered as base load power sources. This means that they operate throughout the day to tackle minimum level of power demand at all times. Base load power plants are large-scale power plants. Reliability of coal plants is a significant strength for a country that was in the depths of an energy crisis.

It is clear that coal was considered a more lucrative alternative because it was domestically available. However, from the list of constructed and under-construction coal-fired power plants under the CPEC, only power plants in the Thar region use local coal. The rest, namely the Sahiwal coal-fired power plant, the Port Qasim coal-fired power plant, the China Hub Coal Power Project, and the Gwadar Coal-Fired Power Project all use imported coal as their primary input. This means that they are as susceptible to changes in the international prices of coal, as the fuel oil-based power plants of the past, which had led to the energy crisis in Pakistan in the first place.

³ Bangladesh is another country where coal-fired power plants were constructed as a means to lowering the cost of electricity, in the wake of dwindling natural gas deposits, which was traditionally used to generate electricity. It was the availability of cheap electricity that led to Bangladesh's garment industry becoming a global leader, which underlines the importance of coal-fired power plants in the region (Rafiq, 2017).

ADVERSE ENVIRONMENTAL AND HEALTH IMPACTS



In addition to financial risks, the CPEC coal-fired power plants also carry a multitude of environmental and health risks (Downs, 2019). The projects will increase Pakistan's greenhouse gas emissions so much so that Pakistan will no longer be able to abide by its Paris convention pledge to reduce such emissions. Secondly, coal mining and processes involved in generating electricity from coal are water-intensive, posing an added threat to Pakistan's water crisis. Finally, in addition to threatening local ecology, the CPEC coal power plants may create health problems from the associated air pollution.

Aslam et al. (2021) look closely at coal power projects in Thar and point out that, given average life of a coal-fired power plant is forty years, current infrastructure centered on such plants will lock Pakistan and its financial sources into an energy system that requires de-carbonization. They conclude that a transition to renewables will not only protect Pakistan from devastations of a climate catastrophe, but also prove cost-effective.

This view has been reflected in other developing countries as well. Bangladesh had settled on using domestic coal to generate cheap electricity, which had allowed its garment industry to become world-renowned; Bangladesh had planned

to fuel most of its electricity by coal by 2030 (Rafiq, 2017). However, given the climate crisis and the emphasis on the need to transition away from non-renewable sources of energy, Bangladesh recently scrapped ten out of eighteen coal-fired power projects in pipeline.⁴

Coal-fired power plants, in general, emit greenhouse gases that are responsible for global warming, and more locally, acid rain (Abbasi et al., 2021). While Pakistan is currently lacking long term strategies for sustainable resource management, several opportunities exist in development of coal-fired power plants which may render the projects more sustainable. By making sure that all coal-fired power plants under CPEC employ super-critical turbines, Pakistan would be able to successfully reduce an estimated two giga-tons of carbon dioxide emissions (Abbasi et al., 2021). This would mean a decrease in associated risks of carbon dioxide emissions, such as air pollution.

Health and environmental concerns may be put to rest if Pakistan takes the necessary steps to install modern technologies. This would allow coal-fired power plants to operate sustainability and would ensure that Pakistan's solution to its energy crisis and Pakistan's aims to combat climate change are no longer at odds with each other. For instance, Pakistan can ensure sustainability of its coal

⁴ <https://www.eceee.org/all-news/news/bangladesh-scraps-plans-to-build-10-coal-fired-power-plants/>

power by employing commercially available High Efficiency Low Emissions (HELE) technologies, such as ultra-super critical turbines and Carbon Capture and Utilization Storage (CCUS), among others (Abbasi et al.,

2021). HELE technologies could be harnessed to achieve close to zero emissions. Not only are carbon dioxide emissions curtailed, but gases responsible for acid rain are also targeted by such technologies.

BOX 1: Exploring Life of a textile factory worker on fixed wages

45-year-old Nasreen Bibi is one of the thousands of women textile workers toiling away eight hours a day as a machine operator on a factory floor in Faisalabad, the biggest textile city in Pakistan. A widow, Nasreen has worked for over 14 years in the textile industry to support her family of two daughters. In 2021, when we interviewed Nasreen, she earned a monthly income of PKR 25,000, which she complained was insufficient to meet her daily expenses “in this never-ending inflation”. Our latest conversation with her in early 2022 tells us that, despite high inflation, her income has remained the same in the past year.

In retrospect, Nasreen’s gross annual salary stands at a mere PKR 300,000 against an inflation rate of 13%, which was at a two-year high recorded in February 2022. Due to rising food prices and energy costs, Nasreen can barely make her ends meet. When interviewed in 2021, Nasreen complained, “A one liter pouch of cooking oil used to cost me 138 rupees in 2018; today I buy it at 250 rupees, while sugar jumped from 50 rupees to 100 rupees a kilo.

Lamenting not being able to earn pay that is equal to her male counterparts, Nasreen blames her poor health, which disallows her to work long hours and operate multiple machines. She is unaware of the gender pay gap and jokingly comments how she wished she was a man who is paid PKR 40,000 for the same work that she now does for far less. Sadly, Nasreen is ignorant of the factors behind the gender pay gap, where women are more likely to live in poverty than men—and significantly more likely to retire in it.

Nasreen is one of the millions of people in Pakistan who earn a fixed income. In her case that income has not crossed PKR 300k in the past year. When interviewed in 2021, sitting in her small one-room house, Nasreen said she paid an average of PKR 2700 to 3000 per month in electricity bills. When we spoke to her again, in early 2022, she was bewildered, “Last month I paid PKR 5000 in my electricity bill. I use the same amount of electricity in my house. But I don’t understand how the bill comes higher every time.”

Electricity rates have increased by 40 percent since July 2018. The base electricity tariff, which stood at PKR 11.72 per unit in June 2018, is now PKR 16.44, reflecting an increase of PKR 4.72 per unit. In simpler terms, with the price hike of electricity unit costs, Nasreen’s electricity bill has now increased by over 45%, averaging PKR 60,000 per year, while her annual income remains fixed.

Pakistan’s import-driven energy policy drains its foreign exchange reserves, exposes, the economy to international energy price shocks, and puts the economy at risk through inflation. Rising prices of imported fuel has a direct impact on common citizens like Nasreen because they are forced to pay higher electricity bills. Over time, Nasreen has lost hope of ever being able to break free from this cycle of poverty and has resigned herself to the dark inequality trap.

**Contributed by Asim Jaffry
Fair Finance Pakistan**

RENEWABLE ALTERNATIVES TO COAL-FIRED POWER PLANTS



It is important to realize that when the decision to make a transition to coal-fired power plants was taking place, coal was, indeed, the cheapest alternative Pakistan had to fuel oil because renewables were more expensive than coal. Renewable alternatives like wind and solar, which Pakistan has great potential for, were not considered because the existing transmission and distribution infrastructure was not suitable to them (Malik, 2018).

In 2015, levelized tariffs in Pakistan for new wind projects were between 13 and 17 cents/kWh, while these tariffs for new solar projects were between 14 to 15 cents/kWh (IRENA, 2018). At the same time, levelized tariffs for coal-fired power plants were much lower at between 8.6 and 9.7 cents/kWh (IRENA, 2018). However, the landscape has drastically changed in present times, with

renewable energy sources now being hailed as the cheapest sources of electricity. In 2018, levelized tariffs averaged at 5.25 cents/kWh for solar power projects and 4.3 cents/kWh for wind power projects; both alternatives cheaper than coal, average levelized tariff for which was more than 8 cents/kWh (Nicholas and Buckley, 2018).

Solar photo voltaics (PV) is a key technology that can be harnessed for efficient energy supply (Sadiqa et al., 2021). It is estimated that levelized cost of energy for a completely renewable system in Pakistan would be US\$ 73.7/MWh in 2050, lower than US\$ 91.93/MWh for the current fossil fuel-based system (Sadiqa et al., 2021). For a country where economic growth is slow, it is important to take advantage of the cheapest sources of energy.

THE WAY FORWARD



Pakistan is paying a high cost of status-quo by depending on fossil fuels. Since the Russia-Ukraine war started on 24 February 2022, prices of oil, gas and coal have sky-rocketed in the global market. Pakistan could no longer afford to buy expensive fuel for its power plants leading to shutting down of more than 5000 MWs worth of power capacity, resulting in long hours of power outages. If Pakistan continues to depend on fossil fuels and does not shift to renewables, it would compromise on its energy security.

Globally, there has been significant movement towards the “phasing-out” of coal. At the recent COP26 held at Glasgow, more than forty countries committed to shift away from coal, and among them were countries that had been major users of coal, such as Chile, Vietnam, and Poland. Twenty countries, including the U.S., signed another commitment to end public financing for unabated fossil fuel projects abroad by end of 2022. Recent evidence indicates that Pakistan has also de-prioritized coal power within the CPEC and there will be no more coal-based power generation; additionally, the Chinese government has also proposed that it would want to make its new foreign investments greener (Lo, 2020).

Part of the reason why the CPEC is so heavily focused on coal is because renewables were relatively more expensive a decade ago than

they are now. The best way forward to restore energy security in Pakistan is to transition away from unviable and unsustainable use of fossil fuels to renewable sources of energy generation.

Pakistan should explore early coal-fired power plant retirement and replacement with cleaner energy technologies that allow shifting from coal to renewables. However, this would not be so easy to implement because the present coal fleet is extremely young, with the oldest coal-fired power plant being only five years old (Isaad, 2021). With more coal-fired power plants entering the system by 2025, the average age will further decrease. As coal-fired plants will be paying off their debt for another 10-15 years, retiring them early would be too costly a debt to take on (Isaad, 2021), which may create more problems than it could solve.

However, there are positive reports that the Asian Development Bank (ADB) will help Pakistan’s federal government buy running coal-fired power projects and replace them with clean energy projects of equal capacity under the Energy Transition Mechanism, approved in the UN Climate Summit COP26.⁵ This will be a step in the right direction as it will accelerate transition towards energy security by diversifying the fuel mix, so that renewable sources make up the key components.

⁵ ADB likely to help Pakistan under energy transition mechanism (thenews.com.pk)

REFERENCES

- Abbasi, S.A., K. Harijan, Z.A. Memon, F. Shaikh, N.H. Mirjat (2021). Is Coal Power Generation a Sustainable Solution for Energy Needs of Pakistan: A Delphi-SWOT Paradigm, *International Journal of Energy Economics and Policy*, 11(1), 308-317.
- Aslam, H., A. Nazir, U. Zia (2021). Prospects of Coal Investments and Potential of Renewable Energy Transition in Thar Region of Pakistan. Working Paper No. 193, Sustainable Development Policy Institute (SDPI), Islamabad.
- Augustine, B. (2019). Impact of Exchange Rate Depreciation on External Indebtedness: Evidence from a Sample of Emerging Economies. Proceedings of 51st International Conference, Vienna.
- Aziz, R., M. Ahmad (2015). Pakistan's Power Crisis: The Way Forward. United States Institute of Peace, Washington D.C.
- Dhaka Tribune (2014). 50% power generation to come from coal by 2030, Dhaka, May 3.
- Downs, E. (2019). The China-Pakistan Economic Corridor Projects: Insights into Environmental and Debt Sustainability. Center on Global Energy Policy, University of Columbia, New York.
- Eijffinger, S.C., B. Karataş (2013). Three Sisters: The Interlinkage between Sovereign Debt, Currency and Banking Crises. CEPR Discussion Papers 9369, Centre for Economic Policy Research, London.
- Fatima, A., A. Nasim (2019). Cost of Electricity Generation in Pakistan – Comparison of Levelized Cost of Electricity of CPEC Coal Plants with Oil and Natural Gas Based Plants Commissioned in 2010-14, Institute of Development and Economic Alternatives. Working Paper No. 02-19, Lahore.
- Fisera, B., W.M. Tiruneh, D. Hojdan (2021). Currency Depreciations in Emerging Economies: A Blessing or a Curse for External Debt Management? *International Economics*, 168, 132-165.
- GoP (1994). Policy Framework and Package of Incentives for Private Sector Power Generation Projects in Pakistan, March 1994, Private Power and Infrastructure Board.
- GoP (2021). Pakistan Economic Survey, 2020-21, Economic Adviser's Wing, Ministry of Finance, Government of Pakistan, Islamabad.
- GoP (2022). *Public Debt Bulletin, July – December 2021*, Debt Policy Coordination Office, Ministry of Finance, Government of Pakistan, Islamabad.
- IRENA (2018), Renewables Readiness Assessment: Pakistan. International Renewable Energy Agency (IRENA), Abu Dhabi.
- Isaad, H. (2021). A word of caution for Pakistan's inclusion in the ADB Energy Transmission Mechanism, Institute for Energy Economics and Financial Analysis, Lakewood, OH, December 20.
- Jahjah, S., P.J. Montiel (2003). Exchange Rate Policy and Debt Crises in Emerging Economies. IMF Working Papers, International Monetary Fund. No. 03/60.

Lo, J. (2020). Pakistan signals coal power exit, in potential model for China's belt and road, Newsletter, Climate Home News, Kent: December 16.

Malik, S., M. Qasim, H. Saeed (2018). Green Finance in Pakistan: Barriers and Solutions. Tokyo: Asian Development Bank Institute. ADBI Working Paper 880.

NEPRA (2017). Determination of Authority. National Electric Power Regulatory Authority, Islamabad.

NEPRA (2020). State of Industry Report 2020. National Electric Power Regulatory Authority, Islamabad.

Nicholas, S., T. Buckley, T. (2018). Pakistan's Power Future: Renewable Energy Provides a More Diverse, Secure and Cost-Effective Alternative. Institute for Energy Economics and Financial Analysis.

NTDC (2018). Indicative Generation Capacity Expansion Plan, 2018 - 2040, Power System Planning, National Transmission and Dispatch Company, Islamabad.

NTDC (2021). Indicative Generation Capacity Expansion Plan (IGCEP), 2021-2030, Power System Planning, National Transmission and Dispatch Company, Islamabad.

Rafiq, A. (2017). The China-Pakistan Economic Corridor: Barriers and Impact. United States Institute of Peace, Washington D.C., No. 135.

Sadiqa, A., A. Gulagi, D. Bogdanov, U. Caldera, C. Breyer (2021). Renewable energy in Pakistan: Paving the way towards a fully renewables-based energy system across the power, heat, transport and desalination sectors by 2050. *IET Renewable Power Generation*. 16, 177- 197.

SBP (2015). *Annual Report 2014-15*, State Bank of Pakistan, Karachi.

World Bank (2017). Implementation, Completion and Results Report on a Series of Credits in the Amount of SDR 744 Million (US\$1.1 Billion) to Pakistan for Power Sector Reform Development Policy Credits I & II. The World Bank, Washington, D.C.

World Bank (2021). *Debt Report 2021*. The World Bank, Washington, D.C.

APPENDIX – 1

Pakistan's Debt Profile

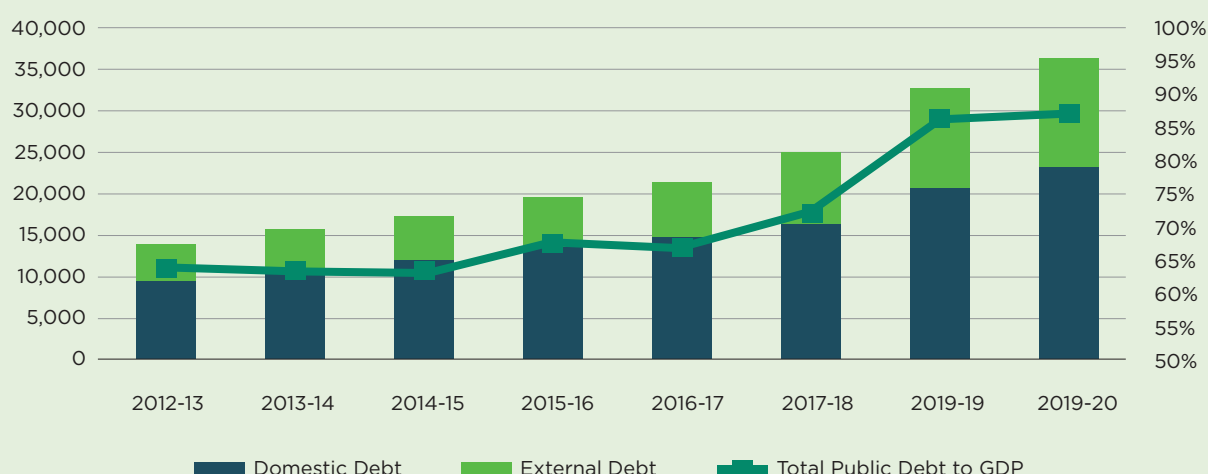
Pakistan's debt burden consists of both domestic and external debt. Domestic debt includes sums that are owed to lenders within Pakistan, while foreign or external debt refers to borrowings from creditors outside Pakistan. Government securities held by the State Bank of Pakistan, and other scheduled banks, and non-bank debt make up Pakistan's domestic public debt. Total external debt consists

of debts from multilateral lenders, e.g., the International Monetary Fund (IMF), the Asian Development Bank, the World Bank, the Paris Club, Euro/Sukuk bonds, etc.

Figure A1 reveals that Pakistan's debt burden has been rapidly growing as indicated by the debt more than doubling from PKR 1.4 trillion in 2012-13 to nearly 36 trillion in 2019-20 and the debt to GDP ratio climbing from 65% in 2012-13 to nearly 85% in 2019-20.

FIGURE A1: Pakistan's overall debt burden, 2012-13 – 2019-20

(LHS: Rs in billion, RHS: Percent of GDP)



Source: GoP (2021)

Public debt refers to the debt owed by the federal and provincial governments, while private debt is incurred by households, businesses, and non-profits. Table A1 paints a picture of how public debt and its external and internal components have evolved in the recent years. It indicates that as of December

2021, gross public debt of Pakistan was PKR 42.75 trillion, which is nearly 84% of GDP. Of this, two-third (PKR 26.75 trillion) was domestic debt and one-third (PKR 16 trillion or USD 89.88 billion at 1USD=PKR 178) was external debt.

TABLE 1: Pakistan's public debt summary, 2019 – 2021

Pakistan's Debt (PKR billions)	December 2019	December 2020	December 2021
Domestic Debt	21,676	24,314	26,747
External Debt	12,035	13,151	15,998
Total Public Debt	33,712	37,465	42,745
Domestic Debt (USD in billion)	127.1 (June 2019)	152	152
External Debt (USD in billion)	74.4 (June 2019)	82	91
Total Public Debt (USD in billion)	163.1 (June 2019)	235	242

Source: GoP (2022)

The World Bank's Debt Report 2021 provides several indicators for assessing a country's external debt, including reserves to debt ratio⁶, debt-to-exports ratio⁷, and debt-to-GNI ratio.⁸ Pakistan's reserves-to-debt ratio by end 2019 at 12.5% was one of the lowest in the region, falling behind all except Sri Lanka, whereas India's had reserves amounting to 77% of the external debt stock, and Bangladesh followed with 56% (World Bank, 2021). Similarly, Pakistan was the country with the second-to-worst performance in South Asia with an external debt-to-export ratio at 324%, following Bhutan at 330%. Both India and Bangladesh's debt-to-export ratios were significantly lower than Pakistan, both below 130% (World Bank, 2021). When comparing

debt-to-GNI ratios for the region, the report found Pakistan's was at a moderate level of 37%, when compared to 53% for the Maldives. However, Pakistan's was higher than that of Bangladesh, which was reported to be just 18% (World Bank, 2021).

Moreover, Pakistan is one of the countries where interest cost to revenue ratio is very high at nearly 46.7% while Sri Lanka tops the list of countries where the percentage of interest payments compared to government revenue in 2020 was nearly 72%.⁹ Countries that have much higher debt to GDP ratio than Pakistan pay less than 20% in interest payments compared to its government revenue.

⁶ The reserves-to-debt ratio measures a country's ability and flexibility to react to unexpected shocks or adverse events. It indicates how many dollars are in reserves for each dollar of debt owed to a creditor.

⁷ The debt-to-export ratio can be used to measure the sustainability, as an increasing debt-to-exports ratio implies that a country's debt is growing faster than the economy's primary source of external income, ergo, indicating that the country may have trouble repaying the debt in the future.

⁸ GNI measures gross national income.

⁹ Sri Lanka Pays the Largest Proportion of Its Revenue as Interest Payment (publicfinance.lk)



About Fair Finance Asia

Fair Finance Asia (FFA) is a regional network of Asian civil society organisations that are committed to ensuring that the business decisions and funding strategies of financial institutions in the region respect the social and environmental well-being of the communities in which they operate. Eight countries within the region are a part of the FFA: Cambodia, Japan, India, Indonesia, Pakistan, The Philippines, Thailand and Vietnam.