

Policy Brief # 82

**Green Financing to Support Energy Transition:
Options and Challenges for Pakistan**

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Abstract

Globally fossil fuels accounts for 80% of total energy generation leading to serious environmental damages. Consensus exists that green energy transition can help reduce this environmental degradation. Financing this transition, however, is a big challenge. By 2040, Pakistan needs around \$9.76-\$14.44 billion every year to finance green energy transition. Given limited fiscal space from conventional sources, it is needed that the country explores new strategies to generate the required financing. This paper discusses the potential options and challenges of market-based green financing faced by Pakistan. There is a need to formulate green financing policies with clear objectives and target followed by a comprehensive legal and institutional framework and that the focus in this regard must go beyond banking sector expanding to capital market and institutional investors.

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1. Introduction

Since the industrial revolution – the absence of a major green energy transition- the global energy demand has consistently risen, pushing economies worldwide to rely exceedingly on fossil fuels for energy generation. More than 80% of the global energy supply is produced by fossil fuels (Tian, et al., 2022). In addition to rising economic costs, it has badly hurt the environment and intensified the climate change risks. Evidence suggests, that around 40% of the total global carbon emissions are attributed to energy production (UN, 2019) whereas the fossil fuels used for energy generation emit roughly two-thirds of total global Greenhouse Gas (GHG) emissions. Limiting the temperature to 1.5° C, under Paris Agreement, CO₂ emissions need to be reduced to 45% by 2030 compared to their level in 2010, and to net zero by 2050 (IPCC, 2018). Eight years away from 2030, it seems a daunting task as 30 gigatons of emissions should be reduced every year to meet the desired target by 2030².

The case of Pakistan as an emerging economy is not different. Fossil fuels – the major contributor of GHG emissions in 2020 contributed roughly 61% of the total energy mix in Pakistan whereas the share of renewables accounts for around 6% only (Durrani, et al., 2021). According to the NDC, (2021), the energy sector emissions in Pakistan are expected to reach at 898 Mt CO₂ by 2030 from 185.97 Mt CO₂ in 2015. In 2001, the per capita CO₂ emissions were 0.74 metric tons which are expected to reach 1.23 metric tons by 2030 (Gable, et al., 2015). In addition, Pakistan is entering into an era of industrialization, due to which the energy demand in Pakistan is consistently rising.

This higher dependency on fossil fuels not only puts the burden on the country's fragile economy -- high fuel imports lead to trade and current account deficits, pressure on the exchange rate, and imported inflation but also causes environmental hazards like global warming. In 2022, the oil import of Pakistan accounted for nearly 29% --around \$23.32 billion-- of the total import bill, increasing from 20% or around \$11.38 billion in 2021. However, it was reported around \$17 billion in 2019-20. Pakistan was ranked 31st largest crude oil producer in 2021³ and its oil consumption is expected to reach approximately 180 million barrels by 2025, and over 205 million barrels by 2030 (GOP, 2021).

Recognizing these economic pressures and greening the post-pandemic recovery (box 1), has stressed the need to focus on reducing fossil fuel consumption. In this regard, the government targets to shift towards renewable sources for energy generation. Accordingly, the government is aiming to shift 20% of energy production from renewables i.e., solar, wind, biomass, etc., by 2025 and 30% by 2030 under ARE policy (NDC, 2021).

However, shifting towards renewable energy is not so easy because of numerous challenges, i.e., financial constraint remains the big challenge. According to (NDC, 2021), around \$101 billion is needed till 2030 - with additional financing of \$65 billion till 2040 - for the energy transition in Pakistan. In other words, we can say that Pakistan's financing need for energy transition stands around \$9.76 per annum till 2030 and \$14.42 billion per annum till 2040. In retrospect, even the lower bound requirements of \$9.76 billion are more than the combined inflows of \$6 billion from the IMF's three-year program —the extended fund facility.

² <https://www.unep.org/interactive/six-sector-solution-climate-change/>

³ <https://www.worldstopexports.com/crude-oil-imports-by-country/>

BOX 1: Pakistan's Key Economic Challenges Energy Sector:

1: Power Tariff Increase due to heavy reliance on Fossil fuels

- Over 90% of Pakistan's generation capacity added over the past two decades was thermal in nature, while renewables (non-hydro) still account for a minute share of less than 5% in total power generation mix.
- Between July 2021-April 2022, Pakistan has paid around \$17 billion only for oil and gas imports. LNG imports have costed \$ 4 billion in these 10 months and may cross \$ 5 billion by the end of this fiscal year.
- Owing to massive increase in fossil fuel prices, only fuel cost of RLNG plants accounted for PKR 16.5/kWh, while Sahiwal coal power plant produced power at a fuel cost price of PKR 28.5/kWh.
- Resultantly, NEPRA was forced to increase the national average electricity price from PKR 16.9/kWh to PKR 24.8/kWh.

#2: Increasing Circular Debt challenge and how RE can support this

- Energy sector of Pakistan is under an immense financial burden resulting from constantly increasing circular debt. From PKR 1.1 trillion in 2018, the circular debt has increased to PKR 2.2 trillion in 2022 and is expected to reach PKR 4 trillion by 2025 under business as usual.
- The circular debt from the gas sector also increased to around PKR 720 billion (1.1% of the GDP), driven by high accounted gas losses, delayed sales price adjustments, uncovered subsidies, and collection shortfalls.
- The major reason behind this is the high reliance on fossil fuels, system inefficiency, DISCOs receivables, high T&D losses, power theft, untargeted subsidies, and constantly increasing capacity payments (due to TAKE or PAY contract basis) which are expected to reach PKR 1.4 billion by 2023.
- By transitioning from fossil fuels to 30% renewable energy (as prescribed under Pakistan's ARE Policy, Pakistan can
 - Save \$5 billion on fuel cost.
 - Save 24 Mt of CO₂-eq emissions.
 - Improve energy security through diversification of fuels.
 - Reduce economic pressure through reduction in import of coal and LNG, thereby improving current account balance.

3: Increased Energy Demand due to climate change impact

- Owing to deteriorating climate conditions (driven by both national and international climate unfriendly practices), Pakistan has witnessed worst kind climate change impacts in the form of heat waves and excessive flooding across the country.
- Over the past few months, the shortfall in Pakistan increased beyond 8000 MW due to increased electricity demand (highest ever of around 28,000 MW), technical and maintenance challenges, and shortage of fuel required for power generation.

#4 Unbudgeted and Untargeted Subsidies

- During the FY-2020, the unbudgeted tariff differential subsidies from the government of Pakistan was approximately PKR 135 billion. Following this, the first half of 2021 also had several support schemes

In the backdrop of aforementioned challenges and facts, this paper argues about Pakistan needs to accelerate the adoption of clean energy sources, especially the variable renewable resources such as wind, solar and others (not large hydro). The challenge is to provide adequacy to meet the financing required to make this transition which would require exploring the potential of required resources and international climate finance avenues. Against this backdrop, this policy paper outlines the opportunities and challenges faced by Pakistan to benefit from local and international green financing markets. Furthermore, it proposes the way forward to strengthen Pakistan's capacity to increase green financing and mobilize it for clean energy transition.

1.1. Scope and objectives

This policy brief highlights the role of green financing to support the green energy transition in Pakistan. Mainly, it discusses the potential options and challenges in generating green financing. Generally, it maintains that the domestic and international green financing options and instruments can help Pakistan raise the required finance sustainably. However, certain challenges exist in this regard that needs to be addressed.

The key objectives of the brief as follows:

- To highlight the significance of green financing to support clean energy transition in Pakistan.
- To explore domestic and international green financing options and instruments to further support renewable energy transition.
- To identify the challenges linked with the financial instruments to support energy transition in Pakistan.

2. Current green financing landscape in Pakistan

2.1. Domestic Sources

Climate-related financing at the domestic level remains very low in Pakistan. Since 2016-17, on average the climate change-related budget allocation accounts for roughly PKR 5013 million, which is around 0.06% of the average total budget outlay during the same period. The lowest fund allocation, for climate change, was in 2018-19, that was around PKR 412 million whereas in FY2022-23 it stood at around PKR 10201 million as shown in figure 1. The climate change spending in terms of total expenditure percentage remains nearly 0.1 per cent of the total expenditures except 2020-21 which accounts for around 0.08 percent of total expenditures.

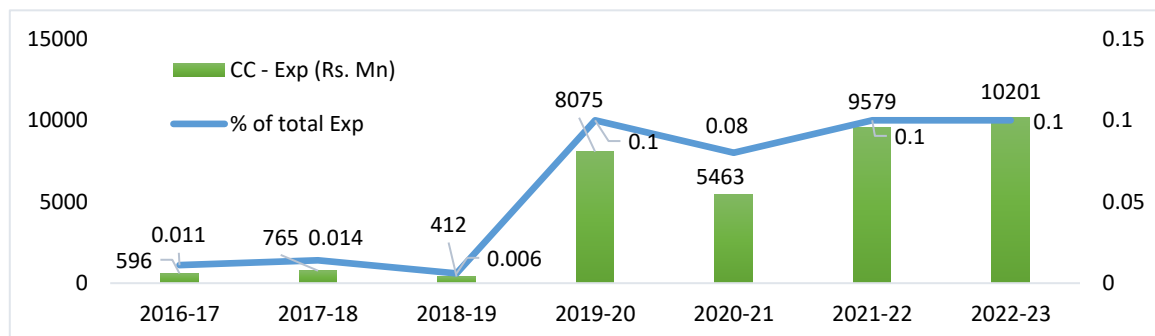


Figure 1: Climate change expenditures

Source: Budget Documents, Ministry of Finance

Similarly, the budget allocation especially for greening the energy sector also remains low at the domestic level. In 2019-20, the budget allocation for the energy sector was around PKR 308,393 million (around 40.6% of the development budget) of which PKR 58,219 million around (7.65 of the development budget) was allocated for developmental projects whereas PKR 250,173 million (equivalent to 33% of developmental expenditures) was earmarked for the non-developmental budget as shown in Figure 2.

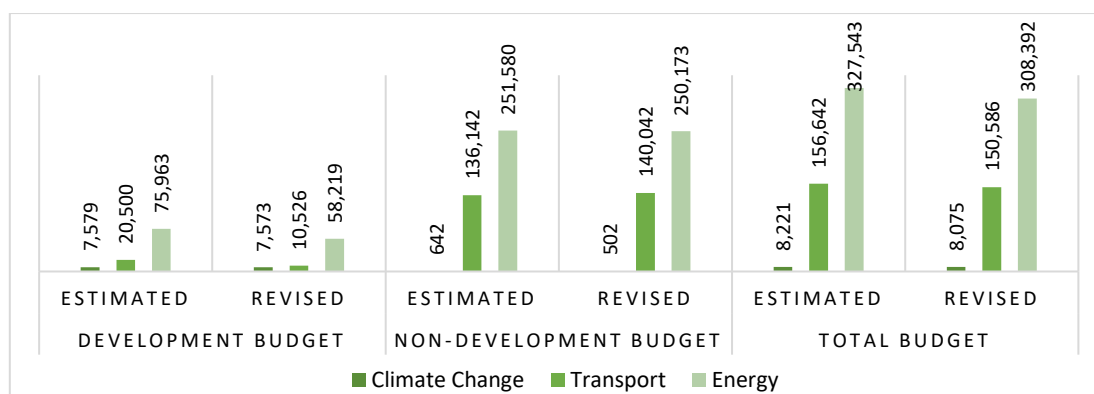


Figure 2: Total Domestic Green Expenditure 2019-20 (PKR Million)

Source: (Indus Consortium, 2021)

In 2022-23 solar energy allocation in Pakistan’s Public Sector Development Program (PSDP) stood at PKR 2,065 million which was higher in comparison to the previous year (PKR 1,734.42 million) (Figure 3). Similarly, the allocation for wind projects also increased, however, the allocation towards coal and hydro power plants faced a decline of around 30.5 percent and 2.6 percent respectively as shown in (Figure 3).

	2018-19	2019-20	2020-21	2021-22	2022-23
Coal Projects	28,141	12514	21073	22,330	15,514
Solar Energy	1,081	430	1,190	1,734.42	2,065
Wind Energy	1,000	4,739	5,000	1,925	3,300
Hydro Power	134,906	130,864	113,985	93,325.97	90,891.74

Figure 3: Energy Sector Allocation by Categories (Million PKR)

Source: (Indus Consortium, 2021) and PSDP (2020-23)

Besides the budget spending, SBP is also undertaking initiatives to boost green financing initiatives at the domestic level. The SBP financing scheme for Renewable Energy is promoting renewable projects in the country both at smaller as well as larger levels. For this, six commercial banks i.e., Bank Alfalah, Bank of Khyber, Faysal Bank, Habib Bank, JS Bank, and Meezan Bank, also took part by providing funding for renewable energy projects (solar, wind, small hydro) having capacities between (1MW – 50MW).

Similarly, the Islamic Banking Institutes (IBIs) and Development Finance Institutions (DFIs), under SBP, are also part of this scheme. Meezan Bank is offering CET financing agreements based on the diminishing Musharakah and Ijarah. Back in 2015, Meezan Bank acted as a Sharia advisor for the Tapal Wind Energy Project which has the capacity to generate 40MW, PKR 6400 million (Tahir & Khunkaev, 2017) whereas the maximum limit for a single renewable project is PKR 6 billion (SBP, 2019).

Similarly, K-Electric in 2015, also raised \$217 million by issuing Sukuk bonds (Reuters, 2015). WAPDA has also issued green Eurobonds for 10 years to raise \$500 million (Salik, 2021). Additionally, the Government of Pakistan has also ensured the promotion of green energy by

introducing various policies i.e., The Alternative and Renewable Policy (2019), National Electricity Policy 2020, Pakistan’s Electric Vehicle Policy (2020-25), etc. In the 2022-23 budget, the government has also announced incentives for households to install solar panels to promote green energy.

2.2. International Green Financing for Energy Transition

International climate financing provides support to the country to stimulate mitigation and adaptation in the country. As is the case for domestic green financing, Pakistan is witnessing a decrease in finances from international sources. It is comparatively well below the other neighbouring countries i.e., India, and Bangladesh as shown in Figure 4.

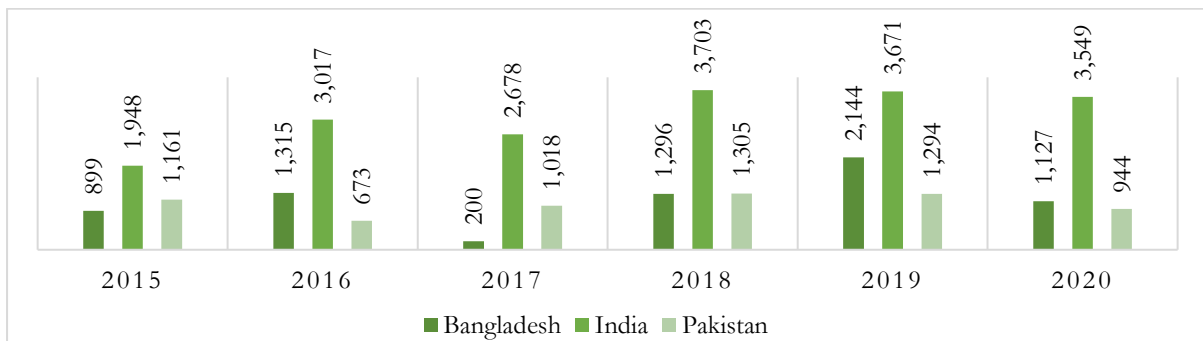


Figure 4: Climate financing received by Multilateral Development Banks (\$ Million)

Source: (EBRD, 2021)

During 2010-18, Pakistan received \$9.9 billion in funding from international sources (including European institutions, governments, and International Development Banks) to support energy transition out of which most of the financing was allocated to hydropower projects (around \$6.5 billion) (IRENA, 2021).

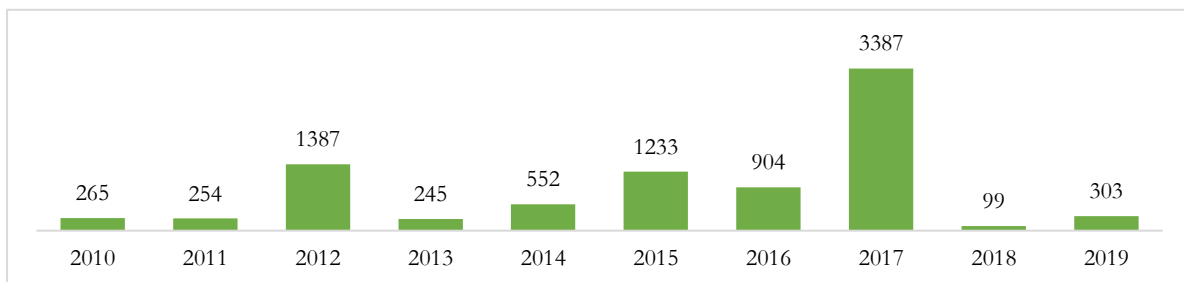


Figure 5: International Financial Flow to support clean renewable energy (\$ Million, 2019 PPP)

Source: IRENA database⁴

Similarly, due to a significant decline in wind and hydropower generation commitments, the financing dropped by 95 percent from \$2.1 billion in 2017 to \$101 million in 2018 as shown in figure 5. Moreover, for the same period, Pakistan had also received non-conventional funding of \$2.3 billion (IRENA, 2021).

⁴ <https://trackingsdg7.esmap.org/country/pakistan>

2.3. Multilateral Climate Finances by source

At the international level, the multilateral climate fund is the major source of green financing, especially for emerging economies. Such funds are owned by multiple national governments to assist developing countries to ensure green financing. The largest multilateral climate finances are the Green Climate Fund (GCF), Global Environment Facility (GEF), and Climate Investment Fund (CIF).

2.3.1. Green Climate Fund (GCF)

The Green Climate Fund (GCF) was founded in Durbin in 2011 at COP17 and established - under the UNFCCC framework - with the objective to significantly contribute to (i)executing Paris Agreement (ii) its adaptation and mitigation target through a paradigm shift in emerging nations towards fewer emissions and climate-resilient growth. Being a one-of-its-kind climate change fund, GCF is playing a crucial role in supporting climate actions in developed countries.

Till date, GCF financed 200 projects globally with a financing of \$10.8 billion which will contribute to reduce 2.1 billion tons of CO₂ emissions.⁵ In Pakistan, GCF is financing four ongoing projects with a funding of \$722.7 million shown in Table 3. For these projects, the total GCF contribution remains around \$222.5 million with a co-financing of \$499.2 million from private sector.

GCF Project	Category	Financing
Pakistan Distributed Solar Project	Mitigation	GCF = \$10 Mn Co-Financing = \$ 44 Mn
Transforming the Indus Basin with Climate Resilient Agriculture and Water Management	Adaptation	GCF = \$ 35 Mn Co-Financing = \$ 12.7 Mn
Green BRT Karachi	Mitigation	GCF = \$ 49 Mn Co-Financing = \$ 534.5 Mn
Scaling-up of Glacial Lake Outburst Flood (GLOF) risk reduction in Northern Pakistan	Adaptation	GCF = \$ 37 Mn Co-Financing = \$ 500k

Figure 6: GCF Projects in Pakistan

Source: Green Climate Fund

Recently in May 2022, GCF approved a solar distribution project in Pakistan to support renewable energy in the country with a GCF funding of \$10 million along with \$44 million co-financing presented in figure 6.

2.3.2. Global Environment Facility (GEF)

The GCF fund was established in 1991 with the collaboration of 18 global entities including MDBs, UN and NGOs, along with 183 countries with an objective of enabling emerging economies to spend more in nature and to sustain international environmental conventions including biodiversity, chemicals, climate change, and desertification.

Globally, GCF provided funding of \$24.75 billion allowing emerging nations to generate global, regional, and local climatic benefits. The per annum allocation and disbursement of GCF in energy-related projects are roughly \$250 million.

⁵ <https://www.greenclimate.fund/#>

Project	Focal Area	Financing
Combating Climate Change through the Promotion and Application of Sustainable Biomass Energy Technologies in Pakistan (PASBET)	Climate Change	GEF Grants = 3,439,041 Co-financing = 24,093,300
Delivering the Transition to Energy Efficient Lighting in Residential, Commercial, Industrial, and Outdoor Sectors	Climate Change	GEF Grants = 1,575,500 Co-financing = 5,786,700
Promoting Sustainable Energy Production and Use from Biomass in Pakistan	Climate Change	GEF Grants = 1,820,000 Co-financing = 5,340,000
Productive Uses of Renewable Energy in Chitral District, Pakistan (PURE-Chitral)	Climate Change	GEF Grants = 950,000 Co-financing = 4,700,000

Figure 7: GEF projects in Pakistan

Source: Global Environment Facility

In Pakistan, GEF is providing funding of \$0.78 million with an additional \$3.99 billion in co-financing with the private sector to support four renewable energy transition projects in Pakistan⁶.

2.4. Multilateral Development Banks (MDBs)

Multilateral Banks across the globe are the major sources of green funding in Pakistan with the aim to support low carbon emissions. In 2020, the Multilateral Development Banks (MDBs) provided \$38 billion to the low-and-middle-income countries. However, the allocation for Pakistan stood at \$944 million. Moreover, Pakistan received around \$6395 million in green funding from MDBs during 2015-20.

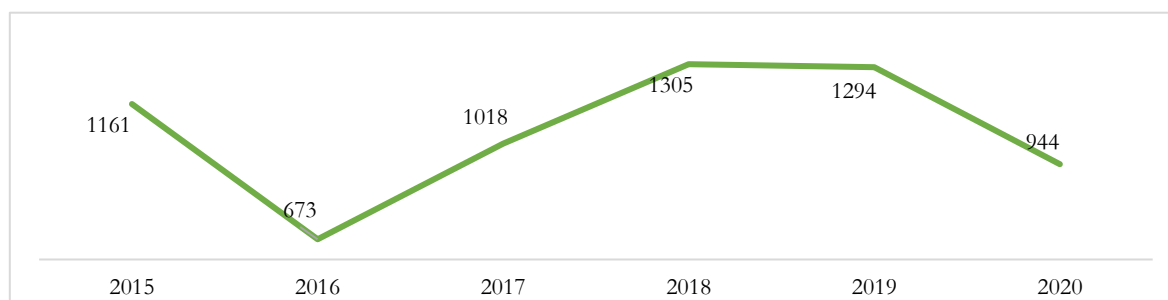


Figure 8: Inflow of climate financing from MDBs to Pakistan (\$ Million)

Source: (EBRD, 2021)

The World Bank and the Asian Development Bank (ADB) remain the major sources of MDBs green financing in Pakistan. Since 2015, the World Bank provided a grant of roughly \$3.2 million to reduce emissions from REDD+ (Economic Survey, 2020). IFC, a member of the World Bank, is actively engaged in renewable projects, particularly wind and solar. In 2017, IFC provided funding of \$238 million for the largest wind power farm. Similarly, in 2019, IFC financed \$450 million for six wind power projects in Pakistan (IFC, 2019).

Besides, the World Bank in September 2020 granted \$450 million to support the renewable energy transition in Pakistan which would decrease dependency on fossil fuels and generate low-cost electricity (World Bank, 2020) whereas, in June 2021, the bank also allocated \$400 million for the “Pakistan Program for Affordable and Clean Energy” project with an objective to promote green energy in the country (World Bank, 2021).

⁶ https://www.thegef.org/projects-operations/database?project_search=energy&f%5B0%5D=regional_country_list%3A123

Similarly, ADB provided green financing reached roughly \$400 million, incorporating both investments and technical assistance, with a major share of roughly \$375 million for mitigation. Besides, ADB at COP26 agreed to provide a grant of \$0.3 million to Pakistan in support of the renewable energy transition (Khan, 2021). In addition, OPEC Fund also assisted the energy sector of Pakistan by providing \$323.9 million in funding for the energy sector⁷. Similarly, OPEC also provided loan of \$72 million for the construction of Mohmand Dam (OPEC Fund, 2022). Overall, the funding from multiple donors during the period 2015-19 for energy transition (solar and wind projects) is shown in the Figure 9.

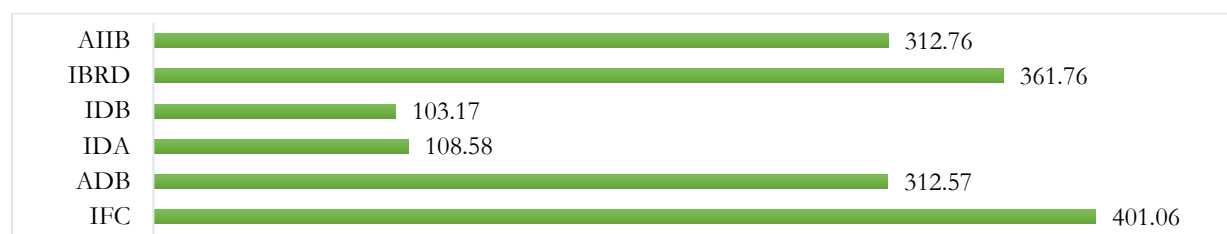


Figure 9: Renewable Energy Finance Flow for Solar and Wind Projects (\$ Million) 2015-2019

Source: IRENA database⁸

2.5. Bilateral Funding

Apart from international funding from MDBs and other financing institutions, Pakistan is also getting a small share of funding through bilateral countries. Bilateral engagements promote financial and technological interaction between two governments to undertake projects, policies, or other measures, which are often sponsored by bilateral development banks or the creditor country.

According to the IRENA,⁹ during the last decade (2010-20), Pakistan had received a public investment of around \$9.2 billion for its energy transition. To date, China remains the largest contributor among all the other countries as shown in Figure 10.

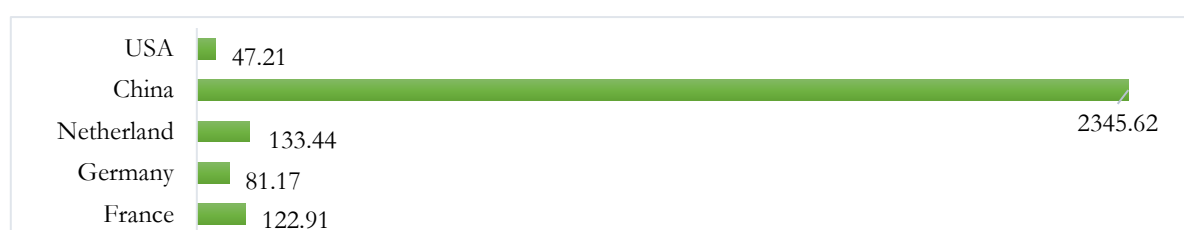


Figure 10: Bilateral Renewable Energy Financing (\$ Million) 2015-2019

Source: IRENA database¹⁰

⁷ <https://opecfund.org/operations/countries-a-z/asia/pakistan>

⁸ <https://www.irena.org/Statistics/View-Data-by-Topic/%20Finance-and-Investment/Renewable-Energy-Finance-Flows>

⁹ <https://www.irena.org/Statistics/View-Data-by-Topic/%20Finance-and-Investment/Renewable-Energy-Finance-Flows>

¹⁰ <https://www.irena.org/Statistics/View-Data-by-Topic/%20Finance-and-Investment/Renewable-Energy-Finance-Flows>

Between 2015-19, Pakistan received \$2.34 billion from China mainly for wind and solar projects. Similarly, funding of \$0.133 billion and \$0.122 billion for energy transition was also received from Netherlands and France respectively as shown in Figure 10.

3. Green financing options for the energy transition

The current green financing from both domestic and international sources is not enough to meet the annual energy transition target of Pakistan that stood on average between \$9.76 – \$14.42 billion per annum till 2040. Apart from the traditional methods of financing, Pakistan can move towards modern methods to boost green financing.

3.1. Green banking guidelines

Pakistan is currently in the earlier stages to adopt green banking initiatives for low carbon emissions. According to Rehman et al, (2021), the banking sector is one of the major stakeholders in the achievement of Sustainable Development Goals in Pakistan, by providing green financing to industries at lower interest rates to combat environmental issues. Recently, in June 2020, the SBP revised its green banking guidelines to support renewable energy projects (SBP, 2021).

As per the revised guidelines, an effort has been made to facilitate the Renewable Energy Investment Entity (RE-IE), certified under the Alternative Energy Development Board (AEDB), for financing their renewable energy projects at lower electricity costs (REON, n.d.). Under this scheme, financial concessions will be provided to both small- and large-scale renewable projects¹¹. Till June 2021, funding of around PKR 53 billion, was granted for renewable energy projects under concessional financing schemes. Moreover, SBP signed an agreement with IFC, in 2018, to support environmental-risk management practices and also assure ethical lending practices – hence promoting green banking in the country.

Moreover, SBP is enroute to enhancing the share of Islamic banking to one-third of the share of the total banking sector by 2025. It plans to do so by increasing assets and deposits of Islamic banking to 30% of the total banking sector (Bukhari, 2021). In this purview, issuing green bonds and engaging commercial banks make it efficient to achieve the target. Banks can offer low-interest loans to companies that make efforts to reduce the adverse impact on the environment. Generating green financing through green banking may not only generate domestic green funding but also reduce the foreign dependency on funding.

3.2. Sukuk bonds

Green finance tools like Sukuk bonds may play a critical role in mitigating climate change and to overcome the financing gap. A Sukuk is an Islamic bond that can provide returns to investors while adhering to Islamic Shariah law, which prohibits interest payments. Sustainable Sukuk bonds may offer green investment for renewable projects. In the recent past, the global Sukuk market has grown rapidly, from an estimated US\$85 billion of Sukuk issuances, in 2016, to an estimated US\$ 172 billion in 2020.

¹¹ Reon Energy– with its 1.86MW project – under SBP’s category III, completed its first financing project in ay, 2021.

Many nations, like Malaysia and Indonesia, have successfully created sustainable Sukuk to finance long-term, climate-resilient growth. In 2017, Malaysia, for example, issued the world's first Green Sukuk worth RM8.3 billion (USD 1.3 billion) (Capital Market, 2014) to support renewable energy development. Similarly, Indonesia issued the first sovereign Green Sukuk worth US\$ 1.25 billion in 2018. In January 2022, Pakistan had released Islamic sukuk bond of \$1 billion in the international market at 7.95% with a maturity period of seven years (Business Recorder, 2022).

3.3. Debt Swap

Another efficient tool used to raise capital, address environmental issues and challenges to encourage green economic growth is debt swap. The management of public debts has always remained one of the grave concerns for Pakistan. Debt swap could be a useful option. Instead of repaying the debt payment to the creditor organization, Pakistan can utilize the payment to support the renewable energy sector. It could be easy as Pakistan has already been part of the Debt Service Suspension Initiative (DSSI) - debt concession initiative.

Moreover, it is not the first time when Pakistan is engaged in any debt swap agreements. For example, in 2006, Pakistan signed a debt swap agreement with Italy in exchange for the Afghan refugees' project and the development of infrastructure for environmental protection. Besides, Pakistan continues to stay in touch with four countries and two international donor agencies for debt relief, through debt-swaps deals and adheres to commit to the conservation targets (The NEWS, 2021).

3.4. Green Bonds

Green bonds have the potential to significantly contribute to the creation of climate funds to help Pakistan's energy transformation. According to (Dina Azhgaliyeva, 2020), the market share of green bonds for energy efficacy grew from \$16 billion in 2016 to \$47 billion in 2017 globally. They were usually established to support programmes that have a positive environmental impact or that helps to reduce the consequences of climate change.

The Securities and Exchange Commission of Pakistan (SECP) has already approved the rules for green bonds, which would encourage innovative financing for various sectors in both mitigation and adaptation as shown in BOX 1 below (Daily Times, 2021). In Pakistan, Water and Power Development Authority (WAPDA) has issued green euro bonds worth \$500 million for the construction of the Diamer-Bhasha dams (Karandaz, 2022). Therefore, Pakistan has the potential to issue such bonds for other renewable energy projects, including solar or wind energy.

Box 2: SECP Guidelines for Issuance of Green Bonds¹²

1. All issuers that are eligible to issue debt securities - including Sukuk either by way of a public offering or private placement - are eligible to issue green bonds while ensuring compliance with the applicable regulatory framework.
2. Issuing of the Green Bonds will help initiate sustainable projects to combat climate change besides facilitating issuers of debt securities to diversify their source of financing. It will also provide an additional financing instrument to those environment-conscious investors for financing/re-financing projects that contribute to strengthen the green environment.
3. To qualify as a green bond, the proceeds must be able to finance or refinance green projects or activities, that bring energy efficiency, protect environment, utilize renewable energy, prevent and control pollution while using natural resources. The projects related to land management, pollution-free transportation, wastewater, water treatment, etc.

3.5. Guarantee mechanisms

Governments, across the world, have numerous financial tools at their disposal to promote development. The government guarantees are another useful tool to mobilize private investment in infrastructure. The government authorities in several countries give guarantees for various projects, which minimizes the investors' risk, emboldens their confidence, and makes it easier to raise funds for such projects with the active engagement of both investors and lenders.

In 2021, the government of Pakistan gave \$9 million (PKR 2,055 billion) worth of guarantees to the power sector (GOP, 2021). Similarly, a sovereign guarantee worth \$2 billion was offered by Pakistan in 2015, to the thar coal mine and power generation project (Hasan, 2015).

The Loan Guarantee Instrument for Trans-European Transport Network Projects (LGTI), which is a joint effort of the European Investment Bank and the European Commission. Another example was the guarantee refinanced by the Flemish government in 2009, to address liquidity issues (Lu et al, 2019).

However, even in the absence of government guarantees, multilateral banks like the African Development Bank, the European Bank for reconstruction and development, and the World Bank can also issue such guarantees in countries where guarantee mechanisms are not available (Majid, 2020).

3.6. Carbon Pricing

The carbon pricing is considered an efficient, significant, and straightforward approach for reducing GHG emissions and generating green financing at the domestic level. Globally, around \$53 billion revenue, was generated and 21.5% of carbon emissions were covered under this initiative in 2021- higher in comparison than previous years - that was around 15.1% in 2020 (WB, 2021). Similarly, around \$40-80 is required per ton of carbon emission for achieving the 2° C goal (World Bank, 2021).

¹² <https://dailytimes.com.pk/775078/secp-issues-guidelines-for-green-bonds-issuance/>

Pakistan is exploring ways for carbon pricing to generate green funding and discover the impact carbon markets have on achieving the country's NDC. In December 2019, Pakistan established a National Committee on the Establishment of Carbon Markets (NCEC) to understand the role of carbon market in delivering the country's NDC and identify the potential challenges for improving on carbon emissions data (WB, 2021). Moreover, Pakistan has also acquired funding from Collaborative Instruments for Ambitious Climate Action (CIACA) to design Carbon Pricing Instrument (CPI) (NDC, 2021).

4. Major challenges in generating green financing and some proposed solutions

Although Pakistan has the potential to attract green financing at national and international levels, there are some major challenges that need to be abridged. Mainly, this section proposes to develop a local sustainable green financing market¹³.

4.1. Absence of a target-specific green finance/investment policy, regulatory and legal framework directly related to green finance for banks and institutional investors

The regulation and green finance policy uncertainty can be another major reason for low green financing. The success of the green projects is based on the credibility of the government and SBP. Most renewable and green projects take around 6-10 years to develop, finance and construct. This investment horizon is typically longer than the tenure of a government, a management team in the private sector, or even a transaction team in a lending institution.

This leads to uncertainty in policies. These uncertainties increase the revenue risks of projects that affect the private sector interest and investment. Moreover, Pakistan, currently, does not possess a strong regulatory infrastructure for promoting green energy transition projects. Pakistan lacks a well-established green financing infrastructure backed by sound green-financing or green-credit policies. Overall, green finance development requires a sound business climate, rule of law and investment regime.

4.1.1. Recommendations:

- First and foremost, Pakistan needs a clear and transparent definition of green finance. It will not only help provide more specificity about what constitutes green finance but also help avoid “greenwashing”.
- Clearly defined standards and rules for disclosure would promote developing green finance assets.
- A comprehensive framework of investments for institutional investors, including pension funds, sovereign wealth funds, and insurances—addressing both the demand and supply sides of green investments can significantly increase green financing in the country.

¹³ To read more on green financing from international sources, such as debt for nature swaps, read (Ayaz, et al., 2022).

4.2. Absence of green products and limited capacity to develop customized green instruments/products.

The banking sector is in the initial phase of green banking and is not resourceful to efficiently develop/design green products, much less develop customized green products, for varying customer groups, particularly in the green energy sector. The State Bank of Pakistan established green banking guidelines back in 2017 to encourage environment-friendly operations by aiding banks and their clients to mitigate environmental hazards. It will take around 3-4 years for commercial banks to comprehend and generate green funding (Noureen, 2020).

Presently, the banking sector of Pakistan has a low capacity to undertake an environmental risk assessment and environmental risk follow-up of loan disbursement. Further, avoiding the risks has a lower base due to the limited number of customers. This limits the capacity of commercial banks to invest in enhancing their capacity to develop innovative instruments for green financing.

4.2.1. Recommendations

- The SBP can engage multilateral agencies like International Finance Corporation (IFC) – already willing to support green banking in developing nations – to support and design green banking mechanisms for commercial banks at the domestic level.
- There is a need to establish a green banking board at the national level for capacity building, regulation, and implementation. The board should serve as a host for three major wings namely, (i) Policy formulation, (ii) M&E framework, and (iii) Special training with the component of administering training modules at the associated levels.
- Investors and the public at large are unaware of the green banking and financing mechanism. Hence the government needs to educate and encourage them regarding its benefits. This can help increase the demand –and lending base—for green finance.
- Products of green mortgages and loans must be gradually scaled up and adjusted for large populations beyond salaried classes. This requires the development of innovative green products.

4.3. Lack of Innovation in the capital market and data availability

Financing green projects or firms is one of the cumbersome challenges that Pakistan currently faces. The adequacy and development of green finance requires work in two areas namely (i) establishing a favourable climate for preparing capital for financing climate-friendly projects and (ii) creating climate-friendly innovative financial instruments. The favourable climate implies the improvement of a green finance ecosystem including partners that empower green organizations through administrative systems and guarantee the accessibility of financial instruments alongside financing and an advisory mechanism (Fraz, 2022).

According to WWF, Asia needs \$5,000 billion worth of sustainable development investment between now and the year 2030. Like any other region or country, the private sector is crucial for green financing in Pakistan, but the lack of innovation in the capital market proves to be a hindrance.

As the banking sector cannot control all the demand for green finance, essentially, we need to mobilize green loans into the debt capital markets. Given the reluctance and limitation of the banking sector, the need for creating green capital markets is crucial if we want to meet green finance ranging between \$9.76 billion to 14.77 billion.

4.3.1. Recommendations

- Clear approach is required with distinct objectives for the green capital market, endorsing carefully designed and fiscally responsive public-private partnerships to increase climate finance for Nationally Determined Contributions (NDCs)
- A clear road map and action plan is a must for international collaboration and capacity building to develop a green capital market, including Sustainable Stock Exchanges-- and to strengthen public sector institutional capacity to carefully design, manage and monitor such partnerships for financing NDCs.
- Improved financial and institutional disclosure/information, and capital market incentives should be given for unlocking opportunities for the green investments
- There is a need to announce capital market incentives such as tax credits for investments in new (risky) technologies, feed-in tariffs for renewable energy, carbon pricing, investment, and insurance or export guarantees.

4.4. Lack of coordination and collaboration between ministries leads to less funding from modern sources of financing, such as debt swaps.

The lack of coordination and collaboration within and between ministries, agencies, institutions, and other stakeholder limits can be coined as one of the major obstacle to green financing in Pakistan. Particularly, the lack of approved energy policies renders fruitless controls over electricity prices (Mirza, et al., 2009). Therefore, the lack of coordination between ministries and departments, leads to lesser funding, - as it is hard for investors to invest their hard money in green energy projects that are not backed by strong policies and regulatory measures.

In Pakistan, the de-centralized and demand-side capacity of institutions remains mainly absent. Organizations such as the Ministry of Petroleum and Natural Resources (MPNR) and Water and Power Development Authority (WAPDA), focus more on the expansion of energy supplies and infrastructure but the limited capacity of such institutions to give attention to the demand side factors remains a major challenge.

Even after the development of Pakistan Council for Renewable Energy Technology (PCRET) in May 2001 and the Alternative Energy Development Board (AEDB) in May 2003, we observe that the institutional roles of such organizations overlap and vary over time. Institutional mandates – clearly defined – remain largely missing, leading to lack of coordination within the ministries and departments concerned.

4.4.1. Recommendations

- Clear coordination between environment and financial policies—both with treasury and central bank—must be designed. Environment, Social, and Governance (ESG) financial disclosure can help in this regard.
- Effective institutional support is crucial for developing renewable energy projects.
- Information and data should be exchanged between the environment and finance ministries, and central bank to formulate and update green financing rules and framework. In this regard, China and Peru can be the suitable case studies.
- Organizations such as PCRET and AEDB, need to redefine their role and mandate, and proactively support the public-private businesses to remove obstacles for supporting the Renewable Energy transition.

Summary

The climate change is the major concern of current world. Under Paris Agreement, countries are trying to limit the global temperature rise by 1.5o C. As, the energy sector is contributing roughly 40% of total carbon emissions and thus the world is shifting towards the renewable methods. The energy sector in Pakistan is depending on fossil fuel for energy generation. Around 80% of needed oil is import base that put burden on economy. Moreover, it also causing environmental degradation in Pakistan. And there is immediately need to shift towards renewables.

However, shifting towards renewable needs much funding which is not possible for a country like Pakistan. Currently, Pakistan has little access to green funding at domestic and international levels to support the green energy transition. The domestic funding allocation stood at roughly 0.1% of the total expenditures of Pakistan. Till 2040, on average Pakistan needs around \$9.4 - \$14.44 billion for energy transition which is quite a perplexing number for countries such as Pakistan. Therefore, Pakistan needs to further explore the market and non-market-based strategies i.e., green banking and green capital markets to improve its outreach to green financing.

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