



**GREEN FINANCING:
AN INCEPTIVE ANALYSIS
OF THE COMMERCIAL
BANKS**



© 2023 Alternate Development Services, Islamabad.

All Rights Reserved.

Any information or excerpts of this publication may be reproduced by duly acknowledging the source.

The contents of this publication may be cited for educational and research purposes, appropriately crediting the Alternate Development Services (ADS), Islamabad.

ISBN: 978-969-23709-2-9.

Researcher and Author: Aqib Nawaz & Amjad Nazeer.

Other Contributor: Asad Khan & Muhammad Asif.

Edition: November 2023.

17, Street 51, G-13/2,
Islamabad.

T: +92 51 230 6852.

www.alternate.org.pk

Acknowledgments

Alternate Development Services (ADS) extends her heartfelt gratitude to the banks, their representatives, and the corresponding associations who actively participated in this study; they generously shared their invaluable insight, information, and feedback. Their cooperation and contributions have been instrumental in advancing our understanding of energy consumption, energy transition plans, financing policy, challenges, and policy recommendations within the context of green financing.

Their commitment to sustainability and environmental stewardship is greatly appreciated and will undoubtedly pave the way for a greener, cleaner, and sustainable future. The ADS team offers its gratitude to the managers and relevant members of all relevant banks i.e., Allied Bank, United Bank Limited, Askari Bank, Bank-al-Habib Limited, Soneri Bank, Bank Islami, JS Bank, Silk Bank, Sindh Bank, and U Microfinance Bank.

Amjad Nazeer

CEO – Alternative Development Services (ADS)

Islamabad

18 November 2023.

Table of Contents

Acknowledgments	iii
Acronyms	vi
Executive Summary	viii
Chapter 1: Introduction and Methodology Adopted	1
1.1. Background	1
1.2. Methodology.....	8
Chapter 2: Policies of Green Banking in Pakistan	13
2.1. Green banking policies and guidelines in Pakistan	13
2.2. Prospects of green finance in Pakistan	29
Chapter 3: Results and Discussions	41
3.1. Qualitative data analysis	41
3.2. Quantitative data analysis	47
Chapter 4: Barriers and Recommendations.....	60
4.1. Barriers to achieve green financing	60
4.2. Policy recommendations.....	67
Chapter 5: Conclusion.....	72
6. References	76
Appendix A: Questionnaire for Green Financing.....	81

List of Figures

Figure 1: Green fin. initiatives for env. decarbonization.....	11
Figure 2: No. of banks participated in RE financing.....	49
Figure 3: Driving factors for green financing.	51
Figure 4: Driving factors of banks/FIs to join RE program...51	
Figure 5: Bank customer categories for solar financing.....	54
Figure 6: Barriers to achieve PV financing.....	56
Figure 7: Support the banks to overcome the barriers.	57
Figure 8: Banks to support solar financing in Pakistan.....	58
Figure 9: Constraint to achieve the green financing.	67
Figure 10: Policy recommendations.....	69

List of Table

Table 1: Key char. of SBP RE financing scheme	17
Table 2: Key char. of solar financing by banks and MFIs.....	22
Table 3: Comparative study on the financial policies.	27
Table 4: Prerequisites for considerations in solar financing. 39	
Table 5: Key information from qualitative data.	42
Table 6: Current energy mix of banking sector.....	48
Table 7: No. of banks participated in the RE Financing.	49
Table 8: RE Financing Program at all branches.....	52
Table 9: Financing for batteries assoc. with solar systems. .54	

Acronyms

ADB	Alternate Development Board
AEDB	Alternative Energy Development Board
AIIB	Asian Infrastructure Investment Bank
BAU	Business as Usual
BRT	Karachi Bus Rapid Transit
CCRF	Climate Change Risk Fund
CDB	China Development Bank
CSOs	Civil Society Organizations
DFIs	Development Financial Institutions
EIA	Environmental Impact Assessment
ERMS	Environmental Risk Management System
ESCO	Energy Services Company
ESG	Environmental Social and Governance
FCDO	Foreign, Commonwealth, and Development Office
GBGs	Green Banking Guidelines
GCF	Green Climate Fund
GEF	Global Environment Facility
GF	Green Financing
GFI	Green Finance Initiative
GIZ	Deutsche Gesellschaft Für Internationale Zusammenarbeit
GLOF	Glacial Lake Outburst Floods
IFC	International Finance Corporation
KFW	Kreditanstalt Für Wiederaufbau

NDC	National Determined Contributions
NEECA	National Energy Efficiency & Conservation Authority
NEPRA	National Electric Power Regulatory Authority
MFIs	Micro-Financial Institutes
PC	Planning Commission
PSDP	Public Sector Development Program
RE	Renewable Energy
RET	Renewable Energy Technology
SBOs	Business Support Organizations
SBP	State Bank of Pakistan
UNDP	United Nations Development Programme
UNEP	United Nations Environment Programme
USAID	United States Agency for International Development



Executive Summary

Green financing promotes environment-friendly practices and sustainable development. Ideally, it facilitates projects having positive climatic effects, such as renewable and sustainable energy options, energy conservation and efficiency, preventing and abating pollution and land degradation, conserving water and the sources of water, and efficient waste management. Therefore, this study analyses credit options for medium and small renewable energy projects. A comprehensive analysis of the current state of green and solar financing within Pakistan's banking sector has been drawn, based on primary data collected from

various commercial banks in Islamabad, Multan, Faisalabad, Rawalpindi Sialkot, and Lahore.

The findings, in general, reveal a diverse landscape of assistance and initiatives assumed by different but well-known retail banks. Certain banks such as Allied Bank and Bank Al Habib Limited have made significant strides in promoting sustainable practices by adopting paper-free banking, collaborating with approved vendors, and offering solar financing products to the applicants. In contrast, United Bank Limited and Soneri Bank have yet to make progress in this area. Askari Bank and Bank Islami have taken a different approach by focusing on solar installations in areas afflicted with high load shedding, contributing to energy savings and reducing reliance on conventional energy sources.

Despite these initiatives, the adoption of sustainable practices and green financing faces several challenges as well. Financial obstacles, for instance, include a lack of specialized expertise, inadequate infrastructure, lack of public awareness of the product, discontinuation of low-interest loaning on KIBOR+4, State

Bank's facilitation, and the need for targeted investments to enhance human capital and technological development. Governance barriers, characterized by political instability, and regulatory inefficiencies, pose risks to the credibility and effectiveness of green financing mechanisms in the country. Market inadequacies and social barriers also exist, such as price distortion, risk perceptions, transaction costs, collateral requirements, procedural bottlenecks, and an underdeveloped market for renewable energy technologies. These factors cause hindrances to the wider acceptance of renewable energy technologies.

Additionally, there are capacity, skills, and infrastructure challenges due to institutional capacity constraints, unclear definitions, limited knowledge of financing options, agreements with solar companies, installation procedures, and an awareness gap among potential investors and borrowers. To overcome these challenges, a multifaceted approach is required. This includes policy reforms, comprehensive awareness campaigns, capacity building, and strategic collaboration among government

bodies, financial institutions, and other stakeholders.

By strengthening regulatory frameworks, enhancing financial literacy, generating awareness, and fostering cross-sector partnerships, Pakistan can create an environment conducive to the growth of green financing and the widespread adoption of sustainable practices. The insights offered in this report underscore the need for concerted efforts and focused initiatives to overcome the key barriers identified. These may drive Pakistan's banking sector towards a more sustainable and environmentally responsible future. All stakeholders must collaborate, share expertise, and take proactive steps to navigate and grapple with these challenges. A robust foundation for green financing and sustainable development is then likely to emerge in Pakistan.



Chapter 1: Introduction and Methodology Adopted

1.1. Background

The financial sector's involvement is pivotal in molding the energy consumption panorama, particularly about alternative energy sources. As the worldwide economy progresses, there is a mounting realization that investments in environmentally friendly and sustainable energy alternatives can propel economic growth and simultaneously mitigate dependence on fossil fuels. The finance sector possesses the ability to expedite and endorse the adoption of renewable energy resources through financial

support to initiatives harnessing the potential of these resources.

A crucial domain in which the financial sector can aid in curbing greenhouse gas emissions is by prioritizing and financing green initiatives. By allocating capital to the development and implementation of renewable energy sources, financial institutions can not only help minimize the energy sector's carbon footprints but can also foster sustainable economic growth. Green bonds, for example, can empower governments and corporations to secure funds explicitly for eco-friendly projects, while socially responsible investing inspires investors to contemplate the environmental consequences of their investments. In developing nations like Pakistan, where population growth and urbanization are fueling escalation in energy demand, the financial sector's role in advancing alternative energy solutions is of heightened importance. By backing up alternate and renewable energy projects like solar power, biofuels, and biomass, the financial sector can enable the nation's shift towards a low-carbon economy. The transition may lead to increased

energy security and Pakistan's reduced dependence on fossil fuel imports.

The banking sector plays an indispensable role in the pursuit of Pakistan's sustainable development objectives by offering low-interest green financing to small businesses, medium and large enterprises, and agriculture activities¹. By catering to environmentally conscious clients, banks can expand their portfolios in areas such as hybrid and/or electric vehicle financing and green-home lending. Although the government bears the primary responsibility for implementing green financing policies, the banking sector can contribute to environmental conservation through the adoption of eco-friendly practices and the establishment of green finance regulations². Consequently, the greening process necessitates a collaborative approach, akin to a two-way street. Bank financing can potentially facilitate the development of ecological infrastructure, including clean water initiatives, waste treatment facilities, waste-to-energy projects, and bio-fertilizer plants, etc.

Additionally, the establishment of dedicated funds such as the Climate Change Risk Fund (CCRF) can contribute to enhanced assessment of potential environmental hazards. This underscores the notion that a bank's principal social responsibility is driven, to a significant extent, by its commitment to greening projects. Failure to execute these projects may have dire repercussions for society at large⁴.

Nonetheless, when investing in eco-friendly products or services, it is crucial to ensure that the interests and priorities of all stakeholders are taken into consideration. By doing so, the financial sector not only contributes to Pakistan's sustainable development but also fosters an environmentally responsible and economically viable future. With the convergence of efforts made by public, private, and financial institutions, a transformative shift towards a greener economy can be realized, benefiting the country's ecological and socio-economic landscapes.

Green financing, a vital push in achieving green growth, refers to balanced economic growth - crucial for attaining sustainable development.

Some researchers believe that "green energy" drives economic growth by providing eco-friendly growth options⁵. Green growth enhances a country's productivity while reducing pollution by employing green knowledge and technology and increasing efficiency in energy and resource production and use.

According to the European Centre for the Development of Vocational Training, "both public and private sectors are essential to establish linkages between technological progress, innovation, and greening of the economy that offers untapped prospects for economic growth" ⁶. Environmental innovation bolsters productivity and competitiveness, potentially decreasing economic costs and promoting ecologically sustainable growth⁷. The World Bank Group has studied green finance projects to analyze funding proposals, assess activities attracting green finance, and integrate environmental, social, and governance (ESG) risk management⁸.

Green Finance covers several categories: bio-system adaptability, energy efficiency,

environmental protection, renewable energy, sustainable land management, recycling and waste management, and water efficiency. Respective governments must develop and regulate green industrial markets by fostering green technologies, products, and consumption to connect green financing and growth.

Green finance assists companies in launching new businesses and implementing green technology. However, if green financing frameworks are inadequate, green products might vanish from the market, hindering economies from becoming green.

Green Finance requires the financial sector to create new financial products and target high-emitting industries and green technology for funding. New technologies, eco-friendly industries, and efficient carbon trading schemes can drive green growth. In January 2016, London as a global financial center and a hub with the support of the British government, established the Green Finance Initiative (GFI) to raise awareness of Green Finance and advocate regulatory and policy strategies that could boost it worldwide⁹.

Asian financial institutions such as the Asian Development Bank (ADB), Asian Infrastructure Investment Bank (AIIB), China Development Bank (CDB), etc., are underrepresented in sustainable finance activities, with only 122 of 1874 members adhering to the Principles of Responsible Investing, representing asset owners, investment managers, and others⁹.

The Green Finance Study Group identified institutional and commercial barriers to green financing in developing nations. The group highlighted the financial system's institutional and market constraints that hinder private green investment in pollution management, clean energy, clean transportation, and energy-efficient products. Strengthening the overall process, according to the group, involves greening the banking system, bond marketing, institutional investment, risk analysis, and evaluating progress¹⁰.

Most developing country banks cannot assess borrowers due to a lack of "green" performance measurements. Innovative products like green bonds also pose challenges for developing

economies. The absence of clear and comparable explanations may erode investors' confidence, while ambiguity and excessive costs can exacerbate issuance concerns.

The lack of disclosure requirements and Environmental Impact Assessment (EIA) capacity may obstruct the full integration of relevant factors into investment decision-making. Similarly, banks and Development Finance Institutions (DFIs) in developing countries may overlook environmental risks in financial decision-making. It's intriguing to note that despite the growing momentum towards embracing sustainable and renewable energy alternatives, these banking entities have thus far refrained from making a drastic transition.

1.2. Methodology

The methodology of the study in hand is categorized into two sections: (i) Desk review, and (ii) Primary data collection. Figure 1 shows the initiative to be taken for the green financing used for decarbonization. It is precisely described here below.

1.2.1. Desk review

By looking at the current scenario of decarbonization in Pakistan; Green financing can play a vital role. Therefore, a comprehensive desk review was conducted keeping in mind the current policies, green banking guidelines, comparative study between the policies of the different developing countries, gaps, sources, and prerequisites of green finance. Afterward, strengthening the backend on the green financing the ADS team carried out thorough on-site visits to banks located in Lahore, Multan, Sialkot, Faisalabad, Rawalpindi, and Islamabad. As a result of these visits, the primary data was collected from bank officials. Throughout these visits, a detailed questionnaire was administered by the team to evaluate the existing energy consumption methods at these banks. It emerges that their energy composition was notably centered around grid electricity, which stands as the primary energy source within their overall energy matrix.

1.2.2. Primary data collection

Primary data collected from the various banks is subcategorized into two (i) sections quantitative, and (ii) qualitative data collection.

1.2.2.1. Qualitative survey

The qualitative data collection was based on a detailed discussion with bankers. These interviews provided key information regarding the trend of green financing in their banks and how they followed the existing policy. Their valuable inputs regarding the constraints in existing policy and possible improvements were also taken into account.



Figure 1: Green financing initiatives for environment decarbonization.

1.2.2.2. Quantitative survey

The quantitative data was collected on the basis of a questionnaire prepared by the ADS team. Throughout these visits, a detailed questionnaire was administered by the team to evaluate the existing energy consumption methods at these banks. Appendix A shows the

questionnaire that explores the questions asked by the bank officials.



Chapter 2: Prospects and Policies of Green Banking and Finance in Pakistan

2.1. Green banking policies and guidelines in Pakistan

2.1.1. Policies

Pakistan's international commitments include signing the Paris Agreement in 2016 and submitting an NDC in 2021. The country has pledged to reduce its greenhouse gas emissions by 30% below Business-as-Usual (BAU) levels by 2030¹¹. However, Pakistan is particularly vulnerable to the impacts of climate change due to its geography, socio-economic conditions, and

high dependence on fossil fuels. The country faces numerous challenges in adapting to climate change, including water scarcity, food insecurity, and health risks¹².

Pakistan has yet to establish a comprehensive national strategy on green financing. Nevertheless, there have been efforts from various public sector organizations to promote environment-friendly initiatives through policies and programs, laying the groundwork for green finance implementation in Pakistan.

One such effort is the Public Sector Development Program (PSDP), overseen by the Planning Commission (PC), which allocates funds for green initiatives on a national scale¹³. In 2017, the State Bank of Pakistan (SBP) developed a green banking framework, aiming to reduce bank's and Development Finance Institutions (DFIs) exposure to environmental risks, encourage their commitment to environmental protection, and enable them to lend toward a more resource-efficient and climate-resilient economy.

In collaboration with the SBP, the International Finance Corporation (IFC) signed an advisory agreement to promote green banking in Pakistan, supporting efforts to better manage environmental risks and promote responsible lending¹⁴. As part of this initiative, the SBP introduced the Financing Scheme for Renewable Energy entitled “SBP Financing Scheme for Renewable Energy”, a tailored scheme providing concessionary financing for solar and wind technologies which was initially launched in 2009 and later revised in 2016 and 2019¹⁵. This scheme offers varied financing options ranging from a maximum of PKR 400 million to PKR 6 billion for a range of entities and persons, including captive energy units, commercial projects, and individual consumers who may share excess production with the national grid.

Financing is critically important for the transition towards capital-intensive technologies like solar PVs or wind turbines, characterized by high upfront costs and lower operating costs. Decreasing costs of solar PV systems and related appliances have spurred general interest in adopting the technology, but limited

access to low-cost financing remains a key impediment to its wide-scale diffusion. Financial institutions and commercial banks play a crucial role in overcoming this cost barrier and fast-tracking the energy transition process by increasing access to renewable financing. Green Finance encourages banks and DFIs to adopt an Environmental Risk Management System (ERMS) to minimize environmental damage. This system encompasses risk parameters, sources of risk, impact assessments, and strategies for mitigating risk. Through adherence to ERMS, financial institutions can measure, evaluate, and analyze environmental risks associated with their clients' economic operations, helping to prevent environmental damage and promote sustainable growth¹⁶.

The SBP Financing scheme for Renewable Energy operates under three distinct tiers/levels, taking into account the current conditions. Tier I address larger systems with capacities ranging from 1 MW to 50 MW. Tier II provides financing for borrowers to install renewable energy-based projects up to 1 MW. Tier III involves certified vendors/suppliers from

the Alternative Energy Development Board (AEDB) for the installation of wind and solar systems on a leased basis or the sale of electricity to the end-users. The refinance facility is considerably more concessional than market-based financing (see Table 1). It offers loans at exceptionally low interest rates and provides up to 100% financing for an extended repayment period¹⁷.

Table 1: Key characteristics of the SBP RE financing scheme

Characteristics	Tier I	Tier II	Tier III
Loan Limit	PKR.6 billion for an individual project.	Up to PKR.400 million for an individual borrower.	Up to PKR.2 billion for a single vendor, supplier, or company.
Loan Repayment Term	12 years	10 years	10 years
Financing Rate	<ul style="list-style-type: none"> • State Bank of Pakistan (SBP) fee: 3%. • Bank margin: 3%. 	<ul style="list-style-type: none"> • State Bank of Pakistan (SBP) fee: 2%. • Bank margin: 4% 	<ul style="list-style-type: none"> • State Bank of Pakistan (SBP) fee: 3%. • Bank margin: 3%.
Maximum Funding Proportion	<ul style="list-style-type: none"> • Projects up to 20 MW are eligible for complete 	Full financing available for all projects	

financing of their total cost.

- Projects with a capacity between 20 MW and 50 MW can receive partial financing of 50% of their total cost.
-

In addition to the aforementioned solar PV financing options in Pakistan, there exist alternative methods of securing financial support for solar systems. Certain banks offer customized or standard financing options, extending loans to individuals seeking to install solar panels. The precise interest rates, key features, and stipulations associated with these loans can vary depending on the bank in question. Moreover, innovative technologies like solar power are intricately linked with various mainstream processes, including technical, financial, and regulatory aspects, all of which play a crucial role in driving their dissemination. In light of this, the ownership and delivery models for micro-generation are undergoing significant changes.

Generally, two prevailing business models based on the ownership of rooftop solar PV systems can be observed in the global market: self-owned (CAPEX) solar PV systems and third-party-owned (OPEX) solar PV systems¹⁸. In Pakistan, as in many other countries, both self-owned (CAPEX) and third-party-owned (OPEX) business models for rooftop solar PV systems are prevalent.

i). **Self-owned (CAPEX) solar PV systems:**

In this model, the owner of the rooftop solar PV system is also the owner of the building or property where the solar panels are installed. They bear the responsibility for financing, installing, and maintaining the solar PV system. The electricity generated by the system can be utilized on-site for the building's own energy needs or can be supplied to the utility grid.

In Pakistan, the self-owned solar PV system model has gained popularity among residential, commercial, and industrial consumers who have the financial capacity to invest in solar installations. Many businesses, factories, and households opt

for self-owned systems, especially in regions with frequent power outages or high electricity costs. These consumers either finance the investment through their funds or avail loans from banks or financial institutions.

The government of Pakistan has also supported the deployment of self-owned solar PV systems by introducing net metering policies. Net metering allows consumers to export surplus electricity to the grid and receive credits or payments from the utility company for the excess energy generated.

ii). Third-party owned (OPEX) solar PV systems:

In the third-party-owned model, a solar developer, or an energy services company (ESCO) installs and owns the rooftop solar PV system on a consumer's property. The solar developer sells the generated electricity to either the roof owner (Power Purchase Agreement or PPA model) or to the utility company (rooftop leasing model). The consumer does not bear the upfront

capital costs and is not responsible for the system's operation and maintenance.

The third-party-owned OPEX model is also gaining traction in Pakistan, particularly among consumers who may not have the financial capability to invest in a solar PV system or want to avoid the responsibility of system maintenance. The PPA model is commonly used for commercial and industrial consumers, where the solar developer negotiates a long-term agreement to supply electricity at a predetermined rate. On the other hand, rooftop leasing is a common approach in the residential sector, where the solar developer installs the system and charges a fixed monthly fee for using the solar-generated electricity.

Overall, both the self-owned (CAPEX) and third-party-owned (OPEX) business models offer viable options for consumers in Pakistan to adopt rooftop solar PV systems based on their financial capacity, preferences, and energy needs. The choice between these models depends on factors like investment capacity, risk

appetite, and willingness to take up system ownership and maintenance.

Some banks are advancing loans for solar systems under their independently designed schemes or regular financing. The interest rate for loans, salient features, and the terms and conditions vary from bank to bank^{9,19–21} as presented in Table 2.

Table 2: Key characteristics of solar financing under individual schemes by banks and MFIs

Banks	Markup Rate	Max Loan Amount (PKR)	Equity (Min)	Financing Tenure (Max)
Habib Metropolitan Bank	1-year KIBOR +3%	Case dependent: 10- 30 million	10%- 30%	7 years
Zarai Taraqiat Bank Limited (ZTBL)	6-months KIBOR Offer Rate + 5%	1 million	10%	10 years
Bank of Khyber	Floating markup rate 1-year KIBOR plus 600 pbs	Category A: 200,000 Category B: 500,000 Category C: 2,000,000	25%	5 years

Banks	Marku p Rate	Max Loan Amount (PKR)	Equity (Min)	Financing Tenure (Max)
Faysal Bank	Shariah compliant facility based upon Musawamah	2 million	First instalment as a down payment	2 years
Bank of Punjab	1-year KIBOR +5%	5 million	20%	7 years
First Microfinance Bank Limited	-	1.5 lacs	None	3 years
Khushhali Microfinance Bank Limited	-	-	None for loans ≤ 5 lacs; 20% down payment for loans >5 lac	5 years
Mobilink Microfinance Bank Limited	-	3 million	10%	5 years
NRSP Microfinance Bank Limited	-	1 million for residential; 3 million for agriculture	10% for residential , 20% for agriculture	2 years
U Micro-finance Bank Limited	-	1 lac for residential; 1 million for businesses and Agriculture	20%	2 yeas for residential ;5 years for agriculture

2.1.2. Green banking guidelines

Green banking is an emerging concept that aims to promote environmental sustainability while

maintaining financial stability. The State Bank of Pakistan (SBP) has taken several initiatives to encourage green banking practices in the country. In 2017, the SBP issued a comprehensive set of guidelines for green banking that aimed to align banking operations with environmental objectives and reduce the carbon footprint of the financial sector²².

The Green Banking Guidelines (GBGs) issued by the SBP outline specific measures for banks to follow to promote sustainable development. These guidelines encourage banks to incorporate environmental risk management in their lending operations, promote investment in renewable energy, and adopt environmentally sustainable practices in their own operations. Furthermore, the guidelines also encourage banks to increase the flow of credit to green projects, such as solar power plants, wind farms, and hydropower projects.

The guidelines also recommend the use of green financing products such as green loans, green bonds, and green mortgages to promote investments in green projects. Additionally, the guidelines encourage banks to incorporate

environmental, social, and governance (ESG) considerations into their lending decisions and provide incentives to customers for adopting sustainable practices. The SBP has also established a Green Banking Forum to facilitate information sharing and collaboration among banks, regulators, and other stakeholders in promoting green banking practices²³.

These guidelines have been instrumental in promoting green banking practices in Pakistan and have encouraged banks to increase their focus on sustainability. Several banks in Pakistan have already introduced green financing products and have taken steps to reduce their carbon footprint.

These guidelines encourage banks to establish a Green Banking Office and appoint a Chief Green Banking Manager to oversee green initiatives. Environmental risks are to be integrated into credit risk management procedures, and due diligence checklists and risk ratings for environmental concerns are to be developed. The guidelines emphasize the importance of supporting green businesses and aligning investment focus with the Sustainable

Development Goals. In addition to promoting green investments, banks are expected to reduce their environmental impact by adopting measures such as paperless banking operations, using renewable energy for branches and ATMs, and setting annual impact reduction targets²⁴.

The State Bank of Pakistan has partnered with the International Financial Corporation (IFC), the private sector arm of the World Bank Group, to launch the Pakistan Sustainable Banking Project. This project aims to improve the green banking portfolio of commercial banks and strengthen the existing Green Banking Group. By raising awareness and improving internal capabilities, the banking sector is expected to benefit from this project's efforts^{10,25}.

2.1.3. Comparison of green finance policies in developing countries

To seek insight and for possible learning, the green financing policies of the relevant regional countries like India, Bangladesh, and Nepal are compared and presented below in Table 3.

Table 3: Comparative study on the financial policies in developing countries.

Country	Guide lines	Approach	Development	Ref#
Bangladesh	2011	Implemented a robust green finance policy to protect against environmental degradation and promote sustainable banking practices. This policy includes incorporating environmental and climate change risks into existing risk assessment methodologies when evaluating potential borrowers. Additionally, banks are establishing green branches as an integral part of their green policy, further demonstrating their commitment to environmentally conscious operations.	<p>The green finance policy was structured into three phases:</p> <p>In phase I, banks and DFIs were required to develop their green banking policies.</p> <p>Phase II involved the formulation of sector-specific environmental policies, green strategic planning, establishment of green banks, and enhancement of in-house environmental management.</p> <p>Phase III aimed at addressing the entire ecosystem by assessing environmentally friendly initiatives and introducing innovative</p>	10

			products. While the time frame for implementing these phases has expired, banks and DFIs are currently at varying stages of compliance with these regulations.	
India	2010	The State Bank of India implemented the Green Channel as an initial measure in green banking, incorporating environmental risk assessment for borrowers. Banks are now adopting voluntary green lending guidelines developed by the industry itself. A significant milestone occurred in 2015 with the issuance of green bonds to support green energy.	Banks and DFIs have implemented green banking measures by the State Bank of India's directives, but further efforts are needed to strengthen and enhance the process.	26
Nepal	2012	Nepal Rastra Bank established an association to	There has been a lack of proactive efforts from	27

<p>facilitate the advancement of environmental and social risk management among banks and development financial institutions (DFIs) to promote green lending.</p>	<p>banks and DFIs to promote green finance. Regulators must enforce stringent measures to ensure compliance with the established procedures outlined in green banking policies.</p>
-------------------------------------------------------------------------------------------------------------------------------------------------------------------	-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

2.2. Prospects of green finance in Pakistan

2.2.1. Gap

Historically, Pakistan's attention to climate change has been overshadowed by more pressing economic and security concerns. However, relatively recently, an increased interest among national and provincial governments and private sector organizations has been observed. The public sector now allocates close to 8% of its total expenditure towards climate-related activities, while the private sector is actively engaging in climate-related investments through philanthropy and corporate social responsibility initiatives²⁸.

Despite the availability of a concessionary scheme and other lending options, the financing of solar power in Pakistan is still in its nascent stage and faces several challenges. Demand-side and supply-side barriers have hindered the progress of solar financing, leading to a limited number of financed projects. According to the latest data, only around 400 projects have been financed in the past four years under Tier II as of February 2021. The majority of commercial banks are reluctant to finance small-scale renewable energy installations due to high perceived risks and other concerns. The slow adoption of tailored financial schemes by the State Bank of Pakistan (SBP) is a key factor in the limited financing of solar projects. The SBP has taken several initiatives to encourage green banking practices and has introduced guidelines to promote sustainable development. However, the uptake of these guidelines has been slow, and banks have been hesitant to adopt them fully.

Foreign investment in green financing in Pakistan has also gradually increased over the past decade, with the Global Environment Facility (GEF) and Green Climate Fund (GCF)

being two of the biggest international funds involved. GEF has supported 38 projects in Pakistan, providing almost US\$100 million in funds, while GCF is currently facilitating 4 projects in the country with a total of US\$131 million²⁹.

Despite the recent increase in investment in Pakistan, the amount of capital flowing into the country is inadequate to address the climate crisis. The countries' updated Nationally Determined Contributions (NDC) targets, which were released in 2021, indicate that the country requires a minimum of US\$101 billion for the energy transition by 2030. The cost of adaptation has been estimated to be between US\$7-14 billion per year until 2050. However, this significant funding requirement also presents numerous business and investment opportunities³⁰.

An analysis by the International Finance Corporation (IFC) suggests that there are green growth opportunities worth US\$197.1 billion available in various sectors. These opportunities can help meet the country's 2030 climate targets, including reducing emissions by 30%

below business-as-usual (BAU) levels and increasing the share of renewable energy to 60% by 2030. The sectors with the most potential for green growth include renewable energy, energy efficiency, waste management, and sustainable transport³¹.

To address these challenges, the Government of Pakistan has taken several steps to promote climate resilience and low-carbon development. These include introducing policies and regulations to encourage renewable energy, investing in climate-smart agriculture and water management, and establishing a climate finance mechanism, the government has allocated approximately \$1.5 billion from its budget to support climate-smart agriculture initiatives and water management projects, aiming to enhance the resilience of the agricultural sector and address water scarcity challenges. However, the country needs additional support from the international community to achieve its climate goals and promote sustainable development³².

2.2.2. Sources

Green finance is an essential element in promoting sustainable development in Pakistan. To achieve this, the country has access to various resources, including domestic resources, development partners, and capital markets. Domestic resources refer to Pakistan's own budgetary allocations and corporate financing for green and sustainable projects. However, these resources alone are inadequate due to the country's struggling economy. Hence, development partners, such as publicly funded multilateral development banks and bilateral cooperation and development aid agencies, play a vital role in providing support in terms of capacity building, project planning, and sharing economic risks.

Several organizations, including the World Bank Group, United Nations Development Programme (UNDP), United Nations Environment Programme (UNEP), Asian Development Bank (ADB), KfW Development Bank, United States Agency for International Development (USAID), Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ), and Foreign, Commonwealth and Development

Office (FCDO), are already involved in such activities in Pakistan.

These organizations provide technical assistance, funding, and advisory services to support the development of green projects and promote sustainable development. They work with the Government of Pakistan, private sector actors, and other stakeholders to identify investment opportunities and promote the adoption of sustainable practices. Moreover, these organizations collaborate with local financial institutions to develop innovative financing mechanisms that support the growth of green finance in the country. Capital markets, which are characterized by the trading of financial securities such as bonds and stocks, are also emerging as a potential resource for green financing in Pakistan, offering new opportunities for private-sector investment²⁹.

1. **World Bank group:** The World Bank has been actively supporting renewable energy projects in Pakistan. One notable project is the "Sindh Solar Energy Project," which aims to increase the generation of solar power in Sindh province. As of 2021, this project has added

around 400 megawatts of solar energy to the grid, contributing significantly to the country's renewable energy capacity.

2. United Nations Development Programme (UNDP): UNDP has been involved in various climate change adaptation and mitigation projects in Pakistan. One example is the "Glacial Lake Outburst Floods (GLOF) Risk Reduction in Northern Pakistan" project. This initiative focuses on reducing the risk of GLOFs in the region by implementing early warning systems, infrastructure improvements, and community-based resilience measures.

3. United Nations Environment Programme (UNEP): UNEP has supported Pakistan in its efforts to address air pollution and promote cleaner transportation. They have worked on projects to enhance the capacity for electric vehicle adoption in major cities like Karachi, contributing to reducing carbon emissions from the transportation sector.

4. Asian Development Bank (ADB): ADB has been a key player in financing infrastructure projects with environmental considerations in

Pakistan. They have supported the development of sustainable transportation, water supply, and waste management projects. For instance, ADB provided financial assistance for the "Karachi Bus Rapid Transit (BRT) Red Line Project," aiming to improve public transport and reduce congestion in the city.

5. KFW development bank: KFW has collaborated with Pakistan in promoting renewable energy and energy efficiency initiatives. They have supported the development of several hydropower projects, contributing to the country's clean energy generation capacity.

6. United States Agency for international development (USAID): USAID has been actively involved in supporting climate resilience and water management projects in Pakistan. For example, they have supported the "Pakistan Safe Drinking Water and Hygiene Promotion Project," focusing on improving access to safe drinking water and sanitation facilities in rural areas.

7. Deutsche gesellschaft für internationale zusammenarbeit (GIZ): GIZ has partnered with Pakistan on various projects related to sustainable agriculture and natural resource management. They have worked on projects to promote sustainable farming practices, including water-efficient irrigation techniques and climate-resilient crop varieties.

8. Foreign, commonwealth, and Development Office (FCDO): FCDO has provided financial support for climate adaptation and disaster risk reduction projects in Pakistan. They have collaborated on projects aimed at enhancing disaster preparedness and community resilience in the face of climate-related challenges.

These examples demonstrate the diverse range of projects and initiatives that international organizations have supported in Pakistan to promote green finance, climate resilience, and sustainable development. The funding and technical assistance provided by these organizations have been instrumental in driving positive changes in the country's environmental and socio-economic landscape.

2.2.3. Prerequisites to qualify for green loan

Most banks in Pakistan have established certain qualifications and prerequisites for those seeking solar PV loans. These eligibility criteria are intended to provide additional measures for secure financing. However, these criteria vary significantly from bank to bank and are quite stringent. Generally, loans are offered to high-rated customers with a strong profile in terms of income scale, job security, and debt-to-income ratio. Interviews with banks reveal that customers interested in solar financing are frequently declined for being unable to fulfill conditionalities. Prerequisites or preconditions for eligibility were extracted from the brochures of several banks, which were available online or were obtained from the banks directly, and presented in Table 4 for reference.

The prerequisites for eligibility set by the majority of banks in Pakistan include age, income, and experience-related benchmarks. Some banks have also imposed property ownership and city-related conditionalities. For example, JS Bank and Allied Bank, which are the two key banks presently most active in solar

financing, have made it mandatory for applicants to own the property where the system is to be installed. Allied and Samba Bank have also restricted the scope of their financing to a few major cities. Meezan Bank has imposed an additional condition of first availing the Mera Pakistan Mera Ghar Scheme^{33,34}.

Table 4: Prerequisites for considerations in solar financing.

Banks	Prerequisites for Consideration
Bank of Khyber	<ul style="list-style-type: none"> ● Income: Minimum monthly Net Income of PKR 25,000/-. The average verifiable net income should be 3 times that of the proposed facility installment. ● Age: From 22 years to 58 years; 65 Years for Businessman- Engaged in business or service for more than 2 years. ● Applicants scoring a Credit Risk Rating from 1 to 5 only will be eligible for this facility.
JS Bank	<ul style="list-style-type: none"> ● The applicant must be the owner of the property. ● Bank statements for business or personal accounts with account maintaining certificate.
Meezan Bank Limited	<ul style="list-style-type: none"> ● Must be qualified for and have availed Mera Pakistan Mera Ghar Scheme from Meezan Bank. ● Aggregate monthly payments on approved solar financing must not be more than 45% of the net income assessed by the bank.
Alfalah Bank	<ul style="list-style-type: none"> ● Clean e-CIB report income proof/salary slips/bank statement. ● Non-objection certificate from all owners in case of joint property. ● The installment amount should not exceed 20-30% over and above the three-month peak bill average.

Banks	Prerequisites for Consideration
Allied Bank Limited	<ul style="list-style-type: none"> ● The applicant must be the owner of the property. ● Income: Salaried individuals: Minimum length of employment of two years and a minimum net monthly salary of PKR 40,000; Self-employed individuals: Minimum length of business/profession should be three years and minimum net monthly salary should be PKR 100,000. ● Approved cities: Karachi, Lahore, Rawalpindi/Islamabad, Gujranwala, Sialkot, Multan, Hyderabad, and Faisalabad.
The Bank of Punjab	<ul style="list-style-type: none"> ● Age: 25-60 years for salaried applicants; 25-65 years for self-employed applicants. ● Minimum monthly gross salary: PKR 40,000. ● Minimum experience: One year for govt employees, three years for contractual employees and self-employed candidates; net income of PKR 50,000 for self-employed people. ● Bank statements for the last six months.
Samba Bank	<ul style="list-style-type: none"> ● Pakistani nationals residing and working in Karachi, Lahore, Islamabad, Rawalpindi, Wah Cantt and Peshawar ● Age: 25 years and 30 years for salaried and self-employed individuals respectively ● Must not be aged older than 65 years (or retirement age, whichever comes earlier) at the time of maturity of the loan. ● Income: Minimum monthly income of PKR 45,000 and PKR 225,000 for salaried and self-employed individuals respectively ● Salaried applicants must be working at their current employer for a minimum period of 6 months or have a total continuous experience of 12 months. ● Self-employed applicants must have a minimum tenure of two years in their current business



Chapter 3: Results and Discussions

3.1. Qualitative data analysis

The collected data provides insights into the efforts made by various banks in Islamabad, Multan, Faisalabad, Rawalpindi Sialkot, and Lahore towards promoting sustainable practices, specifically in the realm of green and solar financing. Below is a detailed analysis of the information obtained from different banks, highlighting their initiatives, approaches, and overall progress in adopting environment-friendly practices. Table 6 elaborates on the key information extracted from the interviews of the various bank officials.

Table 5: Key information from qualitative data from interviews of various banks.

Bank	Official Name/ Designation	Key Information/ Discussions
Allied Bank	Manager	<ul style="list-style-type: none"> • Initiated paper-free banking and considers the customer's portfolio to be an important factor before approving solar financing. • Banks collaborate with approved vendors who install solar panels for the customers.
United Bank Limited	Manager	<ul style="list-style-type: none"> • No substantial progress made in relation to Green Finance.
Askari Bank	Main. Manager	<ul style="list-style-type: none"> • No space is available for solar installations in many of the bank's offices. • Some of their branches have already been solarized in areas where load shedding is particularly high, resulting in significant savings on generator expenses. • Bank has also taken measures to improve energy efficiency and has contracted with OJALA vendors to facilitate Solar Financing.
Bank Al Habib Limited	Zonal Manager	<ul style="list-style-type: none"> • Bank had taken energy conservation measures in line. • However, beyond providing loans or financing to some industries that sought to install solar they had not yet taken any significant steps towards adopting sustainable practices.

Bank	Official Name/ Designation	Key Information/ Discussions
Soneri Bank's	Branch Manager	<ul style="list-style-type: none"> The bank had adopted digital banking to minimize paper usage. Nevertheless, no solarization initiatives were undertaken by the bank, nor had they taken any other significant steps towards sustainable practices.
Bank Islami	Manager	<ul style="list-style-type: none"> Converted some of its own branches to solar power in far-flung areas where energy crises and load shedding were prevalent. Additionally, several of the bank's branches in Karachi have already been converted to solar power. The bank has also been providing loans to small-scale businesses seeking to install solar panels, indicating its commitment to promoting sustainable practices among its clients.
JS Bank	Branch Manager	<ul style="list-style-type: none"> JS bank does provide Solar Financing, but only if the solar panels are installed by an approved vendor according to the bank standards. Other than this, progress towards promoting sustainability was slow.
Silk Bank	Branch Manager	<ul style="list-style-type: none"> Contributing factors to the lack of interest in solar energy are the significant increase in its prices over the past three to five months.

Bank	Official Name/ Designation	Key Information/ Discussions
		<ul style="list-style-type: none"> • Consequently, people are no more attracted to solarisation, as they were previously.
Sindh Bank	Manager	<ul style="list-style-type: none"> • Bank had signed a merger agreement with Sindh Leasing Company Limited to develop their own solar financing scheme. • Currently, the bank is actively working on the framework of the scheme, and it is expected to be finalized by mid-June 2023. • Additionally, the new government had (by June 2023) discontinued all schemes from the previous year (2023). The interest rate for the scheme is set at KIBOR+4% as a means of compliance with Global Banking Guidelines (GBGs). • Furthermore, a strong desire (on the part of the bank) was expressed to reinstate subsidies for solar energy. The bank wished that the government should extend subsidized interest rates, as was the case from 2019 to 2022, to attract more and more consumers interested in putting up solar panels.
U Micro-finance Bank	Branch Manager	<ul style="list-style-type: none"> • Bank's initiatives for solarisation, including the provision of solar loans, were in process.

Bank	Official Name/ Designation	Key Information/ Discussions
		<ul style="list-style-type: none"> <li data-bbox="507 289 912 467">• The bank actively connects customers with reliable solar installers, catering to a diverse range of individuals such as farmers, entrepreneurs, and household users. <li data-bbox="507 475 912 686">• Bank had successfully facilitated about 5,000 to 6,000 solar projects exclusively for farmers in South Punjab, while the number of projects for households and entrepreneurs remained below 1,000. <li data-bbox="507 695 912 774">• Contributed to thousands of solarisation projects in the farming sector.

Bank Islami is also discussed in Table 6, but the interview is from another branch in Multan. The assessment shared during the meeting with the Bank Islami, Model Town Multan, the Branch Manager highlighted that the bank specialized in providing financing for solar-powered tube wells, catering to various customer requirements costing from 15 to 40 lakhs with a competitive interest rate of 7%. As part of its due diligence process, the bank collaborated with its customers and the banking institution to assess the viability of installing a tube well on specific land.

The evaluation, that the bank conducted for the proposed project against a loan, includes an examination of the water conditions of the land to ensure its suitability for the intended purpose. Both the bank and the customer have a vested interest in conducting this assessment, as it helps mitigate the risks associated with investing in a tube well installation. The evaluation is carried out by the Department of Water Irrigation, a trusted authority in water resource management. By adhering to this requirement, the bank aims to maximize the advantages and benefits of installing a tube well by ensuring optimal water conditions for sustainable and efficient operation.

Overall, the collected data revealed that while some banks have taken significant steps towards promoting sustainable practices, others have yet to take any major initiatives in this regard. However, it is worth noting that the banking sector as a whole is gradually moving towards promoting sustainable finance by adopting environmentally friendly practices.

3.2. Quantitative data analysis

This section presents a comprehensive analysis of the quantitative data gathered from Pakistan's banking sector, with a specific focus on current operational practices. The data collection process has been thorough, employing a multifaceted approach that encompassed focal group discussions, key informant interviews, and meticulously designed questionnaires. This methodological diversity facilitated the incorporation of a wide spectrum of viewpoints and perspectives, thereby enriching the informational foundation for comprehending the landscape of green financing within the banking sector.

Energy mix provides us with the current status and the sources or forms of energy being used by any particular industry. It is in fact a bottom line to draw an analysis and then persuade industries to gradually discard thermal sources of energy and switch over to clean and green sources of energy.

Table 6 shows the energy mix of the various banks visited to collect the data. Noteworthy is the absence of a shift towards leveraging

renewable sources, such as solar energy, to power their branches, which could significantly augment their sustainability quotient while also potentially leading the way for others in the sector.

Table 6: Current energy mix of banking sector

Sector	Source	Percent (%)
Banking	Grid electricity	100
	Coal	-
	Natural gas	-
	Renewable energy	-

Furthermore, as part of their comprehensive assessment, the team also inquired about the number of bank branches that had taken part in financing renewable energy projects, including the ones that participated in different years in the renewable energy financing programs. This helped the team understand how many branches were involved in supporting initiatives like solar energy and other sustainable sources. Table 7 shows the number of banks involved in the green financing program and also explains that out of 34 only 27 branches contributed for data. This information is important to see how committed these banks are to using eco-friendly

energy and encouraging the use of renewable resources in their operations.

Table 7: No. of banks that participated in the RE Financing program.

Sector	Participated	Percent (%)
Banking	Yes	79.4
	No	20.6

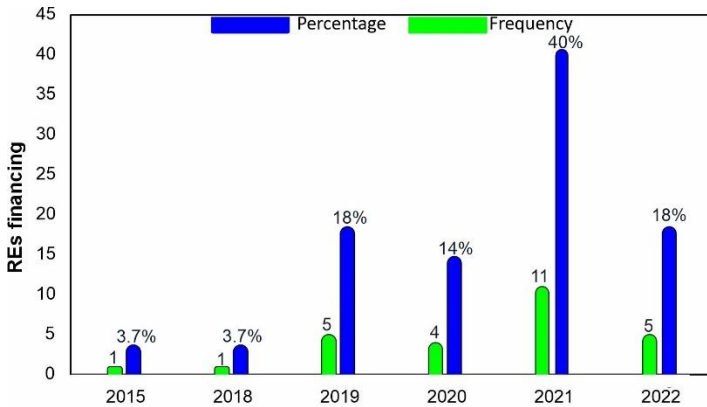


Figure 2: Number of banks that participated in different years in the Renewable Energy financing program.

The team diligently gathered more extensive information about the primary motivations that led various banks and financial institutions to become participants in the Renewable Energy Financing Program. Figure 2 shows the trends of RE financing increasing from 2015 to 2021. Figure 3 and 4 shows the driving factors for the banks. Their in-depth exploration of factors such

as existing client demand, potential for acquiring new clients, a consciousness or intent to reduce CO₂ emissions, prospects for saving and/or increasing profitability, a focus on long-term sustenance, and compliance with GBG guidelines allowed them to construct a comprehensive understanding of the myriad influences that encouraged these entities to join the program. Figure 4 elaborates on the existing client demand and environmental sustainability shows the maximum percentage. By actively engaging with these banks and examining their unique decision-making processes, the team unearthed a wealth of insights, shedding light on how these driving factors aligned with initiatives supporting and promoting renewable energy.

What's more, these findings have been meticulously represented with a detailed graph below, illustrating the specific percentages of each motivating aspect as collected from the banks. This visual representation further underscores the importance of these factors in guiding organizations to contribute to a future shaped by sustainable energy practices.

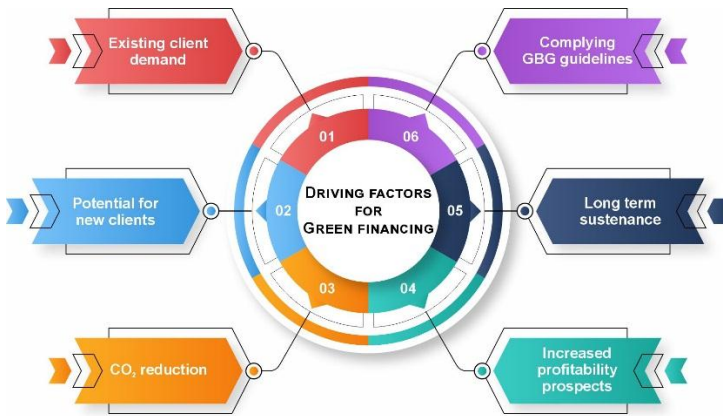


Figure 3: Driving factors for green financing.

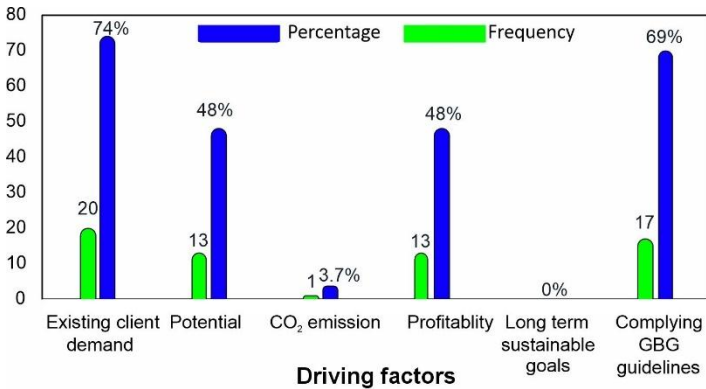


Figure 4: Driving factors of banks/FIs to join the renewable energy financing program.

As part of their data collection process, the team visited various banks to inquire about the availability of the Renewable Energy Financing Program at all branches of the concerned

financial institutions. Table 8 shows that 85.15% of the banks are offering the REs finance to the customers. Their objective was to ascertain whether this particular program was accessible across every single branch. Throughout their visits, the team sought simple "Yes" or "No" responses to this query, which would have greatly aided their research efforts. The primary goal behind these inquiries was to gather comprehensive insights into the program's widespread availability and accessibility, enabling the team to gauge its potential impact on a larger scale. Their interactions with the banks allowed them to collate valuable information, painting a clearer picture of the extent to which this initiative had been rolled out. In essence, these inquiries formed a crucial part of the team's data collection endeavors, contributing significantly to the depth and reliability of their findings.

Table 8: Availability of the RE Financing Program at all branches of the concerned banks.

Sector	Financing scheme for REs	Percent (%)
Banking	Yes	85.15
	No	14.81

The team carefully collected data from the banks regarding the specific customer categories to whom they extended solar financing. This involved a meticulous process of information collection and analysis. The team's efforts focused on identifying the distinct groups of customers that the banks served for solar financing. Through interviews, surveys, and careful examination of the banks' offerings, the team aimed to uncover the varied segments of the population that were eligible for solar financing solutions.

By engaging in detailed conversations with bank representatives and poring over available documentation, the team sought to discern whether the banks provided solar financing to residential customers, commercial enterprises, industrial projects, solar developers, or any other targeted categories. Figure 5 shows the banks providing solar financing to both residential and commercial sectors. As per the findings of the questionnaire, customers are seriously interested in shifting to solar PV, however at reasonable interest rates. The objective of this data collection was to

comprehensively understand the scope and inclusivity of the banks' solar financing initiatives, shedding light on to which extent the renewable energy options were being made accessible across different customer demographics.

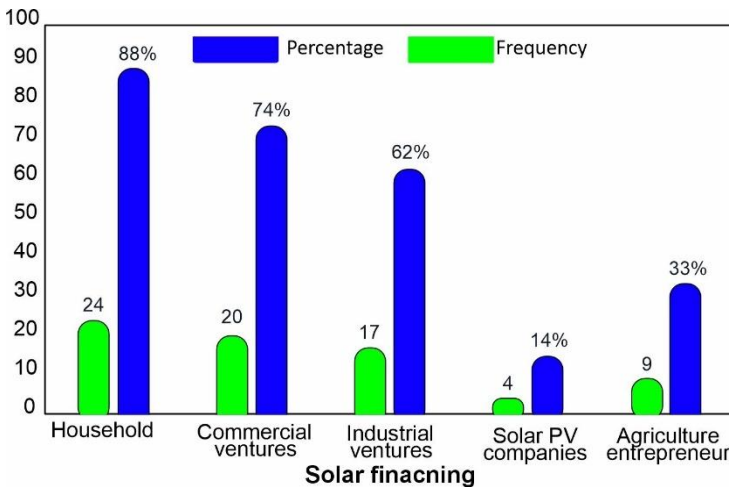


Figure 5: Customer categories to which banks provide solar financing.

Table 9: Financing for batteries associated with solar systems.

Sector	Finance for Batteries	Percent (%)
Banking	Yes	94.1
	No	3.7

In the pursuit of a comprehensive understanding of the dynamics surrounding solar PV financing, the team engaged in insightful discussions with

financial institutions. A key question posed to the banks was, "what are the specific barriers or risks unique to solar PV financing?". Figure 6 shows the socio-economic barriers related to PV financing. Lack of investment/financial barriers dominate as per the figure and response to the query. This inquiry sought to unearth the multifaceted challenges that might impede the widespread adoption of solar photovoltaic (PV) projects. The team delved into various dimensions, including financial constraints, political and economic instability, deficiencies in infrastructure, and other pertinent factors. Table 9 shows that almost all banks offer batteries for photovoltaics as well.

In a commendable display of transparency and cooperation, the banks contributed data that provided a quantitative framework for evaluating the barriers represented in the graph. Their valuable insights illuminate the intricate interplay of obstacles that must be navigated to unlock the full potential of solar PV financing within the broader context of green finance.

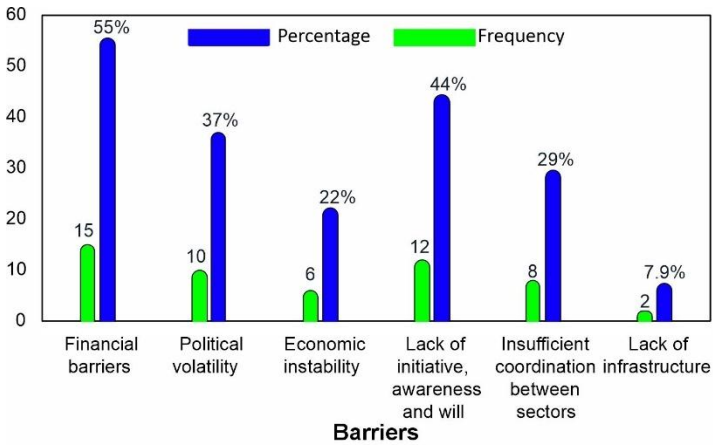


Figure 6: Barriers solar to achieve PV financing.

The team gathered information from financial institutions to learn about the kind of support they believe would help them overcome barriers in solar PV financing. The team asked the banks, "what kind of help from the head office, government, or relevant regulatory bodies would be useful for your institution to deal with these barriers?" This question aimed to understand the actions that could make a positive difference. The banks shared valuable ideas such as creating awareness through campaigns, organizing informative seminars, starting special programs, and providing incentives to encourage solar PV adoption. They also pointed out that having stable political

conditions would be important for promoting renewable energy financing. Figure 7 shows the state's support to familiarize people with the REs and GF. These discussions reveal practical steps that could be taken in partnership with the banks to create an environment that supports green finance, highlighting the importance of working together for meaningful change.

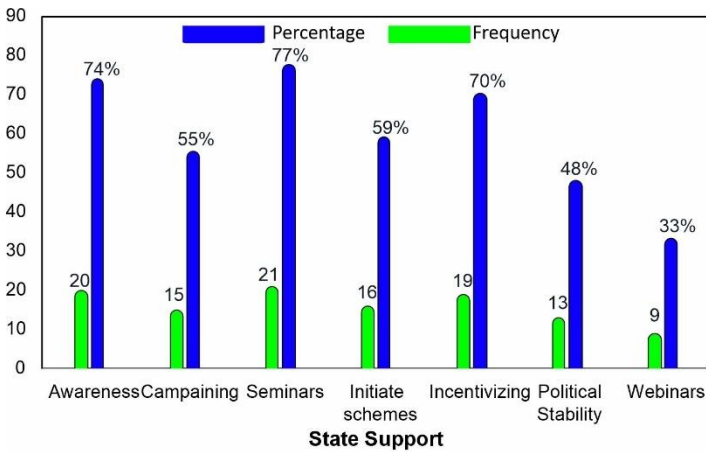


Figure 7: Support from head office/government/SBP beneficial for the banks to overcome the barriers.

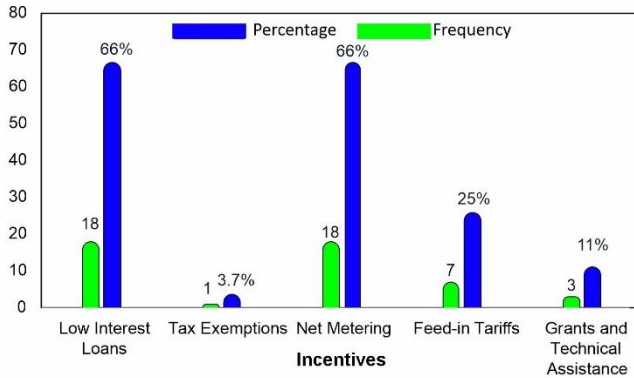


Figure 8: Banks familiar with incentives available to support solar financing in Pakistan.

The team also reached out to banks to gather information about their awareness of various incentives designed to bolster solar financing in Pakistan. Figure 8 shows the incentives offered by the banks for shifting towards renewable energy resources. The team specifically asked about banks' familiarity with incentives such as low-interest loans, tax exemptions, net metering, feed-in tariffs, grants, and technical assistance. This line of questioning aimed to gauge the banks' knowledge of the supportive mechanisms available to promote solar energy adoption. By delving into their awareness levels, the team aimed to assess the extent to which these incentives are effectively communicated and understood within the banking sector. The

insights gleaned from these discussions shed light on the need for comprehensive awareness campaigns and informative initiatives that bridge potential gaps in understanding, ultimately contributing to a more robust and informed landscape for green finance advancement.



Chapter 4: Barriers and Recommendations

4.1. Barriers to achieve green financing

4.1.1. Financial barriers

Green financing is a complex and emerging field that requires specialized technical knowledge and skills that may be scarce in developing countries like Pakistan. To ensure effective green finance initiatives, the country must heavily invest in the development of the necessary human capital and infrastructure.

This includes not only training programs for finance professionals but also investments in

research and development of new green technologies, and the creation of supportive legal and regulatory frameworks that encourage private sector investment in green projects. However, infrastructure such as energy-efficient buildings, building codes, and transportation systems require significant upfront investment that may not be feasible for many investors in Pakistan.

Public awareness campaigns and educational programs are essential to build support and understanding for green finance initiatives and to encourage individuals and organizations to invest in green projects. This includes the development of accessible and user-friendly tools and resources that can help individuals and organizations navigate the complex landscape of green financing ³⁵.

In addition, political instability and governance challenges in Pakistan pose significant risks to the success of green finance initiatives. Corruption and weak institutions can undermine the effectiveness of green financing mechanisms, while political instability can create uncertainty and unpredictability in the

investment climate. Therefore, targeted reforms and institutional strengthening are needed to address these issues, along with efforts to build greater trust and transparency in the government's handling of public funds³⁵.

4.1.2. Governance barriers

One of the main challenges is the country's political instability and poor economic performance, which has led to low credibility in the eyes of financing institutions, making it difficult to secure funds and incentives. Moreover, Pakistan's failure to commit to a complete shift from fossil fuels may damage its prospects of green financing in the international market.

One of the challenges faced in the adoption of renewable energy technologies in developing countries such as Pakistan is bureaucratic hassle, which refers to the lengthy and cumbersome processes involved in obtaining licenses and permits for the deployment of such technologies. These bureaucratic hurdles can significantly impede progress towards a sustainable energy transition. In particular, the process of obtaining technology licenses can be

lengthy and difficult, with many layers of bureaucracy and multiple agencies involved. This can lead to delays and increased costs for investors, as well as decreased transparency and accountability in the licensing process.

Such challenges can discourage investment in renewable energy projects, thereby hindering the overall adoption of renewable energy technologies. Therefore, there is a need for streamlined and efficient procedures that facilitate the licensing of renewable energy technologies and encourage the growth of the renewable energy sector³⁶.

The lack of awareness, initiative, and will among stakeholders is also a significant challenge. Many stakeholders remain either unaware of available resources or unwilling to explore new opportunities. Insufficient coordination between sectors, such as the public, private, and academic sectors, is another drawback. Finally, Pakistan lacks long-term planning and foresight in its approach to green finance, with policies often being developed without considering the holistic picture²⁹.

4.1.3. Market and social barriers

There are several factors that hinder the adoption of renewable energy technology (RET) in Pakistan. One of the main issues is price distortion, which refers to the unaccounted costs of externalities in energy pricing. This can make RET appear more expensive compared to conventional energy sources, even though it may have lower long-term costs. Another challenge is the "hassle factor," which includes higher transaction costs of gathering information and the perceived inconvenience of installing the technology. Split incentives can also be a barrier, where the investor who pays for the upfront costs of RET is not the same person who reaps the benefits of the technology, such as in rental properties.

Additionally, proper RET markets may not be developed, and technology and services may be unavailable due to supply constraints. These challenges have been documented in various studies, including research conducted by the International Renewable Energy Agency (IRENA) and the World Bank Group. Addressing these challenges will require policy reforms, education and awareness campaigns, and

improvements in market infrastructure to create a favorable environment for RET investment and adoption³⁷.

4.1.4. Barriers related to capacity, skills, and infrastructure

The lack of clarity on the definition and implementation of green finance in Pakistan is a major obstacle to its widespread adoption. Stakeholders have varying interpretations of the concept, leading to confusion and hindering progress. Institutional capacity constraints, particularly in local institutions, pose another major challenge. Many lack the necessary expertise to access emerging green financing markets and secure investments. While international best practices are important, there is a need to focus on indigenization and identify local actors in the renewable energy ecosystem to drive progress. The insufficiency of data and risk assessments, along with poor accountability and disclosure mechanisms, also impede the country's journey toward sustainable green finance. Double counting of carbon further exacerbates these challenges, creating confusion and hindering progress towards a sustainable future³⁸.

An awareness gap is a significant issue, with many individuals and businesses in Pakistan unaware of the potential benefits of RET. This is partly due to a lack of information dissemination and outreach efforts by government agencies and other stakeholders³⁹. Another challenge is the limited know-how of financing options for RET investments. This is partly due to a lack of clear guidelines and financing mechanisms for RET in Pakistan. Many potential investors and borrowers are unaware of the available financial incentives and support mechanisms, such as subsidies, tax incentives, and grants, that can facilitate RET investment⁴⁰. A knowledge gap at the installation stage is also a major challenge. RET systems require specialized knowledge and skills for installation, operation, and maintenance. The shortage of skilled professionals in this field poses a significant obstacle to the adoption of RET⁴¹.

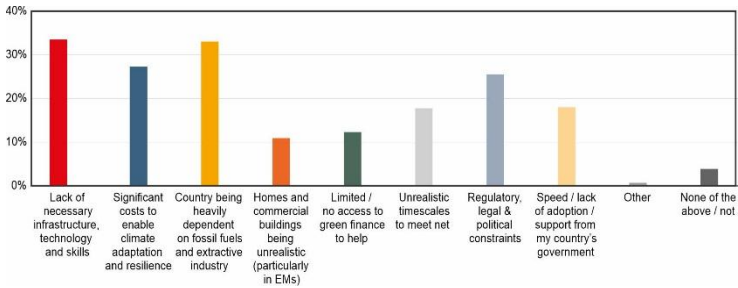


Figure 9: Constraint to achieve the green financing across the world⁴².

Globally there are many constraints faced to achieve green financing. These barriers are broadly classified as the financial, government, market, social, capacity, skills, and infrastructure barriers as mentioned above. These barriers not just exist in Pakistan but in the whole world. Figure 9 shows the barriers associated. The major cause of these barriers is the lack of infrastructure and dependencies on hydrocarbon fuels.

4.2. Policy recommendations

Policy recommendations for promoting green financing and sustainable practices in Pakistan are presented in Figure 9 and explained below. In a nutshell, the preferences and recommendations offered in this section, are a blend of primary and secondary data analysis.

4.2.1. Capacity building and expertise enhancement

- i). Establish specialized training programs by SBP for finance professionals to enhance their understanding of green financing and renewable energy technologies.
- ii). Collaborate with universities and research institutions to promote local expertise and research in the field of green finance.

4.2.2. Regulatory and institutional reforms

- i). SBP needs to standardize the definition of green finance and clear guidelines for qualifying projects to provide clarity for financial institutions.
- ii). NEPRA, AEDB, and SPB should streamline licensing processes for renewable energy projects through the implementation of a single-window clearance system.
- iii). AEDB and private renewable energy firms should enhance transparency and accountability in the sector by introducing standardized reporting and disclosure mechanisms.



Figure 10: Policy recommendations to achieve decarbonization.

4.2.3. Financial incentives and support

- i). Introduce financial incentives by state and relevant institutions i.e., banks, DFIs strengthen green financing. The incentives may include tax exemptions, subsidies, and grants to attract investment in renewable energy projects.
- ii). Facilitate risk-sharing mechanisms between financial institutions and project developers to mitigate perceived risks.

4.2.4. Public awareness and education

- i). Media needs to launch comprehensive public awareness campaigns to educate individuals and businesses about the

long-term benefits of renewable energy and green financing.

- ii). Academia, CSOs, CBOs, and respective institutes should collaborate with banks to provide financial literacy programs that inform customers about available green financing options.

4.2.5. Strategic partnerships and collaboration

- i). To jointly promote and finance renewable energy projects, a collaboration between government organizations, financial institutions, and private sector stakeholders must be formed.
- ii). In order to establish novel financing models, collaboration between financial institutions and suppliers of renewable energy technologies needs to be promoted.

4.2.6. Long-term planning and policy consistency

- i). The State Bank of Pakistan needs to develop a roadmap outlining clear targets and strategies for promoting green

financing aligned with international best practices.

- ii). The state of Pakistan needs to ensure policy stability by maintaining consistent and stable regulations to enhance investor confidence.

4.2.7. Pilot projects and demonstrations

- i). All relevant banks need to fund small-scale pilot projects in various regions to showcase the feasibility and benefits of renewable energy technologies.
- ii). Commercial Banks and the State Bank of Pakistan need to establish a platform to showcase best practices and success stories of financial institutions that have implemented successful green financing initiatives.

Implementing these policy recommendations will create an enabling environment for green financing, foster sustainable practices, and contribute to Pakistan's transition towards a more environmentally friendly and economically resilient future.



Chapter 5: Conclusion

In conclusion, the analysis of primary data collected from various commercial banks in Islamabad, Multan, Faisalabad, Rawalpindi Sialkot, and Lahore offers valuable insights into the efforts and challenges encountered in promoting sustainable practices, particularly in the realm of green and solar financing within Pakistan's banking sector.

The data revealed a mixed landscape of initiatives and progress across different banks. While some institutions, such as Allied Bank and Bank Al Habib Limited, have taken significant steps by embracing paper-free banking,

collaborating with approved vendors, and providing solar financing options, others like United Bank Limited and Soneri Bank are yet to make substantial headway. Notably, Askari Bank and Bank Islami have focused on solar installations in areas with high load shedding, thereby contributing to energy savings and reducing reliance on conventional sources.

Despite the diverse range of initiatives, several challenges stand in the path of comprehensive adoption of sustainable practices and green financing. Financial barriers encompass the scarcity of specialized expertise, inadequate infrastructure, and the need for targeted investments to bolster human capital and technological development. Governance barriers, marked by political instability and governance deficiencies, pose risks to the credibility and efficacy of green financing mechanisms.

Market and social barriers, including price distortion, transaction costs, and a lack of developed renewable energy technology markets, hinder the wider acceptance of renewable energy technologies. Additionally,

capacity, skills, and infrastructure challenges are evident through institutional capacity constraints, a lack of clear definitions, limited know-how in financing options and installation procedures, and an awareness gap among potential investors and borrowers.

Addressing these challenges requires a multifaceted approach, encompassing policy reforms, comprehensive awareness campaigns, capacity building, and strategic collaboration among government bodies, financial institutions, and other stakeholders. By strengthening regulatory frameworks, enhancing financial literacy, and fostering cross-sector partnerships, Pakistan can create an enabling environment conducive to the growth of green financing and the widespread adoption of sustainable practices.

The insights presented in this report underscore the need for concerted efforts and focused initiatives to overcome the identified barriers, ultimately driving Pakistan's banking sector towards a more sustainable and environmentally responsible future. It is imperative for all stakeholders to collaborate,

share expertise, and take proactive steps to navigate these challenges and create a robust foundation for green financing and sustainable development in Pakistan.

6. References

1. Growth FORI. *Green skills and innovation for inclusive growth*. DOI: <https://doi.org/10.1787/9789264239296-en>.
2. Dikau S, Volz U. Central Banking, Climate Change, and Green Finance. *Handb Green Financ* 2019; 81–102.
3. Maheshwari A, Avendano F, Stein P. Measuring Progress on Green Finance - Findings from a Survey, http://unepinquiry.org/wp-content/uploads/2016/09/5_Outline_Framework_for_Measuring_Progress_on_Green_Finance.pdf (2016).
4. Turner B. Asian Development Bank Institute. 2014; 75–75.
5. Martinez-Fernandez C, Wu C-T, Schatz LK, et al. The shrinking mining city: urban dynamics and contested territory. *Int J Urban Reg Res* 2012; 36: 245–260.
6. Mohammad KU, Khan MR. Effectiveness of Green Project Screening for Bank Lending: Evidence From Pakistan. *Bull Bus Econ (BBE)* 2022; 11: 93–103.
7. Raberto M, Ozel B, Ponta L, et al. From financial instability to green finance: the role of banking and credit market regulation in the Eurace model. *J Evol Econ* 2019; 29: 429–465.
8. Rehman A, Ullah I, Afridi F-A, et al. Adoption of green banking practices and environmental performance in Pakistan: a demonstration of structural equation

- modeling. *Environ Dev Sustain* 2021; 23: 13200–13220.
9. Pakistan Infrastructure Housing & SME Finance Department. Green Banking Guidelines. *IH&SMEFD Circ No 08 dated Oct 2017* 2017; 1–18.
 10. Zubair Mumtaz DM, Alexander Smith DZ. Green Finance for Sustainable Development in Pakistan. *IPRI J* 2019; 1–34.
 11. UNERDD. Business-As-Usual (BAU) Scenario, <https://www.un-redd.org/glossary/business-usual-bau-scenario> (2003).
 12. Lerum Boasson E. National Climate Policy. *Natl Clim Policy*. Epub ahead of print 2014. DOI: 10.4324/9781315769059.
 13. World Bank, <https://www.worldbank.org/en/country/pakistan/overview> (2022).
 14. Alternative Energy Development Board (AEDB).
 15. European Centre for the Development of Vocational Training, <https://www.cedefop.europa.eu/en> (2022).
 16. Siddik AB. التمويل الأخضر. Green Finance
 17. Burta FS. State Bank of Pakistan. 2018; 430–439.
 18. Townsend AF. *Natural Gas and the Clean Energy Transition*. World Bank Group, <https://policycommons.net/artifacts/1276631/natural-gas-and-the-clean-energy-transition/> (2019).
 19. Alfalh B. Alfalah Green Energy,

- <https://www.bankalfalah.com/business-banking/sme-loans/alfalah-green-energy/> (2023).
20. Habib B AL. SBP Financing Scheme for Renewable Energy Category II, <https://www.bankalhabib.com/sbp-financing-scheme-for-renewable-energy-category-ii> (2023).
 21. State Bank of Pakistan. SBP Financing Scheme for Renewable Energy, <https://www.sbp.org.pk/Incen-others/Rene.asp>.
 22. Green Banking Guidelines (GBG). State Bank of Pakistan, <https://www.sbp.org.pk/smefd/circulars/2017/C8.htm> (2017).
 23. Khan SS, Jan SU, Abbas B. Green Banking: Concerning Sustainable Development. *Asian J Islam Finance* 2016; 1: 14–35.
 24. Shafique O, Muhammad Usman Khizar H, Najeeb Jamal W, et al. an Empirical Study on the Factors Affecting Bankers' Behavioural Intention To Adopt Green Banking in Pakistan. *Pjæe* 2020; 17: 1–11.
 25. (IFC) IFC. Enabling Sustainable Banking in Pakistan, <https://disclosures.ifc.org/project-detail/AS/603761/enabling-sustainable-banking-in-pakistan> (2020).
 26. Bihari SC, Pandey B. Green banking in India. *J Econ Int Financ* 2015; 7: 1–17.
 27. Pant B. Promoting green finance: Sustainable

- development,
<https://thehimalayantimes.com/opinion/promoting-green-finance-sustainable-development> (2017).
28. Tiger A, Partners C, Corporation IF. Prepared by Asian Tiger Capital Partners Prepared for the International Finance Corporation A Strategy to Engage the Private Sector in Climate Change Adaptation in Bangladesh in Bangladesh. 2010; 1–49.
 29. Government of Pakistan. Pakistan Updated NDC 2021. 2021; 76.
 30. Alam M. Techno-Economic Feasibility Study of Roof Top PV System in India. *CEUR Workshop Proc 2021*; 3058: 4–10.
 31. IFC. Renewable Energy in Pakistan,
<https://pressroom.ifc.org/all/pages/PressDetail.aspx?ID=15977>.
 32. Nasir M, Ur Rehman F. Environmental Kuznets Curve for carbon emissions in Pakistan: An empirical investigation. *Energy Policy* 2011; 39: 1857–1864.
 33. BOK. BOK Roshan Ghar Scheme,
<https://www.bok.com.pk/personal-banking/consumer-finance/bok-roshan-ghar-scheme> (2023).
 34. JS Bank. JS Smart Roshni – Solar Solution Financing,
<https://jsbl.com/business/sme/js-smart-roshni-solar-panel-financing/> (2023).
 35. Tribune E. GREEN FINANCING,
<https://tribune.com.pk/green-financing>.

36. Mumtaz MZ, Smith ZA. Green finance for sustainable development in Pakistan. *IPRI J* 2019; 19: 1–34.
37. Pakistan Environmental Protection Agency, <https://environment.gov.pk/> (2023).
38. Adelaja AO. Barriers to national renewable energy policy adoption: Insights from a case study of Nigeria. *Energy Strategy Rev* 2020; 30: 100519.
39. IEA. Renewable Energy Technologies, <https://www.iea.org/energy-system/renewables>.
40. United Nations Industrial Development Organisation. UNIDO and Renewable Energy. Greening the Industrial Agenda. 2009; 1–23.
41. SUSTAINABLE DEVELOPMENT POLICY INSTITUTE, <https://www.sdpi.org/> (2022).
42. Guide THE. GREEN FINANCE SKILLS : THE GUIDE About ACCA.

Appendix A: Questionnaire for Green Financing

Bank Name: _____

Respondent Name: _____

Interviewer: _____

Date: _____

1. What is the current energy mix of different bank branches?

Grid Electricity	Coal	Natural Gas	Renewable Energy	Any Other

2. Number of banks that participated in the Renewable Energy Financing program?

Bank Name	Participated	Not Participated

3. Number of banks that participated in different years in the renewable energy financing program?

Bank Name	Year	Number

4. What are the main driving factors of different banks/FIs to join the Renewable Energy Financing Program?

Driving factors	Number
Existing client demand	
Potential for new clients	
CO ₂ emission consciousness or intent to reduce CO ₂ emissions	
Saving and/or increased profitability prospects	

Long term sustenance	
Complying GBG guidelines	

5. Is the Renewable Energy Financing Program currently available at all branches of the concerned banks?

Bank Name	Participated	Not Participated

6. To which customer categories does the banks provide solar financing?

Customer Categories	Number
Household	
Commercial Ventures	
Industrial Ventures	
Solar PV Companies	
Agriculture Entrepreneur	

7. Do the banks provide financing for batteries associated with solar systems?

Bank Name	Participated	Not Participated

8. What are the specific barriers or risks unique to solar PV financing?

Barriers	Number
Financial Barriers	
Political Volatility	
Economic Instability	
Lack of initiative, awareness, and will	
Insufficient coordination between sectors	
Lack of infrastructure	

9. What kind of support from head office/government/SBP would be beneficial for the banks to overcome the barriers?

Support	Number
Awareness	
Campaigning	
Seminars	
Initiate schemes	
Incentivizing	
Political Stability	
Webinars	

10. Number of banks Familiar with incentives available to support solar financing in Pakistan from the following?

Incentives	Number
Low Interest Loans	
Tax Exemptions	
Net Metering	
Feed-in Tariffs	
Incentives	
Grants and Technical Assistance	
