



**EMBASSY
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Islamabad



Unlocking the Potential of Carbon Markets in Pakistan

Lessons learnt and the Way Forward

OCTOBER 2024

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SDPI
Sustainable Development Policy Institute

FOREWORD

H.E. Jakob Linulf

Ambassador of Denmark to Pakistan



The pressing challenge of climate change necessitates a robust and multifaceted response. Carbon pricing is an impactful tool within the global climate policy framework. The complexity of carbon pricing systems underscores the importance of sharing knowledge and experiences to maximize their efficacy and reach.

Pakistan is at the forefront of a severe climate crisis, facing increasingly extreme weather events, rising temperatures, and devastating floods. Over the past few years, Pakistan has experienced some of the most intense heatwaves and severe flooding in its history. The rising temperatures have led to widespread water scarcity, affecting agriculture, which is a significant part of Pakistan's economy and livelihood for millions. Additionally, the melting of glaciers in the northern regions is accelerating, contributing to more frequent and severe floods that displace communities and destroy infrastructure.

The frequency and intensity of these climate-related disasters are expected to increase, making the need for effective and innovative solutions more urgent than ever. The impacts of climate change in Pakistan are multifaceted, affecting food security, water availability, public health, and economic stability. For instance, the recent flood in 2022, which were among the worst in Pakistan's history, affected over 20 million people and caused damages estimated at around \$15 billion. Such events highlight the vulnerability of Pakistan to climate change and the critical need for robust adaptation and mitigation strategies.

The establishment of robust carbon markets is one such solution, providing a critical tool in our collective efforts to reduce greenhouse gas emissions and foster sustainable development. By putting a price on carbon emissions, these markets create financial incentives for businesses and individuals to adopt greener practices, thereby reducing their carbon footprint. Moreover, carbon markets attract investments in renewable energy and green technologies, driving economic growth and creating new job opportunities. The revenue generated from carbon

pricing can be reinvested in climate adaptation and resilience projects, enhancing both environmental and economic stability.

Denmark's journey towards sustainability offers valuable insights for Pakistan. Historically facing significant challenges from carbon emissions, Denmark has transitioned towards a more sustainable and resilient economy through comprehensive carbon markets and effective carbon pricing mechanisms. By putting a price on carbon, we have incentivized the reduction of emissions and attracted investments in renewable energy. Our success in offshore wind energy, accounting for over 48% of electricity generation by 2019, is supported by stable energy policies, public and private sector collaboration, and innovative technologies. This holistic approach, including the rise of local wind cooperatives, has driven significant emissions reductions while stimulating economic growth and job creation, demonstrating that environmental and economic goals can be mutually reinforcing. Denmark's ambitious goal of reducing greenhouse gas emissions by 70% by 2030 exemplifies this balanced strategy.

The climate crisis in Pakistan demands immediate and effective action. Establishing carbon markets can play a transformative role in addressing these issues by providing the necessary financial tools to support renewable energy projects, reduce carbon emissions, and build resilient infrastructure. Carbon markets facilitate global cooperation, supporting the ambitious targets set by the Paris Agreement, and enabling countries to trade emission reductions and jointly achieve their climate goals.

The establishment of carbon markets is a strategic imperative for achieving long-term environmental and economic sustainability. Denmark remains committed to supporting Pakistan in this journey, offering our expertise and partnership. Together, global transition to a low-carbon economy, ensuring a healthier and more prosperous world for generations to come. We are delighted with the outstanding efforts of the Sustainable Development Policy Institute (SDPI) in raising awareness and advancing pathways for implementing carbon markets in Pakistan. Their dedication and expertise have been instrumental in this crucial initiative. As we look forward to the second phase of the project, we are excited about the prospect of deepening our collaboration with SDPI, taking our collective efforts a step further.

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Abbreviations

ACR	American Carbon Registry
AES	Applied Energy Service
AFOLU	Agriculture, Forestry and Other Land Use
CAR	Climate Action Reserve
CBAM	Carbon Border Adjustment Mechanism
CBOs	Community Based Organizations
CCM	Compliance Carbon Markets
CDM	Clean Development Mechanism
CSOs	Civil Society Organizations
ETS	Emission Trading System
GCISC	Global Change Impact Studies Centre
GHG	Greenhouse gases
GoP	Government of Pakistan.
GS	Gold Standard
ICVCM	Integrity Council for the Voluntary Carbon Market
IPPU	Industrial Processes and Product Use
ITMOs	Internationally Traded Mitigation Outcomes
JCM	Joint Credit Mechanism
MoCC&EC	Ministry of Climate Change and Environmental Coordination
MoF	Ministry of Finance
NBS	Nature Based Solutions
NDCs	Nationally Determined Contributions
OECD	Organization for Economic Co-operation and Development
RE	Renewable Energy
SBTi	Science Based Targets Initiative
SDG	Sustainable Development Goal
USAID	United States Agency for International Development
VCM	Voluntary Carbon Markets
VCFI	Voluntary Carbon Markets Integrity Initiative
VCS	Verified Carbon Standard
VER	Voluntary Emission Reduction

Executive Summary

The accelerating pace of industrialization, urbanization, and socio-economic development has unlocked significant opportunities for global progress and innovation, yet it has also triggered the urgent challenge of climate change. This crisis, driven by fossil fuel combustion, industrial processes, deforestation, inadequate waste management, and overconsumption, requires immediate action to avert irreversible impacts. Record temperature changes and extreme weather events underscore the need to limit global temperature increases to below 1.5°C, achievable only through net-zero emissions by 2050. International agreements such as the Kyoto Protocol and Paris Agreement have catalyzed global efforts, setting ambitious emission reduction targets.

Carbon pricing and markets emerge as critical tools in this transition, placing a monetary value on CO₂ emissions and enabling the trading of carbon credits. These mechanisms incentivize clean energy initiatives and support both voluntary and compliance-based climate commitments. However, developing countries with high energy costs and limited fiscal space, face significant challenges in establishing the carbon markets.

The global voluntary carbon markets (VCMs) provide a platform for the private sector to trade carbon credits voluntarily, facilitating the achievement of climate goals. Originating in the late 20th century, VCMs have developed with standards such as the Verified Carbon Standard (VCS) and Gold Standard (GS). These markets experienced significant growth, peaking in 2021 with an issuance of 352 million metric tons of CO₂eq and investments amounting to \$1.3 billion in 2022, which led to a reduction of 161 Mt of GHG emissions. Despite setbacks in 2022 and 2023 due to regional conflicts, resulting in a 56% drop in transactions in 2023, the cumulative VCM volume reached \$10.8 billion by 2023. This growth was driven by new project registrations, particularly in Household/Community Devices and Forestry and Land Use sectors.

Carbon pricing remains a critical element in meeting the goals of the Paris Agreement, with 75 carbon taxes and emissions trading systems (ETSs) implemented globally. As of April 2024, these mechanisms covered nearly 13 gigatons of CO₂ equivalent, representing about 24% of global GHG emissions. Revenues from carbon taxes and ETSs surpassed \$100 billion in 2023, supporting green projects and the general budget. Despite this progress, global coverage remains below 30%, with initiatives like the EU Carbon Border Adjustment Mechanism (CBAM) striving to level the playing field for EU producers.

Denmark, an early adopter of carbon taxation since 1992, has set ambitious emission reduction targets of 70% by 2030 and net-zero by 2050. In 2020,

Denmark's carbon tax was \$26/ton, with participation in the EU ETS covering 68% of GHG emissions. Recent political agreements have increased the carbon tax for non-EU ETS companies to €100 per ton by 2030, placing Denmark among the highest globally. The Danish Council on Climate Change has proposed further increases to \$200-250/ton by 2030 as part of the country's comprehensive decarbonization strategy.

Pakistan, categorized as one of the most climate-vulnerable countries yet with a relatively low carbon footprint, holds significant potential to generate carbon credits. However, the country faces challenges due to limited capacity, technical expertise, and uncertain policy frameworks. The collaboration between SDPI and the Embassy of Denmark aims to create a comprehensive strategy for leveraging carbon credits, aligning with Sustainable Development Goals (SDGs), and enhancing capacity across value chains. This study evaluates global carbon market trends, assesses the current state and challenges in Pakistan, and provides a policy roadmap for the effective implementation of carbon markets.

Pakistan faces significant challenges and opportunities in establishing carbon markets, which are crucial for supporting low-carbon development and advancing climate action. Despite contributing minimally to global greenhouse gas emissions, Pakistan is highly vulnerable to the impacts of climate change, as evidenced by increasing climate-induced disasters and substantial economic losses. This vulnerability underscores the importance of implementing carbon markets as a market-driven mechanism to incentivize emission reductions across various sectors, including energy, industry, and agriculture.

However, the country faces substantial barriers in establishing effective carbon markets, including limited technical expertise, inadequate institutional frameworks, and ambiguous policy goals. Addressing these challenges is essential for harnessing the benefits of carbon markets. Carbon markets present a significant opportunity for Pakistan to drive investments in clean technologies, renewable energy, and energy efficiency, thereby decoupling economic growth from environmental degradation. This is particularly important in the context of Pakistan's ongoing socio-economic challenges, including rising energy costs and foreign account deficits. As a signatory to the Paris Agreement, Pakistan has committed to reducing emissions by 50% by 2030, contingent on international financial support. Participation in carbon markets aligns with these commitments and supports global climate mitigation efforts, particularly through mechanisms outlined in Article 6 of the Paris Agreement.

Pakistan has initiated several carbon trading projects, such as the mangrove

plantation project in the Indus Delta, but has not yet fully leveraged its carbon market potential. Opportunities exist across various sectors, including livestock, forest management, clean energy, and agriculture, each offering substantial emission reduction potential. However, the implementation of carbon markets in Pakistan is hindered by several challenges, including the need for capacity building among stakeholders, limited data availability, gaps in knowledge of global standards, and the absence of a comprehensive MRV (Measurement, Reporting, and Verification) system.

To address these challenges and effectively establish carbon markets, Pakistan must overcome barriers faced by project developers, regulators, carbon exchanges, and buyers. The country's significant climate financing needs ranging from renewable energy transitions to energy efficiency and transport decarbonization further highlight the importance of carbon markets in mobilizing necessary resources. Despite the potential benefits, successful implementation will require a coordinated effort to build capacity, improve data transparency, and develop a robust carbon market infrastructure.

To effectively implement carbon markets in Pakistan, a series of targeted policy measures and strategic actions are recommended. Integrating sustainable energy and environmental considerations into macroeconomic policies is essential to simultaneously achieve economic growth, macroeconomic stability, and environmental enhancement, with carbon markets serving as a fundamental component of this integration. Collaborative efforts between public and private sectors should focus on identifying priority sectors for initial carbon trading activities.

Capacity building is crucial for stakeholders engaged in both voluntary and compliance carbon markets. This includes developing expertise in relevant standards, guidelines, registry processes, and implications of international agreements such as Article 6 of the Paris Agreement. To address data gaps and enhance the emission repository, legal frameworks must be established to protect hard-to-abate sectors from data leaks and preserve their competitive advantages.

To resolve policy and regulatory inconsistencies related to voluntary carbon markets (VCMs), it is recommended to implement a regulatory sandbox approach. This would facilitate consensus among stakeholders on pricing mechanisms, monetary flow, and processes for validation and auditing. Additionally, establishing baseline emission factors for sectors with substantial carbon market potential should be prioritized.

The Government of Pakistan has articulated several key plans and policies to support carbon market development. The 2021 Updated Nationally Determined Contributions (NDCs) underscore the role of carbon pricing instruments in attracting climate finance. Pakistan's engagement with Article 6 of the Paris Agreement and the updated National Climate Change Policy 2021 further supports this agenda by recommending measures such as carbon taxation and strengthening market infrastructure. Additionally, the Khyber Pakhtunkhwa Climate Change Policy and the Punjab Green Development Fund highlight carbon markets as a priority in their short- to medium-term action plans.

Finally, Unlocking the potential of carbon markets in Pakistan offers a significant opportunity to address climate challenges while expanding sustainable economic development. To realize this potential, it is crucial to steer and resolve regulatory, data, and economic obstacles through strategic policy interventions and international cooperation. By establishing a well-defined carbon market framework, Pakistan can align its climate objectives with its development goals, thereby enhancing its environmental performance and strengthening economic resilience against global climate challenges. This integrated approach is expected to reinforce Pakistan's environmental integrity and contribute to its long-term economic stability.



SECTION-I:

Introduction

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Introduction

1.1. Background

Driven by industrialization, urbanization, and socio-economic developments, the world has unlocked significant opportunities for its progress and innovation. However, from within these developments have emerged an undeniable challenge of climate change (Kyoji, Mori, and Matsushita, 2024). Led by the increased combustion from fossil fuels, industrial processes, deforestation and agricultural practices, poor waste management, and overconsumption, the world is now entrapped in a vicious cycle of climate catastrophes (Bashir et al., 2024). Not only impacting the environment, but climate crisis has also now led to serious socio-economic crisis that is now impacting the global developments. With each passing year, the intensity and urgency of climate crisis looms higher than ever before. This has led to record temperature changes, extreme weather events, and other factors that reminds an immediate need for climate action to avoid any irreversible changes (Akaev and Davydova, 2023).

Considering this emergency, the world is ramping up its actions by setting the emission reductions goals. Through different climate diplomacy agreements ranging from Kyoto Protocol to the Paris Agreement, not only the countries but many national entities, alliances, and corporations have set their goals and targets (Liu et al., 2020). While the emission-free processes and operations are still a distant prospect, the window to avoid these accelerating challenges has led to various commitments such as Nationally Determined Contributions (NDCs), Net-zero targets, and other similar international and national commitments (Den Elzen et al., 2019). The evidence indicates that to limit the adversaries of climate change, the global average temperature increase must remain below 1.5-degree centigrade, which requires achieving net-zero by 2050 (Anika et al., 2022). However, while science is clear, climate change has a cost and logistical needs that are imperative to driving this change (Zhou, Wilson, and Caldecott, 2021).

The power producers, corporates, developers, and other stakeholders need such effective ways that can finance clean technology, fair transition, and eventually put a cut to global emissions. Thus, transition from carbon-intensive to a low-carbon infrastructure requires shift and development of policies, technological progress, and innovative models that can finance this transition. Especially for developing countries like Pakistan, with unaffordable energy prices, high technology cost,

and limited fiscal space, this transition is even more difficult (Zia et al., 2020). This is all in the backdrop when there is also an increasing pressure on the corporates for “greening” their supply chain, as to show stronger compliance with the “export markets” regulations (Solomon et al., 2024).

“While many corporates are responding to this challenge, various support mechanisms are being explored that can provide them with alternate “economic engines” to bridge those gaps”

Among various instruments in the climate policy toolkit, this report particularly highlights the role of carbon markets for complimenting the climate efforts and accelerating the transition towards a low-carbon economy. The regional focus of this report is of Pakistan given its high vulnerability to climate change and limited fiscal space to enable climate action.

1.2 Carbon Pricing and the role of Markets

Carbon pricing is an environmental and an economic tool that puts a monetary cost on CO₂ and other GHG emissions (Simpa et al., 2024). One carbon credit is equal to one metric ton of carbon dioxide, or in some markets, carbon dioxide equivalent gases (CO₂-eq), and are bought and sold through international brokers, online retailers, and trading platforms. It is structured to internalize the social cost of climate induced damage such as air pollution, health hazards, biodiversity and etc. As an economic tools, the aim of carbon pricing is to incentivize the corporates, industries, and individuals to mobilize the financing for their clean energy initiatives by reducing their carbon emissions. This may include various forms such as those shown in **Figure 1 (Simpa et al., 2024)**.

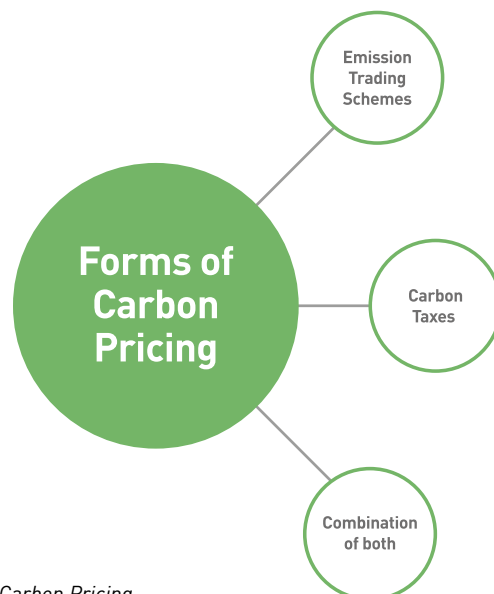


Figure 1 | Forms of Carbon Pricing

Now facilitating carbon pricing requires a system and framework under which the trading can be performed. This is what signifies the role of carbon markets.

“Carbon Markets are a trading system in which carbon credits (one credit equals one ton of CO₂ removed from the atmosphere) are traded either voluntarily or under a compliance of national, regional, or international regulatory requirement. The supply of carbon credits generally comes from the private entities working on low-carbon projects, or government programs that generate emission reductions. These credits are then bought by the companies/individuals that need to compensate for their high carbon footprints”.

Carbon markets are to play leading in transition to a low-carbon economy by either avoiding, reducing, or neutralizing emissions across the supply chains. Key prospects of the CMs are indicated in **Figure 2** (Wang et al., 2023 , Gao et al., 2019).

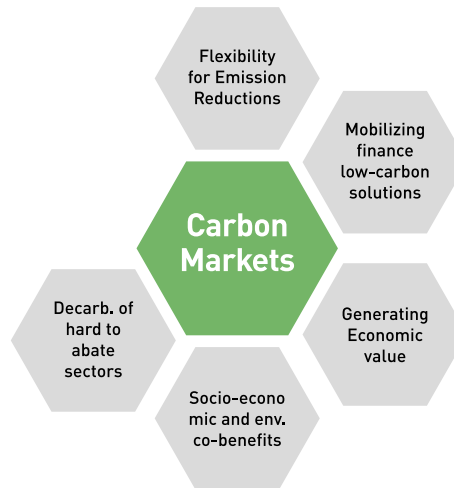


Figure 2 | Prospects of Carbon Markets in driving change

1.3 Carbon Markets: Scope and Classifications

A market is a place where Economic Agents can gather to facilitate the exchange of goods and services. Economic Agents are Buyer, sellers and regulators. Buyers generate demand, producers produce and supply, regulators ensure there are no externalities. The supply demand curve that determines how the prices are set after different demand signals are indicated in **Figure 3**.

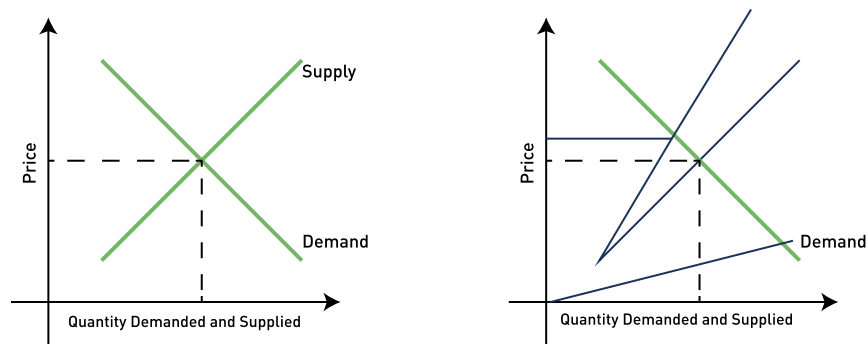
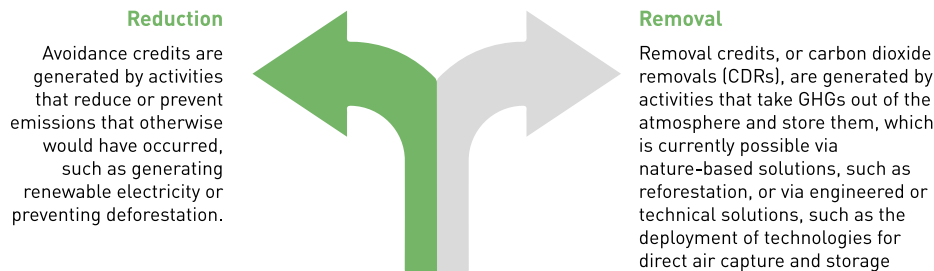


Figure 3 | Supply Demand Curve for price determination with varying market signals

Now carbon markets are a financing tool that enables an entity to trade the reduction and removal of the GHG emissions, in context also known as carbon credits. One carbon credit equals 1 ton of CO₂ either reduced or removed.



CMs offer a large landscape that can be utilized through different instruments, schemes, and mechanisms that exist either nationally or internationally. The buyers participating in these markets can use it for either voluntary (voluntary carbon markets) or compliant purposes (compliant carbon markets). The VCMs can support voluntary climate commitments, while the CCMs can also be used under the international agreements or laws such as emission trading systems, nationally determined contributions or other similar schemes. A broad landscape of different instruments for carbon markets is shown in **Figure 4**.

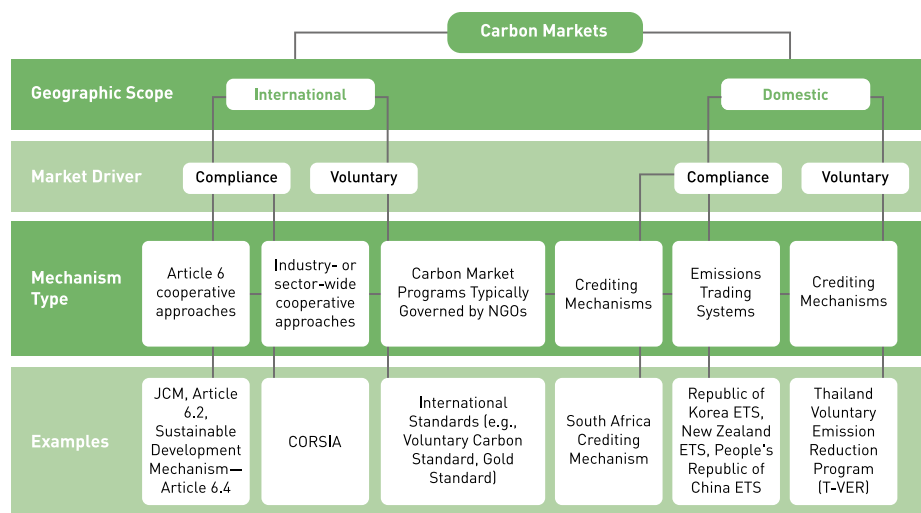


Figure 4 | Landscape of Carbon Market Instruments (Association Development Bank, 2019)

International compliance markets are divided into cooperative and industry- or sector-wide approaches. Cooperative approaches align with NDC targets for entire economies or specific sectors and don't impose targets on individual entities. Examples include internationally transferred mitigation outcomes (ITMOs) under Article 6 of the Paris Agreement, such as the Joint Crediting Mechanism (JCM). Industry- or sector-wide approaches, like CORSIA, apply a harmonized carbon market approach to specific global subsectors. International voluntary markets, utilized by private sector organizations for carbon neutrality or net-zero pledges, are self-imposed and non-binding. Known collectively as the voluntary carbon market (VCM), these markets operate without central governance, with most trade occurring internationally through business-to-business transactions and commodity exchanges.

Domestic carbon markets are being developed to support decarbonization efforts. These markets often include ETS, carbon taxes, and domestic crediting mechanisms, such as Thailand's Voluntary Emission Reduction Program (T-VER). An ETS sets a cap on emissions for specific sectors, allowing regulated entities to trade emissions allowances to stay under the cap. These allowances represent the right to emit 1 metric ton of CO₂ equivalent and are allocated either for free or through auctions. Entities exceeding their allowances are charged a fee, promoting the trading of allowances to avoid penalties. Domestic markets influence international carbon markets and VCMs, with linkages between international voluntary and compliance markets impacting supply and demand dynamics. Carbon markets in any of its forms are considered extremely important, especially in reaching the global goal of net-zero by 2050, further indicated in **Figure 5**.

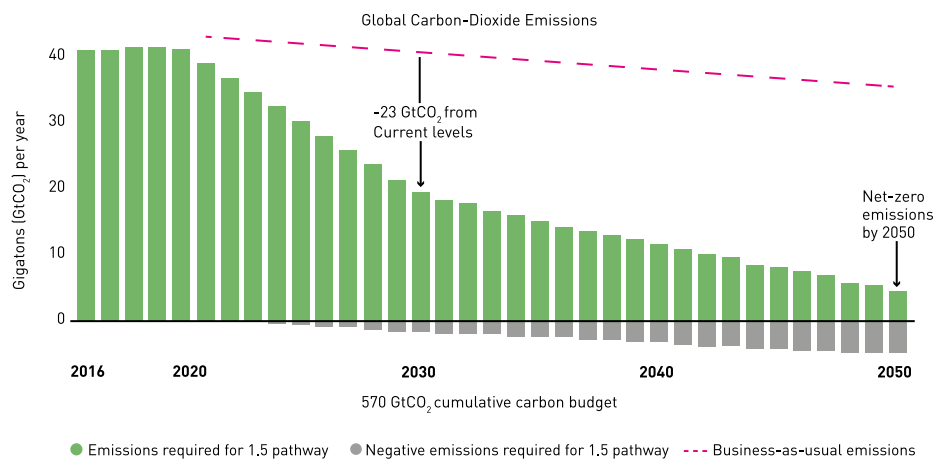


Figure 5 | Significance of Carbon Markets to achieve Net-zero target by 2050 (JPMorgan Chase & Co., 2024)

1.4 Significance of Carbon Markets for Pakistan

Being the eighth most vulnerable country to climate change and having a low carbon footprint, Pakistan has a substantial potential to generate carbon credits and earn revenues for climate change mitigation and adaptation (Otto et al., 2023). However, the country lags in implementing carbon market and trading mechanism as it has not yet been able to present feasible business plans due to limited capacity and technical expertise, insufficient institutional arrangements, and unclearly defined policy goals. Addressing these challenges demands a dedicated effort to address the existing knowledge gaps and build capacity of relevant organizations through cross learnings from leading market players. Justification and relevance of Pakistan for carbon markets is further illustrated in **Figure 6**.

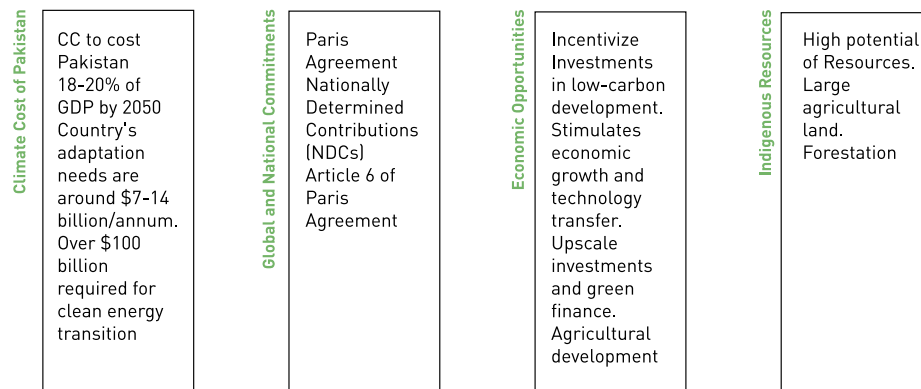


Figure 6 | Significance of Carbon Markets in Pakistan

1.5 Scope and Objectives of the Study

In the backdrop of opportunities and prospects highlighted in the previous section, a significant potential exists for mobilizing finance for low carbon development using carbon markets as a policy instrument. While Pakistan has participated in carbon trading through different initiatives such as Mangrove plantation project in Indus Delta which is selling carbon credits in global market, Pakistan has still not been able to harness its potential due to absence of a carbon market, and the country is still struggling to grapple with its complexities, understand ramifications, and develop an effectively implementable structure. The way forward would require developing an analytical and policy roadmap that can most effectively address the existing challenges and provide a way forward.

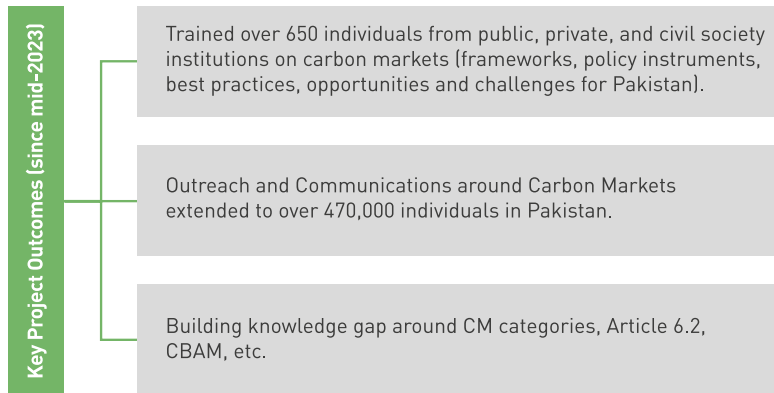
Box 1: SDPI-Embassy of Denmark Project on Implementation framework of Carbon Markets

Among global leaders who have efficiently addressed the climate and energy challenge, Denmark is one of the frontrunner and trend setters in sustainable development, ranking 4th in its international and national climate policy and governance. Key initiatives to address climate mitigation and adaptation include transition towards renewable energy (one of the leaders in wind energy market), climate resilience, climate smart agriculture, and implementation of carbon taxation. Thus, there is an ample opportunity for Pakistan to learn from an effective implementation of this market from Denmark. Denmark's climate policy tools include a carbon tax — introduced as early as 1992. The carbon tax is currently set at €24/tCO₂ and is levied on transport and non-district heating. It also participates in the EU-ETS which covers power generation and manufacturing industries. As per the statistics of OECD, 39% of Denmark emissions in 2021 were priced. Given this backdrop, Sustainable Development Policy Institute (SDPI) and Embassy of Denmark in Islamabad has initiated the project titled “**Unlocking Pathways to support implementation of Carbon Markets**” in Pakistan.

Key objectives of the project include:

- To develop and implement a comprehensive and holistic strategy for integrating sustainable and green solutions into economic policy by leveraging carbon credits as a key tool to reduce carbon emissions and promote climate security & sustainability.
- To align economic and environmental policies with multiple Sustainable Development Goals (SDGs), including SDG7 (Affordable and Clean Energy), SDG11 (Sustainable Cities and Communities), SDG12 (Responsible Consumption and Production), and SDG13 (Climate Action), to create a more sustainable and resilient economy through incentivization of carbon markets.
- To build capacity for developing, implementing and monitoring carbon markets and sustainability practices across the entire value chain, from policy makers and regulators to businesses and communities, with a focus on environmental, social, and governance (ESG) framework.

Since inception in 2023, the project has significantly contributed to Pakistan's carbon market discourse, as highlighted in Figure below.



Given the above context, this study provides an analysis of global trends in the carbon market industry, challenges and status quo of developments around carbon markets in Pakistan, and a roadmap for their effective implementation.

Key objectives of the study include:

- To provide an overview of the carbon market industry and learnings from global practices.
- To analyze the current state, opportunities, and challenges for effective implementation of carbon markets in Pakistan.
- To provide a roadmap and set of policy recommendations for equitable development using carbon markets as a financing tool.

An aerial photograph of a lush green forest with a winding river or stream cutting through it. The river is light blue and meanders across the landscape, surrounded by dense evergreen trees. The overall scene is vibrant and natural.

SECTION-II:

Global Carbon Markets: Tools, Instruments, and Standards

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Global Carbon Markets: Tools, Instruments, and Standards

2.1 Overview of Global Voluntary Carbon Markets (VCM)

Voluntary Carbon Markets are a space where private sector, corporations, and other businesses can engage for the transaction of carbon credits without any compliance, and to achieve the climate goals through voluntary efforts. Since the end of 20th century, the concept of reducing GHG emissions through carbon credits began, initiating the VCMs. Early efforts included companies like Applied Energy Services (AES) that funded the installation of different plants and trees. By the mid of 1990s, the American Carbon Registry (ACR) was established as the first U.S. registry for voluntary offsets. In the 2000s, the VCM expanded with major standards like the Verified Carbon Standard (VCS), Gold Standard (GS), ACR, and Climate Action Reserve (CAR) emerging to shape and regulate the market (Michaelowa, Shishlov, and Brescia, 2019). Now over the past 20 years, the VCMs have grown substantially, moving beyond just helping the corporates to also assisting the governments to achieve their nationally determined contributions (Asadnabizadeh and Moe, 2024).

VCMs picked pace particularly after 2013, with the year 2021 showing the largest issuance of VCM volumes ever (352 million Metric tons of CO₂eq). During the year 2022, VCMs channeled approximately \$1.3 billion in investments that led to reduction of around 161 Mt of GHG emissions. However, driven by the regional turmoil due to Russia-Ukraine conflict, the market experienced a downward trend in 2022 as compared to 2021. **Figure 7** indicates the trend and growth of VCMs since 2010. Although 2022 observed the downward trend, December 2022 was the month with highest credits issued ever.

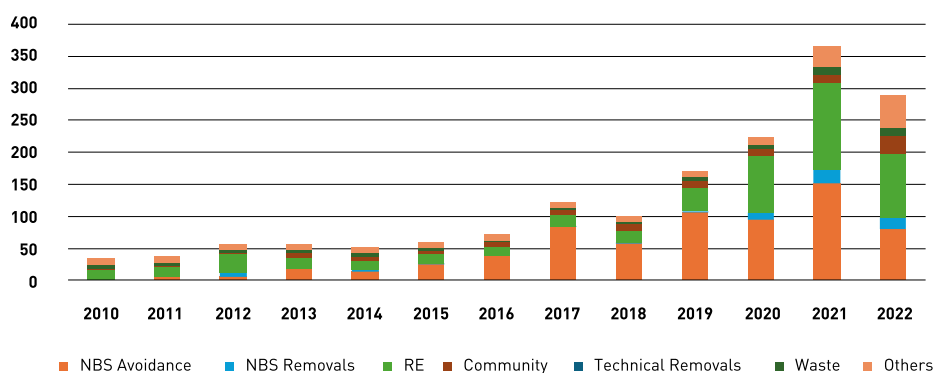


Figure 7 | Carbon Credits issuances for different categories [Source: Figure designed by authors based on data from Ecosystem Marketplace, 2024]

Following 2022, the year 2023 observed another contraction in the VCMs, experiencing a 56% decline in the volume of reported transactions (111 million tons). The difference between parameters around carbon markets in 2022 and 2023 are also indicated in **Figure 8**. Further details of this change as per project category is indicated in Annexure 1.

2022	2023	Percentage Change
Volume: 253.8 Mt	Volume: 110.8 Mt	Volume: -56%
Value: \$1.87 billion	Value: \$723 million	Value: -61%
Price: \$7.37	Price: \$6.53	Price: -11%

Figure 8 | Developments around VCMs in 2023

In the context of cumulative values, the VCMs reached a cumulative volume of \$10.8 billion by 2023. An analysis of data from credit standard registries reveals the supply and demand dynamics of carbon credits in the VCM. Despite challenges, 694 new projects were registered in 2023, with the majority being Household/Community Devices projects. Registrations in Forestry and Land Use, Renewable Energy, Agriculture, and Waste Disposal also increased, while Chemical Processes/Industrial Manufacturing saw the biggest decline. New registrations reflect a lengthy process of project proposals, public comments, and validation. Credit issuances typically occur near the initial sale, but end users often delay retiring purchased credits, reflecting market trends based on registrations, issuances, retirements, and transaction volumes.

In 2023, there was a 93 MtCO₂e decrease in credit issuances and a 2.6 MtCO₂e increase in retirements compared to 2022, indicating a tightening but still significant surplus of carbon credits. The largest declines in issuances came from Chemical Processes/Industrial Manufacturing and Energy Efficiency/Fuel Switching, while Household/Community Devices and Transportation credits increased. Retirements grew most in Forestry and Land Use and Chemical Processes/Industrial Manufacturing, suggesting a shift towards projects with clear carbon removal and emission reduction benefits. Total annual credit retirements have remained around 170 MtCO₂e, indicating steady demand, with potential for increased retirements if corporate buyers can use credits for Scope 3 emissions targets. The cumulative issuances and retirements from 2002-23 are further depicted in **Figure 9**.

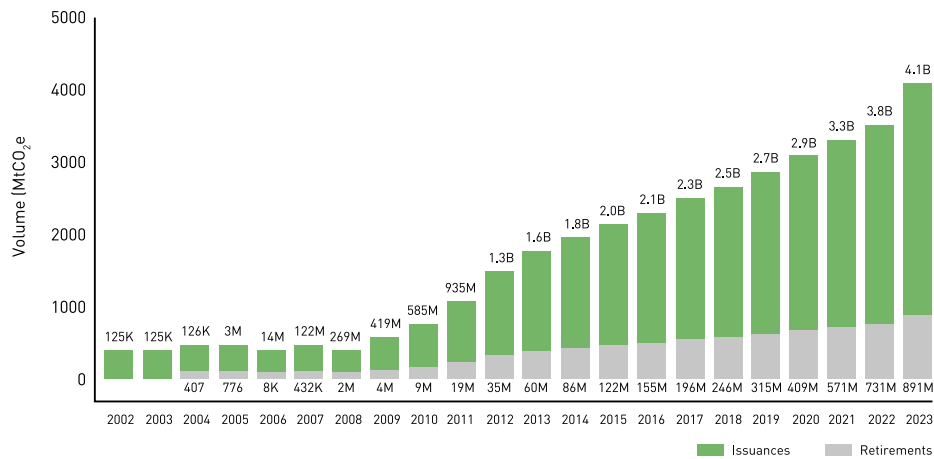


Figure 9 | Issuances and Retirement under VCMs (23-2002) [Source: Ecosystem Marketplace, 2024]

2.2 Trends in Carbon Pricing: Instruments and Values

The global shift towards low carbon development and emission reductions for meeting the goals of Paris Agreement require a continued support across the policy front, particularly for comprehensive carbon pricing. It is an essential component of the policy roadmap that is needed for the countries to support their NDCs and the Paris Agreement targets. This section of the report particularly focusses on the recent progress on the direct pricing of GHG emissions through carbon taxation, emission trading systems, and other carbon credit mechanisms.

Box 2: Pricing of Carbon Credits

The pricing of carbon credits depends on various factors, including but not limited to key aspects highlighted below:

- **Standard issuing the credits:** better-known, established standards (e.g. Verra, Gold Standard, American Carbon Registry, Climate Action Reserve) tend to command higher prices over lesser-known, newer standards.
- **Project methodology or type:** prices vary widely by methodology (e.g. afforestation, clean cookstoves, biochar, etc.), with renewable energy credits priced lowest, and engineered carbon credits priced highest.
- **Vintage or year the credits were issued:** generally, the newer the vintage, the higher the credit price.
- **Country or region where the project is located:** credits from the Global North and from countries with stable governments tend to cost more than those in the Global South or countries with unstable governments.
- **Additional co-benefits beyond carbon:** generally, the more co-benefits (such as positively affecting a community or biodiversity, measured in the form of Sustainable Development Goals), the higher the price of the carbon credit.
- **Whether it is nature-based or engineered:** generally engineered carbon credits cost more than nature based, since they are newer and therefore the cost curves have not come down yet.
- **Whether it is jurisdictional or project-based:** generally, jurisdictional credits (from a government) tend to be higher priced than those generated by private project developers, though there are few jurisdictional credits on the market.
- **Whether it is a carbon removal or carbon avoidance project:** carbon removal projects usually command a price premium over carbon avoidance projects.

Other factors, such as ratings by external ratings agencies or recent news stories: negative news coverage of specific projects tends to depress the prices for that specific project, poor ratings likely have a similar effect, though the carbon rating sector is new and not yet widely consulted

Despite progress in carbon pricing, more is needed to meet the Paris Agreement goals. Globally, there are now 75 carbon taxes and emissions trading systems (ETSs), with increasing adoption by middle-income countries and subnational governments. Sector-specific initiatives for aviation and maritime emissions have advanced, and the EU Carbon Border Adjustment Mechanism (CBAM) is now operational. However, global emissions covered by carbon pricing remain below 30%. Carbon price levels have shown mixed trends, with most jurisdictions' prices still insufficient to meet Paris targets. In 2023, revenues surpassed USD 100 billion for the first time. Governments are also looking to cover nontraditional sectors like maritime transport and waste and are implementing various carbon pricing instruments and using carbon credits to offset liabilities.

In Asia, carbon pricing is gaining momentum in middle-income countries. Indonesia launched its ETS for coal-fired power plants at the beginning of 2023. India established the legal basis for a carbon market, including an ETS, in 2022 and developed the institutional framework over the past year. This intensity-based ETS builds on an existing energy efficiency scheme in emission-intensive industrial sectors and has the potential to evolve into a compliance carbon market. A mapping of carbon taxes and ETS across the world are indicated in **Figure 10**.

As of April 1, 2024, carbon taxes and ETSs covered nearly 13 gigatons of CO₂ equivalent, about 24% of global GHG emissions. In 2023, covered emissions rose by over 400 million metric tons of CO₂ equivalent. This increase includes emissions from Australia's new ETS and new or reinstated carbon taxes in various countries. However, successful carbon pricing policies, like those in the EU, California, and South Africa, reduce emissions over time, potentially decreasing the share of globally covered emissions. For instance, the EU ETS was expanded in 2024 to include maritime transport, increasing coverage by 78 MtCO₂e, while simultaneously reducing the cap by almost 180 MtCO₂e to enhance ambition.

New carbon taxes and ETSs under consideration in Brazil, India, and Türkiye could cover about 3% of global GHG emissions. However, even with these additions, global coverage is unlikely to exceed 30% in the near term. This underscores the ambitious target of the Global Carbon Pricing Challenge announced at COP26, aiming to cover 60% of global emissions by 2030. Existing instruments, like the Washington Cap-and-Invest Program, show the practical limits of policy coverage, covering around 70% of the state's emissions.

The EU Carbon Border Adjustment Mechanism (CBAM), operational since October 2023, imposes a carbon price on imports equivalent to the EU ETS, covering 0.15% to 0.6% of global emissions. This initiative aims to level the playing field between EU producers and international exporters. Payments under the CBAM will start in 2026, prompting countries like India, Indonesia, and Türkiye to consider carbon pricing to reduce compliance costs. Australia, Canada, Japan, and the UK are also exploring similar mechanisms. To avoid high administrative costs and trade barriers, streamlined and harmonized reporting requirements are essential.

ETS markets generated about USD 76 billion in auction and free allocation revenues in 2023, a 5% increase from 2022. These revenues are primarily derived from the EU ETS, the Western Climate Initiative (covering California and Quebec), and Korea's ETS. The EU ETS alone accounted for nearly 75% of the total revenue, amounting to about USD 56 billion. Meanwhile, revenues from carbon taxes increased by 2%, totaling approximately USD 30 billion. Notable contributors included Canada, Germany, and the UK. The combined revenue from ETS and carbon taxes surpassed USD 100 billion for the first time in 2023, as shown in **Figure 11**.

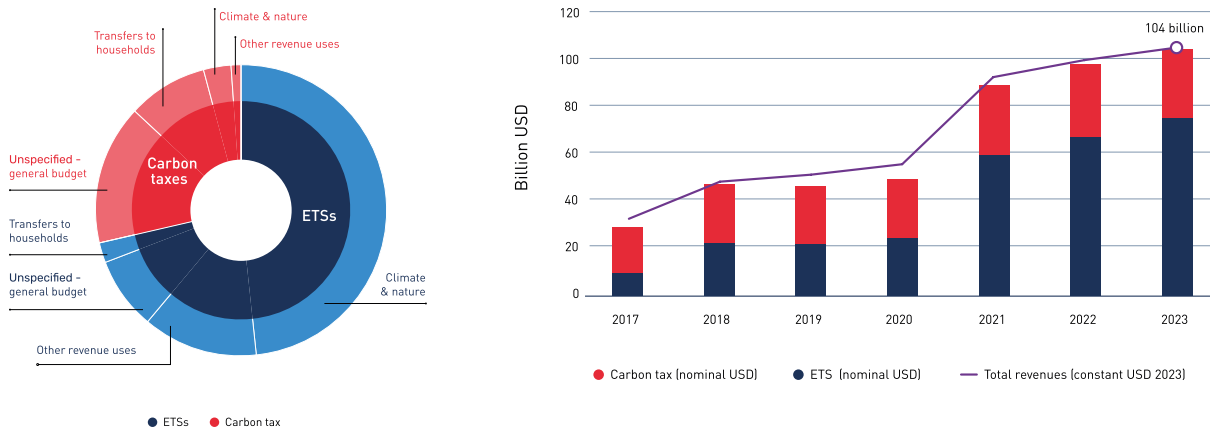
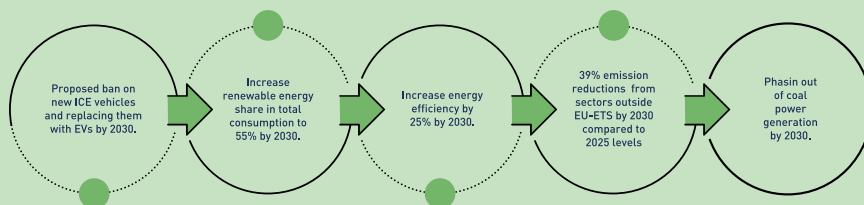


Figure 11 | Cumulative revenues from carbon tax and ETS & the end-use areas

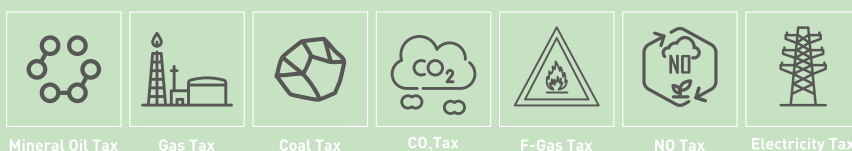
As shown in Figure 8 (right), the majority of carbon revenue has historically been directed towards green and development projects or the general budget. In 2022, over half of the global carbon revenue was allocated to green projects. The EU, for example, mandates that at least 50% of ETS revenues be used for climate and energy purposes, leading to significant investments in green transport (20%), energy efficiency (17%), and renewable energy (12%). About a quarter of the global carbon revenue goes into general budgets, as seen in countries like France and the UK. Additionally, 10% of the revenue is redistributed to households and businesses disproportionately affected by carbon pricing, with countries like Austria and Canada returning a substantial portion to households. In Canada, approximately 8 out of 10 households receive more money back than they spend on the carbon tax.

Box 3: Denmark’s Carbon Trading Landscape: A Case Study

While the increase in carbon taxation presents a challenge for economic growth, Denmark has demonstrated through its effective policies that it is achievable. Through a leading role in policy support for mitigation and adaptation, the country has notably reduced its greenhouse gas emissions. Denmark’s carbon policy had the component of carbon tax as early as 1992 when it was an early adopter of the carbon tax that included transportation and district non-heating. Since then, it has significantly decreased its greenhouse gas emissions and has set an ambitious target of reducing emissions by 70% by 2030 (1990 as baseline) and targeting a net-zero by 2050. Denmark’s intermediary goals for reducing emissions were evidently also stricter than the reinforced targets under EU green deal, aiming for a 55% reductions in emissions by 2030 as compared to the 1990 level. Addition targets include measures highlighted in Figure.



In 2020, the taxation in Denmark stood at \$26/ton placing the country at upper end of the carbon pricing schemes across the world. The explicit carbon pricing comprising of emission trading system costs and the carbon taxes encompassed almost 68% of the GHG emissions in 2021. Additionally, fuel excise taxes, serving as an implicit method of carbon pricing, accounted for 44.4% of emissions in 2021, maintaining the same level as in 2018. Furthermore, Denmark is an active participant in the EU Emission Trading System (EU ETS), which encompasses power generation and manufacturing sectors, together responsible for 26% of the country's greenhouse gas emissions. Companies operating within these sectors are required to purchase carbon permits valued at €98 per ton of CO₂ as of mid-August, unless they qualify for free allowances. While power producers do not receive complimentary permits, manufacturing industries benefit from 30% of their permits being allocated free of charge, primarily benefiting major emitters in sectors such as oil refining, cement, bricks, and glass production. Moreover, road transport faces various fuel excise taxes, contributing to an effective carbon price of €197.7 per ton of CO₂. Based on these taxation measures, the OECD estimated that in 2021, around 39% of Denmark's carbon emissions from energy were taxed above €60 per ton of CO₂, a value that was deemed necessary to meet the Paris Agreement goals. For climate mitigation, the key taxes that were introduced included are depicted in Figure.



Going forward in June 2022, the political agreements in Denmark further increased the carbon taxation values. The carbon tax for Non-EU ETS companies was increased from €24 per ton of CO₂ to €100 by 2030. This positioned the country amongst others with highest values globally. Within the EU ETS framework, the companies had to pay a total of €150 per ton of CO₂ (comprising a €50 carbon tax and an estimated ETS allowance price of €100). As a key strategy of achieving its decarbonization goals, the Danish council on climate change proposed that the carbon price will be increased to \$200-250/ton by 2030.

A rural landscape featuring a vibrant green field in the foreground. In the middle ground, there are several trees of varying sizes and colors, some with yellow blossoms. A small building is visible behind the trees. The background shows a hazy horizon with mountains under a sky filled with soft, white clouds. Power lines stretch across the upper right portion of the image.

SECTION-III:

Carbon Markets in Pakistan: Prospects, Opportunities, and Challenges

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3.1 Need for Carbon Markets in Pakistan

Accelerating climate action and finance to support low-carbon development is a mutual aspiration of global development, especially in the backdrop of increasing vulnerability of under-developed and developing countries to climate change. To address this challenge, implementing carbon markets is essential as it provides a market-driven mechanism to incentivize emission reductions across various sectors such as energy, industry, and agriculture. Being the eighth most vulnerable country to climate change and having a low carbon footprint, Pakistan has a substantial potential to generate carbon credits and earn revenues for climate change mitigation and adaptation. However, the country lags in implementing carbon market and trading mechanism as it has not yet been able to present feasible business plans due to limited capacity and technical expertise, insufficient institutional arrangements, and unclearly defined policy goals. Addressing these challenges demands a dedicated effort to address the existing knowledge gaps and build capacity of relevant organizations through cross learnings from leading market players. Key aspects that signifies the importance of this theme for Pakistan are explained below:

3.1.1 Pakistan's Climate Action

While Pakistan contributes to around 0.88% of global Greenhouse Gas emissions, it is still ranked as the 5th most vulnerable country to climate change.

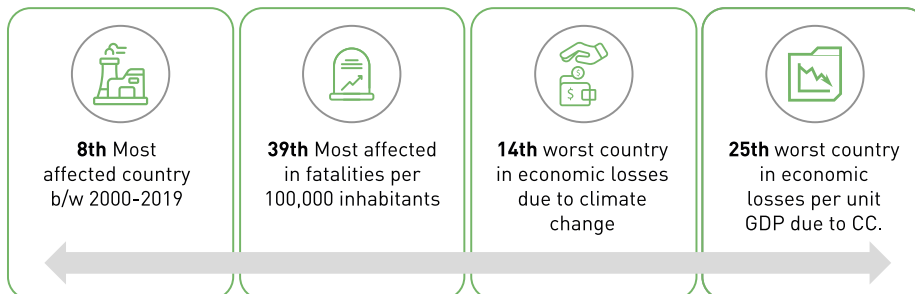


Figure 12a | Pakistan's Climate Vulnerability

Climate change is not only a threat to environment, but also the economic security of Pakistan, as it leads to energy, food, and water insecurity, infrastructure loss, health, and other livelihood impacts. Over the past years, the intensity of climate-induced disasters in Pakistan has significantly increased. With over 1700 deaths and 12000 injuries, world bank reported the economic losses and reconstruction in flood-hit areas of Pakistan in 2022 to be over USD 40 billion. Over the past years, the country has also faced intense heat waves. During May 2024, temperatures rose above 52 degrees Celsius (125.6 degrees Fahrenheit) in Pakistan's southern province of Sindh, the highest reading of the summer and close to the country's record high.

Although Pakistan is currently contributing to less than 1% emissions, the past years have observed an increasing emission intensity. The total emissions in 2022 from different sectors of Pakistan were around 525 Mt with sectoral distribution highlighted in **Figure 12b**.

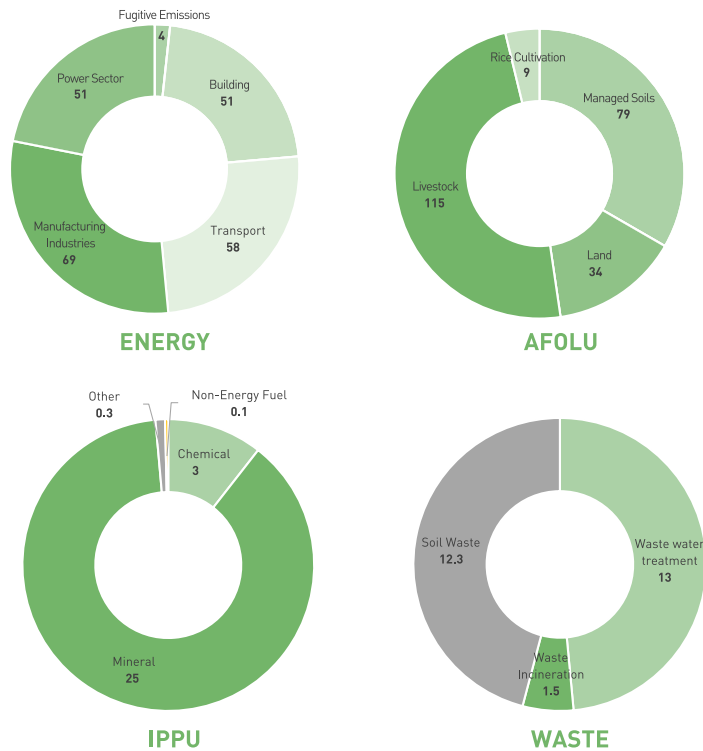


Figure 12b | Sub-sectoral distribution of GHG emissions of Pakistan [Source: Authors own calculations]

3.1.2 Economic case and need for decoupling economic growth with environmental degradation

Over the past years, particularly in the backdrop of polycrisis, Pakistan's economy has been under a socio-economic crisis. With increasing energy prices for both industries and residential consumers, the cost of doing business is becoming challenging. Further with the increasing foreign account deficit,

Pakistan needs to scope mechanisms that can bring foreign investments and currency into the country, and carbon markets could be a low-hanging fruit. The country needs to avoid taxation/subsidies, quotas, as they create market inefficiencies. The one solution is to create another market which can potentially and effectively reduce the damage as further indicated in **Figure 13**.

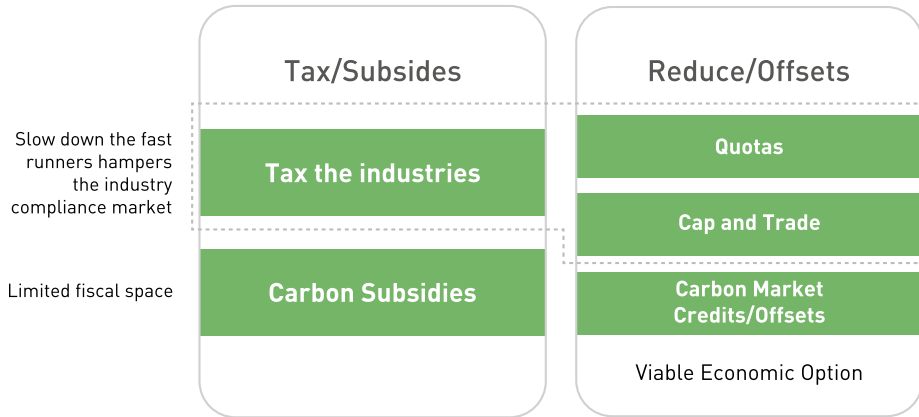


Figure 13 | Economic case for alternate financing mechanisms in Pakistan

By establishing a carbon market, Pakistan can incentivize and promote investments in clean technologies, renewable energy projects, and energy efficiency initiatives. This not only helps in reducing carbon emissions but also stimulates economic growth, job creation, and technology transfer. Given that Pakistan’s economy is already vulnerable to climate change, it needs to couple its economic growth with environmental sustainability. For corporates, industries, and other project developers, this would require providing an alternate engine of economic growth that ensures environmental sustainability while further enabling them to climb up the corporate ladder. This is where carbon markets would play an essential role. With low-carbon development to be the heart of future developments in country, **Figure 14** further highlights the need for coupling of economic growth with environmental degradation.

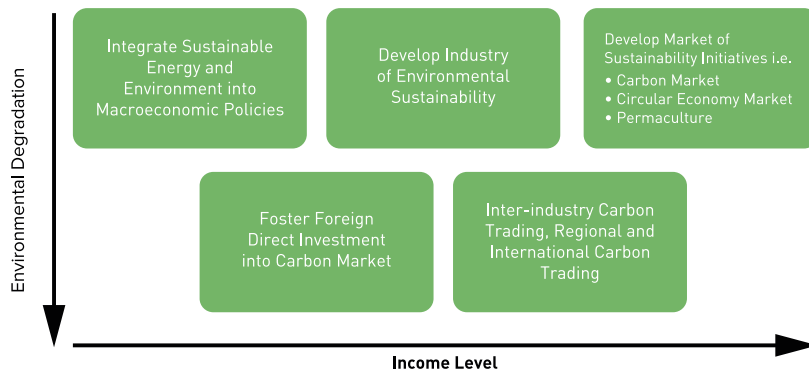


Figure 13 | Coupling of economic growth with environmental degradation

3.2 Pakistan’s Climate Diplomacy and Global Commitments

Pakistan is a signatory to the Paris Agreement, a global effort to combat climate change and limit global warming to preferably 1.5 and well below 2 degrees Celsius. Different commitments Pakistan has ensured under the framework of Paris Agreement are highlighted below.

3.2.1 Pakistan’s Nationally Determined Contributions

In 2021, Pakistan submitted its updated Nationally Determined Contributions (NDC) aimed at reducing 50% of emission reductions by 2030 (using country’s own resources) based on availability of international finance and 15% based on country’s own resources. An overview of Pakistan’s NDCs is depicted in **Figure 15**.

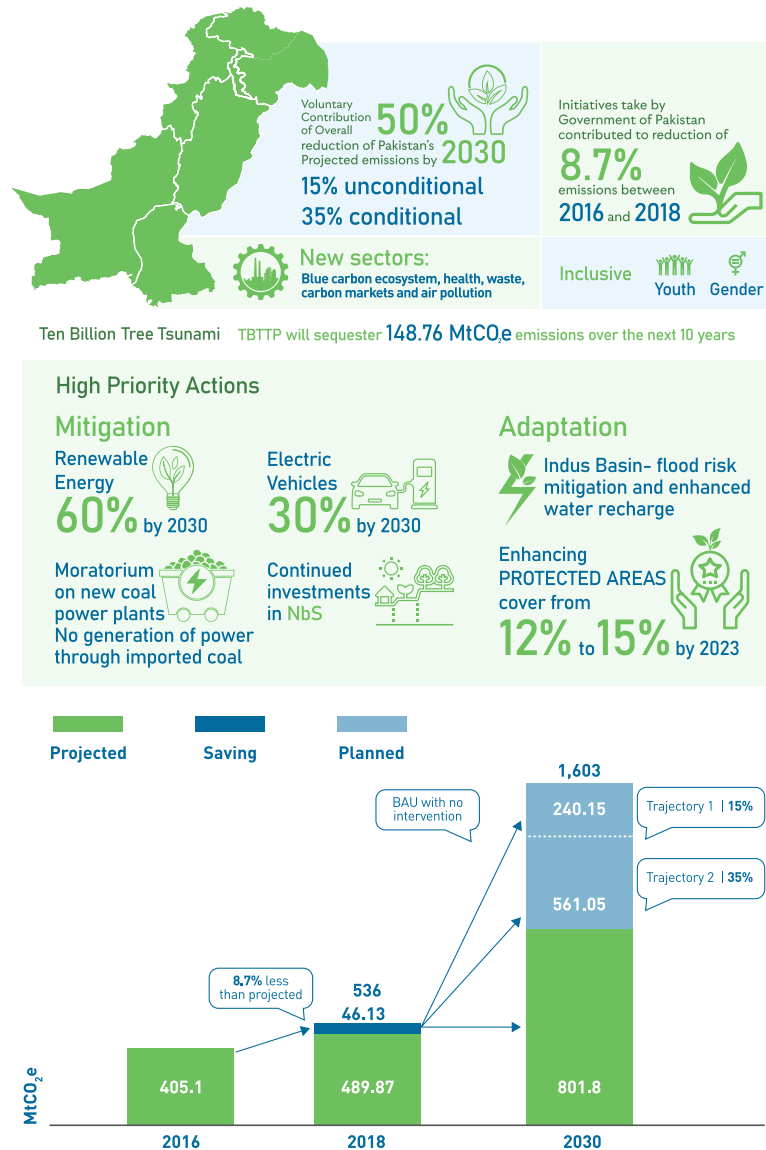


Figure 15 | Overview of Pakistan’s Updated NDCs [Source: UNFCCC, 2022]

The priority actions for Pakistan’s climate mitigation and adaptation are also enlisted in Annexure 4. Under NDCs as well as announcements made under COP27, Pakistan has also committed that it is considering employing financing instruments based on ambitions provided in Article 6 of the Paris Agreement that focusses on carbon markets. Article 6.2 allows countries to trade emission reductions and removals with one another through bilateral or multilateral agreements and Article 6.4 will create a global carbon market overseen by a United Nations entity. Engaging in carbon markets aligns with these commitments and allows Pakistan to actively participate in the global efforts to mitigate climate change. Its importance has also been identified in a number of policy interventions and plans of the government targeting climate mitigation and adaptation, attached as **Annexure 2**. Other climate diplomacy commitments by Pakistan are summarized in **Annexure 3**.

3.2.2 Decarbonization of hard to abate sectors and export regulations

While Pakistan’s export-oriented sector is making some efforts, especially the textile given the consumer demand for green products, the case currently does not exist for hard to abate sectors such as cement or Iron & Steel. Without external pressure, decarbonization efforts in these industries are not being mobilized due to the high cost of alternate solutions. For such industries, carbon markets provide an alternate economic engine to foster decarbonization efforts. Further, with introduction of global initiatives, such “European Union’s Carbon Border Adjustment Mechanism (CBAM)”, Pakistan is going to face an increasing pressure of reducing the carbon footprint of its exports. Especially given that over 44% of Pakistan’s exports are going to Europe, the country has less than seven years to make necessary adjustments before CBAM will be applied. A timeline of CBAM implementation is further indicated in **Figure 16**.

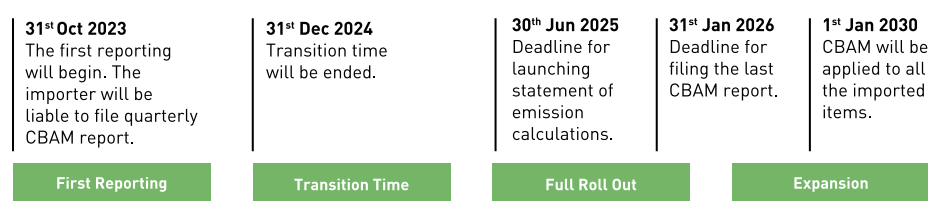


Figure 16 | Timeline for the roll-out of Carbon Border Adjustment Mechanism (CBAM)

3.2.3 Financing Needs for Low-Carbon Developments in Pakistan

Despite its low contribution to global CO₂ emissions, Pakistan has been on the receiving end of climate vulnerabilities, which are expected to cost it 18%-20% of the GDP by 2050. Pakistan's NDCs describe country's adaptation needs of \$7-14 billion/annum and \$101 billion only for clean energy transition. Carbon markets can help mobilize these resources for both private and international finance flow, and reduce costs to provide the necessary space to smooth the low-carbon transition. This would also provide an economic case for the i) energy sector particularly RE projects being curtailed due to low demand and high circular debt, ii) foster corporate transition towards net-zero especially when the demand of greening the product supply chain is being created due to global pressure, particularly for the corporate sector.

Table 1 | Financing needs for climate adaptation and mitigation actions in Pakistan (as described under NDCs)

Sector	Approximate Financing Needs
Renewable Energy Transition	<ul style="list-style-type: none"> • Coal buyout around \$18 billion (as per NDC commitments). • Replacement of coal with solar (\$13 billion). • Power distribution (\$26 billion) • Hydropower development (\$23 billion) • Solar uptake (\$15.12 billion) • Wind energy uptake (\$20.5 billion)
Energy Efficiency	<ul style="list-style-type: none"> • EE in industries (\$9.8 billion) • EE in buildings (\$5.5 billion)
Decarbonization of Transport	<ul style="list-style-type: none"> • Electrification of transport (\$29-30 billion) • Transition cost of stock (\$27 billion) • Transition cost of Infrastructure (\$2-3 billion) • Mass transit systems (\$27-28 billion).

The investment needs for energy transition in Pakistan are depicted in Table 1 while **Figure 17** identifies the overall climate financing needs of Pakistan as per the country climate development report. Based on the statistics highlighted above, carbon markets have a significant potential to bridge the financing needs for both mitigation and adaptation actions in Pakistan.

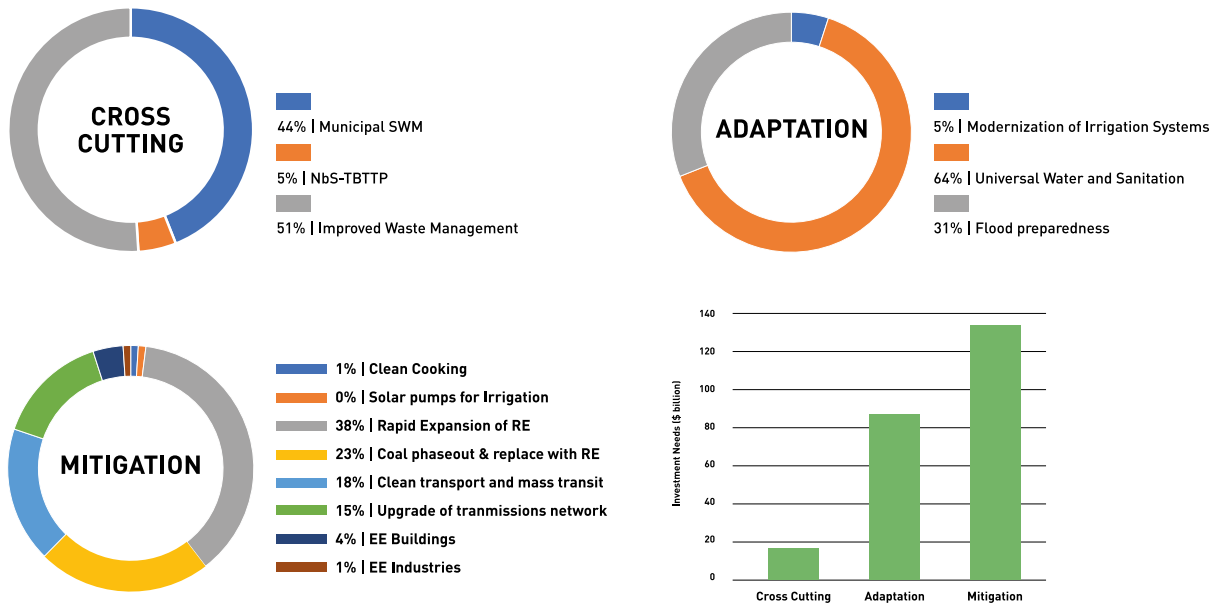


Figure 17 | Climate financing needs of Pakistan [World Bank Group, 2023]

3.3 Sectoral Assessment of Carbon Trading in Pakistan: Opportunity Windows

Pakistan has participated in carbon trading through different initiatives such as Mangrove plantation project in Indus Delta (targeting \$12 billion in revenue) which is selling carbon credits in global market. However, given a high potential, Pakistan has still not been able to harness its potential due to absence of a carbon market, and the country is still struggling to grapple with its complexities, understand ramifications, and develop an effectively implementable structure. An overview of different projects that are under the carbon trading for Pakistan are depicted in **Figure 18**.

Registered Projects (9)	Projects in Pipeline (25)
RE – Wind (6)	RE – Wind (14)
Waste/Composting (1)	RE – Solar (6)
NBS (1)	NBS Removal (1)
RE – Biomass (1)	Waste – Landfil Gas (1)
	RE – Hydro (1)
	Household Clean Water (1)
	Agriculture – Rice (1)

Figure 18 | Overview of projects under carbon trading in Pakistan

Further Table 2 highlights the potential of carbon market reduction and removals in Pakistan in various sectors.

Table 2 Potential of Carbon Trading under different sectors of Pakistan		
Sector	Reduction Potential	Rationale
Livestock	109 MtCO ₂ eq	<ul style="list-style-type: none"> • Methane Capture • Avoids high-potency GHG emissions • Potential co-benefits (e.g., improved air/water quality, additional energy or economic opportunities for farmers)
Forest Management	-	<ul style="list-style-type: none"> • Control and Management in Deforestation. • Provides additional natural carbon sink • Potential co-benefits (e.g., green jobs, habitat/ biodiversity impacts) • Suitable for Labor Abundant and Land abundant country.
Clean Energy	220 MtCO ₂ eq	<ul style="list-style-type: none"> • Energy efficiency • Fuel switching • Renewable energy • Low-carbon energy solutions
Households	40 MtCO ₂ eq	<ul style="list-style-type: none"> • 60 percent households use Firewood • Avoids widespread emissions from inefficient domestic activities. • Potential co-benefits (e.g., improved air quality, sustaining local ecosystems)
Fugitive Emissions	3.94 MtCO ₂ eq	<ul style="list-style-type: none"> • Methane Capture • Ozone Depleting substances • Waste Heat Recovery
Afforestation	-	<ul style="list-style-type: none"> • Additional natural carbon sinks • Potential co-benefits (e.g., green jobs, habitat/ biodiversity impacts) • Potential co-benefits (e.g., improved air quality, sustaining local ecosystems).
Agriculture	120 MtCO ₂ eq	<ul style="list-style-type: none"> • Potential for carbon storage • Potential co-benefits (e.g., conservation funding, green jobs, habitat/biodiversity impacts)
Mangroves Sindh Delta Blue	-	<ul style="list-style-type: none"> • Additional natural carbon sinks • Potential co-benefits (e.g., green jobs, habitat/ biodiversity impacts) • Potential co-benefits (e.g., improved air quality, sustaining local ecosystems).

Institutionalization and Framework for Carbon Markets in Pakistan

This report discusses in detail that while the carbon markets (VCMs) can operate independently, however, given that under the Article 6 of the Paris Agreement and NDC targets also rely on them as central point of whole process, the government of Pakistan has to play a defining role. Defining and understanding this role is critical, especially when it comes to the private sector engagement process. Even under article 6.2, the government needs to facilitate the VCM projects, setting their types, nature and if or not they will be developed under the corresponding adjustments. Additionally, the governments may also set up frameworks to oversee these projects, and even participate in the project development themselves.

As for Pakistan (as of 2023), the institutional governing framework involves the **Ministry of Climate Change and Environmental Coordination acting as the lead organization**, which is currently in the processing of developing the guidelines for trading under the carbon markets. The MoCC&EC mainly aims to come as the regulator and enabler, and not as an investor in the VCM process. The engagement of MoCC&EC in VCM activities inter-relate directly with Pakistan's updated NDC targets which describes an estimated annual cost of \$7-14 billion for adaptation and around \$101 billion for clean energy transition by 2030. Combined with other transitional costs, the GoP has linked meeting the 50% of 2030 reduction target conditional on the availability of international finance, coming from a number of financing instruments including the carbon markets.

While Pakistan's NDCs have laid down the mitigation plan in some areas, there is a need to do a detailed analysis of the complete mitigation pathway to develop an effective NDC financial plan. Hence, it becomes paramount that MoCC in collaboration with line ministries describe a detailed plan on the sectors that will be financed through the VCM window and what sectors from bilateral/multilateral financing. At the same time, it is equally important to take stock of the projects and activities surrounding VCMs that are already invested in. This would result in avoiding the duplication of resources while at the same time mobilizing finance for NDCs. These avoidance and duplication aspects (also underlined under the Article 4.13 of PA) have also demanded that Pakistan sets up its national repository to keep the track of emission reductions. This is already in process through collaboration with the world bank in Pakistan.

Along with MoCC, there are various organizations and development partners that are working around the efficient pathways for CMs in Pakistan. The National Disaster and Risk Management Fund (NDRMF) is engaging with both public and private sector institutions in developing their required capacity. Similarly, apart from the joint project of Embassy of Denmark and SDPI, many development partners and diplomatic missions are supporting the government of Pakistan such as USAID, UK, etc.

In the functional carbon markets, even the private sector is to play a key role and influence the market in a number of ways as highlighted in **Figure 19**.

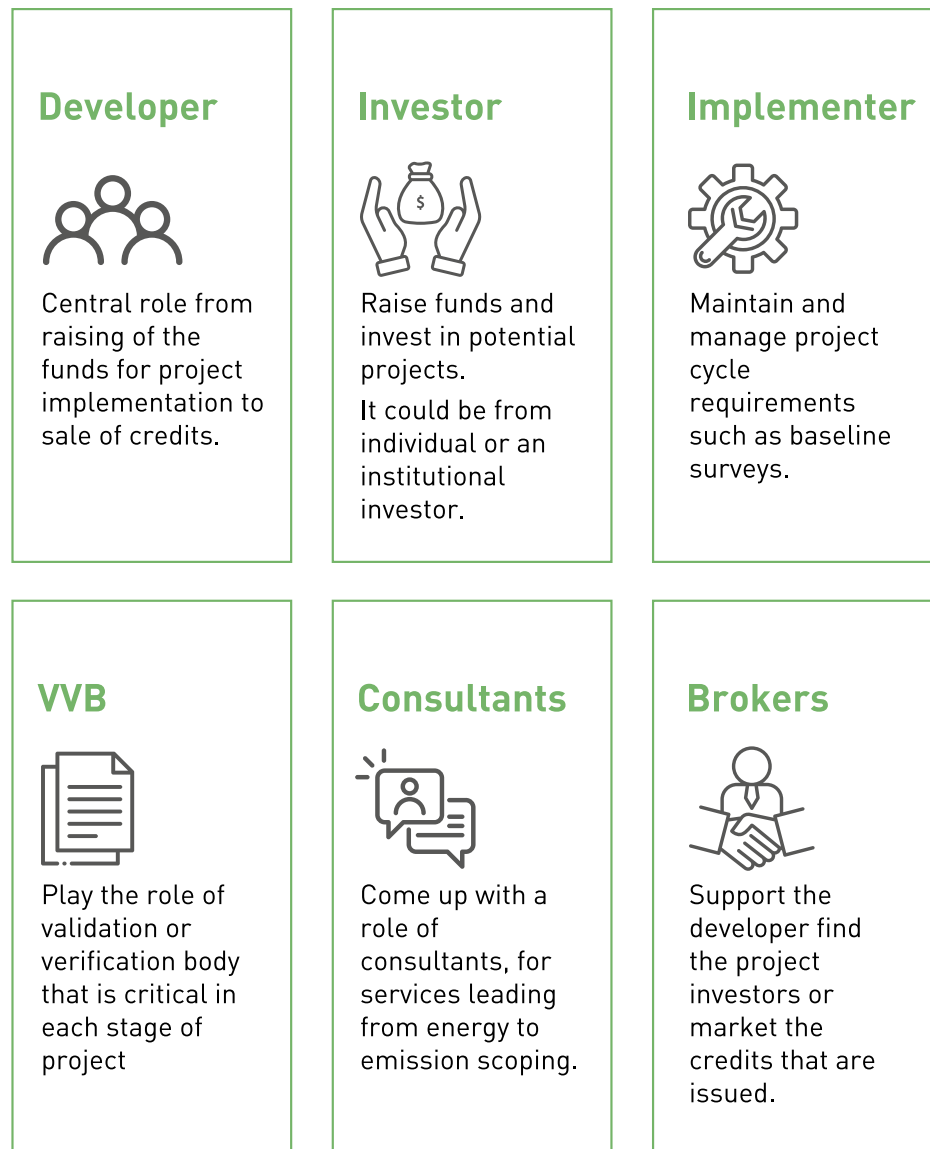


Figure 19 | Potential roles of private sector engagement in the VCM cycle

Project Cycle

Establishing a carbon markets project involves a series of steps, each crucial for ensuring that the project meets regulatory standards and achieves its goals of reducing greenhouse gas (GHG) emissions. This project cycle integrates compliance with recognized bodies such as Verra (Verified Carbon Standard - VCS) and other carbon standard organizations.

The cycle begins with Project Identification and Conceptualization. This initial phase focuses on identifying potential projects that can effectively reduce GHG emissions and generate carbon credits. During this stage, preliminary assessments are conducted to explore opportunities in various areas like renewable energy, energy efficiency, or forestry. A project concept note is then developed, outlining the project’s goals, scope, and its feasibility. This concept serves as a foundational document that guides subsequent steps.

Following conceptualization, the Feasibility Study and Preparation phase evaluates the project's technical, financial, and environmental viability. Detailed feasibility studies are performed, including baseline emissions analysis and environmental impact assessments. These studies are critical in assessing whether the project aligns with carbon market standards such as those set by Verra (VCS), the Clean Development Mechanism (CDM), or the Gold Standard. The outcome of this phase is a comprehensive feasibility report and an initial Project Design Document (PDD), which outlines the methodologies and expected emissions reductions of the project.

Once feasibility is established, the focus shifts to Project Design and Registration. This stage involves developing a detailed plan for the project's implementation and ensuring its compliance with carbon market requirements. The PDD is finalized with specific details on the project's methodologies, emissions reduction targets, and monitoring plans. This document is then submitted for validation to an independent verifier, ensuring it meets the rigorous standards set by bodies like Verra. Upon successful validation, the project is registered with a carbon standard body, making it eligible to generate carbon credits.

In the Implementation and Monitoring phase, the project is executed according to the planned activities. Robust monitoring systems are established to track the project's performance and the actual emissions reductions achieved. These systems must align with the approved methodologies and standards of the carbon market body overseeing the project, such as Verra. Continuous monitoring and data collection are crucial for demonstrating the project's effectiveness and ensuring transparency.

Following implementation, the project undergoes Verification and Certification. This step involves engaging a third-party verifier to assess the reported emissions reductions and confirm their accuracy. Verification reports are prepared and submitted to the carbon standard body for certification. Once the reductions are verified and certified, the project is eligible for the issuance of carbon credits, which can then be traded or sold in the market.

With the credits issued, the Issuance and Trading phase begins. The verified credits are registered in the carbon market registry, making them available for trade. The project proponents can then explore market opportunities to sell or trade these credits, generating financial returns that support the project's sustainability and further emissions reduction efforts.

Throughout the project cycle, maintaining transparency and communication is essential. The Reporting and Communication phase ensures that all stakeholders are kept informed about the project's performance, emissions reductions, and financial outcomes. Regular updates and clear communication help in building trust and maintaining compliance with reporting requirements set by the carbon market authorities.

Finally, the project undergoes Evaluation and Continuous Improvement. This involves a thorough assessment of the project's outcomes, effectiveness, and any challenges encountered. The evaluation helps in understanding the project's impact and identifying areas for improvement. Lessons learned from this process are applied to refine future project planning and execution, ensuring that subsequent projects are even more effective in achieving their climate mitigation goals.

3.4 Challenges and Need Assessment in Pakistan

Establishing carbon markets in Pakistan involves navigating numerous challenges across both the public and private sectors. These challenges must be addressed to create a functional and effective system. For carbon markets to enable climate action in Pakistan, there is a definite need for a broad array of players that must be involved, and ensuring integrity of such engagements will be crucial for an effective framework, as in the case of all financing instruments. Key challenges in carbon markets implementation in Pakistan can be divided into four categories i.e., i) Project Developers-costs involved in its quality, how to ensure the quality, what would be demand for project developers who are developing these carbon projects, etc.), ii) Regulators, registries, evaluators, and monitors-which includes integrity concerns of the relevant entities, ensuring market confidence or confidence of buyers and sellers, etc, iii) Carbon Exchanges, brokers, and traders-market complexity because the commodity we are going to trade in this market is a different kind of commodity which is needed to be measured, which is needed to be monitored, which is needed to be scientifically assessed before we put it into the market), and iv) Buyers.

The primary challenge which carbon markets in general face in any economy is the concept that they are generally leading to absolute reduction in the emissions. A major challenge that under a complex legal or regulatory landscape and the consequences for making environmental claims (greenwashing in other context), the private sector such as high emitters in Pakistan (cement, power sector, etc) will face the criticism of using it as a means of “offsets” rather than the emission reductions. On one hand where it might allow the potential threat for industry to continue polluting, it may also subject the government’s increased reliance on the private sector to reduce emissions, rather than placing strict regulatory interventions to reduce emissions in line with its updated NDCs 2021. Given this debate, trading of carbon credits under both voluntary and compliance markets provide challenges in its conceptualization for Pakistan as well as its practical execution. The scoping of these challenges is critical especially for key stakeholders such as policy makers to conduct a holistic analysis after which it can be effectively implemented. This section provides a detailed analysis of potential challenges and the need assessment for Pakistan.

Policy Provisions and Alignment with local needs

As of 2024, Pakistan is in an initial phase with limited work done around strong policy and regulatory frameworks for the implementation of carbon markets. During this stage, the policy makers need to ensure that this process is a piece of a broader ecosystem requiring mutual and supportive efforts that can enable an equitable transition. Either voluntary or compliance, this would require different instruments such as market forces or policy provisions. However, this all operates in a clean policy framework and guidelines which are yet to be established. Moreover, the governance structures are different for both voluntary – where markets are governed by private standards or compliance – where they are governed by a central regulatory authority. However, currently a number of capacity and knowledge gaps exist for both public and the private sector on how to leverage them more efficiently.

Market Integrity and Design

While Pakistan is still in the nascent stages of developing the market, its scale

and impact will be determined by the supply and demand. Despite the many certifications and verification processes that will exist, the quality of credits is expected to remain contested. Once the market opens, in the short to medium-term, the role of non-state entities, especially the private sector would require it to invest in its climate mitigation activities. For markets to grow, bringing transparency in this process and improving confidence would be essential. Further, putting a mechanism for improving the integrity would require developing clean and common standards as well as a scrutiny process from a wide range of stakeholders.

Pakistan's updated NDCs and the voluntary markets

Although the voluntary markets do not have to operate under the Paris Rulebook, it still forms a structure under which VCMs may operate. The government of Pakistan is yet to decide how the VCMs can operate in the country, and more importantly for contributing towards the NDC targets. This operation would require defining: i) rights to generate and the legal status, ii) using and owning them, iii) tracking, and iv) taking any revenue from the credit sales. Providing clear signals at the very early stage is going to be important to ensure the quality of carbon credits

Lack of Coordination Between Federal and Provincial Governments

Effective environmental management and climate action in Pakistan require synchronized efforts between federal and provincial authorities. However, there is often a lack of alignment and coordination in policy and regulatory frameworks. This misalignment can lead to fragmented efforts, making it difficult to implement carbon market regulations consistently across the country. The lack of a unified national strategy can impede the development and functioning of carbon markets.

Regulatory and Policy Framework Gaps

Pakistan currently lacks a comprehensive regulatory framework specifically designed for carbon markets. This includes clear regulations, incentives, and compliance mechanisms essential for the establishment and operation of carbon markets. The absence of clear policies creates uncertainty and discourages investment and participation in carbon markets. This uncertainty can slow the progress of establishing effective carbon markets.

Limited Institutional Capacity

The public sector departments in Pakistan often do not have the necessary expertise or resources to manage and regulate carbon markets effectively. This includes a lack of trained personnel and adequate infrastructure to oversee carbon trading activities. Weak institutional capacity can lead to ineffective enforcement of regulations, inadequate monitoring of emissions, and poor support for market activities, which are critical for the success of carbon markets.

Funding Constraints

Establishing and operating carbon markets require significant financial investment in infrastructure, capacity building, and incentive mechanisms. However, Pakistan is facing considerable challenges in securing the necessary funding. Without sufficient financial resources, initiatives to develop carbon

markets may stall or fail, limiting the country's ability to leverage carbon trading as a tool for reducing emissions.

Public Awareness and Engagement

There is a general lack of understanding and awareness about carbon markets among the public and stakeholders in Pakistan. Many are unaware of how carbon markets work and the benefits they can offer. Low levels of awareness can lead to resistance or apathy towards carbon market initiatives. This can hinder their acceptance and success, as public and stakeholder buy-in is crucial for the effective implementation of such systems.

Focus on Short-Term Incentives

Many businesses in Pakistan view carbon markets primarily as a means to obtain financial incentives rather than as a long-term strategy for climate mitigation. This short-term focus can undermine the broader goals of carbon markets. This perspective can lead to superficial engagement where companies participate mainly for immediate benefits rather than committing to substantial and sustained emissions reductions.

Lack of Technical Expertise and Awareness

Many companies, especially small and medium-sized enterprises (SMEs), lack the technical knowledge and expertise required to participate effectively in carbon markets. They may be unfamiliar with the processes and technologies involved in reducing emissions and trading carbon credits. The lack of technical expertise can result in low participation rates and missed opportunities for both emissions reductions and financial gains from carbon markets.

High Transaction Costs and Market Entry Barriers

The costs associated with entering and participating in carbon markets can be prohibitively high for smaller businesses. This includes expenses related to certification, verification, and compliance with market regulations. High transaction costs and entry barriers can deter businesses and other potential participants from engaging in carbon markets, limiting the market's overall inclusiveness and effectiveness.

Market Volatility and Uncertainty

Carbon markets can experience significant price volatility and regulatory uncertainty, which can make it difficult for businesses to plan and invest confidently in emissions reduction projects. Such uncertainty can discourage investment and long-term commitment to carbon market participation, reducing the market's effectiveness in driving emissions reductions.

Limited Access to Financing

Many businesses in Pakistan, particularly in the private sector, struggle to secure the financing needed to invest in the technologies and processes required for effective participation in carbon markets. Without adequate access to finance, businesses may be unable to make the necessary investments to reduce emissions and engage fully in carbon trading activities.

Data Availability and Quality

Reliable and consistent data on emissions and reductions are crucial for the functioning of carbon markets. However, data quality and availability are often lacking in Pakistan. Poor data quality can undermine the credibility of the carbon market, hinder accurate pricing and trading of carbon credits, and complicate the monitoring and verification processes.

Cultural and Societal Attitudes

There may be cultural resistance or skepticism towards the concept of carbon markets in Pakistan. Many people may not see the relevance of carbon markets to their local context or may be skeptical of their benefits. Negative cultural and societal attitudes can impede the acceptance and success of carbon market initiatives. Without societal support, it is challenging to implement and sustain carbon markets effectively.

Integration with Existing Climate Initiatives

Aligning carbon markets with NDCs and international climate initiatives can be complex and challenging. There can be overlaps or conflicts with other climate policies and programs. Lack of integration can lead to inefficiencies, duplication of efforts, and missed opportunities for synergy. This can reduce the overall effectiveness of climate action initiatives in Pakistan.

A scenic landscape featuring snow-capped mountains, a turquoise lake, and yellow trees in the foreground. The text is overlaid on the image.

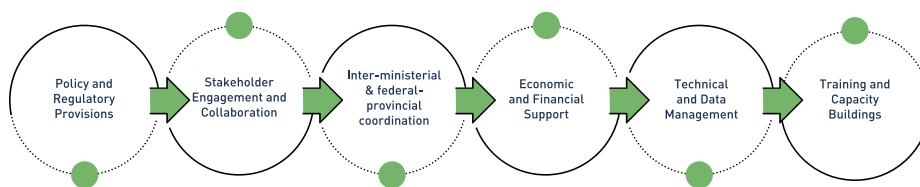
SECTION-IV:

Policy Recommendations and the Roadmap for Effective Implementation of Carbon Markets in Pakistan

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Policy Recommendations and the Roadmap for Effective Implementation of Carbon Markets in Pakistan

With the 2030 agenda on cards and the target of limiting global temperature increase to preferably 1.5 degrees, deep emission reduction pathways and strategies are required across all sectors of the economy. This includes emission reductions as well as neutralizing them with the removals. Carbon markets provide this opportunity for Pakistan to finance its low carbon development and incentivize the emission reduction both nationally as well as through collaboration with other non-state actors and countries through international transfer of the credits that are generated. Based on the discussion around trends, kinds of mechanisms and instruments, challenges, opportunities and best practices highlighted in the previous sections, this study identifies the priority reform areas which must be tapped for the development of an effective carbon market in Pakistan. Figure A provides a summary of these key measures.



Policy and Regulatory Framework

While Pakistan's ministry of climate change and environmental coordination is in the process of developing the guidelines for trading under the carbon markets, it is going to the first step forward. It would remain extremely critical to harmonize the market regulation and define how different aspects such as Pakistan's NDCs, article 6 and the coordination of provide sector would play its role.

Policy Recommendations

- With the updated NDCs, the Ministry of Climate Change and relevant working group departments must scope and put in place the NDC targets that can be achieved using Article 6.2 or VCMs as a financing tool and engagement mechanism with the private sector.
- The government must ensure that the projects that were already in the process of carbon trading (such as Delta) with the investments of foreign investors will be assured their trading rights.
- The Ministry of Climate Change, in collaboration with GCISC and other line ministries, should scope out the sectors with comparatively higher potential for trading and develop an indicative list of projects that can undergo development. More detailed sectoral assessment for such projects can be undertaken with detailed data sources and emission accounting.
- With NDC targets approaching near, the Government of Pakistan needs to develop the national repository and provide an enabling environment for the private sector by laying out procedures and guidelines for the registration of projects in that repository.

With VCM guidelines about to be introduced by the Ministry of Climate Change and Environmental Coordination, there is a need to expedite the process through which the projects under different financing vehicles (such as VCMs, Article 6, climate finance, or other bilateral/multilateral financing) will be defined. A central repository may also be created containing a list of projects that are either in the implementation or planning stage.

Timeframe	Action Item	Key Stakeholders
Medium	Scope the NDC targets that can be achieved through VCMs	MoCC&EC, GCISC, other line ministries.
Medium	Ensure that ongoing projects are kept intact	MoCC&EC
Short	Scope the sectors or sub-sectors with highest potential	MoCC&EC, GCISC, other ministries, and leading academic institutions.
Short	Develop national repository and guidelines for project registrations	GCISC, MoCC&EC
Short	Develop a centralized repository of projects in both implementation and planning stage.	MoCC&EC, provincial governments and departments.

Federal and Provincial Coordination

Since the 18th amendment to constitution of Pakistan, many subjects such as energy or management of resources has been a provincial subject. Further, given high subjectivity to climate catastrophe in Pakistan, the climate is being tacked under various ministries leading from energy, commerce, finance, and the lead ministry on climate change. For an efficient market design, there is need to develop strong coordination mechanisms not only between federal ministries, but also between federal and provincial departments.

Policy Recommendations – Within Government

- Given the importance of climate change across all development sectors of Pakistan’s economy, a well-coordinated approach is critical for making it an integral part of each relevant department. For effective carbon markets, the inter-ministerial gap and coordination need to be strengthened. In this regard, the role of the newly established Climate Change Authority in Pakistan is paramount.
- After the 18th amendment to the constitution of Pakistan, the provinces and their authorities need to be strengthened to take benefits from the carbon market regime. Mitigation strategies tailored to the need of each province must be developed, including their emission inventories. These inventories can then be integrated with national registries for developing a comprehensive tracking system.
- Develop a coordination mechanism between the federal and provincial governments that can open communication channels and joint decision-making, leading to a unified strategy that balances provincial and federal interests. The mechanism and concerning bodies should also work to resolve conflicts, ensuring a common approach to regulations.

Timeframe	Action Item	Key Stakeholders
Short	Strengthen the communications between federal ministries on their role in carbon market regime	Climate change authority, MoCC&EC, provincial departments, other line ministries
Short	Develop Province tailored mitigation strategies, including provincial inventories.	Provincial governments.
Medium	Develop communication mechanisms for unified strategy of tapping into the carbon markets.	CSOs, federal and provincial climate ministries.

Policy Recommendations – Other Stakeholders

- Open candid and collaborative lines of communication between key stakeholders (owners, partners, developers, buyers, agencies, etc.) to ensure efficient working of the markets.
- Civil Society Organizations (CSOs), along with research entities and firms working around providing data and quality ratings, should collaborate and produce robust and credible analysis of climate projects and their impacts. This may also include guidance from SBTi, VCMI, and ICVCM.
- The CSOs, in collaboration with local and national financing institutions, MDBs, and DFIs, should advocate for credit programs that can benefit indigenous people and local communities. The process for technical assistance and finance should be accessible as a priority to people with limited capacity.

Timeframe	Action Item	Key Stakeholders
Short-term	Open line of communications between public and private sector, in close coordination with subject experts	Private sector, Public sector, CSOs.
Medium-term	Produce deep and critical analysis of carbon trading projects and their impacts	CSOs, Academia, private sector.
Medium-term	Advocate for programs that can support indigenous people and communities.	DFIs, MDBs, CSOs, CBOs, district governments.

Economic and Financial Support Mechanisms

The integrity and sustainability of any financial instrument aimed for low carbon development such as carbon market rely on its significance in the policy documents and decision-making process of the country. Carbon markets needs to be integrated into the sustainable energy and environment into our macroeconomic policies so that we have economic growth, macroeconomic stability, and environmental improvement at the same time.

Policy Recommendations

- For attracting investments and interest in project development, the Government of Pakistan should address financial challenges by developing support mechanisms such as risk-sharing mechanisms, subsidies, or grants.
- Establish a mechanism that can develop a trade-off between the benefits of selling credits to attract climate finance or to meet its ambitious NDC targets for 2030. This evaluation, however, requires a long-term strategy for achieving NDCs and engagement with Article 6 to be eligible for transferring internationally.
- The framework for the carbon market in Pakistan should be aligned with its SDG goals, including benefits going towards local communities and underlying objectives such as poverty reduction, community empowerment, and local environmental protection.

Timeframe	Action Item	Key Stakeholders
Medium-term	Develop support mechanisms such as risk-sharing mechanisms, subsidies, or grants for project developers	SBP, Financing institutions, PSX, SECP.
Medium-term	Develop a long-term decarbonization and financial pathway for NDCs. The pathway should identify the involvement of VCMs	MoCC&EC, GCISC, line ministries.
Long-term	Align carbon market framework for broader SDG goals such as social and community benefits	CSOs, CBOs, provincial governments, MoCC&EC.

Training and Capacity Building

Capacity building of the stakeholders is currently identified to be one of the biggest challenges in an effective implementation of carbon markets in Pakistan. This capacity deficit is present not only in the public, but also the private sector, CSOs, and relevant consultants working in Pakistan. While some stakeholders have a basic understanding of the carbon credits, there is very limited information, when we go deep down with regards to project development, project implementation and project execution. There are certain requirements that are said to be compliant in the standards, and most developers do not have capacity for that purpose, which projects are going to get registered, and which are not.

Policy Recommendations

- Launch country-wide campaigns and programs to bridge the capacity gaps around technical knowledge, corporate culture, and market expertise required for the successful integration of carbon markets.
- Develop the capacity of stakeholders around both voluntary and compliance carbon markets in Pakistan and its underlying elements, including current standards, rules, guidelines, Article 6 implications, registry processes, etc.
- Upscale and promote capacity building programs through research institutions for enhancing capacity around accounting mechanisms, market regulations, registries, and the interlinkages of carbon markets with the Paris Agreement. Such programs should also build the technical skills of stakeholders, thereby contributing to a transparent and efficient market landscape.
- Enable cooperative mechanisms where research institutions such as SDP, resource futures, or universities can serve as the center for research on carbon markets. Such centers can produce the next generation of experts to support the continuous improvement in knowledge.

Timeframe	Action Item	Key Stakeholders
Short-term	Launch training programs at various lev-els (federal, provincial, district) to bridge the knowledge gaps	CSOs, development partners, diplomatic missions.
Short-term	Establish cooperative mechanisms where research institutions can support government, private sector, and can serve as center of research.	GoP, MoCC&EC, TEVTA, NECTA, MoE, HEC.

Data Management and Technical Build-up

In the carbon market regime, carbon registry is a major component. However, developing this require collecting a vast set of emission data which many subsectors in Pakistan are not willing to provide. There is even limited transparency on the available carbon trading projects. On private sector's end, any climate effort on their part for which they are not compensated is tricky to go through, especially for hard to abate sectors. Also, Pakistan currently does not have baseline emission factors for every sector & sub-sector and until the time country does not, it will not be possible to develop an effective market.

Policy Recommendations

- To address the data gaps for building an emission repository, there is a need to provide a legal cover for hard-to-abate sectors, which shields them from data leaks and protects their competitive advantages.
- Prioritize developing baseline emission factors, especially for sectors where we can foresee a better transitional opportunity for carbon markets.
- To address the challenges in policy and regulatory inconsistency around VCMs, there is a need to initiate regulatory sandboxing to bring consensus among all stakeholders of the value chain on price mechanisms, monetary flow, validation, and auditing.
- The government of Pakistan and its line ministries should gather support from ICVCM, SBTi, and VCMI to ensure that their guidelines are supported by the country's laws and regulations, leading to effective and integrated sustainable development.

Timeframe	Action Item	Key Stakeholders
Short-term	Provide a legal cover to hard to abate sectors for emission reporting	EPA, MoCC&EC, Ministry of industries and production.
Short-term	Developing of baseline emission factors	GCSIC
Medium-term	Initiate the process of regulatory sand-boxing for bringing stakeholder consensus.	GoP, CSOs
Medium-term	Integrate climate integrity in country's laws and regulations, leading to integrated sustainable development.	GoP, ICVCM, SBTi, VCMI, MoCC&EC

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Annexures

Annexure 1: VCM Transactions per Project Categories									
CATEGORY	2022			2023			Percent Change		
	Volume (MtCO ₂ e)	Value (USD)	Price (USD)	Volume (MtCO ₂ e)	Value (USD)	Price (USD)	Volume	Value	Price
Forestry & Land Use	113.0	\$1.1 B	\$10.14	36.2	\$351.3 M	9.72	-68%	-69	-4
Renewable Energy	92.7	\$386.1 M	\$4.16	28.6	\$111.1 M	3.88	-69%	-71	-7
Chemical Processes/ Industrial Manufacturing	13.3	\$68.5 M	\$5.14	12.2	\$50.2 M	4.10	-8%	-27	-20
Household/ Community Devices	9.1	\$77.6 M	\$8.55	9.9	\$76.6 M	7.70	+10%	-1	-10
Energy Efficiency/Fuel Switching	6.6	\$35.6 M	\$5.39	9.4	\$34.4 M	3.65	+43%	-3	-32
Agriculture	3.8	\$41.7 M	\$11.02	4.7	\$30.6 M	6.51	+24%	-26	-41
Waste Disposal	6.2	\$44.9 M	\$7.23	1.5	\$10.9 M	7.48	-77%	-76	+3
Transportation	0.18	\$770 K	\$4.37	-	-	-	-	-	-

Annexure 2: Government of Pakistan's key plans and policies supporting carbon markets		
Sr. No	Plan/Policy	Description
1	Updated Nationally Determined Contributions (NDCs) 2021	Given that Pakistan has attracted limited international financing for climate mitigation or adaptation, " Carbon pricing instruments " have been identified under NDCs as a key component to attract climate finance. While some progress has been made for this, especially under the CIACA program, there is a need to substantially increase the capacity building, outreach, and bridging knowledge gap through cross-country learnings. Under NDCs, Pakistan also mentioned that it is trying to incentivize industries to go for decarbonization through carbon trading between them.
2	Article 6 of the Paris Agreement	Under NDCs as well as announcements made under COP27, Pakistan has committed that it is considering employing financing instruments based on ambitions provided in Article 6 of the Paris Agreement that focusses on carbon markets . Article 6.2 allows countries to trade emission reductions and removals with one another through bilateral or multilateral agreements and Article 6.4 will create a global carbon market overseen by a United Nations entity.
3	Pakistan's updated National Climate Change Policy 2021	Pakistan's updated NCCP 2021 recommends the implementation of "Carbon tax on the use of environmentally detrimental energy generation from fossil fuels", "Strengthening the carbon market through NCEC secretariat at MoCC", "identifying national institutional needs to develop capacity for carbon trading ", "engaging provinces to setup carbon pricing infrastructure ", and "creating awareness of corporate sector on Sustainable development and carbon markets".
4	Khyber Pakhtunkhwa Climate Change Policy and Punjab Green Development Fund	The action plan of KPK Climate change policy and Punjab Green Development Fund has also prioritized implementation of carbon markets in short- to medium-term planning.

Annexure 3: Pakistan's Climate Diplomacy Targets			
Theme	Goals/Targets	Action/Milestone	
		Timeline	Agency
Recent Declarations signed by Pakistan at COP28			
Coalition for high ambition multilateral partnership (CHAMP) to address climate action.	To enhance cooperation with our subnational governments in the planning, financing, implementation, and monitoring of climate strategies, with a pursuit to limit temperature increase to 1.5-degree centigrade.	<ol style="list-style-type: none"> 1. To enable subnational governments to contribute to further enhancing NDCs, where applicable, ahead of COP30 in 2025, and, where available and appropriate, integrate local and territorial baseline information, targets and actions for emissions mitigation and adaptation across all sectors and industries. 2. Include the Voluntary National Review process of the 2030 Agenda for Sustainable Development, with a view to ensure that national policy frameworks support and, where appropriate, can accelerate ambitious multilevel climate action. 	Government of Islamic Republic of Pakistan.
UAE Declaration on Climate and Health	It underscores the urgent need to confront the connections between climate change and health.	<ol style="list-style-type: none"> 1. Strengthening the development and implementation of policies that maximize the health gains from mitigation and adaptation actions. 2. Facilitating collaboration on human, animal, environment and climate health challenges, such as by implementing a One Health approach. 3. Improving the ability of health systems to anticipate, and implement adaptation interventions against, climate-sensitive disease and health risks. <p>Further details of the declaration at: https://www.cop28.com/en/cop28-uae-declaration-on-climate-and-health</p>	Government of Islamic Republic of Pakistan.

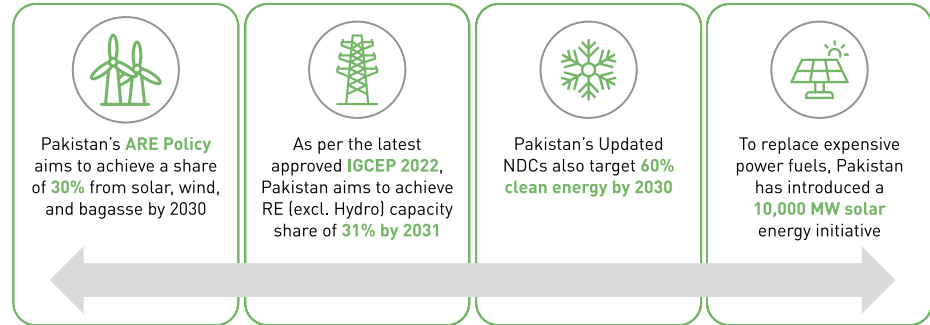
<p>COP28 UAE declaration on Agriculture, Food, and Climate</p>	<p>To expedite the integration of agriculture and food systems into our climate action and, simultaneously, to mainstream climate action across our policy agendas and actions related to agriculture and food systems.</p>	<ol style="list-style-type: none"> 1. Scaling-up adaptation and resilience activities to reduce the vulnerability of all farmers, fisherfolk, and other food producers to the impacts of climate change. 2. Promoting food security and nutrition by increasing efforts to support vulnerable people through approaches such as social protection systems and safety nets. 3. Strengthening the integrated management of water in agriculture and food systems. <p>Timeline: Review the collective (with other countries) progress next year at COP29 with a view to considering next steps in 2025 and beyond.</p> <p>Further details available at: https://www.cop28.com/en/food-and-agriculture</p>	<p>Government of Islamic Republic of Pakistan.</p>
<p>COP28 UAE declaration on Just Transitions</p>	<p>To working collaboratively to support just and inclusive transitions that advance gender equality and the goals of the enhanced Lima Work Program on Gender and its Gender Action Plan.</p>	<ol style="list-style-type: none"> 1. Incorporate the human rights of women and girls in just transition efforts. 2. Encourage gender-responsive strategies on mitigation and adaptation. 3. Implement, as appropriate, gender-responsive budgeting, policy and planning, and develop legislation and policy. 4. Identify funding sources and opportunities with a view to continuing to enhance access to funding for women and girls. 5. Promote measures to reduce, redistribute and value unpaid care and domestic work. <p>Timeline: Reconvene for a dialogue at the 31st UN Climate Change Conference to report on the implementation of these commitments.</p> <p>Further details at: https://www.cop28.com/en/cop28-gender-responsive-just-transitions-and-climate-action-partnership.</p>	<p>Government of Islamic Republic of Pakistan.</p>

Key Declarations signed at other COPs			
US led Global Methane Pledge (signed at COP26)	To cut methane emissions in an effort to tackle climate change.	To cut methane emission by 30% by the end of this decade.	Government of Islamic Republic of Pakistan.
Loss and Damage Fund (COP27 and 28)	Pakistan, as Chair of the Group of 77 and China, galvanized support for establishment of the Fund in COP 27 in Sharm el Sheikh, first by having it placed on the Agenda of the Conference, and then pushing for a consensus agreement.	Loss and Damage Fund was operationalized at COP28. A Loss and Damage Fund would enable developing and vulnerable nations to draw upon adequate monetary resources to protect themselves from the adverse effects of the climate crisis — the only way to make adaptation measures effective	Government of Islamic Republic of Pakistan.
Global Shield (launched at COP27)	Coordinated by Group of Seven president Germany and the Vulnerable Twenty (V20) group of climate-vulnerable countries, the Global Shield launched at COP27 aims to rapidly provide prearranged insurance and disaster protection funding after events such as floods, droughts and hurricanes hit.	The Global Shield against Climate Risks cooperation led by the G7 and the V20 Group of Ministers of Finance of the Climate Vulnerable Forum (V20) has identified the Global Risk Modelling Alliance (GRMA) as a key resource, particularly during initial in-country climate risk assessments and subsequent capacity building. Pakistan has been announced as the first partner country deploying the GRMA. The GRMA aims at strengthening climate and disaster risk insights and will support Pakistan's development of its first National Adaptation Plan and its first Long Term Climate Strategy.	Government of Islamic Republic of Pakistan.
Global Goal on Adaptation Framework	The demand for the establishment of the Global Goal on Adaptation Framework was echoed by the G-77 & China subgroups. Pakistan presented a very strong case given the catastrophic situation it is facing after the devastating floods.		

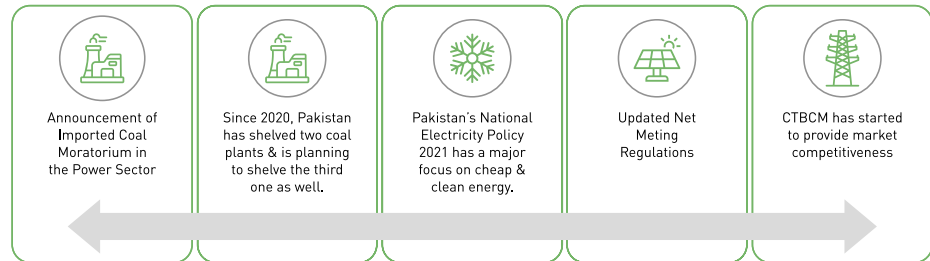
Other Key Climate Policy Targets of Pakistan			
Nationally Determined Contributions (NDCs) 2021	NDCs describe a plan to address Pakistan's climate action (both mitigation and adaptation)	<p>Under the NDCs, Pakistan aimed to reduce its GHG emissions by 15% based on country's own resources and 50% based on availability of international finance.</p> <p>The plan also describes key actions, including:</p> <ol style="list-style-type: none"> 1. Plan to shift towards 60% clean energy by 2030. 2. Plan to shift to 30% electric vehicle sales by 2030. 3. No new coal power plants to come in power sector planning. 4. On adaptation side, the plan highlights country's efforts to increase forest cover, land improvements, and agricultural improvements. 5. Further, the plan also highlights various actions the country aims to achieve including energy efficiency measures and mobilizing climate/green finance. 	Ministry of Climate Change (MoCC)
Energy Transition Mechanism	To scope the feasibility of early retirement of fossil fuel plants	Under this mechanism, Asian Development Bank (ADB) is conducting the feasibility study for early retirement of fossil fuel powerplants in Pakistan.	Asian Development Bank.

Annexure 4: Pakistan's Climate Mitigation Plan

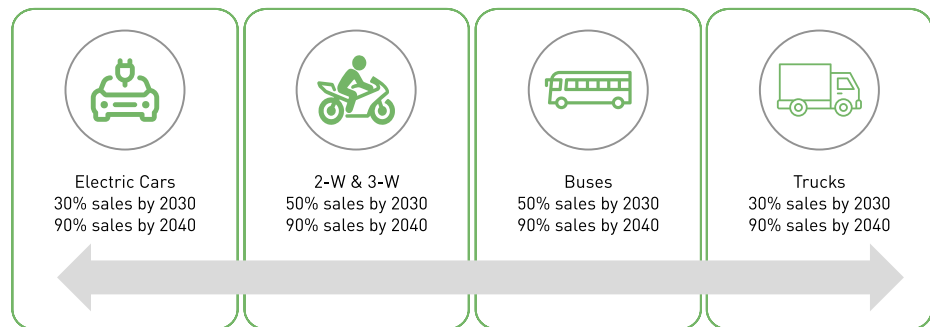
Renewable Energy Transition



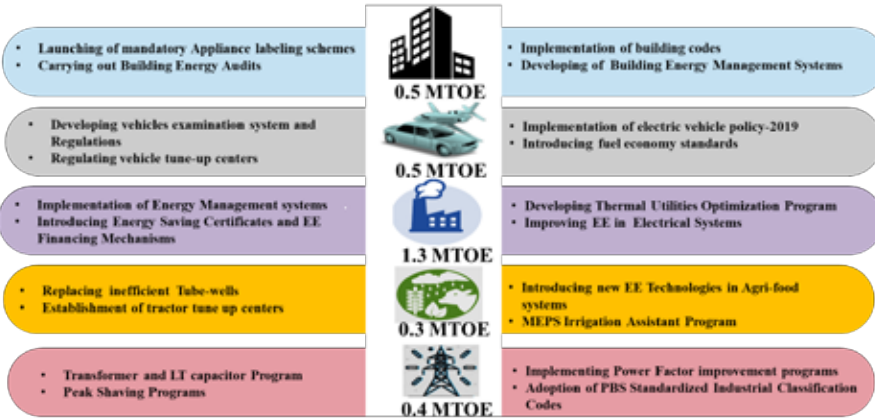
Energy Security



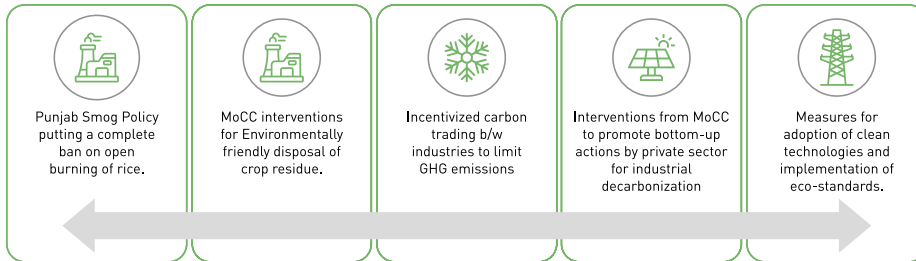
Electric Vehicles Uptake targets



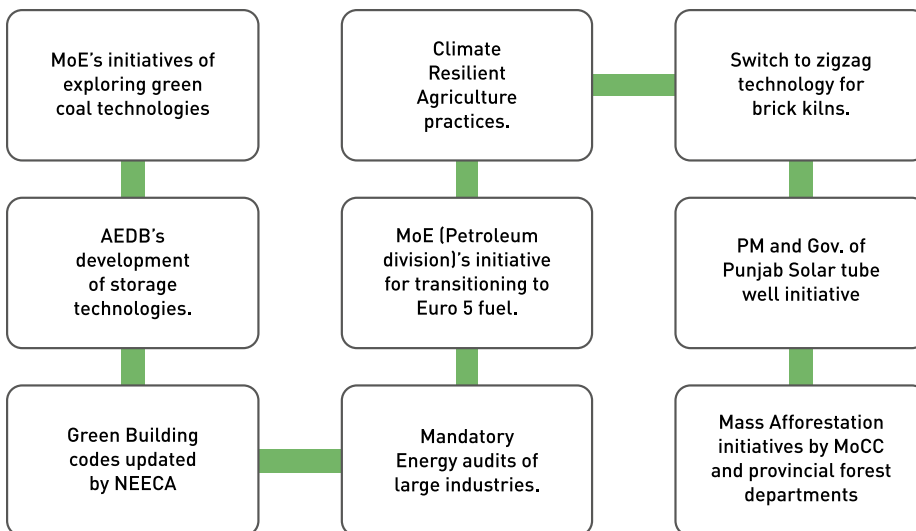
Energy Efficiency and Conservation Plan



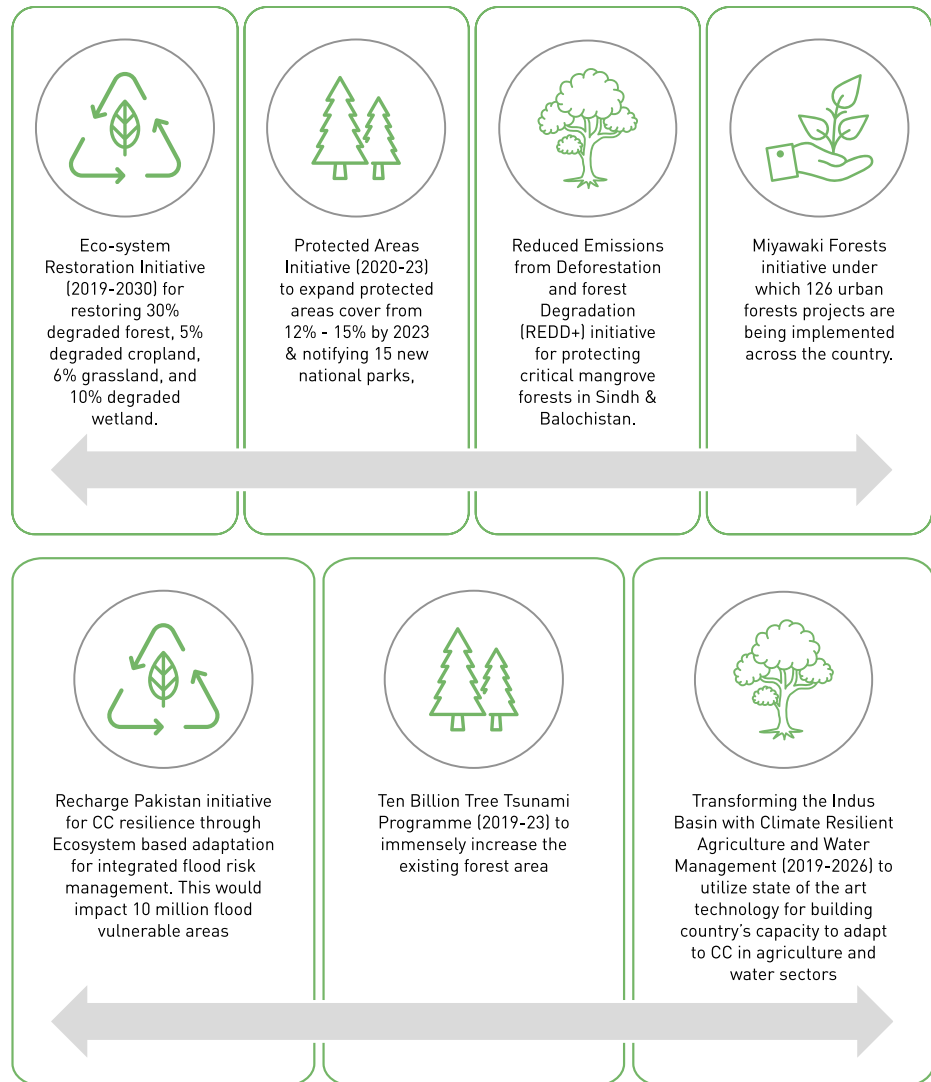
Agriculture and Industrial Transition



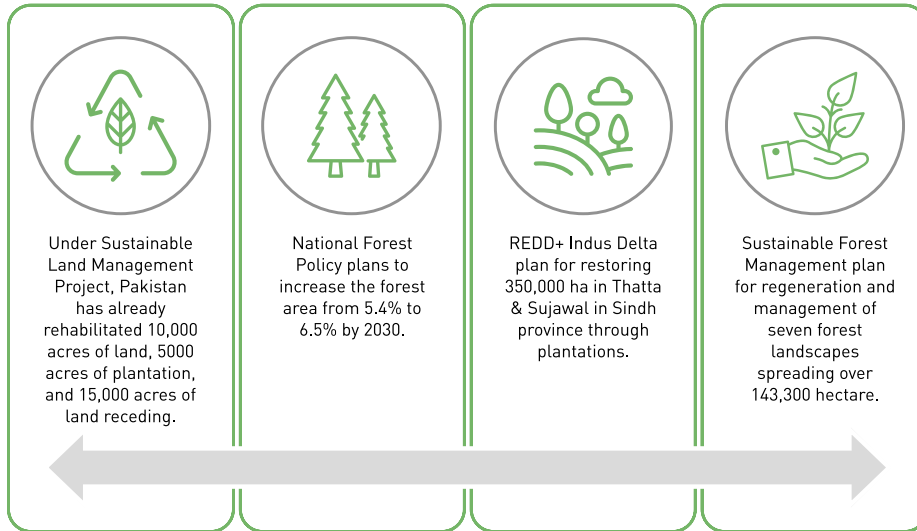
Other initiatives for climate mitigation



Transition to Nature based solutions



Land Use and Forestry



ABOUT THE AUTHORS

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