



Carbon Finance and Trading in the Power Sector in Sub- Saharan Africa

With Specific Reference to Lesotho

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Acronyms

ACMI	Africa Carbon Markets Initiative
AFOLU	Agriculture, Forest and Other Land Use
CBAM	Carbon Border Adjustment Mechanism
CDM	Clean Development Mechanism
CER	Certified Emission Reduction
CH₄	Methane
CO₂	Carbon Dioxide
DNA	Designated National Authority
GHG	Greenhouse Gas
IPPU	Industrial Processes and Product Use
LULUCF	Land-Use, Land-Use Change and Forestry
M	Maloti
MtCO₂	Millions of tons of carbon dioxide
NDC	Nationally Determined Contribution
SSA	Sub-Saharan Africa
TPES	Total Primary Energy Supply
VCM	Voluntary Carbon Market
VCS	Verified Carbon Standard

1 Introduction

In recent years, there has been a **global surge for carbon financing and pricing to combat climate change**. Carbon finance uses financial tools to back projects that cut greenhouse gas emissions (GHG), aiming to fund initiatives reducing carbon dioxide (CO₂). On the other hand, carbon pricing charges a cost on carbon emissions, **encouraging to reduce GHG emissions**. This can be through **carbon pricing instruments and/or voluntary carbon markets**, typically implemented within a country, region or organizations with mitigation goals.

While carbon finance could promise revenue generation in off-grid renewable energy projects and other sectors, it encounters several barriers. **Limited awareness among stakeholders, including local communities and investors, hampers progress**. Raising awareness becomes crucial. Infrastructure gaps, capacity building, and upfront costs are hurdles to implement clean energy projects, creating **financial obstacles including access to capital, attracting investors, and navigating complex financial mechanisms** (World Bank, 2023). In that sense, carbon finance addresses this by monetizing carbon credits, funding mitigation projects.

Carbon trading, also known as cap and trade, establishes emission caps while permitting entities to exchange allowances. This forms a market mechanism that encourages emission reduction when the price aligns with the involved industries. As a result, it becomes a dynamic instrument, requiring frameworks capable of supporting and adapting to various market conditions and ensuring effective environmental impact. This system necessitates robust oversight and flexible strategies to respond to market fluctuations, ensuring it remains an effective tool for achieving emission reduction goals. While, a carbon tax sets a price on emissions, encouraging cleaner practices. In that context, carbon credits represent emission reductions/removals, often from projects like reforestation, energy efficiency measures or renewable energy.

Carbon credits can be a part of both voluntary and mandatory carbon markets. In the voluntary market, companies, governments, or individuals purchase carbon credits to offset their GHG emissions voluntarily, often as a part of their sustainability goals or corporate social responsibility. On the other hand, in the mandatory market, set up by government regulations (ex. ETS) or international agreements (like the Article 6 of the Paris Agreement), entities are required to keep their emissions within an assigned limit. If they exceed this limit, they must buy carbon credits to comply with regulations, often sourced from other entities that have emitted less than their allowed quota. Both markets play crucial roles in incentivizing emissions reduction and funding sustainable projects. **Additionality is key, ensuring projects happen due to financial incentives or by being first in their type**.

For instance, consider a groundbreaking venture like the wind energy project in Lesotho—it inherently meets the additionality criteria for certification. The rationale is that, **without the financial boost from carbon credits, such an innovative project might never have taken off**. The absence of comparable initiatives in Lesotho can be attributed to significant obstacles, including technological disparities, financial limitations, and regulatory intricacies. The financial boost includes the revenue generated from

the sale of carbon credits associated with the project. This income stream becomes crucial for the project's sustainability, as it is reinvested into its operational aspects. The funds derived from carbon credit sales can be used for maintenance, operational costs, and further development of the project, ensuring that it continues to function and generate clean energy independently.

In an effort to prioritise additionality, prominent carbon standards have recently introduced "excluded lists," prohibiting new Renewable Energy (RE) projects in non-least developed countries (LDCs). However, this regulatory shift has a positive aspect: projects initially intended for non-LDC countries can now be redirected to LDCs (Ecosystem Marketplace, 2021), presenting valuable opportunities for nations like Lesotho¹. As renewable technologies become more accessible in LDCs, a gradual shift of type of carbon credits in trade volumes and average weighted prices for offsets is anticipated.

Carbon financing helps with financial constraints but can't solve all challenges. It's part of a broader strategy **needing capacity building and a solid framework**. This aligns with global shifts, like Article 6 of the Paris Agreement², allowing Lesotho to engage in emissions trading or projects for sustainable development, attracting financial support. These shifts go hand-in-hand with other SDGs such as ensuring gender-responsive energy policies.

The main objective of this consultancy initiative is to integrate the findings derived from desk research, the analysis of case studies and the on-site mission to Lesotho. These insights have been incorporated into the development of **concise and useful recommendations, focusing primarily on capacity enhancement and institutional readiness**. The overall objective is to **establish a robust and gender-sensitive framework for carbon finance**, ultimately accelerating the country's electrification efforts and contributing significantly to Lesotho's energy sustainability and climate goals.

2 The Lesotho Power Sector

Lesotho's current **carbon footprint is remarkably low at 0.28 tCO₂e per capita in 2021**, indicating a positive contrast to its neighbour South Africa's **9.1 tCO₂e per capita** in the same year.

Energy production and agricultural activities contribute significantly to Lesotho's emissions. However, **despite abundant renewable energy potential, the country faces energy challenges, with 61% of electricity being imported in 2020**. Approximately 38.5% of households have electricity access, leaving

¹ In the CDM, there is an approved list of criteria for project additionality, which can be consulted in the referenced document. It is specified that for LDCs, a project is always considered additional if it is the first of its kind, less than 2% of the total capacity or has less than 50 MW capacity installed. Refer to: CDM Methodological tools (2019) [EB105_repan05_TOOL32 \(unfccc.int\)](#). Most standards, when they do not have a methodology specific to the type of project, consider those previously approved by CDM.

² Article 6 establishes mechanisms for voluntary international cooperation, including emissions trading, to enhance the implementation of nationally determined contributions (NDCs). It provides a framework for emissions trading and other cooperative mechanisms, enhancing the overall effectiveness of climate action.

around 330,000 households without power. To expedite universal access, exploring cost-effective off-grid solutions is essential.

Lesotho's collaboration with South Africa for electricity trade is stable, yet there are challenges that need addressing. Despite the stable external supply, there are occasionally electricity outages. This indicates a pressing need for upgrades to the internal electrical infrastructure. Enhancing the grid's capacity and reliability is crucial to meet the domestic energy demands consistently and to reduce the import of energy. Investments in grid modernization, maintenance, and potentially integrating more local renewable energy sources could significantly improve the situation, leading to a more stable and efficient power supply within Lesotho.

The country boasts a **potential wind energy capacity of 6,000 MW**, highlighting substantial renewable energy prospects (USAID, 2018). While it's often perceived that renewable projects are more capital-intensive compared to fossil fuel projects, this isn't necessarily the case when considering long-term costs and benefits. The initial investment in renewable energy can be higher, but these projects typically offer lower operational costs and more sustainable returns over time. Moreover, fossil fuel projects may seem less expensive upfront but often entail hidden environmental and health costs that are not immediately apparent. To bridge the initial financial gap in renewable energy projects, **carbon financing offers a strategic solution. This approach not only helps in offsetting the initial investment in Lesotho's transition to renewable energy but also ensures long-term economic viability and sustainability, positioning renewable energy as a competitive and cost-effective alternative to fossil fuels.**

In line with **Lesotho's NDC commitment to a 10% reduction in GHG emissions by 2030**, this report explores carbon finance and trading in the country, particularly in the power sector. It provides crucial information for improving **access to carbon finance, identifies alternatives, and places Lesotho in the broader context of sub-Saharan Africa**. The aim is to accelerate Lesotho's sustainable development and achieve its climate goals.

3 Case Studies

The study of South Africa, Burundi, Malawi and Rwanda in the initial report, presented in Annex 1, summarises the main findings and proposed actions in each country related to carbon finance and trading. Based on the findings, Table 1 below presents the **recommendations, drawn from successful collaborations and successful offset projects, outlining a pathway for Lesotho to integrate into the global carbon market**. Each action highlights Lesotho's potential to **build regional partnerships, identify sectoral offset projects, and strategically align national policies**. Grounded in the experiences of neighbouring nations, these actions seek to provide a solid foundation for the sustainable development of the carbon market in Lesotho.

TABLE 1. Key takeaways and actions

KEY TAKEAWAYS		ACTIONS
Bilateral Collaboration	Lesotho should proactively participate in partnerships with neighbouring countries like Burundi, Eswatini, Malawi, and South Africa. These collaborations offer opportunities for exchanging knowledge and resources , strengthening Lesotho's capabilities in carbon finance and trading. Through joint initiatives, sharing information, and aligning policies, bilateral cooperation can yield positive results .	<ul style="list-style-type: none"> ● Formally establish agreements with neighbouring countries to facilitate shared information and capacity building in the context of project development and collaboration. ● Actively engage in regional events and forums on carbon finance and trading for collaborative learning and networking. Some important events worth mentioning are the Africa Climate Week, Africa Voluntary Carbon Markets Forum, and those by ACMI. ● Establish a dedicated intergovernmental task force or committee to drive cross-border carbon initiatives, identify joint projects, and enhance capacity collectively. ● Consider collaborative applications for international grants and funding to support joint carbon projects with neighbouring nations.
Multilateral Collaboration	Multilateral collaboration through alliances such as the African Carbon Market Initiative (ACMI) or Eastern Africa Alliance on Carbon Markets can provide Lesotho with broader networking opportunities . By partnering with neighbouring countries, Lesotho can enhance its capabilities and tackle shared challenges .	<ul style="list-style-type: none"> ● Organise regular regional workshops or webinars to encourage dialogue and cooperation among stakeholders from Lesotho and neighbouring countries involved in carbon finance and trading. ● Use the opportunity to exchange with partner countries and multilateral organisations on how best to align carbon policies with gender energy strategies.

<p>Offset projects</p>	<p>Lesotho should carefully assess its economy to identify activities suitable for carbon offset projects. Given that a significant part of its electricity is imported, initiating carbon projects in the electricity sector could be a promising and attractive option for meeting the electrification needs of communities, as well as taking advantage of the current state of the growing voluntary carbon markets.</p>	<ul style="list-style-type: none"> ● Encourage the use of clean technologies and practices by offering targeted incentives, conducting capacity-building programs, and fostering partnerships between the public and private sectors. Pay attention to include a gender-sensitive approach when doing this (i.e. promote women’s involvement as service providers and role as partners in PPP, as well as build gender-awareness among policymakers). ● Establish a national registry to monitor emissions reductions, boosting transparency and credibility. ● Engage stakeholders and user representation groups, incl. women groups, to spread information and apply a gender-inclusive participation strategy in all stages of project design, development, and implementation. ● Suitable offset projects for Lesotho might include off-grid solar projects and small-scale hydropower developments.
<p>Article 6 of the Paris Agreement</p>	<p>Explore opportunities to utilise Article 6³ of the Paris Agreement (A6). Lesotho can engage in negotiations, forge partnerships with nations experienced in A6 projects, and align its national policies with the Agreement's requirements to access international carbon markets and financing.</p>	<ul style="list-style-type: none"> ● Actively participate in international A6 negotiations and forums. ● Build partnerships with nations well-versed in A6 projects to share insights and develop expertise in carbon project development, educating local experts, policymakers, and stakeholders. ● Incorporate A6 Paris Agreement provisions into the national climate policy and regulatory framework, ensuring alignment with requirements (institutional arrangements, MRV system, coordinating body, eligible activities). ● Ensure that policy frameworks and strategies are gender-sensitive during the alignment process.

³ Article 6 of the Paris Agreement introduces two innovative mechanisms for global climate action. Article 6.2 allows countries to trade emissions reductions, known as Internationally Transferred Mitigation Outcomes (ITMOs), enabling one country to finance emission reductions and sell them to another country, thereby contributing to their Nationally Determined Contributions (NDCs). This approach encourages cost-effective mitigation and increases ambition in reducing emissions, provided that robust accounting measures are in place to prevent double counting. Article 6.4, related to the Kyoto Protocol's Clean Development Mechanism, establishes a centralised UN mechanism for accrediting emission reduction projects, which generate tradable carbon credits. Aimed at driving investment and technology transfer to developing nations, this mechanism ensures that emission reductions are additional and verifiable.

4 Key Takeaways of the Mission

This section summarises the activities and outcomes of the mission in Lesotho, with a primary focus on evaluating the status and challenges of carbon finance in the power sector. **The goal was to understand the obstacles and formulate recommendations.** Engagements with government entities, including the Ministry of Natural Resources, Mining, and Energy, along with private sector representatives like mining companies and solar energy enterprises, shed light on critical insights.

The Ministry of Natural Resources expressed a clear **intention to integrate solar projects** into Lesotho's energy landscape. There's an urgent **need to leverage capabilities for emission reduction projects** and develop strategies within carbon markets. Conversations with the Ministry of Mining underscored the significance of carbon markets in promoting renewable energy and identified **capacity building as a crucial measure for progress.**

The Department of Energy discussions highlighted challenges with the existing hydroelectric power plant; there are **considerations of the introduction of small-scale electricity projects.** Insights from the Lesotho Electricity Generation Company revealed challenges in meeting energy demands, they have the idea of implementing **solar off grid projects.** Efforts towards a new energy law and the need for capacity building initiatives were highlighted.

Conversations with the Lesotho Meteorological Services highlighted the **lack of climate-related studies,** such as climate vulnerability assessments, renewable energy potential studies and GHG inventories, stressing the urgency for updated data and research to bolster Lesotho's resilience against climate risks.

The interviews with various companies like Mothae Kimberlite Mine, Solar Lights, Lihobong Diamond Mine, and Letšeng Diamond Mine highlighted the complexities of executing projects in Lesotho, citing **resource limitations, lack of technical expertise, and regulatory challenges.** These companies **emphasised the need for capacity building, financial support, and infrastructure development for clean energy initiatives.** The private sector's inclination towards **carbon offset projects signals a significant opportunity for Lesotho.** This interest can be leveraged to drive legislative and policy frameworks that support and incentivise carbon offset project development.

Additionally, the growing trend among international companies to establish decarbonization plans and adopt ESG (Environmental, Social, and Governance) strategies is a key reason behind their interest in creating new projects. These companies are increasingly seeking to source energy from clean sources and to obtain carbon offsets in the countries where they operate, aligning with global sustainability goals. Another motivating factor is the preparation for the potential implications of the Carbon Border Adjustment Mechanism (CBAM) on diamond imports in the European Union, prompting companies to proactively adapt to upcoming regulatory changes and market demands.

The mission concluded with discussions on challenges of coordination among agencies and the **lack of information on carbon markets**. Key recommendations included **simplifying language, enhancing capacity, focusing on energy self-sufficiency, and developing a structured project identification document**. Addressing gaps in updated data, navigating regulatory complexities, improving awareness, accessing technical expertise, and mitigating market uncertainties are critical steps to unlock Lesotho's potential in carbon finance and renewable energy.

5 Suggested Actions and Opportunities for the Lesotho Power Sector

The journey towards carbon markets in Lesotho is a **multifaceted process**, one that involves exploration, learning, and the strategic adoption of diverse alternatives. It's a nuanced progression, demanding meticulous preparation and an openness to adaptability. This section outlines a series of recommendations crafted to simplify Lesotho's trajectory towards carbon market implementation. Recognizing that **effective carbon markets require strategic groundwork**, these recommendations aim to streamline the process, emphasising swift yet comprehensive actions that align with Lesotho's unique context.

It's crucial to underscore that the path towards carbon market implementation is iterative—a process of trial, adaptation, and eventual alignment with the most fitting strategies. The recommendations presented in Figure 1, are **tailored to facilitate Lesotho's preparedness, foster local capacity, and expedite the nation's readiness for active engagement in carbon markets**.

FIGURE 1. Recommendations for the implementation of carbon markets in Lesotho



- 1) **Registration of the Solar Energy Project in Mafeteng:** It is strongly advised to expedite the registration of the solar energy project located in Mafeteng. **Prompt registration** of the Mafeteng solar power project is crucial to ensure its eligibility and potential participation as a new carbon project. This step will maximise its impact and contribution to national emission reduction targets and **may provide extra resources** for operation and maintenance operations specific to the photovoltaic projects. Outline the socio-economic benefits of this project to put forward its potential gender-responsive nature. This will increase visibility and legitimacy. To register the project effectively, it is essential to first identify and adhere to the most appropriate carbon standard. This involves a thorough review of these standards to determine which is best with the project's objectives and the specific requirements of the region. The registration process typically includes the submission of a project design document, detailing the project's

methodology, expected emission reductions, and socio-economic benefits; specific steps to certificate a carbon project are detailed in Annex 3. It is important to outline the socio-economic impacts, highlighting the project's potential to be gender-responsive, thereby increasing its visibility and appeal to investors and stakeholders.

Once the project is registered and operational, it may take a few months to a year before it generates verifiable carbon credits, depending on the size and efficiency of the project.

- 2) Commitment to Capacity Building:** Prioritise the launch of **carbon market training courses tailored** to Lesotho's stakeholders. Rapid facilitation of these courses is essential to foster a **local understanding of carbon markets**. In addition, ensure that information is available in **Sesotho**, the local language, for equitable and understandable access for all groups, including women;

3.1 Training for the Private and Public Sectors, Non-governmental Organisations, and Academia (*How to Monetise Emissions Reductions*): The training addresses a crucial gap in the understanding of carbon markets in Lesotho. Educating key sectors, **both public and private, NGOs and academia**, on how to monetise emission reductions is critical. It allows entities to identify opportunities to actively participate in these markets, generating revenue through mitigation activities. Make sure to actively engage women in the sector and institutions/organisations, as well as women representation groups in trainings.

2.1 Project Registration Training for Individuals: The process of registering projects in carbon markets can be technical and complex. Providing specific training to individuals involved in carbon projects is essential. This ensures that **projects eligible for carbon credits can be effectively registered and traded**. Facilitating this knowledge strengthens the participation of individual actors in the transition to a less carbon-intensive economy. Targeted individuals should be as representative as possible, including women-led businesses and entrepreneurs.

2.2 Online Information Platform and on demand: A dedicated **online platform for carbon market information** in Lesotho (in local language and English) is a valuable resource to **boost the development of carbon markets in the country, outlining additional criteria for each type of project and general framework for financing projects**⁴. It provides continuous access to updated data, regulations, and opportunities. This promotes efficiency in project development. User training on how to access and use the platform will allow more remote user groups to gain access to the platform and to the information, including women and NGOs working with women.

- 3) Project Identification Document:** Prepare a detailed document that identifies and lists projects with potential development opportunities, in different sectors of the economy, not only renewable

⁴ The additional criteria for each type of project and the overall project financing framework should be reviewed and adjusted based on the results obtained from a project identification analysis. For example, in-grid and off-grid in LDC are in most cases additional, however this may depend on the introduction of new technologies in the coming years. In some cases, smaller projects (e.g., those less than 1-5 MW) might struggle to be viable due to the high fixed costs relative to their carbon credit revenue potential. Generally, projects over 5 MW are more likely to find carbon financing.

energy projects⁵, but energy efficiency, agro-industry, or reforestation in the country, in a matrix format with information of mitigation potential, location, sector, methodology and potential standard for project development. This database would facilitate the prioritisation and categorization of projects based on their viability⁶ and implementation potential. Include a gender-sensitive marker for each project listed to include it in the selection evaluation. This marker can refer to several criteria and effects, such as whether it is led by women, it provides directly for women and girls, it contributes to mitigate negative socio-economic impacts on women, etc. **Identifying the most viable projects** shall facilitate implementation and maximise results to develop projects for the voluntary carbon market or for a cooperative mechanism in the Article 6 of the Paris Agreement.

- 4) **Establishing a National Registry for Carbon Projects:** It is highly recommended that a National Registry for Carbon Projects be set up as a strategic initiative to enhance the management and transparency of carbon offset projects within the country. This registry should serve as a centralised database, documenting all carbon projects from inception to implementation, including details about their scope, emissions reductions, methodologies, and verification status. Key features of the National Registry should include comprehensive project documentation, verification and certification records, accessibility and transparency and Integration with international standards.
- 5) **Establishment of a Business-Friendly Community:** Foster an **attractive business environment** to engage project developers and **encourage investment in mitigation projects** in the country. Building a strong and attractive business community is key to successfully catalysing financing and developing new carbon projects. Specifically, also target women-led businesses and women entrepreneurs to ensure the business community is gender-sensitive and those investments also benefit women.
- 6) **Missions to Visit Carbon Projects:** Missions to visit projects already developed in diverse carbon markets in the region provide crucial practical and experiential learning for early-stage projects in the country. It allows participants from Lesotho to **understand firsthand how these projects operate, interact with key players and apply lessons learned to their local context**. This direct experience is highly recommended for strategic planning and effective implementation of carbon markets in Lesotho. During such study trips, use the opportunity to look into how partner countries have aligned their carbon policies with their gender energy strategies.
- 7) **Assessment of the viability of a carbon tax:** Conduct a detailed carbon tax feasibility assessment to determine the potential viability and impact of implementing a carbon tax in the country. This assessment should cover an intricate analysis of the country's current economic structure, key industrial sectors, distribution of GHG emissions, and the likely effects of a carbon tax on the

⁵ An outline of the potential sectors suitable to develop carbon projects in Lesotho are shown in Annex 5.

⁶ An approximately minimum size of individual projects or bundled renewable energy projects to be financially viable in Lesotho are indicated in Annex 4. However, this could be different depending on the specific characteristics of each project, like prices, as Annex 6 overview.

economy, society, and the environment. Pay particular attention to the socio-economic effects it may have, especially on women and poor households and ensure the assessment is gender sensitive.

Considering the challenges and limitations Lesotho faces, with their current government capacity and relatively small number of industries, a carbon tax presents a more direct and manageable method for reducing GHG emissions compared to establishing an ETS. A carbon tax, by imposing a direct cost on carbon emissions, incentivises industries to reduce their carbon footprint. This approach can be tailored to Lesotho's specific context and capabilities and is generally more straightforward to administer than an ETS.

Addressing potential challenges, identifying mitigation opportunities, and assessing the necessary administrative and technical capacity will provide accurate data and crucial insights for informed decision-making on the feasibility and design of a carbon tax in Lesotho.

- 8) **Roadmap for Article 6 Mechanisms:** Develop a clear roadmap outlining the steps and timeline for integrating and operationalizing Article 6 cooperation mechanisms in Lesotho, as some of the initial approaches to carbon markets. This roadmap should outline **policy frameworks, institutional capacities and arrangements, stakeholder engagement plans, strategies for harnessing international cooperation, as well as eligible activities for transfer of mitigation outcomes**. It should serve as a **strategic plan** that guides Lesotho's approach to effectively leverage Article 6 mechanisms, ensuring alignment with national development objectives and international climate commitments. During the alignment process, ensure that policy frameworks and strategies are gender sensitive.

Annex 1 – Case Studies

The following table provides a summary of initiatives, challenges, strategies, and information on renewable energy from the case studies of Burundi, Malawi, Rwanda, and South Africa evaluated in Deliverable 1 of this consultancy. This comprehensive overview encapsulates the diverse approaches and unique contexts of each nation's pursuit of carbon markets implementation, highlighting the progress made and the challenges yet to be overcome.

TABLE 2. Case studies summary

	BURUNDI	MALAWI	RWANDA	SOUTH AFRICA
Key Initiatives	<ul style="list-style-type: none"> - Engaged with the Eastern Africa Alliance on Carbon Markets and Climate Finance and Africa Carbon Markets Initiative (ACMI). - Focus on harnessing hydro energy potential for carbon market integration. 	<ul style="list-style-type: none"> - Creation of authorities or entities that operate the different aspects of the carbon markets, and joining international initiatives: - Department of Environmental Affairs - Investment and Trade Center (MITC) to champion carbon market opportunities in Malawi. 	<ul style="list-style-type: none"> Rwanda is involved in regional collaborations like the East African Community (EAC) and ACMI to strengthen its carbon trading endeavours. - Preparation of the National Carbon Market Framework. - The National Carbon Market Framework is in the development phase. 	<ul style="list-style-type: none"> - Renewable Energy Independent Power Producer Procurement Programme: Encourages private investors to funnel their resources into renewable energy projects. Carbon Tax Incentive for industries to adopt better practices and invest in new technologies.
Challenges	<ul style="list-style-type: none"> - Technical knowledge gaps in carbon finance and trading. - Limited human resources dedicated to the sector. 	<ul style="list-style-type: none"> Elevated cost tied to the creation of non-grid emission factors and baselines. 	<ul style="list-style-type: none"> - Lack of governance in some regions of the country. - Financial constraints to develop projects 	<ul style="list-style-type: none"> Transitioning away from coal, given its significant role in energy production and as an export commodity. The mining sector needs to focus on reducing carbon emissions and adapting operations to climate change impacts.
Strategies Moving Forward	<ul style="list-style-type: none"> - Commitment to utilise Article 6 of the Paris Agreement for capacity building and finance. 	<ul style="list-style-type: none"> - Agency dedicated to carbon credit trading (in progress) - ACMI 	<ul style="list-style-type: none"> - The country is also in the process of establishing its National Registry. - Interest in setting a minimum price of USD 30 per tCO₂e for carbon credits. 	<ul style="list-style-type: none"> - ACMI, Partnership for Market Readiness and the EAC, strengthen the nation's stand on carbon markets.
Renewable Energy	83% of energy in the country comes from renewables.	75% of energy comes from renewables. Biomass: 90%	83% of energy comes from renewables. The electricity generation	Primary energy is coal (65%).

	<p>Bioenergy: 90% Hydropower: 9% The electricity generation comes mainly from Hydro energy.</p>	<p>Hydroelectric: 9% Solar: 1% The electricity generation comes mainly from Hydroelectric.</p>	<p>comes mainly from Fossil fuels (66%) and hydroelectric (33%).</p>	<p>The electricity generation comes mainly from Fossil fuels (94%), solar (4%) and hydropower (2%).</p>
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Annex 2 – Recommendations

The following table outlines the recommended actions for the Technical Assistance team at GET.transform to facilitate the activation of carbon markets in Lesotho across short, medium, and long-term timeframes.

TABLE 3. Technical assistance GET.transform recommended actions

RECOMMENDATION	DESCRIPTION	TIMEFRAME	ACTIONS
SHORT TERM			
Assist with the registration of the Solar Energy Project in Mafeteng	In order to generate carbon credits, a project needs to be registered within 1 year of starting operations. Therefore, it is highly recommended that GET.transform’s technical assistance team approaches an experienced project developer to register the project as soon as possible to avoid losing additionality and failing to produce offsets.	URGENT Next 1-2 months	<ol style="list-style-type: none"> 1. Hire a team of consultants with experience in project registration to analyse which standard and methodology best suits the project and develop the necessary documentation to register the project. 2. Communicate urgently with the project owner to identify and compile all necessary documentation for registration. 3. Schedule and conduct meetings with the project stakeholders to align on the registration process. 4. Help to develop a timeline for the ending of each registration step.⁷

⁷ Please refer to Annex 3 of this document for the detailed steps regarding the registration of a carbon project.

<p>Deliver capacity building workshops on carbon markets alternatives for Lesotho</p>	<p>In order to begin to communicate the characteristics and opportunities of carbon markets, the GET.transform technical assistance team should begin capacity building works with the various stakeholders in Lesotho, sharing the various options available to each stakeholder to participate in the implementation of carbon markets. This will be crucial in developing new carbon projects and ensuring that all stakeholders are aware of the issue and its implications. These actions are valuable to encourage a business-friendly community in Lesotho.</p>	<p>In the next 3 to 6 months</p>	<ol style="list-style-type: none"> 1. With the collaboration of a carbon markets expert team, co-design a curriculum for the capacity-building workshops tailored to Lesotho's context. This could include Article 6, project design, standards, voluntary carbon market prices, etc. 2. Identify and engage with carbon markets experts to lead the workshops. 3. Organise logistics including venue, schedule, and materials. 4. Monitor and evaluate the effectiveness of the workshops with entry and exit polls. 5. With the collaboration of a carbon markets expert, provide focused assistance, if needed.
<p>MEDIUM TERM</p>			
<p>Mission to visit carbon markets</p>	<p>Visiting operational carbon projects in other countries with Lesotho government and private experts, the GET.transform team will gain technical and empirical insights in relation to implementation and key processes.</p>	<p>In the next 6 to 12 months</p>	<ol style="list-style-type: none"> 1. Research and select the most attractive carbon markets and carbon projects in other countries that show best practices and innovative approaches. 2. Outline clear goals for the visit, focusing on learning specific aspects of project implementation and registration processes. 3. Arrange meetings with technical experts, project developers, and

	<p>This knowledge and experience will be important when supporting the development of new carbon projects.</p>		<p>regulatory authorities involved in the projects.</p> <ol style="list-style-type: none"> 4. Keep detailed records of observations, technical data, and operational strategies gleaned from the visits. 5. Share the knowledge gained with local stakeholders, potential project developers, and relevant authorities in Lesotho.
<p>Identification of potential Carbon Projects</p>	<p>To facilitate the financing of emission reduction projects through carbon markets, it is essential to firstly identify areas of opportunity for the creation of these projects. To accomplish this, it is crucial that the GET.transform TA team commissions a potential projects identification study with specific information on investment costs, implementation locations, timelines and other technical details.</p>	<p>In the next 6 to 12 months</p>	<ol style="list-style-type: none"> 1. With the help of a carbon project pool of experts, perform a feasibility study on various carbon offset sectors and project types, such as reforestation, renewable energy, energy efficiency, and waste management. 2. Develop a database of potential projects, including prospective standard and methodology, mitigation and adaptation benefits, and timelines for implementation. 3. Manage the engagement with stakeholders, including local communities, NGOs, and government agencies, to assess the viability and support for potential projects. 4. Identify projects with the highest potential for reducing emissions and with the assistance of a project developer prepare a roadmap for certifying each project
<p>Conduct a Carbon Tax Feasibility Assessment</p>	<p>To effectively implement a carbon pricing instrument in Lesotho, it is vital to conduct a thorough economic, political, social, and environmental analysis of the benefits and potential</p>	<p>In the next 12 months</p>	<ol style="list-style-type: none"> 1. It is recommended to conduct a feasibility study with the assistance of a carbon tax and emission reduction trading expert. 2. Develop case studies of countries with an operating carbon tax that have similar characteristics to Lesotho and compare the implementation of the instrument.

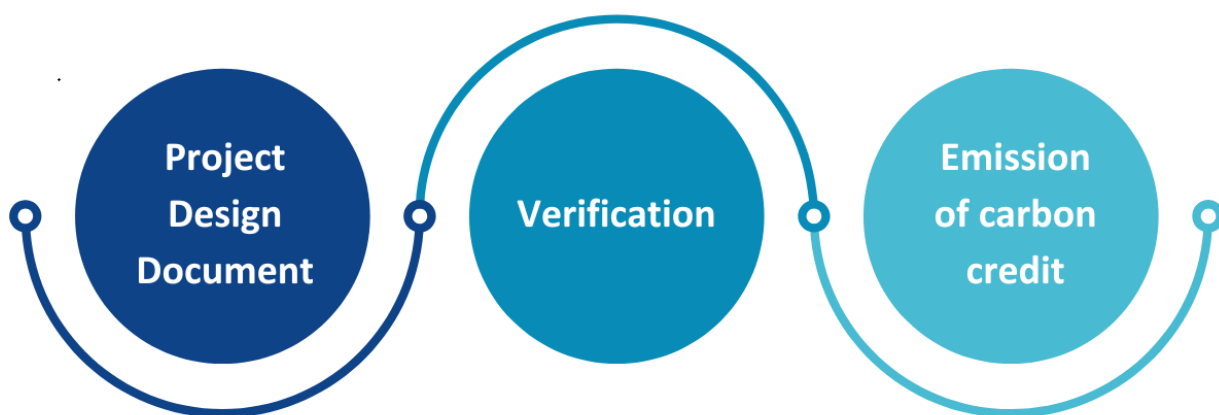
	<p>complications of its applicability. Based on the country's social and industry context, it is advisable for GET.transform's technical assistance team to collaborate with a carbon tax design expert to develop a feasibility assessment for implementation in Lesotho.</p>		<ol style="list-style-type: none"> 3. Collaborate in the design a carbon tax proposal with a carbon market expert to determine: the point of regulation, tax base and rate, considering flexibility mechanisms, and deciding on the use of revenues focusing on procedural and distributive climate and gender justice. 4. Review the framework for the implementation of a carbon tax previously developed with the assistance of a design expert and contextualise it to the social, political, and economic characteristics of the country. 1. Organise stakeholder consultations to discuss the carbon tax implications.
Creation of a National Registry of Carbon Projects	<p>With the implementation of new carbon projects, maintaining a dynamic registry of these initiatives is crucial to secure funding. This database would allow entities interested in purchasing credits to easily access and consult the relevant information.</p>	In the next 12 months	<ol style="list-style-type: none"> 2. Develop a digital platform to record and manage carbon project information. 3. Ensure the system is user-friendly for the public and accessible to all stakeholders. 4. Implement a system for regularly updating and verifying the information. 5. Implement robust security measures to protect sensitive data, if needed.
LONG TERM			
Article 6 of the Paris Agreement	<p>In order to foster the development of mitigation projects through</p>	3 years	<ol style="list-style-type: none"> 1. Propose and lead the creation of a national task force to stimulate the implementation of Article 6 of the Paris Agreement in Lesotho.

	<p>international cooperative approaches, it would be important for the GET.transform technical assistance team to assist in the development of institutional arrangements for the implementation of the Article 6 mechanism of the Paris Agreement specific for Lesotho.</p>		<ol style="list-style-type: none"> 2. With the recommendations of an Article 6 dedicated expert, set up training sessions for government officials on the requirements and mechanisms of Article 6. 3. With expert assistance, co-create a roadmap to implement Article 6 in Lesotho. 6. Develop, with an Article 6 expert, the specific institutional arrangement to allow transactions of emission reductions under Article 6 of the Paris Agreement.
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Annex 3 – How to Register a Carbon Project

The table presented here delineates the fundamental steps required for certifying an emission reduction project under any carbon standard⁸, noting that each standard may prescribe unique criteria and specific requirements.

FIGURE 2. Steps for clarification of an emissions reduction project



Below is an example of a solar energy project in India, detailing the procedure it undertook to issue carbon credits under Gold Standard.

EXAMPLE OF A PROJECT DEVELOPMENT

Project name: 20 MW SOLAR PROJECT IN SANWREEJ, JODHPUR, RAJASTHAN- PRE CDM CLONE

Country: India

Description: Janardan Wind Energy Pvt. Ltd. (JWEPL) is the promoter of the project activity. The project activity involves installation of 20 MWac (corresponding to 22.5 MWp) solar power project in Rajasthan. The project will replace anthropogenic emissions of GHG's estimated to be approximately 35,149 tCO₂e per year, thereon displacing 35,951 MWh/year amount of electricity from the generation-mix of power plants connected to the Indian electricity grid, which is mainly dominated by thermal/fossil fuel-based power plant.

Crediting Period: July 30, 2017 — July 31, 2018

Annual Estimated Credits: 35,149 tCO₂e

Project Type: Solar Thermal - Electricity

Generating credits in the Gold Standard Registry involves a multi-step process that begins with the project's registration and culminates in the issuance of credits.

⁸ Existing carbon market standards include: the UN-backed [Clean Development Mechanism](#), [VCS-Verra](#), [Gold Standard](#), [Cercarbono](#), [BioCarbon Cert](#), [Global Carbon Council](#), etc.

Activities included in each step:

1. Project Design Document

- Develop a Project Idea Note (PIN) detailing the project concept.
- Conduct a preliminary feasibility study to establish the project's potential for reducing GHG emissions and its eligibility.
- Create a Project Design Document (PDD), which includes baseline calculations, monitoring plans, and sustainable development goals aligned with the standard requirements. Engage with local stakeholders, including communities and government, to discuss the project's impact and gather feedback.
- Document all consultations and incorporate relevant feedback into the project design.

2. Validation

- Submit the PDD to a third-party validator.
- The validator will review the PDD, ensuring compliance with the methodologies and verify the project's potential emission reductions.
- Address any non-conformities or recommendations from the validator.

3. Registration

- Once validated, submit the project to the standard for registration.
- Pay the registration fee and provide all necessary documentation as required by the Gold Standard.
- Upon successful review, the project is registered and recognised as a carbon project.

After the project is registered, the project owner must:

4. Implement and monitor

- Implement the project according to the PDD.
- Monitor the project's performance and collect data as outlined in the monitoring plan.

5. Conduct verifications

- After a monitoring period, have the project's performance verified by another approved third-party.
- The verifier assesses whether the project has achieved the predicted emission reductions and if it is in compliance with the PDD and the standard requirements.

6. Credit Issuance

- Submit the verification report to the standard.
- If the verification is approved, the registry issues carbon credits based on the number of emissions reduced by the project.
- These credits can then be sold or traded on carbon markets.

Throughout these steps, it's essential to maintain transparency, adhere strictly to the standard protocols, and ensure the project integrity and credibility.

TABLE 4. Example of carbon projects that already issued credits in Africa

Name of the project	Country	Project Type	Standard	Annual Estimated Credits (tCO ₂ e)
Mobisol Solar Home Systems in Tanzania - VPA 1	Tanzania	Energy Efficiency	Gold Standard	60,000
ASYV 8.5MW Solar PV Project (CPA-001)	Rwanda	Solar - Centralised	Gold Standard	45,000
La Ferme - Bambous solar photovoltaic power plant	Mauritius	Solar - Centralised	VCS-Verra	22,226
Large scale grid connected solar PV Project in Toujounine (Nouakchott)	Mauritania	Solar - Centralised	VCS-Verra	43,836
Outapi PV Plant	Namibia	Solar - Centralised	VCS-Verra	16,689
Nouakchott 30 MW wind power plant	Mauritania	Wind	VCS-Verra	66,438
Ombepo Wind	Namibia	Wind	VCS-Verra	32,464
Aussenkehr solar	Namibia	Solar - Centralised	VCS-Verra	14,673
Ambatolampy 20 MW solar PV	Madagascar	Solar - Centralised	VCS-Verra	23,431
Off grid Solar PV project at IAMGOLD Essakane SA Gold Mine	Burkina Faso	Solar - Distributed	VCS-Verra	19,904

Annex 4 – Minimum Installed Capacity of Energy Projects

An example to determine the minimum capacity installed of a solar photovoltaic project to be financially viable is presented below.

In this example, international reference prices were used for the validation, certification, project development and registration in the standard. **Costs may differ depending on the services contracted.**

TABLE 5. Initial Certification Costs

Concept	Description	Approx. Cost (USD)
Design of the PDD	The design of the PDD includes all contacts with the project owner and drafting of the Project Design Document. It also includes support during validation of the project, answering all questions and participating in the project site visit	25,000.00
Validation	Validation fee by an accredited validation body.	20,000.00
Registration	Registration fee to be paid to the carbon standard. It depends on project size. However, for this exercise a medium size project was estimated.	3,000.00
TOTAL		48,000.00

Once a year –or when the project owner believes it would be better- a verification fee should be paid to a verification body. This fee is usually covered by the buyer of the carbon credits.

To determine the minimum capacity installed of a renewable energy project to be financially viable, it is necessary first to estimate the carbon credits needed sell to return the investment in 3 years, the price at which the credits will be sold must be reviewed. In this example a value of USD 3.97 is taken (2023 average price of credits in the renewable energy sector).

Number of Carbon Credits

$$\text{Number of credits} = \frac{(\text{Total Initial Certification Cost})}{(\text{Carbon Credit Value})}$$

$$\text{Number of credits} = \frac{(\text{USD } 48,000)}{(\text{USD } 3.97)}$$

$$\text{Number of credits} = 12,090 \text{ credits in the investment period}$$

Number of credits per year = 4,030 credits = 4,030 tCO₂e

*Each credit represents 1 tCO₂e

Once the carbon credits needed to be sold to return the investment have been estimated, the minimum electricity generated by the renewable energy project must be calculated in replacement of that currently offered in the country. Since the carbon emission factor for Lesotho's electricity is "0" (as all electricity generated is by hydropower, the actual value of the emission factor for the country's electricity grid must be estimated by including the imported electricity. In this example it is considered the fact that 53% of their electricity is imported from South Africa with an emission factor of 0.8665 tCO₂e/MWh. Thus, when doing a balanced average, the emission factor for Lesotho is assumed to be: 0.459 tCO₂e/MWh.

$$\text{Minimum electricity}_{RE} = \frac{(\text{Number of credits})}{(\text{Emission factor})}$$

$$\text{Minimum electricity}_{RE} = \frac{(4,030 \text{ tCO}_2\text{e})}{(0.459 \text{ tCO}_2\text{e/MWh})}$$

$$\text{Minimum electricity}_{RE} = 8,780 \text{ MWh}$$

When the minimum electricity to be generated by the solar PV project has been estimated for the project to be economically viable, the minimum capacity of this project can be estimated. In this example, Lesotho is considered to have 6 solar hours per day, for a total of 2,190 h in a year.

Minimum installed capacity

$$\text{Minimum installed capacity}_{PV} = \frac{(\text{Minimum electricity})}{(\text{solar hours in a year})}$$

$$\text{Minimum installed capacity}_{PV} = \frac{(8,780 \text{ MWh})}{(2,190 \text{ h})}$$

$$\text{Minimum installed capacity}_{PV} = 4.0 \text{ MW}$$

The same analysis can be done with different values of carbon credits. In the case of selling credits at the average value of those certified on the continent of Africa (USD 7.33), the result of the minimum installed capacity is shown below:

$$\text{Minimum installed capacity}_{(\text{USD } 7.33)} = 2.17 \text{ MW}$$

Annex 5 – Assessment of Potential Sectors for Carbon Projects

The table below outlines the potential of each sector and the respective carbon project in Lesotho. However, to properly determine the potential of each sector, it is necessary to conduct a project identification analysis for the country.

TABLE 6. Potential Sectors for Carbon Projects in Lesotho

Sector	Project Types	Potential
Energy	Solar	Solar radiation levels in Lesotho are amongst the highest in the world. Solar energy has an annual average potential of 7,520 MJ/m ₂ per day on horizontal surfaces. This potential could be useful to develop photovoltaic or thermal solar projects in the country.
	Wind	Estimates have ranged that there is the potential to install over 6,000 MW of wind energy in the foreseeable future. As this technology has not yet been implemented in the country, it is still considered as additional to certify a carbon project.
	Bioenergy	Studies show that in the next 20 years, Municipality Solid Waste generation will range from 185.855 to 513.587 kt. The electricity generation will range from 0.336–0.887 GWh for Anaerobic Digestion technology and 17.15–45.34 GWh for incineration technology. As this technology has not yet been implemented in the country, it is still considered as additional to certify a carbon project.

	Hydroelectric	It is estimated that the large-scale hydropower generation potential for Lesotho is approximately 450 MW. However, these types of projects are not viable for generating carbon credits due to non-compliance with the principle of additionality . Since hydropower is the primary energy source in the country, its use does not count as a reduction or compensation in emissions.
	Geothermal	Inconclusive due to Insufficient Information. The information regarding the potential of these types of projects was not considered for this study.
Forestry and Land use	Reforestation or Forest management	Inconclusive due to Insufficient Information. The information regarding the potential of these types of projects was not considered for this study.
Industrial Processes	Energy Efficiency Upgrades	Switching to more efficient technologies or installing efficient water heating and other processes can significantly reduce energy consumption. For businesses like Maluti Brewery, this translates into lower operational costs and reduced GHG. These types of projects can be developed in Lesotho's industries. Different methodologies could be implemented to certify the project depending on the type of technology installed.
Household-Community Devices	Efficient Cookstoves	There is already an active efficient cookstoves project in Lesotho, showing the viability of those projects in the country. Several projects of this type have been developed in the region, which could consider the lessons learned from other projects.

Energy Efficiency	Upgrades to Green LED Light Bulbs	Inconclusive due to insufficient information. There's potential in energy-efficient Green LED Light Bulbs projects replacing inefficient lighting systems, such upgrades can lead to significant reductions in energy consumption. Detailed studies are needed. The information regarding the potential of these types of projects was not considered for this study.
Waste Disposal	Methane Capture	Lesotho generates 137,510 t/year of waste, of which an average of 20% fall within the collection system, whereas 80% is unaccounted for, either illegally dumped or ends up in open burning practices. This signifies an opportunity for waste management projects. Different methodologies could be implemented to certify the project depending on the type of technology installed.
Agriculture	Sustainable Farming Practices	Only around 10% of lands have agricultural potential, but most of them are degraded. Adopting regenerative agriculture practices could potentially address this problem by rejuvenating the soil and enhancing agricultural productivity. Detailed studies are needed. The information regarding the potential of these types of projects was not considered for this study.
Transportation		Inconclusive due to Insufficient Information. The information regarding the potential of these types of projects was not considered for this study.

Annex 6 – Prices for Emission Reductions

The following tables present the average prices of carbon credits according to data from the State of the Voluntary Carbon Markets Report, with figures for the years 2022 and 2023. Table 7 lists the prices for the African continent, while Table 8 provides a breakdown of prices by sector on a global scale.

TABLE 7. Average price of a carbon credit in Africa

2022	2023
Price (USD)	Price (USD)
8.93	7.33

TABLE 8. Average price of a carbon credit by sector worldwide

	2022	2023
CATEGORY	Price (USD)	Price (USD)
Renewable Energy	4.16	3.97
Forestry & Land Use	10.14	11.22
Industrial Processes	5.14	4.69
Household / Community Devices	8.55	7.33
Energy Efficiency /Fuel Switching	5.39	3.69
Waste Disposal	7.23	9.00
Agriculture	11.02	6.43
Transportation	4.37	-

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