



Evaluation of Mainstreaming Green Growth and Climate Change into the AfDB's Interventions: Energy and Transport Cluster - Technical Annexes

Project cluster evaluations

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Annex 1: Detailed Evaluation Questions

1: How well has the Bank mainstreamed Green Growth and Climate Change (GG-CC) into its energy and transport sector interventions (including policies, strategies and operations)? [adapted from ToR EQ1]

EQ1.1: To what extent are the Bank's GG-CC mainstreaming activities in the sustainable infrastructure (energy and transport) sectors clear, relevant and aligned with other strategies in the Bank?

EQ1.2: Is the AfDB delivering in alignment with its GG-CC strategy in sustainable infrastructure (energy and transport) sectors in terms of the composition of its projects and programs?

EQ1.3: How effective and efficient are the Bank's GG-CC mainstreaming systems and processes within the sustainable infrastructure (energy and transport) sectors, for identifying, designing, supervising and learning from the projects it reports on?

EQ1.4: How do the Bank's GG-CC mainstreaming systems and processes compare with other development partners and similar financial institutions with respect to the sustainable infrastructure (energy and transport) sectors?

2: How well have AfDB-funded GG-CC sustainable infrastructure (energy and transport) projects performed?

EQ2.1: To what extent are the Bank's sustainable infrastructure (energy and transport) project objectives and designs relevant and aligned to the Bank's overall GG-CC goals?

EQ2.2: How effective were the infrastructure (energy and transport) projects that mainstream GG-CC in achieving their expected outcomes? Were there any unintended outcomes?

EQ2.3: How do outcomes in the infrastructure (energy and transport) projects that mainstream GG-CC vary between public and private projects, and which contextual factors play a role in preventing or enabling project success?

EQ2.4: To what extent are the infrastructure (energy and transport) sectors inclusive of women, youth and vulnerable groups?

EQ2.5: What contributions have the projects that mainstream GG-CC made within the infrastructure (energy and transport) sectors?

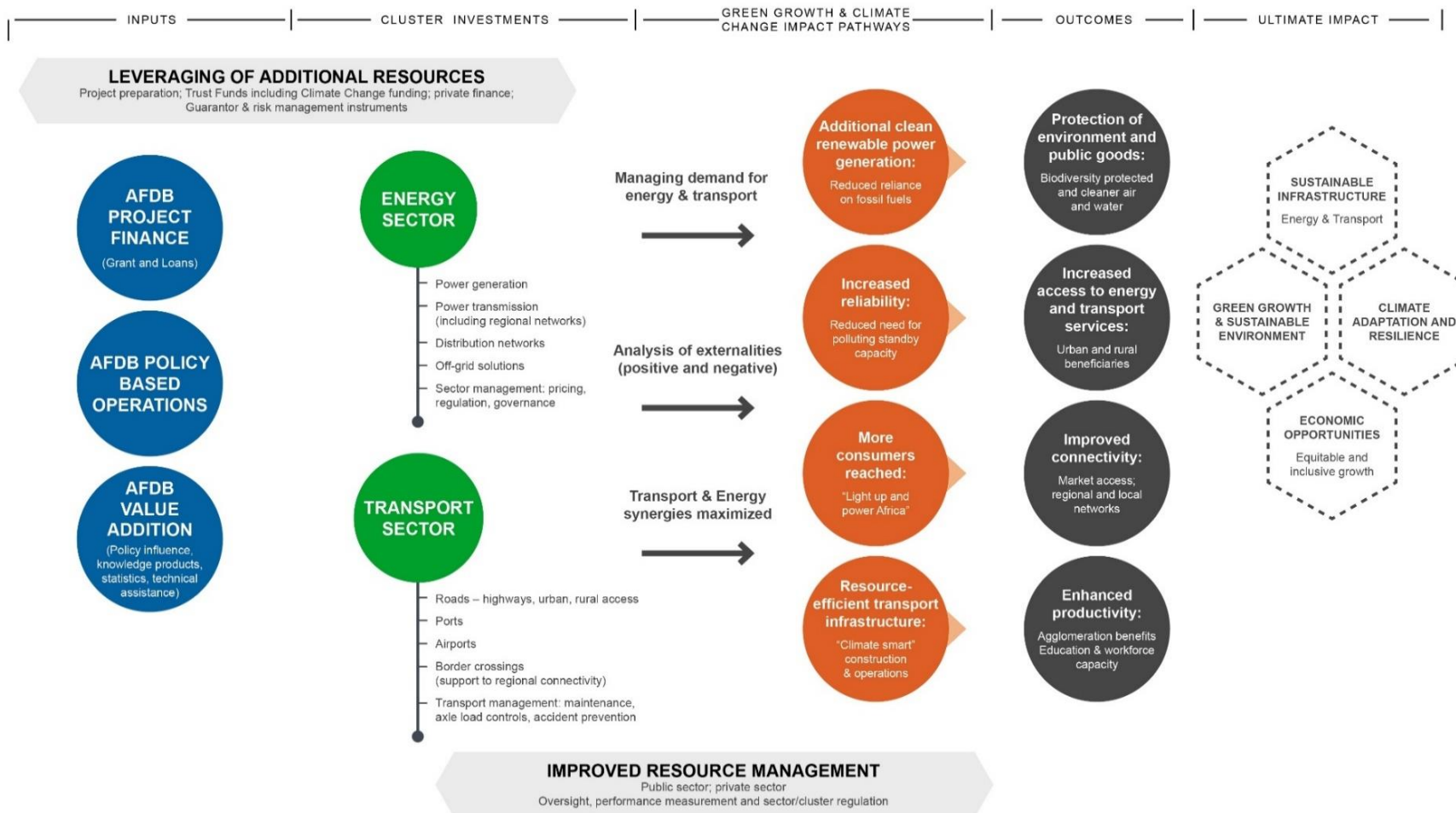
EQ2.6: Are resources allocated to infrastructure (energy and transport) sectors used efficiently and implemented in a timely manner by projects?

EQ2.7: Are the conditions for projects that mainstream GG-CC sustainability in the infrastructure (energy and transport) sectors in place (exit strategy, appropriate funding mechanism, institutional arrangements, technical capacity)?

Annex 2. Theory of Change

The Theory of Change (ToC) for sustainable infrastructure (energy and transport) is presented below:

Annex Figure F1. Cluster evaluation Theory of Change: Sustainable infrastructure



Contextual Factors: Several key characteristics link the energy and transport sectors under sustainable infrastructure, as shown in the ToC:

- The first is that demand for energy and transport is generally derived—in other words, it is a “means to an end.” Whereas in many sectors “more means better”, in the energy and transport sectors this is not necessarily the case. Consumers want reliable power, without interruptions and power surges, etc., but they may benefit from a package of energy efficiency measures to help them insulate homes, offices and business premises from extremes of heat and cold, enabling them to cut down on overall consumption. In transport it is similar. If transport demand (e.g., for cars and trucks) is allowed to increase without controls, this is likely to increase congestion, pollution and slow down travel times, all of which are not in the interests of the population. Demand management, together with offering better, greener public transport options, may be preferable.
- An analysis of externalities within the energy and transport sectors is also important. Positive externalities can include the adoption of cleaner fuels, quieter forms of power generation, roads that are safer for pedestrians, etc. Conversely, negative externalities reduce air quality, damage the environment and create difficulties in disposing of waste products. Key challenges are often price-based: even if households receive electricity, it may not be affordable for cooking purposes or households may have incentives to continue using wood, charcoal or other sources of power that deplete the environment and contribute to deforestation. The challenge is to devise ways, based on best practice, to maximize positive externalities, while minimizing the negative ones.

Inputs: The ToC takes as its starting point the inputs that are available and utilized by the AfDB in the energy and transport sectors. These are as follows:

- project-level grant and loan financing;
- knowledge products and project preparation facilities, including analytical work, such as support for strategies and policies related to GG-CC;
- Policy Based Operations (PBOs) in sustainable infrastructure (e.g., the energy sector);¹ and
- participation (including co-chairing and providing secretariat services) in sector working groups and policy dialogue for energy- and transport-related regional integration.

The Bank has internal resources, and manages Trust Funds on behalf of external stakeholders, some of which include a focus on GG-CC. These include the Emerging Africa Project Infrastructure Fund.²

The AfDB leverages external resources, including from the private sector, bilateral donors, charitable foundations and venture capital. Some of these contribute to sustainable infrastructure, such as the clean energy transition program.

Energy and Transport Sectors: Energy investments can be renewable or non-renewable. Transport projects include both infrastructure (the main focus of Bank operations) and transport services. Power transmission projects play a crucial role in stabilizing the network and supporting regional integration. These have the opportunity to enhance resilience by providing back-up options. They can assist in introducing more sustainable energy solutions, with greater use of solar, wind and geo-thermal power.

In the transport sector, the bulk of the AfDB’s investments are in road projects, especially highways/trunk roads, which represented 65 percent of transport sector investment in 2018. Air transport represented 11 percent of sector investment, including airport upgrading projects, together with a loan to an airline to purchase fuel-efficient aircraft.³

¹ Eight Policy-Based Operations (PBOs) that focused on energy were approved and implemented in five countries (Angola, Burkina Faso, Comoros, Nigeria and Tanzania) between 2012 and 2017 by the AfDB. Source: Evaluation of the African Development Bank Group’s Program Based Operations: Energy Governance Cluster, April 2019.

² The project relates to the financing of the Emerging Africa Infrastructure Fund Ltd (EAIF) in response to the company’s strategy to grow its loan portfolio and reduce infrastructure financing gap in the sub-Saharan Africa. EAIF is a debt fund that provides loans to infrastructure projects in Africa. It was established in 2001 and since then has committed over US\$900 million to more than 40 projects in developing countries. In view of the fund’s balance sheet strength and its plans to grow the loan portfolio over the next three to four years, the existing debt facilities no longer meet the Fund’s requirements. Accordingly, the Fund is seeking for new debt facilities of up to US\$300-350 million through a combination of long- and medium-term senior secured loans and continued Revolving Credit Facilities.

³ Source: AfDB Infrastructure and Urban Development Annual Report, 2018.

The energy and transport sectors have their own discrete identities: they are managed by separate departments within the AfDB. In some RMCs the Bank is supporting one of the two sectors and in others it is supporting both.

Green Growth and Climate Change Impact Pathways:

- The most significant pathway is the migration from funding coal, heavy fuel oil and, to a lesser extent, natural gas power generation toward developing renewable power generation capacity, drawing on Africa's plentiful solar and wind power, together with selective investments in geothermal and other sustainable energy opportunities. The expansion of renewable power positively reduces the unit costs of construction and operation, thereby increasing its competitiveness and deepening the market of providers. This can occur at all levels, from the major solar projects such as the 125 MW Ouarzazate Solar Power Station – Phase I to Phase 4 in Morocco,⁴ the 100 MW Sere Windfarm in South Africa,⁵ down to the provision of solar panels and off-grid power and appliance solutions.
- Increased reliability can also be achieved by developing regional energy markets. This is a GG-CC pathway that creates opportunities to share capacity and address peaks in demand on a regional rather than a national or subnational basis. This creates opportunities to reduce the use of expensive and polluting standby diesel generating sets, which are sometimes part of the grid, or may be simply to serve individual homes or businesses.
- “More consumers reached” reflects the AfDB's High 5s objective of Lighting Up and Powering Africa. The objective is very clear, and the challenge is to achieve this in a green manner. Since it is a continent-wide aim, it highlights the need to strengthen power production and electricity distribution in fragile states and insecure regions. As noted in the introduction, progress has been strong in some regions, but Central Africa in particular is lagging behind. In addition, evidence shows that the AfDB supports comparatively few electricity distribution projects to end-users (districts, households).
- The development of efficient and sustainable transport that is resilient to changes in climate and weather patterns is very important. This necessitates developing and applying revised national construction standards, with much improved drainage and slope stabilization, where possible using green solutions such as vegetation where roots can reduce run-off and soil erosion. Road-surfacing solutions, such as low-cost rural road sealing, have been demonstrated to improve climate resilience and enhance access.⁶ The Bank is participating in the Regional Economic Commission (REC) Transport Coordination Committee (formerly the Sub-Saharan Africa Transport Program, SSATP)⁷ and regional coordination by the African Union Commission (AUC).
- Although it is not a pathway *per se*, the strong links between energy and transport, and water, agriculture and Natural Resources Management (NRM), should be stressed. It was notable that Rwanda's rivers, at the time of the GG-CC fieldwork mission, were running brown with soil erosion due in part to deforestation. A key driver of deforestation is the use of biomass, principally wood and charcoal, as energy sources for cooking. This links both energy and transport: high energy costs mean that, even when connected to the grid, rural households do not migrate to using electricity for cooking. Meanwhile, improved rural access roads encourage the transport of biomass, principally charcoal, into urban areas for cooking. This has an adverse impact on both air quality and forest cover.
- Climate smart transport operations include supporting public transport provision, and ensuring that vehicles are as clean and energy efficient as possible. For illustration, Rwanda is developing green transport modes, including electric and hybrid buses, although the AfDB is not directly involved in this initiative.

⁴ The goal of the Ouarzazate Solar Power Station Project was to initiate the development of Concentrated Solar Power (CSP) technology in Morocco by constructing Phase 1 of the Ouarzazate Complex (125 to 160 MW). The total capacity was expected to be 500 MW on the Ouarzazate complex site over successive phases.

The project was implemented under a public-private partnership (PPP) through a Solar Project Company, covering an area of 2,500 ha on the Tamzaghten Izerki site. Source: PRA.

⁵ The Sere Wind Farm from Eskom, the South African electricity public utility, recently achieved its full commercial operational capacity of a 100 MW. The achievement of this milestone in the Western Cape of South Africa is in line with the commitments made by Eskom in terms of both time and cost. The AfDB approved in 2011 a US\$45 million loan with US\$50 million contribution from the Clean Technology Fund, one of the Climate Investment Funds (CIF) for this first utility scale renewable energy project. The World Bank and the French Development Agency also contributed to the financing of the project. <https://www.afdb.org/fr/news-and-events/eskoms-sere-wind-farm-in-south-africa-financed-by-the-afdb-and-cif-now-in-full-commercial-operation-14420>

⁶ Research for Community Access Partnership (ReCAP). research4cap.org/SitePages/Home.aspx

⁷ <https://www.ssatp.org/>

Outcomes. The ToC identifies four key groups of outcomes:

- Protection of the Environment and Public Goods: Clean air and water provide huge benefits to the population, and are an essential component of GG-CC.
- Increased Access to Energy and Transport Services: This is consistent with the AfDB’s High 5s, notably “Light Up and Power Africa” and “Improve the Quality of Life for the People of Africa”.
- Improved Connectivity: This can facilitate improved market access and strengthened regional and local networks.
- Enhanced Productivity: This may be the result of improved efficiency, more reliable energy and better connectivity.

Ultimate Impacts. Four ultimate impacts have been identified.

- Sustainable energy and transport infrastructure that does not deplete finite natural resources or contribute to climate change.
- Green growth and a sustainable environment that supports biodiversity.
- Climate adaptation and resilience to extreme weather events, such as flooding, drought and the consequences of global warming; and
- Equitable and inclusive growth based on an expansion of economic opportunities for all.

Assumptions Underpinning Theory of Change

The assumptions related to each step underpinning the ToC’s at the sector-level. Note that this ToC was developed as part of the cluster evaluations that took place as part of the overall evaluation. This was developed based on historic documents of strategies, evaluations, and bank-level strategies to promote between alignment. The ToC assumptions listed below can be considered necessary conditions for change, as well as being underlying conditions or resources that need to exist for planned changes to occur.

1.1.1.1.1.1 Table 1. Theory of Change Assumptions

Assumptions
<i>From Inputs to Sectorial Activities</i>
A clear framework for channelling funding is developed that will adequately inform partner selection and programme design.
Better GG-CC screening and monitoring of demand so that investments are based on clear co-delivery between sectors and departments.
AfDB GG-CC Policies and strategies are being consistently applied across geographic regions, operational departments, at country and project levels
Improving GG-CC performance measurement, and better diagnostic tools will mainstream GG-CC in policies, project design and implementation for all sectors.
<i>From Activities to Output (High-Fives) Level Assumptions</i>
AfDB’s investment in agriculture technologies and natural resources management including water management improve access to water and enhance resilience of African communities
AfDB’s investment in energy has been increasingly directed towards renewable energy sources and less on carbon-intensive energy projects.
Increased energy access in Africa results in a corresponding reduction in use of charcoal and wood and will result in an overall reduction in carbon emissions.
Strengthening national/regional capacity can overcome barriers to better national government approaches to achieving GG.
National GG-CC policies and strategies will translate into an increased level of leveraged GG-CC investment.
Strengthening regional integration promotes improved natural resource use.
The reduction in emissions from improved vehicle operating efficiencies resulting from investment in roads will be greater than any corresponding increase in traffic flows that result from improved road conditions.

AfDB's transport investments have increasingly focused on energy efficient public and freight transport schemes (bus rapid transit; rail) in order to support low carbon development
Investment in power distribution networks result in a reduction in electricity losses.
Ensure that portfolio is structured, managed, and resourced in an efficient way – use of logframes, indicators, targets, and results frameworks to monitor and manage project outputs
Building relationships with relevant stakeholders to facilitate project implementation and uptake
Effectively exploits synergies with other climate change finance stakeholders and RMCs government stakeholders
<i>Output-to-Outcome Assumptions</i>
GG-CC interventions supported by AfDB are the most relevant activities for the regional and/or national context.
AfDB GG-CC related projects are effective, and their results will contribute to GG-CC in the region.
AfDB support and investment will leverage additional GG-CC funding and will not crowd out national or private sector investment.
Projects are sustainable, and the institutional structures and funding are in place to ensure that they fulfil their potential and avoid premature deterioration
Successful mobilisation of external finance, technology, and expertise to support delivery
Support of wider development aims and seeks to find synergies with relevant sectors and programmes related to CC mitigation or adaptation
Selection of the most effective interventions to achieve outcomes, using ToC processes and feedback loops
<i>Outcome-to-'Ultimate Impact' Assumption</i>
Investments are able to achieve transformative change that delivers longer term outcomes once project funding is disbursed
The Bank uses network of key stakeholders (including diplomacy) to influence the wider policy and financing debate among donors, MDBs, national governments of RMCs
Bank builds an evidence base for demonstrating the potential for effective action
Impacts the lives of beneficiaries beyond those directly engaged with the projects funded by the Bank (use of ex-post monitoring and ongoing political context analysis to assess impacts at the macro-level)

Annex 3: Portfolio Performance Scorecards

Portfolio Performance Scorecards

A scorecard approach is used to synthesise results across the 7 PRAs, with scores allocated for overall performance against the key performance areas of interest to this evaluation, i.e.:

1. Relevance
2. Efficiency
3. Effectiveness
4. Sustainability

Based on the AfDB satisfaction scorecard for completion reports, the proposed assessment framework for the portfolio's performance uses the following grades and prescribed a numeric score from 1 to 4:

- Highly unsatisfactory (4)
- Unsatisfactory (3)
- Satisfactory (2)
- Highly satisfactory (1)

To which has been added a fifth category: N/A 'insufficient data to assign a score'.

Relevance

▪ Highly satisfactory	▪ The objectives of most (over 80%) of the projects align with the AfDB's regional and country strategy papers and the national policy frameworks relevant for GG-CC. PRA project designs and/or their log frames clearly align with the AfDB's strategies and policies on GG-CC.
▪ Satisfactory	▪ The objectives of a clear majority (at least 50% to 80%) of the PRA projects, their design and possible ToC/log frame align with AfDB and country strategies and policies.
▪ Unsatisfactory	▪ The objectives of a minority (between 20% and 50%) of the PRA projects, their design and possible ToC/log frame align with the AfDB's regional and country strategy papers, and the national policy frameworks relevant for GG-CC.
▪ Highly unsatisfactory	▪ The objectives of few (less than 20%) of the PRA projects, their design and possible ToC/log frame align with the AfDB's regional and country strategy papers, and the national policy frameworks relevant for GG-CC.
▪ N/A	▪ The criterion was considered but data were insufficient to assign a rating or score: Provide explanation.

Efficiency

▪ Highly satisfactory	▪ Few significant challenges affected the performance of projects; efficient solutions were applied for all challenges that were encountered. That is, most (over 80%) of the PRA projects achieved their results on time and budget (score 'high' and are within 5% of the planned budget and implemented within planned or agreed on timelines).
▪ Satisfactory	▪ Significant challenges affected the performance of a minority of the PRA projects, and/or efficient solutions were found for a majority of those challenges that were encountered. That is, a clear majority (50% to 80%) of the PRA projects achieved their results on time and within budget (score 'high' and are within 5% of the planned budget and implemented within planned or agreed on timelines).
▪ Unsatisfactory	▪ Significant challenges affected project performance in a majority of projects, and/or efficient solutions were found for only a minority of challenges that were encountered. That is, a minority (20% to 50%) of the PRA projects achieved their results on time and within budget (score 'high' and are within 5% of the planned budget and implemented within planned or agreed on timelines).
▪ Highly unsatisfactory	▪ Significant challenges affected project performance in most or all projects, and/or efficient solutions were found for few of the challenges that were encountered. That is, less than 20% of the PRA projects achieved their results on

	time and within budget (score 'high' and are within 5% of the planned budget and implemented within planned or agreed on timelines).
▪ N/A	▪ The criterion was considered but data were insufficient to assign a rating or score: Provide explanation.

Effectiveness

▪ Highly satisfactory	▪ Most (over 80%) of the PRA projects' intended results at the output and/or outcome level (as applicable) have been achieved or exceeded. Any unintended outcomes have made a significant positive contribution in the project achievements.
▪ Satisfactory	▪ A majority (50% to 80%) of the PRA projects' intended results at the output and outcome level have been achieved or exceeded. Any unintended outcomes have made a positive contribution in the project achievements.
▪ Unsatisfactory	▪ A minority (between 20% and 50%) of the PRA projects' intended results at the output and outcome level have been achieved or exceeded. Any unintended outcomes have not adversely impacted the project result achievements.
▪ Highly unsatisfactory	▪ Only a few (less than 20%) of the PRA projects' intended results at the output and outcome level have been achieved or exceeded. Unintended outcomes may have adversely impacted the project achievements.
▪ N/A	▪ The criterion was considered but data were insufficient to assign a rating or score: Provide explanation.

Sustainability

▪ Highly satisfactory	▪ Most (over 80%) of the PRA projects have put in place sustainability strategies or relevant sustainability measures. Sustainability strategies address both overall project sustainability (including institutional and financing aspects) and specific outputs/outcomes (as applicable) pertaining to GG-CC and are likely to be effective in the long term.
▪ Satisfactory	▪ A majority (50% to 80%) of the PRA projects have put in place sustainability strategies or relevant sustainability measures. Sustainability strategies address both overall project sustainability (including institutional and financing aspects) and specific outputs/outcomes (as applicable) pertaining to GG-CC and are likely to be effective in the long term.
▪ Unsatisfactory	▪ A minority (between 20% and 50%) of the PRA projects have put in place sustainability strategies. Sustainability strategies address both overall project sustainability (including institutional and financing aspects) and specific outputs/outcomes (as applicable) pertaining to GG-CC and are likely to be effective in the long term.
▪ Highly unsatisfactory	▪ Only a few (less than 20%) of the PRA projects have put in place sustainability strategies and/or sustainability strategies (concerns both general and GG-CC specific output/outcomes) are weak and are unlikely to be effective in the long term.
▪ N/A	▪ The criterion was considered but data were insufficient to assign a rating or score: Provide explanation.

Bank Performance

▪ Highly satisfactory	▪ Most (over 80%) of the PRA projects' the financial and human resources, procedures, and capacity were able to implement the project sufficiently in terms of GG-CC and the project demonstrated that the Bank showed value-added and effective partnership.
▪ Satisfactory	▪ A majority (50% to 80%) of the PRA projects' the financial and human resources, procedures, and capacity were able to implement the project sufficiently in terms of GG-CC and the project demonstrated that the Bank showed value-added and effective partnership.

▪ Unsatisfactory	▪ A minority (between 20% and 50%) of the PRA projects' the financial and human resources, procedures, and capacity were able to implement the project sufficiently in terms of GG-CC and the project demonstrated that the Bank showed value-added and effective partnership.
▪ Highly unsatisfactory	▪ Only a few (less than 20%) of the PRA projects' the financial and human resources, procedures, and capacity were able to implement the project sufficiently in terms of GG-CC and the project demonstrated that the Bank showed value-added and effective partnership.
▪ N/A	▪ The criterion was considered but data were insufficient to assign a rating or score: Provide explanation.

Country Performance

▪ Highly satisfactory	▪ Most (over 80%) of the PRA projects' and CSPs showed that the country had adopted policies and strategies and has the necessary institutional structures supporting GG-CC project operations. The project' and CSPs' demonstrated long-term political commitments and had the necessary incentives in place to achieve GG-CC.
▪ Satisfactory	▪ A majority (50% to 80%) of the PRA projects' and CSPs showed that the country had adopted policies and strategies and has the necessary institutional structures supporting GG-CC project operations. The project' and CSPs' demonstrated long-term political commitments and had the necessary incentives in place to achieve GG-CC.
▪ Unsatisfactory	▪ A minority (between 20% and 50%) of the PRA projects' and CSPs showed that the country had adopted policies and strategies and has the necessary institutional structures supporting GG-CC project operations. The project' and CSPs' demonstrated long-term political commitments and had the necessary incentives in place to achieve GG-CC.
▪ Highly unsatisfactory	▪ Only a few (less than 20%) of the PRA projects' and CSPs showed that the country had adopted policies and strategies and has the necessary institutional structures supporting GG-CC project operations. The project' and CSPs' demonstrated long-term political commitments and had the necessary incentives in place to achieve GG-CC.
▪ N/A	▪ The criterion was considered but data were insufficient to assign a rating or score: Provide explanation.

Annex 4: Project Results Assessment Performance

The Project Results Assessment (PRA) summaries and scores are presented below for the sustainable infrastructure (energy and transport) sectors.

Annex Table 4.1: Morocco – Noor Ouarzazate Solar Project (Phase I)

Key component	Summary Performance	Score (maximum 4)
Relevance of objectives and design aspects	Highly relevant. An integral part of the GoM's Green Growth Strategy. High degree of ownership of the National Energy Strategy (NES), 2009 (in part to make use of solar comparative advantages, and also to reduce dependence on imports of hydrocarbon forms of energy generation). Creation of a dedicated agency, MASEN, ⁸ responsible for managing renewable energy in Morocco and for leading the development of programs of integrated projects aimed at creating an additional 3,000 MW of clean electricity generation capacity by 2020.	4
Development outcomes performance	<p>Noor 1 has an installed capacity of 160 MW with annual electricity production estimated at 500 GWh. It is equipped with a thermal energy storage system (using molten salt), which ensures its operation at full capacity for 3 hours without solar radiation (sunset, cloudy periods). A pathfinder for subsequent projects. In 2015, when it became operational, it was the first solar plant in the world with installed capacity of over 100 MW.</p> <p>Electricity generation from the Noor Ouarzazate I Power Plant. In two years of operation (January 2016 to December 2017), the Noor Ouarzazate I power plant produced and delivered 814 GWh to the national electricity grid, including 163 GWh (20 percent) at peak hours and 651 GWh (80 percent) outside peak hours, and prevented the emission of about 428,000 tonnes of CO₂ from alternate sources of electricity.</p> <p>Noor is the first of a cluster of four solar power plants that helped to prove the technology and viability of investments in solar power. It demonstrated that Morocco is at the forefront of achieving positive development outcomes in terms of sustainable energy generation, as well as enhancing resilience by reducing the need to import hydrocarbons (coal and heavy fuel oil, or HFO).</p> <p>Thanks to the water-saving measures implemented in the cooling tower and the steam cycle, the power plant's annual water consumption decreased by 5 percent in 2017 compared with 2016.</p>	4
Efficiency of resource use	<p>The economics of solar power is improving due to technical advances. Procurement costs come in under budget. Total capital expenditure amounted to a total of MAD 7,100 million, or about Euro 634 million, less than the Euro 800 million raised with the excess capital returned to lenders.</p> <p>The project was funded from several sources co-financed by the AfDB, the Clean Technology Fund (CTF), the World Bank, the French Development Agency (AFD), the European Investment Bank, and the German Cooperation (KfW), and was subject to extensive technical verification. It was seen as an innovative clean energy project and attracted "first mover" advantages because the private sector wanted to gain expertise and saw it as a way to position in a growing market for solar energy.</p>	4
Sustainability of project results	Highly sustainable. Although not all the capital costs are recovered from generation, the fact that this was the first of four projects in the complex creates economics of scale and efficiencies. The GoM was prepared to underpin preparatory work and the financial investments made, as it was central to Morocco's strategy of reducing dependence on fossil fuel imports.	4
Project Monitoring and Evaluation	A high degree of technical oversight was achieved by MASEN. Project monitoring was enhanced because it had to satisfy the requirements of several development partners, and joint supervision missions were conducted.	4

⁸ Initially housed with just five staff within the Office National de l'Electricité et de l'Eau Potable (ONEE), the Agency now has its own building and comprises 150 staff.

	<p>During project implementation, the AfDB was regularly mentioned as one of the first development partners to honor, within the expected time, the disbursement requests submitted to external financial partners during drawing operations (calls) of funds (replenishments of project special accounts).</p> <p>The Bank participated in all the joint supervision missions of development partners, a total of nine missions. The first mission was carried out in December 2013 and the last (the most recent) in March 2018, at the end of which the project completion report (PCR) was produced.</p>	
Bank performance	<p>Excellent achievement: Leveraging Clean Technology Fund (CTF) on this pathfinder project, the first of four in this location. Evidence of good cost controls and supervision.</p> <p>The evaluators were advised by MASEN that: <i>“We were able to benefit from the technical expertise of the Bank’s project lead, who was very present, very responsive, very facilitative, as well as from the environmental and social expertise of the Bank.”</i>⁹</p>	4
Country performance	<p>Morocco is one of four RMC countries that score Green under RISE. High degree of strategic and policy leadership to achieve GG-CC objectives, together with a clear strategy, namely the National Energy Strategy (NES), 2009. Clear institutional arrangements under MASEN. MASEN, as project owner, proved fully capable to support the project operations from a GG-CC perspective.</p>	4
Average score	Excellent pathfinder project and well executed.	28/7 = 4

Table 4.2: Rwanda – KivuWatt

Key component	Summary Performance	Score (maximum 4)
Relevance of objectives and design aspects	<p>KivuWatt is the first project of its kind, separating and utilizing naturally occurring methane at the bottom of Lake Kivu. It is highly relevant to Rwanda for two principal reasons: Rwanda, which has high energy costs, has had to truck in HFO and diesel for generating purposes. These include an offshore gas production barge, a sub-surface pipeline and an onshore power plant feeding the grid.</p> <p>KivuWatt (26 MW) has helped to reduce the ongoing need for this trucking of HFO, while also enabling older polluting generators to be switched to standby purposes.</p> <p>An additional benefit of the project is that it reduces the risk of a spontaneous eruption of poisonous gases from Lake Kivu, reducing risks to the local population.</p>	4
Development outcomes performance	<p>The project is performing as expected and achieving important benefits in terms of energy supply to the national grid.</p> <p>A reduction in 695,208 tonnes CO₂ (2017) was achieved, as per environmental performance reporting, which is subject to external monitoring.</p> <p>The expansion of renewable energy, including the KivuWatt natural methane gas project, resulted in reduced dependence on HFO transported by road in Rwanda. Due to its inland location and lack of a fuel pipeline, HFO has to be transported by truck to power plants. It has been possible to switch HFO generating capacity to a standby role with significant GG benefits.</p> <p>Considerable Corporate Social Responsibility (CSR) activities have been undertaken, including developing a fish hatchery to enhance the natural resources of Lake Kivu and developing sustainable livelihoods for the local population.</p>	4
Efficiency of resource use	<p>This was an innovative and pathfinding project, but its implementation was delayed by three years from 2012 to 2015, and costs (some borne by the contractor, Contour Global) escalated. Delays were caused by design challenges, the remote location, installation issues, and operational approval issues related to the use of untested technology—the first of its kind in the</p>	2

⁹ Interview with MASEN, 13 September.

	world, requiring capturing and processing gases from the bottom of a lake in a volcanically active area. The project includes a barge facility moored in Lake Kivu.	
Sustainability of project results	Safety and environmental protection are of paramount importance. The concession period is 25 years. Subject to safety and security issues, sustainability should be assured.	3
Project Monitoring and Evaluation	The AfDB is providing a Line of Credit and is one of a number of funders. The company provides quarterly technical, environmental and financial reports to the sponsors. Environmental issues, including the underwater plume of bi-product gases released into Lake Kivu, and the impact on water quality and fish stocks, are independently monitored. AfDB oversight appears sufficient, with value added appearing to be similar to other funders.	3
Bank performance	Overall, the AfDB met its funding commitments in a timely manner. There is no PCR because the loan is outstanding, but the expanded supervision report shows that all key issues are being monitored by the AfDB. Regular technical monitoring reports (financial, environmental sustainability, production, etc.) are prepared by the Operator. These were subject to independent verification and meant that the Bank had relatively straightforward oversight.	4
Country performance	Rwanda has been a leader in promoting GG, and this project is consistent with its 2013 Green Growth strategy. Relations between the project promoters (KivuWatt/Contour Global) and the Ministry of Finance have been poor. In part, this appears to be because there is a perception that Contour Global received excessively generous terms.	3
Average score	A highly innovative GG energy project.	23/7 = 3.3

Annex Table 4.3: Rwanda – Scaling Up Energy Project

Key component	Summary Performance	Score (maximum 4)
Relevance of objectives and design aspects	Highly relevant, as Rwanda has low levels of electricity access. Consistent with the Bank's High 5s. Initiative ties in well with a water project involving pumping water to communities. Good demonstration effect given that the AfDB is not undertaking many power distribution projects.	4
Development outcomes performance	Local authorities met during the country evaluation to flag high customer demand for connections. Ownership is also very high and well managed. The extension to the electricity network supports the rural economy, including households, enterprises and service providers. The project design documents made the case that electrifying households would be Green and reduce the use of biomass (wood, charcoal, etc.) for cooking. However, this was unrealistic as electricity prices are too high for the rural population to benefit from this scheme by using it for cooking and this reduced the outcomes score to 3. This shows the importance of using realistic assumptions when preparing cost-benefit analyses. It may also highlight the need to engage at a policy and regulatory level. The AfDB co-chairs, together with the Government, the power distribution sector working group. A follow-up project is addressing the needs of those who cannot afford electricity connections, with the use of off-grid solutions. The latter were delayed, partly for institutional reasons but also because of inadequate quality at entry controls (lack of specificity in project design).	3
Efficiency of resource use	Overall, this has been positive but one company failed to deliver, apparently because it was under-capitalized and/or had under-priced its work and this caused delays, but the power sub-plants are in good order. More than 600 skilled and semi-skilled locals worked on the project, over 40 percent of whom were women (the original design envisaged 600 to 800 of whom 15 percent would be women).	3

Sustainability of project results	Likely to be very good. Once communities and households are connected, they expect/demand to be maintained. The District staff that were met were confident that this would indeed be the case.	4
Project Monitoring and Evaluation	Progress and performance reports in place. Payment by output (e.g., households connected) has proved efficient and effective. This is a lesson that can be utilized elsewhere.	4
Bank performance	Good, with no difficulties reported. The AfDB is co-chairing the energy access working group.	4
Country performance	Impressive ownership found at both Utility and District levels. Good systems in place and oversight of the roll-out.	4
Average score	Demonstrates that the AfDB can deliver electricity distribution projects in conjunction with a strong client.	26/7 = 3.7

Annex Table 4.4: Rwanda – Butare Kitabi-Ntendezi Road

Key component	Summary Performance	Score (maximum 4)
Relevance of objectives and design aspects	<p>A strategic road with trade potential (i.e., part of a corridor initiative to DRC) going through an environmentally sensitive forest area. Rwanda, as an inland country, needs improved connectivity, and realistically there are no greener transport alternatives than road travel in the direction of DRC.</p> <p>The road only had a 15-year design life, which is disappointingly short and suboptimal from a GG perspective, as it requires additional maintenance. For this reason, it scored 3 not 4 under this criterion. Design standards on other roads are understood to have been subsequently increased to 20 years.</p>	3
Development outcomes performance	<p>Road constructed and functioning well. The forest environment was well protected during construction. A term-based periodic maintenance contract is in place.</p> <p>The main contribution to GG is that journey times have been dramatically reduced from 6 to 3 hours with equivalent Vehicle Operating Costs (VOCs) savings. This is the estimate in the PCR and was verified during the field visit with the client's engineer as being a best estimate.</p>	4
Efficiency of resource use	Short design life is suboptimal but other aspects have been efficient.	3
Sustainability of project results	<p>Maintenance contract and high strategic importance of road (close to Burundi border) mean that it is likely to be prioritized for maintenance. The project design included a periodic maintenance contract that has been put in place and, at the time of the field visit, periodic maintenance was being undertaken.</p> <p>It is, however, rather disappointing that substantial areas of bitumen should have required replacing so soon after completion (i.e., within five years). This is a high rainfall and mountainous area, and from an engineering perspective this could add to maintenance requirements. Despite this, the GoR is committed to the roads network, which is protected in the national budget. It should also be mentioned that the road runs close to and parallel with the Burundi border and is militarily sensitive, as was clear from the presence of the army. Its maintenance is highly likely to be prioritized.</p>	4
Project Monitoring and Evaluation	Highly satisfactory. Very experienced Task Manager, offering high value added to the Ministry of Infrastructure. Sector working group joint leadership has helped with this engagement.	4
Bank performance	Highly satisfactory. A strong Field Office presence in the sector. The project also acted as a pathfinder for other road investments in the country funded by the Arab Bank for the Economic Development (BADEA), and this helped to leverage resources.	4
Country performance	Good sector strategy and leadership in place. All road projects have to include tree planting, which is innovative.	4
Average score	Commendable project and performance.	26/7 = 3.7

Annex Table 4.5: Senegal – Autoroute Dakar-Diamniadio

Key component	Summary Performance	Score (maximum 4)
Relevance of objectives and design aspects	Ties in with addressing heavy congestion in Dakar, a rapidly expanding city, but does not offer a public transport alternative, although buses would have faster travel times. It is therefore difficult to see a high-volume toll road as being especially green. This was a PPP project constructed with a 30-year concession contract granted to Effage Group, France.	2
Development outcomes performance	The commissioning in August 2013 of the Dakar-Diamniadio motorway has decongested the Cap-Vert Peninsula, which covers 0.28 percent of the national territory and is home to 25 percent of the country's population, 95 percent of formal sector enterprises, 80 percent of non-agricultural informal sector production units, and 87 percent of full-time jobs. It serves the new Diamniadio development hub established by the Government to attract private enterprises. Travel time was reduced from 90 to 30 minutes between 2008 and 2014. However, its financial rate of return is insufficient because of a shortfall of about 50 percent in heavy goods vehicle (HGV) traffic, probably to avoid the paying tolls. This is an environmental disbenefit, as the same HGVs will be using ordinary urban roads. ¹⁰	3
Efficiency of resource use	<p>The 2016 project evaluation reported that VOCs fell between 18 and 20 percent as a result of the reduction in congestion. This is consistent with a study carried out by the Land Transport Directorate in 2007, which estimated that the cost of operation increases by about 18 to 20 percent on congested roads.¹¹</p> <p>The project has generated employment and vocational training. SENAC had about 250 employees (excluding expatriates) as of December 25, 2014 (141 employees at the end of 2012), including: (i) 14 executives; (ii) 44 officers with master's degrees trained in management; and (iii) 192 workers/employees.</p> <p>This is a toll road, so a parallel non-tolled option is also required. Toll roads create some environmental costs (queuing to pay tolls), but conversely offer leverage in private finance.</p> <p>The design documents refer to improvements at a land-fill site that creates environmental hazards, but these were not implemented.</p>	2
Sustainability of project results	In an urban context and given high demand, and the 30-year PPP contract, this road is likely to be maintained. Effage Group of France, the concessionaire, is a large company with extensive experience of toll roads and would also have reputational concerns to ensure smooth operations and maintenance. From a GG-CC perspective, there are likely to be downsides, such as pollution, additional traffic generated, noise, etc.	3
Project Monitoring and Evaluation	This appears to have been satisfactory for a PPP project.	4
Bank performance	Some aspects of the design, for example, the extensive case made during project design such that resolving the toxic Mbeubeuss landfill would be a key environmental benefit, appear to have been overstated. These environmental benefits were reported as integral core activities of the project with the initial objective of closing the Mbeubeuss landfill, considered by many in Senegal to be a major source of pollution (air, water, soil), but the closure failed to happen.	2
Country performance	Land acquisition difficulties adversely impacted project implementation. This is not unusual, especially for urban infrastructure projects. Such difficulties act as a deterrent to designing and implementing urban projects.	3
Average score		19/7 = 2.7

¹⁰ AfDB Evaluation of Bank Strategies and Programs in Senegal 2004–2013 Summary Report, IDEV, January 2016. Technical data source Mott MacDonald.

¹¹ Source: Study on the costs and operating conditions of public passenger transport vehicles in Senegal for optimal pricing. Land Transport Directorate. September 2007.

Annex Table 4.6: Cameroon: Dibamba Power Plant

Key component	Summary Performance	Score (maximum 4)
<p>Relevance of objectives and design aspects</p>	<p>The project comprises the engineering, financing and construction of an 86 MW thermal power plant and switchyard at Dibamba, in the suburbs of Duala, Cameroon. It includes a 2 km 90 kV transmission line to connect the power plant to the national grid.</p> <p>The objective of the project was to close the supply gap of about 38 MW that prevailed in 2009/10, while providing a capacity reserve margin within the system. At the time, demand for electricity was booming and estimated to be increasing by 6 percent annually over the medium term. Supply shortfalls were therefore expected to worsen without the Dibamba project, leading to widespread load-shedding in the country, with negative impacts on industrial and commercial production, and social welfare.</p> <p>Although the use of HFO was considered to be more costly than other less expensive alternatives, such as gas turbines and/or hydropower projects, the uncertainty of natural gas supplies at the time undermined the case for gas turbines. In addition, the unpredictability of the hydrological situation meant that hydropower projects were not considered to be secure sources of supply when trying to avoid an impending energy crisis.</p> <p>The Dibamba Heavy Fuel Oil Power Plant project, which can be converted to gas turbines at a later stage (which is a positive), was therefore considered to be the most appropriate option available.</p> <p>The project directly contributed to the development of Cameroon's electricity infrastructure. By constructing the 86 MW power plant, the Dibamba project has provided additional capacity to support industrial expansion and meet the increase in demand, which is currently 6 percent per year.</p> <p>The project scored 2 because of the use of HFO, a highly polluting fossil fuel.</p>	<p>2</p>
<p>Development outcomes performance</p>	<p>The main benefit of this project is to reduce power outages by 500 hours a year for about 76,000 consumers. It is producing power as projected, but from a GG-CC perspective generation is not clean, even though the documentation makes a case that this represents a modest share of global emissions.</p>	<p>2</p>
<p>Efficiency of resource use</p>	<p>This is a private sector loan. There was minor slippage at the beginning (from April 2010 to May 2011), and subsequent slippages during construction (see below). The Bank allowed the program to benefit from two extensions for a total of 30 months and direct payment of salaries following the suspension of revolving funds for 25 months.</p>	<p>2</p>
<p>Sustainability of project results</p>	<p>The project is sustainable in financial terms but damaging from a GG-CC perspective.</p> <p>The mechanism provided for a coverage ratio of 2.3 in 2020, which was intended to allow the project to ensure continuity of service. The current projected liquidity risk ratios are adequate, with average and minimum values of 9.5x and 6.8x, respectively. The liquidity risk is low and is therefore considered minimal.</p>	<p>2</p>
<p>Project Monitoring and Evaluation</p>	<p>The performance standards on social and environmental sustainability applicable to the project are:</p> <p>Pollution Prevention and Control: Defines the requirements to minimize pollution from project activities and promote the reduction of emissions that contribute to climate change. These include specific requirements for reducing waste, GHG emissions, etc.</p> <p>Community Health, Safety and Security: Defines the requirements to minimize risks to, and impacts on, the health and safety of the local community during the lifecycle of the project. These include issues such as infrastructure and equipment security, hazardous materials, emergency preparedness and response.</p>	<p>2</p>

	See below also.	
Bank performance	<p>From its inception until March 2013, the program suffered from the low level of AfDB supervision and monitoring of activities, and laxity in the processing of files, which had a negative impact on its performance.</p> <p>In the latter phases of the project, the Bank carried out numerous supervisory missions, which made constructive recommendations that contributed to refocusing the program's operations, namely: (i) resizing activities; (ii) reviewing procurement methods to adapt them to the local context; (iii) regular updating of the timetable for the implementation of activities and the procurement plan; (iv) adaptation of budget allocations to the realities of the domestic market; and (v) revision of the list of goods and services in the program's procurement plan to bring it into line with the financial constraints of ECCAS.</p> <p>The Bank has supported ECCAS, COMIFAC and the PMU in the implementation of Congo Basin Ecosystems Conservation Support Program (PACEBCo) activities throughout the program cycle, and its performance can be considered satisfactory, despite some shortcomings, namely:</p> <p>(i) During the preparation of the program, many constraints to its implementation were not identified and no feasibility studies were carried out, despite the fact that more than 25 percent of the investments were complex infrastructure works.</p> <p>(ii) During the implementation of the program, the Bank did not make a significant contribution until two years after the actual start of activities. Numerous meetings were held with ECCAS, COMIFAC, program partners and the PMU for regular monitoring of activities. The Bank carried out 12 supervision missions during which discussions were held with the authorities on the problems encountered in the implementation of the program and relevant recommendations were made to resolve them.</p> <p>(iii) With regard to fiduciary matters, the Bank supported the program to improve the management of its resources.</p>	2
Country performance	<p>No dominant GG-CC leadership from a country perspective. Instead, the issue was addressed in a cross-cutting manner and not directly.</p> <p>The project is implemented by a private contractor under a PPP arrangement. Thus, the primary objective is financial profitability.</p>	2
Average score	This project is a means to an end and would not be funded by the AfDB given current guidelines.	12/7 = 1.7

Annex Table 4.7: Cameroon – Ketta-Djoum Road Development Project, Phase 1 in Cameroon (i.e., Djoum-Minto)

Key component	Summary Performance	Score (maximum 4)
Relevance of objectives and design aspects	<p>The project contributed to economic and social development, and regional integration in the Economic Community of Central African States (ECCAS) area. It facilitated the implementation of the Consensus Transport Master Plan for Central Africa (PDCT-AC), which aims at ensuring reliable and permanent connections between the national capitals of the sub-region.</p> <p>The specific objective of the project was to improve the service level of the transport logistics chain along the Brazzaville-Yaoundé highway in order to stimulate trade and improve the standard of living of the communities in the project. The development of the Ketta-Djoum road, an important link in this corridor, was planned in two phases. Phase I is the subject of this project and structured around four components in addition to the road works, namely rural access tracks and social actions, the development of a common border post, the protection of heritage and the facilitation of transport.</p> <p>The project did not have a coherent theory of change or log frame to support GG-CC. Although regional connectivity is clearly a priority and improved roads should bring down travel times and VOCs, this aspect scored 3 because of the</p>	3

	<p>lack of demonstrated GG benefits. GG-CC aspects were not given much consideration in the design of the Ketta-Djoum Phase I road project because, according to interviews conducted, environmental aspects were apparently not important to either the Bank or the Government.</p>	
Development outcomes performance	<p>This was only Phase I of this road project and therefore the full regional corridor benefits have yet to be achieved.</p> <p>The project crosses the Congo Basin, the forests of which are carbon sinks with a capacity to absorb 500 million tons of CO₂ per year. Climate change was taken into consideration in the project design, with the drainage of sections of roads to be developed and the sizing of hydraulic structures, taking into account rainfall in the project area.</p> <p>Mitigation measures during road operations included forest and wildlife resource management and governance measures, reducing emissions from deforestation, and conducting environmental and forestry audits. They also included environmental and forestry monitoring and evaluation.</p>	3
Efficiency of resource use	<p>The evaluation mission to Cameroon found several recurring organizational obstacles external to the Bank that contributed to casting a shadow over Bank-financed projects, as follows:</p> <ul style="list-style-type: none"> • Funding of component projects (indirect investments) has been problematic (e.g., matching funds not being mobilized). • Underestimated budgets for the implementation of activities, mainly those allocated to the Government. • Delays in project implementation, mainly due to several organizational factors. • Complex institutional arrangements. <p>The aspect of training is also an issue. In terms of the Government, training needs on GG-CC were highlighted at all levels, without identifying specific needs. It would appear that training is not a priority for the Government, so instead reliance falls on the programs of international development partners, including the Bank, which seem to be lagging behind.</p>	2
Sustainability of project results	<p>As Phase II of the project is still ongoing, the road is not yet carrying its full traffic loads. In institutional terms, there have been some concerns about insufficient budgeting for road maintenance in Cameroon. In 2019, the World Bank announced a major program to support, among other things, road maintenance and institutional strengthening on a network basis.</p>	3
Project Monitoring and Evaluation	<p>GG-CC aspects were not given much consideration according to the interviews conducted, while environmental aspects were apparently not important to either the Bank or the Government. In addition, on the Government's side, there was no environmentalist in the project execution unit (PEC) and instead only engineers who prioritized infrastructure.</p> <p>On the Bank's side, monitoring activities could have benefited from improvement. These activities are carried out through supervision missions that normally take place twice a year. This is followed by a Project Implementation Status Report (PISR), where the progress of each activity is recorded using indicators. However, there are no indicators specifically related to GG-CC, whereas activities such as screening plantings or waste management that have an impact on CC adaptation and mitigation would have benefited from being monitored.</p>	1
Bank performance	<p>Very unsatisfactory from an environmental perspective. The Ketta-Djoum Phase I road project was classified as Category 1 which, in accordance with the AfDB's Policy on the Environment (2004), meant that it was likely to result in substantial adverse environmental and/or social impacts that are irreversible, or significantly affect environmental or social components considered sensitive by the Bank or Cameroon.</p> <p>Category 1 projects require a comprehensive Environmental and Social Impact Assessment (ESIA), including the preparation of an Environmental and Social</p>	1

	<p>Management Plan (ESMP), to prevent, minimize, mitigate or compensate for negative impacts, and enhance environmental and social benefits.</p> <p>An expert from the Bank's Independent Inspection Mechanism (IIM) undertook a field mission from October to November 2018, to assess the level of compliance of the Ketta-Djoudj road development project with the Bank Group's applicable environmental and social policies. The specific objective of the spot audit is to draw lessons from the IIM experience in order to advise Bank Management on compliance issues inherent to high-risk projects.</p> <p>This spot audit revealed that the project was not in compliance with the AfDB's Environmental Policy (2004) or the Environmental and Social Assessment Procedures (ESAP) due, in particular, to the lack of measurable monitoring parameters in the ESAP.</p> <p>The Report of the Advisory Ad-Hoc Compliance Audit of the Ketta-Djoudj Road Upgrading Project – Phase 1 in Cameroon, published in June 2019, identified several factors impeding the success of the environmental and interventions that mainstream GG-CC. The ESIA and related reports were written in a manner that failed to follow Bank guidelines, with a lack of environmental specialists in the Bank's supervision missions, disbursements made against established principles/rules, and environmental and social safeguards and risk mitigation plans simply ignored/not implemented.</p> <p>The Independent Inspection Mechanism (IIM) also reviewed the supervision assistance prepared by Bank staff and found that on some of the missions no environmental specialist was present and that some reports did not address the status of implementation of the Environmental and Social Management Plan (ESMP) or its absence.</p>
Country performance	<p>On the Government's side, the environment specialist of the Project Implementation Unit (PIU) was responsible for monitoring the implementation of the mitigation and rehabilitation measures described in the project's ESMP and compliance with applicable regulations. However, the PIU had no environmentalist, only engineers who prioritized infrastructure.</p>
Average score	<p>Concerns about environmental supervision and compliance should have been picked up at Quality-of-Entry stage because the documentation was unsatisfactory from the start of this project, according to the Compliance Audit.</p>

The five sustainable infrastructure (energy and transport) projects reviewed as a sub-set of the PCRs indicate generally positive performance from a GG-CC perspective, but this varies according to the sector. Average scores are higher for the three energy projects than the two transport projects, and this is likely to be typical of broader sector considerations: sustainable energy projects can have very high GG scores, whereas the best that roads (mainly highway projects) can achieve is to mitigate against the impact of vehicular traffic by including tree-planting measures, green slope stabilization to reduce the risk of land-slides in severe weather events, good drainage, and the appropriate use of construction materials. These are mitigation measures rather than measures that can produce very strong positive externalities, as in the way achieved by the Noor 1 solar power generation project, acting as a successful pathfinder for an energy generation cluster of projects.

Annex 5: Synthesis of Cluster Level PRA Findings

Key component	Summary Performance	Score (maximum 4)
Relevance of objectives and design aspects	<p>Energy: Three of the four energy projects (Morocco Noor I, Rwanda KivuWatt, and Rwanda Scaling Up Energy) scored the top mark of 4 under this criterion. Each is highly relevant in supporting GG objectives. The remaining project in Cameroon (Dijamba Power Plant) only scored 2 because the plant has been constructed to use polluting heavy fuel oil. A redeeming feature of the design is that it can be adapted to run on gas, otherwise it would have only scored 1.</p> <p>Transport: Road projects are rarely totally green, although improving roads should reduce Vehicle Operating Costs (VOCs), including fuel consumption. Two out of the three road projects (Rwanda Butare Road and Cameroon Ketta Dioum Road) in the sample strengthen regional connectivity and will also reduce VOCs, so both score 3, while the third project (the Senegal Dakar-Diamniodio motorway) scores 2. This is a toll road concession constructed under a PPP, which is financially desirable, but no public transport alternative is offered (although buses should be quicker). In addition, toll roads need non-tolled parallel routes, so their land take is higher.</p> <p>Consolidated Findings: Overall cluster performance indicates generally reasonable relevance, with higher scores for energy projects than for transport projects. In the energy sector, major changes have taken place in terms of the evolution of green technologies and much depends on when projects were commissioned. Progress in GG of road projects has been more incremental, and other modes were not represented in the PRAs.</p>	<p>Energy 14/4 = 3.5</p> <p>Transport 8/3 = 2.66</p> <p>Composite 22/7 = 3.14</p>
Development outcomes performance	<p>Energy: The two of the four energy projects (Noor I and KivuWatt) score 4 because they are truly green energy generation, using solar power and renewable methane from Lake Kivu. Noor I is the first of a cluster of four solar power plants that helped to prove the technology and viability of the investment. It also demonstrated that Morocco is at the forefront of achieving positive development outcomes in terms of sustainable energy generation, as well as enhancing resilience by reducing the need to import hydrocarbons (coal and HFO). The Scaling Up Energy project in Rwanda scored 3 because, although it supports GG, including rural economic activities, the price of electricity is too high to make it affordable for cooking, and therefore it will not assist in efforts to reduce the burning of biomass (wood and charcoal), as envisaged in design documents. In Rwanda, off-grid solutions are being used to support the poorest, who may not be able to afford regular utility bills and/or live in remote areas. The Dijamba power plant in Cameroon only scored 2 as, although it is functioning and reducing power outages, it burns HFO, which is a polluting hydrocarbon.</p> <p>Transport: Development benefits from roads projects typically reflect improved connectivity, providing the potential for economic growth and diversification. The Butare-Ntendezi road in Rwanda scored 4, as it has reduced travel times and therefore VOCs from 6 to 3 hours, and also supports regional integration in shortening travel times to Eastern DRC. The remaining two transport projects scored 3. The Dakar-Diamniodio road has reduced travel times from 90 to 30 minutes with corresponding VOC savings, but is attracting far fewer HGVs than projected. HGVs are likely to be using non-tolled more congested roads instead to avoid paying toll fees. The Ketta-Djoum road is performing well from a technical perspective but is only Phase I of a regional corridor development and therefore not yet achieving the full benefits.</p> <p>Consolidated Findings: The composite score reflects reasonable development outcomes for all projects with the exception of the polluting HFO power plant in Cameroon, and even that project has reduced the load-shedding/outages on the electricity grid.</p>	<p>Energy: 13/4 = 3.25</p> <p>Transport 10/3 = 3.33</p> <p>Composite 23/7 = 3.28</p>
Efficiency of resource use	<p>Energy: One energy project scored 4, namely the Noor project. In light of the economics of solar power, Noor I is improving due to technical advances. The project has benefited from excellent and extensive technical verification. Another energy project scored 3, Rwanda's Scaling Up Energy project, which was executed well overall, but suffered some delays due to one contractor failing. Two energy projects scored 2. KivuWatt was delayed by three years due to</p>	<p>Energy 11/4 = 2.75</p>

	<p>technical challenges (it is highly innovative), while the Didamba power project, which is a private sector project, also suffered delays.</p> <p>Transport: One project, Rwanda's Butare-Ntendezi road, scored 3 due to its suboptimal design lifespan and ongoing repairs, while the remaining two projects (Senegal's Dakar-Diamniadio motorway and Cameroon's Ketta-Djoum highway) scored 2. In the case of the former, the low score was because a landfill reclamation component was not undertaken, while in the Cameroon case there were problems with collecting matching funds for environmental measures pertaining to GG.</p> <p>Consolidated Findings: The composite score is a disappointing 2.57, with the dominant inhibitor being delays, together with problems with associated environmental components for two of the road projects.</p>	<p>Transport 7/3 = 2.33</p> <p>Composite 18/7 = 2.57</p>
Sustainability of project results	<p>Energy: Two projects scored 4: the Noor project, because of the scale of its efficiencies. It is the first of four plants and the GoM is fully committed. Also, the Scaling Up Energy project in Rwanda, where there is a high degree of end-user ownership and the District authorities, when interviewed, said there was considerable pressure on the utility company to ensure reliable electricity. KivuWatt in Rwanda scored 3, because there is a high focus on safety, but this is an inherently risky operation in a volatile region. The Dijamba power project in Cameroon scored 2 because, although the project is financially sustainable, it is a cause of pollution and therefore not contributing to environmentally sustainable solutions.</p> <p>Transport: The Butare-Ntendezi road in Rwanda scored 4 because of the presence of a periodic maintenance contract. Also, the road is of high strategic and security importance, and the GoR is committed to funding road infrastructure. The Dakar-Diamniadio toll road has a 30-year PPP contract and, as the major investment has been made, should be financially sustainable. However, from a GG perspective, it will contribute to traffic growth and pollution, so it scored 3. Finally, the Ketta-Njoum road in Cameroon is not yet carrying its full corridor traffic. But the World Bank has committed US\$200 million to road maintenance and institutional strengthening on a network basis, so it scored 3.</p> <p>Consolidated Findings: Overall sustainability of these projects is promising, in essence because they are all important, with strong institutional ownership and vested interests in their continuity. Both public and private sector projects show promising prospects for sustainability. Five out of the seven projects are revenue generating (all of the power sector projects and one toll road), and the other two roads in Rwanda and Cameroon are in countries with, in the case of Rwanda, strong public commitment to road maintenance, while in Cameroon the roads sector is receiving significant development partner support to strengthen asset maintenance.</p>	<p>Energy 13/4 = 3.25</p> <p>Transport 10/3 = 3.33</p> <p>Composite 23/7 = 3.28</p>
Project Monitoring and Evaluation	<p>Energy: Two energy projects scored 4: in Morocco, the Noor 1 project had a high degree of technical oversight achieved by MASEN. Project monitoring was enhanced because it had to satisfy the requirements of several development partners and joint supervision missions were conducted. The Bank participated in all the joint supervision missions. In addition, the Rwanda Scaling Up Electricity project benefited by making "Payment by Outputs", which ensured a real focus on compliance with key milestones. This justifies broader application. KivuWatt also produced good quality quarterly financial, technical and environmental reports, including some independently verified reports covering the "plume" of waste products released into Lake Kivu. In Cameroon, the Dijamba power plant suffered from inadequate supervision by the AfDB in the first two years.</p> <p>Transport: Highly different results were achieved. In Rwanda, the Kitabi-Ntendezi road scored 4 because of excellent supervision by an experienced in-country Bank Task Manager. Similarly, the Dakar-Diamniadio toll road scored 4: it is a PPP project with several financiers and a high degree of accountability. In contrast, in Cameroon the Ketta-Djoum road scored 1 under this category: there was no environmentalist in the Project Implementation Unit and Project Implementation Status Reports did not adequately cover environmental factors.</p> <p>Consolidated Findings: Good M&E requires well-structured and planned M&E with appropriate staffing. In addition, it is appropriate to consider the scope for more contracts to be structured to provide "Payment by Outputs", as this includes scrutiny on performance.</p>	<p>Energy 13/4 = 3.25</p> <p>Transport 9/3 = 3.0</p> <p>Composite</p>

		22/7 = 3.14
Bank performance	<p>Energy: Three out of four projects showed very good Bank performance and scored 4. Noor 1 leveraged Clean Technology Fund (CTF) on this pathfinder project, the first of a group of four solar power stations in this location. There was evidence of good cost controls and supervision. KivuWatt was relatively easy to manage, as the AfDB was only providing a Line of Credit and one among several funders, but nonetheless the Bank still performed well. This was also the case for the Scaling Up Energy project in Rwanda, where no difficulties were reported, and the Bank co-chaired the Energy Access Sector Group. The Dijamba power project only scored 2, due to the lax processing of files in the first two years, although supervision improved later.</p> <p>Transport: The Butare-Ntendezi road was highly satisfactory due to the Bank's strong field office expertise. In addition, AfDB support for the project acted as a pathfinder to leverage resources from BADEA (Arab Fund). It scored 4. In Senegal, the Bank's performance regarding the Dakar-Diamniadio road scored 2, mainly because the Mbeubeuss landfill issue remained not resolved, despite being prominently used as a justification for the project on environmental grounds. Finally, in Cameroon, the Ketta Djoum road was highly unsatisfactory from an environmental perspective. The AfDB failed to adhere to its own procedures at the design or implementation stages. An audit revealed that the project was not in compliance with the AfDB's Environmental Policy (2004) or the Environmental and Social Assessment Procedures (ESAP) due, in particular, to the lack of measurable monitoring parameters in the ESAP. As a consequence, it scored 1.</p> <p>Consolidated Findings: A variable performance across the PCRs. Good continuity of task management by in-country Task Managers made a huge difference with Noor I and the Butare-Ntendezi road being good examples.</p>	<p>Energy 14/4 = 3.5</p> <p>Transport 7/4 = 1.75</p> <p>Composite 21/7 = 3.0</p>
Country performance	<p>Energy: Morocco scored 4 for the Noor I project. It also scores Green under RISE, based on a high degree of strategic and policy leadership to GG-CC objectives, together with a clear strategy as in the National Energy Strategy (NES), 2009. MASEN, as project owner, proved fully capable of supporting the project operations from a GG-CC perspective. KivuWatt scored 3. Although Rwanda shows good country leadership, relations between the Ministry of Finance and Contour-Global, the developer, were poor. The Scaling Up Energy project in Rwanda also scored 4 for its impressive ownership at both the Utility and District levels, together with good oversight systems. In Cameroon, the Dijamba power plant project scored 2, as GG-CC was treated as a cross-cutting issue and not given prominence.</p> <p>Transport: The Butare-Ntendezi road was supported by clear sector strategies, for example, all roads have to include tree planting, so it scored 4. The Dakar-Diamniadio toll road scored 3 because it faced land acquisition challenges, which are a government responsibility. In Cameroon, the Ketta-Djoum road scored 2, because there was a lack of capacity at the PIU level in environmental management.</p> <p>Consolidated Findings: Country performance varied considerably, with large gaps between Morocco and Rwanda, and Cameroon and Senegal. Strategic national leadership of GG-CC is reflected at the project level, and the converse is also the case. This is consistent with the Readiness Review findings for the three countries, which were covered by both assessments/evaluations.</p>	<p>Energy 13/4 = 3.25</p> <p>Transport 9/2 = 3.0</p> <p>Consolidated 22/7 = 3.14</p>
Average score 4 energy projects		91/49 = 3.25
Average score 3 transport projects		60/31 = 2.86
Average score for seven projects across seven dimensions:		151/49 = 3.08

Annex 6: Country GG-CC Strategies/Policies for the Power and Transport Sectors

Country reporting (see below) was structured to focus primarily on Morocco and Rwanda, given that it is these two countries of the sample that have articulated clear GG-CC strategies that have most to offer the cluster evaluation from a lesson-learning perspective. The report also utilizes information from the Readiness Assessment prepared by the AfDB and the Global Green Growth Institute (GGGI).¹² This assessment covered the majority of the countries included in the fieldwork of the GG-CC evaluation, namely, Morocco, Rwanda, Mozambique and Senegal. It facilitated a deep dive into the mechanics of accelerating GG through support and actions with respect to nine readiness dimensions. They also provide useful insights for extrapolation to other African countries.

Rwanda

The Rwanda portfolio supports both the energy and transport sectors. It is therefore highly **relevant** to the cluster evaluation. The **CSP 2008–2011** identified Economic Infrastructure as one of its two pillars, the other being Competitiveness and Enterprise Development. The Bank's support included lending operations for energy and transport infrastructure, as well as ICT, water and sanitation and agriculture. In the **CSP 2012–2016** the AfDB continued with its infrastructure and private sector development focal sectors. The choice of pillars reflected the need to consolidate progress and promote *economic competitiveness for inclusive growth and poverty reduction*. This objective will be achieved through two strategic and complementary pillars: (i) Infrastructure Development; and (ii) Enterprise and Institutional Development. The justification is sound from an economic development perspective, but there is no explicit mention of GG-CC. The CSP noted that: *“Rwanda’s transportation costs and power tariffs exceed regional averages implying a higher cost of doing business. In addition, good transport networks improve national and regional connectivity; increase access to markets for farmers and other entrepreneurs; and support the delivery and consumption of public services such as primary health care and agricultural extension services”*. It noted that expensive and unreliable electricity remained a constraint to Rwanda's economic growth. The AfDB's interventions in energy focused on improving energy production, access, affordability, and reliability.

The Bank's positioning was relevant and logical at this point, and consistent with Rwanda's development needs and the AfDB's comparative advantages. The Bank was also supporting regional integration projects, including power interconnectors and the Isaka-Kigali Railway study.¹³ These regional projects have the potential for GG by enhancing network efficiency in the case of power, and facilitating the transfer of freight from polluting HGVs to rail, which is far greener. There is, however, no evidence at the CSP level that the AfDB was explicitly driving or promoting the GG agenda in Rwanda.

The third CSP covers **2017–2021**. It is of note that the CPPR and 2016 CPIP do not mention issues arising with respect to GG-CC.¹⁴ Key portfolio performance actions related to improved loan processing, the provision of continuous training and capacity development, and in procurement, contract and project management for the executing agencies. The main objective of the CSP 2017–2021 is to accelerate the country's economic transformation process, thereby boosting inclusive private sector-led growth and creating higher value-added formal wage employment. The CSP is articulated around two complementary pillars: Pillar-1 – Investing in energy and water infrastructure to enable inclusive and green growth; and Pillar-2 – Developing skills to promote high value-added economic activities and economic transformation. Transport has been dropped as a focal area. For the first time there is explicit reference to GG, most notably through energy and water infrastructure. This may also apply to the Bank's Pillar 2 work concerning value-added economic activities and economic transformation, but this initiative is recent and there is less readily available evidence.

Non-lending operations that focus on CC-GG include the Sustainable Energy for All (SE4) Investment Prospectus (IP)¹⁵ and the Green Mini Grid study.¹⁶ The IP will help facilitate increased future investment in the energy sector that should advance the country's progress toward its policy objectives relating to energy access, renewable energy power generation, and addressing the unsustainable imbalance between the consumption and production of biomass, as well as improved energy efficiency levels. The Green Mini Grid study will help the Government to design energy programs to achieve the UN Sustainable Development Goal (SDG) 7 to provide affordable, reliable and sustainable electricity and modern energy to all by 2030.

¹² Africa Green Growth Readiness Assessment. A joint study of the African Development Bank Group and the Global Green Growth Institute to support NDC and SDG implementation planning in Africa, Final Draft, May 2020.

¹³ A rail link from Kigali to Tanzania that links to an existing rail line at Isaka in Eastern Tanzania. This initiative is being carried forward.

¹⁴ See Annex 13 of CSP 2017-2021.

¹⁵ <https://www.se4all-africa.org/seforall-in-africa/country-data/rwanda/>

¹⁶ Note these non-lending activities are ongoing in 2020, after the end of the evaluation period.

The AfDB is playing a key role in joint chairing of the **energy distribution sub-working group** and in **co-chairing the sector working group for transport**. This demonstrates the value added that the AfDB can provide. The opportunity for such coordination and leadership varies widely among RMCs.

Institutional responsibility: Rwanda is unusual among RMCs in that it has a single Ministry of Infrastructure (MoI) covering both energy and transport. Responsibility for delivering power and transport infrastructure is devolved from Ministries to State Owned Enterprises (SOEs) or Agencies in many RMCs. Rwanda has devolved responsibility to the Energy Development Corporation Limited (EDCL)¹⁷ and the Road Transport Development Agency (RTDA). These agencies have a performance contract and operational independence with the oversight ministry retaining responsibility for policy. Since funding has been for projects rather than to support sector reforms through PBOs, the key interlocutor from the Government has been the sector agency rather than the MoI for both sectors.

Rwanda has been a leader in the early recognition of the importance of GG. The Government of Rwanda (GoR) initiated a **national tree planting day** that preceded the development of the comprehensive Green Growth and Climate Resilience Strategy, which was published in 2011.

The GoR has been innovative in mainstreaming GG and its response to CC in planning, budgeting and resource management. This has been an ongoing process: different sectors have been working to articulate and mainstream these GG policies, and to refine their response sector by sector.¹⁸ Key national GG-CC documents include:

- Rwanda Green Growth and Climate Resilience Strategy (GGCRS), 2011;
- Rwanda National Environment and Climate Change Policy, Ministry of Environment, June 2019;
- Rwanda National Cooling Strategy, Ministry of Environment, 2019 Rwanda Strategic Plan for Agriculture Transformation 2018-24;
- Forest Investment Program for Rwanda (2017); and
- Rwanda National e-Waste Management Policy for Rwanda (2016).

Other planning documents are nationally owned (i.e., fully approved and signed off by the relevant ministries) but prepared with external assistance. These include:

- National Roadmap for Green Secondary City Development GGCI, December 2015;¹⁹
- National Road Map for Green Cities Development in Rwanda”, GGCI, May 2016; and
- Rwanda Green Fund (FONERWA) documents (various).²⁰

In 2015, Rwanda ratified the Paris Agreement on Climate Change and developed an ambitious climate action plan as a Nationally Determined Contributions (NDCs) to implement its obligations under the Paris Agreement. Rwanda joined the NDC Partnership in June 2018, appointing focal points in the Ministry of Environment and the Ministry of Finance and Economic Planning. Since joining, Rwanda has engaged with the NDC Partnership to elaborate the country’s needs for NDC implementation into clear actions and outputs. The NDC Partnership Plan was developed under the leadership of the Ministry of Environment in collaboration with a range of stakeholders and validated in November 2018. This plan covers the period of 2019–2021.²¹

Rwanda’s NDC Partnership Plan covers a broad range of sectors, including agriculture, forestry, water resources, land-use, disaster management, renewable energy, off-grid electrification, transport, industry, and waste. Rwanda joined the NDC Partnership, and an NDC Partnership Plan was elaborated aiming to develop enabling environments for NDC implementation and identify new funding.

¹⁷ Rwanda Energy Group Limited (REG), is a government-owned holding company responsible for the import, export, procurement, generation, transmission, distribution and sale of electricity in Rwanda. It performs its functions through two wholly-owned subsidiaries: (i) the Energy Utility Corporation Limited (EUCL); and (ii) the Energy Development Corporation Limited (EDCL).

¹⁸ See for example the Rwanda National Investment Policy MINECOFIN, 2017 and Energy Sector Strategic Plan, 2013/14 to 2017/18, MININFRA.

¹⁹ Note that the Foreword to this report was written by Hon. James Musoni, Minister of Infrastructure, Republic of Rwanda.

²⁰ <http://www.fonerwa.org/publications> Note that FONERWA has a wide range of publications online and available at this website.

²¹ <https://environment.gov.rw/index.php?id=49>

These findings are consistent with the AfDB/GGGI Readiness Assessment. This found that Rwanda has an advanced enabling environment for GG. The less developed enabling environment is compensated by the exceptional leadership, speed of execution and drive for results. While developing a broad GG agenda and working to develop the nine dimensions of GG readiness, Rwanda has chosen to focus on inclusiveness and support to local entrepreneurship leading to significant achievements in green jobs. The Readiness Assessment also highlights the innovative role of FONERWA as a role model for mobilizing funds.²²

Morocco

For the **CSP 2007–2011**, the three pillars were: (i) Consolidation of the governance system; (ii) Development and modernization of infrastructure and enterprises; and (iii) Promotion of human development. The three main strategic goals pursued by the Bank assistance strategy through these three pillars were: (i) improving the business environment; (ii) boosting corporate productivity and competitiveness; and (iii) reducing social disparities, especially in rural areas. While GG-CC were not explicitly visible priorities, the CSP stated that the Bank will support the implementation of sector strategies, particularly those related to energy and water, to assist the Government meet the challenges of environmental protection and the fight against climate change, with reference to Morocco's climate change control strategy.

For the **CSP 2012–2016**, the strategic objective was to “Strengthen the Bases for Inclusive Growth through Competitiveness and Social Inclusion”, leading to the following two pillars: (i) strengthening governance and social inclusion and; (ii) **support for green infrastructure development**. The choice of the pillars was in part justified by their expected potential impact on the promotion of GG, which was identified as a “priority objective of the Moroccan authorities,” requiring the protection of natural resources, strengthening of the competitiveness of the economy, and diversification of growth sources. Compared with the previous CSP, GG-CC had become a high priority. GG-CC supports the promotion of clean energies, the conservation of water resources and infrastructure modernization.

The overall objective of the **CSP 2017–2021** is to support the country to accelerate the transformation of its economy and build resilience through targeted support to develop the private sector and reduce employment-related disparities (age and gender). The CSP comprises two pillars: (i) **promote green industrialization through SMEs and the export sector**; and (ii) improve living conditions through jobs for youth and women, and in rural areas. Furthermore, promoting GG is stated to be the cross-cutting theme of this strategy. Under Pillar 1, green industrialization is supported through green infrastructure development by scaling up operations on renewable energy and sustainable means of transport.

It is also important to note that Morocco has the Bank's largest portfolio, comprising 35 operations for a total commitment of UA 2 billion. The portfolio covers seven areas: of these energy (38.7 percent) and transport (24.8 percent) comprise almost two-thirds (63.5 percent) of the total.

The AfDB/GGGI Readiness Assessment found that Morocco has an advanced enabling environment for GG. It found that Morocco²³ has a fairly advanced education system and a pool of local human capacity, as well as the experience of its widespread diaspora. In parallel to the long-term GG agenda, the strong leadership of the King has enabled Morocco to tap its renewable resources, and to mobilize international and climate finance to develop the world's largest solar energy park.

In the energy sector, key policies are the **National Energy Strategy (NES), 2009**,²⁴ and the Integrated Wind/Hydro and Rural Electrification Program (2012–2022). Championed by the King, the NES is seen as a turning point in Morocco's energy strategy, driven by the need both to reduce reliance on energy imports and the high fuel prices associated with these, and the abundant opportunities for renewable energy development within the country. At publication, the NES was one of the most ambitious and comprehensive renewable energy strategies in the Middle East and North Africa (MENA) region. Its intention was to establish 42 percent of installed capacity from solar, wind and hydropower resources by 2020, with equal proportions of installed capacity for each resource (14 percent each), compared with a 31 percent renewable mix in 2010 (28 percent hydro, 3 percent wind).

A key outcome of the NES was the creation of a dedicated agency, MASEN,^{25 26} responsible for managing renewable energy and leading development of programs of integrated projects to create an additional 3,000 MW

²² <http://www.fonerwa.org/about>

²³ Together with Tunisia, in its sample of countries.

²⁴ MEMEE, Ministry of Energy, Mines, Water and Environment, Governmental Actions- Arabic version (2008), <http://www.mem.gov.ma/SitePages/MenuHaut/Documentation.aspx>

²⁵ Initially housed with just five staff within the Office National de l'Electricité et de l'Eau Potable (ONEE), the Agency now has its own building and comprises 150 staff.

²⁶ www.masen.ma/en/

of clean electricity generation capacity by 2020. The Noor Ouarzazate Solar Power Plant I was the first of a complex of solar power plants developed by MASEN, with approval of plant I (160 MW) in 2012 and plants II, III and IV (200 MW, 150 MW and 72 MW, respectively) in 2013, and a plant at another site, Noor Midelt. The AfDB was involved in financing each of these plants apart from Ouarzazate IV, in each case leveraging concessional loans from the Clean Technology Fund (CTF):

The AfDB also invested in two wind-power developments: Wind Farm Tangier II, and research studies for the Wind Farm Koudia al Baida. The Noor Ouarzazate project and subsequent Bank investments highlight the following dynamics between the Government of Morocco (GoM) and the AfDB:

- The request for CC support was firmly driven by the GoM, shaped by a complex mix of drivers, and was targeted at a number of development partners, of which five responded positively to the request to finance Noor Ouarzazate I, namely, the World Bank (WB), the European Union, the German KfW Development Bank, the French Development Agency (AFD) and the AfDB.
- As the request for support by the GoM was consistent with the AfDB's CSP 2012–2017, this enabled the AfDB to respond positively.²⁷ This did not mean, however, that specific interventions of the Noor Ouarzazate I project emanated from the CSP; rather, it is more likely that the CSP 2012–2017 was influenced by initial discussions between the AfDB and MASEN in 2011.
- A significant consideration was that the AfDB was an intermediary for the Clean Technology Fund (CTF) investment, enabling the AfDB to provide significant concessional grant financing from the CTF, as well as its own loan. Grant financing was also provided by KfW and the European Union.
- Given the innovative nature of these integrated projects, the GoM had the opportunity to profit from the combined benefits of a suite of development partners. This meant that the program benefited from the compliance requirements of each development partner, requiring that it met the highest standard in each case; in the case of the AfDB, this included a high standard of environmental and social compliance. Interviewees observed, “We were able to benefit from the technical expertise of the Bank’s chef du projet, who was very present, very responsive, very facilitative, as well as from the environmental and social expertise of the Bank.”²⁸
- In addition, and in contrast to some other development partners, the AfDB was also able to provide technical advice on how the development of the Ouarzazate complex might be used to support the involvement of local industries and the employment of local people.

Relevance: Development of this investment was demand-led, with a timely and appropriate response from the AfDB. MASEN was able to take advantage of the AfDB's high environmental and social standards, its technical support, and the Bank's ability to leverage significant concessional financing from the CTF.

Morocco has a clear policy focus on GG-CC over at least 20 years in the energy sector. There has been significant expansion of investment in renewables over the past decade, particularly in solar. Under the new social pact, which focuses on inclusive growth, much greater consideration should be given to distributed renewables (e.g., rooftop solar and mini-grids).

The AfDB, in its capacity as the executing agency of the CTF Trust Fund, was responsible for channelling part of this allocation, amounting to UA 100 million. The Bank used these loans as instruments for financing the investment costs (capital expenditure) of the solar power plant to be constructed by the private developer. The project was implemented under a Public-Private Partnership (PPP) through a Solar Project Company (SPC), set up by MASEN covering the design, financing, construction, and operation and maintenance of the power plant concerned for a period of 25 years for concentrated solar thermal power plants (CSTP), and 20 years for the photovoltaic (PV) power plant.

Effectiveness: In two years of operation (January 2016 to December 2017), the Noor Ouarzazate I power plant produced and delivered 814 GWh to the national electricity grid, including 163 GWh (20 percent) at peak hours and 651 GWh (80 percent) outside peak hours, and prevented the emission of about 428,000 tonnes of CO₂ equivalent.

Efficiency: The Noor Ouarzazate I plant was satisfactorily constructed on schedule by late 2015. The plant was built using the concentrated parabolic trough solar thermal (CSP) technology. It has an installed capacity of 16 MW with an annual electricity production estimated at 500 GWh, and with a thermal energy storage system

²⁷ Specifically, the focus of pillar II of the CSP 2012–2016 was “support for green infrastructure development”, with the energy, transport and water sectors as the main focus sectors. It is noted in the CSP that “the Bank’s action is consistent with the Government’s priorities, thereby contributing to laying the basis for sustainable growth through the promotion of clean energies.”

²⁸ Interview with MASEN, September 13, 2020.

(using molten salt) to ensure its operation at full capacity for three hours without solar radiation (sunset, cloudy periods). It included water-saving measures. The international competitive bidding process to select the consortium for design, financing, construction, and operation and maintenance of the plant, resulted in quality offers with lower prices than forecast. Total capital expenditure amounted to MAD 7,100 million, or about Euro 634 million, significantly less than the Euro 800 million raised.

Sustainability: This was based on the private partner's capacity to ensure the construction, repair and maintenance of the equipment and facilities to be constructed under the project. The institutional arrangements in this case secured financing of the debt by the borrower (MASEN) from various development partners at concessional rates, and by lending them to the Solar Power Company through a single loan, the terms and conditions of which are shared with private developers during the bidding process. Furthermore, they enabled private partners to carve out their debt repayment profile, and structure the electricity tariff and debt repayments in multiple currencies, at their convenience, thereby reducing the currency risk.

Institutional sustainability is based on the Government's commitment to ensure its financial balance. This is a decisive element for the financial sustainability of solar projects, especially those using concentrated solar thermal technology, the costs of which are relatively high. As part of the broader Ouarzazate initiative, the Noor Ouarzazate I project is one of the most significant low-carbon energy investments in the Bank's Morocco and MENA portfolio. The AfDB, and with it the use of the CTF, played a leading role. Many of these lessons have been written up in recent evaluations of the CIF and the CTF.²⁹

Key conclusions regarding Morocco's green energy. This project highlights the potential of solar power in much of Africa. It also demonstrates the benefit of having clear government policies to promote GG in the energy sector, and clear and accountable institutional and operational responsibilities. The AfDB has proved to be an effective partner to the Government of Morocco, facilitated by having continuity of support and sufficient technical expertise.

Cameroon

Twenty-one projects were financed by the AfDB between 2008 and 2018. The sectors of intervention were: governance, emergency, transport, ICT, water and sanitation, energy, agriculture, regional environment and regional transport. The total portfolio was UA 1,039 million, of which UA 722.1 million was from AfDB loan finance, UA 308.2 million was from ADF finance, and UA 9.0 million was grant finance. Public sector financing comprised UA 805.8 million, private sector UA 42.0 million, and multinational projects totalled UA 191.5 million. Cameroon was not included in the Readiness Assessment.

The **CSP 2010–2014** comprised two pillars, namely: (i) Infrastructure development; and (ii) Strengthening governance with a view to improving central Government's strategic management. The first pillar specifically sought to: (i) construct roads to densify the internal network, link Cameroon to the other countries of the sub-region in a bid to strengthen regional integration, and open up agricultural regions to enable the population to have access to markets and basic social services; (ii) improve access to electricity in urban and rural areas in order to improve the standards of living of households and support the national production mechanism; (iii) improve connectivity to ICTs to enhance the competitiveness of businesses and the performance of public services; and (iv) support the Government's drinking water supply and sanitation policy.

Strategically, the two pillars of the strategy were aligned with the country's priorities and, operationally, the implementation of the CSP was satisfactory overall.³⁰

Transport sector: Under the first pillar, all transport infrastructure projects, as well as rural agriculture support infrastructure projects, were approved. The inter-state corridors to Chad, CAR, DRC and Nigeria are either completed or in an advanced state. In addition, intangible trade facilitation infrastructure was set up. Bank-financed operations helped to open up agricultural production basins, stimulate production and commercial activities in the project areas and, with the above-mentioned countries, contribute to strengthening regional integration.

Energy sector: In the area of energy, all the public and private sector operations were approved. The Lom Pangar Dam and Electricity Transport and Distribution Grid Upgrading and Extension Project (PRERETD) should increase the available energy and the rate of access to electricity by the population and businesses, especially in rural

²⁹ See:

- CIF (2019) *Transformational Change in the Climate Investment Funds: Summary of findings from an independent evaluation and evidence synthesis*. Washington, DC: CIF.
- ITAD (2019) *Evaluation of Transformational Change in the Climate Investment Funds*. Brighton, UK: ITAD.
- Bird N, Cao Y, Quevedo A (2019) *Transformational change in the Climate Investment Funds: A synthesis of the evidence*. London: ODI.

³⁰ Joint 2010–2014 CSP completion and CPPR report (Ref. ADB/BD/WP/2015/56) presented to CODE on May 11, 2015.

areas. These two projects electrify 423 and 150 localities, respectively. Two PPP projects, the Dibamba thermal power plant and the Kribi gas plant, were implemented, helping to substantially raise installed electricity capacity from 1,266 MW in 2010 to 1,561 MW in 2014. In addition, the country's electrification rate increased by 6 percentage points, from 22 to 28 percent. The rural electrification rate increased by 1.5 percentage points, from 3.5 to 5 percent, while the electricity access rate rose by 4 percentage points, from 18 to 22 percent.

The **CSP 2015–2020** focuses on two pillars: (i) Strengthen Infrastructure for Inclusive and Sustainable Growth; and (ii) Build Sector Governance for Effective and Sustainable Investments. The first pillar seeks to develop rural and transport infrastructure in order to promote the value chains of the agro-pastoral and fisheries sectors. It supports competitiveness of non-extractive tradable goods and regional integration. The second pillar seeks to strengthen governance, notably in the transport and energy sectors, where most of the Government's structuring investments and the Bank's interventions are concentrated. Through targeted reforms, it aims to support and make up for the weaknesses of the regulatory frameworks, with a view to enhancing the efficiency of sector public expenditure and ensure sustainable investments.

From an environmental and CC perspective, 10 percent of the Congo Basin forest is situated in Cameroon, covering 41.3 percent of the country's land area. Economic activities heavily depend on natural resource exploitation. As a result, the Government is sensitive to environmental protection and forest conservation issues. To this end, Cameroon is a signatory to most international environmental conventions. In the **energy sector**, the hydroelectricity and gas-fired thermal electricity potential is under-exploited, despite abundant water and natural gas resources. Owing to lack of investment in production and, particularly, networks, technical losses are high (13.4 percent in 2013), electricity needs of households and industries are not met and the country has experienced intermittent load-shedding at peak consumption periods. In the **transport sector**, investments made are insufficient and have not helped to reduce the degradation of the network, or improve the country's competitiveness through a substantial reduction in the cost of factors of production. Recurrent silting at the Douala Port is an impediment to freight shipping. Cameroon's geographic location in the Gulf of Guinea makes it a trans-shipment zone for the traffic of landlocked countries (Chad and the Central African Republic [CAR]), and highlights the need to upgrade transport infrastructure with Bank support.

AfDB interventions in Cameroon include addressing CC issues at the project level. For example, an HFO power generation project has been constructed with AfDB funding with CC mitigation emphasis on minimize emissions.

Senegal

The AfDB's approach took account of Senegal's national environmental policy. This is presented as having always been focused "on the rational management of natural resources, with a view to sustainable development." Progress is identified in biodiversity conservation, re-establishment, reforestation, conservation and protection of forest resources, wildlife and its habitat. Despite this, the situation is still characterized by degradation of natural resources, their low valuation in overall development strategies, and the desire to preserve the productive sectors.

Adaptation to climate change is mentioned as a major new challenge, including the development of phenomena such as floods, coastal erosion and salinization of land. The needs for prevention and adaptation measures are highlighted as "Sustainable solutions must be found to enable people to develop a culture of prevention and adaptation to climate change."

The negative impact of CC on economic activities, and therefore on economic growth, is discussed in the strategy document. "The growing and uncontrolled exploitation of natural resources in a context of environmental degradation is placing new demands on economic development and job creation prospects. In fact, 60 percent of the population depends on sectors related to natural resources such as agriculture, forestry, fishing and tourism. Environmental risks and the shortage of natural resources are serious threats (water deficit, biomass reduction, soil degradation, reduction of fish breeding areas, etc.) on production and therefore on economic growth." A series of sectoral strategic objectives are identified, mentioning the potential of GG and green jobs, as follows:

- improve the knowledge base of the environment and natural resources;
- intensify the fight against the degradation of the environment and natural resources in accordance with the relevant conventions;
- strengthen the institutional and technical capacities of the actors in the implementation of environmental and natural resources conservation;
- encourage the development of natural resources, as is the case with the ongoing initiatives in Bandia Reserve in Mbour and Fatala in Saloum; and
- preserve biosphere reserves (parks, nature reserves), promote a green economy and secure financing for green jobs.

Despite this, climate adaptation measures have not been systematically integrated into development planning. Much still needs to be done at the decentralized level, in particular, few regional authorities have spatial climate plans or local development plans that already take CC into account. This finding is consistent with the Readiness Assessment, which found that Senegal is an example of a less developed country with a lower level of enabling environment for GG. The report notes that a focus on key high impact sectors, such as off-grid solar PV, energy efficiency and climate resilient agriculture, would enable Senegal to achieve greater GG outcomes in proportion to its fairly well-developed enabling environment.

Recent developments show that Senegal is committed to harnessing its GG potential, particularly in the energy, transport and urban development sectors, as evidenced by the implementation of impactful projects such as the Renewable Energy and Energy Efficiency Fund and the rapid express train that links the city of Dakar with the new city of Diamniadio (60 km away from Dakar), as well as pursuing the 158 MW Taiba N'Diaye wind farm, the first large-scale wind farm in West Africa, which should supply nearly one-sixth of the country's power needs.

The **CSP 2016–2020** for Senegal is underpinned by a Policy Letter for the Environment and Sustainable Development Sector.³¹ The CSP is focused on two strategic areas, two specific objectives and four programs:

- Strategic Area 1: Environment and Natural Resources Management.
- Strategic Area 2: Promotion of Sustainable Development. To these strategic axes are anchored specific objectives that constitute the basis of the planning of interventions.
- Strategic Objective 1: Reduce the degradation of the environment and natural resources, the adverse effects of climate change and the loss of biodiversity.
- Strategic Objective 2: Integrate the principles of sustainable development into public policies, the management of the living environment, the promotion of livelihoods, the resilience of vulnerable groups, and the modes of production and consumption.

These are articulated through the following programs: (i) Combating Deforestation and Land Degradation; (ii) Biodiversity Conservation and Protected Areas Management; (iii) Combating Pollution, Harm and Adverse Effects of Climate Change; and (iv) Piloting, Coordination, Service Support, Knowledge Improvement and Promotion of Sustainable Development.

In summary, the GG-CC context in Senegal is much less positive than that found in Morocco and Rwanda. Whereas these two latter countries may be viewed as being pathfinders for the energy and transport cluster, in Senegal national policies have focused largely on adaption to CC, together with environmental protection measures.

Mozambique

The AfDB has not had a pillar focused on the energy or transport sectors in Mozambique, so it is not an area of focus for this evaluation. Despite this, it is appropriate to flag that Mozambique was assessed in the GG Readiness Assessment to be a model (or example)³² of a less developed country with a lower level of enabling environment. The report notes that Mozambique has been able to deliver relatively good GG outcomes in relation to its enabling environment for a greater focus on key GG issues linked to livelihoods, such as deforestation. It has been using its limited capacity and resources to tackle deforestation and increase investment in forestry through a forest investment plan and with innovative performance-based payment to promote forestry conservation. Learning from its recent experience with Hurricanes Idai and Kenneth, which devastated the country in 2019, Mozambique is in the process of updating its GG action plan, under implementation since 2013, to focus more on climate resilience.

³¹ "Lettre de Politique de Développement du Secteur de l'Environnement et du Développement Durable".

³² The term actually used is "model" in the GG Readiness Draft Report, but "example" would be a more appropriate term to use as "model" can imply positivity, i.e., something to aim for.

Annex 7: Documents Reviewed

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