Evaluation of the Scaling up Renewable Energy Program in Low-income Countries

Evaluation Report

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Prepared for the Climate Investment Funds Evaluation & Learning Initiative

ICF

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Acronyms and Abbreviations

ACT	Accelerating the Coal Transition
ADB	Asian Development Bank
AfDB	African Development Bank
ARISE	Accelerating Renewable Energy Integration and Sustainable Energy
ASPIRE	Accelerating Sustainable Private Investments in Renewable Energy
AU	Administrative Unit
CIF	Climate Investment Funds
CTF	Clean Technology Fund
DPSP	Dedicated Private Sector Program
EBRD	European Bank for Reconstruction and Development
ECOWAS	Economic Community of West African States
EOI	Expression of interest
ESMAP	Energy Sector Management Assistance Program
GCF	Green Climate Fund
GDC	Geothermal Development Company
GEF	Global Environment Facility
GEFF	Green Economy Financing Facility
GHG	Greenhouse gas
IDA	International Development Association
IDB	Inter-American Development Bank
IDCOL	Infrastructure Development Company Limited (Bangladesh)
IFC	International Finance Corporation
IPP	Independent power producers
IPPG	Investment Plan preparation grants
LDC	Least developed countries
LEC	Liberia Electricity Corporation
LIRENAP	Liberia Renewable Energy Access Project
MDB	Multilateral development banks
NDC	Nationally Determined Contribution
NGO	Non-governmental organization
NRECA	National Rural Electric Cooperative Association
OECD	Organisation for Economic Co-operation and Development
OGEF	Off-Grid Electricity Fund
OGS	Off-Grid Solar
OPEX	Operating expenses
POISED	Preparing Outer Islands for Sustainable Energy Development
PPA	Power purchase agreement
PPG	Project Preparation Grants
PPIAF	Public-Private Infrastructure Advisory Facility
PPP	Public-private partnership
PSSA	Private Sector Set-Aside
RBF	Results-based financing

REFF	Renewable Energy Financing Facility
REI	Renewable Energy Integration
RELAC	Renewable Energy for Latin America and the Caribbean
RESCO	Renewable energy service company
RISE	Regulatory Indicators for Sustainable Energy
RREA	Rural and Renewable Energy Agency
SCF	Strategic Climate Fund
SHS	Solar Home System
SME	Small and mid-size enterprise
SREDA	Sustainable Renewable Energy Development Authority
SREP	Scaling up Renewable Energy Program in Low-income Countries
TA	Technical assistance
TCLP	Transformational Change Learning Partnership
TFC	Trust Fund Committee
UNFCCC	United Nations Framework Convention on Climate Change

Executive Summary

Background

The Scaling up Renewable Energy Program in Low-income Countries (SREP) is a program of the Climate Investment Funds (CIF) that aims to create new economic opportunities, increase energy supply, and enhance energy access through the use of renewable energy. The program is designed to demonstrate the economic, social, and environmental viability of low-carbon development pathways in the energy sector. SREP was launched as a pilot program in 2010 with approximately US$300 million in pledges and contributions for six pilot countries; the program has since grown to US$780 million and 27 eligible countries.

Purpose and scope

This independent evaluation was commissioned by the CIF Evaluation and Learning Initiative to take stock of SREP's challenges and achievements to date—in terms of program design and delivery as well as progress toward results from its investments. The lessons and good practices from SREP's design and investments discussed in this evaluation will help inform the effectiveness and efficiency of remaining SREP investments, as well as CIF's new programs on the sustainable energy transition.

The evaluation questions align with the Organisation for Economic Cooperation and Development (OECD) Development Assistance Committee's international evaluation criteria, with a particular focus on relevance, coherence, efficiency, and effectiveness. The evaluation also considered impact and sustainability, but in the context of investments that are at relatively early stages of implementation.

Methodology

The overall evaluation design was mixed methods and multi-level, with analysis at the global/portfolio, technology, and country levels. This was deemed the best approach to bring in more analytical depth and breadth and answer the range of process- and results-related evaluation questions. Data collection and analysis methods included documentary review; semi-structured interviews; timeline, quantitative portfolio, and benchmarking analyses; and case-based analysis using countries (Bangladesh, Honduras, Liberia, Mali, and Maldives) and technologies (geothermal, mini-grids, and off-grid stand-alone solar) as the unit of analysis.

The evaluation faced main challenges and limitations related to (a) lack of institutional memory among some interviewees, which was partially mitigated by seeking out and interviewing former CIF Administrative Unit (AU) and multilateral development banks (MDB) staff; (b) travel restrictions associated with the ongoing COVID-19 limitations, which meant that site visits could not be conducted; and (c) limited availability of project documentation for some SREP projects. Despite these limitations, the evaluation was able to triangulate and validate data to support properly evidenced findings.

The evaluation benefited from a close and recurrent engagement with the CIF AU and with an evaluation Reference Group, composed of representatives from contributor countries, recipient countries, MDBs, and the CIF AU. The evaluation report has also undergone a stakeholder review process involving the Reference Group, CIF AU, CIF Evaluation & Learning Advisory Group, MDBs, and other key stakeholders.

Key findings and conclusions

SREP occupies a highly relevant and ambitious niche in the global climate finance landscape. The ambition to work on renewable energy and energy access in low-income countries was relevant, since many of these countries have faced fragile and conflict-affected political situations, experienced significant natural disasters, and have been underserved in terms of concessional finance for sustainable energy. Low-income countries receive a small proportion of global investments in support of clean energy and far below what is required, especially as public budgets become increasingly strained in the context of

COVID-19. At the country level, the objectives and design of SREP projects have been highly relevant to country needs, priorities, and opportunities, and largely coherent with sector institutions, policies, and markets, as well as with the efforts of other development partners.

On balance, many of SREP's original design elements were aligned with its program goals to pilot and demonstrate the viability of renewable energy development and initiate processes toward transformational change in lower-income countries. The programmatic approach created momentum around renewable energy, at a time when sector dialogue was nascent in many SREP countries. SREP's focus on both investment and technical assistance has supported progress in lower-income and lower-capacity countries. The program has provided value by developing pioneering projects in challenging contexts. The scale of SREP's resources also matters. Country allocations were generally right-sized to promote high-level engagement and collaboration, to the absorption capacities in SREP countries at the time, and to at least initiate sector or sub-sectoral transformational processes, depending on the relationship between SREP resources and the size of the country/sector.

SREP has struggled to develop an attractive separate funding channel for private-sector projects. The government-led investment plan development process resulted in few resources allocated to private-sector projects, and the subsequent dedicated private-sector window, the Private Sector Set-Aside (PSSA), used time-bound application processes that were incompatible with MDB private-sector business models. Despite these challenges, the overall SREP portfolio still shows considerable focus on overcoming barriers to scaling up private investment. SREP has made significant use of the private sector (capital, consultancy, co-investment) in its public-sector portfolio.

Over time, funding constraints and the expansion of eligible countries reduced certainty of country program allocations, which further contributed to a slowing interest in SREP among countries and MDBs. Program funding commitments did not grow to match the resource needs associated with adding 14 expansion countries.[1] The strategy of supporting investment plan development without certainty of resource availability has not worked well. MDBs perceived reputational risk in preparing investment plans without available funding. The Green Climate Fund (GCF) funding that the SREP Committee expected to fill the resource gap did not materialize, due in part to procedural challenges in accessing the GCF, along with prioritization and scheduling challenges with the pipelines of the MDBs, countries, and funds. Some MDBs and countries have capitalized on the flexibility of the Clean Technology Fund's (CTF) Dedicated Private Sector Program (DPSP) to scale up projects that were programmed under SREP. In the context of decreasing availability of resources, overprogramming and the sealed/reserve pipeline approach have also contributed to a stagnating pipeline. Many projects in the reserve pipeline are now stale, and MDBs are reluctant to undergo investment plan revision processes. The pipeline approach has been particularly incompatible with MDB private-sector business development processes, which tend to be more opportunistic. SREP now faces challenges in end-of-program resource deployment.

Funder expectations of the program have evolved to become more ambitious over time without being sufficiently supported by additional funding. The original objective viewed SREP as a way of piloting and demonstrating the viability of renewable energy and access solutions in lower-income country contexts. However, expectations evolved to see SREP as a vehicle to deliver transformational sector-wide impacts at national scale across a significant number of countries. This implicit dual mandate creates some lack of clarity around how program success should be benchmarked. While program resources have certainly been sufficient for the former, they have been sufficient to achieve the latter only in selected (often smaller) country or sub-sectoral contexts. The results framework has also not consistently supported this dual framing over time. Core indicators initially focused on project outcomes (energy generation and access beneficiaries) rather than on demonstration effects, enabling environment improvements

[1] From the original six pilot countries, SREP added seven reserve countries in 2011 and then another 14 expansion countries in 2013.

(representing a substantial proportion of program activities) or wider transformation. Revisions following a 2018 stocktaking review of the SREP monitoring and reporting (M&R) system sought to address some of these issues (see below).

SREP was launched at a time when renewable energy development was in the early emergent stages in most of its countries, and the program has been able to successfully leverage MDB infrastructure and other partnerships to develop early-mover or first-of-a-kind projects in challenging contexts—often pursuing technology approaches that carried significant financial or business model risks. This level of risk appetite and ambition has potential implications in terms of slowing the timing and limiting the scale of delivery against core results framework indicators. Some projects (e.g., geothermal) were more focused on upstream exploratory drilling and risk management, which made it unlikely that they would contribute quickly to the core results indicators.

More limited progress has been made against the core outcome indicators, although progress toward these outcomes is accelerating, including in terms of enabling environment, pipeline development, and investment mobilization. Less than 10 percent of expected results have been delivered to date against program core indicators related to energy generation and improved access, with delivery against installed capacity of renewable energy and investment mobilized closer to 30 percent. However, an increasing number of projects are now at a more advanced implementation stage, delivering results in terms of access and installed capacity, with further scaling and follow-on investments expected in the short to medium term. SREP has faced challenges specific to the lower-income country profile of its portfolio, with barriers including weak governance, limited institutional capacity, immature market structures, political crises, natural disasters, and more recently COVID-19. Nonetheless, SREP implementation timelines are largely in line with MDB delivery in similar non-SREP projects and contexts.

SREP's "light-touch" M&R system was designed to allow for differences among the MDBs in both methods used to measure indicators and approaches to defining project boundaries—presenting challenges at times for interpretation of aggregate results. A 2018 stocktaking identified some constraints in the M&R system, including challenges in aggregating certain indicators, the need for clarifications around energy access, and elements of the system that had not been operationalized. Revisions were made to the system, but many of these challenges persist. For about a third of projects, there have been differences among projects and MDBs in core indicator data reporting, due in part to the lack of clear and timely communication between MDBs and the CIF AU. MDBs are not consistently providing the CIF AU with interim monitoring and evaluation reports from their own internal systems, and sometimes the CIF AU is not informed in a timely manner about restructuring of SREP-funded projects. SREP's access indicator encourages, but does not require, reporting on different tiers of improvement, reducing the usefulness of such data from an outcome or impact perspective. Furthermore, national participatory stakeholder workshops still have not been held at the mid-term and closing of the country investment plan; these workshops were intended to assess progress toward country transformative impact and support learning.

SREP contributions to strengthening enabling environments for clean energy access, alongside the value of demonstration effect, have had some transformative impacts in a few countries, including by encouraging other private actors to enter the market. Country case studies demonstrate SREP contributions to market development for solar photovoltaics (PV) (e.g., utility-scale solar in Mali, rooftop solar in Bangladesh, and off-grid solar products in Liberia). SREP has contributed to fundamental shifts and accelerated scaling and systems change for clean energy in a limited number of markets where projects are more mature (e.g., Maldives, Honduras). Overall, it is too early in the program lifecycle to capture widescale impacts or long-term sustainability across the portfolio.

SREP has had more limited influence and profile within the MDBs, although it has contributed alongside CTF to MDBs' energy-related ambition and approach. Factors contributing to the limitations of SREP's contribution are the larger number of smaller, lower-income countries, and the lack of higher-profile champion projects. Still, SREP has informed the development of some country strategies and complemented projects financed through the CTF, with some MDBs and countries now in the process of developing follow-on MDB programs in SREP countries.

SREP also made some useful attempts to convene stakeholders around specific themes early in the program lifetime, but has been unable to fully leverage its potential to cross-fertilize learning across the MDBs or with other partners to influence wider technology or sub-sectoral development approaches. As the program moves further into implementation, there are opportunities to harvest lessons learned that might be useful for other climate finance facilities or new CIF programs.

Recommendations for SREP

Key recommendations for SREP are set out below, bearing in mind that most SREP funds are already allocated, and the program is shifting largely into a monitoring, oversight, and lesson-learning phase:

Pipeline and funding expectation management

- The CIF AU should revisit outstanding SREP fund allocations and sealed/reserve pipeline opportunities with MDBs and Committee members to identify which projects remain realistic and which should be potentially withdrawn to release funds for other project opportunities.
- The CIF AU and MDBs should discuss a more flexible/realistic way forward on unallocated funds, potentially agreeing to reallocate resources among countries and MDBs where high-impact opportunities exist, without revising investment plans. In doing so, a set of hierarchical criteria for prioritization could be useful (e.g., considering the relative priority among countries with existing projects in the pipeline and alternative countries, MDBs with existing projects in the pipeline and alternative MDBs, and generally existing pipeline and new project concepts).

M&E frameworks and reporting

- The CIF AU and MDBs, working with the country focal points, should operationalize the requirement in the current M&R toolkit for investment plan reporting, facilitated as a national participatory stakeholder workshop at mid-term and closing. This process could serve multiple purposes identified as areas of improvement in this evaluation:
  - To encourage energy access reporting that identifies the tier of improvement, such as by using the Multi-Tier Framework for Energy Access (MTF) (supported by SREP).
  - To collect and report on evidence of impact and transformation beyond core results framework indicators. This could involve examining SREP's role in exploring viability and boundaries for renewable energy investment as per the original remit and strengthening the role of qualitative assessment on transformational change and co-benefits.
  - To share lessons learned and identify feasible solutions to challenges, to support the CIF's overall learning remit, and help accelerate implementation.

Lesson learning and knowledge management

- The CIF AU, MDBs, and countries should, where project opportunities still remain, ensure that best practices from other centers of expertise (e.g., CIF programs, Energy Sector Management Assistance Program (ESMAP)) are drawn upon to inform design (e.g., mini-grid models). This objective could be further supported by revitalizing knowledge-sharing events and workshops (including external partners) around very targeted areas of SREP thematic and geographic expertise to share experiences,

access promising practices, and generate lessons learned for future programming (including through the Transformational Change Learning Partnership).
- The CIF AU should explore further how SREP might inform the Renewable Energy Integration (REI) Program, Accelerating the Coal Transition (ACT) Program, and other programs at program and country level, building on the lessons below.

Learning for future programming

The SREP program experience offers a series of lessons that may be useful for both SREP and to inform future programming decisions within CIF as well as for other energy-related climate finance facilities.

Country and thematic structure

- Right-sizing country allocations to the threshold of MDB and political interest, country absorption capacity, and scale of the opportunity is important. Programs should avoid a one-size approach and allocate funds on the basis of opportunity and constraint, rather than based on a sense of "equality" or "fairness." If resources are constrained, allocations should be concentrated in fewer countries, with strong in-country alignment between MDB allocations around specific (sub-) sectoral priorities.
- Country-led programming can be complemented with the development of core thematic foci within a program (such as geothermal and mini-grids in SREP). This balanced approach can support ambitions and generate more opportunities for sectoral learning and scaling over time.

Programmatic ambition

- Programs should have clear line of sight around their objectives and expectations of transformational impact, grounded in a realistic understanding of resource allocations and availability, with appropriate results measurement frameworks. A lack of clarity can create unrealistic expectations of success and set up programs to fail, when they are in fact making a significant contribution, and it is challenging to update results frameworks mid-program.
- Greater realism is warranted in framing contributor and Committee expectations around outcome timescales in lower-income countries with weak governance and markets, particularly where MDBs already have a track record of project implementation.

Policy and planning

- The programmatic approach is not a substitute for national power sector frameworks and electrification plans, the lack of which can create uncertainty around decision making (public vs. private, grid vs. off-grid). Regulatory uncertainty can in turn affect project implementation and investment timelines. Technical assistance should be of sufficient scale to address prevailing enabling environment challenges or investment opportunities reprofiled to ensure viability in uncertain regulatory contexts.

Incentives

- Future programs may consider supporting certainty of resource allocations before inviting countries to prepare investment plans, particularly given the transaction costs faced by policymakers and MDBs. MDB and country-level perceptions of resource predictability and transaction costs matter if programs are to secure senior-level attention and commitment from both countries and MDBs. A lack of resource certainty can erode political engagement.
- Pipeline management needs to provide enough certainty (in terms of funding and timescales) to underpin the credibility of the programmatic approach, but with strong signals that if endorsed projects fail to progress toward implementation, funds will be reallocated to more promising opportunities.

Private sector

- Private-sector operations and timescales do not easily align with public-sector programmatic approaches, with much narrower windows of opportunity. There is need for separate private-sector funding windows that have much greater flexibility (timing, geographic, sectoral).
- Program design and delivery can support private-sector participation in public sector-led projects. There are multiple points of engagement in public-sector projects (co-investment, implementation, advisory) and strategies should be developed to maximize these opportunities.

Management Response to the Independent Evaluation of the Scaling Up Renewable Energy Program in Low-income Countries (SREP)

Introduction

The Climate Investment Funds (CIF) was established in 2008 to provide scaled-up climate finance to developing countries to initiate transformational change towards low carbon, climate resilient development. The CIF encompass two funds: the Clean Technology Fund (CTF) and the Strategic Climate Fund (SCF). The CTF includes dedicated two thematic funding windows – the Accelerating Coal Transition (ACT) Investment Program and the Global Energy Storage Program (GESP). The SCF includes four targeted programs – the Forest Investment Program (FIP), the Pilot Program for Climate Resilience (PPCR), the Renewable Energy Integration (REI) Program, and the Scaling-Up Renewable Energy Program in Low Income Countries (SREP). To date 14 contributor countries have pledged over US$9.6 billion to the CIF, which is expected to leverage an additional US$62 billion in co-financing for mitigation and adaptation interventions in 72 recipient countries.

The Scaling Up Renewable Energy Program in Low-income Countries (SREP), with approximately $780 million in cumulative funding for 27 countries, aims to demonstrate the economic, social and environmental viability of low-carbon development pathways in the energy sector by creating new economic opportunities and increasing energy supply and access through the use of renewable energy. Through concessional financing, SREP's investments support scaled-up deployment of renewable energy solutions such as solar (including on-grid, mini-grid, and home-based solar energy solutions), geothermal, and biomass to reduce energy poverty and/or increase energy security.

In April 2021 the CIF AU commissioned an Independent Evaluation of SREP. The purpose of the evaluation was to strengthen existing SREP investments and to inform the design of new CIF programs and projects, as well as other global efforts, through the identification of relevant lessons and good practices for advancing low-carbon energy access in low-income countries. The program-level evaluation took stock of progress and lessons learned from early experiences and investments. This included a retrospective analysis of how the program was designed and implemented, how it has evolved over time, what the challenges and achievements have been to date (and why), and what can be done going forward to help maximize its effectiveness and impact. It must be noted that while some projects are nearing completion, many SREP projects are still relatively early into implementation and disbursement, as such, the evaluation was designed to have both a summative and formative focus, with an emphasis on learning rather than a performance-oriented evaluation.

This document outlines a response by CIF management and MDBs to key findings and recommendations from the evaluation report on SREP by ICF. We are committed to taking these findings and recommendations forward in future programming strategy and decision-making processes in support of continued transformational change towards low carbon, climate resilient development.

Management response to findings

Management welcomes and is very grateful for the opportunity to learn from an independent evaluation of SREP. This evaluation comes at an opportune time as CIF consolidates the outputs of existing programs and initiates new programs. These new programs will benefit, and have in fact already benefited, from the insights generated through this evaluation. This work is thus closely aligned to CIFs mandate to enhanced learning from a wide range of pioneering climate investments.

Management appreciates the use of a range of data collection methods including an extensive document review (over 20 external reports), timeline analysis (2009-2021), portfolio analysis (almost 100 CIF reports), thematic (3 themes across 30 projects) and country (5 countries) case studies, and semi structured interviews with nearly 200 stakeholders.

Overall, the evaluation finds that SREP has been highly relevant at both the global and country scales, occupying an important niche in the global climate finance landscape and developing projects that are aligned with country needs, priorities and opportunities. Management notes that this led to SREP investments being largely coherent with sector institutions, policies, and markets, as well as with the efforts of other development partners.

Management appreciates the findings that the CIF business model components of a country-led programmatic approach and delivery of finance through MDBs contributed to strengthening the program. It acknowledges that the programmatic approach has not been well maintained after Investment Plan endorsement.

Management also acknowledges the strategy of supporting investment plan development without certainty of resource availability has not worked well.

Management notes, and will reflect on, the perception that SREP would act both as a demonstration and pilot program and at the same time achieve significant scale. The intention was to set the ambition relative to the funding available while recognizing the complexity of the countries within which SREP operated. We believe that the focus piloting and demonstration was consistent with the level of resources and the objectives of the program.

Management notes that innovative projects in low-income countries carry significant risk and implications for speed, scale of delivery, and the probability of successful implementation. While broadly recognized in investment planning, management acknowledges that these risks have remained challenging to address and mitigate.

These challenges have been exacerbated by Covid-19. Management also notes that despite these challenges SREP projects are being implemented at a speed and quality of delivery that is in line with comparable MDB projects.

Management acknowledges that monitoring, reporting, evaluation and learning frameworks can be enhanced. Monitoring and reporting requirements have evolved over time and reporting would benefit from further standardization and detail across the MDBs. In particular reporting such as that related to project logframes, interim progress reports and any restructuring by the MDBs can be more systematically provided to the CIF AU. Evaluation and learning opportunities while evident in the design phase present further opportunity to be maximized during implementation through more formative work. This includes both country workshops and enhanced knowledge sharing among MDBs. Management appreciates the insights and recommendation offered by this evaluation to support learning and improvement across SREP projects, the SREP program, new programs being developed, and innovative climate finance more broadly.

Management response to key recommendations

This section reflects on and responds to key recommendations, as presented in the evaluation report. These recommendations are clustered into: 1) recommendations for SREP and 2) learning for future programming.

Recommendations for SREP

Pipeline and funding expectation management

Management agrees that CIF AU, MDBs, and SREP Technical Committee members, should revisit the current pipeline management procedures to efficiently allocate residual funds for project implementation.

Management acknowledges that this will require consultation on existing pipeline allocation. It will also require the development of criteria for

prioritizing funding allocations in the context of outdated Investment Plans.

M&E frameworks and reporting

Management notes the recommendation that CIF AU and MDBs, working with country focal points, should operationalize the requirements of the current M&R toolkit for investment plan reporting. Management also notes a number of findings and recommendations related to the narrow focus and limited detail of MDB reporting.

Management suggests that despite a number of recommendations emanating from the SREP M&R Stocktake, it has been challenging to operationalize these recommendations. This is partly due to the different reporting standards used by the MDBs such as the calculations of GHGs and co-financing.

Management acknowledges the need to work together to broaden and deepen monitoring and reporting in line with the SREP M&R Stocktake findings and tools such as the Multi-tier Framework for Energy Access.

Lesson learning and knowledge management

Management acknowledges that as many SREP projects are still in the implementation phase opportunities for learning and improvement exist and should be supported. Monitoring, Evaluation and Learning processes including more direct support for mid- and end-term reviews (such as Mid-term IP Reporting through multi-stakeholder workshops) as well as support to countries doing this work should be enhanced.

Management agrees that knowledge sharing events around targeted areas of SREP experiences and broader CIF commitments (e.g. programmatic approach, thematic experiences, transformational change, just transitions) could support improved practices within the SREP and generate lessons learned for future programming. Management appreciates the contribution that this evaluation makes to these processes.

Learning for future programming

Management acknowledges that the timing of this evaluation as CIF initiates new programs including but not limited to Renewable Energy Integration (REI), Accelerating Coal Transition (ACT), Nature, People and Climate (NPC), should be leveraged to inform future programming decisions and strategies.

Country and Thematic Structure

Management acknowledges the recommendation that programming, and funding allocations, should be responsive to context and resource availability and remain adaptive and flexible throughout the implementation to be able to easily adjust to changing market dynamic. We welcome the recommendation that programs allocate resources and support based on transformational opportunity and financial constraint, thus concentrating more resources in a smaller number of countries, and encourage consideration of the recommendation in future funding decisions.

Programmatic ambition

Management acknowledges the need to align program objectives, results measurements, expectations of transformational impact, and resource allocations. It also highlights the importance of “Stocktakes” to inform responses to changing contexts.

Policy and planning

Management agrees that while a programmatic approach enhances relevance and coherence of projects, where policy and planning at the country level is absent, programs should consider either allocating appropriate funding for relevant policy and regulatory support, or work narrowly within the confines of the investment mandate to enable project development. Responding to this recommendation requires careful attention to country priorities to avoid external imposition of conditionalities.

Incentives

Management strongly urges the Trust Fund Committee to carefully consider current and expected resource availability for each program when inviting countries to prepare investment plans given the cost involved, the time required, and the reputational risk to institutions.

Management agrees that when resources are limited, overprogramming to secure a pipeline of projects must be balanced with mechanisms to reallocate funding when it is not used within a predetermined timeframe.

Management acknowledges that some of the country contexts were more complex than was planned for due to both internal and external shocks that added layers of complexity to the initial assessments.

Private sector

Management acknowledges that CIF's model to channel funds through both public and private channels is effective, set up for broad impact and has a potential to lead to a diverse set of outcomes and impacts. However, management also acknowledges that there is a tension between a programmatic approach to national public sector planning and investment on the one hand and more competitive and responsive investment approaches in the private sector. In this context the recommendation, that private sector funding approaches need to be kept separate from public sector planning approaches will require further consideration to ensure relevance, systemic impact and scale at a programmatic level. This may include the need for Investment Plan development and allocation mechanisms to take into account the responsive nature of private sector investment.

Management agrees that flexible program planning processes should be developed to support public-private collaboration. This is evidenced by the Private Sector Set-Aside (PSSA), use of time-bound application processes that were incompatible with MDB private-sector business models. We further agree that this flexibility will necessitate a broader engagement strategy for private-sector investment and thus recognition of diverse private sector contributions to projects and broader program implementation.

Conclusion

In summary, management appreciates the efforts of the ICF team in conducting a thorough evaluation that has resulted in a well-structured report in which the findings are well substantiated with evidence from a rich and diverse pool of data. Timed as it is at a critical point in CIFs history where existing programs such as SREP are being implemented and finalized alongside the emergence of new CIF programs this evaluation provides important guidance across a wide range of decision-making processes. Management remains committed to CIF acting as a learning laboratory for innovative and transformational climate finance and associated climate action.

1 Introduction

1.1 Purpose and objectives

The Scaling up Renewable Energy Program in Low-income Countries (SREP) is a program of the Climate Investment Funds (CIF) that aims to demonstrate the economic, social, and environmental viability of low-carbon development pathways in the energy sector by creating new economic opportunities and increasing energy supply and access through the use of renewable energy. SREP was launched as a pilot program in 2010 with approximately US$300 million in pledges and contributions for six pilot countries; the program has since grown to US$780 million and 27 eligible countries (see Table 1).

Table 1. Descriptive Summary of SREP Countries, Portfolio, and Resources

SREP Countries	
Number of SREP Countries	27 total eligible =
	6 pilot countries (Ethiopia, Honduras, Kenya, Maldives, Mali, Nepal) +
	7 reserve countries (Tanzania, Liberia, Yemen, Armenia, Solomon Islands, Vanuatu, Mongolia) +
	14 expansion countries (Bangladesh, Benin, Cambodia, Ghana, Haiti, Kiribati, Lesotho, Madagascar, Malawi, Nicaragua, Rwanda, Sierra Leone, Uganda, Zambia)
Number of SREP Countries with Endorsed Investment Plans	23
Number of SREP Countries with Approved Projects[a]	20
SREP Project Portfolio	
Number of Projects Approved[a]	51
Total Amount of SREP Financing Approved (US$ million)[a]	$549
Total Amount of SREP Financing Disbursed[b]	$199
Resource Availability	
Cumulative Funding Received[c]	$781
Net Cumulative Funding Commitments[d]	$634
Unrestricted Fund Balance[e]	$157

[a] As of May 17, 2021, MDB-approved Investment Plan (IP) and Private Sector Set-Aside (PSSA) projects; total approved funding includes project funding, Investment Plan preparation Grants (IPPGs), and Project Preparation Grants (PPGs).
[b] As of September 30, 2021.
[c] Contributions received and investment income earned as of March 31, 2021.
[d] Net of MDB project implementation and supervision services, administrative expenses, and technical assistance facility expenses.
[e] Total cumulative funding received less net cumulative funding commitments as of December 31, 2020.
Source: Evaluation team analysis, based on data from the Climate Investment Funds Administrative Unit (2021). SREP Portfolio Data. 13 July 2021; Climate Investment Funds (2021). SREP Operational and Results Report. Meeting of the SCF Trust Fund Committee, 25 June 2021. Washington, DC.

This independent program-level evaluation was commissioned by the CIF Evaluation and Learning Initiative to take stock of progress and lessons learned from SREP's experiences and investments. Because many SREP projects are still relatively early into implementation and disbursement, and because SREP markets can be challenging contexts for scaling up low-carbon technologies, this evaluation takes a formative, learning-oriented approach, with some summative elements where evidence is available. The evaluation seeks to analyze how the program was designed and implemented; determine how it has evolved over time; identify the challenges and achievements to date, especially with respect to the pace of project approvals and disbursements; and suggest steps that can be taken going forward to help maximize SREP's effectiveness and impact. The key evaluation and learning questions for this evaluation

relate to the six OECD Development Assistance Committee international evaluation criteria, with a focus on relevance, coherence, efficiency, and effectiveness, recognizing that impact and sustainability may be more indicative given the early nature of implementation.

The evaluation also takes place at a moment when the CIF are launching new global programs on renewable energy and the sustainable energy transition. Thus the evaluation serves an important purpose in drawing relevant lessons and good practices from the SREP program design and investments to inform the design of new CIF programs and projects, as well as to inform other global efforts for advancing low-carbon energy access in low-income countries.

The primary intended users of the evaluation include the SREP Technical Committee of the Strategic Climate Fund (SCF) Trust Fund Committee (TFC), the broader CIF TFCs, CIF contributor and recipient countries, MDBs, and the CIF AU. Secondary audiences include the private sector and other climate finance and international development institutions.

1.2 Methodology

The overall approach for this evaluation was utilization-focused, tailoring its approaches as described below to a range of evaluation questions that focused on both process and results. Evaluating SREP's support to renewable energy and energy access in low-income countries is complex given the multiple technologies supported, the diversity of country contexts, and the significant evolution in global and country-level markets and enabling conditions over the past decade. The overall evaluation design was mixed methods and multi-level, with analysis at the global/portfolio, technology, country, and project levels. This was deemed the best approach to address the program complexity, bring in more analytical depth, breadth, and nuance, and answer the range of process- and results-related evaluation questions.

The program theory is captured in the SREP Logic Model (shown in Appendix F) and was also translated into a narrative format by the evaluation team, to capture broader elements of the SREP delivery model (see box on page 13).

Evidence was collected and analyzed using a range of key strategies and methods:

- **An extensive document and literature review.** Given that previous CIF evaluations have also made (more limited) assessments of SREP, and past MDB evaluations have reviewed the banks' performance in the areas of renewable energy and energy access, the evaluation sought to make the most of existing secondary evidence. Documents reviewed included SREP program documents, meeting and decision documents, existing and ongoing evaluations and studies, MDB evaluations, and peer-reviewed and gray literature. Appendix A includes a list of documents reviewed.
- **A timeline analysis** was conducted to analyze how the program was designed and implemented, how it has evolved over time, and the implications for efficiency and effectiveness. Appendix B shows a visual summary of this timeline.
- **Portfolio analyses** were performed using data available from the CIF AU as well as from external datasets on climate finance, renewable energy development, and energy access.
- **Benchmarking analysis** was used to help contextualize SREP timeliness in the project cycle and cost-effectiveness.
- **Semi-structured interviews** were held with nearly 200 stakeholders, including SREP Committee members and observers, current and former members of the CIF AU, MDB staff, government officials, representatives of civil society organizations and the private sector, other development partners, and international experts on renewable energy and energy access. Interview data were analyzed using content analysis. Appendix C includes a full list of stakeholders interviewed.

SREP Theory of Change

The SREP program theory of change can be described as:

> *If* SREP provides grant and loan financing for renewable energy and energy access infrastructure and capacity in lower-income countries—using a country-led programmatic approach, encouraging private sector investment, and leveraging significant additional finance from MDBs and other sources—*then* the program will increase access to clean energy and supply of renewable energy, *leading to* improved low-carbon development pathways.

At the **impact** level, SREP expects to support low-carbon development pathways by reducing energy poverty and increasing energy security, and by demonstrating the economic, social, and environmental viability of these pathways in the energy sector (e.g., through demonstration and innovation, promoting first-of-a-kind technology/country approaches) and/or increasingly by embedding these innovations through systems change (enabling environment strengthening, capacity building) and scaling (public and private finance investment, markets) to promote transformation. These impacts follow on from **outcomes** of increased access to clean energy and increased supply of renewable energy, supported by co-benefits of increased reliability and reduced costs of renewable energy. These outcomes are delivered through a series of **project-level interventions and outputs** that cover a range of sectoral priorities including renewable energy generation, grid extension and strengthening, mini-grids, energy market development, and community energy provision. These interventions are supported by SREP **inputs**—primarily the provision of new and additional concessional finance (loans, grants), which in turn finance capital investment, technical assistance, and capacity building.

SREP is delivered using the backbone of the global and regional MDB structures, supported by an administrative unit (CIF AU) housed in the World Bank. Packages of support are structured through a programmatic country-led approach under which countries, MDBs, civil society, local communities, and the private sector work together to develop an investment plan that is aligned with national development goals, existing programming, and partnerships. Investment plan components seek to be mutually reinforcing around higher-level goals and outcomes. SREP also supports these outcomes by supporting knowledge and learning across the portfolio to enhance the likelihood of success.

- **Thematic case studies** were used to engage more explicitly with the broader contextual and external factors that impact SREP's success in specific technology areas: geothermal, mini-grids, and off-grid solar photovoltaic (PV) systems. These areas were purposively selected to cover a range of SREP outcomes, technologies, and project approaches (e.g., business models, markets, financing approaches). The thematic case studies triangulated across document review, sub-portfolio data analysis, and semi-structured interviews. Appendix D provides a list of the projects covered under the thematic case studies.
- **Country case studies** were used to provide a deeper understanding of the relevance, coherence, efficiency, effectiveness, impact, and sustainability of SREP interventions—using the country as the unit of analysis. Country case studies using contribution analysis were the primary approach to understanding progress toward national-scale outcomes and impacts. A transformational change approach was also applied to the country case studies, building off previous conceptual and evaluation work by the CIF's Transformational Change Learning Partnership (TCLP), to identify signals of

transformational change.[2] Five countries were purposively selected for case studies—Bangladesh, Honduras, Liberia, Maldives, and Mali—to cover geographical regions, MDBs, and pilot, reserve, and expansion countries, as well as a diversity of project financing modalities, technologies, and enabling environment projects. Countries were also selected for maturity of project implementation.

Findings reported are those that emerged from triangulation of evidence across these sources and methods—as well as across levels (project, country, technology, portfolio/program)—to ensure validity and robustness. For more specific details on how each data source/method was triangulated with others to answer each evaluation question, see the evaluation matrix in Appendix E.

The evaluation faced three main limitations. First, because the program was launched more than a decade ago, many of the individuals involved in key strategic decisions no longer have a formal role with SREP. The evaluation team mitigated this challenge by seeking out and interviewing former CIF AU and MDB staff. Potential for respondent bias and recall issues were also mitigated by making efforts to collect multiple perspectives and review supporting documentation. Second, the travel restrictions and safety concerns associated with the ongoing COVID-19 pandemic meant that international team members could not travel to case study countries. The evaluation team used in-country consultants to collect data and conduct interviews in person when it was not possible for an international team member to attend virtually. The evaluation team also used video platforms when bandwidth allowed and interviewees' preferred languages when interviewing remotely (the Honduras case study was conducted in Spanish; and Mali in French), to support rapport-building with interviewees. Third, the evaluation encountered limited availability of some documentation, including publicly available progress reports and independent evaluation for some SREP projects and benchmarking data from some MDBs. For country and thematic studies, additional documents were requested from the project implementation teams. The evaluation report also specifies the MDBs for which benchmarking data were available.

The independent evaluation benefited from a close and recurrent engagement with the CIF AU and with an evaluation Reference Group, composed of representatives from contributor countries, recipient countries, MDBs, and the CIF AU, who provided guidance and feedback at critical junctures in the evaluation process. The evaluation report has also undergone a stakeholder review process involving the CIF AU, MDBs, E&L Advisory Group, and other key stakeholders.

1.3 Report

The remainder of the report is structured in five chapters:

- **Chapter 2** considers the relevance, coherence, and value-addition of SREP in an evolving national and global context for renewable energy development and improved energy access.
- **Chapter 3** assesses the implications of SREP design elements for the program's effectiveness and efficiency, with lessons for future programming.
- **Chapter 4** evaluates SREP progress toward results to date at program, technology, and country levels; factors affecting progress; and the relative cost-effectiveness of the program.
- **Chapter 5** presents early indications of SREP's impact and sustainability in specific areas, markets, systems, and institutions.
- **Chapter 6** presents the overall conclusions, lessons, and recommendations.

[2] The TCLP's transformational change approach identifies five dimensions of transformational change that must be attended to or present for there to be confidence that climate actions are transformational. These dimensions are: Relevance, Systemic Change, Speed, Scale, and Adaptive Sustainability. Additional work has helped to identify signals of transformational change, including for the energy sector, as a way of observing tangible progress toward this grand ambition. See: CIF (2021a). Transformational Change Concepts. Transformational Change Learning Brief. September 2021; and CIF (2021b). TCLP Signals of Transformational Change. Working Draft. May 2021.

2 SREP Program Relevance, Coherence, and Evolving Context

Key Messages

- SREP occupies an important niche in the global climate finance landscape, bringing substantial concessional finance to countries that have struggled to attract it.
- SREP was developed with a clear and responsive mandate to flexibly address energy transition challenges across a range of developing country contexts.
- The program has provided value by developing pioneering projects in challenging contexts.
- SREP projects are highly relevant to national-level country needs, priorities, and opportunities.
- SREP projects have been largely coherent with sector institutions, policies, and markets, as well as with the efforts of other development partners. Some challenges were faced in institutional coordination and related to rapid market and technology evolution.

2.1 Value added by SREP as a program

With its focus on renewable energy and energy access in low-income countries, SREP occupies an important niche in the global climate finance landscape. SREP is the only multilateral climate fund specifically targeting renewable energy and energy access, or the energy transition in general, in low-income countries. Nineteen of the 27 countries eligible for SREP are least developed countries (LDCs). Another key differential is that while other multilateral climate funds seek to maximize greenhouse gas (GHG) emission reductions, SREP has been willing to promote energy transitions in countries with lower GHG abatement potential. Other multilateral climate funds, namely the Green Climate Fund (GCF) and Global Environment Facility (GEF), have supported similar renewable energy and energy access projects in low-income countries, but their mandates are broader, encompassing climate change mitigation programming more widely. At the time that SREP was being designed and launched, the GEF was concluding a period during which it had moved away from support for off-grid renewable energy, since past projects had achieved less-than-desired results.[3]

The GEF has since renewed its support for this area, but renewable energy development remains only one component of its broader climate change strategic objectives.[4] In the GCF, the mandate from the United Nations Framework Convention on Climate Change (UNFCCC) encompasses support to developing countries to limit or reduce their GHG emissions, although recent actions suggest some movement toward more support for renewable energy generation and access; in response to the direction of the GCF Board to find areas of investment where GCF can have the most impact, the GCF Secretariat has recently developed a sectoral guide on this topic.[5] One multilateral fund, the Global Energy Efficiency and Renewable Energy Fund, has been working in parallel to SREP in terms of timing[6] and geographical scope—but has a much more bounded investment modality compared to SREP, cooperating exclusively with private equity funds. In this broader landscape of climate funds, SREP remains unique in its dedicated support for sustainable energy transition in low-income (and often fragile and conflict-affected) countries through a programmatic approach encompassing investment and technical assistance.

SREP has brought substantial resources to countries that struggle to attract sufficient sustainable energy finance. Since its launch, SREP has represented a significant portion of the multilateral sustainable

[3] Global Environment Facility Independent Evaluation Office (2017). GEF/ME/C.53/Inf.02. Climate Change Focal Area Study. GEF Council Meeting, 31 October 2021. Washington, DC.
[4] Global Environment Facility (GEF) (2014). GEF/A.5/07/Rev.01. GEF-6 Programming Directions. 22 May 2014. Washington, DC.
[5] Green Climate Fund (GCF) (2021). Draft GCF Sectoral Guide: Energy Generation & Access (2020-2023). 29 April 2021.
[6] GEEREF became operational in 2008 and reached the end of its investment period in 2019, and GEEREF NEXT is now being financed with support from the GCF.

energy finance directed to low-income countries, and LDCs in particular. As of May 2021, $549 million has been Committee- and MDB-approved[7] for 51 projects in 20 countries. Through its broad geographic and sectoral positioning, SREP has been able to achieve significant country reach and project scale (an average of $10 million per project), which has allowed it to position itself as a global program, responsive to a broad range of technologies and development priorities at country level. In the 20 countries with approved projects, SREP represented an average of 60 percent of multilateral sustainable energy finance from 2010-2021.[8] Among all sources of finance (including multilateral, bilateral, MDB, philanthropic, and private-sector sources), SREP accounted for almost a fifth of committed funds for sustainable energy in its 20 countries from 2013-2018.[9]

SREP's commitment to concessional finance for clean energy in low-income countries remains relevant a decade after its launch. Although international public financial flows to developing countries in support of clean energy have grown since SREP was launched in 2010, low-income countries receive a small proportion of global investment—far below what is required.[10] The investment increases have been concentrated in a few countries, with the 46 LDCs receiving just 20 percent of commitments to developing countries.[11] The latest report on tracking progress against Sustainable Development Goal 7 (SDG 7)[12] concluded that "international public financial flows to developing countries need to rise substantially and target more of the countries that have fallen furthest behind in reaching SDG 7."[13] This evaluation's own analysis also supported the assertion that low-income countries are falling behind, in both access and finance. SREP countries that have not had investment projects Committee- or MDB-approved (e.g., Benin, Ghana, Madagascar, Malawi, Sierra Leone) have accessed an average of 40 percent less financing from other dedicated multilateral climate funds than have SREP countries with approved SREP projects.[14]

The need for concessional finance to accelerate the energy transition has become even more pronounced post-COVID-19, as low-income countries face rising levels of public debt as they seek to address the impacts of the pandemic on their economies. Interviews conducted for this evaluation, combined with the strong response to the call for expressions of interest for the CIF's new Renewable Energy Integration (REI) program, help demonstrate the substantial interest in and need for investment in renewable energy and energy access in low-income countries. Indeed, many SREP countries and other emerging markets face rising demands for power, associated with economic growth and increased energy access, demonstrating a clear need to ensure that new generation capacity and off-grid access solutions are based on renewable sources while existing fossil fuel sources (e.g., diesel in Small Island Developing States [SIDS]) are also replaced with renewables.

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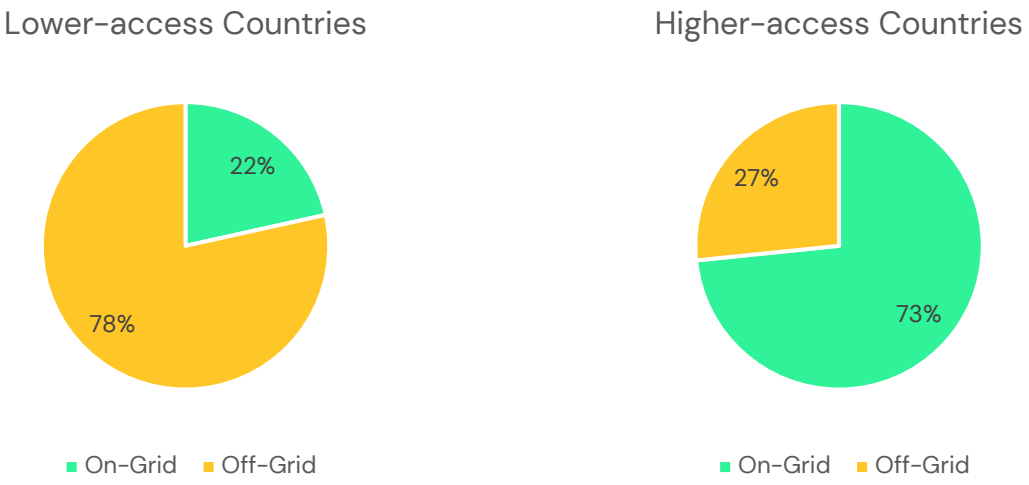
[7] SREP projects undergo a two-stage approval process. First, the SREP Committee approves the project proposal with associated SREP grant and/or non-grant funding. Second, the project must be approved through the relevant MDB's own Board approval process.
[8] Prior to the launch of the GCF in 2016, SREP projects on average represented 77 percent of multilateral funding for sustainable energy finance in countries with SREP projects. After the launch of the GCF, SREP still represented on average 64 percent of sustainable energy financing. Analysis based on data from the Climate Funds Update Dashboard, accessed 1 November 2021. This figure does not include global, regional, or multi-country financed projects, since funding cannot be easily assigned to specific countries.
[9] Evaluation team's analysis based on the Stockholm Environment Institute (SEI) Aid Atlas, for commitment categories "Energy generation, renewable sources - multiple technologies," "Wind energy," "Geothermal energy," and "Solar energy for centralised grids." The evaluation team compared all financing sources for these commitment categories to SREP funding for MDB-approved projects. The SEI Aid Atlas may provide an underestimate given tagging issues associated with the Rio Markers.
[10] Climate Investment Fund and Bloomberg New Energy Finance (2021). Multiplying the Transition: Market-based Solutions for Catalyzing Clean Energy Investment in Emerging Economics. 27 October 2021.
[11] International Energy Agency (IEA), International Renewable Energy Agency (IRENA), United Nations Statistics Division (UNSD), World Bank, and World Health Organization (WHO) (2021). Tracking SDG 7: The Energy Progress Report. World Bank, Washington DC.
[12] SDG 7 is to ensure access to affordable, reliable, sustainable, and modern energy for all.
[13] IEA, IRENA, UNSD, World Bank and WHO (2021).
[14] Climate Funds Update (2021). Data Dashboard. Available at: https://climatefundsupdate.org/data-dashboard/ (accessed 1 November 2021). This figure does not include global, regional, or multi-country financed projects since funding cannot be easily assigned to specific countries.

SREP's twin objectives of renewable energy development and energy access have allowed partner governments and MDBs flexibility in addressing diverse country needs. SREP's diverse set of countries—with energy access rates ranging from 11 to 100 percent—were flexibly supported through the combined access-power agenda.[15] As shown in Figure 1, lower-access countries tended to focus their SREP programs on off-grid technologies designed to increase access, whereas higher-access countries placed more emphasis on on-grid technologies that could support growth in clean generation capacity.

Figure 1: SREP project financing by level of access and on-grid and off-grid technologies



Note: Lower-access countries are defined as those where less than 50 percent of the population has electricity access. Higher-access countries are those where greater than 50 percent of the population has electricity access. Project financing is exclusive to MDB-approved financing.
Sources: Evaluation team analysis, based on data from the CIF AU (2021); World Bank (2021). Sustainable Energy for All (SE4ALL) database. Available at: https://data.worldbank.org/indicator/EG.ELC.ACCS.ZS (accessed May 20, 2021); Independent Evaluation Group (2015). World Bank Group Support to Electricity Access, FY2000-2014: An Independent Evaluation. World Bank, Washington, DC.

SREP has provided value by pursuing pioneering investments in challenging country contexts. With many SREP countries in their early days of renewable energy development when SREP was launched, SREP's approach to prioritizing innovation and early- and first-mover projects was highly relevant. Mali, for example, had no grid-connected solar or mini-hydro, and mini-grids were primarily diesel-based, at the time that the SREP investment plan was designed to advance these technologies. In Honduras, Lesotho, Vanuatu, and Solomon Islands, SREP is piloting renewable energy-powered mini-grids and building new capacity in government agencies to replicate these approaches. Interviews and review of SREP Committee documentation also indicated that the Committee took an active approach to promoting innovativeness and additionality of some proposed projects. Pursuing these innovative projects in a range of challenging country contexts (Table 2), however, contributed to difficulties in implementation, as explored further in Chapter 4.

[15] World Bank (2021). Sustainable Energy for All (SE4ALL) database. Available at: https://data.worldbank.org/indicator/EG.ELC.ACCS.ZS (accessed May 20, 2021).

Table 2. Prevalence of Challenging Country Contexts in the SREP Portfolio

Country	LDC	Fragile and Conflict-Affected Situations FCAS	Major Disruptive Event	Difficult Business Environment	Low RISE Score	Low Electricity Access	Low RE Penetration
Armenia		*	*				
Benin	*			*		*	*
Bangladesh	*			*			*
Cambodia	*			*			
Ethiopia	*	*	*	*		*	
Ghana					*		
Haiti	*	*	*	*	*	*	*
Honduras							
Kenya					*		
Kiribati	*	*		*	*		*
Lesotho	*					*	
Liberia	*			*	*	*	
Madagascar	*			*	*	*	
Malawi	*				*	*	
Maldives			*	*			*
Mali	*	*	*	*	*		
Mongolia							*
Nepal	*		*		*		
Nicaragua					*		
Rwanda	*					*	
Sierra Leone	*			*		*	
Solomon Islands	*	*			*		*
Tanzania	*				*	*	
Uganda	*				*	*	
Vanuatu							
Yemen	*	*	*	*			
Zambia	*					*	

Note: **Major Disruptive Events** are defined as extreme weather and natural disasters, internal and external conflicts, and severe political instability, including coups. **Challenging business environments** include countries in the bottom quartile of the World Bank's Ease of Doing Business rankings. **Low RISE** scores are for those countries with a score of less than 50 (2019). **Low Electricity Access** countries are defined as those where less than 50 percent of the population has electricity access. **Low RE Penetration** are defined as those where renewable electricity is less than 10 percent of total electricity output; renewable energy sources include large hydropower.
Sources: Cline Center for Advanced Social Research (2022). Coup D'état Project (CDP). Available at https://clinecenter.illinois.edu/project/research-themes/democracy-and-development/coup-detat-project-cdp (accessed January 14, 2022); ESMAP (2021). Regulatory Indicators for Sustainable Energy database. Available at: https://rise.esmap.org/indicators (accessed May 20, 2021); World Bank (2021). World Bank Country and Lending Groups. Available at: https://datahelpdesk.worldbank.org/knowledgebase/articles/906519-world-bank-country-and-lending-groups (accessed May 20, 2021); World Bank (2021). Sustainable Energy for All (SE4ALL) database. Available at: https://data.worldbank.org/indicator/EG.ELC.ACCS.ZS (accessed May 20, 2021); World Bank (2022). Classification of Fragile and Conflict-Affected Situations. Available at https://www.worldbank.org/en/topic/fragilityconflictviolence/brief/harmonized-list-of-fragile-situations (accessed January 14, 2022); World Bank (2022). Ease of Doing Business rankings. Available at https://www.doingbusiness.org/en/rankings (accessed January 14, 2022).

2.2 Country-level relevance and coherence

This evaluation applies the evaluation criteria of relevance and coherence as defined by the OECD DAC Network on Development Evaluation. While relevance assesses whether the intervention is doing the right things,[16] coherence is about how compatible the intervention is with other interventions in a country, sector, or institution. Coherence is meant to capture linkages and systems thinking, by assessing how well other interventions (including policies) support or undermine the intervention, and *vice versa*. This includes both internal coherence (between the intervention and other interventions carried out by the same institution/government) and external coherence (between the intervention and other actors' interventions).

SREP program and project design and objectives are highly relevant to national-level country needs, priorities, and opportunities. The five country case studies showed that SREP country programs are responsive to national and market contexts (as shown in Table 3). This finding is further supported by past evaluations of the CIF; the evaluation of transformational change in the CIF found that the four SREP country programs evaluated (Armenia, Honduras, Kenya, and Nepal) demonstrated a high degree of relevance and alignment with national priorities by identifying the most likely transformational opportunities available at the time. SREP program and project objectives have also remained relevant over time, as evidenced by the carrying forward of priorities in SREP investment plans to future sector plans, strategies, and Nationally Determined Contributions (NDCs) in all five case study countries.

Table 3. Relevance of SREP programs in case study countries

Bangladesh	The SREP portfolio in Bangladesh is well aligned with national needs and priorities, focused on utility-scale and rooftop solar PV and solar irrigation pumps, with some additional support for wind development and a waste-to-energy pilot. At the time that Bangladesh prepared its investment plan (2015), there was simultaneously extremely limited grid-connected solar PV in the country and significant renewable energy development targets for a large power market, including an expectation to deliver 5 percent of power from renewable sources by 2015 and 10 percent by 2020 (2008 Renewable Energy Policy). While Bangladesh did not come close to meeting these targets (about 3 percent of the total energy mix currently comes from renewable sources), the Government has set a new aspirational target of up to 40 percent renewable sources by 2041 and its new draft National Solar Energy Roadmap (2021-2041) includes targets for the technologies supported by SREP. Bangladesh's NDC also identifies the SREP-supported technologies as priorities. In interviews, there was widespread agreement that rooftop solar PV has substantial potential in Bangladesh and that utility-scale projects can also be scaled up, and that the SREP project was addressing important barriers related to availability of concessional finance, awareness and confidence among rooftop owners and renewable energy project developers, and technical quality of systems.
Honduras	The SREP investment plan (endorsed 2011, revised 2017) portfolio is highly relevant. Two SREP technical assistance projects have supported the evolution of the Honduran institutional and policy architecture to support renewable energy development. Another large public-sector investment project has helped address a key limitation to the amount of renewable energy that can be supplied to the grid and a barrier for the participation of private investment in the transmission sector—namely, the inadequacy of the electrical transmission infrastructure. Energy access projects have focused on the development of the first renewable energy-power mini-grids in the country, clean cookstove dissemination, and solar-powered mobile hospitals as a COVID-19 response. Program objectives also align with strategic plans that later emerged, including Honduras' NDC and SDG 7 Energy Compacts, as well as participation in the regional Renewable Energy for Latin America and the Caribbean (RELAC) Energy Compact.

[16] Specifically, "the extent to which the intervention objectives and design respond to beneficiaries', global, country, and partner/institution needs, policies, and priorities, and continue to do so if circumstances change." See: OECD Development Assistance Committee Network on Development Evaluation. (2019). Better Criteria for Better Evaluation: Revised Evaluation Criteria Definitions and Principles for Use.

Liberia	Sector planning was nascent at the time that the SREP country program was designed (2013), but relevance was demonstrated with Liberia's National Energy Policy (2009) and long-term Agenda for Transformation, which identified high cost and lack of reliable access to electricity as key obstacles for stability and growth. The two SREP projects (World Bank and AfDB) in Liberia are also aligned with strategic priorities and plans that followed, including Liberia's National Renewable Energy Action Plan under the Sustainability for All (SEforALL) framework (2015), the Electricity Law (2015), NDC (2015 and 2021), Rural Energy Strategy and Master Plan (2016), and the National Electrification Strategy (2020). Mini-grids and stand-alone PV systems, supported by the Liberian Renewable Energy Access Project (World Bank), for example, are identified in the Master Plan and National Electrification Strategy as key modalities to expand electricity access beyond the grid.
Maldives	The Maldives SREP portfolio was developed to underpin the national energy strategy. There was strong coherence around national policy objectives. The SREP investment plan (2012) was prepared in line with the Maldives Vision 2020, Strategic Action Plan (SAP, 2008-2013), National Sustainable Development Strategy (NSDS, 2009), Maldives Energy Policy (2010), 3rd Environment Action Plan (3rd NEAP, 2008), as well as different climate change policies especially with the objective of becoming a carbon-neutral country based on a zero-carbon electricity sector. There was coherence in MDB objectives, delineated around differing geographic and public/private mandates. The Asian Development Bank (ADB) Preparing Outer Islands for Sustainable Energy Development (POISED) project addressed the hybridization of small island grids through a public-sector delivery model, working with the two state-owned utilities (State Electric Company Limited [STELCO] and POISED), while the World Bank Accelerating Sustainable Private Investments in Renewable Energy (ASPIRE) project sought to mobilize private investment into the larger grids of the Greater Male Area. The program built on earlier work supported by ADB to prepare a medium-term road map and investment plan and building capacity for the Maldives Energy Authority and Ministry of Environment and Energy (including investment plans, operator licensing and consumer tariffs, and a grid code).
Mali	The SREP portfolio is well aligned with national needs and priorities, focused on adding grid-connected renewable energy generation and on rural electrification through hybridizing diesel mini-grids with solar PV. At the time the investment plan was endorsed (2011), the country had no grid-connected solar or mini-hydro and in rural areas electricity was mostly supplied by diesel mini-grids. Mali had a National Strategy for the Development of Renewable Energy, which was bolstered by the Economic Community of West African States (ECOWAS) Renewable Energy Policy in 2013, and which aims to increase the share of renewable energy in the region's overall electricity generation mix to 23 percent by 2020 and 31 percent by 2030. The ECOWAS policy was later translated into Mali's National Renewable Energy Action Plan (2015), which fed into the SEforALL Action Agenda of Mali. Mali's NDC (2016) also identifies renewable energy and rural electrification as priorities.

SREP projects have been largely coherent with sector institutions, policies, and markets, but with some challenges faced in institutional coordination and rapid market and technology evolution. The country case studies demonstrated synergies between SREP projects and national policy evolutions, suggesting that countries and MDBs have been designing projects that fit well with sector momentum and that demonstrate government buy-in. For instance, the approach in the Renewable Energy for Electrification in North and Center Liberia Project Mini-Grids (World Bank) was designed to be coherent with broader government policies aimed at transitioning a largely government-led process for procurement and distribution of products to one that involves greater private-sector engagement and investment to support reaching scale. The Liberia project also leveraged a brand-new policy development—a legal framework for mini-grids—in its project design, to support broader replication. Similarly in Bangladesh, both the ADB and World Bank implemented projects have been critically amplified by recent policy guidelines for net metering that incentivize rooftop solar PV and for purchasing surplus electricity from solar irrigation pumps. Government commitment or buy-in to SREP approaches is also demonstrated by the inclusion of targets in its new draft National Solar Energy Roadmap (2021-2041). In Mali, the Rural Electrification Hybrid Systems project (World Bank) is aligned with evolving institutions and

the level of market development. The project design also improved on an existing bottom-up approach driven by local developers and coordinated by Mali's rural electrification agency (Agency for the Development of Domestic Energy and Rural Electrification [AMADER]);[17] this approach had been implemented through a previous World Bank operation (Household Energy and Universal Access Project) that successfully delivered rural electrification through approximately 255 diesel mini-grids (as of 2017), and that had the benefit of relatively rapid deployment.[18] Interviewees also consistently held the view that the level of SREP concessionality offered by SREP was appropriate to address the level of financial, economic, and other market risks.

The thematic study on mini-grids identified a few examples where project design lacked coherence with market size and maturity, due in part to the absence of a comprehensive approach to identifying and addressing barriers to technology adoption. In Rwanda, for example, the limited project approach of providing credit lines to private developers was not compatible with the nascent stage and small size of the Rwanda mini-grid market. Similarly in Kenya, the complex public-private partnership (PPP) design of the mini-grid component proved to be incongruous with the small scale of mini-grids, and with a political economy favoring a national tariff and public ownership of mini-grids. The PPP model was replaced by a simpler engineering, procurement, and construction contract and a limited duration fee-based contract for the operation and maintenance of the mini-grids.

Indeed, effective adaptive management has been important to ensure continued coherence of design in rapidly evolving energy sectors. In Bangladesh, for example, the rural grid electrification situation has evolved significantly since the investment plan was endorsed. At that time, 74 percent of the population had access to electricity; today, 99.5 percent do. The SREP project implemented by ADB has adapted to this new reality, removing micro/mini-grids from the project design and shifting from replacing diesel-powered pumps with off-grid solar irrigation pumps to grid-connected ones instead. SREP flexibility has been appreciated in its support for MDBs' adaptive management practices, including restructuring (see also Chapter 4).

Insufficient cross-government coordination also contributed to a few instances of internal incoherence. In Honduras, the coherence of SREP off-grid energy access projects was challenged by programs pursued by government agencies not involved in SREP. During the time that SREP concessional finance supported an approach to reduce subsidies for cookstoves and engage micro-finance to reduce concessionality (Inter-American Development Bank [IDB] Lab, executed through a non-governmental organization [NGO], Fundación Vida), the Government of Honduras launched the Vida Mejor Program, which donated 100,000 cookstoves at no cost to recipients. This had a detrimental effect on the Honduran clean cookstove market, with buyers postponing their purchases and multiple manufacturers and suppliers ceasing activities.[19] In Bangladesh, some concerns were raised in interviews about the potential lack of coherence of the solar irrigation pump project (ADB), executed by the Bangladesh Rural Electrification Board under the Ministry of Power, Energy, and Mineral Resources, with solar pump approaches being supported by the Infrastructure Development Company Limited (IDCOL) under the Ministry of Finance, including with World Bank financing since 2013. These projects are using different business models (e.g., a fee for service model versus a farmer ownership model) and have different effective rates of concessionality. While innovation in and testing of different business models in off-grid technologies is to be expected to some extent, many interviewees called for more coherent sub-sectoral strategies.

[17] Based on the evaluation team's review of documentation for the Mali: Rural Electrification Hybrid Systems project.
[18] The project improved on the bottom-up approach through bundling of mini-grid sites, imposing certain criteria, and reducing unit and fuel costs through hybridization, thereby making the mini-grids more sustainable and economically viable. See: Castalia Limited (2015). Evaluation of Rural Electrification Concessions in sub-Saharan Africa Detailed Case Study: Mali, report prepared for the World Bank. Washington, DC.
[19] Based on interviews for the Honduras country case study and also CIF (2018). Promoting Sustainable Business Models for Clean Cookstoves Dissemination in Honduras. Case Study, June 2018.

The lack of clarity on policy and strategic direction for rural electrification, however, was a challenge for designing and implementing coherent SREP investments, especially for mini-grids, and limited policy support was designed into these SREP projects to address these issues. The institutions, planning, and regulations for mini-grids were and remain quite incipient in SREP countries, and even where strategic and regulatory frameworks exist, their implementation has been uneven. This has meant that some SREP projects suffered from unclear delineations between grid and off-grid areas. In Rwanda, changes in this delineation created uncertainty that deterred private investment.

In Mali, the absence of an integrated rural electrification plan impeded investment in solar hybridization in areas adjacent to the grid. A smaller SREP technical assistance project in Mali (Promoting the Scaling Up of Renewable Energy Project [PAPERM], African Development Bank [AfDB]) produced relevant policy documents and analyses related to mini-grids and rural electrification, although this type of policy support is more the exception in the portfolio.[20] Without agreed strategies for rural electrification, some mini-grid projects also struggled with incompatibility with national subsidies and tariff setting. In Tanzania, private sector-led mini-grid development froze following a lowering of tariffs, and the prioritization of a national utility-led and grid-based electrification. A change in the level of subsidy provided by the government following project approval also affected the Nepal private sector mini-grid project, resulting in a reduced pipeline of larger mini-grids and the necessity to provide soft credit to private developers.

In a few cases, SREP helped to support needed sector planning. In Honduras, for example, SREP institutional capacity building has helped build toward national electrification planning (see also Chapter 5); in Liberia, the World Bank-administered Public-Private Infrastructure Advisory Facility (PPIAF) provided support for national electrification planning in 2020, parallel to the SREP-funded project (also World Bank).

External coherence is strong; SREP projects have been supported and complemented by the efforts of other development partners. The Renewable Energy for Electrification in North and Center Liberia Project Mini-Grids (World Bank), for example, is coordinated with the United States Agency for International Development (USAID)-funded National Rural Electric Cooperative (NRECA), which provides technical assistance to the Rural and Renewable Energy Agency (RREA) for field evaluation and design of the distribution network. In Bangladesh, the Scaling Up Renewable Energy Project (World Bank) is well coordinated with the efforts of other development partners, including a parallel-financed KfW rooftop PV project (including complementary technical assistance to address some institutional barriers). The World Bank Group has also aligned its private-sector arm and trust funds to provide coherent support to the Government of Bangladesh, including International Finance Corporation (IFC) advisory services to develop utility-scale solar on public lands through a competitive auction, ESMAP technical assistance to assess renewable energy potential in industrial zones, and PPIAF support for assessment of national land management process to more systematically consider renewable energy in zoning and allocation processes. In Mali, coordination of on-grid renewable energy development and related transmission strengthening has been evident, with development partners supporting efforts to restore the financial viability of the national utility (Société Energie du Mali, or EDM) while improving service delivery and upgrading and expanding transmission and distribution. These activities are supportive of SREP projects focused on mini-hydropower and distribution lines (AfDB, executed by EDM) and the Segou solar plant (AfDB, World Bank, and IFC, with the power purchase agreement (PPA) negotiated with EDM). In Maldives, several international finance institutions (e.g., IDB, European Investment Bank) and bilateral agencies (e.g., Deutsche Gesellschaft für Internationale Zusammenarbeit [GIZ], Japan International Cooperation Agency) crowded into finance investment and technical assistance complementary to SREP investments.

[20] Mali's Reference Framework for Rural Electrification, adopted in 2003, sets out the general principles for rural electrification, but the country does not have a specific off-grid policy, law, or action plan in place.

3 Program Design and Efficiency

Key Messages

- On balance, many of SREP's original design elements were aligned with its program goals to pilot and demonstrate the viability of renewable energy development and initiate processes toward transformational change in lower income countries.
- The programmatic approach, by linking predictable concessional resources to strategic planning, helped secure country and MDB support for many first- and early-mover investments. SREP has not sustained the programmatic approach in implementation, however, undermining the potential opportunity for more coherent delivery and learning in some cases.
- While SREP struggled to develop an attractive funding channel for private-sector projects, the portfolio still shows considerable focus on overcoming barriers to scaling up private investment.
- At approval, SREP country programs have been successful in mobilizing significant additional finance from other sources. SREP also met its objective to blend its finance with that of the MDBs.
- Over time, when the scale and certainty of funding eroded, the program model became constraining, contributing to a reduction in program momentum. The strategy of supporting investment plan development without certainty of resource availability has not worked well. MDBs perceived reputation risk with preparing investment plans without available funding and were also reluctant to undergo investment plan revision processes when resources were scarcer.

While some of SREP's design elements were agreed from the outset, others emerged as strategic decisions were taken by the SREP Sub-Committee to address effectiveness and efficiency concerns. Through review of the SREP design document and Sub-Committee meeting reports, along with interviews, the evaluation team identified five program design and delivery elements that were particularly influential in yielding benefits or leading to constraints over time. Each of these is discussed in more depth in the sub-sections that follow:

- The programmatic approach.
- Country resource allocation and the consideration and approval of additional pilot countries.
- Pipeline management strategies aimed at ensuring effective and efficient use of SREP resources.
- Private-sector engagement and programming strategies.
- Blending with and mobilizing finance from MDBs and other financiers.

3.1 Programmatic approach

The programmatic approach is one of the core design elements of the CIF. In general terms, the CIF's programmatic approach encompasses the development and implementation of a country-led investment plan—supported by MDB collaboration, informed by multi-stakeholder consultation, and associated with a predictable and flexible resource envelope—that sets out strategically linked investments, unified by a transformative vision. [21] In the SREP program design, the programmatic approach focused on combining "both renewable energy investments […] and technical assistance, together with support for policy changes" and creating national platforms to "crowd in" appropriate activities and resources to align with the objectives of the SREP approach.[22]

[21] ICF International (2018). Evaluation of the Climate Investment Funds' Programmatic Approach, report prepared for CIF AU. October 2018. Fairfax, VA.
[22] CIF (2009).

Linking predictable concessional resources to strategic planning helped convene government and other actors for high-level sector dialogue, at a time when such dialogue was nascent in many SREP countries. This contributed to country and MDB support for many first- and early-mover investments. Interviews, country case studies, and previous CIF evaluations showed that the stakeholder engagement approach,[23] combined with the assurance of a country resource envelope, created momentum around renewable energy development in SREP countries. When most SREP investment plans were being developed, between 2011 and 2014, few countries had national integrated energy plans or least-cost electrification planning, and the processes of developing SE4ALL Renewable Energy Action Plans, NDCs, and SDG7 Energy Compacts had not yet been launched. This dearth of strategic planning at the time lent gravity to the SREP investment planning process. SREP was also seen by interviewees as helping to elevate the conversation around renewable energy by bringing substantial concessional finance to the table, such as in Armenia, Bangladesh, and Maldives. According to interviews, the "sweetener" of grant financing was crucial in encouraging countries to pursue first- and early-mover investments. Strategic dialogue and resource predictability in the investment planning process also helped identify potentially transformative investments in some countries, especially when government leadership was strong, such as in Maldives and Rwanda.[24]

While the value of supporting dialogue was recognized, multiple MDB interviewees held the view that the development of the investment plan report itself became somewhat inflated in SREP—with original expectations of a concise 20-30 page plan quickly ballooning to 100-250 pages or more—siphoning resources to consultancy teams without adding proportional value.[25] This points to a potential lesson for future programming, especially in the present context where countries have NDCs and more advanced sector planning, to focus on the value generated by the process of consultation rather than the length of the investment plan.

MDB interviewee feedback on the SREP programmatic approach

"There was great value in the investment plan process itself—otherwise it would have been difficult to have those wide range of consultations […] It created momentum on the best way to use SREP resources."

"The SREP programmatic approach [through] collaboration with government and other MDBs was an effective way of linking to national plans [and was] very useful to prioritize what governments [want to pursue in the context] of wider development plans."

"In SREP, [it has been] extremely helpful for all the parties around the table to have a sense of what the situation was, and collectively, how to approach the sector in a way that would lead to change over time. This was the programmatic approach's biggest strength."

"The investment plan is a fantastic instrument up front. Instead of offering one single project, it's a plan for transformation, which is fabulous. You have predictability of resources, and a couple of different MDBs and bilaterals together. Those pieces are really nice."

"The development of the Investment Plan kickstarted talk about renewables."

SREP's focus on "both investment and technical assistance" supported progress in low-income and lower-capacity countries. All SREP investment plans include funding for capacity building of key

[23] SREP investment plan development involved strategic dialogue and consultation, largely led by ministries and agencies responsible for energy and finance, economy, or planning, and informed by consultation with development partners, international and national NGOs, local communities and civil society organizations, and the private sector. Joint MDB planning supported the process.
[24] CIF programmatic approach evaluation.
[25] The lack of reporting on the use of the investment plan preparation grants (IPPGs) limited the ability of the evaluation team to discern contributions of the investment plan development process to specific gains in terms of the enabling environment (e.g., such as those as measured by RISE indicators). Several indicators point to a more limited influence, however, including the facts that only two-thirds of SREP countries with endorsed IPs (16 of 23) have received IPPGs of up to $300,000; that most IPPGs were not fully utilized, with an average of $229,000 utilized; and that interview partners indicated that most IPPG resources were transferred to consultants for the preparation of the investment plan report itself.

stakeholders and institutions; this technical assistance support is a key differentiator for SREP (vis-à-vis the CIF's CTF) and consistent with needs in low-income and lower-capacity countries.[26] For mini-grid projects, for example, capacity constraints in government agencies (e.g., for tender design, project management, procurement) and among local project developers have required significant project-based support to advance implementation. In Liberia and Mali, human and institutional capacity was diagnosed as a challenge for program implementation at the time of investment plan development, and approved projects in both countries include specific support for such capacity development in key government agencies, such as the RREA in Liberia, and AMADER and the National Directorate of Energy in Mali.

SREP has not sustained the programmatic approach in implementation, undermining the potential opportunity for more coherent delivery and learning in some cases. Unlike in the other SCF programs, the country coordination mechanisms identified in SREP investment plans have not always been established or engaged. National participatory stakeholder workshops to discuss progress in investment plan implementation have not been held in SREP countries, although they are called for in the M&R Toolkit at the mid-term and completion of SREP investment plans (see also section 4.1.3). Few resources have been requested for SREP countries from the CIF's central country programming budget[27] to support the project implementation phase (e.g., for conducting country-level knowledge and learning activities, or convening stakeholder review meetings or forums, or gender-related activities).

The country focal point position is not serving its intended purpose to coordinate the SREP program. The country case studies demonstrated that SREP country focal points are not playing an active role in implementation, as illustrated by the fact that in four of five countries studied, the country focal point was either different than the person on record with the CIF AU or an unfilled position. In addition, the organizational locations of the SREP focal points did not always empower them to effectively coordinate across SREP country activities, such as in the case of Honduras (see box on page 63 discussing the role of programmatic coordination in driving transformational change). By ceding to a project-oriented approach in implementation, countries rely on business-as-usual (and often sub-optimal) sectoral coordination. Rather than forcing the position of the country focal point, it may be more effective for future programming to explore working to strengthen existing sectoral coordination mechanisms, or helping governments to establish them where they are not yet well-rooted.

The investment plan construct has become constraining later in the SREP program lifetime, when resources have become scarcer and more uncertain. The flexibility to reallocate resources to reflect changing conditions has been a benefit of the programmatic approach, and one that has been used effectively in countries such as Honduras. However, despite the responsiveness of the CIF AU, the requirement to revise investment plans in order to redeploy resources came to be seen as a barrier when resources were more limited. As discussed in the following Section 3.2, SREP funding commitments did not increase proportionately with the number of eligible countries, creating resource constraints. MDB interview partners indicate reluctance to revise investment plans for smaller amounts of resources or without certainty that resources will be available for the project after the revision process. This has contributed to a stagnating pipeline, with some project concepts now four to nine years old and not yet submitted for Committee approval (see also Section 3.3 on pipeline management).[28]

[26] ICF (2018).

[27] Over the years, CIF has made multi-year resources available for country-level activities to sustain the programmatic approach, which are accessed through the MDBs. Eligible categories are: IP/SPCR preparation and updates/revisions; stakeholder review meetings; annual monitoring and reporting exercises; support for gender analysis, knowledge, or technical work in the preparation or implementation of the IP/SPCR; and country-specific knowledge products or activities

[28] While COVID-19 has been significantly affecting implementation of approved projects over the past two years, MDB interviewees did not raise the pandemic as a major factor contributing to slowness in the pipeline.

3.2 Country resource allocation and expansion

Consistent with the program's design decision to work in a small number of low-income countries, "to maximize its impact and the demonstrative effect," the SREP Sub-Committee initially selected six pilot countries: Ethiopia, Honduras, Kenya, Maldives, Mali, and Nepal. Indicative allocations were set at $25–$30 million for Honduras and Maldives, up to $40 million for Mali and Nepal, and up to $50 million for Ethiopia and Kenya.[29]

A year later, in November 2011, an additional reserve list of five countries (Armenia, Liberia, Mongolia, Tanzania, and Yemen) and a South Pacific Regional Program (including Solomon Islands and Vanuatu) were invited to begin developing investment plans. These invitations were made recognizing that resources may not necessarily be available to finance those plans under SREP, but that financing may be available through other sources of climate finance.

In October 2013, the SREP Committee approved an additional 14 countries to prepare investment plans, while recognizing that "at present there is not sufficient funding under SREP to finance the projects and programs that may be proposed in the investment plans but notes its expectation that there will be climate finance available to fund high-quality projects and programs." For these 14 countries, the SREP Sub-Committee agreed in January 2015 to endorse their investment plans on a first-come, first-served basis, regardless of funding availability. Funding for the projects and programs proposed in the investment plans would be contingent upon the availability of funds.

Overall, indicative country resource allocations were right-sized to promote high-level engagement, to reflect absorption capacities in SREP countries at the time, and to initiate transformational pathways at different scales, depending on the size of the sector. MDB and government official interviewees widely perceived that SREP appropriately sized its indicative country allocations[30]—including in Armenia, Bangladesh, Cambodia, Nepal, Vanuatu, Mali, Honduras, Nicaragua, Maldives, and Liberia—to engage the interest of MDBs and countries and to finance projects at a meaningful scale. In Honduras, for example, interviewees believed that a larger allocation would have led to implementation problems. In larger SREP countries, such as Ethiopia, Kenya, and Bangladesh, while the size of the country allocation did not prevent the countries from identifying specific areas of engagement for SREP, the potential results are more bounded to a sub-sector or technology (e.g., geothermal). The extent to which the SREP allocation was sufficient to initiate transformational pathways at different scales also depended on the extent to which the country program was designed to maximize alignment or synergies around sector or sub-sectoral priorities. In a SIDS like Maldives, the allocation was large enough to be perceived as the national renewable energy program, and the World Bank and ADB projects were well coordinated to drive national-level transformational processes. In other countries, MDB projects focused on different subsectors, fragmenting the resources, and limiting the potential to drive higher-scale change (see also Section 5.4 on transformational change).

A previous evaluation of CIF found that smaller resource allocations discouraged MDB collaboration;[31] further analysis conducted for this evaluation supports this finding but also offers a slightly more nuanced explanation for SREP. SREP's later expansion countries do show more prevalence of single-MDB SREP programs (e.g., ADB in Kiribati and Cambodia, World Bank in Rwanda and Haiti, and AfDB in Ghana and Uganda). However, interviews suggest that this outcome was also influenced by the preferences of some MDB regional management to not "share the pie" at the specific time that investment plans were being developed; a change in management supported more collaboration in later-endorsed countries, such as in Madagascar and Lesotho.

[29] CIF (2011). Summary of the Co-Chairs. Meeting of the SREP Sub-Committee. 11-12 November 2010.
[30] Although indicative country allocations were generally right-sized, perceptions about the actual availability of those resources affected interest in the program, as discussed later in this section.
[31] ICF International (2018).

SREP's decision to expand from 13 to 27 countries was a deviation from its design principle to work in a small number of countries to maximize impact, although reasonable given the context at the time. In late 2013, the launch of the GCF[32] as the world's largest dedicated climate fund was seen as imminent, and the CIF TFCs were actively discussing the implications of the CIF's sunset clause. [33] Within SREP, the approval rate across the first pilot and reserve countries was low—only four projects had been approved, representing 20 percent of total endorsed funding; no projects had yet been submitted by four of the countries, and investment plans were not yet endorsed for an additional five countries.[34] Interviews suggested that the decision to expand to more countries reflected an interest on the part of some SREP Committee members to speed up progress by hedging their bets on multiple countries. The selection of the expansion countries was conducted transparently: eligible countries were invited to submit an expression of interest (EOIs), and an independent expert group recommended countries for selection based on applying set criteria to the 40 EOIs submitted.[35]

This strategic decision had consequences for maximizing impact. Funds could have been used alternatively to later deepen programs in existing pilot or reserve countries or to expand the SREP set-aside to enhance engagement with the private sector—but at that point in time, in 2013, it is likely that neither of those options was particularly attractive. As noted, existing pilot countries were delayed in bringing forward their initial endorsed projects, and the first round of private-sector set-aside project proposals raised questions about quality and innovativeness (see also Section 3.4).[36]

The overall availability of resources in the SREP program was not congruent with the program objective, once the number of eligible countries expanded without accompanying resource expansion. At the time that the expansion countries began to be considered, $46 million was considered to be available to finance projects for additional countries, according to analysis by the CIF AU in October 2013. Additional contributions were made to the program following the approval of the 14 expansion countries—approximately $200 million was contributed between 2015 and 2017.[37] But this amount was not considered sufficient to fully fund investment plans for the 14 countries on par with the level of indicative resources approved for the pilot and reserve countries (e.g., approximately $30 to 50 million per country), which would have required contributions of between $420 to $700 million.

The strategy of supporting investment plan development without certainty of resource availability has not worked well. SREP's expansion to 14 new countries without sufficient funding to finance the projects in their investment plans created strategic challenges for the program—most notably a waning interest on the part of MDBs. There was a perception of reputational risk associated with helping countries prepare investment plans without the promise of resources (e.g., an unfunded mandate). MDB management staff were less willing to commit human and financial resources to assist in the investment

[32] The GCF was established in 2010 under the Cancún Agreements as an official financial mechanism of the UNFCCC, with a complementary mandate to the CIF to promote paradigm shift toward low-emission and climate-resilient development pathways by providing support to developing countries to limit or reduce their GHG emissions and to adapt to the impacts of climate change. Funding for the GCF's first project was approved in 2015. The GCF provides support for a sustainable energy transition, among other areas of investment, and within the bounds of a balanced allocation between mitigation and adaptation.

[33] The CIF are designed with a sunset clause that states that the CIF will "take necessary steps to conclude its operations once a new financial architecture is effective." (See Governance Framework for the SCF, December 2011.) Consideration of the sunset clause was postponed indefinitely in 2019.

[34] CIF (2013). SREP/SC.10/3. SREP Semi-Annual Operational Report. Meeting of the SREP Sub-Committee, 31 October 2013. Washington, DC.

[35] The original six pilot and seven reserve countries were selected according to the criteria of: (a) Willingness to undertake a program for renewable energy development that could eventually move the country toward a low carbon development path in the energy sector; (b) Potential capacity for implementation, including a business-friendly environment and sufficient institutional capacity; (c) Regional balance (at least three regions) as well as balance among diverse contexts for scaling up renewable energy, such as urbanization, industrialization, dispersed rural populations, and stage of renewable energy development; and (d) Natural conditions for developing renewable energy. The SREP Sub-committee requested the Expert Group to select expansion countries using the same criteria and focus.

[36] Vivid Economics (2014). A Review of the Private Sector Set-asides of the Strategic Climate Funds, report prepared for CIF Administrative Unit, October 2014. London, United Kingdom.

[37] Analysis based on Trustee reports to the SREP Committee.

plan development process, and MDB operational staff were also less willing to engage; one contributing factor is that staff performance incentives align with investment approvals and disbursements. In the words of one MDB interview partner, "The SREP capitalization issue meant that the certainty [of projects being funded] disappeared over time, and this decreased hope and confidence in SREP as a program."

The outcome is that programs have not meaningfully advanced in about half of expansion countries (Benin, Malawi, Sierra Leone, Uganda, Ghana, Madagascar, Zambia). Of the 14 expansion countries, Benin, Malawi, and Sierra Leone did not submit investment plans, and no funding has yet been MDB-approved in Ghana, Madagascar, or Zambia. In other expansion countries, such as Bangladesh, Cambodia, Rwanda, and Haiti, projects were prepared quickly, before the message of resource scarcity could be absorbed.

GCF funding also did not materialize to fill the resource gap. Multiple decisions by the SREP Committee in 2014-2017 urged MDBs, countries, and the CIF AU to use SREP investment plans as a platform to access other climate finance channels, including the GCF, and secure funds for the implementation of these projects. The evaluation team did not identify any instances in which project concepts similar to those included in SREP investment plans were funded subsequently by the GCF.[38] This finding is supported by an independent study of synergies among climate funds, which concluded that smaller countries, such as many SREP-eligible ones, have far fewer funding confluences, specifically with GCF funding for national projects.[39] Many factors likely contributed to this outcome, as documented in evaluations of the performance of the GCF, [40] including perceptions of substantial transaction costs associated with accessing the GCF, delays experienced in accrediting some MDBs, and structural issues.[41]

3.3 Pipeline management and efficiency

SREP's approach to pipeline management[42] has evolved over the program lifetime. The original pipeline approach only allowed projects in the pipeline up to the amount of pledged resources. In 2013, the Committee agreed to additional steps intended to speed up the preparation and implementation of SREP projects in the pipeline.[43] Overprogramming[44] was the key measure adopted, allowing the value of projects in the pipeline to exceed pledged resources by up to 30 percent, in recognition that some projects in the pipeline are bound to slip or not materialize at all.

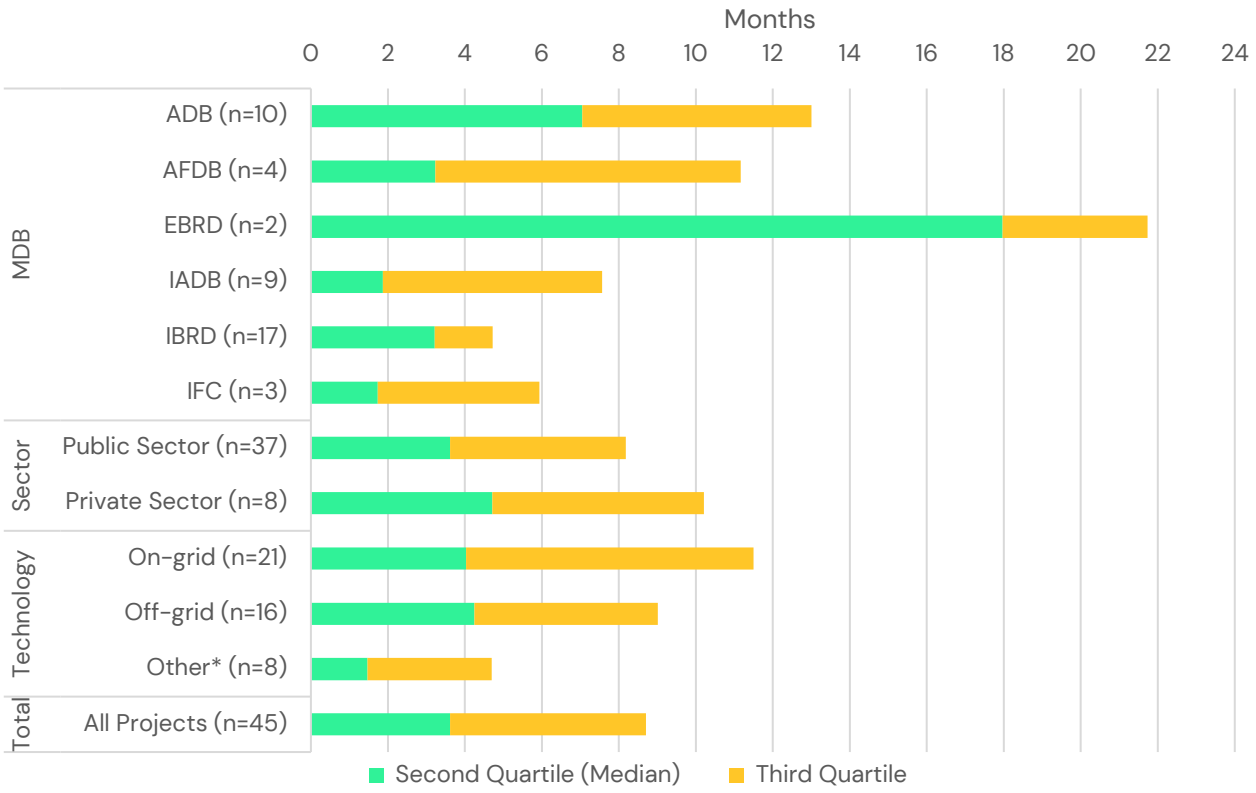
In 2017, the concepts of a "sealed" and "reserve" pipeline were introduced. The sealed pipeline matches the projected available funding, updated semi-annually, while the reserve pipeline includes overprogrammed projects (i.e., those for which sufficient resources are currently not available). Projects would be placed in the sealed pipeline based on readiness and would have an expiration date after which, if they failed to be submitted to the Committee for funding approval, they would be dropped to the reserve pipeline. Projects from the reserve pipeline could be moved to the sealed pipeline as resources become available and as they were ready. The intention was that this pipeline approach would "provide more predictability of resources to the MDBs for project development and encourage them to deliver projects expeditiously and make best possible project submission forecasts."[45]

[38] The GCF has provided co-financing to EBRD's Sustainable Energy Financing Facility, which was earlier financed in part by SREP in Armenia.
[39] CIF and GCF. (2020). Synergies between Climate Finance Mechanisms: Synthesis Report.
[40] GCF Independent Evaluation Unit (IEU) (2019). Forward-looking Performance Review of the GCF. June 2019. Songdo, South Korea.
[41] See CIF and GCF (2020). This report found that "there was a collaborative attempt between CIF and GCF to fund the investment plans for Madagascar and Uganda from GCF funds. However, prioritization and scheduling challenges with the pipelines of the agencies, countries and funds prevented this effort from succeeding."
[42] Pipeline management spans from investment plan preparation and endorsement, to project preparation and approval by the SREP Committee and MDB Board, to project effectiveness.
[43] CIF (2013). SREP/SC.10/6. Proposal for Enhancing SREP Pipeline Management. Meeting of the SREP Sub-Committee, 31 October 2013. Washington, DC.
[44] The CIF Administrative Unit proposed 20 percent overprogramming; the Sub-Committee approved 30 percent overprogramming.
[45] CIF (2017). SREP/SC.IS.4/2. SREP Pipeline Management Policy. Meeting of the SREP Sub-Committee, 22 February 2017. Washington, DC.

The SREP Committee also set expectations[46] for the speed with which projects should move through the pipeline. These include targets of 24 months from investment plan endorsement until all projects therein should be submitted to the Committee for funding approval, 9 months from Committee funding approval until submission of appraised public-sector projects for MDB approval, and 9 months from MDB approval until project effectiveness.

SREP projects have mostly met expectations in terms of the speed with which they move through the pipeline. Three-quarters of all projects have advanced from SREP Committee approval to MDB approval within 9 months; half of projects have reached MDB approval within 4 months. World Bank, IDB, and IFC projects have generally reached this milestone more quickly, with three-quarters of World Bank projects MDB-approved by 4.7 months (Figure 2). SREP projects became effective soon after MDB approval, with half of all projects becoming effective approximately 4 months after MDB approval and all projects becoming effective in 10 months. From effectiveness, half of projects reached disbursement within 8 months, with three-quarters of projects achieving this milestone within 12 months.

Figure 2. Second (median) and third quartile for months elapsed from Committee approval to MDB approval, by project characteristics



*Other technologies include enabling environment, biogas, and cookstove projects.
Note: Excludes projects approved under the PSSA. Due to the small sample size for certain MDBs, including European Bank for Reconstruction and Development (EBRD) and IFC, elapsed months should be considered in the context of specific projects and not necessarily part of broader trends. For example, the EBRD Caucasus Green Economy Financing Facility (GEFF) experienced significant delays between sub-committee and MDB approval, which may not be indicative of other EBRD projects.
Source: Evaluation team analysis, based on data from CIF AU (2021).

[46] CIF (2012). SREP/SC.7/6. Proposal for SREP Pipeline Management. Meeting of the SREP Trust Fund Committee, 1 May 2012. Washington, DC.

The most significant delays in the pipeline have been experienced between investment plan endorsement and submission of projects to the SREP Committee for funding approval. Analysis of the speed with which SREP projects move through pipeline milestones shows that fewer than half of all projects received SREP Committee approval within 24 months of investment plan endorsement (per the target set in the 2013 pipeline management approach). The timeliness of progress through this milestone appears to be influenced by the implementing MDB and the project focus. ADB and World Bank projects have moved fastest; AfDB projects have moved slowest on average, although AfDB has also implemented the largest proportion of Project Preparation Grants (PPGs) (Figure 3). Among technology types, geothermal projects have moved the most quickly for Committee approval (15 months average). Projects that have reached SREP Committee approval faster tend to be larger (an average size of $11 million) than those that have been slower to reach this milestone ($5 million), potentially suggesting higher priority for larger SREP contributions. Other trends are hard to discern, suggesting that the reasons for projects moving faster or slower are more project-specific. MDB interviewees explained that project preparation can be a long process, especially for first-mover projects in low capacity and fragile contexts. In Ghana, for example, project preparation with feasibility studies has been a multi-year process.

Figure 3. Second (median) and third quartile of months elapsed from investment plan endorsement to Committee approval, by project characteristics

*Other technologies include enabling environment, biogas, and cookstove projects.
Note: Excludes projects approved under the PSSA. Due to the small sample size for certain MDBs, including EBRD and IFC, elapsed months should be considered in the context of specific projects and not necessarily part of broader trends. For Honduras, the time elapsed between investment plan endorsement and Committee approval for projects receiving approval after the investment plan was revised in April 2017 is measured from the date of revision.
Source: Evaluation team analysis, based on data from CIF AU (2021).

Perceptions of resource certainty supported active pipeline development. For SREP's initial six pilot countries and additional seven reserve countries, MDBs and governments developed project pipelines because they expected that resources were available to fund the endorsed project concepts in their

investment plans**.** Nearly all (97 percent) of endorsed investment plan funding for the six pilot and seven reserve countries has converted into Committee-approved projects. However, in some of the 14 expansion countries,[47] MDBs and governments believed that there may not be sufficient resources available to fund endorsed project concepts, and this contributed to endorsed project concepts not being actively developed and brought forward for Committee and MDB approval. A smaller proportion (70 percent) of endorsed investment plan funding for the 14 expansion countries has been Committee-approved.

In the context of decreasing availability of resources, however, the sealed and reserve pipeline approach has contributed to a stagnating pipeline. Overprogramming and the sealed and reserve pipelines were rational strategic responses to uncertain funding availability and delays in project preparation. MDB interview partners generally appreciated the flexibility of the sealed and reserve pipeline approach in principle. However, in a situation of dwindling resource availability, MDBs lacked incentives to devote resources or prioritize developing projects for which SREP concessional resources may not be available. As one MDB interview partner put it, "there are internal challenges […] MDB team time has to come from the MDB internal budget, and it's tough to get resources approved for this without certainty of funding." Another MDB interview partner expressed that "It is poor politics to raise expectations and then disappoint, and the fall out is not easy to manage. It can influence the relationship between MDBs and countries." In addition, the uncertainty of resource availability and downward pressure on the allocations to individual projects—leading to MDBs' perception that some projects were sub-funded—negatively affected MDBs' willingness to take on the transaction costs associated with accessing SREP finance (e.g., Lesotho for AfDB). The scale of resources also affects MDBs' willingness to take on the reputational risk or transaction costs; one interviewee explained that an MDB may be willing to do so for $100 million in concessional finance but not for $5 million. A further contributing factor is that the scale and uncertainty of available resources also influences MDB willingness to revise investment plans, as discussed in Section 3.1.

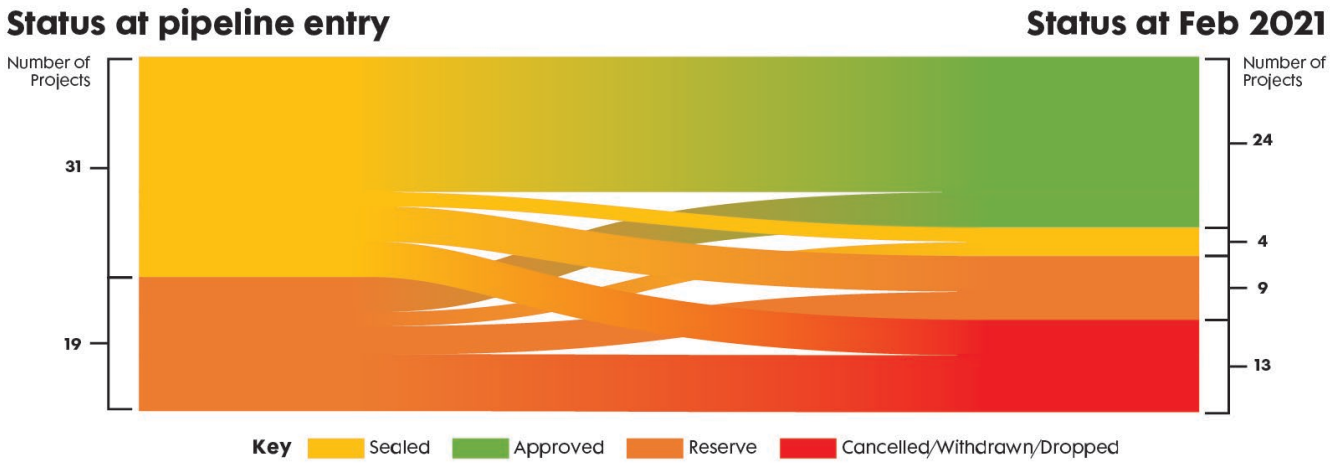
These MDB incentive dynamics, in a situation of limited resource availability and certainty, have created a tendency to sit on resources in the sealed pipeline rather than allow projects to be downgraded to the reserve list. Without knowing whether resources would again be available under the program, MDBs were reluctant to release their "spot in line." The pipeline management policy intended for projects to only move up to the sealed pipeline once approval was imminent, yet projects tended to exceed their agreed expiration date for the sealed pipeline multiple times. On average, projects spent three Committee meetings in the sealed pipeline before approval. The sealed/reserve pipeline approach was particularly ill-aligned with private-sector project development processes. MDB interviewees also explained that the funding uncertainty associated with the reserve pipeline was ill-aligned with private-sector project development processes. Resource certainty and flexibility are particularly important given the often-opportunistic nature of private-sector investments, compared to public-sector investments, where project preparation is easier to forecast. Four private-sector projects spent more than six Committee meetings in the sealed pipeline without being submitted for Committee approval, tying up nearly $40 million over a three-year period. The pipeline dynamics were further complicated by needing to balance demand for grant versus non-grant resources (e.g., at times, only grant resources were over-demanded, while non-grant resources were available in the sealed pipeline), and the fact that resources were not easily fungible (i.e., resources were tied to a specific country and not easily transferrable to another opportunity).

Tying up these resources in the sealed pipeline had opportunity costs in that projects in the reserve pipeline could not advance. Indeed, few projects that entered the SREP pipeline as "reserve" have been approved (as shown in Figure 4), and many of the reserve projects are now stale, since they have not been

[47] Among the expansion countries that moved more quickly to prepare their investment plans (e.g., Bangladesh, Cambodia, Ghana, Haiti, Nicaragua, Rwanda), there was still a perception that resources would be available to fund projects.

under active development by MDBs. One MDB representative said: "A lot of funding ends up being locked in, either in countries or in non-advancing projects; the process is kicking the can down the road. It's a zombie pipeline that needs greater flexibility." The SREP experience points to the need for more flexibility and certainty in pipeline management, in the context of resource scarcity.

Figure 4: Project movement through SREP sealed and reserve pipelines



Source: Evaluation team analysis, based on data compiled and analyzed from CIF (2020). SREP/SC.22/3. SREP Operational and Results Report. Meeting of the SREP Sub-Committee, 16 January 2020; CIF (2018). SREP/SC.20/3. SREP Operational and Results Report. Meeting of the SREP Sub-Committee, 19 December 2018; CIF (2017). SREP/SC.18/3. SREP Operational and Results Report. Meeting of the SREP Sub-Committee, 5 December 2017.

3.4 Program design implications for private-sector engagement

SREP's original design recognized the significant role of the private sector in promoting renewable energy and aimed to "overcome economic and non-economic barriers in order to scale up private sector investments." Through its investment plan development process, SREP intended to "combine public-sector and private-sector actions." A PSSA was later added to the program to augment private-sector actions in the SREP portfolio. In October 2012, the SREP Committee agreed initially to set aside up to $90 million of SREP resources for allocation to projects and programs, competitively selected, in the first six SREP pilot countries that either support private-sector clients working through MDB private-sector arms or public-sector entities that would in turn channel all funds to private-sector recipients through innovative, competitive mechanisms such as competitive allocation of subsidies to private-sector entities, PPPs, or results-based financing. Four projects (in Kenya, Mali, Honduras, and Nepal) were selected from the initial application round,[48] with two additional projects in Kenya and one more in Honduras selected in a second round. Building on the PSSA pilot, the CIF AU proposed a larger private-sector program for SREP, but the SREP Committee did not approve it, in part due to funding constraints.

SREP struggled to develop an attractive funding channel for private-sector projects.[49] The government-led nature of the investment plan development process meant that countries were sometimes less willing to allocate resources to private-sector projects, since doing so would result in less concessional finance available for public-sector projects—i.e., the equivalent of a zero-sum game.[50] Weaker enabling

[48] Selection was made with the input of an expert group employing prioritization criteria that included alignment with the objective of the country IPs, level of innovation proposed, leveraging ratios, and project readiness.
[49] In the CIF's system, projects implemented by the private-sector arms of the MDBs are classified as private-sector projects, whereas those implemented by the public-sector arms of the MDBs are classified as public-sector projects.
[50] ICF International (2014). Independent Evaluation of the Climate Investment Funds. World Bank. Washington, DC. (2015); Vivid Economics (2014).

environments to support private-sector investment and lower capacities among public and private-sector actors also made it difficult to identify private-sector projects and appropriate counterparts.

The limited experiences of the private-sector arms of the MDBs on renewable energy and access in low-income countries and fragile economies further contributed to a smaller proportion of direct private-sector investment. Interviewees indicated that MDB private-sector arms were not as well set up to work at scale in difficult country environments in the early years of SREP. MDBs had a greater historical focus on middle-income countries, and low-access countries had received a much smaller proportion of electricity access finance.[51]

The result has been that direct private-sector investment projects have emerged in only a small number of SREP projects. As shown in Table 4, private-sector projects have represented a declining proportion of overall projects by number and investment volume, from project concepts in endorsed investment plans, to Committee- and MDB-approved projects. Although about half of SREP countries (11 out of 23) with endorsed investment plans included private-sector projects in their plans, only four of those countries (Armenia, Ethiopia, Honduras, and Tanzania) have had a private-sector project advance to MDB approval. In two of those countries (Ethiopia, Tanzania), the private-sector projects were advisory services rather than investment. MDB interview partners explained that although they engaged in advisory services in more countries, an investment window only eventually emerged in a small number (see box on page 37).

Table 4. Private-sector projects as a proportion of SREP's investment plan portfolio

	Proportion of private-sector projects					
	In endorsed IPs		Committee-approved		MDB-approved	
SREP	By number of projects	By value of projects	By number of projects	By value of projects	By number of projects	By value of projects
Total	27%	15%	20%	8%	17%	4%

Note: Excludes projects approved under the PSSA.

The PSSA was successful in tripling the value of private-sector projects within SREP, but its time-bound application process was not compatible with the MDB private-sector business model. In total, $60.7 million was MDB-approved under the PSSA, triple the MDB-approved finance for private-sector projects identified through the investment plan process. The PSSA's timelines and processes, however, were too rigid to accommodate MDB internal processes, especially in the lower-capacity contexts of SREP countries. The result was an overall lack of competition and a widespread perception that the quality of submitted concepts was lower than expected.[52] MDB interviewees noted that the construct of a time-limited application window did not mesh well with the MDB private-sector project development process; resources need to be deployed when promising deal opportunities arise, which may not align with a short open window. MDB representatives also reported that the requirement that PSSA projects come from only the six (rising to eight) SREP countries where investment plans were endorsed, with their weak enabling environments, exacerbated the challenge of identifying quality projects during the open window. The uncertainty over project funding (due to the competitive allocation) and the smaller amount of resources available in SREP's Round 2 of the PSSA also made the set-aside less attractive to MDBs—and hence fewer project concepts were submitted in Round 2.

In the absence of a follow-on private-sector program for SREP, MDBs and countries have capitalized on the flexibility of CTF's Dedicated Private Sector Program (DPSP) to scale up efforts after most SREP resources were programmed. The CTF DPSP model alleviated the main constraints of the PSSA process,

[51] Independent Evaluation Group (IEG) (2015). World Bank Group Support to Electricity Access, FY2000-2014: An Independent Evaluation. World Bank, Washington, DC.
[52] Vivid (2014).

namely by opening eligibility to all CIF countries, using a rolling application process, and having significant resources available (e.g., $500 million for DPSP III). A total of $208 million has been Committee-approved (with $148 million MDB-approved) for SREP countries[53] under the DPSP, with about 90 percent of this amount approved after 2017. These DPSP projects have been, on average, twice the size of those approved through the SREP investment plan modality.

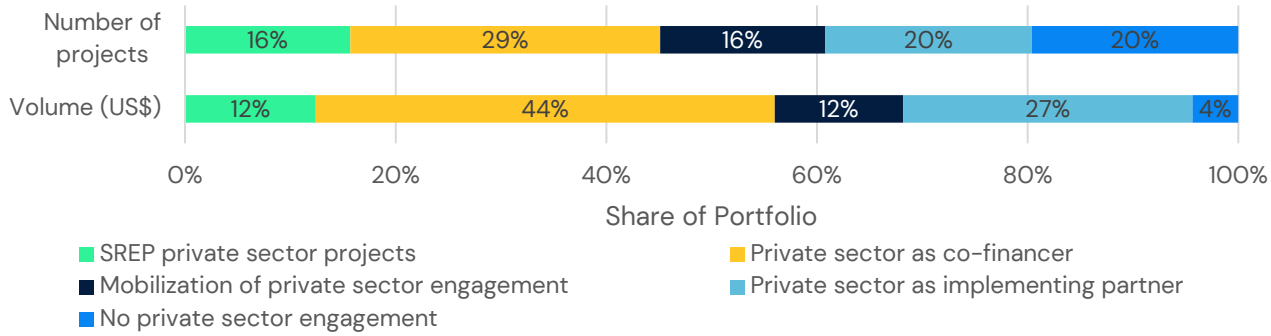
MDB interview partners positively view DPSP as a flexible model. A main appeal of DPSP is that resources can be accessed without revising country investment plans; the resources are also perceived as more substantial than what is available through SREP. In the words of one MDB representative, "An investment plan has a list of projects that you cannot change: you have to update it in consultation with other MDBs and government, wait, get it endorsed, etc. Those are [SREP] operational realities. The alternative is a window (DPSP) where you just come whenever you are ready with a project." In Uganda, for example, the DPSP offered a channel for the World Bank to bring forward an electricity access scale-up project without going through the process of revising the Uganda investment plan (which was channeled through AfDB and then withdrawn); this single DPSP project is nearly as large as the entire SREP allocation for the country.

The thematic and country case studies demonstrated benefits of having a private-sector window available both concurrent to and after investment plans were designed. In Haiti and Nicaragua, DPSP resources were sought in direct coordination with projects envisioned in the SREP investment plans—with requests for SREP and DPSP resources submitted at the same time, as a means of expanding country interventions. In Nicaragua, both DPSP and SREP funds support the Geothermal Exploration and Transmission Improvement Program (IDB). In Haiti, interviews indicated that while private-sector investment was not the focus of the Government of Haiti during investment plan development, the potential to complement public-sector-led SREP resources with private-sector efforts through available DPSP funds was compelling. The SREP-financed project supports a comprehensive investment and capacity building program to unlock renewable energy investment, while the DPSP-supported project is establishing an Off-Grid Electricity Fund (OGEF) that will invest equity and provide loans to Haitian off-grid electricity businesses. The DPSP has also been effectively used to later scale up efforts in SREP countries beyond their initial resource envelope, in ways that align with the overall transformational vision in their investment plans. In Maldives and Tanzania, where their entire indicative pipeline allocation has been Committee-approved, their single DPSP project more than doubled their entire SREP allocation. In Kenya and Ethiopia, DPSP funds were Committee-approved to scale up concessional finance for geothermal generation, with the intention to build on previously approved SREP projects.

Although SREP faced difficulties in developing an appealing private-sector funding channel, the SREP portfolio still shows substantial focus on overcoming barriers to scaling up private-sector investment. The evaluation team reviewed all MDB-approved projects and categorized them according to the level of private-sector engagement, ranging from projects that directly leverage private capital to purely public projects—as shown in Figure 5. More than half of projects are expected to mobilize private finance, either directly or indirectly (see box on page 37). In five countries (Nepal, Rwanda, Tanzania, Lesotho, Mali) the mini-grid projects are using private-sector-led business models. Most other SREP projects have a private-sector implementation role with potential for market development and supply chain benefits (see also Chapter 5.1.2 on SREP's emerging market development impacts).

[53] In Honduras, Kenya, Haiti, Maldives, Nicaragua, Tanzania.

Figure 5. Extent of private-sector engagement in SREP projects



Note: Based on the total number of MDB-approved projects and total financing at MDB approval.
Source: Evaluation team analysis.

Table 5. Private-sector engagement in SREP projects

Category	Description
SREP private-sector projects	Projects/programs approved under IP and PSSA modalities that are implemented through an MDB private-sector arm
Private sector as co-financer	Active private-sector participation with own resources, including as project/sub-project sponsor, PPPs, and independent power producers (IPPs)
Mobilization of private-sector engagement	Development of programs/projects with the specific goal to incentivize private-sector engagement
Private sector as implementing partner	Private-sector involvement only as a paid planning or implementing entity
No private-sector engagement	Purely public project

Source: Categories adapted based on Stoll et al. (2021). Mobilizing Private Adaptation Finance: Lessons Learned from the Green Climate Fund. *Climatic Change* 167 (45).

Country case study examples of mobilizing private-sector finance through public-sector projects

In **Mali**, under the Mali Rural Electrification Hybrid System Project (World Bank), the private operators operating the mini-grids are providing part of the investment in the mini-grid network extensions equivalent to 5 percent of the cost of the hybrid systems. Private operators are responsible for the continued operation, maintenance, and replacement of parts of the hybrid systems.

In **Liberia**, under the off-grid solar component of the Renewable Energy Access Project (World Bank), private companies are now procuring solar products and making private investment both in product inventory and in the credit portfolios that are financing solar assets at the customer sites. (See also Chapter 5.1.2 for a longer discussion of these ripple effects.)

In **Maldives**, the World Bank ASPIRE project has mobilized $9.3 million in private investment to support 6.5MW of grid-connected solar in the Greater Male region, supported by grant funds and International Development Association (IDA) guarantees. The state utility STELCO has signed PPAs with 2 IPPs. This has catalyzed a larger follow-on private investment project (Accelerating Renewable Energy Integration and Sustainable Energy [ARISE]).

In **Bangladesh**, both the World Bank and ADB project models indirectly mobilize private-sector finance. The Scaling Up Renewable Energy Project (World Bank) and its $108 million REFF expects to leverage $120 million in sponsor financing for industrial rooftop PV and utility-scale PV projects. In the ADB project, the solar irrigation pump ownership business model being employed is expected to attract farmers to invest in equity (10 percent down payment at contract signing) for a total of $1.8M in private indirect co-finance mobilized.

The World Bank project is also supporting increased private-sector participation via emerging renewable energy service companies (RESCOs), which are participating in piloting operating expenses (OPEX) models for industrial and public rooftops. The project is additionally providing technical assistance, in collaboration with IFC advisory

services, to develop utility-scale solar PV at an identified public land site in Kushtia, which will engage a private-sector sponsor through a competitive auction process. Much of the project's technical assistance work is further aimed at addressing major barriers for private-sector engagement in large-scale solar PV and wind development in Bangladesh, including identifying public land for utility-scale solar (also in collaboration with a PPIAF grant), supporting wind measurement at two sites identified for utility-scale wind development, and building capacity in IDCOL for utility-scale PV due diligence, supervision, and financing instruments.

3.5 Mobilizing additional financing at the design stage

A program objective of SREP in its original design was to blend its own financing with significant additional financing from "MDBs, bilateral agencies/banks and from other public and private sources to achieve large-scale renewable energy impacts."[54]

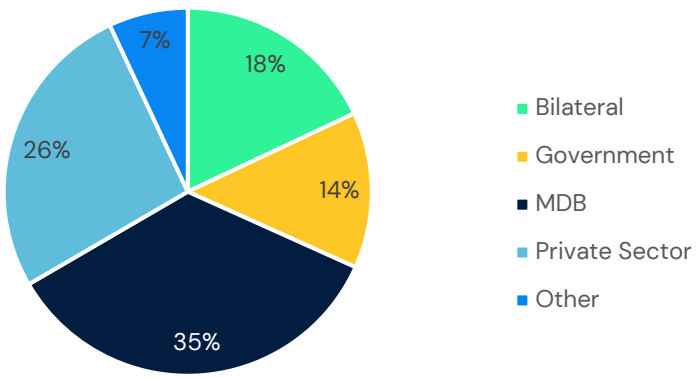
At approval, SREP country programs have been successful in mobilizing significant additional finance from other sources. Across the entire portfolio, $549 million in SREP finance is expected to mobilize $3.4 billion in co-financing from MDBs, private-sector entities, recipient governments, and bilateral and other sources (Figure 6). On average, a dollar of SREP funding is expected to mobilize an average of $6.60. As shown in Table 6, expected mobilization is higher among private-sector projects than public-sector projects. Co-financing ratios also vary significantly by technology, with the highest ratios for geothermal and on-grid renewable energy, and lower ratios for mini-grid/off-grid projects. On average these are comparable to GCF co-finance ratios for decentralized renewable energy projects in low-income countries.[55]

Table 6. SREP Co-financing Ratios at MDB Approval

Project Type		Average Co-Financing Ratio
Sector	Public Sector	1:5.6
	Private Sector	1:27
Technology	On-Grid	1:6
	Mini-Grid / Off-Grid	1:2.4
	Geothermal	1:12

Note: Includes projects approved under the PSSA.
Source: Evaluation team analysis, based on data from CIF AU (2021).

Figure 6. Sources of Project Co-financing at MDB Approval



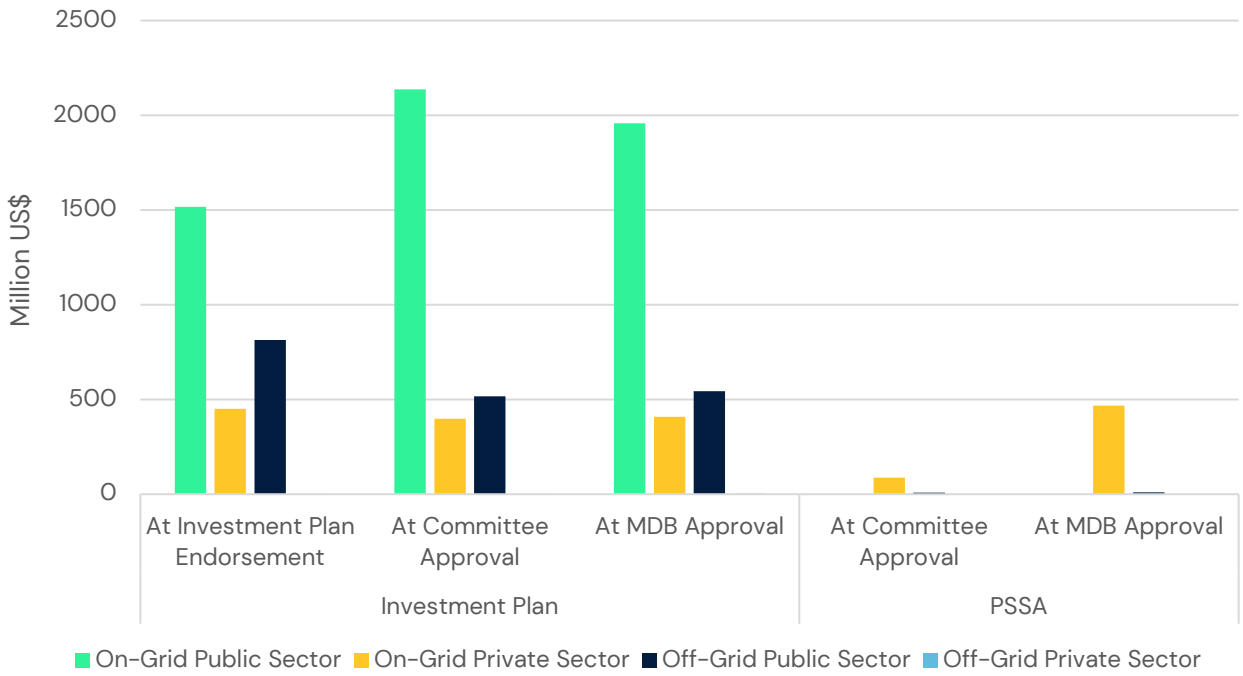
Note: Includes projects approved under the PSSA.
Source: Evaluation team analysis, based on data from CIF AU (2021).

[54] CIF (2008).
[55] Calculated by the evaluation team, based on data from the GCF's website.

Co-financing expectations at investment plan endorsement generally held true for on-grid projects, while off-grid projects made more accurate co-financing projections at Committee approval. Among on-grid renewable energy projects, total expected co-finance for public-sector projects increased between investment plan endorsement and MDB approval, as shown in Figure 7. Expected co-finance for on-grid private-sector projects remained relatively stable for those that were programmed through the investment planning process; projects that originated from the PSSA reported higher expectations for co-financing at MDB approval than at Committee approval. Overall, half of all on-grid projects expected more co-financing at MDB approval than at concept endorsement (Figure 8).

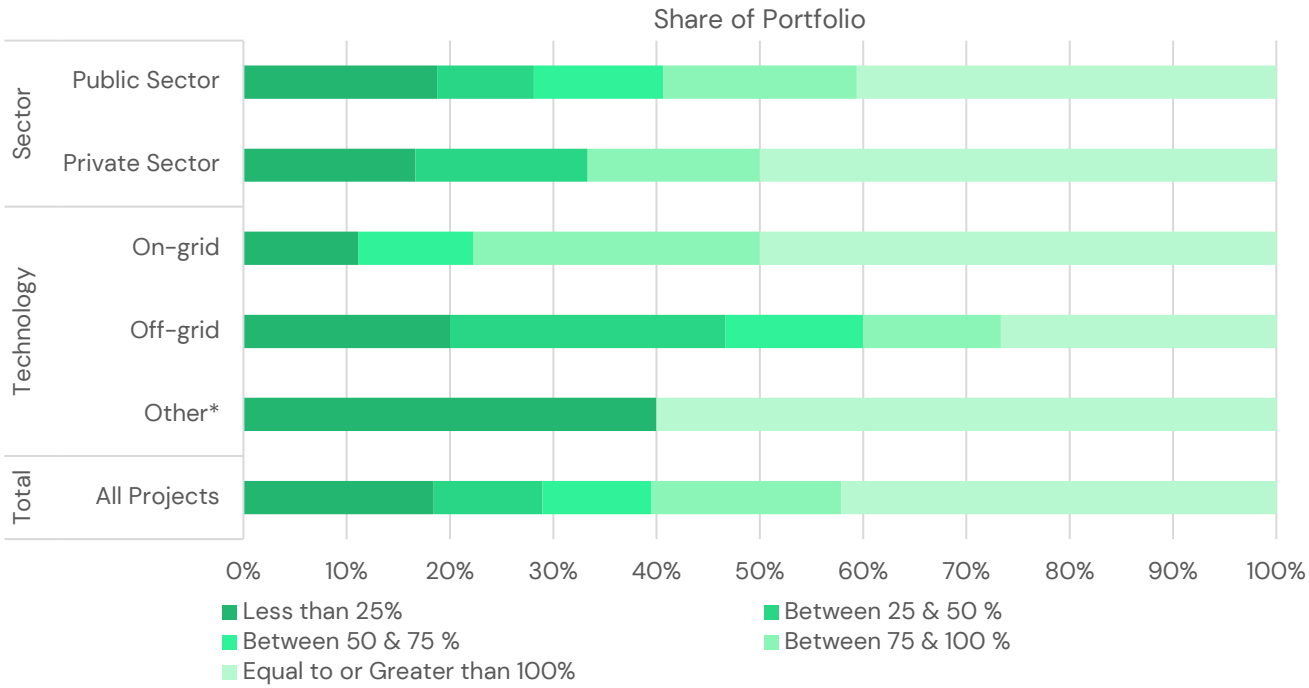
Off-grid projects have seen overall expected co-finance fall between investment plan endorsement and Committee and MDB approvals (Figure 8). Nearly half of projects (7 of 15) have reported expected co-finance at MDB approval that is 50 percent or less of what was anticipated at concept endorsement. Most of the reductions are associated with private-sector and "other" sources of co-finance; expectations for private-sector co-finance were halved between concept endorsement and MDB approval (although concentrated in just two projects), while expectations for "other" sources were cut by nearly two-thirds overall. For "other" sources, this significant decrease may be reflective of a finding of the CIF programmatic approach evaluation: that the programmatic approach has been less of a specific driver for crowding in co-finance or parallel finance than anticipated. Although other sources of co-finance were identified at investment plan development, the authors of those investment plans may have been overly optimistic about how firm those financing commitments were.

Figure 7. Expected co-financing at investment plan endorsement, Committee approval, and MDB approval by technology focus



Notes: Includes expected co-financing for projects approved under country investment plans and the PSSA. PSSA co-financing figures are only for Committee and MDB approval because they were not part of country investment plans.
Source: Evaluation team analysis, based on data from CIF AU (2021).

Figure 8. Share of expected co-financing at investment plan endorsement realized at MDB approval



*Other technologies include enabling environment, biogas, and cookstove projects.
Note: Excludes projects approved under the PSSA.
Source: Evaluation team analysis, based on data from CIF AU (2021).

SREP met its objective to blend its finance with that of the MDBs. Approved SREP projects are expected to mobilize $1.2 billion from MDBs, representing more than a third of all expected co-finance (Figure 6). On average, the amount of MDB co-financing expected increased from the time of investment plan endorsement (1:2.2) to MDB Board approval (1:2.4).[56] About four-fifths of SREP projects (40 of 51) were MDB-approved alongside project finance from MDB envelopes (such as World Bank IDA allocations). The projects that did not include MDB co-finance were concentrated in a small number of countries, primarily Armenia, Honduras, Ethiopia, and Nepal; many of these projects were also smaller technical assistance projects, focused on policy and capacity building.[57]

In many SREP countries, the objective to blend with MDB finance helped to direct some of the countries' limited IDA and IDA-equivalent allocations to sustainable energy finance. Interviews for the thematic and country case studies suggested that SREP grant financing was an important factor in ensuring that many projects advanced, including several of the mini-grid (e.g., Mali) and geothermal projects (e.g., Kenya, Armenia). SREP low-income countries face many competing development priorities for how to use their limited MDB resources.

In a few countries, governments decided to prioritize other sectors or opportunities for use of their limited MDB allocations, which effectively terminated the development of their SREP project concepts. In Uganda,

[56] Ratio does not include projects approved through the PSSA modality. When these projects are included, the average co-finance ratio at MDB approval is 1:2.2.
[57] MDB approved projects without MDB co-financing include: Strengthening the RE Policy and Regulatory Framework (FOMPIER) Phase II (Honduras); Mini-Grids Project (Tanzania); Project for Scaling Up Renewable Energy in Mali (Mali); Grid-Connected RE Development Support (ADERC) - Transmission Phase I (Honduras); Strengthening the Renewable Energy Policy and Regulatory Framework Program (FOMPIER), Part I (Honduras); Capacity Building and Regulatory Support Technical Assistance (Mongolia); Geothermal Sector Strategy and Regulations (Ethiopia); Lighting Ethiopia / Clean Energy SMEs Capacity Building and Investment Facility (Ethiopia); Biogas Extended Program (Nepal); Sustainable Energy Industry Development Project (Pacific Region); Strengthening of the ADERC H-REFF in Honduras Private Sector (Honduras); and Nepal Private Sector – Led Mini-Grid Energy Access Project (Nepal).

for example, interviews indicated that following the endorsement of the SREP investment plan, country dialogues took place with AfDB (in the context of finalizing Uganda's country strategy paper) that focused on prioritizing either transport or energy. Ultimately the Government decided to prioritize the use of AfDB resources for the transportation sector, leaving no available AfDB co-finance for SREP energy projects, and those projects were subsequently withdrawn. Similarly, in both Uganda and Tanzania, geothermal project concepts were endorsed in investment plans but did not advance to the approval stage. Interviews with MDBs and country representatives for the thematic studies pointed to countries' reluctance to commit their limited MDB allocations to high-risk capital-intensive drilling as a contributing factor. Neither Uganda nor Tanzania is endowed with extensive high-temperature resources (unlike Kenya or Ethiopia), and thus drilling full-width wells in green fields may be perceived as too risky for the use of scarce MDB allocations that could be allocated to other high-need development objectives.

4 Early Results and Effectiveness

Key Messages

- SREP has been successful in assembling a portfolio aimed at testing and demonstrating the viability of renewable energy development in lower-income countries; this ambition brings significant financial or business model risks that must be considered when assessing program progress toward results.
- More limited progress has been made against the core outcome indicators, although progress toward these outcomes is accelerating, including in terms of enabling environment, pipeline development, and investment mobilization.
- SREP's monitoring and reporting system was designed to allow for differences among the MDBs in methods used to measure indicators as well as approaches used to define project boundaries—presenting challenges at times for interpretation of aggregate results.
- Although implementation timelines for SREP projects have been perceived as slow, this speed of implementation progress is broadly in line with MDB comparator projects in similar country contexts.
- SREP projects have faced implementation challenges related to weak governance and capacity, immature market structures, political crises, and natural disasters. Although many of these challenges can be anticipated given the country contexts, they have nonetheless been disruptive.
- Cost-effectiveness for SREP appears robust and broadly in line with comparable non-SREP projects, although benchmarking is difficult given project diversity and changes over time.

4.1 Progress toward results

4.1.1 Framing SREP achievements

Although SREP's original program objective was oriented toward piloting and demonstration, stakeholder expectations rapidly evolved to more transformative achievements. SREP's original program objective was to pilot and demonstrate the economic, social, and environmental viability of low-carbon development pathways in the energy sector by creating new economic opportunities and increasing energy access through the use of renewable energy.[58] The country portfolio was oriented toward low- and lower-middle income countries with significant power generation and electricity access issues and that also faced wider economic development challenges. These countries were not being well served by other climate finance mechanisms such as the Clean Development Mechanism under the UNFCCC, which tended to focus on lower cost, higher GHG impact investments in more carbon-intensive markets. SREP was therefore designed to explore the feasibility and opportunity for using renewable energy to address these challenges. Nonetheless, interviewees involved with SREP governance indicate that expectations of the program rapidly evolved to focus on more transformative outcomes (e.g., systems change at a national level, significant scaling of renewable energy generation or access). It is in the context of both paradigms (piloting and demonstration versus transformational change) that the program should be assessed as it represents a more realistic reflection of funded activities (e.g., enabling environment strengthening, upstream risk mitigation, large-scale financing in smaller country contexts).

Measuring SREP's achievements only against its results framework would not capture the full breadth of the SREP mandate. The SREP monitoring and reporting (M&R) system, including its results framework indicators, have evolved over the program lifetime (including through a stocktaking review in 2018; see Appendix F for a brief history). However, a constant has been a focus on core program-level indicators for

[58] Climate Investment Funds (CIF) (2009). Design Document for the Program on Scaling-Up Renewable Energy in Low Income Countries, A Targeted Program under the Strategic Climate Fund. Washington, DC.

annual electricity output from renewable energy and the number of people, businesses, and community services benefiting from improved energy access. In 2018, the SREP core indicators were expanded to include two more; combined, these indicators are:

- Core indicator 1: Annual electricity output from renewable energy, as a result of SREP interventions (megawatt hours per year, MWh/yr).
- Core indicator 2: Number of women and men, businesses, and community services benefiting from improved access to electricity and/or other modern energy services, as a result of SREP interventions.
- Core indicator 3: Increased public and private investments in targeted subsectors, as a result of SREP interventions.
- Core indicator 4: Capacity (direct/indirect) from renewable energy (MW), as a result of SREP interventions.

While an improvement over the previous results framework, these core indicators still do not capture well the original mandate around understanding the viability of renewable energy solutions through piloting and demonstration, nor wider transformational effects. Co-benefits such as enabling environment were included as non-core indicators following the 2018 stocktake. While the CIF M&R system encourages MDBs to provide reporting information beyond core indicators, such information is not systematically shared. Opportunities for strengthening the M&R system in this regard were identified as part of the SREP M&R stocktake process, such as through participatory investment plan reporting processes, but these have not been fully operationalized (see also Section 4.1.3 below on the M&R system).

SREP's success also must be assessed in the context of the risks that its program design embraced. By prioritizing innovation and demonstration, being willing to invest in higher-risk sectors, and working entirely in lower-income countries, SREP has built a portfolio that carries significant financial or business model risks with higher risks of failure. Piloting and demonstration of new and first-of-a-kind technologies and business models (e.g., mini-grids, geothermal) in country carries a high level of project risk. Some projects that did not lead to new investment nonetheless should be considered successful in that they were able to clarify what might or might not be possible (e.g., Armenia Geothermal).

While it has been challenging to deliver results in many cases (see Section 4.2.1 below), SREP has succeeded in assembling a portfolio that tests the viability and boundaries of renewable energy solutions in given country contexts—providing significant exploratory value. For example, SREP has sought to explore the commercial viability of mini-grid business models deploying concessional finance alongside private-sector investment to understand both investor and operator interest as well as the willingness and ability to pay of communities and SMEs.[59]

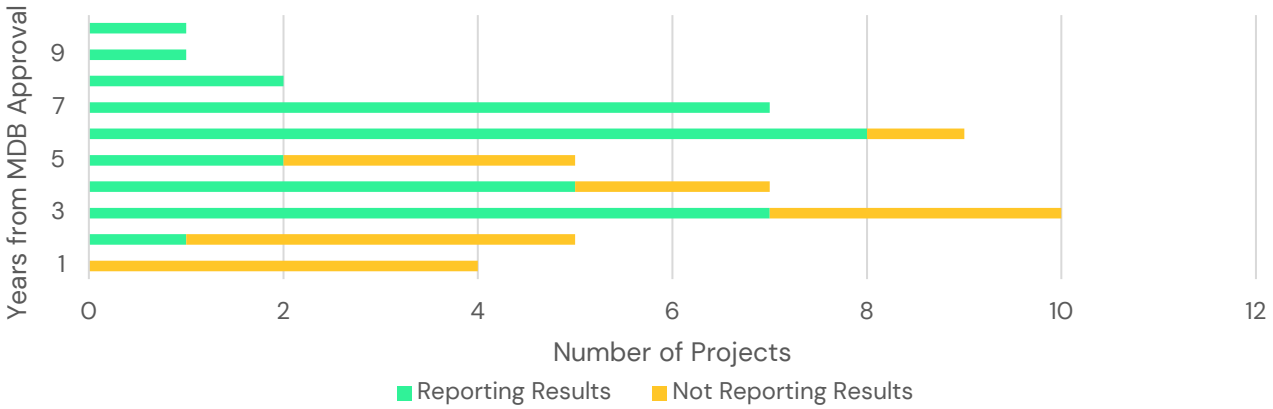
4.1.2 Progress toward results in the SREP results framework

SREP projects have delivered a small portion of the aggregate results targets for MDB-approved projects. While over two-thirds (35 of 51) of MDB-approved projects[60] are reporting some results against the program core indicators as of June 2021, actual results represent a small proportion of project-level targets and are concentrated in a small number of projects in the original six pilot countries. This situation partially reflects a somewhat young portfolio: the average age of a SREP project is 4.6 years (measured from MDB approval date). Of the 51 approved projects only six have closed, and fewer than 10 have undergone mid-term review. In general, more mature SREP projects are starting to report against program

[59] This has, at times, resulted in mini-grid models that limited scaling due to inadequate subsidies. See box on page 51.
[60] Inclusive of the six closed projects.

core indicators (Figure 9). All but six projects[61] that are four years past MDB approval are reporting against at least one program core indicator.

Figure 9. Age and results-reporting distribution of MDB-approved SREP projects



Source: Portfolio data from CIF AU (2021); results reporting as of December 2020.

Results relating to the indicator of increased supply of renewable energy supplied remain relatively limited, in part due to structural lags in reporting (i.e., generation outputs accumulate over a 20-30 year period as opposed to installed capacity, which is already reached after capital investment and commissioning). At present, just 4 percent of the target has been achieved through 2020 (~167 [gigawatt hours] GWh), with projects in the original six pilot countries accounting for 93 percent of results reported to date. Most of these results are concentrated in two projects: the Honduras Renewable Energy Financing Facility (H-REFF) (IDB)[62] and Nepal Extended Biogas Program (World Bank). H-REFF is an impact fund that has invested in several renewable energy projects in Honduras (7.5MW Betulia hydropower project; 3 MW biomass power project) and the wider region. The Nepal project is notable because the majority of the 68 GWh reported to SREP is from biogas generated for thermal application; direct biogas-based electricity generated is reported as 3.44 GWh in the latest project implementation status report. A risk to delivery against SREP program targets for electricity generation is that more than a half of these targeted results are associated with SREP's riskier geothermal portfolio (see discussion below).

Electricity generated is reported within the SREP portfolio as actuals, which accumulate over time following capital investment. This can create the impression of program under-delivery. Although SREP is only reporting 4 percent of its energy generation target, the program has reached 27 percent of its installed renewable energy capacity target (282MW), suggesting that the electricity generation indicator will scale over time through asset operation lifespans.[63]

Results relating to increased access to modern energy services are also limited. Just 7 percent of the target had been achieved through 2020, equal to about 728,000 people. Major project contributors to this result are the Maldives Outer Island Sustainable Electricity Development Project (ADB), Honduras Clean

[61] Of those six projects, two are small technical assistance projects (in Maldives and Mongolia) that would not be expected to report against SREP core indicators, and three are in countries that have experienced serious political and natural disaster challenges (Haiti, Nicaragua, Mali); the sixth project is Renewable Energy for Rural Electrification (Tanzania). No AfDB projects have yet reported against access and renewable generation SREP indicators.

[62] Evaluation team correspondence with the CIF monitoring and reporting team clarified that the results reported for "Honduras Renewable Energy Financing Facility" in SREP Operational and Results Reports are inclusive of multiple IDB-implemented projects, including the private sector H-REFF impact investing facility (IDB-LAB) and the public sector support for grid-connected renewable energy development (IDB-Public). The CIF team also clarified that results reported to date are only for the H-REFF impact investing facility. Disaggregating reporting of these two very distinct project streams could provide more clarity on project progress.

[63] Calculated by the evaluation team based on data maintained by the CIF monitoring and reporting team, combined with primary data from project implementation status reports.

Cookstoves (IDB), and Mali Rural Electrification Hybrid Systems (World Bank). Less than one-third of projects (10 of 36) with electricity access targets have reported results. Only one of 11 countries with mini-grid projects is reporting access data due to slow mobilization of investment, which has in turn affected access data reporting (see later discussion on mini-grids). With about a third of all energy access results in SREP associated with the mini-grid portfolio, this represents a risk for overall program outcome delivery.

There is a greater level of reporting of increased investments in targeted subsectors. More than 30 percent of targeted increases in public and private investment have been reported through 2020 ($856 million; or $868 million through June 2021). This reported amount is highly concentrated (about three-quarters) in two projects—Kenya Menengai and Maldives POISED. The percent delivered against the target for private-sector finance mobilized is lower, at 9 percent.

Although reporting against the program core indicators remains limited, signals of progress in enabling environment, pipeline development, and investment mobilization can nonetheless be identified, with many projects beginning to report intermediate results. Among World Bank projects, two-thirds were reporting progress against parent project[64] intermediate indicators as of June 2021. Of those projects not reporting, most were in early implementation or had been subject to political upheaval or natural disasters that had significantly slowed the progress of project implementation (e.g., Haiti, Nicaragua, Mali). The level of output and intermediate outcome reporting indicates a level of expectation that outcomes are likely to follow over the coming period.

Several SREP projects are also in or close to the capital investment stage, which will have a direct impact on the scale of reported outcomes on access and capacity. Within the SREP portfolio, several projects are close to financial close or are scaling their investment operations, with the expectation of significant scaling of reported outcomes. For example, in Bangladesh, more than 80MW of rooftop solar PV is approved or under appraisal, with a further pipeline of 536 megawatt peak (MWp) of utility-scale PV under evaluation (World Bank). In the Maldives, 5MW of grid-connected solar is expected to be commissioned in late 2021 (World Bank).

SREP has also supported enabling environment activities and built capacity that is likely to strengthen program results over time. SREP has engaged on a number of project-level technical assistance interventions that have the potential to or are already contributing to supporting achievement of higher-level project results. Examples include:

- Support for development of renewable energy regulations in *Honduras* (FOMPIER) has led to the Secretary of Energy establishing a planning process with the Social Fund for Electricity Development (FOSODE) to achieve universal energy access seeking least-cost rural electrification options based upon an evaluation of the cost-effectiveness in different geographies of the three rural electrification modalities: Grid Extension, Mini-grids, and Off-Grid Solar (OGS).
- Early SREP capacity building was provided to the Government of *Maldives* to enable the development of solar (hybrid) grids in both the Greater Male region and outer islands. Technical assistance (TA) was provided to the Maldives Energy Authority on key licensing and technical regulations, renewable energy investment, and sector roadmap development. Additional capacity building was provided to the Ministry of Environment and state utilities (FENAKA, STELCO) on technical planning and design activities for island grids that they directly managed.
- In *Mali*, the Promoting Renewable Energy in Mali (PAPERM) project (AfDB) has strengthened the capacity of the National Directorate of Energy (DNE) and Renewable Energy Agency of Mali (AER) as a result of their role as implementing agencies, which in turn has supported the wider Mali renewable

[64] Parent projects refer to the broader MDB investment operation (with its own results framework), of which SREP funding or activities form a component.

energy ecosystem by raising awareness of the country's renewable energy potential and investment opportunities. More specifically, key actors benefited from policy reviews and the development of templates, processes, and investor guides (see box below).

- In *Bangladesh*, technical assistance and capacity building support has underpinned the success of the program, with SREP strengthening technical monitoring for rooftop solar (e.g., for initial site feasibility assessment and verification) and promotional capacities of IDCOL (increasing awareness of rooftop solar PV and net metering benefits). SREP has also supported wind site measurement to support utility-scale projects. SREP is cooperating with its co-financing partners including KfW (rooftop solar), IFC (utility-scale auctions), ESMAP (RE potential assessment), and PPIAF (land zoning policy support).
- In *Liberia,* the second component of the World Bank project is targeting capacity development with the RREA. This has resulted in the development of import tariff exemptions for off-grid solar products, which is in turn energizing the private-sector-led OGS market. SREP TA efforts complemented other donor support (Millennium Challenge Corporation, European Union, GIZ, USAID, AfDB, World Bank).
- IFC provided inputs to the development of *Ethiopia* geothermal regulations that have been adopted, supporting private-sector development, including two private concessions that have proceeded through multiple licensing rounds and PPP negotiations.

Overall, a major contribution by SREP to the sectoral level enabling environment has been the investment planning process, which enabled countries at an early stage to reframe their perspective on renewable energy as a means to address energy access and supply issues as part of wider economic development. SREP project-level activities have also contributed to enabling environment strengthening (often in terms of capacity building for specific agencies), but this has mostly been in the context of supporting SREP investment project delivery rather than sector development per se (with the exceptions of Mali and Honduras).

SREP Mali: Building capacity for energy transition in low-income states

Mali is a fragile and conflict-affected state. Although the country has significant solar and hydro potential, overall production capacity is less than 700MW to serve a population of around 18 million people. EDM, Mali's state-owned electric utility, is poorly managed and heavily subsidized, with high electricity prices (c. $0.17/kWh) failing to cover cost of production ($0.24/kWh).

Mali's rural electrification strategy relies predominantly on a small, centralized state-run grid, supported by a private-sector decentralized mini-grid approach, coordinated by AMADER, Mali's rural electrification agency. AMADER is responsible for 255 localities served by diesel generators, operated under private concession, with EDM (the national utility) also serving 24 isolated centers.

SREP took a comprehensive approach to support national power sector development, seeking to mobilize the first private investment in grid-connected solar (33 MW Segou PV), hybridize and extend existing private mini-grids though AMADER, develop remote hydro-mini-grids, and provide sufficient regulatory and capacity building support to address sector-wide barriers.

Regulatory strengthening was a core part of both the SREP investment planning process and the PAPERM project (AfDB). A range of policy frameworks was developed, including a revised National Energy Policy, National Strategy for the Development of Renewable Energy, National Strategy for the Development of Energy Efficiency, and a framework for the development of rural electrification.

PAPERM also established processes and templates to facilitate private-sector investment, including tender and concession templates, a power purchase agreement template, and an investor guide. A web portal mapping RE projects was developed with AER, with training and workshops held for a range of stakeholders, supported by an international conference on renewable energy investment in 2019—the first Malian Renewable Energy Week. In 2021, the second Malian Renewable Week was held in Abidjan, Cote d'Ivoire, with contribution from the SREP country engagement budget.

Over time, PAPERM has helped unlock progress in the other Mali country program components, with substantial capital investment in both on- and off-grid underway. However, the effectiveness of capacity building and

regulatory development was reduced by weak institutional support, capacity challenges in the DNE, and by inconsistent MDB engagement.

Some of the analysis and regulatory frameworks were only produced after the project was transferred to the AER, seven years after the IP was approved and four years after the project began implementation. While the SREP IP identified the need for private-sector capacity building, it may have underestimated the need for similar support to the public-sector institutions (e.g., in DNE, EDM and AMADER).

It can be concluded that while an MDB programmatic approach can assist in capacity building, it is no substitute for broader national electrification planning or effective institutions. Targeted TA approaches can facilitate wider investment pipeline implementation, but such work needs to be properly phased and prioritized if benefits are to be realized, particularly in lower-income more fragile states.

4.1.3 Challenges in monitoring and reporting

SREP's M&R system reflects the "light-touch" approach to program management that was inherent in the CIF design; this has meant that the system allows for differences among the MDBs in methods used to measure indicators as well as approaches used to define boundaries—presenting challenges at times for interpretation of aggregate results. The CIF were set up to leverage the operational systems of the MDBs, with a light overlay within the CIF's own AU.[65] This gave flexibility for MDBs to use their own approaches to report on core program indicators, and additional reporting beyond those core indicators is not obligatory. A 2018 stocktaking identified some constraints in the M&R system, including challenges in aggregating certain indicators, the need for clarifications around energy access, and elements of the system that had not been operationalized. Revisions were made to the system, but many of these challenges persist.

The evaluation team identified reporting differences among projects and MDBs in nearly a third of MDB-approved projects. Some targets and achieved results reported by MDBs to SREP for individual projects do not appear to align with MDB own-reporting reviewed as part of case studies.[66] In other cases, parent project restructuring has affected indicator targets, but this information has not been formally communicated to the SREP M&R team and are not reflected in targets in the Operational and Results Report (ORR). For example, the Ethiopia Geothermal Sector Development Project (World Bank) was restructured in July 2020, an action that halved the project targets for geothermal capacity confirmed (MW), generation capacity (GWh), and people benefiting from improved access to electricity; these changes are not reflected in the SREP ORR as of December 2020.

In terms of private finance, the evaluation team identified several projects where expectations for private mobilization appear not to have been fully recognized as such, including PSSA projects. In Mali, for instance, project documentation provided to the evaluation team identified €8.5 million in private co-financing for the Segou Solar Park project (AfDB).[67] As another example, in the Bangladesh country case study, interviews and project documentation indicated that both the World Bank and ADB projects expect to mobilize private-sector financing that is not reflected as such in the SREP ORR, including up to $120 million for World Bank projects; instead, these amounts are reflected as "other" sources of co-financing.

[65] ICF International (2014).

[66] The Mali Rural Electrification Hybrid Systems project (World Bank) serves as an example. In SREP's latest SREP Operational and Results Report (ORR), the energy access target (612,000) reported for this project is consistent with the parent project indicator "People provided with access to electricity under the project by household connections," which considers people connected to mini-grids (funded by SREP) and solar household systems upgraded or installed. For this indicator, the latest project report reports 217,260 people connected. However, the SREP ORR reports results associated with a different indicator in the parent project results framework ("direct project beneficiaries"); this larger number of 472,460 people is more broadly inclusive of recipients of compact fluorescent lights and beneficiaries of other non-SREP-funded activities (e.g., Lighting Africa pico-PV appliances, energy-efficient equipment, and those served by socio-community centers covered by the project).

[67] World Bank and International Finance Corporation. (2017). Project Appraisal Document for the FCS RE Segou Molaire Mali Project.

While the SREP ORR appropriately reflects MDB reporting,[68] this approach has potential to create challenges in interpreting the expectations of the overall SREP portfolio.

In addition to the light-touch M&R system design, two other factors were identified as contributing to these differences. One is that, in some cases, the SREP indicators are not part of the parent project results reporting, creating some lack of transparency. For example, among the 16 World Bank projects that have an SREP-level target for electricity output, 11 have a corresponding indicator in the project-level results framework; 11 of 13 projects with improved energy access targets have a corresponding indicator in their project-level results framework. A second is the lack of clear and timely communication between the MDBs and CIF AU. MDBs are not consistently providing the CIF AU with interim monitoring and evaluation reports from their own internal systems, and sometimes the CIF AU is not informed in a timely manner about project changes that affect results expectations. Both MDBs and CIF AU staff may have different perspectives over the origin or boundaries of certain project values in the SREP ORR.

Another challenge for the interpretation of SREP results is that MDBs are not required to report on the tier or quality of access improvements under the indicator on improved energy access. While such reporting is encouraged in the SREP M&R toolkit (for example, using the Multi-tier Access Framework funded by SREP and developed by ESMAP), it is not mandatory.[69] As a result, it is difficult to achieve a clear picture of the nature of access improvement, even with reporting against direct and indirect beneficiaries. A single indicator covers a range of access changes, including fuel switching (e.g., from diesel to renewable mini-grids), price and/or reliability improvements on the existing grid, and new access (ranging from solar lanterns to new grid connections). In Maldives, all island residents where activities are implemented are classified as having improved access to energy, whereas in qualitative terms most would not see any noticeable change in the quality of supply (given the well-established diesel-based island grids), and any potential power cost improvements would be only indirectly captured in national tariff setting.

4.2 Timeliness in implementation

Although implementation timelines for SREP projects have been perceived as slow, this speed of implementation progress is broadly in line with MDB comparator projects in similar country contexts. Interviews with SREP Committee members, MDBs, and CIF AU staff all indicated concern among some contributing countries about the timescales for delivering results under SREP. This evaluation's benchmarking analysis, suggests, however that SREP projects are being delivered along comparable timelines to similar non-SREP MDB projects, if not faster. An evaluation of energy sector operations at AfDB identified average project delays of 11 months during 2008 to 2018. The majority of delays were attributed to "protracted loan, ratification processes, difficult compliance with conditions precedent (environmental and social, financial management, release of counterpart funds, etc.), and procurement processes…."[70] An evaluation of the World Bank's electricity access portfolio from 2000 to 2014 found that projects had a median implementation time of nine years and slower in countries with lower access rates. More than three-quarters of projects faced delays relative to planned implementation, with average delays of 2.5 years. "The major reasons for implementation delays in these projects are the responsibility of both the Bank and the borrower," with low- and medium- access countries more affected by institutional capacity constraints.[71] By comparison, World Bank SREP projects anticipate a median

[68] According to the CIF M&R team, MDBs often report co-financing as "other" at the start when it is not clear whether all of the specified amount would come from the private sector, but MDBs are expected to revert the co-financing back to private sector once the achieved co-financing is clear.
[69] See ESMAP (2022). Multi-Tier Framework for Energy Access (MTF). Available at: https://esmap.org/mtf_multi-tier_framework_for_energy_access (Accessed January 18, 2022) for further detail
[70] Independent Development Evaluation African Development Bank (IDEV) (2020). Evaluation of the AfDB's Support to the Energy Sector in Africa. African Development Bank Group. Abidjan, Côte d'Ivoire.
[71] IEG (2015).

implementation time of six years, as measured from effectiveness to revised closing dates. Seven out of 17 World Bank SREP projects have revised their closing dates, experiencing average delays of 7 months.[72]

SREP projects have also reflected the general trend of less favorable MDB performance in low-access countries. A World Bank Independent Evaluation Group evaluation found poorer performance in terms of project design, quality at entry, and project supervision in low-access countries than more broadly across the energy portfolio. For example, only 55 percent of projects had results rated Moderately Satisfactory or better compared with 76 percent for the whole cohort.[73] This is comparable to the World Bank SREP portfolio, where two-fifths (7 of 17) of World Bank SREP projects have been rated Moderately Unsatisfactory or Unsatisfactory in terms of implementation progress at some point but have been restored to Moderately Satisfactory; 10 projects have remained Satisfactory or Moderately Satisfactory (although this may have masked the performance of some subcomponents).

Two-thirds (11 of 17) of World Bank SREP projects have also been restructured, some more than once, although this is not necessarily due to specific project failings and can reflect adaptive management. MDB interview partners also reported that this is not atypical of similar energy sector projects. Restructuring SREP projects has involved cancelling or adjusting project components or subcomponents, reallocating funds across components, merging disbursement categories or estimates, adjusting project development outcomes and intermediate indicators, changing the implementation schedule, and extending the closing date of credits or grants. While many approved projects are experiencing delays and restructuring, there was no evidence that this would result in significant requirement for budget reallocation as a result of project non-delivery, with the expectation that most projects would disburse allocated funds but over longer timescales than expected.

Geothermal: SREP Approach and Lessons Learned

What is the sectoral opportunity?

Geothermal energy provides significant opportunity for countries with suitable resource to shift to low-cost low-carbon baseload power. Several countries within the SREP portfolio have already developed significant geothermal resources, of which Kenya is the most advanced with more than 800MW of installed capacity (2019). Geothermal takes a mixed public-private cost-sharing resource development approach, but with some countries also adopting a state utility-led model in parallel (Ethiopia, Kenya).

Among the main challenges for development of geothermal energy are the high capital costs and risk associated with upstream exploration drilling to confirm resources. These factors deter both governments and private developers from committing the necessary capital, which in turn slows downstream development. Indicative of the need for public financing are the public geothermal development companies SREP countries have established (Kenya, Tanzania) or intend to establish (Ethiopia). A recent study estimates more than 50 percent of upstream exploration costs need to be covered by concessional finance to incentivize full resource exploitation. The maturity and size of markets, weak governance structures, off-taker risk, and policy frameworks also increase project risk profiles.[1]

What has SREP achieved?

SREP has focused primarily on developing projects that address and mitigate upstream exploration risk. SREP has piloted innovative risk mitigation mechanisms using contingent recovery grants that partially reimburse developers for unproductive wells as a cost-effective approach, sometimes combined with long-maturity loan facilities. Elsewhere, SREP has supported public geothermal development companies to develop the steam field and sell steam to IPPs in a "steam sale model" (e.g., Geothermal Development Company [GDC] in Kenya, through the AfDB-implemented Menengai project).

The program has developed geothermal projects in four countries (Kenya, Ethiopia, Nicaragua, and Armenia), with a total planned capacity of 215 MW. Most SREP geothermal projects were "first-of-a-kind" in terms of scale or

[72] Comparable data for project timeline were not readily available from other MDBs
[73] IEG (2015).

profile. SREP has also supported enabling environment and capacity development (e.g., Geothermal Law in Ethiopia with two IPPs subsequently undergoing several rounds of licensing and PPAs), and through technical capacity building for drilling and steam well development (Ethiopia, Kenya). Out of two SREP portfolio projects where drilling was completed, one has resulted in steam production sufficient for a 105 MW plant (Kenya).

Geothermal exploration has also been a programmatic focus within the wider CIF, with CTF also investing $235 million through the Global Geothermal Development Plan. In some countries (Kenya, Nicaragua), CTF and SREP have cooperated to co-finance projects or taken complementary roles at the country level (Ethiopia). While the SREP contribution has been relatively smaller, its finance has been more concessional, reflecting the low-income status of SREP countries, the market and resource risk profile, and the role of public counterparties (Ethiopia and Kenya).

As a result, the SREP and the CIF have become the leading source of international development finance for early-stage geothermal project exploration and development, providing more than half of total public finance for exploratory drilling. Collectively SREP and CTF have resulted in a shift in the share of MDB investment being directed toward upstream development from an average of 6 percent before 2012 to 39 percent by 2020. Collectively, the CIF has a potential pipeline of 3.5GW if developed. CIF activity has also led to further MDB interest in geothermal projects (e.g., Djibouti).

What have been the challenges?

SREP geothermal projects have faced several specific barriers that have delayed or otherwise affected project implementation, including:

- Capacity gaps among counterparties (GDC Kenya, EEP Ethiopia, MEM Nicaragua)
- A complex development model with no in-country previous experience (Kenya Menengai)
- Complex procurement of a hybrid contract for drilling rigs and services (Ethiopia)
- Challenging geology for drilling (Kenya Menengai)
- Failure to identify economically viable resource following exploratory drilling (Armenia)
- Reduction in scale due to reallocation of IDA lending to address COVID-19 priorities (Ethiopia)
- Political instability and governance risk (Nicaragua)
- Unwillingness of some countries to commit scarce African Development Fund resources to exploratory drilling

Even where SREP has successfully addressed upstream drilling risk, SREP projects are dependent on others funding and proceeding with downstream steam field development. Where resource downstream investments are delayed (e.g., Kenya Menengai due to a reduced sovereign guarantee), then outcomes do not materialize. SREP can potentially address this issue through using concessional capital to improve the bankability of downstream plant construction.

What are the lessons learned?

While the SREP portfolio is too small and project experience too singular to derive broader lessons, SREP with the support of the MDBs could have fostered a broader and longer-term approach to accelerating geothermal resource development and private investment by addressing financing needs and capacity gaps in agencies responsible for promoting, regulating, and overseeing geothermal resources. In particular, SREP could have given more consideration on how to best support countries endowed with fewer high-temperature resources such as Tanzania and Uganda.

Geothermal energy will have a continued need for highly concessional risk capital, including grant financing, and concessional long-term lending. This needs to be structured as a financing continuum to ensure that successful exploration leads to downstream power plant construction. Portfolio approaches and scale are important to address risk, and future SREP or CIF investments may consider aligning with regional facilities (Geothermal Risk Mitigation Facility in East Africa and the Geothermal Development Facility in Latin America). There is also value in making resource data available for private-sector developers to better assess risk. Finally, geothermal heat remains undervalued as a product for both heating and cooling applications.

In general, rapidly declining costs and shorter lead times for solar PV and wind projects, together with an unfavorable design of electricity markets (in Latin America) are making geothermal resources less attractive to developers, particularly given the upstream drilling risks and capital-intensive nature of projects, long lead times for resource confirmation (2 years+), and the lack of recognition of reliability in auction design. Collectively, these disincentives are leading to an underinvestment in geothermal energy.

4.3 Factors affecting implementation and results

A range of contextual challenges are slowing the delivery of outcomes for SREP projects, many of which are directly related to the socioeconomic profile of the SREP country portfolio. SREP seeks to support lower-income countries on energy transition issues. The majority of SREP-eligible countries are LDCs (19 out of 27), with many facing significant economic, governance, and natural disaster-related hurdles. Projects in lower-income countries typically require a higher level of concessional and grant finance, and a greater focus on capacity building and technical assistance support. While these risks are well recognized within SREP investment plan development and project design, they are nonetheless still difficult to fully mitigate. As a result, SREP projects are exposed to a complex range of political, social, and economic challenges, compounded more recently by the global economic impacts of COVID-19.

Political, social, and environmental instabilities have been significant factors in many SREP country contexts, leading to significant implementation delays and challenges. The SREP country portfolio focuses on addressing energy challenges in less developed and more fragile states, often exposed to issues including climate vulnerability, social disruption, and weak social safety and health systems. Such countries may be more prone to political upheaval or be less resilient against natural and social disasters. SREP countries such as Mali and Nicaragua have been exposed to significant periods of political instability and social protest, which have diverted government attention and slowed delivery. Other countries such as Haiti (2021) and Nepal (2015) have been subject to high-impact natural disasters such as earthquakes, while Liberia experienced an Ebola outbreak (2014-15). A broader range of SREP countries have been impacted by disruptive climate impacts such as tropical storms and floods, which also create delivery challenges.

A weak regulatory environment has often contributed to delays in project implementation and investment, with SREP having to pilot frameworks to enable project investment. Particularly in earlier SREP projects, there was often a near total lack of policies and regulations necessary to underpin project development. As a result, SREP has been required to engage more actively in strengthening enabling environments. In Rwanda, there were issues around the uncertainty of grid extension, which in turn undermined potential investment. Many SREP projects were developed in the absence of integrated national electrification planning frameworks, which has created uncertainties around the role of grid vs. off-grid. The policy aim in Mali is to equalize mini-grid tariffs with grid/EDM tariffs, which creates complexity around the financial viability of individual grids in the absence of a comprehensive framework of cross subsidies.

Projects face a range of localized challenges related to land access, site-specific challenges, or community engagement. Several SREP projects have experienced delays related to project-specific challenges associated with geography or social context. Land access has been a particular challenge for renewable energy development in countries with space constraints or complex land ownership. This is particularly evident in SIDS (e.g., Vanuatu, Solomon Islands, Maldives) or population-dense Bangladesh.

SREP projects have regularly experienced sudden changes in policy regimes or other baseline conditions that have forced a change of program approach. A number of projects within the SREP portfolio have been impacted by unforeseen changes in the political or policy environment, sometimes associated with change in government regime. One example is the impact of a shift in national electrification planning to favor grid extension over mini-grid roll-out (e.g., Tanzania, Kenya). Similar shifts have been seen in both Honduras and Bangladesh. In other cases, subsidy and guarantee regimes have been changed abruptly, changing the investment risk profile (e.g., Kenya geothermal), or governments have shifted on the balance of public vs. private ownership in the power sector (e.g., Tanzania and Kenya). SREP projects have adapted their business models to address these changes (see box below on mini-grids), but this process takes significant time and effort and sometimes requires restructuring, highlighting the importance of flexibility and adaptive management in the investment plan implementation process.

The SREP portfolio has focused on higher-risk subsectors and business models that create additional implementation risks. SREP has a significant portfolio concentration on technology subsectors that present specific challenges. For example, SREP sought to develop six geothermal projects targeting upstream drilling risk with a view to unlocking downstream power generation. However, geothermal risk mitigation is a challenging area even in developed country contexts, with investors and governments wary of committing significant capital without guaranteed downstream generation capacity. As a result, two of these projects never received investment plan approval, and none have yet resulted in generation. Likewise, the SREP portfolio of mini-grid projects has faced a range of inherent challenges around affordability, subsidy, and business model development. As a result, only one of these projects has currently advanced to capital investment stage (see box below on mini-grids). This layer of technology risk compounds existing country-level risk to slow implementation.

SREP has operated over a decade in which there have been rapid improvements in the cost, efficiency, and availability of renewable energy technologies, making it difficult to "pick winners." Renewable energy technology costs, efficiency, and availability have evolved rapidly since 2010. At the time of investment plan preparation and project design, it was challenging to understand or predict these trends, which have resulted in highly dynamic energy technology and market contexts. For example, at low levels of grid penetration, solar PV now outcompetes geothermal power both in terms of cost and speed of deployment.

Finally, COVID-19 has created significant delays in implementation across all SREP projects. All projects in implementation reviewed as part of the evaluation reported significant delays and disruption associated with the COVID-19 pandemic. Although operations were generally continuing, disruptions to international travel and supply chains, along with the impacts of lockdowns, had slowed implementation and led to significant restructuring of project timelines. In some cases, project funds were redirected from SREP projects by governments to support COVID-19 response and recovery (e.g., Ethiopia Geothermal). The *Renewable Energy Fund* project in Rwanda was delayed in part due to COVID-19-related supply chain disruptions. Of the 21 public World Bank projects, nine projects mentioned COVID-19 as a challenge to implementation. For example, the SREP project in Bangladesh experienced delays in outreach activities and the initiation of sub-projects under the second component of the project.

SREP mini-grids portfolio: approach, achievements, and lessons learned

What is the sectoral opportunity?

To address the challenge of providing clean and affordable energy services to non-grid-connected communities, SREP has pursued the development of portfolios of mini-grid projects across 11 countries. Mini-grids fulfill a key role in providing (near-) grid-equivalent community-scale access to energy for both households and productive use and are rapidly becoming a mainstream component of national electrification planning.

However, mini-grids face challenges around high investment costs, limited economies of scale, and the need for capital subsidies. Off-grid communities are often poorer, with lower willingness and/or ability to pay. This results in lower load demand profiles that in turn reduce operator revenue. Governments also have differing views on the preferred roles of the public and private sectors in the power sector, as well on the equity of imposing differentiated full-cost recovery tariffs on off-grid consumers.

What has SREP achieved?

The SREP portfolio was ambitious in its scope and scale, with projects ranging in size and complexity. Some were relatively small (e.g., Kenya and Nepal with target populations of 10-30,000), whereas others were significantly larger (e.g., Mali, targeting 680,000 people). Projects often included both new connections and improved access (i.e., higher-tier or fuel switching). Four projects sought to deliver the first mini-grids in-country at the time of project appraisal (Honduras, Lesotho, Vanuatu, Solomon Islands) with a further three countries having very limited experience of mini-grid deployment.

Recognizing the challenges specific to both the business model and local context, SREP sensibly pursued a high degree of localization in terms of ownership and operating structures, in line with the political economy context. It supported both public- (e.g., Honduras, Liberia, Solomon Islands) and private-sector-led models (e.g., Rwanda, Nepal, Tanzania). Each employed differing approaches to subsidy (e.g., capital expenditure subsidies) and tariff setting (e.g., cost reflective vs. grid tariffs).

To date, the program has developed and agreed sustainable investment and operating models in six of its countries, with work ongoing in the remainder. To support this effort, SREP convened a series of roundtables and knowledge events to collect and share best practice among its countries and with other partners (e.g., ESMAP). In terms of capital investment, the mini-grid project in Mali (solar PV hybridization of existing diesel mini-grids) has made substantial progress, with 18 mini-grids currently in operation.

What have been the challenges?

Although the deployment of mini-grids is accelerating in some countries, SREP has struggled overall to move forward its portfolio of mini-grid projects. Several projects have been or are likely to be scaled back following approval (e.g., Mali mini-hydro, Nepal, Tanzania, Rwanda) and most have yet to move forward to capital investment. While mini-grids should in theory be relatively straightforward and quick to deploy, in practice there has been a need for capacity building, including new regulatory approaches, tariff setting, the development of private-sector subsidies, and a lack of resources to support licensing processes.

Beyond recent challenges of COVID-19, implementation barriers in specific countries have included:

- A lack of commercial lending for mini-grid projects, and the ongoing need for (and lack of availability of) sufficient public or donor subsidies.
- Changes in policy, with shrinking importance of the OGS and mini-grid role in national electrification (Tanzania, Rwanda).
- Uncertainty over grid extension, with weak delineation of off-grid areas, a lack of compensation arrangements, undercutting mini-grid business models and payback periods (Rwanda, Mali)
- Downward pressure on subsidies or reduction/uncertainty in regulated tariffs undermining financial sustainability (Nepal, Mali, Tanzania)
- Site selection, community engagement, and land acquisition delays (Solomon Islands, Vanuatu, Kenya, Honduras)

What are the lessons learned?

Overall, SREP took a reasonable approach to mini-grid development, with a diversified set of projects designed to reflect local political economy and development contexts. However, the program has faced challenges in finding models that sustainably bridge the gap between mini-grid costs and revenues and has struggled with challenges around tariff policies and subsidy support schemes.

The relatively small demonstration scale of SREP's mini-grids portfolio (with the exception of Mali) also meant that it was unable to capitalize on economies of scale necessary to sustain private-sector interest and drive down costs. Successful schemes in other non-SREP countries (e.g., Democratic Republic of the Congo, Nigeria) have been moving into peri-urban areas to ensure sufficient demand. The timescales of SREP program design and implementation have also meant that projects have been exposed to fundamental shifts in the regulatory environment and national electrification policy toward grid extension.

While there were early SREP programmatic efforts to support lesson learning and the sharing of best practices, these have become less frequent despite much of the portfolio remaining at the pre-capital investment stage. This may have been because of the challenges and delays faced in moving business models from design to implementation. Nonetheless, SREP has accumulated significant insight into mini-grid development that could be captured and leveraged in countries pursuing significant mini-grid development (e.g., Kenya, Nigeria, Sierra Leone).

In retrospect, SREP might have considered taking a more comprehensive approach to identifying and addressing the barriers to mini-grids development, not making assumptions around the ability to depend on bilateral support (e.g., Rwanda subsidies and feasibility studies) without commitments, enabling alternative access to capital where commercial banks are unwilling to lend (e.g., through national development banks), and understanding government views on the ownership and management of generation and distribution (e.g., Tanzania TANESCO and Kenya).

4.4 Cost-effectiveness

SREP projects demonstrate a very broad range of target costs per result, reflecting the different objectives (access and renewable power), size, scale, and profile of investments. Based on a review of project target results, SREP projects expect to deliver a very large range of reported costs per result for core indicator metrics (see Table 7). The variation reflects the broad sectoral focus and scale of projects (in stand-alone solar, mini-grids, and utility-scale solar, geothermal, and small hydropower) and the differing focus between projects (renewable energy generation vs. energy access, on-grid vs. off-grid). SREP's dual objectives of energy access and renewable energy demonstration/scaling mean that, at a portfolio level, the cost-effectiveness of either is difficult to assess, with most projects combining elements of both. This means that the program cannot be compared directly with benchmarks for either large-scale generation projects or pure energy access projects. Ranges also reflect different proportions of overall project volumes directed at investment versus technical assistance. Interview partners noted that SREP capital investment projects generally required significant technical assistance and capacity building support, reflecting the developing country market challenges, which in turn could increase overall project values relative to expected capacity or access outcomes.

Table 7. SREP benchmarks and reported costs

Target cost-effectiveness benchmarking	SREP portfolio level	SREP median project (range)	Median (Range) of portfolio of non-SREP projects (GEF/GCF/MDB)
Cost per MW installed capacity	$4.1 million/MW	$3.9 million/MW ($0.5m-$37.5m)	$3.3 million/MW
Cost per kWh over project lifetime (SREP funds plus mobilized capital)	$0.05/kWh	$0.11/kWh ($0.01-$0.83)	Insufficient data
Access to improved energy (cost per person with improved access)	$326/person	$234/person ($45-$3300)	$846/person
GHG Abatement (cost per lifetime tCO_2eq)	$37/ tCO_2eq	$118/ tCO_2eq ($6 –$4573)	$33/ tCO_2eq

Source: Evaluation team analysis based on data from CIF AU (2021) and data on GCF and GEF projects compiled from Climate Funds Update (2021) and public project documents on the GCF and GEF project websites (accessed September 2021). Portfolio level data is for all projects, including those not reporting against a given indicator. Median project provides better indication of typical project than project average due to presence of significant outliers that can significantly influence analysis.

Cost-effectiveness for SREP appears robust and broadly in line with comparable non-SREP projects. MDBs and country stakeholder interview partners recognized that SREP made significant efforts to be cost-effective in its processes and systems. SREP was underpinned by a transparent procurement model within the MDBs and strong governance and project approval arrangements. Occasionally, the SREP Committee has intervened to review project costs to support cost-effectiveness; the unit costs of solar irrigation pumps were scrutinized for Bangladesh, for example, and in that particular case, cost savings were achieved during procurement.

The benchmarking analysis also supports the finding of comparability with non-SREP projects. Based on a review of more than 80 renewable energy/energy access projects in similar lower-income country contexts supported by the GEF, GCF and MDBs, and implemented over similar timescales (2013-2020), the evaluation finds that overall cost benchmarks are broadly within similar ranges, noting the challenges of like-for-like comparison in terms of portfolio composition, technology, timing, and specific country context. The following observations are made for each cost-effectiveness metric:

- **MW installed capacity:** SREP costs are generally in line with similar non-SREP projects with both reporting median project costs of $3-$4 million per MW installed capacity. Higher SREP costs may relate the overweighting of mini-grid and off-grid interventions within the SREP portfolio or reflect differences in procurement and planning timelines (given the rapid fall in technology costs over the period). Costs may also be highly country- and market-specific. For example, in Mali, the mini-grids project relied on regional benchmarks to estimate the cost of solar hybridization but those costs were revised upward after the feasibility studies were completed, necessitating additional financing to meet the target indicators.
- **Cost per kWh.** Overall, the SREP portfolio estimates an average portfolio cost of US$0.05 per kWh of renewable power generated (based on target assumptions), which is significantly less than the average cost of generation in many SREP countries, particularly where energy access is an issue. The variation within the portfolio (US$0.01-0.83) reflects the broad sectoral focus and scale of projects in stand-alone solar, mini-grids, and utility-scale solar, geothermal, and small hydro. Generation costs are significantly higher for mini-grid and off-grid projects than for utility-scale projects. Comparative benchmark data on generation costs are not presented due to small sample size for reporting.
- **Cost per person with improved access:** There is a broad range of reported outcomes in terms of access costs. SREP access indicator cost data provide an average of $326/person at portfolio level, with a median project value of $234. This compares favorably to the benchmark portfolio ($846/person median project value), but this may reflect a greater SREP focus on access outcomes. However, there is little disaggregation within the SREP reporting in terms of the quality of improved access, with the indicator covering both those benefiting, for example, from solar lanterns to those with new or improved grid connection. Being able to assess the value of access at a portfolio level is therefore challenging without this being further disaggregated by quality or tier of access improvement (see also Section 4.1.2).
- **Cost per tCO_2eq abated:** SREP reports a portfolio average of $37/$tCO_2eq$ for GHG reductions. This is broadly in line with the median portfolio average of the benchmark portfolio ($33/$tCO_2eq$). The median project in the SREP portfolio has a higher abatement cost ($118/$tCO_2eq$), but this reflects the wide range of projects, with portfolio GHG costs influenced by a smaller number of large utility-scale renewable energy projects that offset higher access and off-grid abatement costs. In general, these costs reflect the mix of access and generation priorities within both the SREP and benchmark portfolios and cannot be further benchmarked against pure mitigation projects that focus on large-scale utility renewable energy (e.g., CTF).

Benchmarking SREP cost-effectiveness is challenging, given rapid changes in renewable energy technology costs, long project procurement timelines, and shifts in country contexts. Given the significant lead times in SREP investment plan development, project approval, and procurement, it is challenging to create robust benchmarks against which to measure the value for money of the SREP portfolio at any specific moment or over time. Over the SREP program lifetime, there has been significant downward movement in the costs of renewable energy technologies (often on an intra-year basis).

5 Emerging Indications of Impact and Sustainability

Key Messages

- SREP contributions to strengthening enabling environments for clean energy access, alongside the value of demonstration effect, have had some transformative impacts in a few countries, including by encouraging other private actors to enter the market.
- Some direct and indirect co-benefits are beginning to emerge around social, economic, and environmental themes, but evidence is limited by the early-stage implementation of many projects and a lack of targeted reporting.
- Due to a larger number of lower-income countries, and the lack of higher-profile champion projects, SREP has had more limited influence and visibility at senior management level within the MDBs—although it has contributed alongside CTF and as part of the wider CIF relationship.
- SREP has not fully leveraged its potential to cross-fertilize learning across the MDBs or with other partners to influence wider technology or sub-sectoral development approaches.

5.1 Impact and sustainability

5.1.1 Enabling environment

While the SREP programmatic approach helped support early sectoral development and capacity building, overall SREP contributions to the maturity of clean energy and access policies and regulations are not readily evident at the national scale, as measured by the Regulatory Indicators for Sustainable Energy (RISE). As evidenced in earlier CIF evaluations,[74] the programmatic approach and investment planning process contributed to early momentum and capacity to pursue renewable energy opportunities. There have also been clear examples of SREP contribution to sub-sectoral enabling environments (as set out earlier in Section 4.1.2). However, for the most part, project-level technical assistance interventions have offered marginal incremental benefits from a national regulatory or policy perspective.

A review of RISE framework data[75] (see Figure 10 and Figure 11) indicates that enabling environment progress on energy access and renewable energy has been similar for both SREP and non-SREP countries over time, with both sets of countries improving at a similar pace). In part, this is seen by stakeholders as part of a "rising tide" in which all countries have benefited from improving global technology costs, regional supply chains, and policy maker awareness—and in part from MDBs, other donors, and financing agencies scaling their operations in non-SREP countries. The use of contribution analysis in the country case studies however did identify clear SREP contributions that might yet be reflected in these indicators.

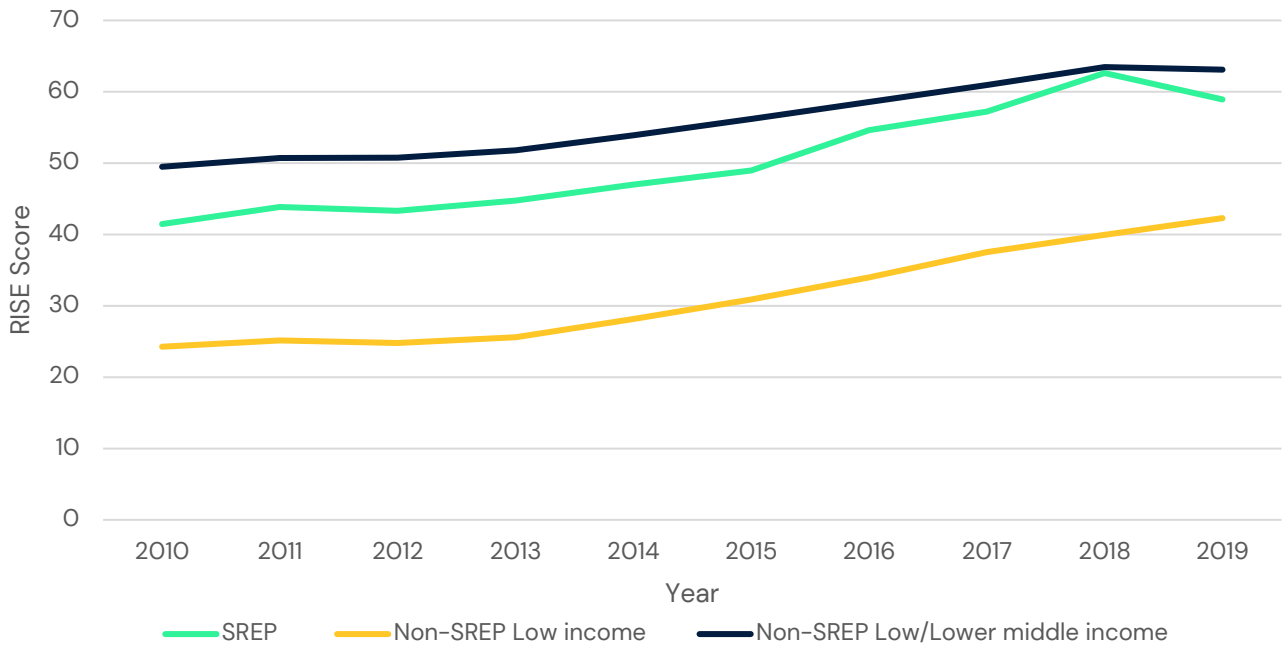
Several factors contribute to this finding. While interviewees and previous evaluative work has pointed to benefits of the investment planning process for building capacity, raising awareness, and even changing mindsets about renewable energy development, these benefits are less likely to be reflected in concrete policy and regulatory changes measured by RISE. In addition, many projects were designed with project-oriented technical assistance and capacity building components, with less influence (to date) on the broader sector-level enabling environment. In mini-grids, for example, few SREP projects focused on the policy and regulatory framework for mini-grids that is measured by RISE. In addition, in larger markets (e.g., Ethiopia, Kenya, Bangladesh), SREP has had impact in a specific sub-sector, but has not been the primary catalyzer for broader development across renewable energy or access. More significant and sustained investment in

[74] ICF International (2018).
[75] The RISE indicators are based on a composite measure of indicators covering different aspects of the regulatory environment for access and renewable energy. For further information, visit https://rise.esmap.org/indicators#pillar-renewable-energy.

policy and regulatory reform would likely be needed to improve national-scale policy indicators.[76] SREP's enabling environment improvements have been important in the context of piloting investment opportunities, with the more important benchmark for SREP likely to be found in the demonstration effect arising from its investments (increasing confidence) and their catalytic impact on wider public and private financial flows (as well as on the scaling of ambition in sector planning and targets).

Nonetheless, there are examples where the collective weight of SREP activities is beginning to feed through into wider market development and sector ambition, although this may not necessarily be reflected in RISE scores. In its more mature projects, the collective impact of the investment planning process, capacity building, and the confidence-building effects of first-mover projects is creating the conditions to catalyze further investment and development going forward. For example, in Honduras, early SREP capacity building for the newly formed Secretary of Energy has now evolved into support to the development of electrification planning frameworks, which is expected to create the basis for sustainable planning and investment in renewable power (although solvency challenges with the off-taker present an ongoing barrier). In Maldives, the scale of SREP-mobilized investment relative to the power sector has built confidence for the government to strengthen its power decarbonization targets and commit to net-zero ambition.

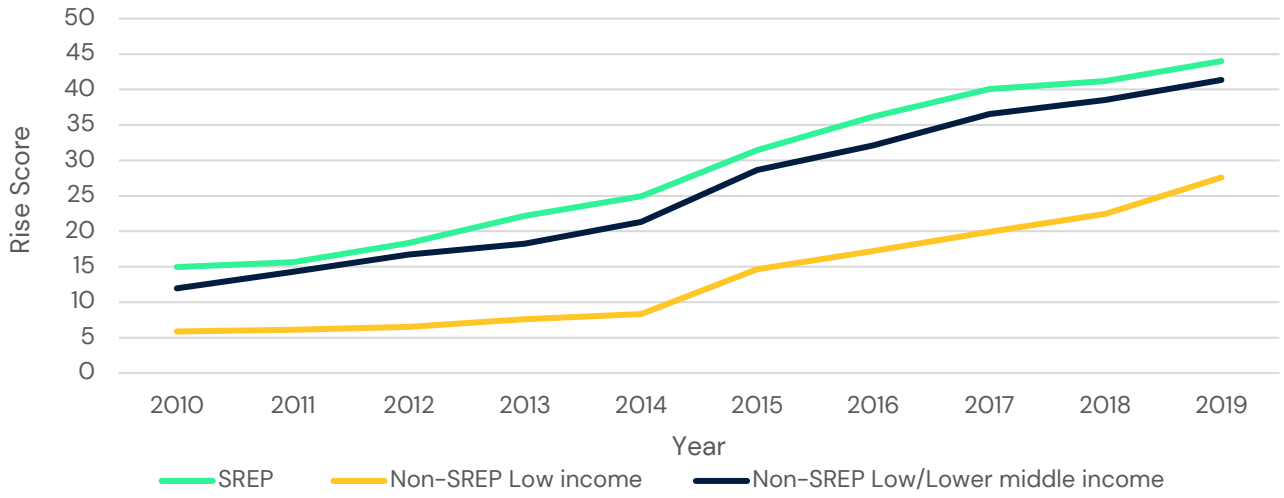
Figure 10. Average RISE Electricity Access Scores for SREP and Non-SREP Countries



Note: The evaluation team used World Bank country and lending groups data to identify low-income and lower middle-income countries. SREP's portfolio includes countries in both income groups.
Source: ESMAP (2021). Regulatory Indicators for Sustainable Energy database. Available at: https://rise.esmap.org/indicators (accessed May 20, 2021); World Bank (2021). World Bank Country and Lending Groups. Available at: https://datahelpdesk.worldbank.org/knowledgebase/articles/906519-world-bank-country-and-lending-groups (accessed May 20, 2021).

[76] Regulatory and policy reform are normally the remit of dedicated large multi-year donor grant-based programmes (often themselves designed at the scale of SREP country envelopes).

Figure 11. Average RISE Renewable Energy Scores for SREP and Non-SREP Countries



Note: The evaluation team used World Bank country and lending groups data to identify low-income and lower middle-income countries. SREP's portfolio includes countries in both income groups.
Source: ESMAP (2021). Regulatory Indicators for Sustainable Energy database. Available at: https://rise.esmap.org/indicators (accessed May 20, 2021); World Bank (2021). World Bank Country and Lending Groups. Available at: https://datahelpdesk.worldbank.org/knowledgebase/articles/906519-world-bank-country-and-lending-groups (accessed May 20, 2021).

5.1.2 Private-sector market development

In some cases, SREP investment has encouraged other private actors to enter the market, even in challenging country contexts. SREP has been able to develop confidence among other investors to mobilize capital and take forward projects through demonstrated market commitment. One example is the Mali Segou project where an SREP concessional loan of $20m through the PSSA resulted in IFC InfraVentures and SCATEC taking forward the first 33MW grid-connected PV plant, which is awaiting approval of the concession agreement and state guarantee by the Council of Ministers. A larger commercial project (50MW Kita Solar Power) was commissioned earlier in 2020, but stakeholders recognized that the early negotiations around the Segou project (tariffs, IPP structure, and concession arrangements) set the framework for its more rapid approval. Other IPPs in Mali are also under development, benefiting from the SREP-enabled capacity building and confidence measures. In Liberia, capacity building and financing support is leading to a significant scaling of private-sector deployment (see box on page 58). In Bangladesh, rooftop solar PV markets are expanding—including with increased participation of RESCOs—with technical support and monitoring provided through IDCOL, although access to commercial finance remains a main barrier (see box on page 59). In Haiti, in direct coordination with SREP programming, DPSP has supported the development of the OGEF, a private-sector market-based model to invest in solar supply enterprises, managed by a professional fund manager (Bamboo Capital) that also offers results-based financing (RBF) for VERASOL-certified products.

Because of MDB procurement rules many contracts have gone to international companies, which is perceived as slowing the development of local private-sector capacity and supply chains. The thematic and country case studies pointed to tension in the SREP portfolio between support for international versus local companies, in terms of capacity versus local private-sector and supply chain development**.** SREP leverages the robust MDB procurement and tendering process to ensure its implementing partners and consultants have the capacity to deliver often large and complex projects in markets that may lack sufficient domestic capacity and supply chains. In Maldives, local private-sector stakeholders highlighted the barriers that using an international contractor-led approach can have, even

where implementation is subcontracted to local delivery partners. Domestic private-sector companies can be effectively excluded from participating due to financial thresholds—leaving much of the project economic value outside of the country in terms of both equipment and human resource. In other countries, such as Liberia, the SREP project worked directly with local small businesses to supply OGS products, but the one-off engagement was insufficient to build capacity for further local private-sector supply chain development (i.e., local businesses do not have the capital to import a container full of OGS equipment after the project ends). At the same time, SREP support that led to the Liberian government waiving the import tariff has helped a new OGS distributor establish itself in the country (see box below).

Ongoing concessional support will be required to support some private-sector markets due to prevailing technology or country-level risks. There has been a mixed level of market development, dependent on the ongoing technology and market risks. While SREP has made some progress in piloting and demonstrating first-of-a-kind projects, in some contexts and technology markets SREP projects have demonstrated that there is likely to be ongoing need for concessional capital to offset market and technology risks. For example, geothermal projects indicate the continued need for risk mitigation finance to support both upstream and downstream development. While six of the mini-grid projects have developed financial business models for their operation, these all require some level of subsidy to make them economically viable for both consumers and investors/developers. As an indication of the ongoing need for concessional funds, the call for proposals for the new CIF REI program in 2021 received more than 50 expressions of interest from potential partner governments for support to develop renewable energy development, grid integration, and storage.

SREP Liberia: Building the market for OGS

At 12 percent, Liberia has one of the lowest electricity access rates in the world, in part due to the civil war which ended in 2003 and destroyed much of the power infrastructure. Even in the capital Monrovia, less than 20 percent of the population has access to electricity, and only 10 percent of the country can access the grid. By 2030, the Government of Liberia is looking to provide 35 percent of the population with access.

Given these constraints, and the relatively weak position of the Liberia Electricity Corporation (LEC), off-grid solutions (both mini-grids and OGS) are the primary channels for rural electrification. Community- and cooperative-managed mini-grids provide a significant share of current existing electricity access in the country.

SREP has supported a number of projects in line with national electrification plans and strategies. These include a public-sector 9.4MW grid-connected hydropower project to increase LEC grid capacity (AfDB), a public-financed 2.5MW hydro mini-grid with 1.8MW diesel backup for 10,000 households (World Bank), and the development of private markets for stand-alone off-grid solutions.

While the larger SREP infrastructure projects in Liberia have faced some delays, market development for stand-alone solar has moved forward more quicky. Through the Liberia Renewable Energy Access Project (LIRENAP), SREP has been supporting the RREA to transition from a small public-sector initiative to a larger sustainable market driven by the private sector.

Alongside capacity building on distribution and marketing for private-sector companies, SREP has supported the development of regulations that have encouraged private-sector activity, bring in import tariff waivers for OGS distributors and mini-grid components for developers. The transformational impact of this work was recognized in the 2020 Powering Africa Off-Grid Solar Market Assessment.

One company, LIB Solar, over a three-year period has imported and financed solar products that now provide basic electricity for over 20,000 households. The company has also provided OGS systems to over 100 commercial establishments to power refrigeration. LIB Solar has attracted $2 million in debt-financing that has been supporting an average roll-out of 1,000 customer per month.

A key lesson is that SREP market support for OGS can provide a solution for countries that may struggle in the medium term to provide a large percentage of their populations with higher level access through grid or mini-grid provision. LIRENAP is creating private-sector bridging models to at least Multi-Tier Framework for Energy Access (MTF) Tier 1-3 while LEC/regulators can put greater efforts into national electrification planning.

SREP Bangladesh: Scaling grid-connected rooftop solar at the national level

The SREP investment plan process in Bangladesh provided an opportunity to help the country move from off-grid to a more structured approach to grid-connected renewables. At the time that the plan was prepared, Bangladesh had developed a highly successful off-grid Solar Home System (SHS) program implemented by IDCOL, a government-owned non-bank financial institution. However, there was virtually no grid-connected RE installed capacity or experience in Bangladesh. SREP supported the World Bank to develop the REFF, co-financed by IDA, as part of the Scaling Up Renewable Energy Project. REFF provides financing for both grid-connected rooftop PV and utility-scale PV projects. REFF addresses a range of barriers through awareness raising [led by the Sustainable Renewable Energy Development Authority (SREDA)], technical support from IDCOL, and concessional finance (longer tenor, lower rates, reducing overall generation costs by approximately 25 percent).

As of August 2021, 6.17 MWp installation from five rooftop solar projects had been completed with REFF financing. These projects leveraged $1.6 million in private capital through sponsor project contributions. In total, 23 sub-projects have been approved, with generation capacity of 35.78 MWp, and a substantial pipeline is also in development. Projects have been supported by the new net metering policy introduced by the Government of Bangladesh.

The potential for rooftop solar with net metering is widely perceived as substantial and the next promising program for solar PV in the country. The draft National Solar Roadmap, developed by SREDA, puts due emphasis on capacity additions from rooftop solar systems and utility-scale solar projects.

The REFF project pipeline is expected to about double existing on-grid solar PV capacity in Bangladesh by adding an additional 310 MW, increasing rooftop PV installed capacity by a factor of at least four. Market signals of further expansion include an increase in the average sub-project size, the falling cost per MW installed between portfolio and pipeline projects, and the emergence of projects using an OPEX or RESCO model.

Bangladesh's new eighth Five Year Plan indicates that the government's thinking on power development since 2016 has evolved, with plans now focused on sector decarbonization. Stakeholder interviews indicated that SREP had made a contribution to confidence building. The success of REFF has led IDCOL to include a follow-on rooftop PV project as part of the country's GCF program using a similar financing approach.

5.2 Co-benefits

Some direct and indirect co-benefits are beginning to emerge around social, economic, and environmental themes, but evidence is limited by the early-stage implementation of many projects and a lack of targeted reporting. In part, this also reflects a wider lack of focus on co-benefits within SREP project design documents and reporting frameworks. In addition, the demonstration nature of many SREP projects means that the opportunities for co-benefits are contained within narrow project boundaries that may have limited catalytic effect on wider social, economic, and environment systems.[77]

High-level modeling being undertaken by SREP indicates potentially large direct and indirect economic benefits from the portfolio. SREP is investing in understanding the potential scale of benefits through high-level modeling of the portfolio. Early results suggests that the 826MW of planned capacity could create 3,562 jobs during the operational phase, with a further 142,681 jobs in the supply chain and due to the enabling effects of clean energy supply. This would also create approximately $435 million in Economic Value Add (EVA) on an annual basis. This is in addition to significant employment and EVA benefits from the initial construction phase of the portfolio.[78]

Social co-benefits in terms of pro-poor development, gender equality, and health are generally well mainstreamed in SREP projects at the activity level, even where this is not fully captured by reporting against core indicators. For example, a number of projects in the case study countries (e.g., Bangladesh, Honduras) include gender mainstreaming components and objectives. In terms of health outcomes, some

[77] It should nonetheless be recognized that the SREP M&R toolkit did introduce a section on co-benefits reporting, and that enabling environment and GHG benefits are classified as such.

[78] See CIF (2021). Estimating the Social and Economic Development Impacts of Climate Investments. SREP.

respondents identified reports of localized air quality benefits from switching from fossil fuels to renewables (e.g., Maldives). However, social co-benefits are not considered systematically across the portfolio and further effort could be made into identifying them as part of reporting, for example across health, education, or other social outcomes.[79] Actively pursuing some social co-benefits such as affordability has occasionally resulted in trade-offs and unintended outcomes where these have undermined the viability of renewable energy business models and private-sector delivery (particularly in mini-grid development). SREP should maintain a strategic focus on the potential trade-offs involved between cost to consumers and commercial viability.

Co-benefits of solar irrigation pumps

In Bangladesh, the ADB project supports productive use of renewable energy through adoption of solar irrigation pumps (SIPs), often replacing diesel-powered irrigation. The project includes complementary support for capacity building and livelihood training for women and poor and vulnerable households on economic opportunities associated with SIPs. SIPs are expected to provide irrigation services beyond agricultural fields, such as for women's homestead gardens or production of fruits and vegetables for income generation. To date, the ADB SREP project has conducted awareness-raising campaigns, including with female farmers, and livelihood trainings and trainings on the safe and efficient use of energy (both with 50 percent women).

Although not associated with the SREP project, a recent impact assessment of SIPs in Bangladesh found that "the reliability, accessibility, and affordability features of solar irrigation prompted farmers to harvest in more areas and plots in relatively longer seasons" contributing to a higher yield and enhancing farmers' wellbeing—although the regression analysis did not show consistently robust crop returns across all agricultural plots.

Sources: Interviews; and Hossain, M. and A. Karim. 2020. Does Renewable Energy Increase Farmers' Well-being? Evidence from Solar Irrigation Interventions in Bangladesh. ADBI Working Paper 1096. Tokyo: Asian Development Bank Institute.

Some economic co-benefits can be identified, particularly in terms of reduced costs of energy and improved reliability of power for productive uses. The potential for renewable energy systems to offset fossil fuel costs and volatility has been identified in a number of projects. For example, at a macro level, there is evidence that conversion of Maldives grids is reducing fuel costs by 25 percent, which in turn will allow the STELCO and FENACA—the two state utilities—to reduce net fuel imports, manage power prices, and benefit the country's balance of payments. At a productive use level, there is evidence that the use of solar PV and net metering on industrial buildings is reducing energy costs for factory owners in Bangladesh, both through on-bill savings and reduced reliance on diesel generators. Mini-grid projects across the portfolio have the potential to facilitate a switch to more productive uses of energy, but progress toward implementation has been slow. Job creation is a factor in many projects (both from capital investment and infrastructure operation). For example, 150 local jobs have been created by H-REFF projects in Latin America. However, these tend to be project-specific and at fairly limited scale.

From an environmental perspective, GHG co-benefits are projected to be relatively strong, but environmental focus in SREP project documents tends to be on "do no harm" rather than on proactive delivery of environmental co-benefits. Projects report significant GHG abatement benefits (primarily as a result of fuel switching from fossil fuels to renewables), and projects are strongly aligned with national NDCs and Paris Alignment commitments. SREP projects delivered annual emissions reductions or avoidance of an estimated 235,000 tCO_2eq in the last reporting year, and have a target of more than 89 million tCO_2eq over the operating lifetime of the project investments. SREP projects, using MDB processes, have a strong focus on environmental safeguards, and there is good evidence from project documentation that these processes are robustly implemented. However, there is little wider evidence from the country case studies that projects

[79] Note a development impact evaluation is underway in parallel to explore potential co-benefits and the extent to which these are being achieved.

are delivering a wider set of environmental benefits (e.g., switch from extractives, avoided deforestation, improved water and land use), although this may be due to a lack of reporting.

5.3 SREP's influence on the multilateral development banks

SREP has had some influence on the strategic evolution of MDB operations. Interviews with MDBs and previous evaluative work[80] have pointed to some influence—in combination with CTF—on energy-related ambition and approach within MDB strategy and operations. In some limited cases, SREP programmatic efforts have helped shape wider MDB country strategies to prioritize clean energy investment or pioneer first energy operations. For example, engagement by the Government of Cambodia with SREP encouraged ADB to incorporate clean energy as a sectoral pillar in its country strategy (where it had previously been absent), resulting in large-scale investment in on-grid solar. The SREP project in Kiribati was also ADB's first energy sector operation in that country. Similarly in Lesotho, the World Bank's first energy operation was SREP co-financed. In several cases, it was the initial interest by the host government that drove the MDB to adapt its broader sector strategy.

SREP country programs have also helped develop model approaches for MDBs to pursue in certain geographic and sector contexts. For example, the SREP Maldives program was reported by ADB representatives as developing the model for improved clean energy access in SIDS and is being replicated in other ADB SIDS markets. There is also some evidence that thematic areas of focus have helped MDBs learning which has in turn informed other regional programming (e.g., Africa geothermal, mini-grids). The mini-hydro project in Mali was the first of its kind for AfDB and is now informing the design of another non-SREP project in the region. These influencing aspects are largely dependent on successful implementation of projects that can then be scaled or replicated, or from which learning can be shared.

A few countries have seen the development and launch of scaled MDB programs, building on SREP foundations. SREP investment in enabling environment and capacity has enabled a number of MDBs to develop further programs that build on the frameworks and project structures developed. One example is in Maldives, where the World Bank in 2020 announced the ARISE program, mobilizing US$107.4 million for further investment in renewable energy, battery storage, and grid integration (including US$20 million from the CTF DPSP). ADB is also currently developing a scaled successor to the POISED project. Other follow-on scaled MDB projects can be found in Mali, Liberia, Kenya, and Ethiopia, with concept notes being developed for follow-on GCF funding in Bangladesh for IDCOL. These are sometimes co-financed by CIF itself (e.g., Maldives CTF DPSP).

However, SREP influence on the MDBs has been limited in part by the lack of high-profile champion projects. MDB interview partners generally struggled to identify flagship SREP projects that have captured senior management attention. This was in part due to SREP targeting countries that were potentially lower priorities for senior management. In addition, in cases where SREP resources have been programmed as small components of much larger MDB operations, interviews suggested that those components often lose some priority or visibility from an operation and management perspective. This is especially true when the SREP-funded component represents a particularly challenging endeavor, such as in the Kenya Electricity Modernization Project, where SREP finance represents 1 percent of total parent project financing, allocated to a sub-component to pilot mini-grids.

Limited evidence is also available of learning being cross-fertilized across the MDBs or with other partners to influence wider technology or sub-sectoral development approaches. SREP convened meetings, roundtables, and workshops with partners earlier in the program, such as SREP pilot country meetings, mini-grid roundtables, and South-South learning—which were viewed positively by participant

[80] Itad (2019). Evaluation of Transformational Change in the Climate Investment Funds. January 2019. Submitted by Itad in association with Ross Strategic and ICF.

countries, MDBs, and CIF AU staff alike.[81] These types of learning events have become less frequent and visible over time, however—despite the fact that much of the portfolio is only now reaching the investment stage and specific technology and business model challenges remain. Given the concentration of certain technology approaches within the portfolio (e.g., geothermal, mini-grids), and their pioneering nature, SREP has not fully maximized the cross-learning opportunities across MDBs and with other programs (e.g., with ESMAP, CTF) to identify best practices and share/learn from each other's insights. It should be noted that recent efforts have been impacted by the COVID-19 pandemic. For example, the CIF had planned its Trust Fund Committee meetings in March 2020 in Nairobi, Kenya, including a full learning tour of the Menengai Geothermal Project for all participants, which was unfortunately cancelled. Other SREP learning opportunities have not been fully operationalized. For example, as noted previously, the SREP M&R toolkit provides for national workshops at the mid-term and completion of investment plans to support progress assessment and lessons learning; these have not been held.

5.4 Transformational change narrative

SREP was designed with a solid transformational change perspective in terms of the ambition in relation to its country and technology portfolio. Overall, the evaluation finds that the program was developed and informed by a strong "transformational change" narrative (both in terms of delivering first-of-a-kind projects in challenging country environments and responding to specific country challenges and needs). The nature of the markets and countries in which SREP has operated demands a strong focus on systemic change in policy, regulation, capacity development and market building, to which the program has been partially responsive through the investment planning process and more selectively through project-level technical assistance. The program has been able to pull forward activity in markets that otherwise would have been lower priority for the MDB and the wider investment community. The country examples of Maldives and Honduras (see boxes below) help illustrate the importance of strategically coordinating investments through a programmatic approach to drive transformation, as well as follow-on investment to keep momentum for the sector transition.

However, even with several projects well into implementation, the program has faced significant challenges in delivering systemic change and scaling. With some exceptions, the program has struggled to move beyond demonstration to achieve scaling effects at national levels and has not been sufficiently large or targeted to shift sectoral approaches at regional or global levels. Although some activities have gained sufficient traction to suggest longer-term impact and sustainability, existing challenges around governance, risk, and capacity in many respects remain, creating the need for ongoing concessional finance and technical assistance support in many markets.

[81] ICF International (2014). Independent Evaluation of the Climate Investment Funds. Washington, DC: World Bank.

Examining SREP with a transformational change lens

Dimension	Evidence of SREP contribution to signals of transformational change
Relevance	Investment plans created strong alignment with country-level priorities and political economy buy-in, although long project development timescales and political instability have created challenges in some markets. Investment plan structure becomes a hinderance for projects where windows of opportunity are missed, and greater flexibility is required at end of program.
Systemic Change	Investment planning process has built government capacity and awareness, with supporting regulatory and capacity interventions at the country level. Investments are helping change risk perceptions on energy/LICs investment opportunity. There is weak sectoral influence at the regional/global level due to lack of scale and progress.
Scaling	Some external scaling from individual projects, but generally too early in the lifecycle to see impacts. Isolated examples of market development (e.g., Liberia). Some SREP projects operating at "whole-of-market" scale in smaller, less-developed economies.
Speed	Good evidence that SREP funding has pulled forward innovation and first-of-a-kind projects in countries, primarily through incentives of concessional funds. However, there have been significant delays across a wide range of projects (although broadly in line with comparator non-SREP projects).
Adaptive Sustainability	Follow-on project activity is now emerging in terms of both public- and private-sector development (e.g., Maldives, Ethiopia, Bangladesh). Fixed lifespan and sunset clause have encouraged innovation in new CIF programming thematics (ACT, REI).

SREP Maldives: Driving clean energy transformation in SIDS

The Maldives, a collection of low-lying atolls, has long relied on expensive fuel imports for its energy and power generation needs. In 2019, it imported over 700,000 metric tons of fuel at the cost of US$465 million, equivalent to 8.3 percent of the gross national product. As well as being expensive, fuel imports make the macroeconomy vulnerable to any external crises (e.g., 2004 Tsunami, COVID-19).

SREP's US$30 million program, implemented through the World Bank and ADB, has sought to scale up the use of renewable energy through private-sector investment in the Greater Male grid (World Bank ASPIRE) and by working with state utilities to convert outer island grids to diesel solar PV hybrids, some with battery storage (ADB POISED).

Technical assistance has been a core component. Under the World Bank ASPIRE program (supported by SRMI), technical assistance was provided to streamline procurement and develop seven standard contracts and guidelines for private-sector procurement. Under POISED, significant effort has been put into building the capacity of the utilities and island councils to design and operate grids.

Program challenges have slowed implementation. These include risk perceptions among private-sector investors, off-taker and currency risk, weak procurement and planning processes, and the geographically dispersed nature of the island nation. Both programs were significantly impacted by COVID-19 which has affected procurement processes, supply chains, and travel.

To date (2021), the ASPIRE program has resulted in the mobilization of US$9.3 million to support a cumulative installation of 6.5 MW solar PV. PPA prices have reduced over bidding rounds from US$ 0.21 per kWh (1.5MW) to US$ 0.09 (5 MW). By late 2020, POISED had installed 9.5MW of Solar PV, with 5.6MWh of battery storage already implemented on 70 outer islands, reducing energy costs by 25 percent.

A key learning from the SREP Maldives program is the importance of integrated MDB cooperation on a national energy strategy, with each institution defining clear areas of contribution and support (e.g., geographic delineation, public vs. private). Other lessons include ensuring the right-sizing of support, with SREP funding mobilizing sufficient capital to deliver national-scale power sector transformation.

The Maldives projects are having clear transformational impacts. The ADB reports that the approach adopted in the Maldives is serving to inform the approach being taken on renewable energy scaling and access in other small island states. The SREP program has also underpinned the confidence of the government of Maldives to commit to its net-zero and power sector decarbonization targets.

The SREP projects are also leading to follow-on investments. In December 2020, the World Bank launched its follow-on ARISE project, mobilizing US$107.4 million, and a pipeline of US$45 million from commercial financing for solar PV generation (including US$30 million from the CTF). The ADB is also currently preparing a follow-on project.

SREP Honduras: The importance of coordination and alignment in maximizing transformational impact

Honduras is a relatively small but developed power market within the SREP portfolio. The energy sector nonetheless faces several challenges—not least the poor creditworthiness of the state utility ENEE, which is the off-taker for IPPs. Rural electrification remains challenging, and there are high technical and economic losses in distribution. Tariff reform and improving arrears collection are priorities.

IDB was the primary MDB delivery partner in Honduras for SREP. Using the programmatic approach, IDB developed a portfolio of 10 projects that incorporated a wide range of sub-sectoral activities. The portfolio has had some significant outcomes, including strengthening regulatory capacity for clean energy planning. In 2020, an SREP grant helped finance upgrades that included a new transformer that was installed in Tegucigalpa (Tocontin), enabling the transmission of an additional 31MW of renewable energy generating power capacity from southern Honduras.

While the large number of projects created the possibility for synergies and positive externalities, it also to some extent diluted the transformational focus of the country program, with some projects being more central to national energy transition policy and market context than others. The opportunistic reallocation of funds by IDB to emerging projects demonstrated strong adaptive management and commitment, but nonetheless also created some further dilution.

Although the SREP country program was implemented by one MDB, the portfolio is managed by three distinct entities within the IDB Group: the main IDB, which funds public-sector projects; IDB-Invest, which finances large private enterprises; and IDB-LAB, which primarily funds NGOs, micro-finance institutions, and small and mid-size enterprises (SMEs). While there were some examples of cooperation among the projects, respondents felt that there could have been more effective communication and collaborative strategy development, with staff sometimes unaware of activities planned or underway across the portfolio in a relatively small and interconnected market. Contributing to the challenge of coordination and communication was the relocation of the project focal point from the Ministry of Finance to the national utility (ENEE), which weakened programmatic oversight, leaving activities to be driven by individual IDB entities rather than as an overall coherent national strategy.

There were also challenges in inter-institutional cooperation. For example, $1.4 million of funds in the Sustainable Rural Energization project (ERUS) were redirected by IDB-LAB toward solar-powered mobile health units to be managed by the Secretary of Health, but interviewees raised concerns about the extent of Ministry-level engagement and consultation with the SREP-funded FOMPIER project, which was supporting the Secretary of Energy on rural electrification planning (including rural health centers and schools).

6 Conclusions, Recommendations, and Lessons

6.1 Conclusions

SREP has been highly relevant at both global and country scales, occupying an important niche in the global climate finance landscape and developing projects that are aligned with country needs, priorities, and opportunities. The twin objectives of energy access and renewable energy demonstration and scaling provided a sensible framing that allowed MDBs and partner governments the flexibility to address country needs. SREP investments have been largely coherent with sector institutions, policies, and markets, as well as with the efforts of other development partners.

On balance, many of SREP's original design elements were aligned with its program goals to pilot and demonstrate the viability of renewable energy development and initiate processes toward transformational change in lower-income countries. The programmatic approach created momentum around renewable energy, at a time when sector dialogue was nascent in many SREP countries. The program has been able to meet expectations of MDB co-finance with widespread evidence of blending SREP resources to support larger scale investments. SREP's focus on both investment and technical assistance supported progress in lower-income and lower-capacity countries. The scale of SREP's own resources also mattered. Indicative country resource allocations were generally right-sized to promote high-level engagement and collaboration, to the absorption capacities in SREP countries at the time, and to initiate sector or sub-sectoral transformational processes, depending on the relationship between SREP resources and the size of the sector. Program funding commitments did not grow to match the resource needs associated with adding 14 expansion countries, however, which limited the scale at which transformational pathways could be initiated.

Over time, interest in SREP slowed among countries and MDBs as the certainty of country program allocations weakened due to funding constraints and country expansion. The strategy of supporting investment plan development without certainty of resource availability has not worked well. MDBs perceived reputational risk in preparing investment plans without available funding and GCF funding did not materialize to fill the resource gap. As a result, programs have not meaningfully advanced in about half of the 14 expansion countries. When the scale and certainty of funding eroded, the SREP program model became constraining. With resources dwindling, the sealed/reserve pipeline approach has contributed to a stagnating pipeline. At end of program, MDBs are reluctant to revise investment plans, and more flexibility in terms of resource reallocation may be required. The programmatic approach has also not been maintained in SREP after investment plan endorsement; participatory national workshops, as provided for in the updated M&R system, have not been operationalized.

SREP has been characterized by two differing framings. The first of these is a program that aimed to demonstrate and pilot renewable technologies and improve energy access in lower-income countries. The second is that of a large-scale program that would deliver impact and transformational change at national and sectoral level. These two perspectives have sat together somewhat uneasily since program inception. The former represents the original program objective while the latter quickly emerged during implementation and is bolstered by the results framework, which has the quantitative scale of outcomes (MW, MWh, tCO_2eq, beneficiaries) as its primary framing. This lack of clarity creates ambiguity over how the program should be judged, and a clearer line of sight from program objectives through theory of change to results frameworks would be helpful.

Against the demonstration framing, SREP has successfully developed early-mover or first-of-a-kind projects at scale in challenging contexts, often pursuing technology approaches that carried significant financial or business model risks (with some expectation that not all approaches would be successful). This level of innovation and risk appetite carries implications, however, for both the timing and scale of

delivery against the core results framework indicators. More limited progress has been made against the core outcome indicators, although progress is accelerating across its portfolio as well as in terms of investment mobilization and pipeline development. Significant capacity additions are in the process of being commissioned (e.g., Bangladesh, Maldives), and there is sufficient evidence to suggest that outcomes will continue to emerge and strengthen as the portfolio matures. SREP has also delivered on its objective to address barriers to scaling up private-sector investment through both its direct private investment projects and public sector-led projects.

SREP's "light-touch" M&R system was designed to allow for differences among the MDBs in both methods used to measure indicators and approaches to defining project boundaries—presenting challenges at times for interpretation of aggregate results. For about a third of projects, there have been differences among projects and MDBs in core indicator data reporting, due in part to the lack of clear and timely communication between MDBs and the CIF AU. Reporting on tiers of energy access improvement is only encouraged and not mandated, which reduces the usefulness of aggregated data. Transformational change narratives do not currently form part of the reporting framework, but more work could be done outside of the project-based reporting part of the M&R system, building on the work of the TCLP and other emerging methodologies.

The lower-income profile of the SREP country portfolio brought with it an expected range of challenges and barriers, including weak governance, limited institutional capacity, immature market structures, political crises, and weak recovery from natural disasters. Identified barriers, while broadly recognized in investment planning, have nonetheless remained challenging to address and mitigate. A lack of social and economic resilience has been compounded by COVID-19 (which has in turn led to further disruption and redirection of resources). Although implementation progress has been slower than originally expected, primarily as a result of unrealistic assumptions around project delivery timescales, SREP projects are being implemented in line with the speed and quality of delivery of other MDB comparator projects.

Overall, it is too early in the program lifecycle to capture widescale programmatic-level impacts or long-term sustainability effects across the portfolio. SREP contributions to strengthening enabling environments for clean energy access (e.g., Ethiopia, Honduras, Mali), alongside the value of demonstration effect, have had some transformative impacts in a few countries, including by encouraging other private actors to enter the market. SREP also made early contributions to building sector capacity and momentum through its programmatic approach and investment planning processes. But subsequent project-level technical assistance has generally has not been undertaken at a scale necessary to have significant national cross-sectoral impact. Broadly, SREP's achievements have been most noticeable as a result of the demonstration effect and capacity building around investment planning processes.

Due to its operation in lower-income countries and lack of higher-profile champion projects, SREP has had a more limited influence or profile within the MDBs. Projects have had some success in influencing the shape and structure of MDB country-level operations but have been less impactful at the regional and global levels. Influence in the MDBs on energy sector and climate ambitions is more evident in collaboration with CTF. Still, SREP suffers from relative comparison with CTF within the MDB context, which has operated at 10 times the funding level and in a more concentrated set of countries.

SREP has also not fully leveraged its potential to cross-fertilize learning across the MDBs or with other partners to influence wider technology or sub-sectoral development approaches—especially as the program has moved into implementation. SREP has generated a wealth of insight because of the successes and challenges of program design and project implementation, but these have not been systematically harvested or shared. Earlier efforts to convene stakeholders around common technologies and business models were considered useful (e.g., mini-grids, geothermal) as part of the design phase. As SREP moves further into implementation, it can play a more constructive role in cascading findings around

areas of expertise to other climate finance and energy partners facing similar challenges, as well as incorporate wider programmatic lessons for new CIF programs.

6.2 Recommendations

Key recommendations for SREP are set out below, some of which may also be relevant to future CIF energy programs or other energy-related climate finance facilities.

1. **Pipeline and funding expectation management**
    - The CIF AU should revisit outstanding SREP fund allocations and sealed/reserve pipeline opportunities with MDBs and Committee members to identify which projects remain realistic and which should be potentially withdrawn to release funds for other project opportunities.
    - The CIF AU and MDBs should discuss a more flexible/realistic way forward on unallocated funds, potentially agreeing to reallocate resources between countries and MDBs where high-impact opportunities exist, without revising investment plans. In doing so, a set of hierarchical criteria for prioritization could be useful (e.g., considering the relative priority among countries with existing projects in the pipeline and alternative countries, MDBs with existing projects in the pipeline and alternative MDBs, and generally existing pipeline and new project concepts).
2. **M&R system**
    - The CIF AU and MDBs, working with the country focal points, should operationalize the requirement in the current M&R toolkit for investment plan reporting, facilitated as a national participatory stakeholder workshop at mid-term and closing. This process could serve multiple purposes identified as areas of improvement in this evaluation:
        - To encourage energy access reporting that identifies the tier of improvement, such as by using the Multi-Tier Framework for Energy Access (MTF) (supported by SREP).
        - To collect and report on evidence of impact and transformation beyond core results framework indicators. This could involve examining SREP role in exploring viability and boundaries for renewable energy investment as per the original remit and strengthening the role of qualitative assessment on transformational change and co-benefits.
        - To share lessons learned and identify feasible solutions to challenges, to support the CIF's overall learning remit and help accelerate implementation.
3. **Lesson learning and knowledge management**
    - The CIF AU, MDBs, and countries should, where project opportunities still remain, ensure mutual learning and transfer of best practices between SREP and other centers of expertise (e.g., CIF programs, ESMAP) to inform design (e.g., mini-grids business models). This objective could be further supported by revitalizing knowledge-sharing events and workshops (including external partners) around very targeted areas of SREP thematic and geographic expertise to share experiences, access promising practices, and generate lessons learned for future programming, including through the TCLP.
    - The CIF AU should explore further how SREP experience might inform REI, ACT and other emerging CIF programs at program and country level.

6.3 Learning for future programming

The SREP program experience offers a series of lessons that may be useful to inform future programming decisions and strategies.

Country and thematic structure

- *Right-sizing country allocations to the threshold of MDB and political interest, country absorption capacity, and scale of the opportunity is important.* The SREP experience shows that scale of resources matters to garner both MDB and high-level political interest. Especially in the context of lower-income countries, however, the scale of finance needs to be balanced against country absorption capacity, and the relative scale of opportunity. A "one size fits all" policy that is built on expectations of equitable distribution of concessional funds between countries (and MDBs) while being politically advantageous can have its drawbacks. In larger countries, a program can find itself limited to operating within narrow sub-sectoral niches, slightly disconnected from wider power sector transformation discussions. By subdividing funds among MDBs, there is further risk that they choose to operate in broadly disconnected areas, and as a result lose complementarities and economies of scale. At the other extreme, in smaller countries, a program can find itself supporting efforts to mobilize relatively large-scale investment before underlying enabling environment challenges (e.g., electrification planning, utility off-taker creditworthiness) have been addressed. Programs should consider allocation on the basis of transformational opportunity and constraint, rather than a sense of "fairness," and concentrate more resources in a smaller number of countries where funding constraints exist.
- *Country-led programming can be balanced against proactive thematic focus.* A country-led engagement forms a core part of the programmatic approach and is vital to creating political buy-in (among both countries and MDBs). This can be balanced, however, against the development of core thematic focus within the program (such as geothermal and mini-grids in SREP), to generate more opportunities for sectoral learning and scaling over time. Without proactive and informed MDB and CIF thematic engagement at the investment planning stage, countries may fail to fully understand the potential for emerging technologies or business model opportunities (particularly given the long lead times associated with project development and implementation). A hybrid approach (a matrix overlaying core technology and business models over country-led programming) requires informed and proactive upstream dialogue on energy transition with country counterparts, engagement in more developmental and collaborative learning processes across countries and MDBs, and likely involvement of core MDB knowledge and innovation hubs (e.g., ESMAP). In particular, CIF should engage with MDB sector experts to work collaboratively with MDB country leads to ensure that ambition and opportunity are fully explored.

Programmatic ambition

- *Programs should have clear line of sight around their objectives, expectations of transformational impact, and associated resource allocations and results measurement.* Programs need to be clear and realistic in terms of what they are aiming to achieve, how they will resource this, and how progress will be measured. SREP has struggled with multiple objectives (both demonstration and transformation), with resulting ambiguity in its theory of change and results frameworks. This ambiguity can prevent adequate recognition of project achievements that are not scale-focused. In many larger country contexts, SREP has not been sufficiently well resourced to deliver national energy sector outcomes but has been able to pilot and demonstrate innovative projects at the sub-sectoral level. Programs pursuing an innovation and demonstration strategy should assess their success at a portfolio level (with the expectation that there will be a range of project outcomes, including some failures). A lack of project failure across the portfolio is likely to be a sign of insufficient ambition rather than successful implementation.

- *Expectations should be set realistically for delivery of results given the country context and delivery model.* Timescales have been longer than expected across the SREP delivery model (investment plan development, implementation) although not out of line with other similar (MDB) projects. Structures such as the CIF and MDBs (with a proven track record of investment success) should have sufficient confidence to communicate realistic timing for project and market transformation processes (5-10 years) and associated implications for when core indicator targets may be achieved, and to not undersell complexity or risks. They should also have confidence in their strengths relative to other climate finance modalities that cannot mobilize wider investment in the same way. Greater realism is also warranted among Committee members to ensure that programs are not set up for perceived failure. Programs should review typical implementation timescales for MDB projects in similar country contexts to help frame likely delivery timescales and challenges.

Policy and planning

- *The programmatic approach is not a substitute for national power sector frameworks and electrification plans.* SREP country programs have benefited from embracing an integrated country-led approach through the investment planning process. This, alongside project-level technical assistance, has built capacity within partner governments sufficient to mobilize projects to implementation. However, many projects have been delivered in a nascent planning and policy environment, without adequate or comprehensive electrification or power sector development strategies. This can create uncertainty (e.g., around public vs. private, on-grid vs. off-grid). Where such frameworks are absent, programs should consider either allocating appropriate funding for relevant policy and regulatory support, or work narrowly within the confines of the investment mandate to enable project development.

Incentives

- *Future programs may consider supporting certainty of resource allocations before inviting countries to prepare investment plans, particularly given the transaction costs faced by policymakers and MDBs.* MDB investment teams generally require a strong set of incentives to engage with trust funds such as SREP (with the associated access and reporting requirements). While overall conditions are now more conducive to promoting MDB engagement (e.g., climate lending targets and clean energy strategies are in place), MDBs still need to be comfortable that there is strong certainty around fund availability to justify dedicating resources from their own administration budgets for project development. Asking countries and MDBs to prepare investment plans without the certainty that substantial resources will be available to fund them has not worked well for SREP.
- *Pipeline management needs to provide enough certainty (in terms of funding and timescales) to underpin the credibility of the programmatic approach, but with strong signals that if endorsed projects fail to progress toward implementation, funds will be reallocated to more promising opportunities*. Overprogramming as a pipeline management approach may work in a situation of regular resource replenishment but can be disincentivizing in a situation of declining resource availability; overprogramming is also incompatible with private-sector project development processes. Clear "use it or lose it" approaches could be adopted (e.g., endorsed resources are reallocated if projects are not brought for Committee approval within a certain number of years), but with realistic timescales in order to allow for developing country capacity constraints.

Private sector

- *Private-sector operations and timescales do not easily align with public-sector programmatic approaches.* While a programmatic approach is suitable for large-scale public investments, private-sector investors are generally more opportunistic, responsive to market and technology developments, and have narrow windows of opportunity in which to structure and agree finance. They require

significantly greater flexibility (and certainty of funding) to engage and have much lower tolerance for procedural bureaucracy. Cost of capital is often in competition with convenience in terms of decisions around funding partnerships. This is particularly true for developers and investors in more commoditized, cross-border technology markets (e.g., solar PV). Those operating in more capital-intensive, localized higher-risk sectors (e.g., geothermal) are likely to be more patient due to lack of alternative funding and project opportunities. As a result, program approaches such as SREP require maximum flexibility in their private-sector funding approaches (timing, geographic, sectoral) to maximize chances of success and impact and these should be kept separate from more structured public-sector planning approaches.

- *Having a flexible private-sector window open alongside the investment planning process can support public-private engagement and scaling*. Although the PSSA modality suffered from design flaws, the SREP projects approved under it aligned with the strategic objectives of those countries' investment plans. Having the CTF DPSP window open to SREP countries supported scaling up of some countries' ambitions and helped other countries design more private-sector engagement into their transformational vision.
- *Program design and delivery can support private-sector participation in public sector-led projects.* One key lesson from SREP is that it is important to have a much broader private-sector engagement strategy to complement direct investment in private sector-led projects. Having a narrow focus on the use of private-sector windows or calls for proposals can result in an underappreciation of the opportunities for maximizing private-sector participation in public-sector projects. Given limited public-sector capacity, the private sector often engages as a partner (e.g., through IPPs) as a co-investor or as a delivery agent (e.g., project construction, operation). There is strong value in maximizing the opportunities for private-sector engagement—not only in terms of direct lending to private-sector institutions, but more broadly across the public-sector portfolio, in particular ensuring that procurement and contracting models help to facilitate local involvement wherever possible to support market development and supply chains, and that private investor views are captured in enabling environment reform.

Appendix A. List of Documents Consulted

SREP Documents

Climate Investment Funds (2009). Design Document for the Program on Scaling-Up Renewable Energy in Low Income Countries (SREP), a Targeted Program Under the Strategic Climate Fund.

Climate Investment Funds (2010). SREP/SC.3/Inf 2. Information Note on the Use of Hybrid Systems Under SREP. Meeting of the SREP Sub-Committee, 22 June 2010. Washington, DC.

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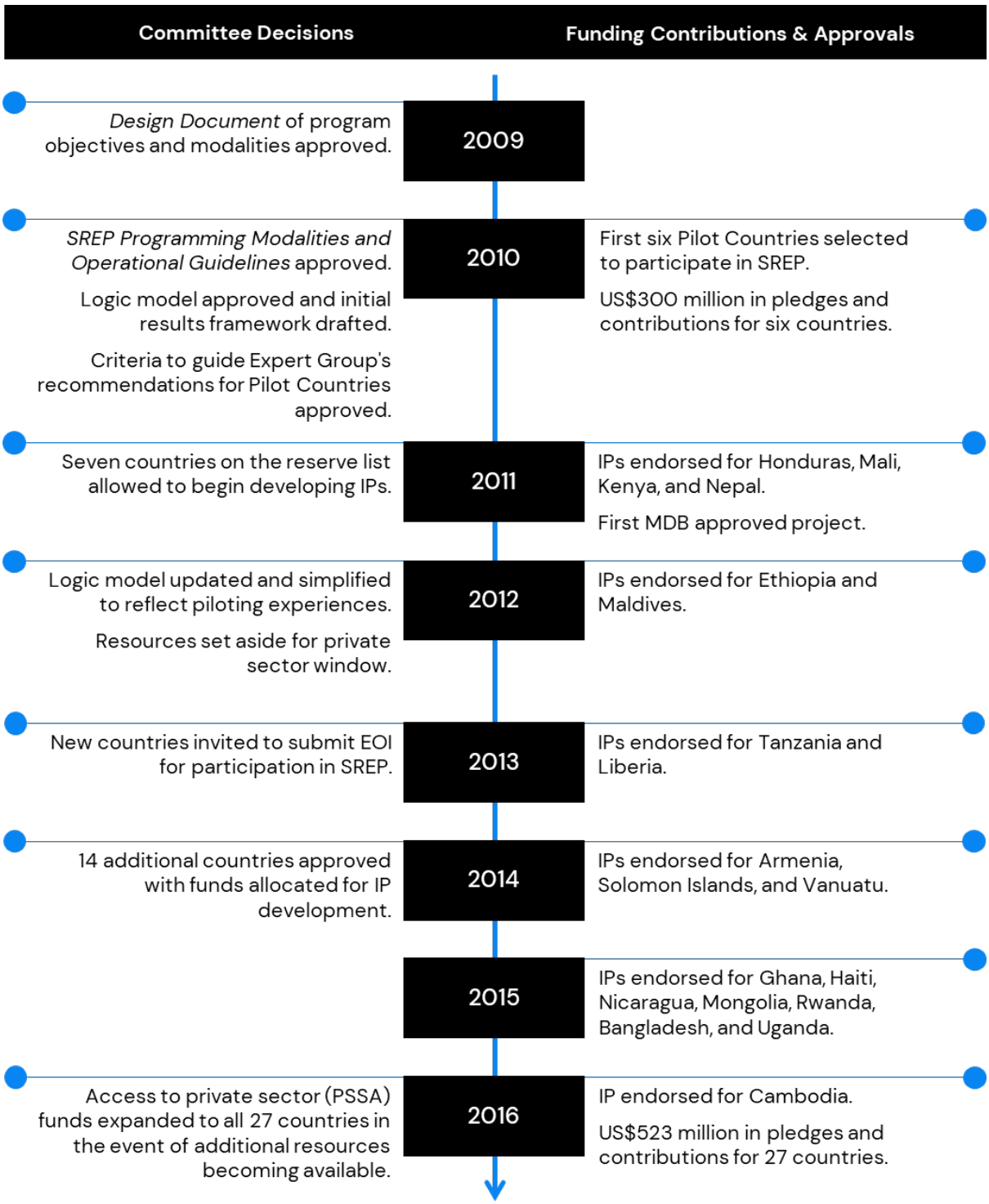
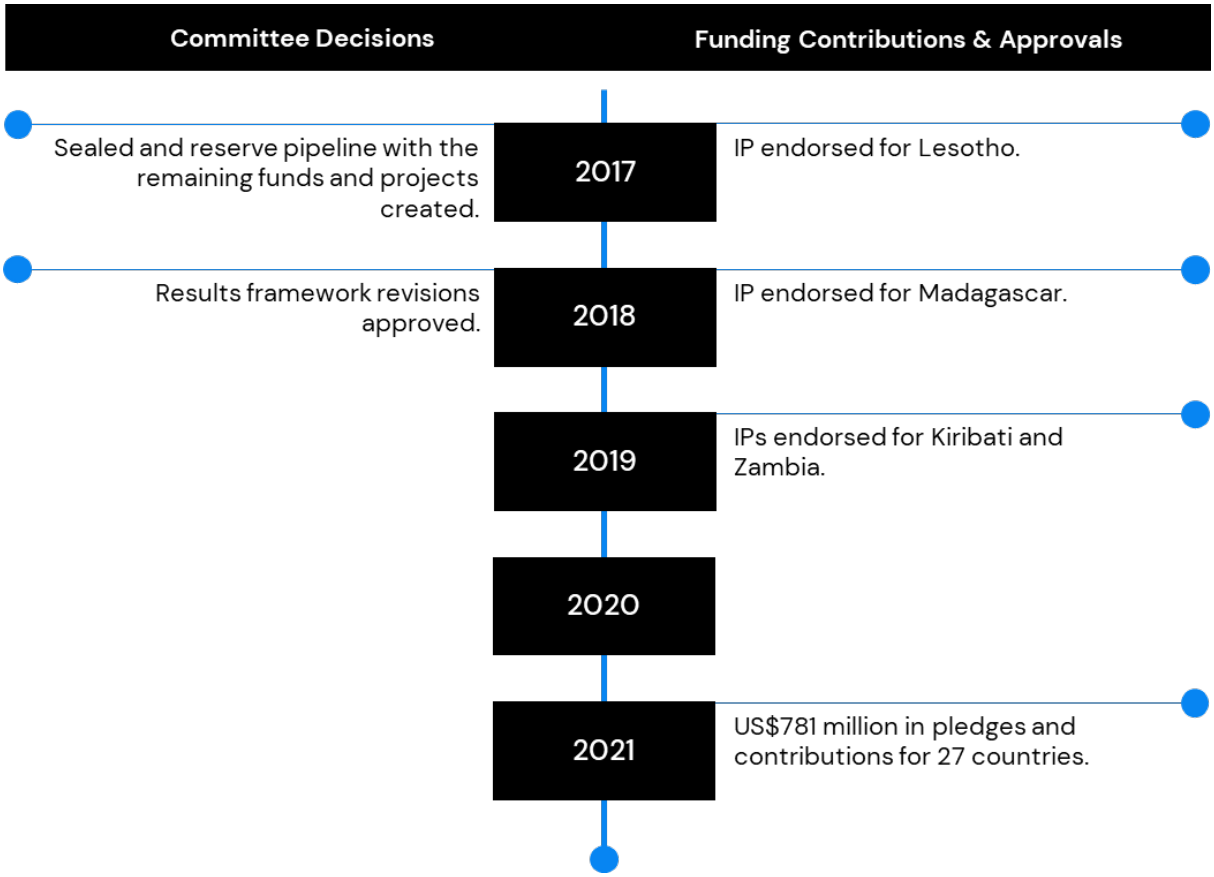
Appendix B. SREP Timeline





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Appendix C. Stakeholder Interviews

SREP Committee Members and Observers

Country / Affiliation	Name
Dominican Republic	Rodrigo Fincheira
The Gambia	Kemo Ceesay
The Netherlands	Frank van der Vleuten
Spain	Marta Mulas Alcántara
	María Presmanes Andrés
Switzerland	Daniel Menebhi
United States	Nicholas Strychacz
	Elizabeth Hearn
ActionAID	Sophie Rigg

MDB Focal Points and CIF Administrative Unit

Affiliation	Name
AfDB	Leandro Azevedo
	Kidanua Abera Gizaw
ADB	Karan Chouksey
	Christian Ellermann
IDB (formerly)	Claudio Alatorre Frenk
IFC	Andrey Shlyakhtenko
	Tendai L.C. Madenyika
World Bank	Monyl Nefer Toga Makang
	Juliet Pumpuni
	Chandrasekar Govindarajalu
CIF Administrative Unit (current and former)	Sandra Romboli
	Shane Suksangium
	Madu Selvakumar
	Zhihong Zhang
	Rafael Ben
	Jimmy Pannett

Thematic Studies

Country	Affiliation	Name	Position
Armenia	World Bank	Almudena Mateos	Senior Energy Specialist
Armenia	R2E2	Zaruhi Gharagyozyan	Project Manager
Ethiopia	IFC	Daniel Shepard	Principal Operations Officer, Infrastructure
Ethiopia	World Bank	Kenta Usui	Senior Energy Specialist
Ethiopia	EEP	Mesay Fekady Biru	Project Manager
Ethiopia	Ethiopian Energy Authority	Tesfaye Kassa Mekonnen	Director Geothermal Resource Development License and Administration Directorate
Ethiopia	Corbetti Geothermal	Helgi Leifsson	CEO
Ethiopia	TMGO	Sigurgeir Geirsson	Chief Technical Officer

Country	Affiliation	Name	Position
Iceland	Jarðhitaskóli GRÓ	Guðni Axelsson	Director, Forstöðumaður, GRÓ Geothermal Training Programme
Iceland	Reykjavik Energy	Thrainn Fridriksson	Senior Geoscientist
Kenya	World Bank	Laurencia Karimi Njagi	
		Zubair Sadeque	
Kenya	Rural Electrification and Renewable Energy Corporation (REREC)	Edward Gakunju	KEMP Project Coordinator
		Jonathan Mbugua	Accounting Officer
Kenya	AfDB	Peter Onyango	Principal Investment Officer, Capital Markets Development Division
		Daniel Gitahi Ngegwa	Senior Investment Officer
		Alemayehu Wubeshet-Zegeye	Division Manager
Kenya	Geothermal Development Company	Stephen Busieny	General Manager, Finance
		Kevin Risancho	
Lesotho	World Bank	Frederic Verdol	Senior Power Engineer
Lesotho	Ministry of Energy and Meteorology	Mathapelo Keke Silase	Project Coordinator
Nepal	World Bank	Barsha Pandey	Energy Specialist
Nepal	AEPC, MoEWRI	Rai Santosh	Senior Officer
Nicaragua	IDB	Carlos Jacome Montenegro	Senior Energy Specialist
Nicaragua	Ministry of Energy and Mines (MEM)	Santiago Bermudez	Director
Rwanda	World Bank	Chiara Rogate	Task Team Leader
Rwanda	Rwanda Development Bank	Liliane Igihozo Uwera	SPIU Coordinator
		Denis Rugamba	Project Manager REF
		Umesh Prasad	RE financing expert
Solomon Islands	World Bank	Renee Berthome	Task Team Leader
Solomon Islands	Solomon Power	Jeremy Maneipuri	Acting General Manager Capital Works and Manager Planning
Solomon Islands	Ministry of Mines, Energy and Rural Electrification	John Korinihona	Director, Energy Division
Tanzania	IFC	Andrew Mnzava	Operations Officer
Tanzania	World Bank	Jenny Maria Hasselsten	Task Team Leader TREEP
Tanzania	REA	Advera F. Mwijage	TREEP REA Program Manager
Tanzania	Tanzania Geothermal Development Company	Kato Kabaka	MD/General Manager
		Shakiru Idrissa	Business Development Director
Vanuatu and Solomon Islands and	World Bank	Mitsunori Motohashi	Senior Energy Specialist
Vanuatu	Department of Energy	Antony Garae	Director
West Africa/Regional	IFC	Yann Tanvez	Upstream Lead, Infrastructure West and Central Africa & Mini-Grids

Country	Affiliation	Name	Position
N/A	Energrow	Aaron Leopold	former CEO of AMDA and current CEO of EnerGrow
N/A / Africa Region	AMDA	Jessica Stephens	CEO
N/A	SE4ALL	Ruchi Soni	Programme Manager
N/A	World Bank	Jon Exel	Senior Energy Specialist
N/A	PowerGen	Aaron Cheng	CEO
N/A	Winch Energy	Nicholas Wrigley	CEO
N/A	UNEP	Meseret T. Zemedkun	Project Manager ARGeo
N/A	World Bank/ESMAP	Elin Hallgrimsdottir	Senior Energy Specialist
N/A	World Bank	Pierre Audinet	Lead Energy Specialist
N/A	IDB	Christiaan Gischler	Lead Energy Specialist
N/A	Think Geo Energy	Alexander Richter	Founder and Principal
N/A	IRENA	Jack Kiruja	Program Officer
N/A		Michelle Alejandra Ramirez Bueno	Program Officer

Country Case Studies

Affiliation	Name	Position
Bangladesh		
ADB	*Names of eight interviewees withheld*	
World Bank	Jari Vayrynen	Senior Energy Specialist
	Tanuja Bhattacharjee	Energy Specialist
	Joonkyung Seong	Senior Energy Specialist
Bangladesh University of Engineering and Technology	Dr. Md. Ziaur Rahman Khan	Professor
United International University	Md. Shahriar Ahmed Chowdhury	Assistant Professor and Director, Centre for Energy Research
Solshare	Syed Ishtiaque Ahmed	Principal - Engineering & Innovation
Bangladesh Solar and Renewable Energy Association	Dipal Barua	President
KfW	Mareike Schamel	Portfolio Manager, South Asia
	Tazmilur Rahman	Deputy Director
IFC	Sudipta Husain	Investment Officer, Infrastructure
USAID Bangladesh	Shayan Shafi	Senior Energy Advisor
Electricity Generation Company of Bangladesh (EGCB)	Ibrahim Ahmad Shafi Al Mohtad	Chief Engineer (P&D)
	Mohammad Anwar Hossain	Superintending Engineer
Bangladesh Rural Electrification Board (BREB)	Md. Sakil Ibne Sayeed	Project Director
	Syed Mahbubur Rahman	Director, Directorate of Program Planning
Infrastructure Development Company Limited (IDCOL)	Md. Abdullah Al Matin	
	Farzana Rahman	Unit Head (Investment), Renewable Energy
	Md. Enamul Karim Pavel	Head of Renewable Energy
	Kazi Ahsan Uddin	Asst. Vice President (Monitoring)
Sustainable and Renewable Energy Development Authority (SREDA)	Md. Tanvir Masud	Assistant Director
Honduras		
IDB-Public	Carlos Jacome	Task Team Leader
	Jorge Mercado	Task Team Leader
	Jorge Omar Samayoa	Technical Assistance (PAUE Stoves)
IDB-LAB	Fausto Castillo	Task Team Leader (ERUS Stoves)
	Anita Fiori de Abreu	Task Team Leader (H-REFF)
IDB-INVEST	Joan Carrillo	Task Team Leader (Self-Supply)
	Beatriz Briceno	Task Team Leader (Self-Supply)
	Christian Parra	Technical Assistance (Self-Supply)
UN-ECLAC	Debora Ley	Energy Access Lead
ENEE	Rosa Anatrella	Focal Point Representative
ENEE	Lucas Ramos	Manager of Transmission Company
ENEE	Rene Madrid	Director of Transmission Engineering
Previously SEFIN	Leonardo Matute	Previous Focal Point Representative (SEFIN)

Affiliation	Name	Position
FOSODE	Josue Rodriguez	Project Management Specialist
Secretary of Energy	Miguel Figueroa	Director of Electricity and Markets
System Operator (ODS)	René Barrientos	Executive Director
Regulatory Commission	Gerardo Salgado	Commissioner
Secretary of Health	Joe Ochoa	Manager Health Networks
Fundación Vida	Julissa Briceño	Executive Director
Trees, Water and People	Sebastian Africano	Executive Director
UNITEC	Wilfredo Flores	University Professor
AHER	Elsia Paz	President
AHPEE	Génesis Rodezno	Executive Director
APRODERDH	Evelyn Nunez	Executive Director
Ayuda en Accion	Dilmer Maradiga	Program Manager
Tecnosol	Loyda Alonso	General Manager
Consultant	Jairo Betancourth	Consultant (Former Manager SmartSolar)
Equinsa Energy	Abraham Riera	Sales Manager
INVEMA	Luis Cohello	Operations Manager
H-REFF	Fernando Alvarado	Fund Manager
Liberia		
AfDB	Emmanuel Maniragaba	Task Team Leader
World Bank	Ky Hong Tran	Task Team Leader
USAID	Jusu Holmes	Civil Engineer-Office of Economic Growth
GIZ	Euler Hartlieb	Manager of Energising Development
Environmental Protection Agency of Liberia (EPA)	Prof. Wilson Tarpeh (& Staff)	Executive Director
Rural and Renewable Energy Agency (RREA)	Stephen V. Potter	Deputy Executive Director/Technical
	Steven Payma	Manager World Bank SREP Project
Ministry of Mines and Energy	Prince C. Wilson	Assistant Director
	William T. Thompson	Assistant Minister for Energy
Liberia Electricity Regulatory Commission	Augustus Goanue	Managing Director
Liberia Electricity Corporation	Henry Kimber	Senior Program Coordinator
	Moses E. Farley	Director, Rural Electrification
	Paschaline Mashingaidze	International Procurement Expert
National Rural Electric Cooperative Association (NRECA)	Luis Arismendi	Chief of Party for USAID NRECA project
Mercy Corps	Emmanuel Aziebor	Previously Manager in Liberia (Now Ethiopia)
Easy Solar	Natty Davies	Country Manager
LIB Solar	Nicholai Lidow	Founder & CEO
Ecopower	Vickson Korlewala	Founder
Trust Savings Credit Union, Inc.	Thomas Demawu	General Manager
Dennis Electronic Shop	John Dennis	Owner
Kortee Business Center	David Kortee	Owner
God's Favor Business Center	Madam Alice M. Zinnah	Owner
Maldives		

Affiliation	Name	Position
Ministry of Environment, Climate Change and Technology	Ajhad Mustafa	Permanent Secretary
Ministry of Environment, Climate Change and Technology	Ahmed Ali	Energy Engineering
State Electric Company Limited (STELCO)	Ibrahim Nizam	Head of Department
	Ali Anas	Power Engineer
	Abdulla Shareef	Power Engineer
	Ali Niyaz	Power Engineer
	Abdul Malik Thoufeeg	Head of Projects Department
Renewable Energy Maldives	Ibrahim Nashid	Chairman
ADB	Jaimes Kolantharaj	Energy Specialist SARD
	Charina Apolo	Project Analyst
World Bank	Amit Jain	Senior Energy Specialist
	Chong Suk Song	Energy Specialist
	Sreyamsa Bairyganjan	Senior Climate Finance Specialist
FENACA	Abdulla Nashith	Director
Consonant Solutions PV	Mohammed Rasheed	Managing Partner
Shaviyani Atoll Council	Hamdhoon Naseeem	Assistant Executive Director
Velidhoo Council	Athif Hussain	Council Member
Hdh Kulhudhuffushi Council	Ahmed Abdulla	Council Member
Plankton Investment	Ibrahim Atif	Director
	Ali Ahmed	Project Manager
Avi Technology	Hassan Yasir	Managing Director
	Abdul – Aleam Mohamed	Project Manager
Mali		
Ministry of Mines, Energy and Water	Aminata Fofana	Directrice Général de la DNE and SREP focal point
	Adama Yoro Sidibe	Directeur Général Adjoint de la DNE
	Ousmane Alassane Maiga	
	Birama Diourte	Coordonnateur du projet PAPERM
World Bank	Yussuf Uwamahoro	Senior Energy Specialist
African Development Bank	Leandro Azevedo	SREP focal point
	Silvie Mahieu	Principal Investment Officer
	Agne Hawaly	Investment Officer
	Halidou Minkaïlou Toure	Energy Risk and PPP Specialist
	Goran Lima	Senior Operations Officer, SEFA
IFC	Nicolas Souche	Chief Investment Officer, Infrastructure
EDM-SA	Diarra Ramatoulaye Kanakomo	Chargée de Suivi & Evaluation au projet Mini-Hydro
	Tountou BALLO	Coordinateur du projet Mini-Hydro
AMADER	Bakary Bocoum	
	Sagou Tembely	Responsable administratif et financier
AER-Mali	Sanogo Cheick Ahmed	Consultant projet PAPERM
SINERGIE SA	Salifou Bengaly	DG
ACCESS	Ibrahim Togola	Président

Affiliation	Name	Position
BADEA	Mounir Benseddik	Infrastructure Specialist – PERSHY project focal point
Islamic Development Bank	Mohammed Issam Khouy	Operations Team Leader
IRENA	Adeline Duclos	Program Officer
	Job Mutyaba	Program Officer
AFD	Alice Vauleon	Project Manager
UNDP	Oumar Tamboura	Conseiller en Environnement
GIZ	Aukje Saye-de Jager	Project Director

Appendix D. Projects Included in the Thematic Studies

Geothermal Projects

Project Title	Public / Private	Country	Programming	Project / Program	Lead MDB	Status
Geothermal Sector Strategy and Regulations	Private Sector	Ethiopia	IP	Project	IFC	Closed
Olkaria VI Geothermal Power Plant	Private Sector	Kenya	PSSA	Program	AfDB	Concept Endorsed
Geothermal Exploratory Drilling Project (GEDP)	Public Sector	Armenia	IP	Project	IBRD	Closed
Geothermal Sector Development Project (GSDP)	Public Sector	Ethiopia	IP	Project	IBRD	MDB Board Approval
Menengai Geothermal Development Project	Public Sector	Kenya	IP	Project	AfDB	Closed
Nicaragua Geothermal Exploration and Transmission Improvement Program under the PINIC	Public Sector	Nicaragua	IP	Project	IADB	MDB Board Approval

Mini-grid Projects

Project Title	Public / Private	Country	Program-ming	Project / Program	Lead MDB	Status
Mini-Grids Project	Private Sector	Tanzania	IP	Project	IFC	Closed
Renewable Energy for Rural Electrification	Public Sector	Tanzania	IP	Project	IBRD	MDB Board Approval
ERUS Universal Energy Access Program (PAUE)	Public Sector	Honduras	IP	Project	IADB	MDB Board Approval
Renewable Energy and Access for All	Public Sector	Haiti	IP	Project	IBRD	MDB Board Approval
Renewable Energy for the Metropolitan Area	Public Sector	Haiti	IP	Project	IBRD	MDB Board Approval
Electricity Modernization Project	Public Sector	Kenya	IP	Project	IBRD	MDB Board Approval
Renewable Energy for Electrification in North and Center Liberia Project-Mini-Grids	Public Sector	Liberia	IP	Project	IBRD	MDB Board Approval
Liberia Renewable Energy Project	Public Sector	Liberia	IP	Project	AfDB	MDB Board Approval
Lesotho Renewable Energy and Energy Access Project	Public Sector	Lesotho	IP	Project	IBRD	MDB Board Approval
Rural Electrification Hybrid Systems	Public Sector	Mali	IP	Project	IBRD	MDB Board Approval
South Asia Sub-regional Economic Cooperation Power System Expansion Project: Rural Electrification Through Renewable Energy	Public Sector	Nepal	IP	Project	ADB	MDB Board Approval
Nepal Private-Sector-Led Mini-Grid Energy Access Project	Public Sector	Nepal	PSSA	Project	IBRD	MDB Board Approval
Renewable Energy Fund	Public Sector	Rwanda	IP	Project	IBRD	MDB Board Approval
Electricity Access and Renewable Expansion Project – 2	Public Sector	Solomon Islands	IP	Project	IBRD	MDB Board Approval
Rural Electrification Project	Public Sector	Vanuatu	IP	Project	IBRD	MDB Board Approval

Note: Shaded projects are also covered by country case studies.

Off-grid Solar PV Stand-alone Projects

Project Title	Public / Private	Country	Program-ming	Project / Program	Lead MDB	Status
Lighting Ethiopia / Clean Energy SMEs Capacity Building and Investment Facility	Private Sector	Ethiopia	IP	Project	IFC	Closed
ERUS – Solar-Powered Mobile Health Units for Honduras	Private Sector	Honduras	IP	Project	IADB	MDB Board Approval
Off-Grid Solar PV-Solar Irrigation	Public Sector	Bangladesh	IP	Project	ADB	MDB Board Approval
ERUS Universal Energy Access Program (PAUE)	Public Sector	Honduras	IP	Project	IADB	MDB Board Approval
Renewable Energy and Access for All	Public Sector	Haiti	IP	Project	IBRD	MDB Board Approval
Renewable Energy for Electrification in North and Center Liberia Project-Mini-Grids	Public Sector	Liberia	IP	Project	IBRD	MDB Board Approval
Renewable Energy Fund	Public Sector	Rwanda	IP	Project	IBRD	MDB Board Approval
Renewable Energy for Rural Electrification	Public Sector	Tanzania	IP	Project	IBRD	MDB Board Approval
Rural Electrification Project	Public Sector	Vanuatu	IP	Project	IBRD	MDB Board Approval

Note: Shaded projects are also covered by country case studies.

Appendix E. Evaluation Matrix

Sub-Questions	Indicators	Data collection and analysis methods/sources
1. RELEVANCE AND COHERENCE		
a. To what extent is the SREP design fit-for-purpose to support and align with program goals and contexts, and how have the various design and delivery elements yielded benefits or led to constraints over time? What is the overall perceived value-added of SREP as a program?		
How clearly and consistently have SREP's program goals been articulated in documentation and understood by involved stakeholders, including TC members, over time?	• Evidence of consistent understanding of SREP program goals • Evidence of evolution in the emphasis given to different SREP program goals over time	• Document review and analysis including SREP Design Document, Results Frameworks, pilot country selection process documentation, SREP TC meeting summaries and comments on investment plans and projects, SREP presentations and outreach materials • Interviews with CIF AU, MDBs, and SREP TC members
What is the overall perceived value-added of SREP as a program?	• Evidence of perceptions of SREP's value addition and evolution over time • Comparison of SREP key program features (e.g., programmatic approach, implementation through MDBs) with other funds/programs in the global climate finance architecture • Comparison of the volume of SREP finance to other energy-sector climate finance by SREP country, as measured by SEI's Aid Atlas	• Document review of SREP Design Document and design documents of other global climate funds (e.g., GCF, GEF); synthesis of existing evaluations of SREP (e.g., programmatic approach evaluation) • Data analysis of energy-sector climate finance volumes by country • Interviews with CIF AU, MDBs, and SREP TC members • Country and thematic case studies
To what extent is the SREP design fit-for-purpose for the program objective and operational context of SREP countries? How have the SREP design and delivery elements changed over time? To what extent have these elements yielded benefits or led to constraints?	• Evidence of SREP design and delivery elements (e.g., programmatic approach; size of country allocations; results framework; private-sector programs; number of pilot countries; resource, pipeline, and risk management; and engagement with GCF), and changes in these elements over time • Evidence of interaction with other CIF program delivery elements, such as the CTF and DPSP • Evidence of SREP design features, changes, and interactions contributing to efficiency, early results, and effectiveness (including changes in expectations for program results, MDB engagement, country engagement, provisions for Project Preparation Grants, expectations for mobilizing co-finance, pipeline flexibility), including in different operational contexts	• Document review and analysis including SREP Design Document, Results Frameworks, SREP TC meeting summaries and documents (e.g., on pipeline and risk management, pilot country selection methods and expert group reports, private-sector engagement) • Timeline analysis • Interviews with CIF AU, MDBs, and SREP TC members • Country and thematic case studies

Sub-Questions	Indicators	Data collection and analysis methods/sources
	• Evidence of drivers and trade-offs between program depth (larger country program allocations) and breadth (larger number of countries), and implications for effectiveness	
b. At the country level, to what extent are the strategic focus areas of SREP country programs relevant to, and coherent with, the priorities, opportunities, and related policies or interventions present within country and market contexts?		
To what extent are SREP country programs relevant to country priorities, policies, and barriers for scaling up RE and energy access?	• Evidence of alignment between SREP country programs and country priorities and policies • Evidence that SREP investments are linked to long-term sector planning, such as least-cost electrification planning • Evidence of domestic co-financing of SREP projects • Evidence that SREP country programs are designed to address key barriers for scaling up RE for energy access in the country context	• Country and thematic case study analysis
To what extent are SREP country programs coherent with MDB sector and country partnership strategies and investments?	• Evidence of renewable energy and/or energy access issues addressed in MDB sector and country partnership strategies (at time of SREP projects identification/approval, or later, showing evidence of contribution) • Evidence of allocation of IDA or IDA-equivalent resources to co-finance SREP projects • (See also Question 4(a) on SREP influence on MDBs)	• Document review of MDB county partnership strategies • Country and thematic case study analysis
To what extent are SREP country programs coherent with other development partners' programs?	• Evidence that SREP country programs are complementary to other actors' interventions and add value	• Country and thematic case study analysis
2. EFFICIENCY		
a. To what extent have program activities and investments advanced in a timely manner, in light of initial expectations and existing country/market realities? What are the major barriers or facilitating factors impacting timeliness and how could these be improved in the future?		
How efficiently have SREP activities advanced through the programming cycle, specifically: • Preparation of SREP investment plans	• Evidence of the elapsed time between program cycle milestones, including by technology, country/market context, and SREP country groups • Evidence of the extent of the pipeline that is cancelled, not under active development, or otherwise delayed	• Document review and analysis including of operational reports, risk reports, and country portfolio reports • Portfolio analysis • Benchmarking analysis

Sub-Questions	Indicators	Data collection and analysis methods/sources
• SREP TC and MDB approval of investment projects • Implementation and disbursement rates	• Evidence of the extent of SREP portfolio flagged for implementation risk, by type of risk, technology, country/market context, and MDB • Comparison of the elapsed time in project cycle for SREP projects and other MDB comparator projects	
What are the major barriers or facilitating factors impacting timeliness?	• Evidence of trends in the factors affecting timeliness in approval processes (IP endorsement, Committee approval, MDB approval) • Evidence of trends in the factors affecting timeliness in implementation, by technology, country/market context, and MDB (e.g., were these capacity related or driven by external factors such as political instability)	• Document review and analysis including of operational reports, risk reports, country portfolio reports, and MDB project implementation reports • Portfolio analysis • Interviews with CIF AU, MDBs, and Government focal points • Thematic and country case studies
b. To what extent is the SREP program cost-effective, from a value for money and additionality perspective, in relation to program goals and operating contexts?		
To what extent has SREP efficiently utilized its program resources?	• Evidence that SREP program resources are fully utilized (e.g., in IP PPG and Committee and MDB-approved projects) • Evidence of effective use of project preparation grants	• Portfolio analysis • Interviews with CIF AU, MDBs, and SREP TC members
To what extent has SREP used the most appropriate financial instruments and minimum concessionality?	• Evidence of trends in the use of financing instruments in SREP (e.g., by technology, country/market context, MDB) over time • Evidence of trends in the concessionality of SREP resources (e.g., by technology, country/market context, MDB) over time • Evidence that trends in financing modalities and concessionality are consistent with needs and principles, including in different operational contexts	• Portfolio analysis • Document review and analysis of comments on project proposals submitted for TC approval • Interviews with CIF AU, MDBs, and SREP TC members • Thematic and country case studies
To what extent has the SREP program been cost-effective, in relation to program goals and operating contexts?	• Evidence of co-financing mobilized (at IP endorsement and actual), by source of co-finance, technology, country/market context, MDB, financing modality • Evidence of reasons for changes in co-financing mobilized between IP endorsement and MDB approval • Comparison of targeted/achieved results (e.g., MW, improved access, GHG emissions reduced or avoided) to program/investment cost (inclusive of administration and implementation costs)	• Portfolio analysis • Benchmarking analysis • Interviews with CIF AU, MDBs, and SREP TC members

Sub-Questions	Indicators	Data collection and analysis methods/sources
	• Comparison of SREP cost-effectiveness to other similar investments outside of SREP, including MDBs	
c. How have CIF institutions and organizational relationships, including between the CIF Administrative Unit and MDBs, and between MDBs and recipient countries or private-sector institutions, influenced efficiency of operations and the use of concessional funds, including financing modalities and the leveraging of co-financing from governments and private-sector?		
How have CIF institutions influenced efficiency and use of concessional funds, including financing modalities and co-financing?	• Evidence of CIF institutional agendas and relationships influencing the use of different financing modalities (e.g., projects programmed through IPs, PSSA, and DPSP) • Evidence of CIF institutional agendas and relationships influencing the extent of co-finance, including from MDBs, government, and private sector	• Interviews with CIF AU, MDBs, SREP TC members, and Government focal points • Thematic and country case studies
3. EARLY RESULTS AND EFFECTIVENESS		
a. What are the major achievements of the program so far, including progress on intended results vis a vis the Results Framework as well as unintended (positive and negative) results?		
What are the major results achieved so far, and to what extent are they additional and represent value in relation to the size and scale of the program?	• Evidence of trends in progress toward intended results in the Results Framework, including by on-grid/off-grid, country/market context, and MDB • Evidence of scale of outcomes relative to program size and activities	• Document review and analysis, including of SREP operational and results reports, MDB results reporting, GDI and other external studies of SREP projects, and other past E&L studies • Interviews with CIF AU, MDBs, and Government focal points • Thematic and country case studies
What are the different types and levels of outcomes for different types of technologies or approaches (e.g., grid-connected renewable energy, mini-grids, household energy solutions, geothermal energy, etc.)?	• Evidence of trends results by technology or approach, for Results Framework outcomes and for common technology or approach-specific outcomes and intermediate outcomes (e.g., GHG emissions reduced, number of wells drilled, legal/regulatory changes)	• Document review and analysis, including of SREP operational and results reports, MDB results reporting, GDI and other external studies of SREP projects, and other past E&L studies • Portfolio analysis • Interviews with CIF AU, MDBs, and Government focal points • Thematic and country case studies

Sub-Questions	Indicators	Data collection and analysis methods/sources
What unintended results (positive or negative) have been achieved so far?	• Evidence of other major achievements or unintended results	• Document review and analysis, including of SREP operational and results reports, MDB results reporting, GDI and other external studies of SREP projects, and other past E&L studies • Interviews with CIF AU, MDBs, and Government focal points • Thematic and country case studies
b. What are the main lessons emerging from the implementation and results of the SREP program so far, and in what ways are these relevant to current and future programming in CIF/SREP as well as in other related funds and institutions?		
What factors explain the trends in results achievement in SREP so far? What other lessons emerge from SREP implementation to date? And what are their relevance to current and future programming?	• Evidence of trends in common challenges (including COVID-19) and enabling factors for advancing SREP implementation, including by technology and country/market context • Evidence of the relationship between broader market and institutional (e.g., MDB) trends and SREP progress toward results • Evidence of other main lessons from SREP implementation and results, including related to defining and measuring results • Evidence of relevance to current and future programming (e.g., issues with variable renewable energy grid integration, cross-fund collaboration)	• Document review and analysis, including of SREP operational and results reports, MDB results reporting, GDI and other external studies of SREP projects, and other past E&L studies • Portfolio analysis • Literature review • Interviews with CIF AU, MDBs, and Government focal points • Thematic and country case studies
4. EMERGING INDICATIONS OF IMPACT AND SUSTAINABILITY		
a. To what extent are there early indications of impact in specific areas or regions in addition to broader institution, market and country (and/or regional or global) systems?		
To what extent are there emerging signals of transformation in the way energy is produced and distributed/accessed in institutions, markets, countries, or wider systems?	• Evidence of emerging (or advanced) signals of relevance, systemic change, scaling, speed, and/or adaptive sustainability and SREP contributions to these signals • Evidence of the follow-on effects of SREP first-mover investments • Evidence of SREP contribution to observed trends in pilot countries reporting results to date, such as increases in renewable energy generation, number of people with energy access, and improvements in RISE indicators • Evidence of SREP's influence on MDBs' investments in renewable energy and energy access in low-income countries over time	• Country case studies, applying the transformational climate action dimensions and signals framework, and using contribution analysis • Thematic studies • Document review of MDB climate and energy strategies and plans, relevant MDB evaluations, and external studies of the MDBs' energy investments and trends • Interviews with CIF AU, MDBs, and SREP TC members

Sub-Questions	Indicators	Data collection and analysis methods/sources
	(e.g., corporate trends in investment volumes in renewable energy, off-grid energy, and energy access; contributions to learning about "what works"; other MDB investments in SREP countries on similar or complementary issues, showing evidence of learning from SREP investments; etc.)	
b. What are the major co-benefits of SREP investments in supporting the Sustainable Development Goals (SDGs), including cross-cutting themes such as gender, equity of access, just transitions, economic growth, jobs, and private-sector engagement, and what lessons or insights can be derived in these areas?		
What are major co-benefits of SREP investments related to the SDGs, and how do these trends vary by technology, country/market context, and delivery model?	• Evidence of social and economic benefits of SREP projects (targeted and achieved), including related to gender, equity of access, just transition, economic growth, jobs, and private-sector engagement • Evidence of trends in co-benefits by project focus (e.g., access, RE generation, enabling, on-grid, off-grid), technology, country/market context, and delivery model (e.g., IP or PSSA programming)	• Document review and analysis, including of SREP operational and results reports, MDB results reporting, GDI and other external studies of SREP projects, and other past E&L studies • Portfolio analysis • Data from parallel CIF E&L efforts, including the portfolio data-driven economic modeling for estimating co-benefit impacts and the development impacts evaluation • Thematic and country case studies
What factors have helped or hindered the achievement of co-benefits in SREP investments? What lessons can be learned?	• Evidence of factors influencing co-benefits in SREP investments, including COVID-19	• Document review and analysis, including of SREP operational and results reports, MDB results reporting, GDI and other external studies of SREP projects, and other past E&L studies • Interviews with CIF AU, MDBs, and Government focal points • Thematic and country case studies
c. What is the likelihood of the sustainability of emergent impacts, based on early indications and current trends, and how has SREP affected these potential trajectories? What are the major risks and facilitating factors going forward?		
What is the likelihood of the sustainability of emergent impacts?	• Evidence of sustainability or factors supporting sustainability in SREP investments	• Document review and analysis, including of SREP operational and results reports, MDB results reporting, GDI and other external studies of SREP projects, and other past E&L studies • Interviews with CIF AU, MDBs, and Government focal points • Thematic and country case studies
What are major risks for sustainability?	• Evidence of risks to sustainability (e.g., barriers that SREP or complementary investments have not addressed, emerging indications of regression or unsustainable business models), including COVID-19	

Appendix F. History of SREP M&R System Revisions

In October 2010, the CTF logic model was adopted by the SREP Sub-Committee as the initial basis for the programmatic theory of change, capturing the program outputs, outcomes, and impacts. It was suggested that this be subsequently updated to broaden the country-level outcomes and include results statements on the SREP's role as a pilot to learn from its operations. It was also suggested that the results statement be updated to include "increased energy security" as a better reflection of the socioeconomic dimensions of the SREP program.

In 2010, an initial SREP results framework was also drafted to include 13 national-level indicators and nine project/program indicators.[82] These indicators provide a useful insight into the original program design. The initial framework was developed as a living document to be tested with the initial country programs. Impact and SREP Catalytic and Replication Outcomes at the country level were as follows (to be used as needed according to country programming):

- Percentage (%) share of energy services from modern, renewable, low-carbon sources
- Percentage (%) of population (rural/urban) consuming energy services from RE sources (country level) (women/men)
- Level of household "energy poverty"
- Change in the Energy Development Index
- Percentage (%) of RE investment of total energy sector investment
- Percentage (%) of private-sector RE investments of total energy investments
- Adoption and implementation of low-carbon energy development plans
- Enactment of policies, laws, and regulations for renewable energy
- Change in percentage (%) of total investment in RE sector from private sector
- Change in percentage (%) of total energy employment working in RE (women/men)
- Cost of RE $/MWh compared to cost of fossil fuels $/MWh
- Increase in percentage (%) of total energy supply from RE sources in the power industry and in the energy sector
- Prevalence of Acute Respiratory Infections (in children under 5 years) (rural/urban)

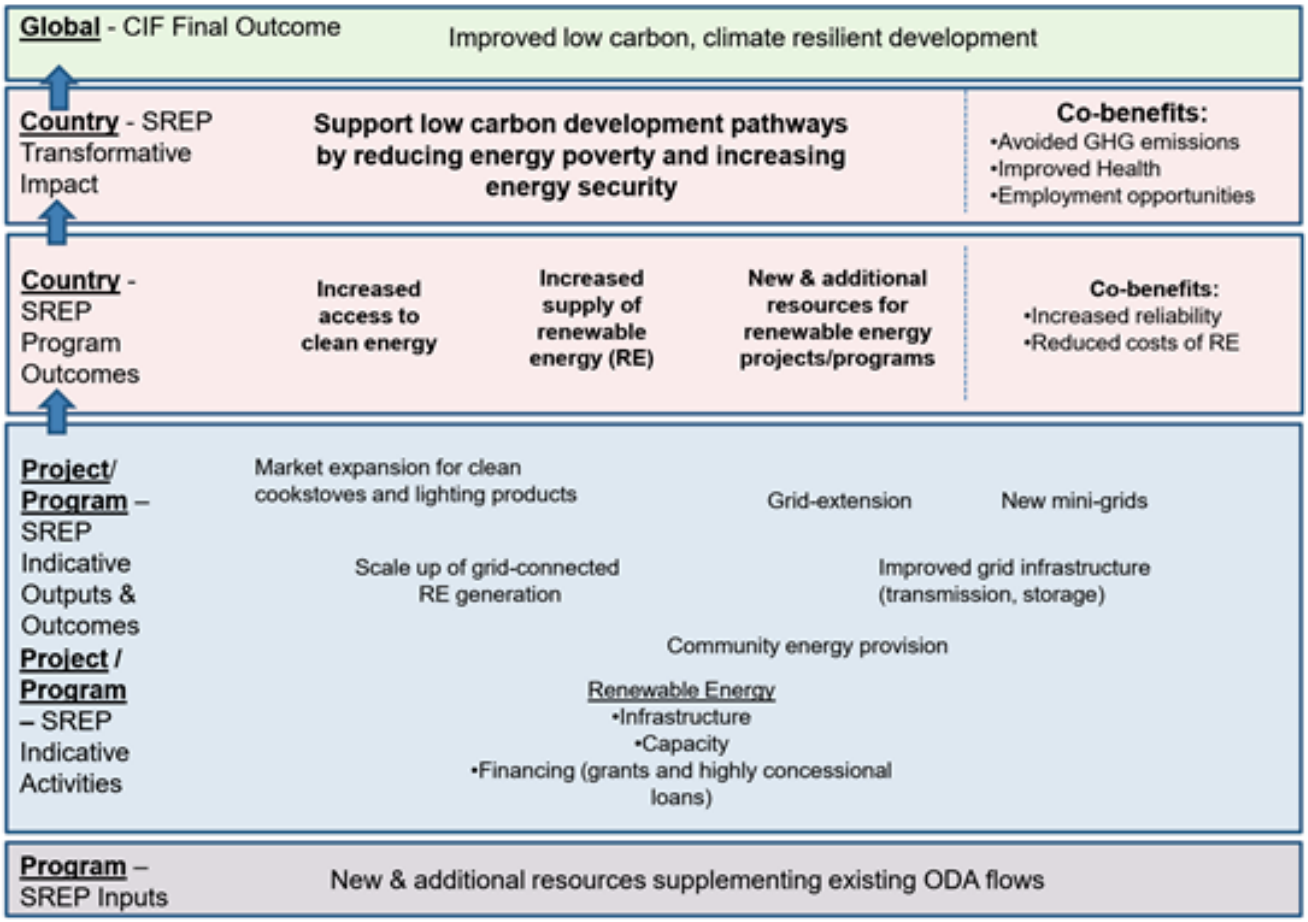
Nine additional project output and outcome indicators were mandatory for reporting by MDBs:

- Percentage (%) change in number of project beneficiaries with access to energy services from RE
- Percentage (%) change in number of GWh from RE and per capita
- Number of jobs (women and men) in RE services created
- Percentage (%) in tons (millions) of CO2 equivalent mitigated and $ cost per ton
- Percentage (%) change in $ cost/GWh of renewable energy for project beneficiaries grid-connected
- Number and type of knowledge assets (e.g., publications, studies, platforms, learning briefs, communities of practice, etc.) created
- Number of non-SREP countries replicate SREP project approach (e.g., investment documents citing SREP pilot project documents)
- Evidence of use of knowledge assets
- Leverage factor of SREP funding; $ financing from other sources (contributions broken down by MDBs, governments, multilaterals and bilaterals, CSOs, private sector)

[82] Climate Investment Funds (2010). SREP/SC.4/7. Program for Scaling Up Renewable Energy in Low Income Countries Results Framework. Meeting of the SREP Sub-Committee, 25 October 2010.

In 2012, the logic model was substantially updated and simplified (Figure 12), reflecting experience of piloting in the initial six countries, the emerging operational priorities of SREP, and associated changes to the SREP results framework. There was a new country-level impact statement. This revised logic model reduced the number of outcomes while making access more prominent as a program objective, while reclassifying some outcomes as co-benefits (e.g., health, reliability, affordability, employment).

Figure 12. Revised SREP Logic Model (2012)



Source: CIF (2012). Revised SREP Results Framework.

Discussions at the SREP Sub-Committee level during 2012 also indicated a desire to ensure a balance between different scales and types of programs (productive uses vs. access) within the investment plans. At the same time, SREP was developing its PSSA facility as part of the wider CIF private-sector mobilization strategy. Although not reflected in the above logic model, this reflected a focus on the role of the private sector from the original 2009 design documents and subsequent operational strategy.

Alongside a new logic model, it was proposed that the SREP results framework also be simplified. This recognized both the complexity of the original framework from a practical implementation perspective as well as the learning from the operational focus of SREP country investment plans (in which access, community energy systems, and markets were playing a more substantial role than had been the case in the CTF logic model). The following indicators were identified (Figure 13). Because funding to SREP is classified as "climate finance," it was also proposed that the SREP results framework include a measure of the GHG emissions co-benefits associated with an increased supply of renewable energy at the outcome level. A methodology was subsequently developed based on that agreed by the MDBs.

Figure 13. SREP Program Indicators (2012)

SREP Core Indicator 1: Annual electricity output from renewable energy, as a result of SREP interventions (MWh) **SREP Core Indicator 2:** Number of women and men, businesses, and community services benefitting from improved access to electricity and fuels, as a result of SREP interventions (number of beneficiaries)
SREP Co-Benefit Indicator 1: Increased public and private investments in targeted subsectors as a result of SREP interventions (developed per project) **SREP Co-Benefit Indicator 2:** Gender impact (developed per project) **SREP Co-Benefit Indicator 3:** GHG emissions avoided (developed per project) **SREP Co-Benefit Indicator 4:** Other development co-benefits, such as health (improved health and decreased air pollution), livelihoods (income generation, temporary and long-term employment), energy reliability, economic viability (renewable energy cost reduction, improved renewable energy policy and regulatory frameworks

Source: CIF (2012). SREP/SC.8/4. Follow-Up to SREP Revised Results Framework. Meeting of the SREP Sub-Committee, 31 October 2012. Istanbul, Turkey.

Subsequently revisions to the SREP results framework were approved by the SREP Sub-Committee in June 2018. This was completed following a stocktaking of the operations of the SREP results framework between 2014 and 2017, which found that SREP indicators are not as suitable and effective in geothermal and enabling environment projects as in SREP projects focusing on direct generation of renewable energy. It also found that indicators on energy access were not capturing the full benefits of energy services alongside electricity connection. There were two new core indicators: co-financing leveraged by SREP projects and installed capacity (MW).[83] The revised core indicators were as follows:

- Core indicator 1: Annual electricity output (megawatt hours per year, MWh/yr) from renewable energy as a result of SREP interventions
- Core indicator 2: Number of people, businesses, and community services benefiting from improved access to electricity and other modern energy services as a result of SREP interventions
- Core indicator 3: Increased public and private investments in targeted subsectors as a result of SREP interventions
- Core indicator 4: Installed capacity (megawatt, MW) from renewable energy as a result of SREP interventions

In addition, there was a set of co-benefit indicators, updating the existing co-benefit indicators and in particular introducing an indicator on strengthened policy and regulatory environment for renewable energy:

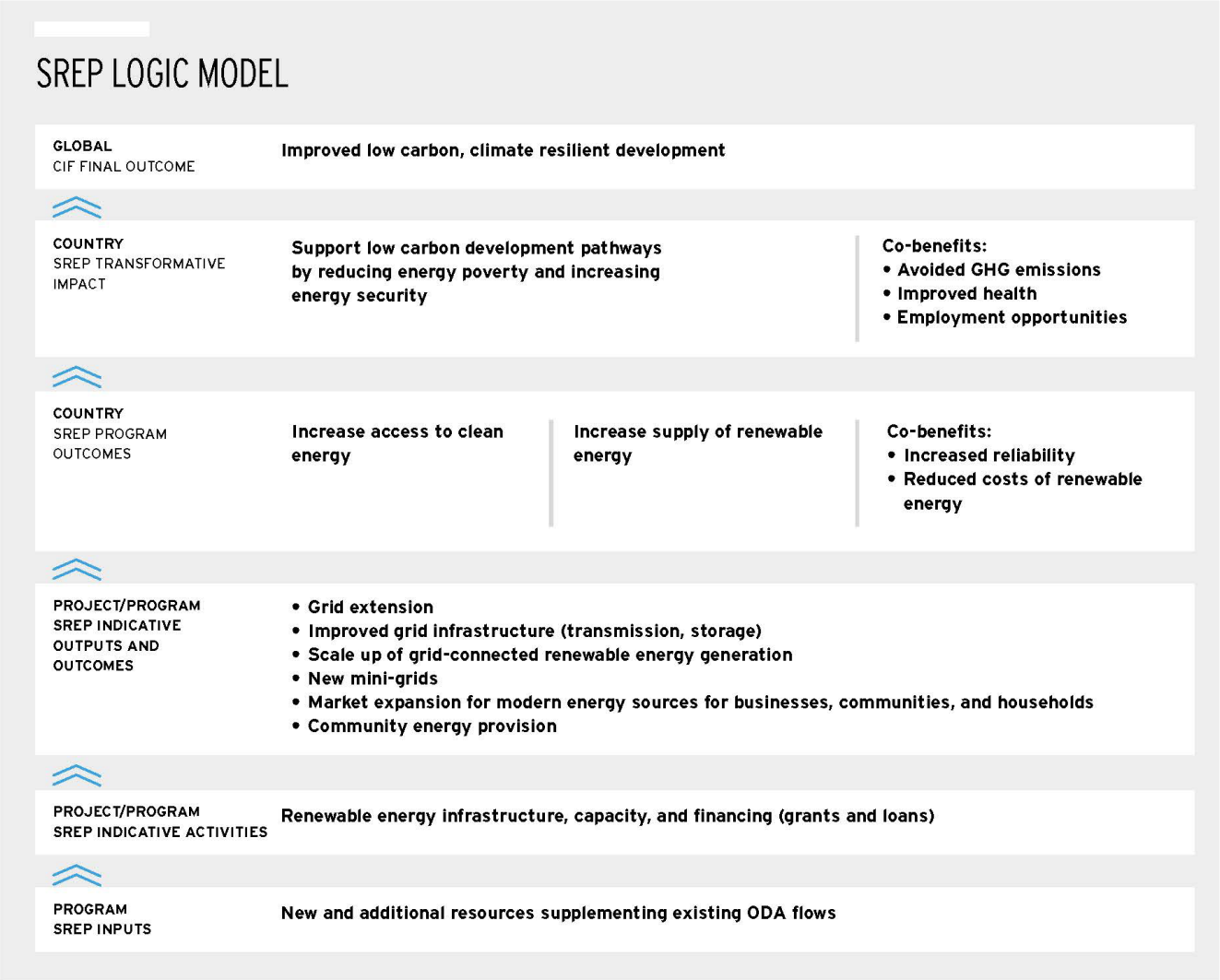
- Co-benefit indicator 1: Increased/strengthened regulatory, institutional, and policy frameworks to support the use of renewable energy
- Co-benefit indicator 2: Gender impact indicator
- Co-benefit indicator 3: GHG emissions avoided
- Co-benefit indicator 4: Other development co-benefits such as health (improved health and decreased air pollution), livelihoods (income generation, temporary and long-term employment),

[83] For a full overview, see CIF (2018). SREP/SC19.5. Stocktaking Review of SREP Monitoring and Reporting System. Meeting of the SREP Sub-Committee, 16 May 2018.

energy reliability, economic viability (renewable energy cost reduction, improved energy policy and regulatory frameworks)

The SREP Logic Model was also updated through the stocktaking, as shown below.

Figure 14. SREP Logic Model (2018)



Source: CIF (2018). SREP Monitoring and Reporting Toolkit: SREP Scaling Up Renewable Energy in Low Income Countries Program.