



Piloting a Standardized Crediting Framework for Scaling Up Energy Access Programs

Lessons Learned Note

Rwanda Pilot

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Executive Summary

The Standardized Crediting Framework (SCF) is an initiative by the Carbon Initiative for Development (Ci-Dev) to enhance carbon market support to energy access programs and to facilitate the transition of the project pipeline under the Clean Development Mechanism (CDM) to the new regulatory framework of the Paris Agreement, as well as provide relevant inputs and lessons learned into the ongoing negotiations of Article 6 (Ci-Dev 2019; Spalding-Fecher et al. 2016). The SCF follows years of work by Ci-Dev and partners to reduce carbon market transaction costs and increase country ownership for energy access carbon market programs. The SCF therefore provides for a host country-led approach to crediting that simplifies scaling-up and replication of project activities within defined sectors of the economy – starting with energy access – as well as a potential transition to sectoral or sub-sectoral approaches to crediting emission reductions that go beyond the current CDM Programme of Activities (PoA) model.

The SCF concept includes, among other improvements, the following elements:

- **Standardized emission reductions** – more of the parameters for both baseline and project emissions are standardized, to reduce the MRV costs and align the monitoring requirements with the typical business activities. For example, program proponents are mainly required to monitor activity levels (e.g. operational devices and consumption), while the conversion of this activity to emission reductions is largely standardized and includes country-specific default factors.
Simplified project cycle – The boundary of the program is determined by tracking all units rather than “including” new components (i.e. as in the CDM PoA process), which eliminates this step in the project cycle. In addition, the SCF builds on earlier proposals for streamlining the project cycle by eliminating the validation step and combining verification of the project design and project performance into a single ex-post third party audit of program performance and compliance with eligibility criteria.
- **Streamlined approaches** – The SCF uses a positive list approach to additionality for various energy access technologies, supported by transparent and objective eligibility criteria. Templates and clear guidance for “listing” (i.e. similar to registration), monitoring and verification reduce the time and costs associated with these steps in the project cycle.
- **National governance** – As a host-country led approach, the SCF has a national “Governing Board” –led by the key climate change ministry – supported by a Technical Committee (i.e. to provide technical advice on the rules) and an Administrator (i.e. for day-to-day implementation of the rules). In implementing the national governance and administrative functions, the SCF pilot establishes efficient structures to minimize the administrative and financial burdens on governments, while ensuring transparent decision-making. This is done by building on existing national structures that oversee climate change projects and policies.

The rules and detailed guidance on eligible activities for Article 6 under the Paris Agreement have yet to be agreed. The SCF is therefore designed to be “instrument neutral”, which means that the concept itself could fit under Article 6.2 and/or Article 6.4. To implement either of these approaches, however, Rwanda would need an institutional procedure to authorize the transfers of mitigation outcomes under the Paris Agreement, as well as to make sure that

all technical aspects of the SCF (e.g. baseline setting, etc.) meet the relevant Paris Agreement requirements. These issues will need to be addressed after the current pilot.

Ci-Dev initiated two pilots of this concept in Senegal and Rwanda. The Rwanda pilot covered improved cookstoves, building on the Inyenyeri improved cookstove program. This “Lessons Learned Note” reviews the experience of the pilot so far and draws a comparison between the CDM and the SCF, highlighting differences in procedures for each step of the pilot phase. This comparison is limited by the fact that the Inyenyeri improved cookstove program had already been developed as a CDM PoA, so much of the program development work was complete, and because the CDM first monitoring and verification phases are still ongoing. Nevertheless, assessing the time and costs so far in the early stages of the project cycle, as well as the process of setting up this “country-led” crediting approach, provides important lessons and highlights opportunities.

The SCF process saved several years of process time in comparison to the CDM process, and even for new programs under the SCF it would be unlikely the program preparation would take more than six months. Just in the phases up to registration/listing, the cost savings were more than \$180,000 for one program. These are almost 50% greater than the entire set-up cost of the SCF pilot (\$120,000). Even if additional programs require some support for project development, the savings are substantial compared to the CDM, and could also be significant during monitoring and verification.

In addition to process time and cost savings, there are additional cross-cutting lessons from the Rwanda pilot that can inform the design and implementation of similar schemes in other countries. Firstly, while the host country responsibility is much greater for a scheme such as the SCF, so is the engagement of local stakeholders and the potential for country ownership. Greater use of domestic expertise, such as local auditors, can further reduce costs and build capacity for climate change mitigation. Secondly, developing efficient and simple rules and templates requires substantial and ongoing interaction with program proponents, but this leads to greater understanding, ownership, and success. This methodological work will require funding and technical assistance. Increasing engagement with local technical experts early in the process, and keeping them on board, can support this goal. Thirdly, engaging local verifiers in the future would require developing an accreditation standard for the SCF in Rwanda. The challenge for a national accreditation process, beyond the costs and technical issues involved, is the credibility of the system within international trading, so this should be considered carefully.

The SCF pilot also provides important lessons on process – particularly how to use each stage of the process to prepare stakeholders for future steps and how to create momentum in the planning and implementation of the pilot – as detailed in this note. The SCF will need a sustainable source of financing and institutional capacity: continuity of the governance structure will require sufficient resources to continue their work and further expand the SCF to other sectors. Ensuring sufficient capacity to manage the SCF process beyond the pilot will also require additional trained staff in the Administrator. This also implies the need for a dedicated funding for staff and experts overseeing the crediting program. Rwanda and their partners should explore other financing sources, which might include some form of “share of proceeds” and well as external donor support.

One purpose of supporting a second SCF pilot was to identify lessons from working in a different country, different technology area and with a different type of program proponent (e.g. public vs private sector). The most significant difference between the two pilots is in the MRV process. In Rwanda, not only did the program proponent do all of the primary data collection, but the requirements for the SCF were designed such that they were almost the same as the requirements for their own business model. The result was a faster, lower cost and more accurate monitoring and verification process. The Rwandan pilot also incorporated some process improvements based on Senegal's experience, such as earlier engagement on technical and institutional issues with government and technical experts. At the same time, a process element that took more time was the request by the Rwandan government to have a Memorandum of Understanding (MoU) with the World Bank to clearly identify roles and financial responsibilities for different aspects of the pilot. In retrospect, this helped clarify the government's role and made it easier to move forward with the pilot. This could therefore be considered as something that is done prior to the first mission of a future pilot. If a draft of the MOU were ready prior to the first mission, the terms could be agreed during that initial mission and would not cause delays in the launch of the pilot.

A near term priority should be to begin to plan how international transfers might be authorized by the Rwandan government, and whether this may require the adaptation of the SCF governance structures or institutional arrangements. This also relates to another key technical and methodological challenge, which is the link to Rwanda's NDC pledges. While there is agreement among many experts that a host country's NDC pledge should be incorporated into the baseline for crediting, how this can be done in practice is not at all obvious. Perhaps the most important lesson here is the need for supporting host countries in clarifying their NDC pledges and developing more detailed implementation strategies, so that linkages will be clearer.

Based on the lessons learned from both the Rwandan and Senegalese pilots, this note suggests next steps in four additional areas:

- for the current Rwanda cookstove pilot: in addition to considering additional monitoring periods, the priority would be to address the governance of international transactions by the Rwandan government. In addition, a key technical issue that these authorities will need to address is the fact that the emissions reductions attributed to the cookstove programs, which are considered to be "energy sector" actions in the NDC, will not show up in the energy sector GHG inventory.
- for additional cookstove programs that could be incorporated in the Rwandan pilot: The SCF could be an opportunity for a wider group of implementing agents – with a wider range of business models, technologies and MRV approaches – to benefit from carbon finance in the future. A key question would be how to fund this process.
- for possible expansions of the SCF into other sectors in Rwanda: expanding into other sectors within Rwanda could also increase impact and generate important experience. An obvious choice for another technology would be electrification, since the Senegalese pilot developed a workable set of methodology, templates, forms and calculation tool for this type of program. More broadly, Rwanda may want to focus on sectors and technologies with high development impacts, and not simply those with the greatest mitigation potential.

- for replication of the SCF in additional countries: An expansion of the SCF to other countries could start with countries that share similar ongoing programs (e.g. electrification or improved cookstoves).

The SCF is one of the first pilot programs internationally for potential carbon crediting under the Paris Agreement. It is an attempt to build on the lessons from the CDM and incorporate many of the proposals for simplification and streamlining into the next generation of crediting mechanisms, as well as to build the domestic institutional framework for crediting under the Paris Agreement. The SCF also provides an option for existing CDM PoAs to transition to a new framework that could potentially be compatible with Article 6 trading. The Rwanda pilot on improved cookstoves has demonstrated that, even when considering the time and cost to set-up a new scheme, significant savings are possible compared to the typical CDM process. While the host country's responsibility is much greater for a scheme such as the SCF, so is the engagement of local stakeholders and the potential for country ownership.

At the same time, the SCF pilot is only the starting point. The Rwanda experience highlights the additional capacity building and stakeholder engagement that will need support for new crediting mechanisms to be successful in the long run. Building institutions and expertise is a long-term process and one that needs dedicated financial support – national and international – for skills development, technical capacity and administration. Not only can the expansion of the SCF within Rwanda contribute to building essential capacity for mitigation, but additional pilots – covering other countries, sectors, and technologies – can support the evolution of the global carbon market and the functioning of the Paris Agreement.

1. Introduction

1.1 Background and purpose of this note

The Standardized Crediting Framework (SCF) is an initiative by the Carbon Initiative for Development (Ci-Dev) to enhance carbon market support to energy access programs and to facilitate the transition of its project pipeline under the Clean Development Mechanism (CDM) to the new regulatory framework of the Paris Agreement, as well as provide relevant inputs and lessons learned into the ongoing negotiations of Article 6 (Ci-Dev 2019; Spalding-Fecher et al. 2016). The SCF follows years of work by Ci-Dev and partners to reduce carbon market transaction costs and increase country ownership for energy access carbon market programs. The SCF therefore provides for a host country-led approach to crediting that simplifies scaling-up and replication of project activities within defined sectors of the economy – starting with energy access - as well as a potential transition to sectoral or sub-sectoral approaches to crediting emission reductions that go beyond the current CDM Programme of Activities (PoA) model. Importantly, it gives a role to host country governments and institutions in overseeing and implementing the crediting approach, recognizing the link between crediting and the implementation of NDCs and the relevance of host countries to be able to define crediting modalities suitable to their national and sectoral circumstances. Furthermore, the SCF concept incorporates a simplified approach to the project cycle, baselines and monitoring, which can lower transaction costs and increase flexibility.

To demonstrate proof of the concept, Ci-Dev initiated two *pilots* of this concept in Senegal and Rwanda¹. The Rwanda pilot focused on the improved cookstoves, building on the Inyenyeri improved cookstove program. The SCF Pilot is a “simulation” (i.e. no units are issued or traded), initially building on the ongoing CDM activities in Rwanda and testing arrangements that have minimal incremental costs, so that Rwanda can gain experience with potential approaches to carbon and climate finance while the rules for these mechanisms under the Paris Agreement are still being developed.

This Lessons Learned Note reviews the experience of the pilot and draws a comparison between the CDM and the SCF, highlighting the difference in procedures for each step of the pilot phase. This comparison is limited by the fact that the Inyenyeri program had already been developed as a CDM PoA, so much of the program development work was complete, and because the CDM’s first monitoring and verification phases are still ongoing. Nevertheless, the time and cost savings evident in the early stages of the project cycle, as well the process of setting up this “country-led” crediting approach, provide important lessons and highlight opportunities.

The pilot phase of the SCF in Rwanda will finish in February 2020, at which point the Rwandan government can decide on its future scope and role within the country. Moreover, the Ci-Dev may decide whether and how to expand the piloting of SCF activities in other sectors or countries. With this in mind, there are important lessons – beyond the cost and time savings outlined above – that can be drawn from the Rwandan SCF experience. These

¹ For lessons from the Senegal Pilot, see Spalding-Fecher, et al. (2019).

can inform both the expansion of the SCF in Rwanda and the design and implementation of it in other countries. Additionally, given that the SCF has now been piloted in both Senegal and Rwanda, lessons can be drawn by comparing the experiences of the scheme in each.

1.2 The SCF concept

Compared to existing crediting under the CDM, the SCF includes, among other improvements, the following elements:

- **Standardized emission reductions** – more of the parameters for both baseline and project emissions are standardized, to reduce the MRV costs and align the monitoring requirements with the typical business activities. For example, program proponents are mainly required to monitor activity levels (e.g. new connections and consumption), while the conversion of this activity to emission reductions is largely standardized and includes country-specific default factors.
- **Simplified project cycle** – The boundary of the program is determined by tracking all units rather than “including” new components (i.e. as in the CDM PoA process), which eliminates this step in the project cycle. In addition, the SCF builds on earlier proposals for streamlining the project cycle by eliminating the validation step, and rather combining verification of the project design and project performance into a single ex-post third party audit of program performance and compliance with eligibility criteria.
- **Streamlined approaches** – The SCF includes a positive list approach to additionality for various energy access technologies (i.e. based on the CDM small scale rules), supported by transparent and objective eligibility criteria. Templates and clear guidance for “listing” (i.e. similar to registration), monitoring and verification reduce the time and costs associated with these steps in the project cycle.
- **National governance** – As a host-country led approach, the SCF has a national “Governing Board” (GB) – in Rwanda’s case, led by the Ministry of Environment – supported by a Technical Committee (i.e. to provide technical advice on the rules) and an Administrator (i.e. for day-to-day implementation of the rules). In implementing the national governance and administrative functions, the SCF has established efficient structures to minimize the administrative and financial burdens on national government, while ensuring transparent decision-making. This is done by building on existing national structures overseeing climate change projects and policies.

Importantly, these features foster greater host country ownership of new mechanisms, even though host countries do not necessarily have sole discretion to decide on their crediting approach.

The rules and detailed guidance on eligible activities for Article 6 under the Paris Agreement have yet to be developed. The SCF is designed to be “instrument neutral”, which means that the concept itself could fit under Article 6.2 and/or Article 6.4. Under Article 6.2, the transferring and acquiring countries must ultimately agree on a cooperative approach consistent with UNFCCC guidance, whereas under the Article 6.4 mechanism, the Supervisory Body would need to approve the SCF components as part of the crediting mechanism rules. To implement either of these approaches, however, the Rwanda would need an institutional procedure to authorize the transfers of mitigation outcomes, as well as to make sure that all technical

aspects of the SCF (e.g. baseline setting, etc.) met the relevant Paris Agreement requirements. These issues will need to be addressed after the current pilot.

The proposed simple and robust design of the SCF goes hand in hand with the focus on energy access technologies, and methodological approaches based on consumption of energy services (i.e. as opposed to the larger scale supply of these energy sources). By developing the concept of an SCF initially for energy access, and activities that would be considered automatically additional, greater simplification is possible while still ensuring environmental integrity. Similar standardized approaches could be possible in other sectors, although which elements are included would depend on the technical and financial characteristics of the technologies covered (e.g. the potential to create positive lists for additionality).

1.3 The SCF Pilot in Rwanda

The SCF Pilot in Rwanda started in April 2018 with a “pilot set up” phase, during which a team of international and local consultants worked with the Rwandan Environment Management Authority (REMA) to develop and approve the rules, guidelines and templates for the pilot (see Figure 2). After discussion of different governance options and key methodological issues, these rules – in the form of a “Program Protocol”, methodology, and series of templates – were approved by the GB in November 2018. The governance structures are shown in Figure 1. The GB includes not only key government actors but also a leading NGO. Civil society and private sector representatives are also included in the Technical Committee (TC).

Figure 1. Rwanda SCF Pilot governance

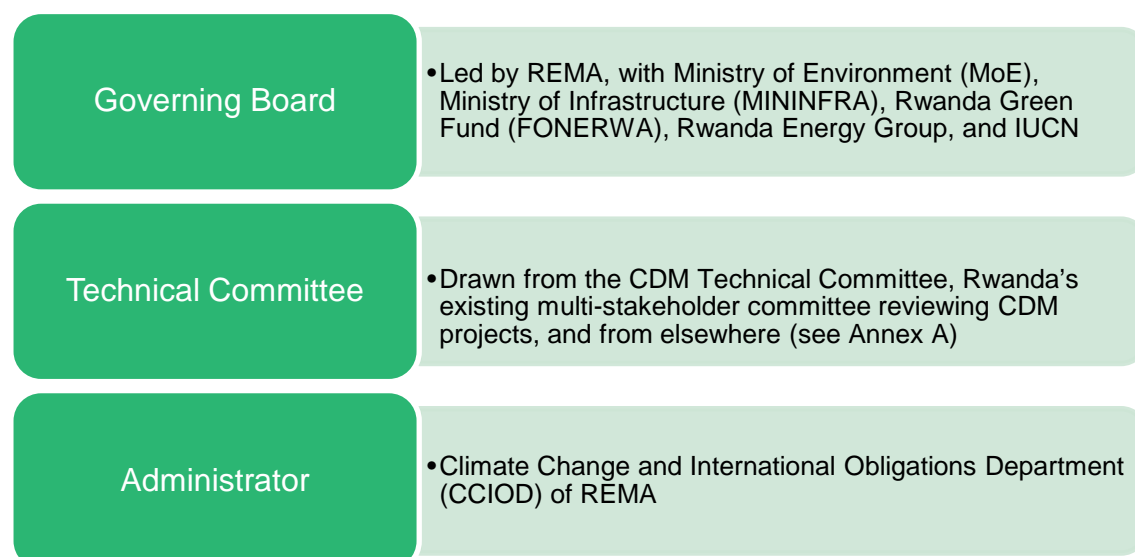
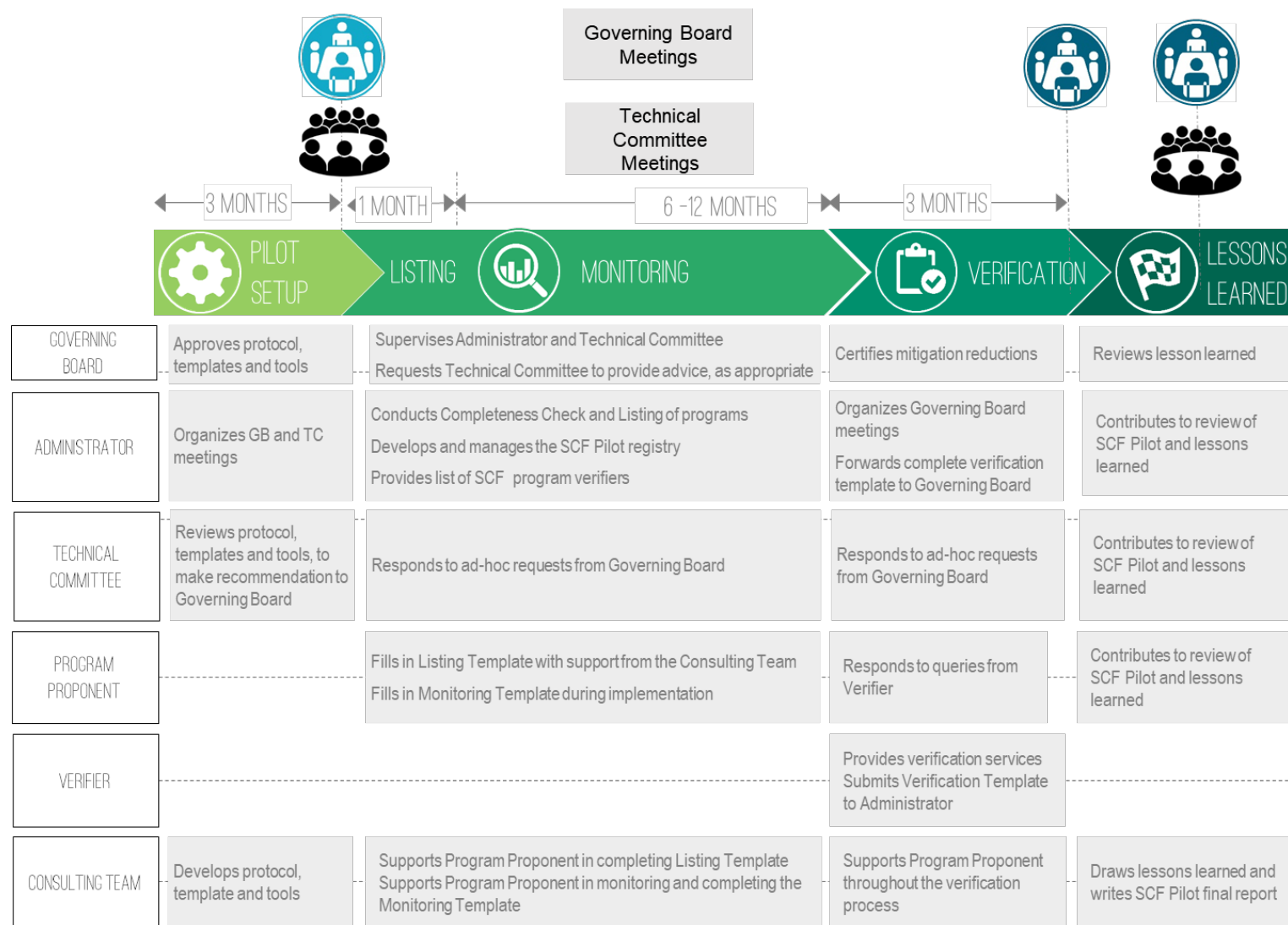


Figure 2. Timeline, roles and responsibilities in the Rwanda SCF Pilot



As mentioned, the program used to test the SCF concept in Rwanda was the Inyenyeri improved cookstove CDM PoA, which was also registered as a CDM PoA in May 2018. Under the Inyenyeri program, households are provided with highly efficiency microgasification cookstoves and wood pellets for those. Microgasification cookstoves burn wood fuel very efficiently and cleanly, by producing their own gas from solid biomass in a controlled manner. Gas generation occurs separately from subsequent gas-combustion. Since wood gas is burned, the microgasification cookstoves are nearly as clean as LPG stoves. The design of the microgasification wood stoves used in this program may evolve over time to increase efficiency, cleanliness and the user friendliness of the stove. The clean burning pellet stoves replace traditional wood and charcoal stoves, thereby reducing the demand for non-renewable biomass. Under the program improved cookstoves (ICS) will be deployed which will reach a specified efficiency of at least 30%. Where possible, Inyenyeri will also manufacture and supply ICS users with biomass pellets derived from biomass waste products (e.g. sawdust). Stove distribution and pellet provision are envisioned to take place all over Rwanda.

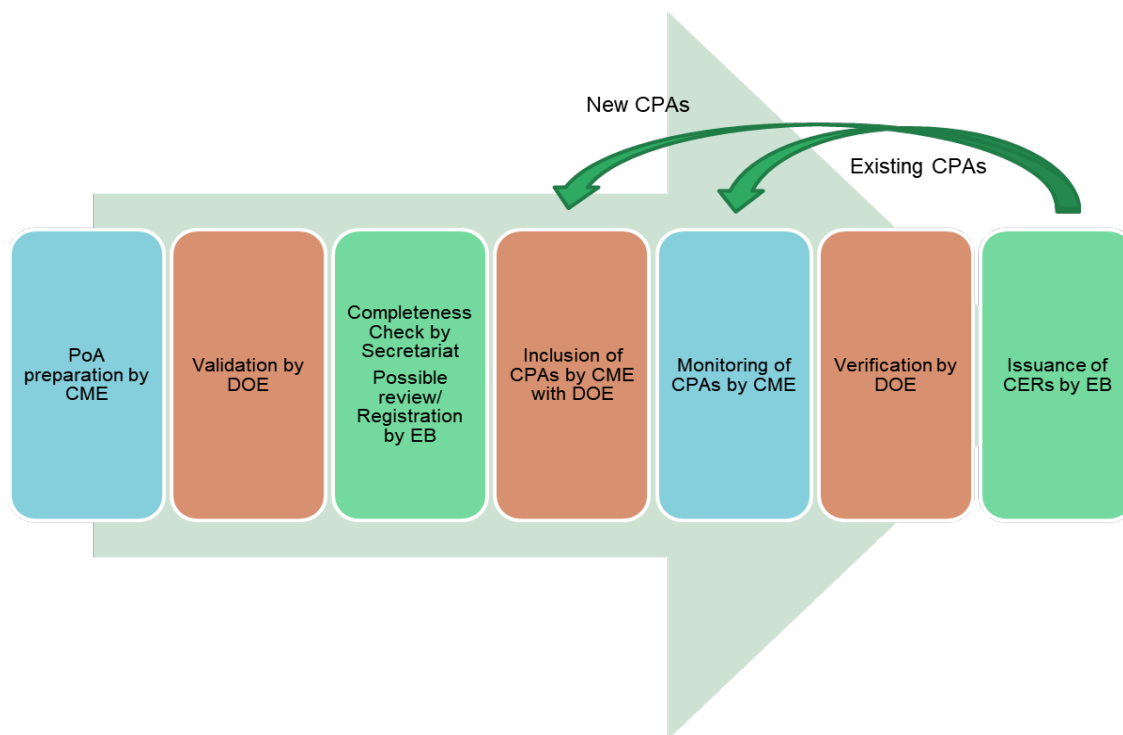
For the SCF pilot, the listing of the Inyenyeri program was completed in February 2019, following a brief completeness check conducted by the Administrator. Monitoring was conducted up to July 2019 and included collecting data for the year prior to listing – because program and crediting start date under the SCF may be up to one year prior to the listing date (following a practice similar to many voluntary carbon market standards). Verification commenced in August 2019 and was completed in January 2020. By the end of the monitoring period, there were approximately 6,500 operational devices covered by the program (i.e. installed since February 2018, the start of the monitoring period one year prior to the listing date).

The next section begins the analysis of the time requirements and costs of the SCF as a mechanism, and the comparison, where relevant, with the CDM. For the set-up phase, addressed in section 2.1, there was no comparison with the CDM but rather an assessment.

2. Reduced time and costs for the project cycle

Under the CDM, the project cycle includes seven steps that are needed to fully implement an activity, starting with the preparation of the Project Design Document (PDD) and ending with the issuance of Certified Emissions Reductions (CERs), with a repeat of Monitoring, Verification and Issuance for each monitoring period. This is even more elaborate for a CDM Programme of Activities (PoA), because part of the cycle for including new Component Project Activities (CPAs) must be repeated (Figure 3). The SCF project cycle similarly begins with the preparation of a simplified program document and ends with certification of emission reductions (i.e. there is no issuance of credits, although post-2020 this could change as discussed below), but with combined validation and verification to reduce the upfront time and costs. In other words, both the eligibility and performance of the program are verified ex-post at the same time. In addition, the SCF cycle does not require the separate inclusion of CPAs, because the program boundary is defined during each monitoring period based on the scope of all the cumulative households served (Figure 4).

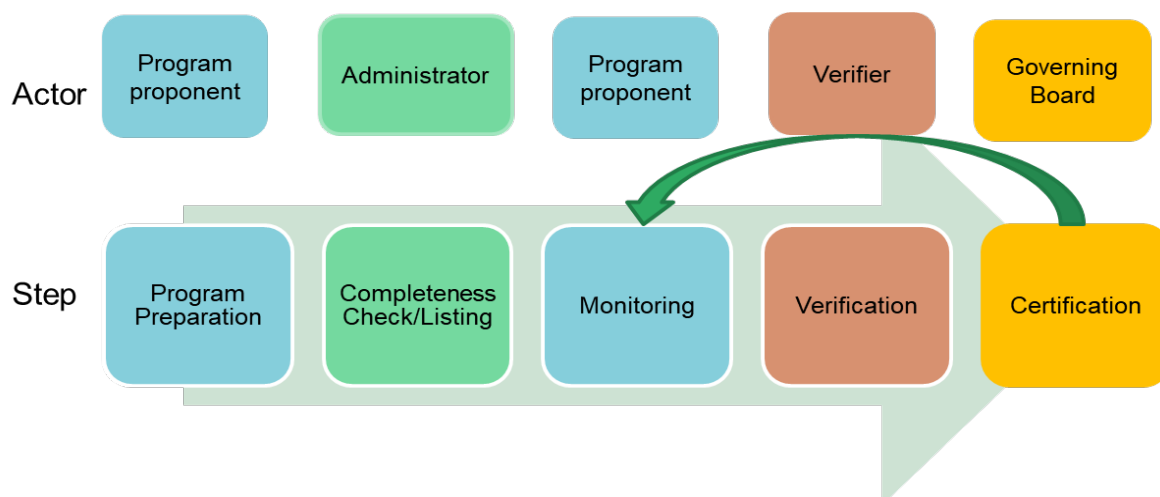
Figure 3. Current project cycle for a CDM Programme of Activities



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Note: PoA = Programme of Activities, CME = Coordinating/Managing Entity, DOE = Designated Operational Entity (auditor), EB = (CDM) Executive Board, CPA = Component Project Activity, CERs = Certified Emission Reductions

Figure 4: SCF project cycle



From a project proponent's perspective, the SCF model provides an opportunity to reduce transaction costs and the time required for the different stages of the project cycle, based not only on the streamlined project cycle but also on the simplified approaches and templates used. These transaction costs include not only the time from program developers, but also expenses for consultants and auditors and even time inputs from the funders (i.e. the Ci-Dev). The following sub-sections compare the SCF Pilot with the CDM in the early phases of

the project cycle. As mentioned before, it is important to remember that the SCF Pilot builds on an existing CDM PoA, and so much of the groundwork for project development was already done before the pilot. A new program developed for the SCF would necessarily require more effort, but the experience with the Inyenyeri program still provides insights into how easy the SCF tools, templates and procedures are to apply. Putting a new program through the SCF project cycle could be an important next step for developing the SCF concept in Rwanda.

2.1 Setting up the SCF

Unlike the CDM, where all the rules and governance structures were established at an international level, the SCF concept includes a national governance structure and rules that, while based on international best practices, are tailored to the host country context to allow for greater simplification and streamlining. The set-up phase included the development of a “roadmap” (Spalding-Fecher et al. 2018)(i.e. summarized in Figure 2) for the SCF pilot as well as a Program Protocol (REMA 2018)(i.e. similar to a crediting program standard) that address the technical and governance issues for the SCF in Rwanda. The governance scheme was developed together with the Rwandan government agencies. The set-up phase also included two missions to Rwanda by the consultants and the Ci-Dev team (first mission only) to meet with the SCF TC and the proposed GB. The development phase of the Rwanda pilot lasted until November 2018, when the GB officially approved the Program Protocol and related templates and guidance documents.

The set-up phase also included developing templates for the Listing Document (i.e. analogous to a Project Design Document – PDD- under the CDM), Completeness Check, Monitoring Report and Verification Report. Wherever possible, these templates use checklists instead of longer text descriptions. The templates also require the inclusion of supporting documentation when they are submitted. For example, evidence of the technologies included in the program could come from the earlier CDM PoA DD or a similar feasibility study or program document produced for a funder. Where emission reductions are reported, a completed calculation tool should be provided as part of the supporting documentation. The SCF Pilot also provided this tool, in the form of a “Monitoring Calculation Tool” in Microsoft Excel, rather than requiring the program proponent to develop their own tool.

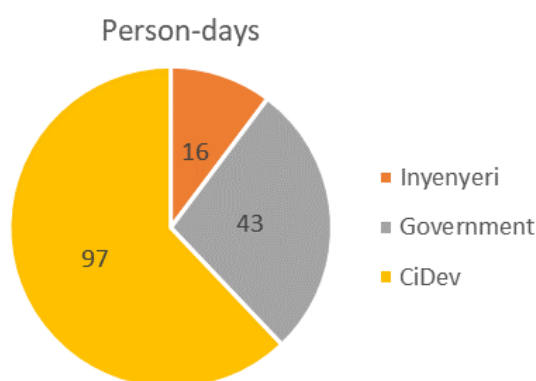
The TC, prior to approval, reviewed all of the SCF rules. The overall Program Protocol, methodology, listing document template, monitoring report and verification report template (along with guidance for each of these), and monitoring calculation tool were all reviewed during the first TC meeting in November 2018. The TC also met in July 2019 to discuss and approve a range of improvements in the methodology, tool and templates that came out of the early monitoring experience.

The time inputs for the set-up phase from different stakeholders are presented in Figure 5, while the main activities, duration and costs of this phase are shown in Table 1. This was a one-time cost for the pilot scheme, however, rather than an ongoing cost associated with the project cycle of the SCF. A more detailed analysis of the time and costs for the Rwandan governance bodies (i.e. GB, Administrator and TC) is presented in Section 3 of this report.

Table 1: Principal activities, time and costs for SCF setup

SCF	Duration & Cost
<ul style="list-style-type: none"> Development, review and approval of two documents: <ul style="list-style-type: none"> SCF pilot roadmap Program Protocol and related annexes (e.g. templates, guidance) Development of governance scheme with Rwandan government Two missions to Rwanda Two meetings of the TC and GB 	<ul style="list-style-type: none"> Duration of the set-up phase: 7.5 months Total cost (including time from government, Ci-Dev, consultants and program developers): ~\$120,000

Figure 5. Person-days for SCF pilot setup



2.2 Program preparation

Inyenyeri has been developing improved cookstove programs since its founding in 2011. As the business model of supplying a stove+fuel system to consumers was developed in Rwanda, they started to explore the links to carbon markets for supporting the scaling up of the program. Inyenyeri prepared a pre-PIN for Ci-Dev in February 2014 and started on a PIN in January 2015. The PIN was finalized in April 2016 and work on the PoA documents commenced. In May 2017, Inyenyeri hired a consultant to finalize the CDM PoA DD and CPA DD. They also submitted a notice of Prior Consideration on 22 Jun 2017 to the UNFCCC. The program preparation phase ended when Inyenyeri contracted the DOE for validation, in July 2017. This means that the program preparation phase took at least 3.5 years.

Under the SCF, the program template is standardized and simplified into a “Listing Document”, which is prepared based on a template (i.e. similar to the CDM PDD forms but much shorter). As discussed earlier, the listing document contains a checklist to be filled by the project proponent with clearly defined eligibility criteria for technologies. In addition, the program proponent must submit supporting documentation. The presence of this support documentation is checked as part of the Administrator’s completeness check prior to listing. The simplified format and content of the listing document means that the time and effort required to collect data and documentation upfront is reduced significantly. As mentioned earlier, in the case of Inyenyeri, the listing document could be easily prepared from the

existing draft CDM documentation, although Inyenyeri, the consultants and the Administrator all felt that the listing process would still be much faster and less time intensive than the CDM even with an entirely new program. The Listing Document was prepared after the approval of the SCF rules in November 2018 and was submitted to the SCF Administrator in late February 2019. Table 2 illustrates the differences in program preparation requirements, duration and cost of those activities, while Figure 6 demonstrates the time savings under the SCF.

One aspect that needs to be considered for when the pilot phase comes to an end is how new program proponents, without any previous CDM program documentation, will navigate this process. The simplified templates and rules will undoubtedly make the process far less costly and time consuming, but the details ideally need to be tested with new proponents after the pilot. In addition, the SCF might need to provide guidance on what type of supporting documentation is needed, and how typical feasibility studies and similar documents could be used for the SCF process.

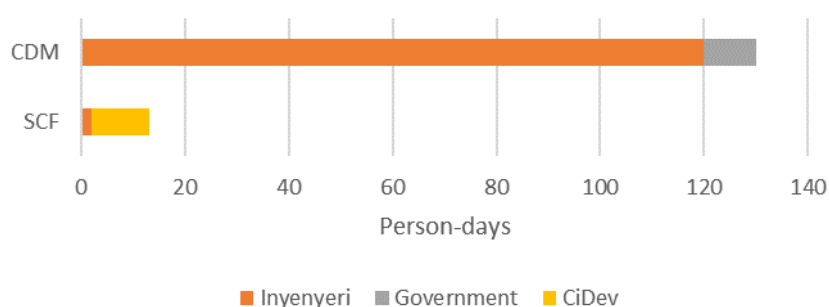
Table 2: Program Preparation activities, duration & costs

CDM	SCF	Benefits
<ul style="list-style-type: none"> Comprehensive project description, application of baseline and monitoring methodology PDD prepared by external consultant with inputs from project participant 	<ul style="list-style-type: none"> Checklist approach No narrative part, minimal drafting effort Data collection much less time consuming but this was partly because of data collected for CDM PoA 	<ul style="list-style-type: none"> Reduced consulting input required Reduced time spent by project proponent on drafting the required documentation
Total duration	Total duration	Reduced process time
>41 months	2.2 months	>39 months of overall duration
Total costs	Total Costs	Cost savings
~\$134,000	~\$11,000	~\$120,000

Table 3: National Letter of Approval (LoA) activities

CDM	SCF	Benefits
<ul style="list-style-type: none"> Issuance of LoA by the host country's DNA to confirm that activity is voluntary and contributes to the sustainable development Assessment by CDM TC reporting to REMA 	<ul style="list-style-type: none"> Not needed, because SCF is a national process, with oversight from national government before any emission reductions are certified 	<ul style="list-style-type: none"> Eliminate time and costs for applying for the LoA

Figure 6. Person-days for program preparation (including Letter of Approval)



2.3 Validation

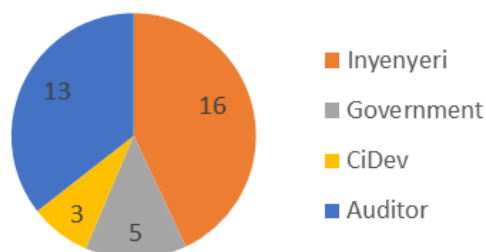
The validation process under the CDM is conducted by an accredited third party called the Designated Operational Entity (DOE). For the Inyenyeri program under the CDM, Inyenyeri submitted documents to the DOE (i.e. Shenzhen CTI International Certification) to start the validation in July 2017, which included a site visit conducted in November 2017. The DOE submitted a Request for Registration for the Inyenyeri program in May 2018, marking the end of the validation phase. The activities, duration and costs of the CDM validation phase are shown in Table 4, while the person-days are shown in Figure 7.

The SCF does not include the validation process as a separate step in its project cycle, therefore no time or costs are estimated.

Table 4: Validation activities and duration

CDM	SCF	Benefits
<ul style="list-style-type: none"> Independent evaluation of PoA and supporting documentation by the DOE against the requirements of the CDM 	<ul style="list-style-type: none"> No separate step – validation is combined with verification 	Costs and time savings related to: <ul style="list-style-type: none"> hiring auditor validation site visit responding to validation comments
Total duration	Total duration	Reduced process time
10.7 months	N/A	~ 11 months
Total costs	Total costs	Savings
~\$30,000	0	~\$30,000

Figure 7. Person-days for CDM validation (no costs for SCF)



Note: Auditor days estimated from DOE contract value

2.4 Completeness check and registration/listing

Under the CDM, once the DOE has completed its validation report, it submits a request for project registration. The UNFCCC Secretariat undertakes a “completeness check” of all documentation provided before the request for registration can be forwarded to the CDM Executive Board, which can often take three to six months. The Inyenyeri PoA was submitted for registration the first time in May 2018, after which the Secretariat requested certain changes to be made. The documentation was resubmitted in October 2018, and the completeness check came to an end in December 2018. The process therefore lasted approximately seven months. However, because the CDM rules say that the official registration date is the date when the DOE submits the request for registration, the PoA registration date is still 31 May 2018.

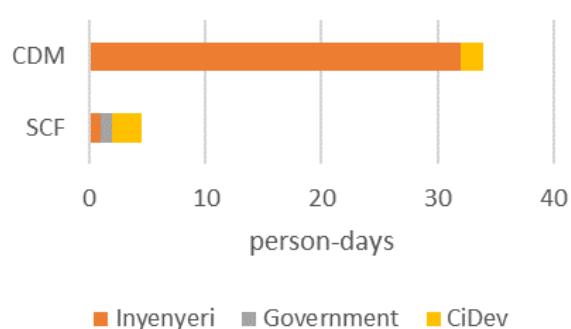
The SCF on the other hand, uses a simplified listing process, whereby the SCF administrator checks the completeness of the Listing Document, registers the activity in its database and provides a notification to the project proponent. Inyenyeri submitted their program documentation on 21 January 2019 and received a letter confirming the listing on 12 February 2019. This required only a few days of input from the consulting team, Inyenyeri, and the Administrator, which was also largely due to the listing process being performed for the first time. Table 5 presents the activities, duration and costs of the registration/listing phase, while Figure 8 shows the person-days.

One important difference between the SCF and the CDM is the starting date for the crediting period. For the CDM, the crediting period for each CPA within a PoA occurs only after the PoA has been registered and the CPA has been included. The registration date for the CDM PoAs is the date when their complete request for registration was submitted. The SCF, on the other hand, allows the crediting period to start up to one year prior to the listing date, so the time required for program development and listing do not reduce the potential emission reductions attributed to the program. Combined with the elimination of the validation step, which can take one to two years for the CDM, this means that an SCF program might have a crediting period starting two to three years earlier than under the CDM model.

Table 5: Registration/Listing activities, duration and costs

CDM	SCF	Benefits
<ul style="list-style-type: none"> Validation report submitted by DOE to CDM Executive Board with request for registration Completeness check by secretariat and possible revisions if project fails completeness check Assessment by Secretariat Assessment by Executive Board (Registration & Issuance Team) If review requested, project undergoes review Payment of registration fee (not in LDCs) 	<ul style="list-style-type: none"> Completeness check by the SCF administrator Entry into the SCF database and notification to the project proponent No fees required 	<ul style="list-style-type: none"> Significant time and cost savings, as well as savings in process time No direct costs involved in listing for the SCF (i.e. no registration fees), although this could change after the pilot.
Total duration	Total duration	Reduced process time
6.7 months	0.7 months	~ 6 months savings
Total cost	Total cost	
\$33,600	\$3,200	~\$30,000

Figure 8. Person-days for registration/listing



2.5 Monitoring

With the registration of the Inyenyeri CDM PoA, CDM monitoring activities only began in mid-2018 and so are currently ongoing. Monitoring for the SCF pilot began in February 2019 and the monitoring period ended in July 2019. Data was collected for not only this six-month period but also the year prior to the listing date (i.e. February 2018, the start of the program and crediting period, to January 2019).

As Figure 9 shows, the SCF monitoring phase required 44 person-days, with the largest share from CiDev support in this pilot activity. The total cost of the monitoring phase was

approximately \$30,000. The person-days and costs for CDM monitoring are not yet known since this is an ongoing activity.

While under the SCF some of the data collection is similar to the CDM, significant cost savings are expected for the following reasons:

- The SCF does not require a sample survey of households to determine the share of operational devices if the program proponent has records of fuel purchases for each customer (i.e. Inyenyeri’s customer database).
- For average biomass use per device, the SCF allows using customer sales data instead of doing surveys of consumption.
- The SCF pilot does not have multiple CPAs and there is no cost and time investment for inclusion.
- Where sample surveys are used for any parameter, the survey size is fixed, so no time and costs are required (often from consultants) to accurately determine and justify sample size.

Nevertheless, both the SCF and the CDM will require the development and maintenance of a database of all consumers and devices in the program. For Inyenyeri, this database is the same as the customer database developed for their core business operations. This means that database development, population, and management is not an incremental cost for CDM or SCF monitoring. Only the customized extraction of data and analysis for the SCF monitoring report would be considered part of the SCF transaction costs.

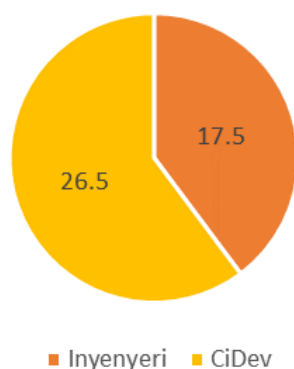
Table 6 presents the monitoring activities for the CDM and SCF.

Table 6: Monitoring activities

CDM	SCF	Time/Cost Savings
<ul style="list-style-type: none"> • Project participant responsible for monitoring key parameters according to approved methodology • Preparation of CDM monitoring report 	<ul style="list-style-type: none"> • Project proponent to report data according to SCF monitoring template, with fewer monitoring parameters and more options for measurement • Filling in of SCF monitoring template and calculation tool 	<ul style="list-style-type: none"> • Potential for reduced effort for data collection because of greater flexibility in the methodology under SCF
Total duration	Total duration	Reduced process time
First monitoring period: ² 12 months (expected), plus additional time to prepare monitoring report.	First monitoring period: six months, plus a month to finalize data collection, methodology changes and monitoring report	Not applicable – monitoring period is set at the discretion of the project proponent following cost-benefit considerations

² Note that in this case the length of the monitoring period is decided by project proponents.

Figure 9. Person-days for monitoring phase under SCF



2.6 Verification

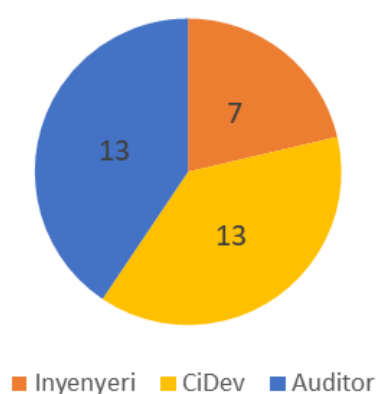
For the verification process under the CDM, a new DOE (i.e. different from the one conducting validation) verifies the monitoring report, conducts an on-site assessment, and finally drafts the verification report. While the time required for verification under the CDM is quite project-specific, the timeframe for verification is at least three months. However, the average time across all CDM projects from the end of the monitoring period to issuance of CERs is typically six to eight months, considering that the Monitoring Report must be uploaded one month before the site visit and the actual site visit by the DOE could be three months after the start of verification, not to mention the many rounds of queries that may be required.

The verification phase of the SCF pilot required 33 person-days of input (see Figure 10) and cost approximately \$27,000. While the costs of the CDM verification phase are not yet known, there are reasons why the SCF process is likely to have lower transaction costs. This is due to the simplification of monitoring under the framework. The clear verification guidance and verification report template can also potentially lower the fees charged by auditors and reduce the process time. While the SCF pilot used an internationally accredited DOE (i.e. AENOR), in the long run, additional cost saving potential could be unlocked through the accreditation and training of local auditors. This would, of course, require substantial upfront investment in training and developing a local accreditation scheme. As part of this process, the verifier for the SCF will therefore provide some initial training for the verifiers and include them in verification meetings in Kigali.

Table 7: Verification activities and duration

The CDM	The SCF	Benefits
<ul style="list-style-type: none"> DOE verifies monitoring report, certifies reported emission reductions and drafts verification report 	<ul style="list-style-type: none"> Auditor (initially DOE but could be local auditor in the future) verifies emission reductions reported in the SCF monitoring template 	<ul style="list-style-type: none"> Potential for lower costs due to simplification of process and more straightforward verification guidance Potential for cost savings in future if local auditors become accredited
Total duration	Total duration	Reduced process time
This will only be known in 2020 due to the delay in the CDM PoA project cycle	5 months	This will only be known in 2020.

Figure 10. Person-days for verification phase under the SCF



2.7 Certification and issuance

The final step of the project cycle for both the CDM and the SCF is the certification and issuance process. Under the CDM, the DOE submits the verification report with a request for issuance to the CDM Executive Board. The issuance step includes a completeness check by the Secretariat, and an assessment or screening by both the Secretariat and the Executive Board and potential review of the issuance (if requested by a Party or three members of the Board).

For the SCF, the Administrator checks the completeness of the documentation and verification opinion from the verifier before emission reductions can be certified. The SCF pilot however, does not issue tradeable units at this stage because it is still a simulation of a crediting standard. The GB merely certifies (i.e. confirms) emission reductions during the pilot phase. The certification phase of the SCF pilot required 11.5 person-days of input (See Figure 11) and cost approximately \$7,000.

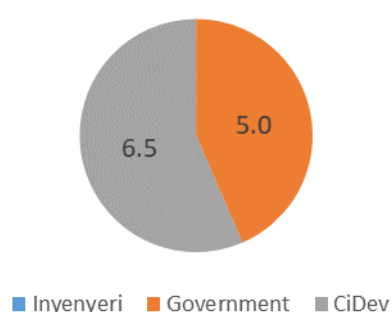
In the long run, be a possibility that the SCF issues transferrable units and/or authorizes transfers under Article 6 of the Paris Agreement. This would be a more complex process as it includes several components that will have to be considered, such as

how the transfer of mitigation outcomes generated by the SCF program would relate to the Rwandan NDC pledge, the infrastructure needed for issuance and tracking, and the financial and technical capacity required for issuance.

Table 8: Certification and issuance

CDM	SCF	Benefits
<ul style="list-style-type: none"> DOE submits verification report with request for issuance to CDM Executive Board Payment of issuance fees (Rwanda is exempt as a Less Developed Country) 	<ul style="list-style-type: none"> SCF administrator checks verification report SCF Governance Board certifies emission reductions No issuance involved during pilot 	<ul style="list-style-type: none"> Time savings relate to the process for certification Time and costs are reduced with the Administrator and Governance board working together to certify emission reductions
Total duration	Total duration	Reduced process time
This may only happen in 2021 due to the delay in the CDM PoA project cycle	1 month	Not known due to delays in CDM process

Figure 11. Person-days for certification phase under the SCF



2.8 Project cycle risk

The analysis above shows that the SCF project cycle is likely to provide a quicker and less time-consuming process for program proponents to verify, and potentially monetize, emission reductions. In addition, another aspect not captured in this comparison but of utmost relevance for program proponents is the element of risk. With the clear and transparent instructions of the SCF listing document, the program proponent faces much lower risks from the crediting scheme, as long as the program is implemented according to the SCF guidelines. CDM validation and registration, on the other hand, are often difficult, with many projects rejected, and carry significant policy risks for potential program developers. Even the validation of the Inyenyeri PoA under the CDM took a full year, which means the program had to wait longer to receive any revenue from CER sales.

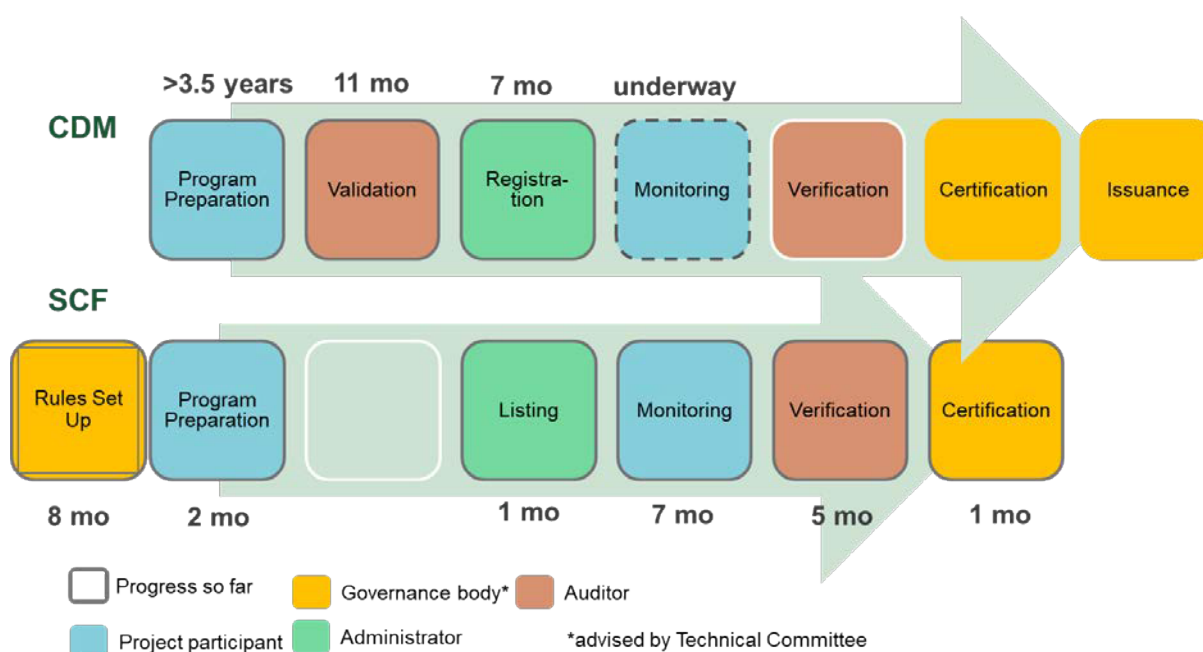
Another risk for when the pilot comes to an end is the fact that the pilot phase is supported by Ci-Dev and the documentation and data was already available for this particular project through the CDM. This means that, for a new project, stakeholders will have to consider the added time and costs for collecting new data and creating documentation as well as finding

different means of financing beyond Ci-Dev or international stakeholders. As more experience is gained with the SCF concept, more local stakeholders will be able to navigate the system. In the short to medium term, however, technical support from consultants and financial support from donors will likely be necessary. At the same, if this support is used to develop a system that is more transparent and objective than traditional crediting schemes, this will reduce the barriers and transaction costs for all future participants.

2.9 Summary of project cycle comparison

The SCF pilot has demonstrated the substantial cost and time savings that can be achieved through simplification and streamlining, even just considering the program preparation, validation and registration/listing phase of the project cycle (see Figure 12 for process time). The CDM process took longer than the SCF, and even for new programs under the SCF it would be very unlikely the program preparation would take more than six months. In these three phases, the cost savings were more than \$180,000 for one program. This is almost 50% more than the entire set-up cost of the SCF pilot (\$120,000). Even if additional programs require some support for project development, the savings are substantial compared to the CDM, and could also be significant during monitoring and verification. The question for other countries – and even for expansions of the SCF into other sectors in Rwanda – would be who pays for this set-up cost. This could potentially be linked to international initiatives support countries in NDC implementation and MRV.

Figure 12. Process time for CDM and SCF to date



3. Increased responsibility for governance

Under the SCF, the host country government takes charge of the administration and governance of the mechanism, providing it with greater control and responsibility. This, however, also comes with higher expenses in terms of time and costs. The time and costs for

the governance bodies can be distinguished by two stages: the set-up phase of the SCF on the one hand and, on the other, the routine tasks taken on during the pilot phase and thereafter. The time and costs for both are outlined in more detail below, for each of the three governance structures: GB, Administrator and TC.

Moreover, while the project proponent under the SCF does not have to shoulder the cost of applying baseline and monitoring methodologies and in some instances developing them, this task is shifted to the SCF institutions, similar to the Standardized Baseline process of the CDM. In addition, the host country assumes roles that, under the CDM, are filled by the UNFCCC secretariat and the CDM Executive Board.

The governance structure in place is also key for the country's readiness for Article 6.2 (cooperative approaches) as well as the Article 6.4 global mechanism.

3.1 The SCF Governing Board

The GB includes the following members:

- Ministry of Environment (MoE), Director General for Climate Change (chair);
- REMA, Director General (co-chair);
- Ministry of Infrastructure (MININFRA), Division Manager, Energy;
- Rwanda Green Fund (FONERWA), Fund Manager;
- Rwanda Energy Group, Chief Operations Manager; and
- International Union for Conservation of Nature (IUCN), Regional Country Coordinator.

The GB takes on the role of the CDM Executive Board in terms of certifying emission reductions and overseeing the rules, procedures and bodies of the SCF pilot. These rules and regulations outlined by the GB is carried out by the Administrator and TC.

A combined GB and TC meeting was held during the set-up phase of the SCF pilot (November 2018), where the Board agreed to launch of the pilot and approve the SCF Program Protocol and related documents. The final GB meeting was held in February 2020 to certify the emission reductions from the pilot.

Table 9: Governing Board tasks and time

Tasks	Time
<ul style="list-style-type: none"> • First capacity building workshop • Second capacity building workshop • First GB meeting (Nov 2018) 	<ul style="list-style-type: none"> • six-hour meeting for three people • six-hour meeting for three people • five-hour meeting for four people
<ul style="list-style-type: none"> • Second GB meeting (with, July 2019) 	<ul style="list-style-type: none"> • Three-hour meeting for three people
<ul style="list-style-type: none"> • Third GB meeting (with TC, February 2020) 	<ul style="list-style-type: none"> • Three-hour meeting for five people

3.2 The SCF Administrator

The Climate Change and International Obligations Department (CCIOD) of REMA assumes the role of the Administrator, taking charge of the listing process as well as organizing the TC and its workshops. During the set-up phase of the SCF, the Administrator performed the

completeness check of the Listing Document, registering the activity and providing a notification to Inyenyeri.

Under the CDM, the DNA issued the Letter of Approval, but in most cases, the DNA was no longer involved or did not receive information regarding the status of the project or portfolio. Going forward with the SCF, it is key that the Administrator continues to stay involved in the process and projects in order to receive information after the listing occurs. This is to minimize any issues or roadblocks in the future.

During the lifetime of the SCF program, the Administrator receives the listing requests, verification reports and requests for certification. In addition, the regular tasks of the Administrator consist of: authorizing the project proponent under the SCF pilot to select the auditor from an approved list of auditors provided; preparing the TC and GB meetings; and preparing meeting reports. It also includes presenting the SCF in Rwanda in international climate conferences and meetings as well as administrating and disseminating SCF pilot documentations through the REMA website.

While the Administrator has managed to perform its tasks – with the support of the consulting team - thus far, there is further need and potential for capacity building in the long run. Having the SCF pilot supported by Ci-Dev and based on CDM documentation has aided the process, but this will need to be supported in other ways if the SCF is expanded.

Table 10: Administrator tasks and time

Tasks	Time
<ul style="list-style-type: none"> Kick-off meeting with Ci-Dev and consultants 	<ul style="list-style-type: none"> Four-hour meeting for six people
<ul style="list-style-type: none"> First capacity building workshop 	<ul style="list-style-type: none"> six-hour meeting for two people
<ul style="list-style-type: none"> Second capacity building workshop 	<ul style="list-style-type: none"> Six-hour meeting for two people
<ul style="list-style-type: none"> Completeness check of the Listing Document 	<ul style="list-style-type: none"> One person-day
<ul style="list-style-type: none"> Preparation of meetings for GB & TC 	<ul style="list-style-type: none"> Three hours for one person
<ul style="list-style-type: none"> Participation in meetings of GB and TC 	<ul style="list-style-type: none"> Three hours for three people;
<ul style="list-style-type: none"> Review of meeting reports 	<ul style="list-style-type: none"> Five hours for one person
<ul style="list-style-type: none"> Completing the Administrator Certification Template 	<ul style="list-style-type: none"> Four hours for one person
<ul style="list-style-type: none"> Hosting and administration of SCF pilot documents on the REMA website 	<ul style="list-style-type: none"> Four days for one person

3.3 The SCF Technical Committee

The existing CDM Technical Committee serves as the TC of the SCF in Rwanda and includes stakeholders with relevant expertise in the climate and energy fields (see Annex A). The work of the TC allows for methodologies to be contextualized and enables the link between the SCF and Rwanda’s NDC process. As discussed in section 2.1, during the set-up

phase of the SCF pilot, the TC reviewed all of the rules, templates and tools, including the methodology and any guidance documents to explain how to use the templates. Moreover, TC members participated in outreach and capacity building events. The GB also invited the TC to the certification meeting at the end of the pilot.

Table 10: Technical Committee tasks and time

Tasks	Time
<ul style="list-style-type: none"> • First capacity building workshop 	<ul style="list-style-type: none"> • Six hours for eight people
<ul style="list-style-type: none"> • Second capacity building workshop 	<ul style="list-style-type: none"> • Six hours for nine people
<ul style="list-style-type: none"> • TC meetings (3 meetings) 	<ul style="list-style-type: none"> • Five hours for six people x 2 • Three hours for three people

4. Developing institutional capacity and ownership

4.1 Ensuring capacity through dedicated administrator staff

The SCF pilot was intentionally designed to build on host country institutions and governance structures to keep administrative costs low and to support existing climate policy institutions. However, additional institutional capacity is still needed over time, particularly at the Administrator and TC level, to ensure the quality of programs as well as to avoid bureaucratic delays and keep project cycle times low.

Ensuring sufficient capacity to manage the SCF process beyond the pilot will require additional trained staff in the Administrator. This also implies the need for a dedicated funding for dedicated staff and experts overseeing crediting programs. The Administrator, for example, covers a wide range of tasks under the SCF, whose timing and time investment may be beyond the current availability of staff. A position for a dedicated SCF coordinator within the Administrator may be needed, with appropriate training to facilitate the administrative tasks and also ensure that the Administrator can provide leadership from government.

4.2 Increasing the role of local auditors

One aim of the SCF for the verification phase should be to engage and train local auditors that could verify mitigation activities. Working with international DOEs has been a major bottleneck in the CDM process, especially for Africa, as it is very costly, and the number of qualified staff is limited. While the SCF pilot was unable to solely rely on local auditors due to both time and budget constraints, the DOE for verification (i.e. AENOR) provided a half day capacity building workshop for five local Rwandan firms to introduce them to auditing international emission reduction projects. This could be the starting point for an auditor-training program in a future phase of the SCF, which would need additional donor support.

4.3 Ensuring the financial sustainability of the SCF

During the pilot phase in Rwanda, almost all of the set-up costs were covered by Ci-Dev. It is already clear, however, that further resources are needed for capacity building efforts to ensure that stakeholders can be not only successful in following through with the pilot, but also able to expand their efforts to other programs, if Rwanda decides to do so. Future capacity development could be supported by climate finance, particularly funding sources focused on NDC implementation. Unlike the CDM, where project proponents pay for the functioning of the CDM institution through the “share of proceeds”, project proponents currently do not provide fees to the SCF institutions. The pilot has not yet established other financial schemes that could provide further support for the operational management of the scheme, such as the collection of fees from project proponents. While during the pilot phase this alternative financial scheme is not crucial, once the pilot comes to an end further financial strategies need to be established for activities to be self-sustaining in the long run and not solely reliant on external support.

4.4 Authorizing the transfer of emission reductions generated by the SCF

Another institutional lesson is about the relationship between the SCF governance and the NDC implementation governance. As any international transfers of emission reductions will affect Rwanda’s progress towards NDC mitigation pledges, these decisions need to be under the oversight of the same institutions. Rwanda does not yet have a system in place to evaluate and approve international transfers of mitigation outcomes, and the detailed rules for these are still under negotiation at the UNFCCC level. A near term priority should be to begin to plan how international transfers might be authorized by the Rwandan government, and whether this may require the adaptation of the SCF governance structure or institutional arrangements.

5. Engaging stakeholders

The experiences from the Rwandan SCF pilot showed that developing efficient and simple rules and templates, requires substantial and ongoing interaction with program proponents. The consulting team met with Inyenyeri during the first mission – even before the rules for the SCF pilot had been developed and approved – and continued to engage with them regularly to understand their business model and MRV system. Engaging with project proponents early on, allowed the team to test MRV systems and tools, and to begin the formal monitoring process immediately after listing. This was done using historical data from the previous year (i.e. since the SCF allows the program and crediting period to start up to one year prior to listing) and using this data to fill in inputs for the calculation tools. This process was particularly important to test and improve the Monitoring Calculation Tool – an excel-based tool to calculate emission reductions. The consulting team and Inyenyeri worked in an iterative process to streamline and simplify this tool, so that not only Inyenyeri, but also future program proponents could create accurate, transparent and robust monitoring reports for verification.

Increasing engagement with local technical experts early in the process, and keeping them on board, is another important element of success. The TC (TC) was another key stakeholder group that the team engaged from the start of the process. Potential committee members were invited to the first capacity building workshop, and the local consultant met with key members of this group prior to the first formal meeting. This provided an opportunity to explain the SCF concept and rules face-to-face and answer questions prior to the formal launch. The group then convened for the second capacity building workshop the day before the inaugural meeting for the TC. The proposed revisions to the Monitoring Calculation Tool, Monitoring Report Template and Methodology that came from the interaction with Inyenyeri were also discussed in the second TC meeting. Similar to Senegal, the TC was also invited to the GB meeting for certification of the emission reductions, so that they understood the full program cycle. This engagement built confidence and understanding among TC members, which will be important for future expansions of the SCF concept.

6. Developing an accreditation standard

Engaging local verifiers in the future would also require developing an accreditation standard for the SCF in Rwanda. The SCF pilot currently draws on entities that have already secured accreditation under other standards (e.g. CDM, VCS, JI), reducing transaction costs as well as the burden on the GB to establish an accreditation system. A future accreditation standard for the SCF could build upon the CDM accreditation framework, but while looking carefully for opportunities to simplify and streamline the process. This would require additional external funding support but could yield significant cost savings in the long run. The challenge for a national accreditation process, beyond the costs and technical issues involved, is the credibility of the system within international trading. If each country has an entirely independent accreditation system, it may be difficult for potential buyer countries to just the quality of the verification process and the resulting emission reductions. While sub-national crediting schemes such as the Climate Action Reserve have their own accreditation system, the units from these schemes cannot be used in other and voluntary international schemes such as the Verified Carbon Standard.

7. Streamlining the pilot development process

The pilot also provides important lessons on process – particularly how to use each stage of the process to prepare stakeholders for future steps and how to create momentum in the planning and implementation of the pilot. A critical element of setting up an SCF pilot is to set clear expectations, particularly for the government, at the earliest stages of engagement. For example, before the first mission to a new host country, it is critical to gather information on their climate governance structure and establish which entities can fill which roles. Additionally, starting to discuss possible simplifications of methodologies can already set the stage for how the SCF can be applied within this new country context. This can also reduce the program set up time, by clarifying expectations for the host country government.

Once these aspects have been clarified and expectations have been set, the first mission can then be used to present a draft Program Protocol, methodologies, templates, timelines and

roadmaps (i.e. instead of presenting these only during a second mission). For the Rwanda pilot, the Program Protocol from Senegal was presented, to help the capacity building workshop participants understand more concretely how the pilot might work. This first meeting also already started to discuss the SCF governance structure in the country and agreed on some of the technical aspects such as a website. Visiting the program proponent during the first missions was also useful. Seeing what data is collected, documented and archived is also vital to know in the early stages, to reduce the risks of problems with monitoring and verification later on in the process. The meetings in Inyenyeri clarified many of these issues early in the process, which make the later stages quicker and more effective.

Developing efficient and simple rules and templates requires substantial and ongoing interaction with program proponents. As discussed earlier, working with Inyenyeri early on to test MRV system and tools was a key to the success of the Rwanda pilot. The consultant worked with Inyenyeri starting immediately after listing to fill in some data in the calculation tools. An iterative process of working with the program proponents to update the tools created a simpler and more sustainable MRV system.

Finally, bringing TC members on board early in the process, providing periodic updates, convening meetings to discuss potential improvements in the rules, and inviting them to the GB certification meeting (and possibly other meetings) as observers would all build capacity, ensure that the project cycle flows smoothly, and make it easier to assess future programs and methodologies. This was achieved in Rwanda by holding an additional TC meeting in the middle of the monitoring period, to discuss improvements to the methodology and templates.

8. Addressing technical and methodological issues

Creating new methodologies after the pilot phase will still require substantial technical support – as well as some external expertise – even as local capacity is improved. In terms of some of the technical issues faced during the SCF pilot, one lesson was that simplification and standardization are easier with some technologies than others, and any standardization or simplification needs to be weighed against keeping the SCF pilot and scheme as broad as possible (i.e. because simplification might include narrowing the range of options covered by the methodology and MRV system). The existing cookstove methodologies, for example, provide five different options for estimating the biomass savings per device. Inyenyeri only needed one of these options (i.e. calculating the savings by measuring the amount of fuel used under the project). Rwanda has other cookstove program developers, however, that could be part of future crediting initiatives and use the same business model. They would therefore need different monitoring approaches. Keeping all these options open made the methodology and Monitoring Calculation Tool more complex - although this was necessary to keep the mechanisms as inclusive as possible. All of this meant, however, that more of the time from the consulting team was devoted to technical issues rather than governance and institutional support.

Another key technical and methodological challenge is the link to Rwanda's NDC pledges. While there is agreement among many experts that a host country's NDC pledge should be incorporated into the baseline for crediting, how this can be done in practice is not at all obvious. Rwanda has an economic-wide emissions goal, which is not linked to any specific

reductions in the energy sector or actions related to cookstoves and is entirely conditional upon “availability of international support for finance, technology and capacity building”. Even if Rwanda did have a sectoral emissions reduction pledge, household cooking is a small part of the overall energy sector emissions. The Rwandan NDC does mention an aspirational goal of all households having access to clean cooking but does not define what service levels should be achieved. Given that all of the mitigation contributions are conditional, it is difficult to incorporate these into any form of crediting baseline. Perhaps the most important lesson here, therefore, is the need for supporting host countries in clarifying the NDC pledges and developing more detailed implementation strategies, so that linkages will be clearer.

9. Lessons from Rwanda versus the SCF pilot in Senegal

One purpose of supporting a second SCF pilot was to identify lessons from working in a different country, different technology area and with a different type of program proponent (e.g. public vs private sector). Given that the Senegal pilot is complete, and the Rwanda pilot is nearing completion, there are some important differences in the two experiences that could also have relevance for future pilot initiatives.

The most significant difference between the two pilots is in the MRV process. In Senegal, the program proponent (and CME for the CDM PoA) is a government agency with overall responsibility for the rural electrification program. The actual data collection, however, is done by the rural electrification concessionaires – public-private partnership companies who implement grid, mini-grid and off-grid solutions in a defined area. The existing monitoring systems at the concessionaries did not include some of the key parameters needed for monitoring emission reductions or did not collect them in the level of detail required. In addition, these companies have no direct interest in the emission reduction efforts, and so have limited incentive to adapt their systems and respond quickly to requests for additional information. This added significant time, cost and complexity to the data collection process and also created delays during verification (i.e. because of the time needed to clarify issues, collect additional data, and respond to queries from the verifier). In Rwanda, by contrast, not only did the program proponent do all of the primary data collection, but the requirements for the SCF were almost the same as the requirements for their own business model. This was possible because of the simplification to the methodology and standardizing certain parameters for Rwanda. Inyenyeri’s key business indicators are the number of customers, number of devices, and sales of pellets, and therefore the MRV system for the SCF was designed around this. The result was a faster, lower cost and more accurate monitoring and verification process.

The Rwandan pilot also incorporated some process improvements based on Senegal’s experience. For example, as mentioned earlier, during the first mission the consultant team was able to explain how the Senegalese pilot was implemented and already present suggestions for the institutional, governance and technical approach the could work for Rwanda. Having the local consultant meet with key TC and GB members prior to the launch workshop also ensured a smooth start for the pilot. At the same time, a process element that took more time was the request by the Rwandan government to have a Memorandum of Understanding with the World Bank to clearly identify roles and financial responsibilities for different aspects of the pilot. In retrospect, this helped clarify the government’s role and made

it easier to move forward with the pilot. This could therefore be considered as something that is done prior to the first mission of a future pilot. If a draft of the MOU were ready prior to the first mission, the terms could be agreed upfront and would not cause delays to the launch of the pilot.

The methodological challenges for the Rwandan pilot were in some ways greater than for Senegal, as the latter was able to build on an already simplified and consolidated methodology for rural electrification (i.e. AMS III.BL). As discussed above, the Rwandan pilot also had to cater for more monitoring options, due to the diversity of cookstove programs and a desire to keep the framework open to inclusion of future programs with different business models. This will be important to consider for future pilots: the experience with the SCF process can reduce the costs of setting up the program, but each new country and technology will have their own technical, governance and administrative challenges that must be addressed.

10. Recommendations and conclusions

Based on the lessons learned from both the Rwandan and Senegalese pilots, this section presents recommendations in four areas: (1) for the current Rwanda cookstove pilot, (2) for additional cookstove programs that could be incorporated in the Rwandan pilot, (3) for possible expansions of the SCF into other sectors in Rwanda, and finally (4) for replication of the SCF in additional countries.

10.1 For the current pilot

While the current pilot has largely delivered on the initial expectations of Ci-Dev and the government, there is significant potential to enhance the usefulness and contribution of this initiative. To start with, conducting a second monitoring period (i.e. 1 August 2019 to 31 July 2020) would give a clearer indication of the ongoing MRV costs and time requirements would be, because the initial monitoring period always presents more challenges. This would also provide an opportunity to compare the SCF with the entire CDM project cycle, since the first monitoring of the CDM PoA and most of the first verification would be complete by this time as well. This would allow for a more complete comparison of the two mechanisms.

As mentioned in the previous section, the Rwandan pilot will still need to address the governance of ITMO transactions by the Rwandan government. If the SCF is used as the basis for generating ITMOs post-2020, then the authorities in charge of approving ITMO transfers will need to be engaged within the SCF institutional arrangements.

In addition, a key technical issue that these authorities will need to address is the fact that the emissions reductions attributed to the cookstove programs, which are considered to be “energy sector” actions in the NDC, will not show up in the energy sector GHG inventory. Emissions from biomass are included only as a memo item in energy sector emissions, because non-renewable biomass is instead captured under land use change in the inventory for Agriculture, Forestry and Land Use (AFOLU). Moreover, because the AFOLU inventory is based on changes in stocks of carbon rather than emissions, and because residential biomass consumption is small compared to the total change in forest biomass stocks, the impact of an improved cookstove program is unlikely to be visible in the national GHG inventory. This could present a problem for Article 6 trading, because any transfers of

emission reductions will trigger corresponding adjustments to Rwanda's reported emissions for purposes of NDC compliance. This corresponding adjustment would increase national reported emissions (i.e. adding back the exported emission reductions) but the measured inventory might not decrease for the reasons discussed above. This means that Rwanda's total reported emissions for purposes of NDC compliance (i.e. "adjusted" emissions) might actually *increase* as a result of trading.³ This is an important issue being discussed in the Article 6 negotiations.

Finally, the current pilot could also be used to test possible sustainable development indicators or "co-benefits" indicators for cookstove programs (and other mitigation actions). While there are emerging examples of MRV for co-benefits, the costs and robustness of these approaches still need to be tested. The Inyenyeri program could be an appropriate opportunity to explore these additional indicators, given the strong focus of the business on broader issues of sustainable development.

10.2 For additional cookstove pilots

Since the outset of both pilots, an important question from other national stakeholders has been whether other organizations in the sector might also be able to apply for listing under the SCF. Not only does Rwanda have many other cookstove CDM PoAs, there are also local manufacturers of improved cookstoves that have not been able to access carbon finance due to the high transaction costs. The SCF could be an opportunity for a wider group of implementing agents – with a wider range of business models, technologies and MRV approaches – to benefit from carbon finance in the future. Including these new actors would also test how robust the SCF rules, templates and tools were to serve the full range of innovative options in the sectors. It might also, of course, require an expanded registry system, particular to prevent any double counting of cookstoves and households among the different programs.

A key question would be how to fund this process. For the Inyenyeri pilot, the Ci-Dev covered most of the costs of SCF program development, listing, monitoring and verification. A similar level of funding would be needed for each new program (but not for the cost of setting up the SCF rules and governance structures), given that currently the programs could not use the SCF to generate marketable emission reduction units (i.e. so project developers cannot recoup their transaction costs through carbon credit sales).

The improved cookstove sector may face a broader challenge under the rules for Article 6 accounting, because the emission reductions from reduced use of non-renewable biomass are not accounted for in the energy sector inventory. While in principle, the reduced consumption of non-renewable biomass should impact agriculture, forestry and land use (AFOLU) inventories, in practice the land-use change inventories are based on changes in

³ For a solar PV project, on the other hand, the implementation of this project would reduce measured energy sector emissions. If the resulting emission reductions were transferred, then the corresponding adjustment would be the same as the measure inventory decrease, so reported emissions for NDC compliance would remain the same. This is necessary to avoid double counting and ensure that only one country can use the emission reductions for NDC compliance. The challenge with non-renewable biomass projects is that the emission reductions that are caused by the project may not show up in the inventory because of how biomass is addressed in the current national GHG inventory system in most countries.

biomass stocks. They are not linked to estimated biomass emissions, which only appear in the national inventory as a memo item in the energy sector inventory. If these mitigation actions do not show up in the GHG inventory and Rwanda is subject to corresponding adjustments for ITMO transfers, then future Article 6 cooperation could potentially make it *harder* for Rwanda to reach their NDC pledges. This issue is under discussion in the Article 6 negotiations, as well as the elaboration of the transparency framework. The SCF could provide a practical example of the challenges of ITMOs related to biomass use and could be used to test out different solutions to this problem.

10.3 For expanding to other sectors

To leverage the SCF infrastructure developed for the pilot, expanding into other sectors within Rwanda could also both increase impact and generate important experience. An obvious choice for another technology would be electrification, since the Senegalese pilot developed a workable set of methodology, templates, forms and calculation tool. This could easily be applied either to the entire Electricity Access Rollout Program (EARP) or to specific programs implemented by public or private sector actors. More generally, focusing on technology areas with low additionality risks will reduce the methodologic complexity of the system while maintaining a high level of credibility. Rwanda may want to focus on sectors and technologies with high development impacts, and not simply those with the greatest mitigation potential. Mitigation activities with clear impacts on the national GHG inventory will also be easier to accommodate within the expected Article 6 accounting rules.

10.4 For expanding to other countries

The expansion of the SCF pilot beyond one country has already proven successful. While different hurdles were experienced in both Senegal and Rwanda (as outlined above), especially considering difference in technologies and business models, the standardized approaches could be adapted to suit each country and program. An expansion of the SCF to other countries could start with countries that share similar programs. Ci-Dev has, for instance, other cookstove programs that could make use of the SCF, including: the SimGas biogas program in Kenya, an ethanol cookstoves program in Madagascar, and a biogas program in Ethiopia. These countries and programs could build on the experience of the SCF in Rwanda. Similarly, the Senegalese experience could be applied to countries focused on rural electrification (e.g. Uganda and Mali rural electrification programs, Ethiopia off-grid renewable power).

What is important in any of these scenarios is to set clear expectations, particularly for government, at the earliest stages of engagement. For example, before the first mission to a new host country it is critical to gather information on their climate governance structure and establish which entities can fill which roles. Additionally, providing the first draft of an MoU between the World Bank and the host country regarding these roles, responsibilities, terms of funding, among others, as well as starting to discuss possible simplifications of methodologies, can already set the stage of how the SCF can be applied within this new country context. This can also reduce the program set up time, by clarifying expectations for the host country government.

Once these aspects have been clarified and expectations have been set, the first mission can then be used to present a proposed Program Protocol, methodologies, templates, timelines and roadmaps (i.e. instead of presenting these only during a second mission). In addition, this meeting could already be used to agree on the SCF governance structure in the country along with receiving approval for technical aspects such as a website. Visiting the program proponent early on to see what data is collected, documented and archived is also vital to know in the early stages, to reduce the risks of problems with monitoring and verification later in the process.

More advance planning and setting clear expectations will allow for a smoother expansion of the SCF into other countries. The key lessons learned from the SCF in Rwanda and Senegal can now be applied to create momentum in innovative climate market pilots in the region. The SCF expansion could also explore what types of regional cooperation might be possible under the SCF.

11. Conclusions

The SCF is one of the first pilot programs internationally piloting potential carbon crediting under the Paris Agreement⁴, and provides an option for existing CDM PoAs to transition to a new framework that could be compatible with Article 6 trading under the Paris Agreement. The SCF pilot is also an attempt to build on the lessons from the CDM and incorporate many of the proposals for simplification and streamlining into the next generation of crediting mechanisms, as well as to build the domestic institutional framework for crediting under the Paris Agreement. The Rwanda pilot on improved cookstoves has demonstrated that, even when considering the time and cost to set-up a new scheme, significant savings are possible compared to the typical CDM process. While the host country's responsibility is much greater for a scheme such as the SCF, so is the engagement of local stakeholders and the potential for country ownership.

At the same time, the SCF pilot is only the starting point. The Rwanda experience highlights the additional capacity building and stakeholder engagement that will need support for new crediting mechanisms to be successful in the long run. Building institutions and expertise is a long-term process and one that needs dedicated financial support – national and international – for skills development, technical capacity and administration. Not only can the expansion of the SCF within Rwanda contribute to building essential capacity for mitigation, but additional pilots – covering other countries, sectors, and technologies – can support the evolution of the global carbon market and the functioning of the Paris Agreement.

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⁴ See Greiner et al. (2019) for a review of Article 6 pilot activities.

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Annex A. SCF Technical Committee members

#	Organization	Type	Proposed Staff
1	Rwanda Environment Management Authority (REMA)	Public (Chair)	Climate Change and International Obligations Department Manager
2	Rwanda Standards Bureau (RSB)	Public	Energy Division Manager
3	Rwanda Water and Forest Authority (RWFA)	Public	Forestry Department Director
4	Ministry of Industry and Trade (MINICOM)	Public	Director in Charge of Trade and Investment
5	Rwanda Utility Regulations Authority (RURA)	Public	Energy Division Manager
6	Rwanda Housing Authority (RHA)	Public	Housing and Investment Manager
7	Private Sector Federation	Public	Representative of Energy Chamber
8	Energy Development Corporation Limited (EDCL)	State-owned enterprise	Biomass Energy Division Manager
9	ENEDOM	Private	Managing Director
10	New Forest Company	Private	Harvesting Forest Manager
11	Rwanda Renewable Energy Alliance (RREA)	NGO	Executive Director
12	ARCOS Network	NGO	Energy Specialist
13	Climate Action Network	NGO	National Representative
14	Rural Development Inter-Diocesan Service	NGO	Executive Secretary
15	African Center of Excellence in Energy for Sustainable Development/ University of Rwanda	Academic	Center Director