



MitigationMomentum

# Closing the gap between finance and climate mitigation actions

## A financial mechanisms deep-dive

Authors: Angélica Afanador, Thomas Haehl (Ecofys)

Editors: Noémie Klein and Jan-Willem Bode (Ecofys)

# Acknowledgements

We would like to thank all interviewees for participating in this study. Their contributions were instrumental in identifying common success factors of financial mechanisms that promote Renewable Energy and Energy Efficiency in developing and less developed countries. Thus, we highly appreciate their valuable contributions.

Interviewee Name	Organisation
Amal-Lee Amin, Chief of the Climate Change Division, Climate Change and Sustainable Development Sector	Inter-American Development Bank
Maria Tapia Bonilla, Capital Markets Lead Investment officer in the Financial Products & Services Division	Inter-American Development Bank
Olympus Manthata, Investment Manager	Development Bank of Southern Africa
Muhammed Sayed, Principal Investment Officer	Development Bank of Southern Africa

All views expressed in this report are those of the authors alone and do not necessarily represent the views of those acknowledged here.

December 2017.

**Supported by:**



Federal Ministry for the  
Environment, Nature Conservation,  
Building and Nuclear Safety

based on a decision of the German Bundestag

This project is prepared and published as part of the Mitigation Momentum project.

This project is part of the International Climate Initiative. The Federal Ministry for the Environment, Nature Conservation and Nuclear Safety supports this initiative on the basis of a decision adopted by the German Bundestag.



# List of Abbreviations

---

<b>ABS</b>	Asset-Backed Security
<b>CTF</b>	Clean Technology Fund
<b>DBSA</b>	Development Bank of Southern Africa
<b>DEA</b>	Department of Environmental Affairs (South Africa)
<b>EBRD</b>	European Bank for Reconstruction and Development
<b>EE</b>	Energy Efficiency
<b>ESC</b>	Energy-Saving Contract
<b>ESCO</b>	Energy Service Company
<b>ESMAP</b>	Energy Sector Management Assistance Program
<b>FRPA</b>	Funding and Risk Participation Agreement
<b>GCF</b>	Green Climate Fund
<b>GEF</b>	Global Environment Facility
<b>GHG</b>	Greenhouse Gas
<b>GIZ</b>	Deutsche Gesellschaft für Internationale Zusammenarbeit
<b>IDB</b>	Inter-American Development Bank
<b>IDBG</b>	Inter-American Development Bank Group
<b>IFC</b>	International Finance Corporation
<b>IFIs</b>	International Financial Institutions
<b>IKI</b>	International Climate Initiative
<b>LAC</b>	Latin America and Caribbean
<b>LFI</b>	Local Financial Institution
<b>M&amp;V</b>	Measurement and Verification
<b>MBS</b>	Mortgage-Backed Security
<b>MDB</b>	Multilateral Development Bank
<b>MSME</b>	Micro, Small, and Medium Size Enterprise
<b>NAMA</b>	Nationally Appropriate Mitigation Action
<b>NDC</b>	Nationally Determined Contribution
<b>PCG</b>	Partial Credit Guarantee
<b>PTA</b>	Eastern and Southern African Trade and Development Bank
<b>RE</b>	Renewable Energy
<b>SDG</b>	Sustainable Development Goal
<b>SEFA</b>	Small Enterprise Finance Agency of South Africa
<b>SIDA</b>	Swedish International Development Cooperation Agency
<b>SL</b>	Syndicated Loan
<b>SME</b>	Small and Medium Size Enterprise
<b>SPV</b>	Special Purpose Vehicle
<b>SSA</b>	Sub-Saharan Africa
<b>UGEAP</b>	Universal Green Energy Access Programme
<b>USD</b>	US Dollars



# Contents

---

<b>1</b>	<b>Introduction</b>	<b>6</b>
<b>2</b>	<b>Main Findings</b>	<b>12</b>
<b>3</b>	<b>Methodology</b>	<b>15</b>
3.1	Compiling the Longlist of RE and EE Programmes	15
3.2	In-Depth Analysis of Three Selected RE and/or EE Programmes	19
3.3	Comparative Analysis of Three Selected RE and EE Programmes	19
<b>4</b>	<b>Analysis of Three Selected RE and EE Programmes</b>	<b>20</b>
4.1	Energy Efficiency Green Bonds in Latin America and the Caribbean (LAC)	20
4.1.1	Description of the Programme	21
4.1.2	Process that Led to the Selection of the Financial Mechanism	22
4.1.3	Structure of the Financial Mechanism	23
4.1.4	Factors that Determined the Success of the Financial Mechanism	26
4.2	SCF Capital Solutions	27
4.2.1	Description of the Programme	28
4.2.2	Process that Led to the Selection of the Financial Mechanism	29
4.2.3	Structure of the Financial Mechanism	30
4.2.4	Factors that Determined the Success of the Financial Mechanism	33
4.3	Universal Green Energy Access Programme (UGEAP)	35
4.3.1	Description of the Programme	35
4.3.2	Process that Led to the Selection of the Financial Mechanism	36
4.3.3	Structure of the Financial Mechanism	37
4.3.4	Factors that Determined the Success of the Financial Mechanism	41
<b>5</b>	<b>Discussion</b>	<b>43</b>
<b>6</b>	<b>References</b>	<b>48</b>

# List of Figures

---

<b>Figure 1</b>	Share of Public and Private Sector Funding in Longlisted RE and EE Programmes	<b>16</b>
<b>Figure 2</b>	Share of Each Financial Instrument (Grants, Loans, Equity, Bonds, Guarantees) in Longlisted RE and EE Programmes	<b>17</b>
<b>Figure 3</b>	Programmes' Expected Cost Efficiency	<b>18</b>
<b>Figure 4</b>	Financial Mechanism of the First Facility (Phase I)	<b>24</b>
<b>Figure 5</b>	Financial Mechanism of the Second Facility (Phase II)	<b>25</b>
<b>Figure 6</b>	Financial Mechanism of the SCF Fund	<b>32</b>
<b>Figure 7</b>	Financial Mechanism of UGEAP for FRPA Structure	<b>40</b>
<b>Figure 8</b>	Financial Mechanism of UGEAP for SLs	<b>40</b>

# 1 Introduction

---

As outlined in the Paris Agreement, countries need to communicate a second round of Nationally Determined Contributions (NDCs) in 2020 and every 5 years thereafter. The first global stocktake on progress will take place in 2023, and it will assess the global progress towards achieving the goals of the Paris Agreement. This will also occur every 5 years. Reaching the Paris Agreement's mitigation goals will depend on how quickly countries implement their NDCs and their determination to increase the NDC's level of ambition. In developing countries, the speed of implementation depends highly on the costs and the availability of funds, among many other factors. An assessment by Weischer et al. (2016) provides an indicative estimate of developing countries' financial needs to implement both unconditional and conditional NDCs,<sup>1</sup> which amounts to more than USD 4.4 trillion. Additionally, Hof et al. (2017) estimated annual global abatement costs of achieving the unconditional NDCs at USD 58 billion to USD 135 billion by 2030. They also estimated the added costs of fully implementing the conditional NDCs to be substantial, ranging from USD 40 billion to USD 55 billion. The International Finance Corporation (2016) found a USD 23 trillion investment opportunity from 2016 to 2030 if a group of developing countries achieve their goals to scale up solar and wind energy, increase green buildings, put clean transport in place, and implement waste solutions as laid out in their NDC commitments.

Accessing climate finance remains a challenge for developing and less developed countries. To cover the costs of mitigation actions, countries tap into national public funds, international public finance, and private sector investments. However, the level of success in accessing finance continues to be low. Looking at Nationally Appropriate Mitigation Actions (NAMAs) using the Ecofys NAMA database (2017) one can see that out of 259 NAMAs developed since 2010, less than 9% have succeeded in securing funds and started implementation. Throughout the studies carried out under the Mitigation Momentum Project, the team has highlighted this trend and identified that one of the major reasons for this is a lack of successful financial mechanisms attached to NAMAs. Most NAMAs and low carbon programmes that seek international climate finance appear to be facing difficulties in achieving financial close.<sup>2</sup>

Considering the situation above, this paper seeks to find insights to address the following question: what factors make a financial mechanism successful? The research team focuses on the energy sector for three reasons:

1. It is the largest contributor to greenhouse gas (GHG) emissions and therefore plays a major role in achieving the temperature targets of the Paris Agreement.
2. It is almost universally included in all mitigation commitments of NDCs.
3. It is the sector with the largest share of NAMAs.

<sup>1</sup> Unconditional targets are considered voluntary and implementable without outside support. More ambitious conditional targets are assumed to be conditional on either financial support from a "high - ambition" (H) bloc of countries, or conditional on supportive climate-related policies pursued by other countries (Strand, 2017).

<sup>2</sup> In this paper, financial close occurs when all the project and financing agreements have been signed and all required conditions contained in them have been met. It enables funds (e.g., loans, equity, grants) to start flowing so that programme implementation can actually start.



### What do we mean by financial mechanisms?

In this paper, the financial mechanism is the mechanism that enables investments under a low-carbon programme. It is designed to lower the financial risks and/or improve the returns to mobilise investments. It is made of the programme's business case and financing structure. **The business case** justifies out *why* the programme should be implemented. It explains, for example, the type of energy services between stakeholders, such as end users and ESCOs, but also the profitability of the RE and/or EE services. **The financing structure** explains *how* the programme and the projects implemented under the programme will be financed. This includes the financial flows from public and private funders (amounts and frequency) from the financiers to the beneficiaries and the financial instruments used (e.g., loans, grants, equity etc.).

The research team tries to identify success factors through in-depth analysis of the financial mechanism of three concrete renewable energy (RE) and energy efficiency (EE) programmes. The programmes exhibit specific characteristics, but their analysis sheds light on programmes in the broader energy sector. The programmes have the following characteristics: (i) households and (micro) small and medium-size enterprises are the main beneficiaries, (ii) programmes have been awarded implementation funding, and (iii) programmes (or at least some components of the programme) are currently under implementation. A summary of the three programmes are in boxes 1, 2 and 3.

**Box 1. Energy Efficiency Green Bond in Latin America and the Caribbean**  
**Unlocking the financing of EE projects through capital markets securities**



**The challenge:** Small and Medium size Enterprises (SMEs) that offer energy efficiency services have limited access to financing, they lack the collateral that commercial banks demand, and therefore their track record with these banks is low. Local financial institutions' knowledge and experience in EE investments is minimal and their risk perception on such investments is high.

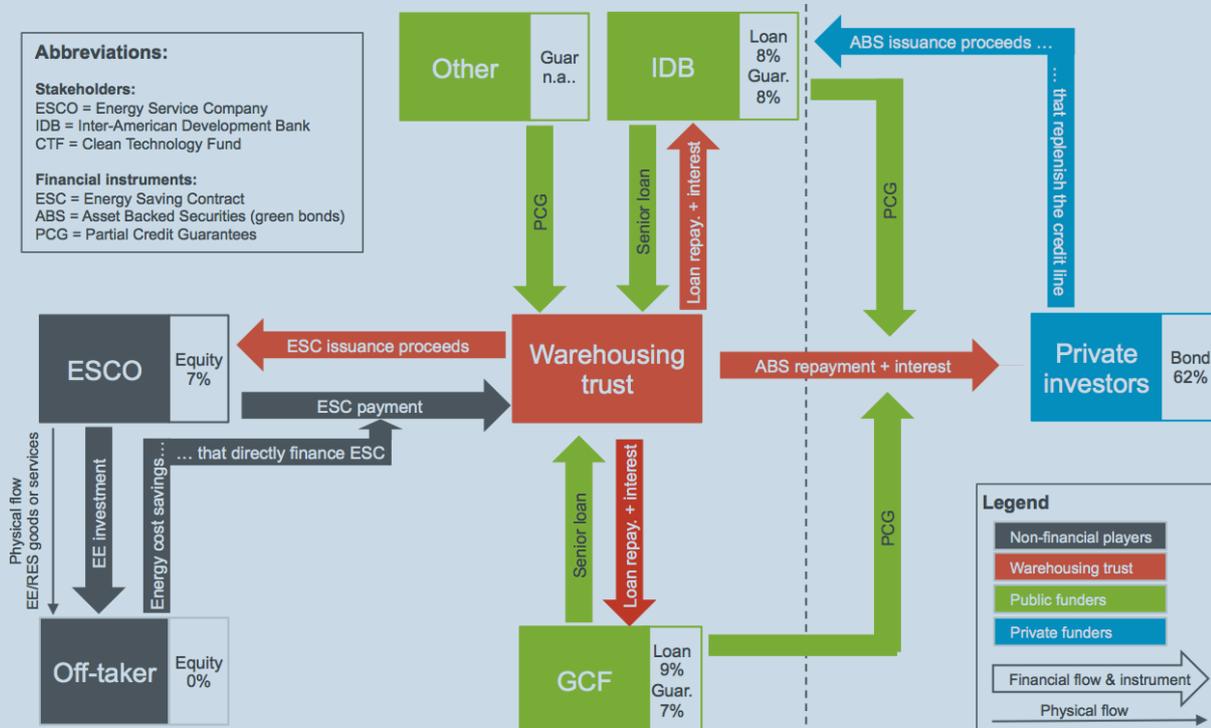
**The solution:** a green bond in which a pool of EE projects is packaged, issued and backed by the energy cost savings generated by the underlying projects.

**The financial mechanism (phase II):**

- Financial stakeholders: GCF, IDB, the Clean Technology Fund (CTF), and private sector stakeholders
- Financial instruments: Guarantee (provided by GCF, IDB, CTF), Grant (provided by GCF), Loan (provided by IDB), Equity (provided by the private sector), Bond (provided by private sector)
- Co-financing share (next to GCF): 85%
- Private funding share: 69%

**Step I: Accumulation**

**Step II: Mobilisation**



<sup>3</sup> Phase II refers to the financial mechanism that is based upon the good results of phase I, a pilot project in Mexico, which had a similar financial mechanism structure. The financial mechanism for this programme is the result of combining good results of a pilot project in Mexico, the potential for scale up in the country and replicability in the region, and the ambition of country governments to increase EE investments in their economies.

## Box 2. Supply Chain Finance (SCF) Capital Solutions

### Increasing MSMEs' working capital through supply chain financing techniques

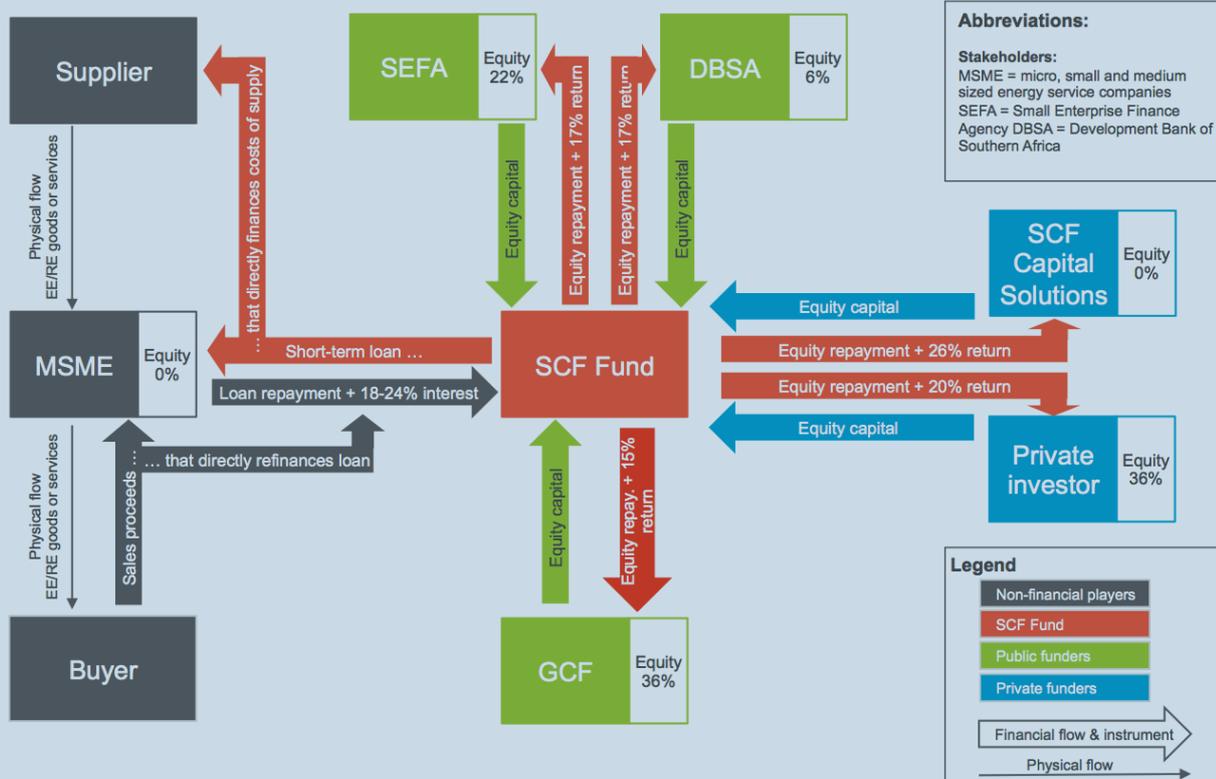


**The challenge:** Micro, Small and Medium size energy service companies (MSMEs) have limited access to financing, they have a small track record with commercial banks, and they lack the collateral that these banks demand. Besides, local financial institutions avoid offering such financing to SMEs because their knowledge and experience in EE and RE investments is minimal.

**The solution:** a supply chain finance (SCF) fund whereby MSMEs' working capital is increased. Credit approval decisions are made based on the credit worthiness of the energy service buyer (not the MSMEs), the fund provides loans that directly finance the costs of supply while the buyer directly finances the loan.

### The financial mechanism

- Financial stakeholders: GCF, private investors, the Small Enterprise Finance Agency of South Africa (SEFA), the Development Bank of Southern Africa (DBSA), SCF Capital Solution (a private sector fund).
- Financial instruments: Equity provided by SEFA, DBSA, SCF capital solution and the GCF, and loans provided by the SCF fund itself.
- Co-financing share (next to GCF): 64%
- Private funding share: 36%





### Box 3. Universal Green Energy Access Programme

#### Empowering local financial institutions (LFIs) to enable local financing of rural electrification

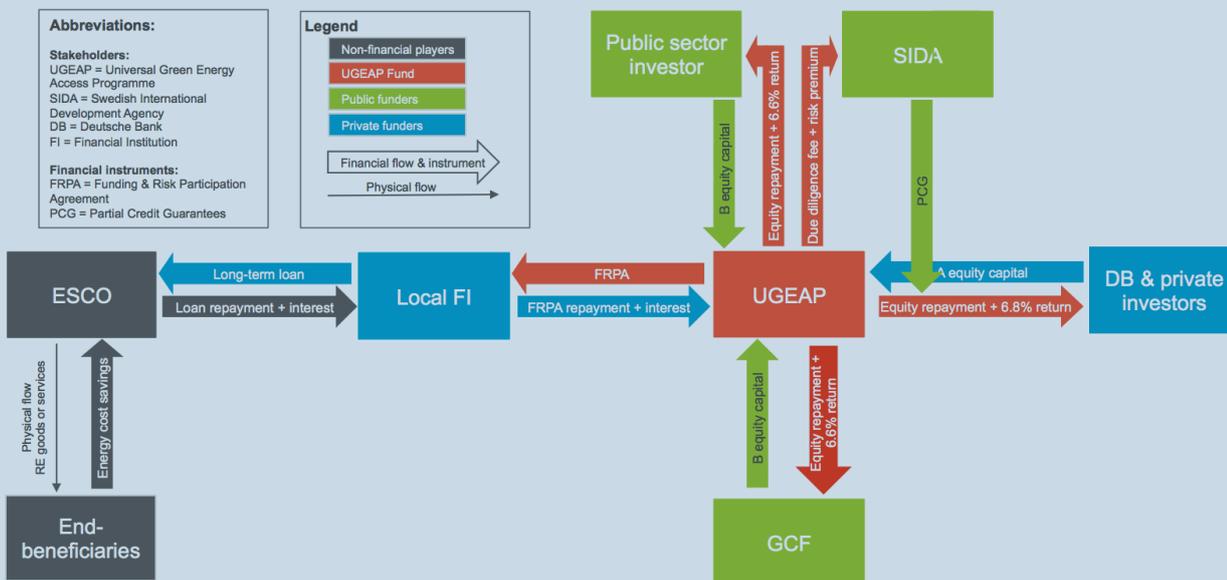


**The challenge:** limited access to electricity in rural communities of Sub-Saharan Africa (SSA), frequent power shortages and high prices of electricity. National public funds are limited and not enough to cover the capital required to solve these challenges.

**The solution:** a fund capitalised by public and private sector funding to empower local financial institutions (LFIs) through funding and risk participation agreements. Through these agreements, LFIs are able to provide loans of longer duration in local currency or in USD for ESCOs that offer clean electricity solutions to households and industries, such as solar home systems, renewable energy mini grids, and renewable electricity for industries.

#### The financial mechanism

- Financial stakeholders: GCF, Deutsche Bank, Private sector investors, public sector investors
- Financial instruments: Grant (provided by GCF), Equity (provided by Deutsche Bank, private sector, public sector), Guarantees (provided by the Swedish International Development Cooperation Agency (SIDA))
- Co-financing share (next to GCF): 73%
- Private funding share: 67%

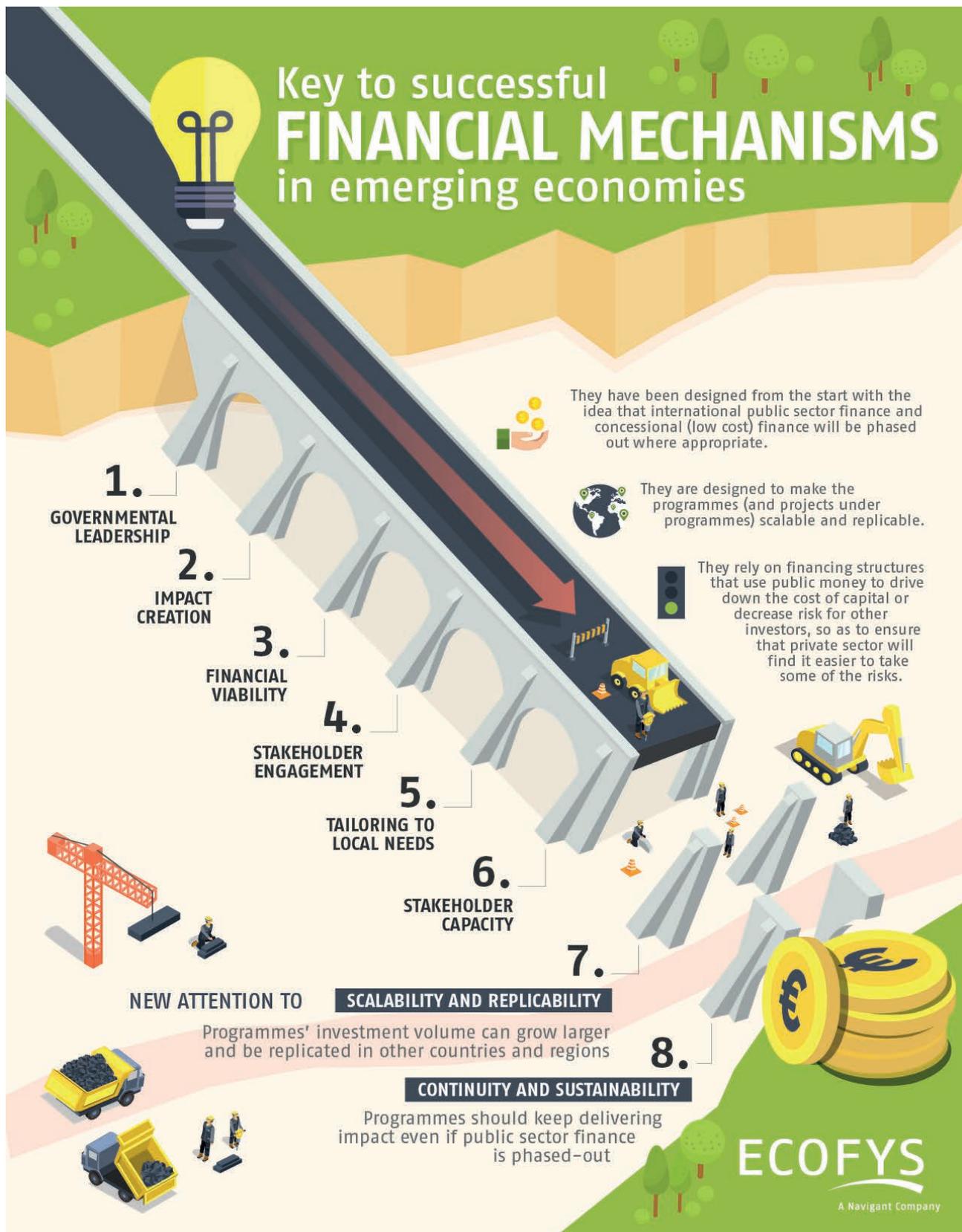


The analysis' results intend to provide insight to stakeholders in the climate finance community that are engaged in developing and implementing financial mechanisms for RE and/or EE programmes. As NDCs will require a significant scale up of the pipeline of RE and EE programmes globally, the research team provides recommendations to help stakeholders in the climate finance community to design and set up successful financial mechanisms.

This research paper is structured as follows:

- Section 2 summarises the research's main findings
- Section 3 describes the research's methodology
- Section 4 analyses the three RE and/or EE programmes in detail, focusing on:
  - a. A description of the programme
  - b. The process that led to the selection of the financial mechanism
  - c. The structure of the financial mechanism
  - d. The factors that determined the success of the financial mechanism
- Section 5 discusses the research findings

## 2 Main Findings



Implementing NDCs will require a significant increase in the pipeline of RE and EE programmes, as well as successful financial mechanisms that enable the implementation of these programmes. The research team's analysis suggests that successful financial mechanisms have the following in common:

- They have been designed from the start with the idea that international public sector finance and concessional (low cost) finance will be phased out where appropriate.
- They are designed to make the programmes (and projects under programmes) scalable and replicable.
- They rely on financing structures that use public money to drive down the cost of capital or decrease risk for other investors, so as to ensure that private sector will find it easier to take some of the risks.

### Structuring Successful Financial Mechanisms for RE and EE Programmes

The team's key recommendations for building a successful financial mechanism to stakeholders in the climate finance community are as follows:

First, develop a business case that can be operational on the ground and with the right technical and financial features to solve the energy issue at hand—for example, the energy services that will be offered; the type of contracts between end users, energy companies, and financial institutions; and the profit's size. The business case explains why it makes sense to do the programme based on the benefits, costs, impacts, etc.

Second, confirm the financial mechanism is robust by integrating these eight pillars:

1. *Ensure there is enough governmental leadership driving the programmes (e.g. national targets, strategies, political will)*
2. *Demonstrate the financial mechanism's impact creation (e.g. employment, GHG mitigation, etc.)*
3. *Demonstrate the financial mechanism's financial viability (e.g. profitability, affordability analysis)*
4. *Engage all stakeholders in setting up the financial mechanism (e.g. workshops, awareness raising)*
5. *Tailor the financial mechanism to local needs (e.g. preferred financing, currency lending)*
6. *Develop and build up capacities of stakeholders to run the financial mechanism (e.g. trainings)*
7. *Design the financial mechanism for scalability and replicability (e.g. programme or project can grow larger, a pipeline of projects can be identified)*
8. *Design the financial mechanism for continuity and sustainability (e.g. opt-out strategy)*

Third, devise a financing structure that suits the needs of the programme with features such as the volume of financial flows from public and private funders, the sort of financial instruments that will be used, and the financial terms/conditions of each instrument. The financing structure explains how the programme is financed. It can include, for example, the share of equity and debt and specific instruments used (e.g. loans, grants, equity), the sources of funds (public and private), and the financial terms and conditions.

### Zooming in on the Eight Pillars to a Successful Financial Mechanism

The following pillars have been identified as common across the successful financial mechanisms the research team analysed:

1. Governmental leadership
2. Impact creation
3. Financial viability
4. Stakeholder engagement
5. Tailoring to local needs
6. Stakeholder capacity
7. **Scalability and replicability**
8. **Continuity and sustainability**

As part of its analysis, the team looked at the structure of the financial mechanisms of three RE and EE programmes and the process used to set them up. It is not surprising that pillars 1 to 6 are important in developing financial mechanisms. The results of previous climate finance research completed under the Mitigation Momentum Project, indicate that it is common for international financial institutions to treat some of these as key investment criteria (Cuntz, Afanador, Klein, Barrera, & Sharma, 2017). These first six pillars can be seen as conditions to lay the groundwork to successfully develop financial mechanisms. In addition, pillars 7 and 8 highlight specific characteristics that successful financial mechanisms exhibit.

#### Box 4. Two Pillars that Help Make Financial Mechanisms Secure Funding for Implementation

In addition to the conditions that lay the groundwork to successfully develop financial mechanisms, the two common factors that make financial mechanisms stand out are:

- **Scalability and replicability:** programmes can be scaled up in size and volume, for example, by increasing the capacity installed (MW), the number of beneficiaries, and the investment volume (USD). Programmes can also be replicable widely in other countries or regions, while sharing and expanding the knowledge from country to country. In the case of SCF Capital Solutions, the team observed that programme developers designed for scalability and replicability from the beginning. The SCF Fund is preparing to establish partnerships with large private sector enterprises that are potential buyers of energy services from MSMEs to build supply chain financing anchored around these large buyers. Overall, the team saw that all programmes needed to increase the amount of RE and/or EE projects while also being able to scale up available financing. For example, in the “energy efficiency green bond in Latin America and Caribbean (LAC)”, the concrete results of a pilot in Mexico, provided lessons that enabled project developers to propose the upscale of the generation capacity from 5MW to 30 MW and to design the replication of the Mexico’s programme (USD 335 million) in other LAC countries, such as Colombia, Dominican Republic and Jamaica (USD 1,265 million).
- **Continuity and sustainability:** the design process of the programmes start with the idea in mind that the public sector finance (e.g. from local and international financial institutions) will be, where appropriate, phased out after a certain time, from which the programme should keep running by itself (i.e. continuous and sustainable in time). In all the three programmes, the research team observed that programme developers design for continuity and sustainability of financing from the beginning. In the Energy Efficiency Green Bond in Latin America and the Caribbean programme, for example, from the start, the government and the IDB were concerned with the issue of continuity. By issuing more and more green bonds in the local/regional capital markets over time, they sought to make the financial mechanism less dependable on IDB’s financial support.

# 3 Methodology

---

The research team took a three-step approach to assess the success factors of financial mechanisms in RE and EE programmes:

- 1. Selection of RE/EE programmes:** The team created a longlist of RE and EE programmes that already receive financing or that have been accepted for financing using internationally available databases. Then, the team analysed this longlist and selected three RE and/or EE programmes based on certain criteria that served as a first indication for a programme's financial mechanism's success.
- 2. In-depth analysis of the three programmes:** The team conducted an in-depth analysis of the three selected RE and/or EE programmes by carrying out semi-structured telephone interviews with persons in charge of designing and setting up the programme's financial mechanism.
- 3. Comparative analysis of the three programmes:** based on the results from the interviews and desk research, the research team conducted a comparative analysis of the three programmes, identifying important common elements that made the financial mechanism successful (i.e., factors of success) and drawing conclusions for stakeholders in the climate financing community.

Each step is described in more detail in the following sections.

## 3.1 Compiling the Longlist of RE and EE Programmes

To create a longlist of RE and EE programmes, the research team needed to define certain parameters upfront that would subsequently help the team analyse and compare the programmes' financial mechanisms. Parameters such as basic programme information (region, measure, date of approval, mitigation type, etc.), programme performance indicators (programme size, mitigation, avoided emission costs, cost efficiency, etc.), and most importantly, information on the financial mechanism (financial stakeholders, financial instrument, finance volume, co-financing share, public financing share, etc.) were deemed crucial for the analysis. The team then searched different publicly available RE and EE programme databases for these parameters. The databases reviewed were those from the NAMA Facility, the Green Climate Fund (GCF), the Green Environmental Facility (GEF), and the Energy Sector Management Assistance Program (ESMAP). The GCF database provided the most detailed information on the financial mechanisms. Therefore, the research team decided to extract the longlist of programmes from the GCF database. Currently, the database includes 45 programmes, 15 of which focus on supporting RE or EE; the remaining 30 generally had a focus on adaptation. The 15 longlisted RE and EE programmes were entered and processed in an Excel-based database so the team could analyse and compare the programmes' financial mechanisms.

To identify and then select three RE and/or EE programmes from the longlist, the research team first defined certain criteria—i.e., programme finance characteristics. These criteria are based on ex ante data published in the GCF database. Therefore, it is important to note that the team made the analysis based on what is expected to happen and not on actual realisations. While programmes have secured GCF funding, they cannot yet provide ex-post data that would have enabled the team to do an analysis of how the share of public and private sector finance would evolve over time.

- a. Share of private sector funding:** If a programme is designed to leverage a high share of funding from the private sector in relation to public funding, then the financial mechanism is deemed likely to be a success, as programme returns seem to be attractive.
- b. Financial instruments used:** If a programme relies less on grants while at the same time attracts not only debt (loan/bonds) but also equity, then the financial mechanism is deemed likely to be a success, as the programme is less sensitive to grants being abolished while investors are also more willing to take risk by contributing equity.

**c. Programme cost efficiency:** If a programme has an expected high cost efficiency (avoided tCO<sub>2</sub>e/USD million), then it is deemed likely to be a success, as programmes with a higher cost efficiency more easily attract (public and private) finance.

The results of the analysis of each criterion are shown below.

### Share of Private Sector Funding

Figure 2 shows the share of public and private sector funding for the 15 longlisted RE and EE programmes. It shows that four programmes attract funding from the private sector at a level of above 50%: FP005 KawiSafi Ventures Fund in East Africa, FP027 Universal Green Energy Access Programme, FP038 Geeref Next, and FP006 Energy Efficiency Green Bonds in Latin America and the Caribbean.

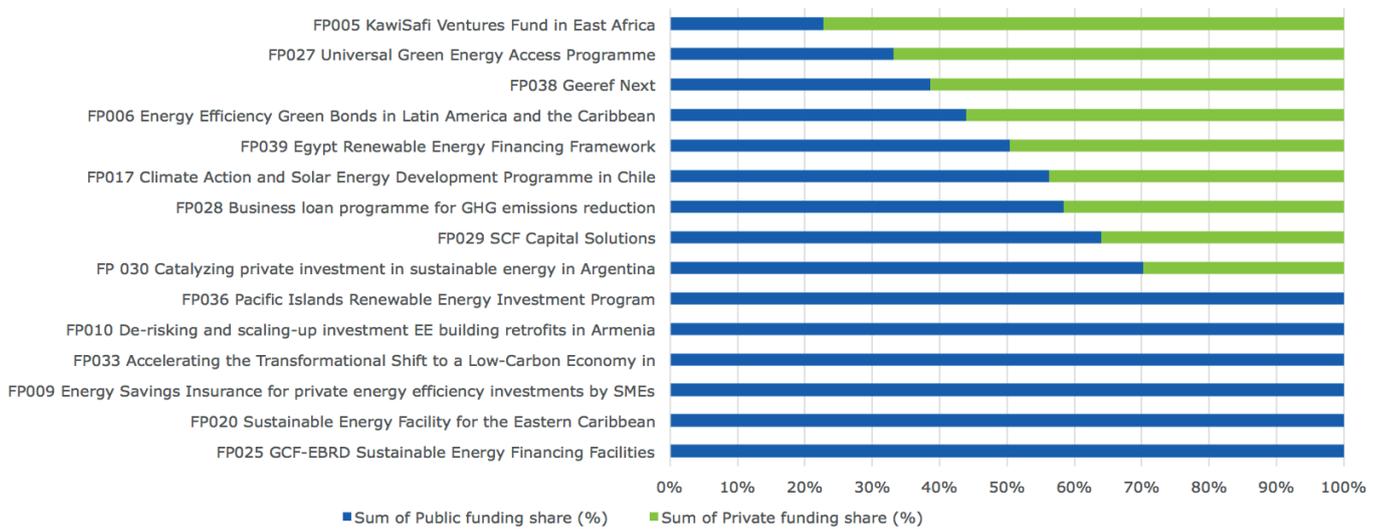


Figure 1: Share of Public and Private Sector Funding in Longlisted RE and EE Programmes

### Financial Instruments Used

Figure 3 shows the share of each financial instrument (grants, loans, equity, bonds, guarantees) in the 15 RE and EE programmes from the longlist. It shows that many programmes have a grant share lower than 10%. However, some of these are of particular interest: FP029 SCF Capital Solutions and FP027 Universal Green Energy Access Programme need no or only small grants, while having a high share of equity (e.g., 100% for FP029). The FP006 Energy Efficiency Green Bonds in Latin America and the Caribbean programme also attracts attention. It is financed by all five financial instrument types (grants, loans, equity, bonds, and guarantees), applying an innovative approach with so-called green bonds.

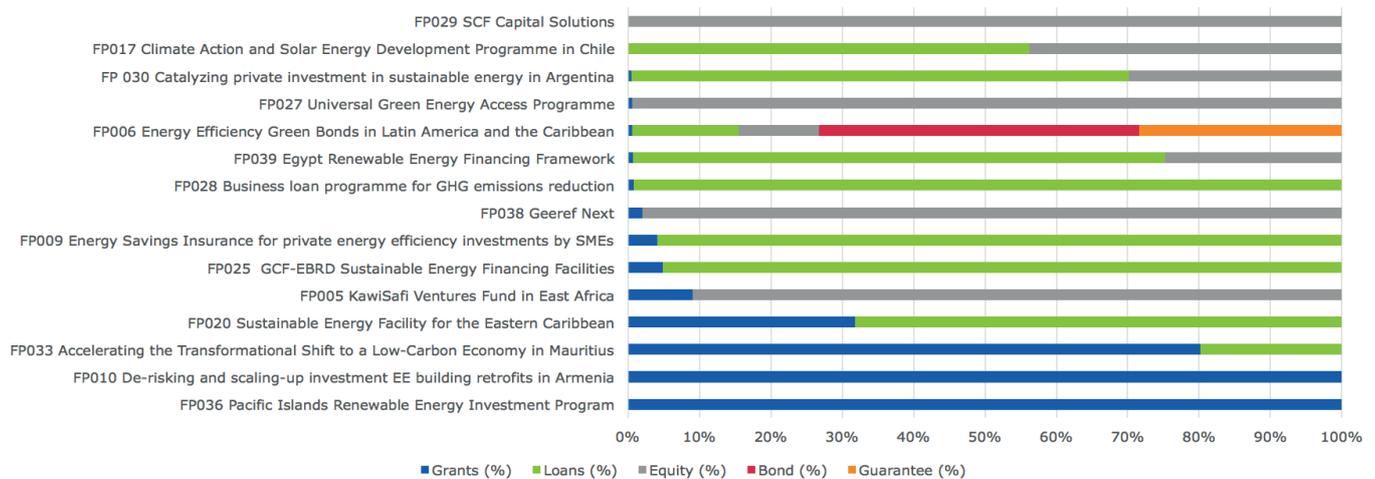


Figure 2: Share of Each Financial Instrument (Grants, Loans, Equity, Bonds, Guarantees) in Longlisted RE and EE Programmes

### Programme Cost Efficiency

Figure 4 shows the cost efficiency expressed by mitigation achieved and total investment volume in the 15 longlisted RE and EE programmes. It shows that FP029 SCF Capital Solutions and FP027 Universal Green Energy Access Programme are expected to be the most cost efficient from the longlist, as they expect to achieve a high mitigation while the investment volume remains small to moderate. This means that the expected mitigation per million USD is the highest. It is important to note that FP038 Geeref Next is also highly cost efficient, but due to its significant mitigation volume it is not shown in the figure below.<sup>4</sup>

<sup>4</sup> Putting FP038 Geeref Next into Figure 4 would make the other programmes hardly readable as it achieves a significant mitigation of more than 750 million t CO<sub>2</sub>e at a total investment volume of around USD 800 million.

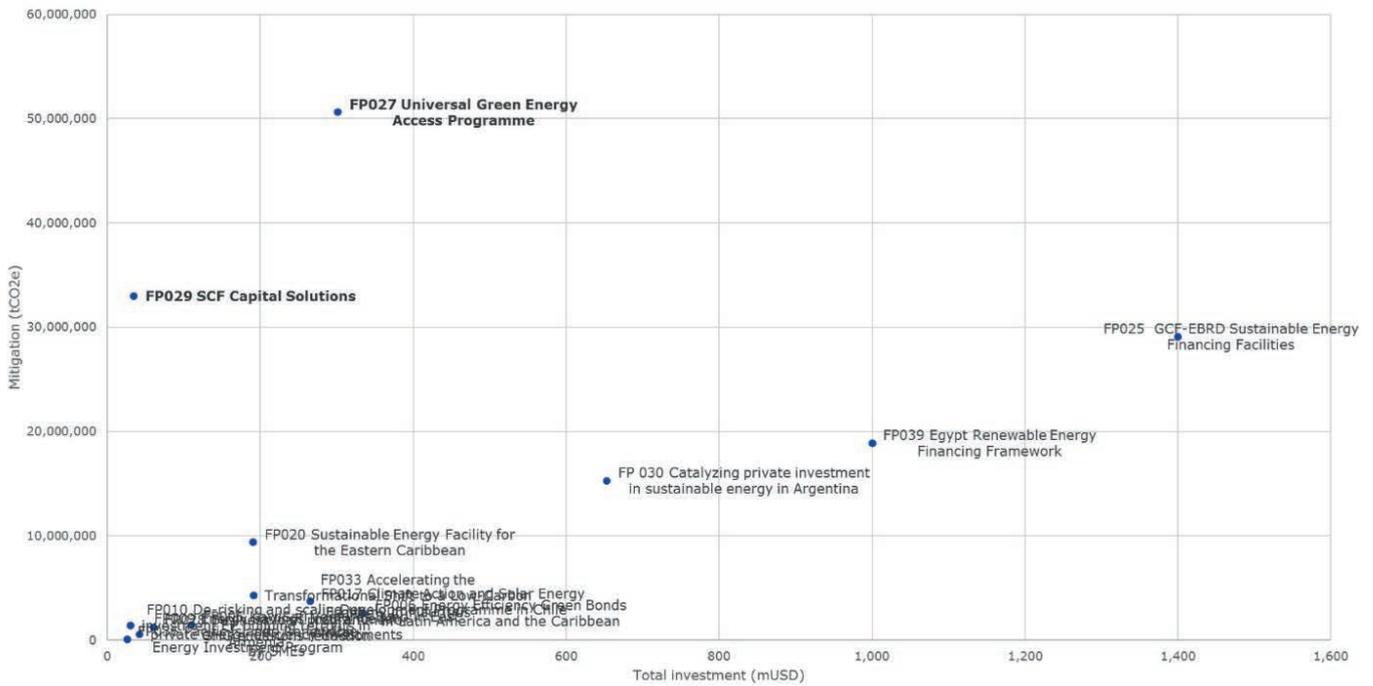


Figure 3: Programmes' Expected Cost Efficiency

According to the analysis above, the FP27 Universal Green Energy Access Programme fulfils all three criteria simultaneously, while FP029 SCF Capital Solutions, FP006 Energy Efficiency Green Bonds in Latin America and the Caribbean, and FP038 Geeref Next fulfil two out of the three criteria. In contrast, the FP005 KawiSafi Ventures Fund in East Africa only fulfils one criteria.

Consequently, the FP27 Universal Green Energy Access Programme, FP029 SCF Capital Solutions, and FP006 Energy Efficiency Green Bonds in Latin America and the Caribbean were selected for the subsequent in-depth analysis. Note that FP038 Geeref<sup>5</sup> was not taken into further consideration, as this programme—in comparison to all other 14 programmes in the longlist—has a substantially higher investment size, which limits the comparative assessment.

<sup>5</sup> FP038 GEEREF NeXt is structured as a fund of funds, with the aim of being a first investor (anchor investor) in RE/EE investment funds and encouraging other investors to co-invest. It finances the development, construction, and operation of RE/EE beneficiary projects across GCF-eligible countries, either indirectly via specialised funds or directly via investments into the beneficiary projects themselves.

### 3.2 In-Depth Analysis of Three Selected RE and/or EE Programmes

For the in-depth analysis of the three selected RE and/or EE programmes, the research team used a mix of semi-structured telephone interviews and desk research.

For FP029 SCF Capital Solutions and FP006 Energy Efficiency Green Bonds in Latin America and the Caribbean, the team conducted interviews to find out more about:<sup>6</sup>

1. The programme
2. The process that led to the selection of the financial mechanism
3. The financial mechanism's structure
4. The factors that determined the financial mechanism's success

For the three programmes, the research team collected publicly available information through desk research, mostly from the GCF database. Through this, the team was able to understand, in detail, the business case and financing structure of the programmes.

Based on the findings from the interviews and the desk research, the team conducted an in-depth analysis of each of the three selected RE and/or EE programmes to identify the factors that would make each financial mechanism successful.

### 3.3 Comparative Analysis of Three Selected RE and EE Programmes

Based on the results from the in-depth analysis, the research team conducted a comparative analysis of the three programmes. The goal was to identify the most important common elements between the programmes that made each financial mechanism successful in securing funding for implementation. Such elements ranged from specific financing features and financing sustainability—i.e., financing scalability/replicability and continuity—to stakeholder involvement and capacity building. The comparative analysis helped the team identify general and common success factors for a financial mechanism that programme developers should consider.

Finally, the team drew key conclusions for stakeholders in the climate financing community that are and/or will be developing and implementing future RE and EE programmes. The analysis and results presented in this paper were reviewed by the interviewees, who provided additional feedback before publication.

<sup>6</sup> Note: The team established a dialogue with stakeholders from the FP27 Universal Green Energy Access Programme but a semi-structured interview was not possible given it was too early for the programme developer to share information beyond what was publicly available. The programme developer recommended completing the analysis using information and data currently available on the Internet. Therefore, the team completed the analysis of the FP27 Universal Green Energy Access Programme via desk research.



# 4 Analysis of Three Selected RE and EE Programmes

## 4.1 Energy Efficiency Green Bonds in Latin America and the Caribbean (LAC)<sup>7</sup>

<b>Programme Features</b>	Programme Type	GCF
	Programme Owner	Inter-American Development Bank (IDB)
	Mitigation Action	EE and RE (with focus on EE)
	Programme Eligibility	Energy savings of at least 15% or reduce at least 17,000 tCO <sub>2</sub> e per million USD
	Approval	November 2015
	Duration	6 years
	Country (ies)	Mexico, Dominican Republic, Jamaica, and Colombia
<b>Programme Performance</b>	Programme Finance Volume <sup>8</sup>	USD 335 million (Phase I Mexico) USD 1,265 million (Phase II other LAC)
	Expected Mitigation	2.6 million tCO <sub>2</sub> e (Phase I Mexico) 10.7 million tCO <sub>2</sub> e (Phase II other LAC)
	Expected Mitigation per Million USD	7,800 tCO <sub>2</sub> e (Phase I Mexico) 8,500 tCO <sub>2</sub> e (Phase II other LAC)
	Mitigation Costs per tCO <sub>2</sub> e	USD 129 (Phase I Mexico) USD 118 (Phase II other LAC)
<b>Financial Mechanism</b>	Financial Stakeholders	<ul style="list-style-type: none"> <li>• GCF</li> <li>• IDB</li> <li>• Clean Technology Fund (CTF)</li> <li>• Private sector</li> </ul>
	Financial Instruments	<ul style="list-style-type: none"> <li>• Guarantee (GCF, IDB, CTF)</li> <li>• Grant (GCF)</li> <li>• Loan (IDB)</li> <li>• Equity (private sector)</li> <li>• Bond (private sector)</li> </ul>
	Co-financing Share (next to GCF)	93% (Phase I Mexico) 85% (Phase II other LAC)
	Private Funding Share	56% (Phase I Mexico) 69% (Phase II other LAC)

<sup>7</sup> The following analysis is based on a semi-structured interview conducted with officials from the IDB.

<sup>8</sup> Note that this project finance volume is not equal to the total project investment volume into EE measures. The reason is double counting of financing from financial instruments—notably loans from the public sector that will be replaced by green bonds from the private sector and guarantees that will not need to be released if there were no defaults of EE projects.

#### 4.1.1 Description of the Programme

##### Challenge

EE is considered to have one of the greatest potentials to lower production costs and improve business productivity while simultaneously reducing GHG emissions. This EE potential has incentivised private initiatives along the EE value chain, so-called energy service companies (ESCOs), to offer comprehensive EE solutions to companies interested in investing in EE. The lack of appropriate financing for ESCOs to develop such EE projects, however, poses a significant barrier to EE projects in LAC. Local financial institutions (LFIs) are conservative when lending to private sector companies; they also have limited expertise and capacities to assess and structure EE financing. In addition, LFIs prefer short-term, collateral-based lending schemes,<sup>9</sup> which are often not well-suited for EE project financing. At the same time, ESCOs are usually SMEs with a limited size balance sheet, resulting in higher risk LFI pricing. This results in high collateral, high interest rate, and short-term tenors (up to 1 year), making the loan terms for EE projects inadequate. Therefore, private sector EE initiatives are lacking sufficient and adequate financing.

##### Solution/Objective

Capital markets present an alternative to LFI loans for financing EE projects. In contrast to risk-averse LFIs, capital markets provide a platform for investors with the appetite and capacity to participate in the financing of EE projects through debt securities, called green bonds. In the last few years, the green bond markets have expanded significantly from USD 4 billion in 2012 to more than USD 80 billion in 2016 (Climate Bonds Initiative, 2016). Through green asset-backed securities (ABSs)—i.e., a type of green bond in which a pool of green projects is packaged, issued, and backed by the energy cost savings generated by the underlying projects—private sector companies could tap capital markets and not only access more financing but also better financing terms and conditions for their EE projects. Since the securities are backed by the EE projects' cash flows and because the pooling reduces the risks and costs associated with each individual project, this financing mechanism is more flexible and less dependent on the existing balance sheets of ESCOs. Pooling and securitising can thus bridge the financing gap and open the door to projects that would otherwise not be funded.

Despite the positive international developments in green bonds, the market for green ABSs remains fairly underdeveloped in the LAC region. To change this, the IDB set up the Energy Efficiency Green Bond in Latin America and the Caribbean programme. Its purpose is to unveil the market for green bonds in the LAC region by issuing green ABSs for EE projects. The programme is composed of two sub-programmes:

- The first facility (Phase I) is a pilot project in Mexico—Capital Markets Solution for Financing Energy Efficiency in Mexico—and was approved by the IDB Board of Executive Directors in July 2014. This phase seeks to support the ESCO market and reduce its financing gap for small-/medium-sized EE projects (up to 5 MW) in Mexico. This pilot transaction has already been recognised internationally as a best practice to unlock the financing of EE projects through capital market securities.
- The second facility (Phase II) is a Regional Green Bond Facility that aims to bring the pilot project in Mexico to scale by replicating the financing structure of Phase I with larger EE projects in several capital markets of the LAC region. This second facility is expected to finance EE projects with a size up to 30 MW in other countries in LAC. This rollout phase is expected to address the financing gap for EE projects in the private sector by promoting alternative sources of finance and developing a new asset class in capital markets (both domestic and international).

<sup>9</sup> Note that collateral is often not tangible for RE and/or EE projects (e.g., energy management systems, insulation), meaning that LFIs are resistant to provide funding.

The programme seeks to scale up the existing pilot in Mexico in at least three LAC capital markets. Initial countries under consideration for allocation of the GCF and IDB resources of the programme beyond Mexico include the Dominican Republic, Jamaica, and Colombia. Other countries could participate based on availability of EE projects seeking adequate financing, appropriate legal and regulatory environments, capital market readiness for the issuance of green ABSs, and institutional capacity of local institutional investors to invest in ABSs.

As part of the programme, the highest standards for green ABSs with a rigid verification and validation of environmental impacts according to the Green Bond Principles<sup>10</sup> are established. The mitigation potential is considerable: the GHG emission reductions from the underlying projects are expected to be more than 8,000 tCO<sub>2</sub>e per million USD invested over the lifetime of the projects. The aggregate expected emission reductions are around 13.3 million tCO<sub>2</sub>e. The GCF will be contributing to the implementation of such an innovative financing structure that can be catalytic to attract additional financing for a larger-scale programme for EE in LAC.

#### 4.1.2 Process that led to the Selection of the Financial Mechanism

The financial mechanism for this programme is the result of combining good results from the pilot project in Mexico, the potential for scale up in the country and replicability in the region, and the ambition of country governments to increase EE investments in their economies.

The context under which the Mexican pilot was implemented is similar to other countries in the LAC region. At least three features are common, including: 1) governmental energy agencies are aware of the socio-economic and environmental benefits of implementing EE measures; 2) governments have adopted EE strategies, plans, and policies; and 3) despite the first two, governments face obstacles in achieving the EE goals because the market is not ready to offer the enabling conditions for investments.

Notwithstanding the benefits of EE and its potential financial appeal, project developers in the region encounter few affordable financing options to implement EE projects. This situation is often caused by local financial players' limited awareness, high risk perception, and/or liquidity constraints. Most project developers are small ESCOs with a limited credit record with local financial banks, and because LFI assess their credit based on their balance sheet and not the project financing, the ESCOs' credit requests are usually rejected.

In the case of the Mexican pilot, the IDB with the support of the Clean Technology Fund (CTF) developed an innovative solution to this long-standing problem. The initiative, championed by the IDB and supported by the CTF, resulted in a cooperation to increase the knowledge on EE financing and build a track record on EE investments.

The structure of the pilot's financial mechanism was developed based on the need to diversify the risk of EE and the need to make it financially appealing to local financiers. The first idea was to aggregate EE projects from ESCOs to build up a portfolio large enough the IDB could offer funding, while the CTF would offer guarantees for the portfolio of projects. However, the question was of sustainability of financing: how could IDB financing act as a catalytic force without creating dependency? The solution was to create a loop of financing between the IDB, the ESCOs, and off-takers to increase the portfolio of EE projects and then securitise the accumulated portfolio through the issuance of green bonds in the local capital market. The intent is to build enough experience in the market and demonstrate that EE projects make financial sense. The IDB expects that over time the portfolio aggregate could be financed by the capital market itself.

<sup>10</sup> Green Bond Principles are described here: <https://www.ceres.org/resources/reports/green-bond-principles-2014-voluntary-process-guidelines-for-issuing-green-bonds/view>

The pilot implementation experienced initial obstacles, such as scepticism from ESCOs, lack of standardisation among ESCOs, and the limited understanding of the ESCO model by financial institutions. The pilot results showed, however, that these obstacles could be overcome by capacity building of all stakeholders and by standardising the ESCO model. The results of the pilot were positive enough to envision a scale up of the initiative in Mexico and other countries in the LAC region. The governments of Colombia, the Dominican Republic, and Jamaica, aware of the pilot results, asked the IDB to be part of the scale up. While the maturity of the capital markets differs substantially between the countries, the IDB worked in unison with the governments to develop what is now the Energy Efficiency Green Bonds in LAC GCF programme.

#### 4.1.3 Structure of the Financial Mechanism

The total financial volume of Phase I (Mexico) and Phase II (Other LAC) of the programme adds up to USD 1.6 billion and is structured as shown in Table 1.

**Table 1: Financing Structure of the Programme**

From	Financial Instrument	Millions USD	Share	Funding by Sector
<b>First Facility (Phase I): Mexico</b>				
GCF	Guarantee	20	6%	Public
GCF	Grant	2	1%	Public
IDB	Loan	50	15%	Public
IDB	Guarantee	56	17%	Public
CTF	Guarantee	19	6%	Public
Private Sector	Equity	38	11%	Private
Private Sector	Bond	150	45%	Private
	<b>TOTAL</b>	<b>335</b>	<b>100%</b>	
<b>Second Facility (Phase II): Dominican Republic, Jamaica, Colombia<sup>11</sup></b>				
GCF	Loan	110	9%	Public
GCF	Guarantee	85	7%	Public
IDB	Loan	100	8%	Public
IDB	Guarantee	100	8%	Public
Other Public	Guarantee	N/A	N/A	Public
Private Sector	Equity	90	7%	Private
Private Sector	Bond	780	62%	Private
	<b>TOTAL</b>	<b>1,265</b>	<b>100%</b>	

Figure 5 and Figure 6 explain the financial mechanism—i.e., the financial (and physical) flows between stakeholders, the financial instruments used by stakeholders, and the financing structure—of the first facility (Phase I) and the second facility (Phase II) in more detail. The programme's innovative financing mechanism for both Phase I and Phase II consists of a two-step financing solution: the 1) Accumulation Step, in which public finance is accumulated and disbursed to finance EE measures, and the 2) Mobilisation step, in which capital market investments are attracted.<sup>12</sup>

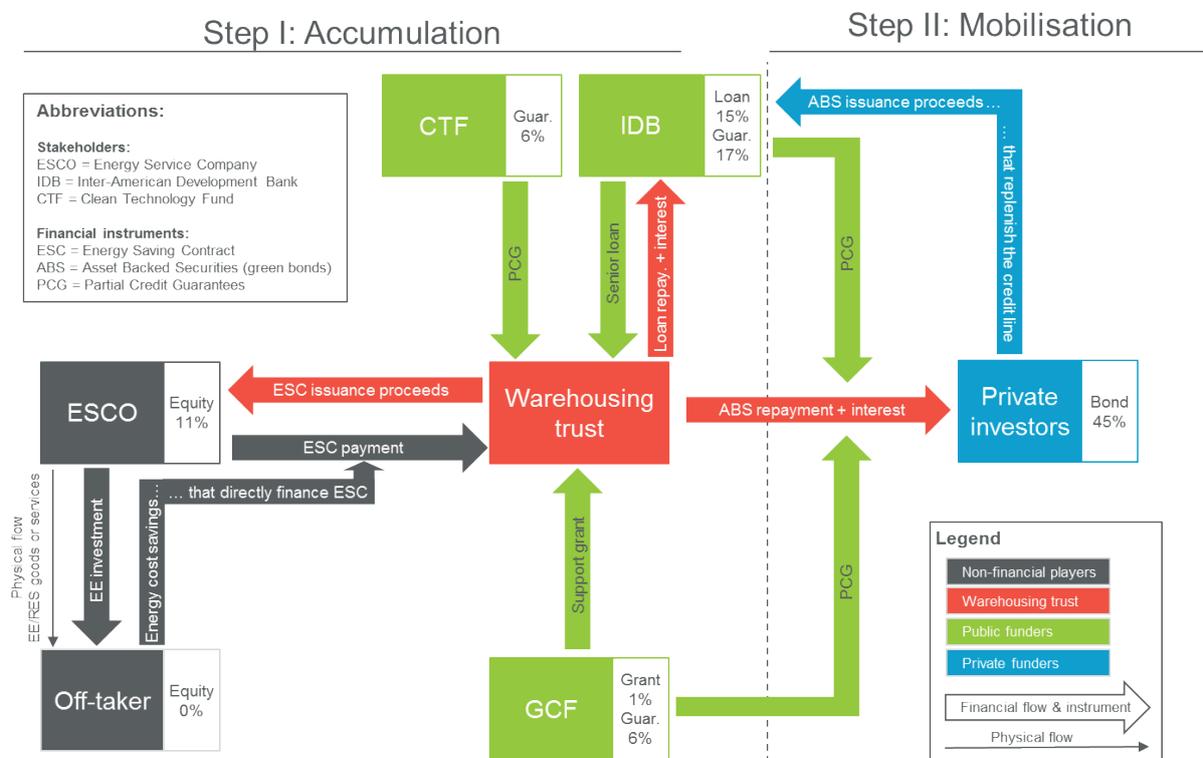
<sup>11</sup> Please note that the GCF Board still needs to get approval for the USD 195 million of Phase II.

<sup>12</sup> The financing mechanism can be used in a combined manner (Accumulation plus Mobilisation Steps) or in a separate manner (either Accumulation or Mobilisation) depending on the specific needs of the EE project.

**1. During the Accumulation Step**, the IDB (Phase I and II) and the GCF (only Phase II) grant senior loans to a so-called warehousing trust with the objective to increase financing for EE projects.<sup>13</sup> The capital of the warehousing trust is then used to finance ESCO EE projects by purchasing energy-saving contracts (ESCs)—i.e., credit rights between ESCOs and an EE off-taker that entitles the ESC purchaser to benefit from the energy cost savings of an EE off-taker. In return, the warehousing trust receives a certain share of the off-taker’s energy cost savings in the form of continuous ESC payments, which are then used to reimburse the senior loans of public funders. Only with the help of this funding, the ESCO can implement the EE measure. To set up ESCs, ESCOs constitute special purpose vehicles (SPVs)<sup>14</sup> to enable mini project financing. Through SPVs, ESCOs sign all contracts and pledge the purchased EE equipment to the warehousing trust. The ESCO notifies the off-taker as soon as the ESC has been sold to the warehousing trust and instructs that the ESC payments be deposited into the warehousing trust. This mechanism is a true sale of the assets and an off-balance sheet financing.

In the warehousing trust, the financed, standardised, and accumulated EE projects developed by ESCOs are then backed by a first loss partial credit guarantee (PCG),<sup>15</sup> either granted by the CTF (Phase I) or by other public funders (Phase II)—for example, by CTF and the Nordic Fund.

**2. During the Mobilisation Step**,<sup>16</sup> the warehousing trust issues ABSs (i.e., green bonds) that are backed by the cash flow (i.e., ESC payments) generated by the EE projects. These bonds are placed for private investors, primarily in the local capital markets. The ABS issuance proceeds are used to replenish the credit line of public funders to accumulate new EE projects to later securitise them again. In both phases, the IDB and GCF will grant second-loss PCGs for the issued green bonds to attract private funders. The PCGs provide external credit enhancement to meet investors’ risk appetite.



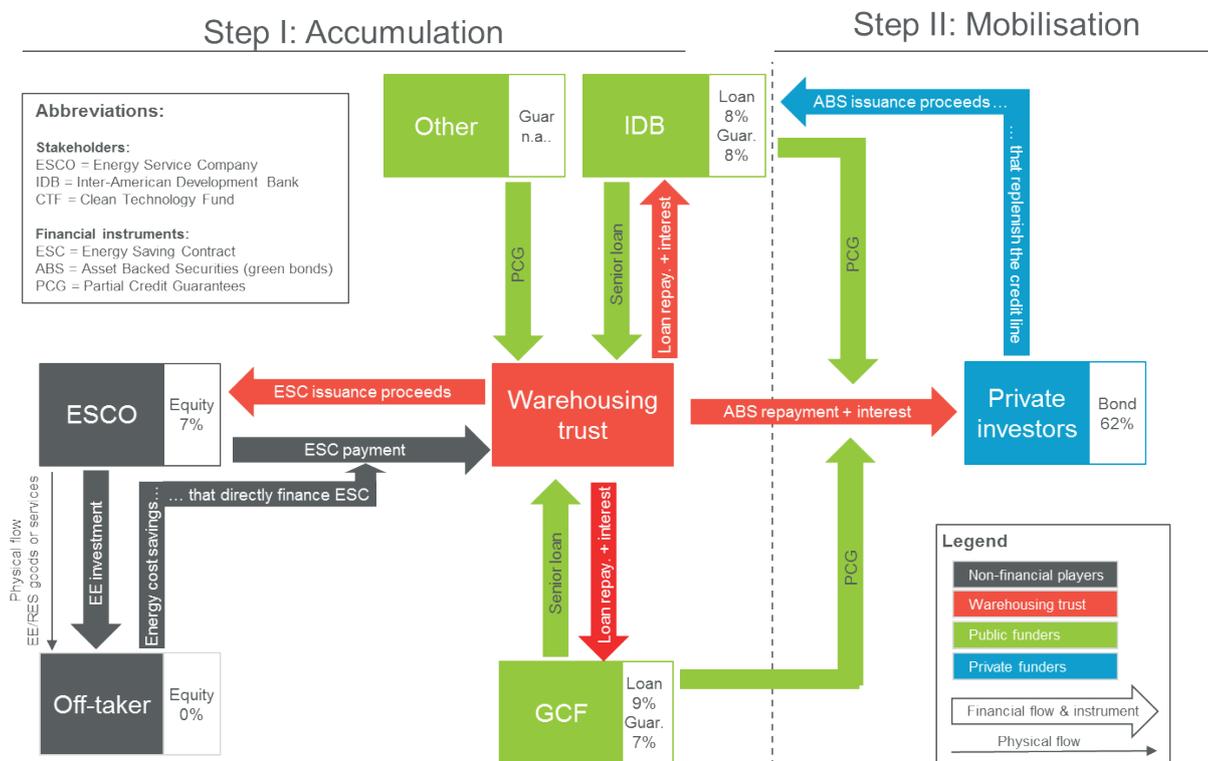
**Figure 4: Financial Mechanism of the First Facility (Phase I)**

<sup>13</sup> Note that in Phase I, the GCF also provides a USD 2 million grant to help establish the warehousing trust.

<sup>14</sup> SPVs are entities created for a specific, limited, and normally temporary purpose. They are limited companies or partnerships to which the debt of another company is transferred. By transferring its debt off the balance sheet into an SPV, a company can isolate itself from any risk that the debt might pose. SPVs are often used in securing loans or other instruments. For example, a bank may issue a mortgage-backed security (MBS), the income from which is derived from repayments from a pool of mortgage loans. The bank may wish to legally separate itself from the loans and does so by setting up an SPV and transferring the loans to it. (Reuters, Financial Glossary, 2015)

<sup>15</sup> “The basic principle of a credit guarantee scheme is that a third party (the guarantor) shares the credit risk of a project with the lender and takes all or part of the losses incurred by the lender in the event of default by the borrower.” A partial credit guarantee only covers part of a loan granted by the lender to its borrower. (IDB, Guarantee for Green Markets, 2014).

<sup>16</sup> Currently, neither Phase I nor Phase II has fully implemented the Mobilisation step. Note that for Phase I this step will be implemented by the end of 2017.



**Figure 5: Financial Mechanism of the Second Facility (Phase II)**

For Phase I, project eligibility criteria included the following, among others:

- The project is an EE or RE project
- The maximum project size is 5 MW of capacity
- The energy savings are at least 15% lower than the baseline
- A minimum of 5,000 tCO<sub>2</sub>e per MXN10 million (USD 0.56 million) invested is reached
- The off-taker has a minimum credit rating of B+

#### Lessons Learned - Insights into What Helped Make the Financial Mechanism a Success:

1. First loss guarantees during the aggregation phase are fundamental to lower the risk of portfolio concentration
2. Financing for small-scale projects must be in local currency to avoid exchange risk
3. Fixed interest rates are preferred, as these are less risky for investors (borrower and bond buyer)
4. Project eligibility criteria are fundamental to maintain portfolio credit quality, but it should be flexible to allow the entrance of more EE and RE projects from SME companies
5. Simple measurement and verification (M&V) processes for measuring energy savings under ESCs are important
6. Awareness campaigns on the economic benefits of EE shall be implemented in parallel to the launching of the program
7. Invest in developing more capacity building for other ESCOs to join the program (i.e., scalability)

#### 4.1.4 Factors that Determined the Success of the Financial Mechanism

There are many crucial factors to successfully developing the programme's financial mechanism. The most important factors identified were strong governmental leadership, capacity (building) of stakeholders, an innovative solution tailored to local needs, scalability and replicability potential, and planning for continuity/financial sustainability.

- Governmental leadership:** The political willingness of the Mexican government to create a favourable environment for the implementation of RE and EE technologies was fundamental to create change in the market. Implementing policies and regulations that pushed the market towards the use of RE and EE technologies made clear that regulations alone would not help them achieve the targets. However, their persistence to find a solution guided the government in the right direction to discover that policies and regulations were necessary for the local finance sector, as were incentives to foster capital market maturation.
- Capacity (building) of stakeholders:** The IDB offered capacity building to project developers (ESCOs), LFI, and public officials. The Mexican pilot significantly helped to build and improve capacities through learning by doing. This proved instrumental to raise awareness about the project's business case, its characteristics, the operation plan, the sources of financing and revenue, the intended customers, the product, and all financing details. The capacity building sessions were also useful to receive feedback and new ideas that could be incorporated in the model to ensure its appropriateness to the local context. Capacity was also crucial for drawing attention from both the local capital market as well as international climate financiers. The pilot served again to evaluate the business case, analyse obstacles and solutions, and draw lessons for future projects in Mexico and the LAC region. The IDB capitalised on the pilot lessons and developed an enhanced financial structure that could attract more international public climate finance.
- Innovative solution tailored to local needs:** Within the context of the global drive towards green and climate bonds, the accumulation and mobilisation of EE finance through local/regional bond issuances is an innovation not previously applied by major international financial institutions. Of particular importance is the fact that the financial mechanism was tailored to local needs in the sense that it helps to improve and leverage existing local/regional capital markets. The financial mechanism thereby creates a virtuous cycle in the local capital market for a sector (EE) that is often not regarded competitive from the financial perspective. It fosters the mobilisation of domestic private capital to EE projects, supports the growth in maturity of domestic capital markets, and increases the ESCO model know-how.
- Scalability and replicability potential:** This condition is inherently linked to the concrete results of the pilot. The results of the Mexican pilot were spread throughout the LAC region, and other governments were curious and interested in replicating the experience. The governments of Colombia, the Dominican Republic, and Jamaica expressed their willingness and commitment to undertake such replication, providing a strong impetus in the process that led to the development of a proposal to obtain climate finance from the GCF and other donors.
- Continuity/financial sustainability (sustainable finance over time):** From the start, the government and the IDB were concerned with the issue of continuity—can the financial mechanism be sustainable over time? Can it run without the IDB's perpetual support? While the financial mechanism must be adjusted to the local conditions of each country (market), its essential features are: aggregating projects into a large portfolio and a self-sustaining warehousing trust that administers the portfolio, providing funding to ESCOs, and receiving the repayment through ESCs. These essential features are meant to show that a self-sustaining trust is possible, that it can grow in size, and that it can be successful. Over time, the trust could be taken by a private capital stakeholder, making the financial mechanism less dependable on the IDB's financial support.



**The success of the financing structure—i.e., technical and financial features on the financing side—was based on three main factors:**

the size of the portfolio of EE projects, the financial regulatory environment, and the maturity of capital markets.

- **Portfolio size:** The portfolio must have a sufficient volume of EE projects in the pipeline, built up by ESCOs facing a financing gap. Benchmark issuances are usually characterised by an issuance size above USD 200 million.
- **Financial regulations:** The implementation country should have adequate legal and regulatory environments, such as clear bankruptcy laws for an effective true sale of assets and certainty of asset repossession, and an adequate securities law for securitisations.
- **Capital market maturity:** Minimal capacity and appetite of local capital markets is required; however, the programme itself has a strong capacity building component aimed at creating the readiness of local capital markets for securitisation.

#### 4.2 SCF Capital Solutions<sup>17</sup>

<b>Programme Features</b>	Programme Type	GCF
	Programme Owner	Development Bank of Southern Africa (DBSA)
	Mitigation Action	RE and EE
	Programme Eligibility	<ul style="list-style-type: none"> <li>• Only micro-, small-, and medium-sized energy service companies (MSMEs), active in climate change mitigation/adaptation</li> <li>• Maximum finance volume of 5 million USD per MSME project</li> <li>• Minimum project margin of 15%</li> </ul>
	Approval	December 2016
	Duration	10 years
	Country (ies)	South Africa
<b>Programme Performance</b>	Programme Investment Volume	USD 34 million
	Expected Mitigation	33 million tCO <sub>2</sub> e
	Expected Mitigation per Million USD	970,000 tCO <sub>2</sub> e
	Mitigation Costs per Tonne CO <sub>2</sub> e	USD 1
<b>Financial Mechanism</b>	Financial Stakeholders	<ul style="list-style-type: none"> <li>• GCF</li> <li>• Private investors</li> <li>• Small Enterprise Finance Agency of South Africa (SEFA)</li> <li>• DBSA</li> <li>• SCF Capital Solutions</li> </ul>
	Financial Instruments	Equity
	Co-financing Share (next to GCF)	64%
	Private Funding Share	36%

<sup>17</sup> The following analysis is based on a semi-structured interview conducted with officials from DBSA/SCF Capital Solutions.

#### 4.2.1. Description of the Programme

##### Challenge

The South African government is seeking to achieve a 34% reduction in domestic GHG emissions by 2020 and 42% by 2025. In addition, according to officials, the growth foreseen in the green economy is expected to create almost 255,000 jobs in South Africa in the medium term. Despite these targets, there is still a significant lack of access to finance for MSMEs that provide EE or RE goods or services. This is mostly due to the lack of track record and collateral of such MSMEs, which traditional banks require to approve finance. In the future, MSMEs can only play an instrumental role in achieving climate policy goals if their access to finance challenges can be sustainably improved and extended.

##### Solution/Objective

To improve access to finance for MSMEs in the green economy, the DBSA set up an entity named SCF Capital Solutions.<sup>18</sup> Its objective is to establish a fund for MSMEs utilising development funding and private sector investment. This SCF Fund seeks to deploy equity capital committed by its partners to support the most promising working capital prospects of MSMEs in the green economy. The lack of finance for MSMEs is solved by using supply chain financing techniques to provide working capital to MSMEs on purchase orders or invoice discounting.<sup>19</sup> In supply chain financing, credit approval decisions are made based on the credit worthiness of the buyer (not the MSMEs) and the overall strength of the supply chain. Supply chain financing is generally applicable where MSMEs need finance to supply goods or services to large credit-worthy buyers. An example is a small solar MSME that installs a large PV system for a hospital and, therefore, needs to finance high upfront costs for the purchase of PV panels from its supplier. Existing factoring and contract financing firms in supply chain financing tend to charge high monthly fees for this type of short-term funding, between 4% and 8% per month, which is unsustainable for most MSMEs whose margins are typically not that high. The development funding within the SCF Fund attracts private sector investment, which generally needs to price higher to obtain sufficient returns, as public funding (e.g., from GCF) enables a build-up of the book by reinvesting returns until the desired rate of return of the private sector can be achieved. Consequently, the SCF Fund allows MSMEs to benefit from lower and affordable fees, thereby promoting more green activities throughout South Africa. The SCF Fund, which has already been tested during a pilot phase where it was solely capitalised by public funding from DBSA and SEFA, is expected to kick off with private investments by the end of 2017.

The mitigation potential is considerable: the GHG emission reductions are expected to be 970,000 tCO<sub>2</sub>e per million USD invested over the lifetime of the projects. The aggregate expected emission reductions are around 33 million tCO<sub>2</sub>e. The programme seeks to attract around USD 12 million of private investment. In the future, by building a track record of MSME supply chain finance performance, the SCF Fund seeks to attract further private investors while continuously reducing public funding needs.

According to the GCF funding proposal, potential key priority sectors for supply chain finance in the green economy landscape in South Africa where the programme will play an important catalytic role in supporting MSMEs are: 1) Rural energy including mini-grid and off-grid, 2) biogas and biofuels, 3) sustainable water management, 4) green buildings, 5) cleaner industrial production, 6) ecosystem services, 7) solar water heating, and 8) sustainable agriculture.

<sup>18</sup> SCF Capital Solutions is relatively new. It was established in 2015, and was capitalised as part of a pilot project that was funded by DBSA and SEFA. SCF stands for Supply Chain Finance.

<sup>19</sup> Invoice discounting helps ambitious companies expand and grow. They refer to the same essential process: an asset-based working capital solution that allows businesses to get advances on cash they are due from customers, rather than waiting for those customers to pay. Businesses can then invest faster in growth (Market Invoice, 2017).

#### 4.2.2. Process that Led to the Selection of the Financial Mechanism

Under the framework of South Africa's green economy and climate commitments, the Department of Environmental Affairs (DEA) developed the National Green Fund. The department appointed DBSA to be the fund manager. Among many opportunities to green the economy, DBSA saw a remarkable opportunity in MSMEs offering low carbon solutions. MSMEs are a major driving force of South Africa's economy, but still face barriers to access credit, limiting their potential to create impact. DBSA partnered with SEFA to design a pilot fund, i.e., the SCF Fund. This pilot fund was created in 2015, with a volume of ZAR60 million, equivalent to approximately USD 4.5 million with all funding coming from both DBSA and SEFA. The fund achieved noteworthy results on its first year, prompting DBSA and SEFA to scale it up, leading the two institutions to submit a proposal to the GCF, which, in late 2016, approved USD 12 million in financing.

##### Box 5. Key Drivers for Setting Up a Compelling Financial Mechanism

Successful results of pilot programmes are key drivers to capture the attention of other stakeholders that could potentially be interested in scaling up the programme. In the case of the SCF Fund, the pilot fund demonstrated the following results before receiving funding from the GCF:

- Numbers of MSMEs financed: 40
- Number of projects financed: 50
- Numbers of loans issued: 200
- Number of jobs created: >2,700
- Total investment size: ZAR 60 million
- Average project investment size: ZAR 1.5 million (USD 110,000)

Other indicators, important for the local context of South Africa, such as gender and ethnicity were also considered:

- Proportion of MSMEs owned by people of colour: 80%
- Proportion of MSMEs owned by women: 43%

DBSA and SEFA faced certain barriers during the implementation of the pilot fund, most of them related to the risk perception of the market and the unfamiliarity with green investments. Capital markets feel more comfortable in participating only after a long track record of success; the time varies, but they expect a minimum of 3 years. To solve this issue, DBSA and SEFA will use the GCF funds to subsidise funding to private investors for the programme period of 10 years. This will allow DBSA to demonstrate to the capital market that the funding model works. The funding is then expected to run without any concessions.

Beyond DBSA and SEFA, the creators of the pilot fund, other stakeholders were also indispensable for the successful implementation of the pilot. These include MSMEs (providers of the RE/EE service), RE/EE technology suppliers (providers of the technology to the MSMEs), and buyers (end users who receive the RE/EE service). An additional stakeholder joining the scale up is the private investor (not yet known), which provides equity capital to the SCF Fund. DBSA and SEFA presented a compelling business case to all stakeholders, illustrating the following main value propositions:

- **MSMEs:** While they are only paid for their services after they satisfactorily finish the work, the business case of the SCF Fund allows them to access the technologies required to complete the services without any upfront costs. The costs are instead paid directly by the fund.

- **RE/EE technology suppliers:** Their risk perception of doing business with MSMEs is high, and they often reject any business proposal from these sort of enterprises. By doing this, technology providers are limiting their sales opportunity and access to the full market potential. The business case of the SCF Fund opens a big market window for them, and the fund guarantees payment for their services to the MSMEs.
- **Buyers/end users:** Demand for RE/EE technologies is growing in South Africa, but end users either have had bad experiences with MSMEs that were unable to complete the works due to lack of proper financing or they have had to pay higher prices to large enterprises. The business case of the SCF Fund reduces the fear of the end user and provides higher confidence in MSMEs.
- **Private investor:** A private investor is continuously looking for promising investment opportunities while at the same time being hesitant or even resistant to invest into unknown MSMEs (and their specific business cases); this is because the perceived financial risks are prohibitively high. The business case of the SCF Fund reduces these risk perceptions through subsidising the return of private investors that generally need to price higher to obtain sufficient returns, and showing over the course of the SCF Fund's lifetime that MSME business cases are more mature and less risky than currently perceived by private investors.

It is worth noting that the current structure of the SCF Fund is a result of numerous discussions among stakeholders and the GCF about the management of private investor risk, the duration of the fund execution, and the level of equity.

#### 4.2.3 Structure of the Financial Mechanism

The total finance volume of the programme is shown in Table 2:

**Table 2: Financing Structure of the Programme**

From	Financial Instrument	Millions USD	Share	Funding by Sector
GCF	Equity	12	36%	Public
Private Investor	Equity	12	36%	Private
SEFA	Equity	7	22%	Public
DBSA	Equity	2	6%	Public
SCF Capital Solutions	Equity	0	0%	Private
	<b>TOTAL</b>	<b>34</b>	<b>100%</b>	

Figure 7 explains the financial mechanism behind the SCF Fund—the financial (and physical) flows between stakeholders, the financial instruments used by stakeholders, and the financing structure—in more detail. The research team explains Figure 7 by 1) elaborating on how the SCF Fund provides affordable supply chain financing to MSMEs, and by 2) showing how the SCF Fund catalyses private sector investment that needs to price higher to obtain good returns, thus utilising public development funding.

1. The SCF Fund provides affordable supply chain financing to MSMEs by granting supply chain finance for EE or RE goods or services in the form of short-term loans (generally with a maximum tenor of 4 months). As shown in Figure 7, no equity is required from MSMEs, meaning that the transactions (i.e., total investment volume) are 100% financed by funding from the SCF Fund. Short-term loans are not disbursed to MSMEs themselves; instead, they are used to directly finance and pay for the costs of the MSMEs' suppliers. This process is followed because the SCF Fund aims to have control over the cash flows, here the costs, of the MSMEs.

In return, the SCF Fund requires loan repayment and an annualised interest rate of between 18% and 24%. The exact interest rate depends on the individual risk profile of the transaction (e.g., the creditworthiness of the buyers). In a similar way as for the loan disbursement, the short-term loan is not reimbursed by the MSMEs themselves; instead, it is directly financed by the purchase price of the EE or RE goods or services that was agreed upon between the MSME and the buyer. Thereby, the SCF Fund again aims to have control over the cash flows, here the revenues, of the MSME. This means that the MSMEs' revenues from the buyer are used to directly reimburse the SCF Fund, while the remaining revenues after loan reimbursement are passed through to the MSME.

Before and during the entire programme phase, the SCF Fund closely monitors the operational processes and cash flows (i.e., costs and revenues) of the supply and delivery of the EE or RE goods or services to reduce the default risk of the MSME. A prerequisite for an MSME project to get SCF funding is a minimum project margin of 15% and a maximum finance volume of USD 5 million.

2. The SCF Fund is completely based on equity funding with equity coming from both public and private funders. As shown in Figure 7, the GCF (36%), DBSA (36%), and SEFA (22%) contribute public financing, which accounts for 64% of the fund's capitalisation. Private funding comes, to the largest extent, from a single private investor<sup>20</sup> (36%) plus a negligible amount (<1%) from SCF Capital Solutions.

By combining public and private funding, the SCF Fund lowers the MSME's interest rate while crowding in private sector investors. GCF funding allows a build-up of the book by reinvesting returns until the desired rate of return can be achieved. As a result, the private investor's equity return lies at 20%, whereas it is 17% for SEFA and DBSA and 15% for GCF. The return on equity expected for SCF Capital Solutions is around 26%.<sup>21</sup>

<sup>20</sup> Note that the private investor is not determined as negotiations have not been finished yet.

<sup>21</sup> It should be noted that this is due to the low base considering SCF's level of equity contribution.

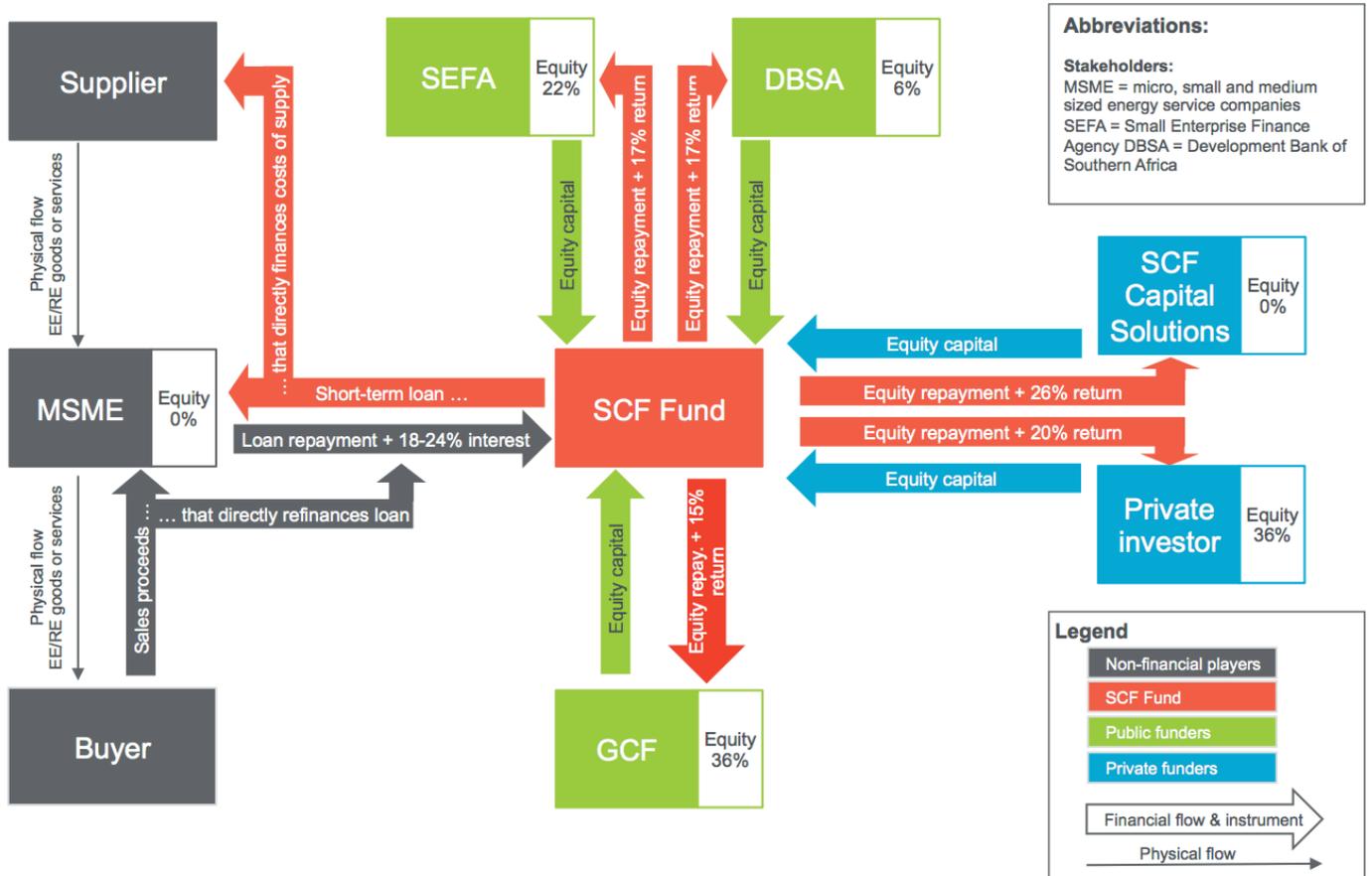


Figure 6: Financial Mechanism of the SCF Fund

### Box 6. What is Supply Chain Finance?

Supply chain finance is a set of technology-based business and financing processes that link the various parties in a transaction—the buyer, seller, and financing institution—to lower financing costs and improve access to finance for MSMEs. In supply chain finance the financial institution avails credit to the supplier based on the credit strength of the buyer, which would normally be a large entity. Thus, in supply chain finance the credit risk is on the buyer, and performance risk is on the supplier. The supplier performance risk can be broken down further by looking at how early in the supply chain the transaction is financed. Supply chain finance provides short-term credit that optimises working capital for both the buyer and the seller. Supply chain finance generally involves the use of a technology platform to automate transactions and track the invoice approval and settlement process from initiation to completion. The growing popularity of supply chain finance has been largely driven by the increasing globalisation and complexity of the supply chain, especially in industries such as automotive, manufacturing, and retail.

SFC Capital Solutions developed specific eligibility criteria for MSME supply chain financing in the pilot phase of the SCF Fund when it was still solely capitalised by public funding from DBSA and SEFA. It is built on five pillars:

1. **Assessing the bankability of the transaction:** Ensuring that the transaction makes sense from a business and economic perspective
2. **Assessing the buyer's credit risk:** Ensuring that the buyer is willing and able to pay
3. **Assessing the SME's ability to perform:** Ensuring that the SME has the credibility, skills, and experience to perform on the contract, as well as due diligence on the manufacturer, buyer, and logistics of the corresponding contracts
4. **Structuring the transaction risk and cash flow:** Putting together a financing structure based on the specific transaction details
5. **Administering credit:** Administering the financing conditions via the credit administration

When the criteria above hold, short-term loans are eligible to be disbursed to MSMEs.

#### 4.2.4 Factors that Determined the Success of the Financial Mechanism

There are many crucial factors to successfully developing the SCF Fund's financial mechanism. The most important factors identified were the significant creation of impact, proven financial viability, strong stakeholder engagement (plus capacity building), an innovative solution tailored to local needs, scalability and replicability potential, and planning for continuity/financial sustainability.

- **Impact creation:** The business case is positively impacting the economy and the environment, showing that fostering low carbon development can create opportunities for economic growth. The model triggers economic growth in a sector that has been lagging behind given the limitations to access finance, while enabling the implementation of green energy solutions. For example, in South Africa, the need to retrofit public and private buildings is high. The retrofit demand has been rising as building owners become more aware of its benefits. However, individual retrofitting projects are not big enough for large ESCOs—their size would be better managed by MSMEs. Through the SCF Fund, MSMEs have higher chances of addressing the retrofitting demand. This increases the MSMEs' economic activity and, therefore, the creation of jobs while reducing GHG emissions significantly. These positive employment and environmental benefits convinced the South African government to support the programme from the beginning.

- **Financial viability:** The financial viability of the business case of RE and/or EE projects between MSMEs, suppliers, and buyers is crucial for the success of the SCF Fund. Therefore, good and reliable performance of MSMEs, for example, is indispensable. MSMEs need to demonstrate that they have the technical capacity to offer the RE and/or EE services they claim. At the same time, it is important that the buyers have an acceptable credit risk profile and actively demonstrate their ability to pay for the services rendered by the MSMEs. This also applies to suppliers, as it needs to be ensured that the suppliers can really deliver quality in time. Suppliers and buyers also need to have trust in the technical capacity of the MSME, accept high involvement of the SCF Fund, and demonstrate their commitment to the service by signing service contracts.
- **Stakeholder engagement (plus capacity building):** This was key for DBSA to ensure that project stakeholders, such as MSMEs, RE/EE technology suppliers, and the end users, participated in developing the business case and the financial mechanism. The engagement was completed through workshops and capacity building activities. One of the capacity building programmes focused on training staff from MSMEs on financial readiness; a spin-off from this training was a pilot programme to explore ways to provide financial support to MSMEs through supply chain financing methodologies. The success of the pilot was the basis upon which the GCF funding approval was sought and successfully received.
- **Innovative solution tailored to local needs:** The financial scheme relies on a supply chain finance model, which removes the need for MSMEs to have collateral. Supply chain finance directly links the various parties in a transaction—the buyer, seller, and financing institution—to lower financing costs and improve access to finance for MSMEs. The financial institution avails credit to the supplier based on the credit strength of the buyer, who would normally be a large entity. This allows MSMEs to finance the high upfront costs for the purchase of RE or EE systems. Supply chain finance is not new. Supplier financing and reverse factoring have long been offered by the big banks to large, or investment-grade, corporations. However, today these techniques are being transformed by technology and that transformation maximises opportunities for MSMEs and financial institutions alike. This innovative financing solution tailored to the local need of improving finance for MSMEs will result in more green developments being implemented across South Africa, which will help South Africa leverage low carbon growth opportunities.
- **Scalability and replicability:** DBSA is already preparing to establish partnerships with large private sector enterprises that are potential buyers of energy services from MSMEs to build supply chain financing anchored to these large buyers. These enterprises often have thousands of MSMEs as ESCOs. Hence, by establishing these partnerships, large enterprises play an influential role by hiring only those MSMEs that participate in the DBSA fund initiative. Through this approach, DBSA is already influencing the scalability factor of its financial mechanism, the SCF Fund.
- **Continuity and sustainability of financing (sustainable finance over time):** Financial support from governmental entities was required during the pilot phase to fund operating costs to prove the concept. In the post pilot phase, such support will not be required anymore. The revenue model of the fund manager, which consists of quarterly upfront management fees and a share of the profit, will be sufficient to fund the operations and realise returns to attract investments. Currently, the equity capital from GCF is only needed to attract private investors by improved returns. As soon as private capital markets will have built a track record on these supply chain financing projects, the plan is to replace this funding with private capital.



### 4.3 Universal Green Energy Access Programme (UGEAP)<sup>22</sup>

<b>Programme Features</b>	Programme Type	GCF
	Programme Owner	Deutsche Bank
	Mitigation Action	RE
	Programme Eligibility	N/A
	Approval	October 2016
	Duration	15 years
	Country (ies)	Multiple (Sub-Sahara African countries)
<b>Programme Performance</b>	Programme Investment Volume (USD)	USD 302 million (Phase 1) USD 200 million (Phase 2)
	Expected Mitigation	50 million tCO <sub>2</sub> e
	Expected Mitigation per Million USD	167,000 tCO <sub>2</sub> e
	Mitigation Costs per Tonne CO <sub>2</sub> e (USD)	USD 2
<b>Financial Mechanism</b>	Financial Stakeholders	<ul style="list-style-type: none"> <li>• GCF</li> <li>• Deutsche Bank</li> <li>• Private investors (private sector)</li> <li>• Public investors (public sector)</li> </ul>
	Financial Instruments	<ul style="list-style-type: none"> <li>• Grant (GCF)<sup>23</sup></li> <li>• Equity (Deutsche Bank, private sector, public sector)</li> <li>• Guarantees (Swedish International Development Cooperation Agency [SIDA])<sup>24</sup></li> </ul>
	Co-financing Share (next to GCF)	73%
	Private Funding Share	67%

#### 4.3.1 Description of the Programme

##### Challenge

Sub-Saharan African (SSA) countries face many challenges to electrification. An estimated 621 million people in SSA lack access to electricity, and power shortages reduce the region's growth by 2-4% per year. In addition, Africa's poorest households generally have higher electricity prices than households in developed countries. At the same time, the African population is expected to double by 2050 to over 2 billion. Most will have no access to electricity and clean cooking fuels if energy access trends continue unchanged. Energy access estimates commissioned by the Program for Infrastructure Development in Africa indicate that only 37% of the eastern African and 25% of the southern African population had access to electricity in 2010. To enable access to electricity while reducing the climate impacts of access to electricity, investments in projects that use RE technologies is indispensable.

<sup>22</sup> The following analysis is based on desk research using publicly available information, as the financial mechanism has not yet been fully developed and set up according to programme officials. As a result, the analysis of this programme is less extensive than the analysis of the other two programmes. In addition, there might also be changes developed for/to the financial mechanism, which might not be covered here.

<sup>23</sup> According to the GCF database, GCF provides a grant. In the official funding proposal, however, no grant is mentioned.

<sup>24</sup> According to the GCF database, no guarantees are provided. In the official funding proposal, however, partial credit guarantees are mentioned to be given by SIDA.

There are numerous national, regional, and Pan-African initiatives to address the issue that the lack of electrical energy supply hinders the economic and social development of the continent. In most cases, grid-based electrical energy supply remains the most efficient and cheapest way to provide energy to consumers. In SSA with its scattered rural population, however, there are economic limitations to this paradigm shift, as financially viable grids need a specific minimum population density. Research unanimously confirms that the capital expenditure required to meet the forecasted energy demand and the ambition to give the population access to electrical energy cannot be met with national funding sources by most SSA countries. Therefore, in the future, clean electricity access in SSA can only be achieved if access to international finance can be improved.

### **Solution/Objective**

To overcome the barrier to international finance, Deutsche Bank developed the Universal Green Energy Access Programme (UGEAP), an international investment fund. UGEAP's objective is to contribute to universal access to electricity in SSA by scaling up investments in RE from local financial markets and the international private sector. The fund works with and through LFI on innovative financing structures to enable local banks to provide long-term loans in local currency or USD for ESCO businesses that provide clean electricity solutions to households and industries. As a public-private partnership instrument, it multiplies the amount of public capital through private investment by at least 2 times, thereby significantly increasing impact.

UGEAP pursues investments in three types of transactions (the Target Investments):

1. Category 1: Off-grid renewable electrical energy (solar home systems)
1. Category 2: Mini-grid renewable electrical energy (green mini-grids)
1. Category 3: Industrial renewable electrical energy and selected on-grid installations

UGEAP targets households and industry as beneficiaries of its investment activity (the End Beneficiaries). It plans to execute an expected 50 investments with a total target volume of USD 500 million over a 5-year investment horizon. Until the end maturity of UGEAP (15 years after closing), further investments are expected beyond the initial 50 through reinvestments. The fund is capitalised by public and private sector funding.

The mitigation potential is considerable: the GHG emission reductions are expected to be 167,000 tCO<sub>2</sub>e per million USD invested over the lifetime of the projects. The aggregate expected emission reductions are around 50 million tCO<sub>2</sub>e. The programme seeks to attract around USD 200 million of private investment. Once the business case has been proven, sustainability for UGEAP could be achieved by private sector investors without the need for a public sector risk taker.

All features of the program are applicable to any country in SSA (the Target Region), while the investment activity will expand in two phases that are different in terms of the regional investment activity. According to the GCF funding proposal, UGEAP will focus first on a selected number of countries within SSA (Phase 1, USD 300 million)—Benin, Kenya, Namibia, Nigeria, and Tanzania. After having executed the first investments in these countries, the regional focus of UGEAP will be expanded to countries selected based on demand, regulatory feasibility, and technical/business feasibility (Phase 2, USD 200 million).

### **4.3.2 Process that led to the Selection of the Financial Mechanism**

At the end of 2016, Nicolas Moreau, head of Deutsche Asset Management and member of the Management Board of Deutsche Bank AG, said: "As the first commercial bank accredited by the Green Climate Fund, we are very pleased that the GCF Board has decided to become the anchor investor in our proposed Universal Green Energy Access Program (UGEAP) fund for Africa. This investment will allow Deutsche Asset Management to support up to USD3.5bn of investment from local banks and entrepreneurs over the next 15 years and, ultimately, support the provision of clean electrical energy to individuals and businesses." (Deutsche Bank, 2016). Despite approved funding from GCF at the end of 2016, the process of setting up the final

UGEAP financial mechanism, which enables local banks to provide long-term loans to ESCO businesses, has not yet been finished completely according to programme officials.

As the research team did not have an interview with the persons in charge of setting up the programme financial mechanism, the team based its subsequent description of the process that led to the selection of the financial mechanism on public information such as Deutsche Bank websites and the official GCF funding proposal. From public information, the team observed that many stakeholders needed to be involved in developing the financial mechanism—stakeholders such as Deutsche Bank, LFI, GCF, and potential international investors; local governments, and to some extent project developers and end beneficiaries, were also involved.

As the capital expenditure required to meet the energy demand forecast and the ambition of local governments to give access to electrical energy cannot be met with national funding and public sources alone in most SSA countries, local governments such as the those of Benin, Kenya, Namibia, Nigeria, and Tanzania highly endorsed the UGEAP (Deutsche Bank, 2016). Specifically, the UGEAPs innovative public-private partnership financial mechanism was highly welcome.

Of importance for the development of the proposed financial mechanism was that Deutsche Bank worked closely with local/regional public and private financial institutions to better understand, for example, the financing needs of different end beneficiaries. Households that install off-grid renewable electrical energy (Category 1 investments) prefer local currency denominated lending, while large businesses often prefer USD denominated lending as their products are oftentimes traded in international markets. In the absence of a close exchange with local/regional public and private banks (and to some extent, project developers and end beneficiaries), the financial mechanism would not have been convincing to local banks (and their customers) and, therefore, would have likely failed. A syndication option for lending to businesses has also been developed in response to requests from development banks such as the Eastern and Southern African Trade and Development Bank (PTA). Thus, Deutsche Bank has already been able to sign two memorandums of understanding with financial institutions in the host countries and is actively working on developing additional partnerships to reduce the risk of execution.

The intensive stakeholder engagement combined with the innovative financial mechanism (see next section), resulted in a positive feedback and endorsement from local stakeholders and subsequently led to an approval by GCF.

#### **4.3.3 Structure of the Financial Mechanism**

UGEAP is structured as an investment fund to be managed by Deutsche Bank. It invests debt through or with LFI to the Target Investments above. As a public-private financial partnership and investment vehicle, UGEAP bundles capital from the GCF with capital from the project owner/sponsor (in the form of equity contribution from end users), local banks/financial institutions, and international private sector investors.

The total finance volume of Phase 1 (Benin, Kenya, Namibia, Nigeria, and Tanzania) and Phase 2 (other SSA countries) of the programme adds up to around USD 500 billion and is structured as shown in Table 3.



**Table 3: Financing Structure of the Programme<sup>25</sup>**

From	Financial Instrument	Millions USD	Share	Funding by Sector
<b>Phase 1: Benin, Kenya, Namibia, Nigeria, and Tanzania</b>				
GCF	Equity	78	26%	Public
GCF	Grant	2	1%	Public
Deutsche Bank	Equity	9	3%	Private
Private Sector	Equity	193	64%	Private
Public Sector	Equity	20	7%	Public
	<b>TOTAL</b>	<b>302</b>	<b>100%</b>	
<b>Phase 2: SSA Countries Selected Based on Demand</b>				
GCF	Equity	52	26%	Public
Private Sector (incl. Deutsche Bank)	Equity	135	68%	Private
Public Sector	Equity	13	6%	Public
	<b>TOTAL</b>	<b>200</b>	<b>100%</b>	

UGEAP has a two-tiered capital structure consisting of one-third of B-Capital (to be invested in by GCF along with other public sector investors/guarantors) to provide a risk buffer to enable two-thirds of A-Capital (to be invested in by private sector investors). The GCF will be expected to invest into the B-Capital of the UGEAP, with an initial capital contribution of USD 80 million for Phase 1 and an additional capital contribution of USD 52 million for Phase 2. Deutsche Bank, in its function as placement agent, will lever the public sector contribution with private sector investors (A-Capital investment). A- and B-Capital will be structured as shares in a collective investment undertaking/investment fund based in Luxembourg where investors contribute capital in the form of shares.

As end beneficiaries of each Target Investments category may have different financial ability and need profiles, Deutsche Bank has developed two instruments for UGEAP, each of which can serve the different sectors with an instrument that matches demand: 1) a Funding and Risk Participation Agreement (FRPA) structure for Category 1 and 2 investments (i.e., off-grid and mini-grid RE system); and 2) Syndicated Loans (SLs) for Category 3 investments (i.e., industrial installations). The goal of both instruments is to support local banks in extending loans to local ESCOs as borrowers on longer terms and in local currencies under no. 1 or international currencies under no. 2. The ESCOs will use the funding from the local banks and the UGEAP to provide energy supply services to the final beneficiaries: households, communities, businesses, or local grid operators/utility companies.

Figure 8 and Figure 9 explain the financial mechanism—i.e., the financial (and physical) flows between stakeholders, the financial instruments used by stakeholders, and the financing structure—of no. 1 and no. 2 in detail.

<sup>25</sup> Guarantees are not shown here as they were not explicitly mentioned in the GCF database. According to the official funding proposal, guarantees from SIDA will add up to 50 million.

1. **FRPA for Category 1 and 2 investments:** To allow local banks to extend debt financing in the form of long-term loans to ESCOs, leasing companies, and mini-grid operators, UGEAP will offer an FRPA that will deliver both long-term, USD denominated funding to the local bank, and a partial risk transfer of the credit risk of local banks to UGEAP; this risk transfer will generate out of the portfolio of eligible loans towards Category 1 and 2 investments. Part of the structure is that the local bank takes the foreign exchange risk and uses its balance sheet as a natural hedge between the USD denominated funding from UGEAP and the local currency denominated lending it grants to local borrowers. The FRPA will have two legs combined in one agreement: the Funding Leg and the Risk Participation Leg. Under the Funding Leg, the local bank will receive a loan. The Risk Participation Leg details under which conditions the loan amount repayable by the local bank might be reduced.
  
2. **SLs for Category 3 investments (i.e., industrial installations):** The major difference between businesses that will benefit from the FRPA structure above is that businesses falling into the third investment category typically require larger amounts of long-term debt capital that single investors generally are not able to provide and can and would want to take USD denominated debt on board rather than local currency. This is because their products are oftentimes traded in international markets; thus, the business has USD (hard currency) income. Syndicate partners all rank equal in terms of risk and return. This means that under SLs, both UGEAP and local banks each contribute 50% of the total loan given to ESCOs and, in case of default of the ESCO, also bear 50% of the losses. Through the syndication option, which has been developed in response to requests from local and regional development banks such as PTA, the UGEAP will provide the additional capacity and give access to larger amounts of funding compared to what is currently available locally. This will allow loans to clean energy projects and companies to be made available that could not have been financed by local and regional development banks on their own.<sup>26</sup>

Under both instruments, the UGEAP will be financed through equity from public sector investors<sup>27</sup> and the GCF. The expected returns for both lie at 6.6% according to official funding proposal documents. The private sector, represented by Deutsche Bank and other private investors, will also provide equity capital (internal rate of return - IRR at 6.8%). To attract this private sector funding, SIDA will also grant PCGs<sup>28</sup> on private funders equity. The PCGs provide external credit enhancement to meet investors' risk appetite.

Deutsche Bank as investment manager will originate, structure, and decide on behalf of UGEAP the investments along the instruments described above. Note that target investees of UGEAP are expected to justify a sufficient level of operational capacity while detailed due diligence of the results is to be completed by the investment manager of UGEAP. UGEAP will only finance proven, bankable technology and sustainable business concepts.

<sup>26</sup> The syndicate can be led either by Deutsche Bank or the local bank, with local leadership as the preferred option to develop the syndication capacity of local and regional banks. Local and regional development banks such as PTA Bank are the target partner for this structure.

<sup>27</sup> These have not been defined yet.

<sup>28</sup> The foreseen PCGs are required to be issued by an AAA-rated sovereign entity. The guarantee shall cover principal and no returns.

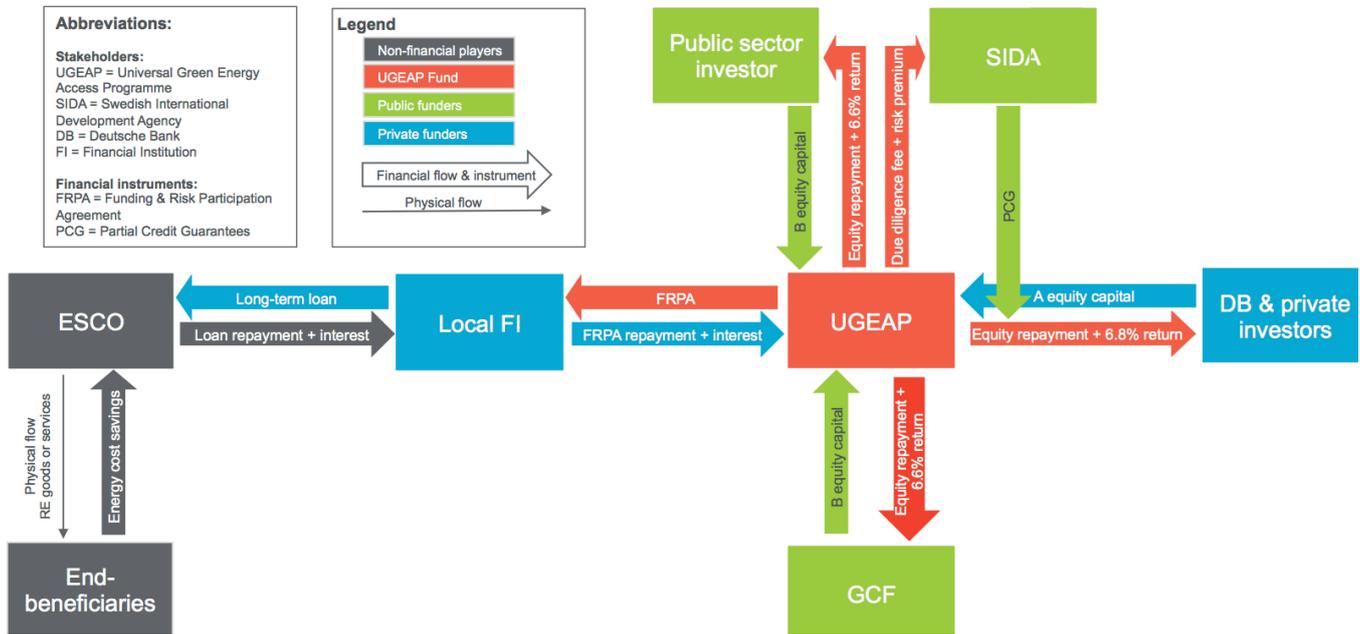


Figure 7: Financial Mechanism of UGEAP for FRPA Structure

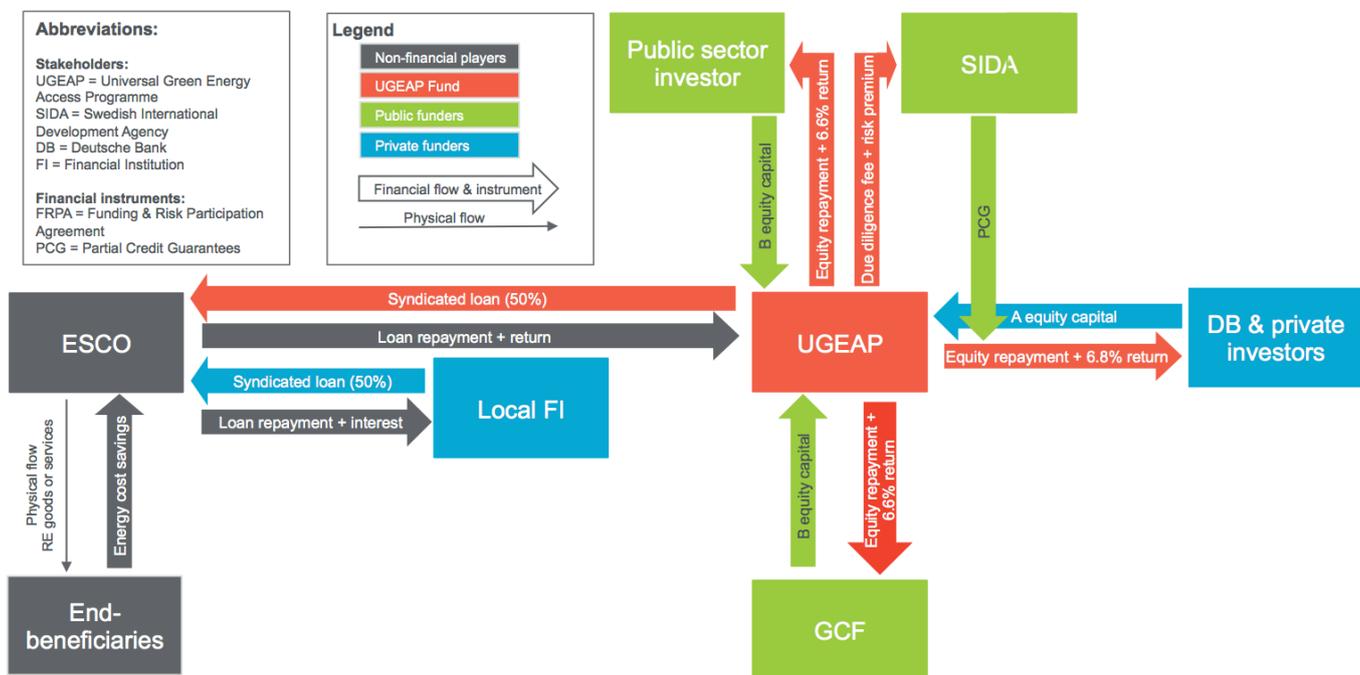


Figure 8: Financial Mechanism of UGEAP for SLs

#### 4.3.4 Factors that Determined the Success of the Financial Mechanism

There are many crucial factors for successfully developing the UGEAP's financial mechanism. The most important factors identified were strong stakeholder engagement, capacity (building) of stakeholders, innovative solution tailored to local needs, and planning for continuity/financial sustainability.

- Stakeholder engagement:** Of importance for UGEAP's success was that Deutsche Bank worked closely with local/regional public and private financial institutions in developing UGEAP's financial mechanism (e.g., addressing financing needs of different end beneficiaries appropriately). Deutsche Bank also partnered with these local/regional public and private financial institutions throughout UGEAP's execution. This intensive stakeholder engagement led to an innovative financial mechanism and, more importantly, resulted in a positive feedback and endorsement from local stakeholders (such as local governments and LFI). Both the close stakeholder engagement and the local endorsement were indispensable to get approval for GCF funding.
- Capacity (building) of stakeholders:** Today, capability of local banks to finance and underwrite RE base businesses is largely lacking in SSA. Most local banks' in-house experience to deal with consumer-based lending in rural areas and long-term project finance structures is limited; therefore, they require external support from knowledgeable and experienced consultants. Thus, UGEAP works closely with local banks to build capacity across the sector on RE financing, while also better connecting financial institutions among each other. This will not only strengthen the capacity of banks by creating network and know-how transfer effects, but also produce competition between banks, which will improve the availability of funding for businesses under the UGEAP. The capacity building is expected to scale up local currency finance to climate change mitigation projects, thereby creating a new local market in financial intermediation.

Also of importance for UGEAP's success, from a capacity point of view, is DB's long track record of working with public sector investors to raise higher amounts of private capital to achieve positive environmental and social outcomes and a return on investment. As a large private bank, Deutsche Bank has the capacity and experience to set up, manage, and market a large-scale RE fund such as UGEAP. This is a major reason why Deutsche Bank was selected as the first commercial bank to receive funding under the GCF.
- Innovative solution tailored to local needs:** To make UGEAP successful, an innovative public-private financing partnership tailored to local needs was developed. For project developers and end beneficiaries, UGEAP provides tailored credit lines to enable local banks to extend medium- and long-term loans, either in local currency or in USD for businesses that provide clean electricity solutions. A risk participation provides an even stronger incentive to serve industries and clients that have not yet been covered by the local banks. Furthermore, by using limited public funds for climate-smart electricity access solutions and multiplying them through additional private finance, UGEAP creates fiscal space for local governments to invest in other sectors relevant to sustainable development. For private sector investors, UGEAP provides the first opportunity to invest in renewable African energy access projects, unlocking access to a new large-scale financing source through appropriate terms regarding investment size and risk return profiles.
- Continuity/financial sustainability:** UGEAP is designed to continue running on its own, meaning without public support, after the GCF investment has been repaid at maturity (i.e., 15 years after closing). Once the business case has been proven, sustainability for UGEAP is planned to be achieved by private sector investors investing in A-Capital with longer maturities and in higher yielding B-Capital, so that UGEAP would continue operations without the need for a public sector risk taker. Sustainability could also be achieved through alternative development pathways:

- Other international capital market investors start investing into the sectors UGEAP covers.
- Local financial markets would have developed in terms of depth and the capital available, which translates into an environment that the need for external funding in the form of UGEAP is no longer required.
- Businesses under Category 3 investments get in a position to finance their clean energy access from their own cash flow and no longer require an investment from UGEAP.
- The wealth of end beneficiaries increased such that they can afford investments in clean energy sources from their own cash flows without the need to make use of the energy supply companies UGEAP will invest into, which may be more unlikely for Category 1 and 2 transactions, though.

# 5 Discussion

---

Financial mechanisms of RE and EE programmes are fundamental to create traction in the path towards the implementation of NDC mitigation targets (as well as NAMAs for that matter). In this paper, the research team analysed three RE and EE programmes that have been successful in obtaining climate finance for implementation from the GCF. The team identified eight common factors across the three programmes that acted as enablers for developing strong business cases and viable financing structures, which together make the financial mechanisms of the programmes.

**What do we mean by a strong business case?** The business case justifies out *why* the programme should be implemented. It explains, for example, the type of energy services between stakeholders, such as end users and ESCOs, but also the profitability of the RE and/or EE services. *A business case is strong when it is able to address the technical and financial barriers that prevent RE/EE programmes to advance, thereby making a clear case for going ahead with the programme, and when all stakeholders receive a return on investments that is in line with their expectations.* See Box 2 the two types of barriers that appeared common in the three cases.

**What do we mean by a viable financing structure?** The financing structure explains *how* the programme and the projects implemented under the programme will be financed. It includes the financial flows from public and private funders (amounts and frequency) from the financiers to the beneficiaries and the financial instruments used (e.g., loans, grants, equity etc.). *A financing structure is viable when it enables implementing the programmes or projects through cost-effectively using public and private monies.*

The analysis of the three cases suggests that innovative financing structures are needed to ensure that public money is used to drive down the cost of capital or decrease risk for other investors, ensuring that private sector will find it easier to take some of the risks. The team has also observed this in previous research under Mitigation Momentum (Cuntz, Afanador, Klein, Barrera, & Sharma, 2017) (ECN & Ecofys, 2016). The team sees that this is becoming even more relevant as international financial institutions implement approaches to crowd more private finance into their climate projects (G20, 2017a) (G20, 2017b). For example, the World Bank is using the cascade approach through which they assess investment decisions by identifying whether projects can be financed on commercial terms without government guarantees while remaining affordable. When this is not the case, the World Bank emphasises the need to put upstream reforms to address market failures. Only when these reforms cannot be put in place and risk instruments are not enough, then the World Bank would determine whether concessional financing would be used to finance the full project (The World Bank Group, 2017).

Through the analysis of the three cases, the research team gained insights into what is needed to make the business case and financing structure effective in securing funding for implementation; these insights translate into eight success factors, which we call pillars:

### **1. Governmental leadership**

For all three programmes, the team found that they were initiated by a first national governmental drive and commitment to increase renewables and energy efficiency in the participating countries. These countries either set up RE and/or EE targets, established policies to foster action in the sector, or gave mandates to sector agencies or public funders to identify a course of actions to decarbonise the economy. For example, in the Energy Efficiency Green Bond in Latin America and the Caribbean programme, the political willingness of the Mexican government to create a favourable environment for the implementation of RE and EE technologies was fundamental to foster change in the market. To make a financial mechanism that promotes RE and/or EE a success, governmental leadership is highly relevant.

### **2. Impact creation**

In all three programmes, the team observed that significant positive impacts to the economy (through job creation and green growth) and the environment (reducing GHG emissions) convinced countries in joining the respective RE and EE programme. For example, in the SCF Capital Solutions programme, the positive employment and environmental benefits convinced the SA government to support the programme from the beginning.

### **3. Financial viability**

The business case and the financing structure of the RE and/or EE programmes should be financially viable. In two of the three programmes, before obtaining finance from GCF, pilot projects were set up to test whether (a) the business case was financially (and technically) viable (e.g. sufficient profit margin) and to test whether (b) the financing structure was financially viable (e.g. sufficient return for funders). In the SCF Capital Solutions programme, for example, the size of the MSME individual RE/EE project margin was crucial to obtain funding from the SCF Fund (i.e. SCF Fund required a minimum return on investment of 15%). Overall and most importantly, however, was the fact that all three programmes created a win-win situation for all stakeholders, which finally convinced all stakeholders to participate in the programmes.

### **4. Stakeholder engagement**

Engaging programme stakeholders is highly relevant during the development of the business case and the financial structure. In the Universal Green Energy Access Programme (UGEAP), for example, the team observed that stakeholder engagement was key to getting acceptance and endorsement of the respective financial mechanism by all stakeholders. This was also indispensable to get approval from the GCF board for funding. In case of UGEAP, strong stakeholder engagement also resulted in the development of locally tailored innovative financing solutions, which would not have been found if not all stakeholders were actively involved.

### **5. Tailoring to local needs**

The design of the business case and the financing structure should consider the local needs and contexts. In all the three programmes, the team observed that financing needs highly differ from country to country and from stakeholder to stakeholder. In the case of UGEAP, for example, households prefer different type of financing than those preferred by businesses; for example, households prefer to borrow in local currency, whereas businesses often prefer to borrow in USD. In the Energy Efficiency Green Bond in Latin America and the Caribbean programme, the team noted that some countries preferred to promote small scale RE and/or EE projects while others preferred to promote large scale. Stakeholder engagement is critical when tailoring the financial mechanism to local needs.

## 6. Stakeholder capacity

Programme developers should implement capacity building programmes to ensure that local stakeholders increase their knowledge and abilities to participate in the development of financial mechanisms. In all the three programmes, the team noted that capacity building programmes and/or the development of capacity through pilot projects were crucial to make the financial mechanism viable and bring all stakeholders onboard. The Mexican pilot in the case of the Energy Efficiency Green Bond in Latin America and the Caribbean programme was instrumental to show tangible results, especially to stakeholders that were not yet convinced of the programme or had no practical experience in RE/EE implementation or financing.

It is not surprising that pillars 1 to 6 were important when developing the financial mechanisms. The results of previous climate finance research completed under the Mitigation Momentum Project and other authors indicated that it is often the case that international financial institutions treat some of these as key investment criteria<sup>29</sup>. The first six factors can be seen as conditions to lay the groundwork for successfully developing financial mechanisms. In addition, factors seven and eight add new insights and provide further guidance into what makes a successful financial mechanism

## 7. Scalability and replicability

Programmes can be scaled up in size and volume, for example, by increasing the capacity installed (MW), the number of beneficiaries, and the investment volume (USD). Programmes can also be replicable widely in other countries or regions, while sharing and expanding the knowledge from country to country. In the case of SCF Capital Solutions, the research team observed that programme developers designed for scalability and replicability from the beginning. The SCF Fund is preparing to establish partnerships with large private sector enterprises that are potential buyers of energy services from MSMEs to build supply chain financing anchored around these large buyers. Overall, the team saw that all programmes needed to increase the amount of RE and/or EE projects while also being able to scale up available financing. For example, in the “energy efficiency green bond in Latin America and Caribbean (LAC)”, the concrete results of a pilot in Mexico, provided lessons that enabled project developers to propose the upscale of the generation capacity from 5MW to 30 MW and to design the replication of the Mexico’s programme (USD 335 million) in other LAC countries, such as Colombia, Dominican Republic and Jamaica (USD 1,265 million).

## 8. Continuity and sustainability

To make a financial mechanism that promotes RE and/or EE a success, continuity and sustainability of financing is highly relevant. In all three programmes, the research team observed that programme developers design for continuity and sustainability of financing from the beginning. This means that the design process of the programmes starts with the idea in mind that the public sector finance (from local and international financial institutions) will be phased out after a certain time, from which time the programme should keep running by itself (i.e., continuous and sustainable in time). Once the financial mechanism has proven successful, it shall be able to continue running on its own, meaning without public support. In the Energy Efficiency Green Bond in Latin America and the Caribbean programme, from the start, the government and the IDB were concerned with the issue of continuity. By issuing more and more green bonds in the local/regional capital markets over time, they sought to make the financial mechanism less and less dependable on IDB’s financial support.

<sup>29</sup> Sources include: Cuntz, Afanador, Klein, Barrera, & Sharma, 2017; G-24 (2017); Catapult (2014); Hohne (2015)

### Box 7. Two Barrier Types Common among the Three Cases

The financial mechanisms analysed addressed common barriers that RE and EE initiatives face in developing and less developed countries. Two types emerged as common among the three cases: financing and technical barriers.

- **Financing barriers:** In all programmes, the research team observed that local commercial banks have limited experience with green transactions and regard them as too risky, especially if these are proposed and developed by SMEs. The level of scepticism is high because banks lack a track record for RE and EE projects, which have high upfront capital costs. In addition, banks generally evaluate risks based on SME balance sheets rather than project finance and, therefore, require loan terms that are difficult to be met by SMEs such as short-term tenor and high interest rates. Under such conditions, project developers face high borrowing costs that they often cannot afford. This issue is exacerbated by the lack of equity of project developers, which struggle to acquire sufficient equity financing to make their business work. Overall, this creates a non-favourable environment for green SMEs to thrive and offer clean energy technology solutions such as RE and EE.
- **Technical barriers:** In all programmes, the team observed that stakeholders initially had limited knowledge on the implementation and profitability of RE and EE projects in their respective local context. In particular, there was a substantial lack of knowledge on ESCO business cases and the functioning of ESCs—i.e., credit rights that entitle the ESC holder to benefit from the energy cost savings of an RE or EE off-taker. This, in turn, led to distrust and scepticism of banks to finance such RE and EE projects (see financing barrier described above). At the same time, SMEs are often unfamiliar with standardised business and/or financial planning, which is a prerequisite for banks to grant loans.

As a result of the barriers above, the financial mechanisms of the three programmes analysed are structured to support SMEs in greening businesses and/or households and to create an environment to lower the risk perception among stakeholders. In the long run, the experience from a financial mechanism's performance is meant to demonstrate to private funders (e.g., local banking sector or other private investors) that financing RE and EE programmes and projects in developing and less developed countries is economically sound and less risky than currently perceived.

Implementing NDCs will require a significant increase in the pipeline of RE and EE programmes as well as successful financial mechanisms that enable the implementation of these programmes. The team's key recommendations for building a successful financial mechanism to stakeholders in the climate finance community are as follows:

First, design a business case that can be operational on the ground and with the right technical and financial features to solve the energy issue at hand—for example the energy services that will be offered; the type of contracts between end users, energy companies, and financial institutions; and the profit's size.

Second, create the pillars of the financial mechanism by:

1. Ensuring there is enough governmental leadership driving the programmes (e.g., national targets, strategies, political will)
2. Demonstrating the financial mechanism's impact creation (e.g., employment, GHG mitigation, etc.)
3. Demonstrating the financial mechanism's financial viability (e.g., profitability, affordability analysis)
4. Engaging all stakeholders in setting up the financial mechanism (e.g., workshops, raising awareness)

5. Tailoring the financial mechanism to local needs (e.g., preferred financing, currency lending)
6. Developing and building up capacities of stakeholders to run the financial mechanism (e.g., trainings)
7. Designing the financial mechanism for scalability and replicability (e.g., programmes or projects can grow larger)
8. Designing the financial mechanism for continuity and sustainability (e.g., opt-out strategy)

Third, design a financing structure that suits the needs of the programme with features such as the volume of financial flows from public and private funders, the sort of financial instruments that will be used, and the financial terms/conditions of each instrument.

# 6 References

---

- Catapult. (2014). Urban innovation and investment: the role of international financial institutions and development banks. Retrieved from <http://futurecities.catapult.org.uk/resource/urban-innovation-and-investment-full-report/>
- Climate Bonds Initiative. (2016). Green Bonds Highlights 2016.
- Cuntz, C., Afanador, A., Klein, N., Barrera, F., & Sharma, R. (2017). Connecting multilateral climate finance to mitigation projects: a guide to the multilateral climate finance landscape of NAMAs. Cologne: Ecofys. Retrieved from <http://www.mitigationmomentum.org/downloads/Connecting-multilateral-climate-finance-to-mitigation-projects.pdf>
- Deutsche Bank. (2016). Newsroom Deutsche Bank. Retrieved from [https://www.db.com/newsroom\\_news/2016/medien/en-11718.htm](https://www.db.com/newsroom_news/2016/medien/en-11718.htm)
- Deutsche Bank. (2016). Newsroom Deutsche Bank. Retrieved from [https://www.db.com/newsroom\\_news/2016/medien/deutsche-bank-submits-sustainable-energy-for-africa-proposal-to-green-climate-fund-en-11700.htm](https://www.db.com/newsroom_news/2016/medien/deutsche-bank-submits-sustainable-energy-for-africa-proposal-to-green-climate-fund-en-11700.htm)
- ECN & Ecofys. (2016). Status Report on Nationally Appropriate Mitigation Actions (NAMAs). ECN & Ecofys.
- Ecofys. (2017). NAMA database. Retrieved from <http://www.nama-database.org/index.php/Special:RunQuery/QueryData>
- G20. (2017a). G20 Leaders' Declaration: Shaping an interconnected world. Hamburg, Germany. Retrieved from [https://www.g20.org/Content/EN/\\_Anlagen/G20/G20-leaders-declaration.pdf?\\_blob=publicationFile&v=1](https://www.g20.org/Content/EN/_Anlagen/G20/G20-leaders-declaration.pdf?_blob=publicationFile&v=1)
- G20. (2017b). Joint MDB Statement of Ambitions for Crowding in Private Finance. Hamburg, Germany. Retrieved from [http://www.bundesfinanzministerium.de/Content/DE/Downloads/G20-Dokumente/Hamburg\\_Genannte\\_Berichte/Joint-MDB-Statement-of-Ambitions.pdf?\\_blob=publicationFile&v=1](http://www.bundesfinanzministerium.de/Content/DE/Downloads/G20-Dokumente/Hamburg_Genannte_Berichte/Joint-MDB-Statement-of-Ambitions.pdf?_blob=publicationFile&v=1)
- G-24. (2017). Public Investment for Sustainable Development: Working Paper commissioned by the G-24 as part of its work program on. Retrieved from [https://www.g24.org/wp-content/uploads/2017/09/Public\\_Investment\\_for\\_Sustainable\\_Development.pdf](https://www.g24.org/wp-content/uploads/2017/09/Public_Investment_for_Sustainable_Development.pdf)
- Green Climate Fund. (2017). Projects & Programmes. Retrieved from <http://www.greenclimate.fund/what-we-do/projects-programmes>
- Hof, A., den Elzen, M., Admiraal, A., Roelfsema, M., Gernaat, D., & van Vuuren, D. (2017). Global and regional abatement costs of Nationally Determined Contributions (NDCs) and of enhanced action to levels well below 2°C and 1.5°C. *Environmental Science & Policy*(71), 30-40. Retrieved from <https://www.sciencedirect.com/science/article/pii/S146290116308978>
- Hohne, N. e. (2015). Developing 2°C - Compatible investment criteria. Retrieved from <https://newclimateinstitute.files.wordpress.com/2015/11/2criteria-final.pdf>
- International Finance Corporation. (2016). Climate investment opportunities in emerging markets. Washington D.C.

Market Invoice. (2017). Market Invoice. Retrieved from <https://www.marketinvoice.com/business-finance/what-is-invoice-discounting>

Strand, J. (2017). Unconditional and conditional NDCs under the Paris Agreement: Interpretations and their relations to policy instruments.

The World Bank Group. (2017). Foreard Look: a vision for the World Bank Group in 2030 - progress and challenges. Retrieved from <http://siteresources.worldbank.org/DEVCOMMINT/Documentation/23745169/DC2017-0002.pdf>

Weischer, L., Warland, L., Eckstein, D., Stephan, H., Michaelowa, A., Koehler, M., & Wehner, S. (2016). Investing in ambition: analysis of the financial aspects in (intended) Nationally Determined Contributions. Bonn, Germany: Germanwatch e.V. & Perspectives Climate Group GmbH. Retrieved from <https://germanwatch.org/de/download/15226.pdf>



[www.mitigationmomentum.org](http://www.mitigationmomentum.org)

Supported by:



Federal Ministry for the  
Environment, Nature Conservation,  
Building and Nuclear Safety

based on a decision of the German Bundestag



**Katja Eisbrenner**

Director

Ecofys

T: +49 (0)30 29773579-32

[k.eisbrenner@ecofys.com](mailto:k.eisbrenner@ecofys.com)



**Xander van Tilburg**

Senior Researcher

ECN

T: +62 (0) 812 82668876

[vantilburg@ecn.nl](mailto:vantilburg@ecn.nl)