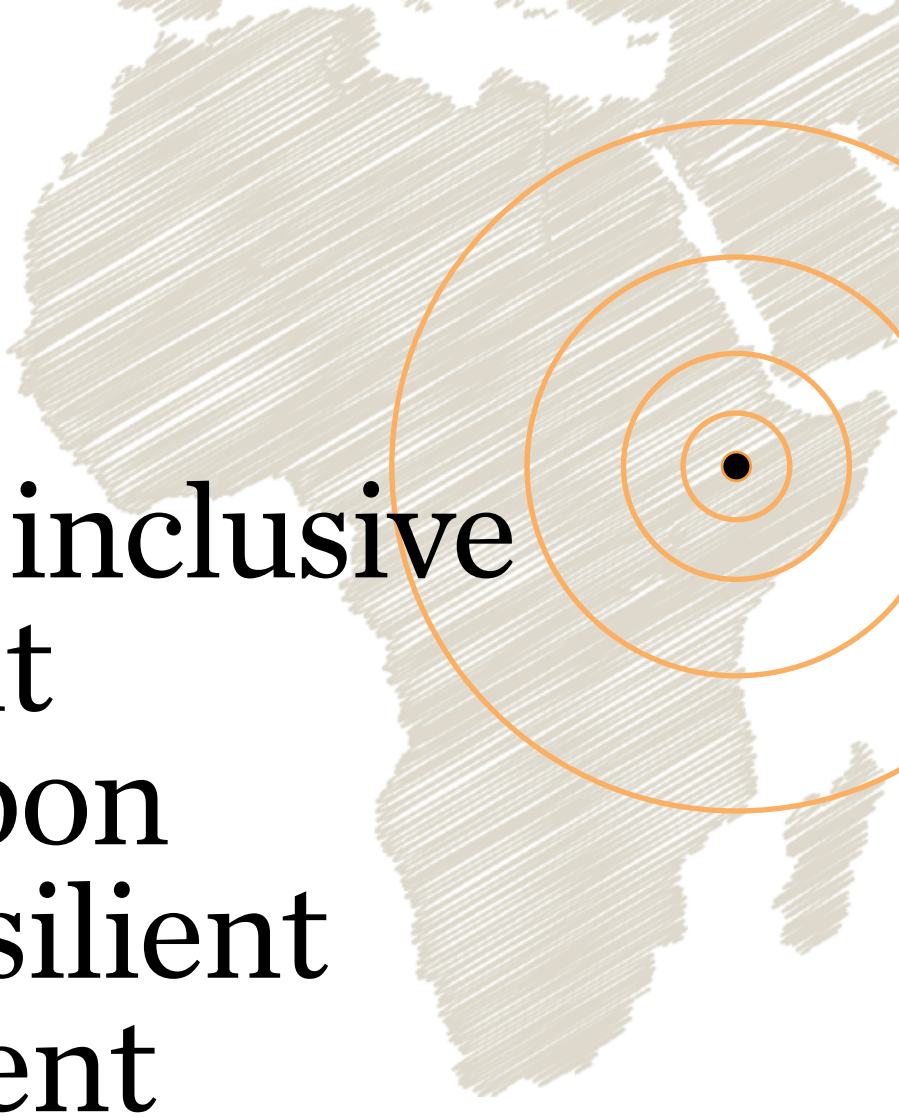

Financing inclusive investment in low carbon climate resilient development

The role of national financial institutions in Ethiopia's Climate Resilient Green Economy

Nanki Kaur, Lidya Tesfaye, Simret Mamuye and Daniel Fikreyesus

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Climate change disproportionately affects the poorest people in the world. The Climate Change Group works with policy and research partners to redress the balance by helping the poor in low and middle-income countries achieve climate resilience and development.

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Echnoserve Consulting PLC is an Ethiopian based sustainable development, environmental and energy consulting firm, with over seven years of experience working in climate change issues. Echnoserve works with international partners and local agencies providing innovative solutions in policy and program development.

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Supporting inclusive investment in Ethiopia's transition to a Climate Resilient Green Economy (CRGE) is a key policy priority for the government of Ethiopia.

To achieve this, policymakers will need to address financial and market development needs of prospective investors, including those of rural households, small and medium enterprises and start-up private sector enterprises.

In this paper, we focus on the role of national development finance institutions in mobilising and delivering finance for inclusive investment in CRGE. Based on a case study of the Development Bank of Ethiopia, we find that national development finance institutions have the potential to deliver scaled-up and long-term finance to those who need it most.

Contents

Acronyms

AETPDD	Alternative Energy Technology Promotion and Dissemination Directorate
CRGE	Climate Resilient Green Economy
CRGES	Climate Resilient Green Economy Strategy
DBE	Development Bank of Ethiopia
ECAE	Ethiopian Conformity Assurance Enterprise
EE	Energy efficiency
EEA	Ethiopian Energy Authority
EEPCo	Ethiopian Electric Power Cooperation
EIB	European Investment Bank
GTP	Growth and Transformation Plan
IDA	International Development Association
MDRE&EEP	Market development for renewable energy and energy efficient products
MFI	Microfinance institution
MoFED	Ministry of Finance and Economic Development
MoWIE	Ministry of Water, Irrigation and Energy
NEP	National Energy Plan
OBWME	Oromia Bureau of Water, Mines and Energy
OCSSCO	Oromia Credit and Saving Share Company
ODA	Overseas development assistance
PFEA	Public Financial Enterprises Agency
PSE	Private sector enterprise
RE	Renewable energy
SME	Small and medium enterprise
SRM	Sector Reduction Mechanism
UNFCCC	United Nations Framework Convention on Climate Change
WB	World Bank

Summary

Supporting inclusive investment in Ethiopia's transition to a Climate Resilient Green Economy (CRGE) is a key policy priority for the government of Ethiopia.

To achieve this, policymakers will need to address financial and market development needs of prospective investors, including those of rural households, small and medium enterprises and start-up private sector enterprises.

In terms of financial needs, scaled-up finance is required to support the current and projected cost of CRGE investments; long-term finance to sustain and incentivise investment in CRGE; and flexible finance to support investment pathways that respond to climate-induced uncertainty. Finance will need to be delivered to those who need it most if they are to be a part of the transition to a CRGE development pathway. In Ethiopia this will mean addressing barriers to financial inclusion by providing rural and collateral-free credit to enable production and distribution of CRGE products and services, and credit in the form of foreign currency to enable the import of renewable energy and energy efficient products.

In terms of market development needs, policymakers will need to raise awareness of investors and build the capacity of actors in the investment chain to implement and maintain investment in CRGE.

Financial intermediaries – institutions that enable the flow of climate finance from its source to the end use or users – play a key role in addressing the financial and, to some extent, the market development needs of investment in CRGE. Intermediaries like multilateral development banks and agencies, bilateral agencies, national agencies, national development finance institutions, commercial financial institutions and climate change funds play a key role in mobilising and delivering finance for investment in CRGE. Each intermediary has its own comparative advantage when accessing or delivering single or multiple sources of finance to a range of investors and CRGE initiatives (Kaur *et al.*, 2016).

In this paper, we focus on the role of national development finance institutions in mobilising and delivering finance for inclusive investment in CRGE. Based on a case study of the Development Bank of Ethiopia, we find that national development finance institutions have the potential to deliver scaled-up and long-term finance to those who need it most.

This paper illustrates how policymakers can address market and financial development needs through effective design choices in the financial landscape and by introducing appropriate incentive structures. This in turn enhances the ability of policymakers to use public sources of finance to unlock additional international and national sources of public and private finance for inclusive investment in CRGE.

Introduction

1

Investment in low-carbon resilient development (LCRD) is an international and national policy agenda to enable households and the economy to achieve, protect and enhance development in the context of escalating climate change impacts.

The government of Ethiopia has developed a Climate Resilient Green Economy Strategy (CRGES), which outlines a carbon-neutral, climate resilient pathway to achieving middle-income status by 2025. The strategy aims to transform development planning and economic and social investments to deliver inclusive and climate resilient development outcomes. The green economy strategy takes an economy-wide approach and prioritises four investment pillars, including investment in renewable energy (RE) and energy efficiency (EE) technologies. The climate resilience strategy takes a sectoral approach to identify and implement interventions that will build resilience to the impacts of climate change. Three types of investments are supported by the CRGE: activities that enable investment in CRGE; activities that mainstream CRGE into regular development and economic investments; and investments that are in addition to mainstream development investments (Kaur *et al*., 2016).

Investment in the green economy is expected to cost US$150 billion by 2025. This amounts to approximately US$7.5 billion per year. Adaptation in Ethiopia could cost up to US$10 billion a year (World Bank, 2010). The demand for climate finance exceeds the current supply, most of which is drawn from national and international public sources; for example, the country received US$1.3 billion in overseas development assistance (ODA) between 2010 and 2013 (OECD-DAC, 2015). Private sources of finance, both national and international, are also being used to support investment in CRGE initiatives.

To support inclusive investment in CRGE, policymakers will need to use existing public and private sources to leverage and deliver appropriate finance. This includes: scaled-up finance to support the current and projected cost of CRGE investments; long-term finance to sustain and incentivise investment in CRGE; flexible finance to support investment pathways that respond to climate-induced uncertainty; and accessible finance to enable the most vulnerable to invest in CRGE.

The government of Ethiopia has responded to this need by identifying financial intermediaries, instruments and planning systems to access finance from a range of international and national public and private sources and deliver the same to a range of investors. It has established a national climate change fund, known as the CRGE Facility, as the primary intermediary for mobilising and disbursing climate finance for CRGE investments. The facility has been designed to mobilise resources efficiently by pooling multiple sources of international and national finance. The facility enables Ethiopia to manage climate funds within a single coherent system, which allows investors to determine best practices to support the country's CRGE objectives. This 'programmatic approach' aims to minimise transaction costs, fragmentation and duplication associated with funding unconnected projects. The facility has been designed to work with additional financial intermediaries to access and channel climate finance. It will work with implementing and executing entities to disburse public finance for investment in CRGE, including national financial institutions to disburse public and private finance for private sector investment in CRGE (FDRE, 2014).

In this paper we assess the role of national development finance institutions in mobilising and channelling public and private finance for private sector investment in CRGE. We focus specifically on how the Development Bank of Ethiopia (DBE), in partnership with microfinance institutions (MFIs), mobilises and delivers finance under the market development for renewable energy and energy efficient products (MDRE&EEP) programme to support investment by households, private sector enterprises (PSEs) and small and medium enterprises (SMEs) in off-grid renewable energy and energy efficient technologies.

Our study is based on a political economy analysis of actors and their decisions in the MDRE&EEP financial landscape. We outline the key actors and their roles, and the design choices and incentive structures that shape effective resource mobilisation and its delivery for inclusive investment in CRGE.

This study is part of a cross-country study gathering evidence on the role of national intermediaries in financing inclusive investment in LCRD. Other country case studies include Bangladesh, Nepal and Rwanda (Rai *et al*., 2015; Steinbach *et al*., 2015; Fisher & Rwirahira, *forthcoming*). The paper builds on phase I of research carried out in 2014 to map design choices in Ethiopia's and Rwanda's national climate finance landscape (Kaur *et al*., 2016).

The case study contributes to the existing body of evidence on understanding the political economy of climate finance. The findings aim to contribute to ongoing policy deliberation in Ethiopia on financing inclusive investment in CRGE. We identify how the CRGE Facility can put in place policy instruments and incentive structures to strengthen the role of development finance institutions in financing inclusive investment in CRGE.

Chapter 2 provides an overview of the analytical and methodological approach used to gather and analyse data. Chapter 3 provides an overview of the financial landscape in Ethiopia, including the policy direction guiding financial investment in CRGE and the financing needs associated with CRGE investments. Chapter 4 focuses on case study findings. It includes a section on the actors, the financing needs of investors, and the design choices and incentive structures within the MDRE&EEP financial landscape. Chapter 5 provides an assessment of the effectiveness of development financial institutions in financing inclusive investment in CRGE. Chapter 6 concludes with recommendations for policymakers, specifically the CRGE Facility, on how to support inclusive private sector investment in CRGE.

Approach and methodology

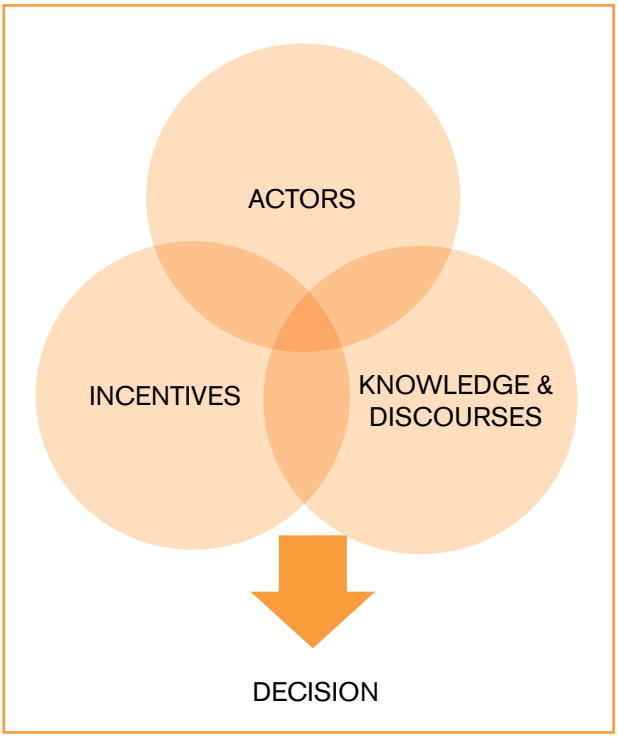
In this section we outline the two main analytical frameworks – political economy analysis and the climate finance landscape framework – that we use to analyse the role of national financial institutions in financing inclusive investment in CRGE. We also provide an overview of the case study and interview methodology that we use in this report.

2

2.1 Political economy analysis

In this study, we use a political economy lens to understand the factors that drive or constrain inclusive investment in LCRD. Political economy analysis acknowledges that different actors have different knowledge that is shaped by discourses, narratives and values, and that their decisions are influenced by different incentive structures (Rai *et al*., 2015; Tanner & Allouche, 2011). These underlying factors shape the choices actors make in designing the national financial landscape to mobilise, manage and deliver finance for inclusive investment in CRGE. The combination of these three political economy factors – actors, knowledge and incentives – leads to decisions (see Figure 1).

Figure 1: Political economy analysis



Actors: A range of actors, both international and domestic, are involved in shaping the climate finance landscape. These include multilateral and bilateral partners, and development and commercial financial institutions from the public and private sectors. Each actor plays a specific role by either providing the finance or policy direction for financial investment, managing financial resources to ensure effective and efficient delivery of finance, or accessing the finance for investment in CRGE. Table 1 lists actors involved in the MDRE&EEP landscape.

Knowledge and discourses: The decision-making process of individual actors is shaped by the knowledge they acquire and use, as well as the discourses and narratives to which they are exposed. While these are important, we limit our analysis to how knowledge of financial and market development needs has influenced the choices of actors in the MDRE&EEP case in Ethiopia.

Incentives: In this report we analyse the underlying drivers and incentives that shape investment in CRGE as well as choices actors make. We also outline how the lack of appropriate incentive structures can constrain inclusive investment in CRGE.

In summary, we use political economy analysis to examine actors in Ethiopia's MDRE&EEP value chain, the knowledge and discourses they deploy and the underlying incentive structures that drive decision making. Through this lens, we examine the incentives that led to design choices in the financial landscape, those that encourage various actors to invest in CRGE and whether these incentives are effective in financing inclusive investment in Ethiopia's CRGE.

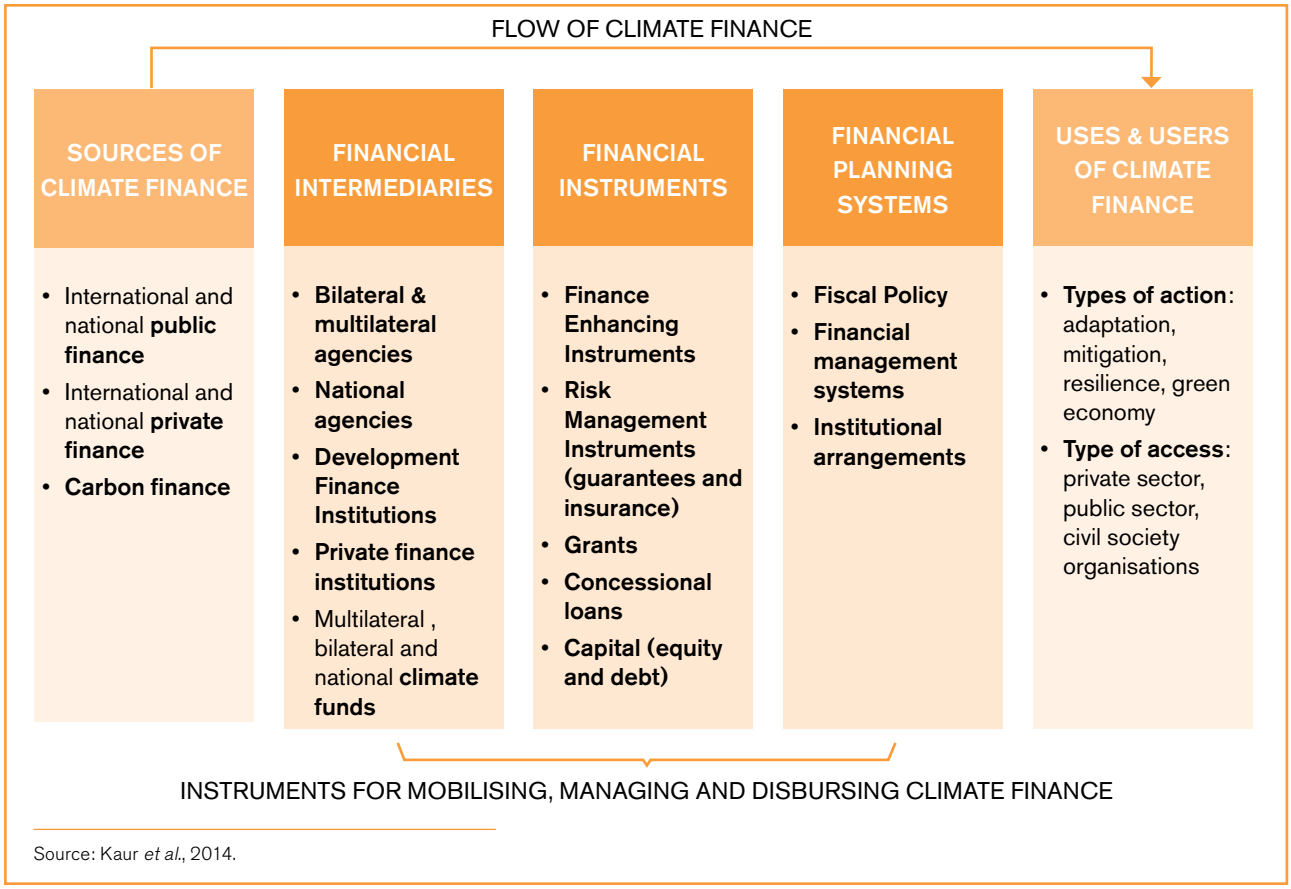
2.2 Climate finance landscape framework

The second analytical framework that we use in this report is the climate finance landscape framework.

The climate finance landscape framework helps map out how climate finance is delivered from its source of origin to the investor at the end of the financial delivery chain. It is a useful tool to understand the different actors, financial instruments and management systems that are used mobilise, channel and deliver finance for investment in CRGE. There are five pillars to the framework:

1. **Sources of climate finance:** refer to both the origin (international or national) and type (long and/or short term, public, private and/or carbon) of finance.
2. **Financial intermediaries:** the institutions that enable the flow of climate finance from its source to the end use/users. Intermediaries play a role in mobilising and disbursing climate finance.
3. **Financial instruments:** provide incentives for climate-relevant investments. A financial instrument is any contract that gives one entity a financial asset and another a financial liability. Different instruments suit different investment needs.
4. **Financial planning systems:** play a key role in the management and governance of climate finance.
5. **End users of climate finance:** refer to the type of investors targeted by climate finance.

Figure 2: Climate finance landscape framework



Source: Kaur *et al.*, 2014.

2.3 Case study methodology

In our case study, we examine how the DBE, in partnership with microfinance institutions, mobilises and delivers finance under the MDRE&EEP programme to support investment by households, private sector enterprises (PSEs) and small and medium enterprises (SMEs) in off-grid energy.

Inclusive investment in RE sources and EE technologies are two of the four pillars prioritised in Ethiopia's CRGES; private sector investors are expected to invest in these areas. Access to appropriate finance plays a key role in the ability of Ethiopia's private sector to invest in new sources of energy and technology. To address this need, the government of Ethiopia promotes the use of development finance intermediaries to mobilise and deliver finance to private sector investors. In line with the government's policy direction, the recently operational CRGE Facility is designed to work with development finance intermediaries to channel public and private sources of climate finance to private sector investors investing in CRGE.

Our case study aims to illustrate how the DBE finances inclusive investment in a CRGE-related sector, which can provide evidence for policy deliberations within the CRGE Facility on how best to work with development finance institutions to deliver finance for private sector investment in CRGE.

To conduct the research for this case study, we carried out a desk-based literature review and semi-structured interviews with actors involved in the MDRE&EEP value chain. We began our political economy analysis by mapping the different actors in the MDRE&EEP value chain. We then collected data between January and March 2015 through a series of semi-structured interviews with 22 actors, including: funders, financial intermediaries, technical intermediaries and investors/beneficiaries of the finance (Table 1). Each of these interviews included questions on the incentives that drive choices in the MDRE&EEP financial landscape, the incentives that drive RE investment in Ethiopia and the DBE's effectiveness in promoting inclusive investment in CRGE. Researchers noted similarities in responses across four main actor groups in the MDRE&EEP value chain.

Table 1 lists the participating institutions, agencies and communities from the four main categories of actors. See Annex 1 for a complete list of interviewees.

2.4 Defining effectiveness

Our case study aims to assess the effectiveness of development finance institutions in financing inclusive investment in CRGE. We define effectiveness as the "ability to produce a desired result" (Drucker, 2006). We focus on the following three desired results, identified during stakeholder interviews, to assess the effectiveness of national development finance institutions in financing inclusive investment in CRGE:

The ability to provide targeted finance for inclusive investment in CRGE: the ability to provide scaled-up, long-term and flexible finance for inclusive investment in CRGE; and the ability to deliver finance to incentivise investment in initiatives that deliver co-benefits. See Chapter 5 for more details.

Table 1: Categorisation of actor groups

ACTOR GROUPS	LIST OF AGENCIES/ STAKEHOLDERS INTERVIEWED
Funders: Actors providing finance for investment in MDRE&EEP	World Bank
Financial intermediaries: Actors responsible for accessing, managing and channelling finance for inclusive investment in LCRD	Development Bank of Ethiopia, microfinance institutions
Technical intermediaries: Actors responsible for supporting promotion and uptake of investment in LCRD	Ministry of Water, Irrigation and Energy (MoWIE), including the Alternative Energy Technology Promotion and Dissemination Directorate (AETPDD)
Investors/beneficiaries: Actors accessing finance for investment in LCRD	Private sector enterprise and rural households

Financing inclusive investment in Ethiopia's Climate Resilient Green Economy: The policy and investment landscape

In this chapter we outline the policy and the investment landscape that shapes finance for inclusive investment in CRGE.

3

3.1 The policy context

The government of Ethiopia's CRGES outlines a pathway to achieving middle- income status by 2025 in a carbon neutral and climate resilient way. The strategy aims to deliver inclusive and climate resilient development outcomes.

Taking an economy-wide approach to achieving development goals while limiting greenhouse gas emissions (FDRE, 2011), the Green Economy Strategy is supported by four pillars:

1. Improving crop and livestock production practices to achieve better food security and raising farmers' income while reducing emissions
2. Protecting and re-establishing forests for their economic and ecological value, such as their function as carbon stocks
3. Expanding electricity generation from renewable energy sources for domestic and regional markets, and
4. Leapfrogging to modern and energy-efficient technologies in transport, industry and building.

The Climate Resilience strategy takes a sectoral approach to identifying and implementing investments that will build resilience to the impacts of climate change.

The government is currently developing guidelines that will integrate climate actions into Ethiopia's national development planning process, guided by the Growth and Transformation Plan (GTP) II (MoFED, 2010). Guidance aimed at developing CRGE investment plans categorises investments into three types[1]:

1. **Type 1 enabling activities** for investment in CRGE
2. **Type 2 mainstreaming activities** to include CRGE in regular development and economic investments
3. **Type 3 investments** in addition to mainstream development investments.

Policy and institutional frameworks shaping financial investment in Ethiopia's energy sector are outlined in Box 1.

In the energy sector, our case study (see Chapter 4) focuses specifically on the MDRE&EEP programme, the overall goal of which is to promote private sector-led development of RE and EE products in rural areas by removing financial barriers to private investment. The programme uses financial intermediaries and instruments to enhance access to credit, including access to foreign currency and collateral.

3.2 The investment landscape

In Ethiopia, investment in the green economy is expected to cost US$150 billion by 2025. This amounts to approximately US$7.5 billion per year. Adaptation in Ethiopia could cost up to US$10 billion a year (World Bank, 2010). Table 2 provides additional details on costs of investing in CRGE.

The demand for climate finance exceeds the current supply, most of which is drawn from national and international sources of public finance. Domestic revenue in the current five-year plan (2010–2015) is expected to increase from US$3.5 billion in 2010 to US$9.15 billion[2] by 2015 (MoFED, 2010). Even with a three-fold increase in domestic revenue, the country won't be able to raise the required US$7.5 billion for CRGE. In terms of international sources of public finance, the country aims to draw down on multilateral and bilateral funds. Over the last four years (2010–2013) the country received a total of US$ 1.3 billion in the form of overseas development assistance for investment in adaptation and mitigation (OECD-DAC, 2015)

The CRGE Facility, acting as the primary intermediary for mobilising and disbursing climate finance for CRGE investments, pools multiple sources of international and national finance. The facility has successfully accessed bilateral sources of climate finance and applied for accreditation to the Adaptation Fund and the Green Climate Fund under the United Nations Framework Convention on Climate Change (UNFCCC) to access multilateral sources directly. This approach of managing climate funds within a single coherent system aims to minimise transaction costs, fragmentation and

[1] At the time of conducting research, climate resilient green economy investment categories were identified in the Draft Sector Reduction Mechanism (SRM), which was expected to guide the preparation and implementation of sector-specific investment plans. It is likely that guidance developed under the GTP II will replace the SRM.

BOX 1: POLICY AND INSTITUTIONAL FRAMEWORKS SHAPING FINANCIAL INVESTMENT IN ETHIOPIA'S ENERGY SECTOR

Enhancing access to energy by scaling up public and private sector investment in grid-connected and off-grid energy production and distribution is a key policy agenda in Ethiopia. This box provides a snapshot of Ethiopia's policy and institutional framework shaping financial investment in the energy sector.

Energy Demand and Supply

Demand for energy is growing rapidly in Ethiopia. The demand forecast made for the CRGES projects total power demand to grow from 4 terawatt-hours (TWh) in 2010 to nearly 70 TWh in 2030. This increase results from both growing electrification of the country and rapid growth of electricity-intensive industries. Electricity consumption on the national grid has grown at more than 12 per cent annually. The annual per capita consumption of electricity, however, is less than 100 kilowatt-hours (kWh), while sub-Saharan Africa consumes on average 521kWh per capita (MoWIE, 2012). The industrial sector has had the most rapid increase in its demand for electricity since 2000. The household sector, consuming 89 per cent of the energy supply, accounts for the largest share of sectoral energy consumption. Of the total, 74 per cent is consumed by rural households and 15 per cent by urban households.

Only 10 per cent of the total energy consumption in Ethiopia is supplied by electric power; the rest is from biomass, such as wood fuel and dung. The current installed power generation capacity is 2,360 MW, 86 per cent of which is from hydropower, 13 per cent from diesel and 1 per cent from geothermal. The inter-connected transmission system generates more than 98 per cent of the total energy supply through the national grid. Self-contained systems are used for energy supply in off-grid areas. These rely on small-scale power plants, including hydropower, solar energy and wind energy plants.

Policy Framework

The key policy direction in the energy sector is to deliver a secure, accessible and affordable modern energy supply to the entire country to accelerate and sustain social and economic development (MoWIE, 2012). The main policy objectives are stated in the national development plan, the Growth and Transformation Plan (GTP), the national energy policy and the CRGES. Policy objectives focus on addressing issues of energy access, the quality and supply of energy, and the productive use of energy. Interventions aimed at achieving policy objectives include:

- Accelerating and completing the construction of hydroelectric power and other RE generation projects
- Expanding and strengthening the existing transmission and distribution lines to provide improved access to rural villages
- Modernising the distribution system to reduce power losses to meet international benchmark levels.

Providing the necessary support and incentives for the private sector to participate in the energy sector is a key policy goal in Ethiopia. The draft feed-in tariff proclamation allows the international and national private sector to supply power to the national grid system. The draft proclamation sets competitive tariff rates to incentivise private sector investment in RE production.

Financing Inclusive Investment in RE

To meet the rapidly growing domestic demand and become an energy hub in East Africa, the government of Ethiopia is actively seeking additional investment for the energy sector. The main objective is to leverage investments for expanding the energy supply. Financial resources come from government equity, multilateral banks, development partners, local banks and revenue earned from the export of power (EEPCo, 2009).

In 2013, the government opened the sector to foreign direct investment in the production of hydropower, wind, solar and thermal energy (FDRE, 2013). Private sector project developers investing in the energy sector are given custom duty and tax privileges (FDRE, 2003). Finance-enhancing regulatory instruments like feed-in tariffs and power purchase agreements have also been introduced to incentivise private investment.

Key actors

The key agencies in the broader energy investment landscape are the Ethiopian Electric Power Cooperation (EEPCo), which is responsible for the generation, transmission, distribution and sale of electricity; the Ethiopian Energy Authority (EEA), which is responsible for setting the tariffs and supervising access by private operators to the electricity grid, including the approval of power purchase agreements; and the Ministry of Water, Irrigation and Energy (MoWIE).

Other institutions important to the energy sector include the National Strategic Petroleum Reserve Administration, which administers strategic domestic fuel reserve depots to ensure a sustained supply; the Ministry of Finance and Economic Development, responsible for public finances; the Ministry of Trade, which is involved in the petroleum pricing system; the Ministry of Mines and Energy which oversees upstream hydrocarbon and geothermal resources exploration; and the Ministry of Environment and Forest, which regulates the environment aspects of energy development activities.

Table 2: Costs of implementing a Climate Resilient Green Economy pathway in Ethiopia

CLIMATE CHANGE INITIATIVE	APPROXIMATE COSTS	NOTES
Green Economy Strategy	US$150 billion over 20 years	The strategy follows an economy-wide approach and has identified more than 60 initiatives that will help the country achieve its development goals while limiting greenhouse gas emissions.
Climate resilience strategy: agriculture	US$600 million by 2030 in addition to ongoing climate relevant investment	There is significant overlap between 'development investments' and 'resilience building investments'. Investment in the agriculture sector comes from the federal budget and other sources such as regional budgets, donor finance and the private sector. Between 2007 and 2013, 60 per cent (US$0.3 billion) of the federal budget was spent on 'resilience building' activities.
National Adaptation Programme of Action	US$770mn	There are 11 projects.
Ethiopia's Programme of Adaptation on Climate Change	US$10 million	There are 29 different components addressing climate resilience and poverty reduction.

duplication associated with funding unconnected projects. The facility works with additional financial intermediaries to access and channel climate finance. It will work with implementing and executing entities to disburse public finance for investment in CRGE, including national financial institutions to disburse public and private finance for private sector investment in CRGE. Figure 3 provides a snapshot of the national climate finance landscape emerging in Ethiopia.

The Development Bank of Ethiopia has the potential to play a significant role in mobilising and delivering finance for investment in Ethiopia's CRGES. The DBE's has the mandate to lend to sectors and products that fall under the CRGES, and also to provide more risky investments to households and enterprises. The bank is likely to become an accredited financial intermediary to the Green Climate Fund under the UNFCCC and work in partnership with the CRGE Facility to deliver public and private finance to private sector investors. The DBE can mobilise and deliver finance by:

- Accessing national and international sources of public, private and carbon finance
- Pooling/blending different sources of finance
- Deploying a range of financial instruments, including long-term loans and guarantees.

The DBE finances investment in CRGE-type interventions in two ways:

1. As a trust agent, the DBE administers funds on behalf of another entity, receiving a commission for its administrative services. It does not share risks related to the investment portfolio.
2. The DBE also manages its own credit line with a share in the investment risk. It accrues income from the interest charged.

Figure 4 highlights how the DBE works to provide finance for CRGE investment.

[2] Exchange rate of 18.9 birr to US$1

Figure 3: The national climate finance landscape in Ethiopia

SOURCE	INTERMEDIARY	INSTRUMENT	PLANNING SYSTEM	USE & USERS
Public finance Private finance Carbon finance	**Resource mobilisation**: CRGE Facility **Resource disbursement**: Implementing and Executing Entities	Range of financial instruments	**Policy**: CRGES, CRGE Facility operational management **Financial management systems**: Public financial management systems for public sources of finance. Development financial institutions for public/ private finance; commercial financial institutions for private finance.	**Use**: CR & GE **Users**: Direct access for implementing entities

Estimated cost of climate resilient green economy (CRGE): US$150b over 20 years for GE; US$80b for capital investment & US$70b for recurrent investment; Approx. US$7b/year

Supply of climate finance:

1. **ODA**: In 2012 US$80.67m as principal investment in adaptation and mitigation
2. **Budget**: In 2011–12 1.8% of GDP allocated to cover climate relevant expenditure

Source: Kaur *et al.*, 2016

Figure 4: The DBE's financial delivery landscape for investment in CRGE

SOURCE	INTERMEDIARY	INSTRUMENT	FINANCIAL PLANNING SYSTEM	USE & USERS
National • Public finance from GoE • Debt finance (bonds) International • Financial institutions (WB, EIB) • Carbon finance (DBE is working with WB to tap into this source) *2012: Authorised capital 3 billion br. Paid-up capital 1.8 billion br.*	As a financial intermediary, DBE mobilises, manages and channels finance in two ways: • **Trust Agent:** It administers funds; receives service commissions; does not share the risk. • **Credit line:** It manages its own credit line; shares the risk; has an income from the interest charged DBE can channel finance to Public agencies, MFI & Private sector	A range of financial instruments tailored to suit the investment type. • Guarantee • Concessional and market rate loans • Co-finance • Debt finance (bond sale)	**Policy:** Credit Policy **Institutional arrangement:** DBE is supervised by Public Financial Enterprises Supervising Agency. Board of Management administers the Bank;	**Use** • Manufacturing and Extractive Industry • Agro-processing • Commercial agriculture • Special programmes, including energy, rural electrification, export, credit & guarantee **Users:** • Private Ltd companies • Sole proprietorship • Share companies • MFI

Case study

In this chapter, we present our case study of the Market Development for Renewable Energy and Energy Efficient Products (MDRE&EEP) programme. We include a section on the actors in the financial chain, investor financing needs, the institutional arrangements for how the MDRE&EEP accesses, channels and delivers finance (referred to as design choices) and the incentive structures that have shaped these design choices.

4

4.1 The MDRE&EEP programme

Investment under the MDRE&EEP programme is akin to that foreseen under pillar III of the CRGES: expanding electricity generation from renewable sources of energy for domestic and regional markets. The overall goal of the programme is to promote private sector-led development of RE and EE products and dissemination of these products to rural areas. The technologies that are expected to be covered under this programme include: solar lanterns, solar home systems, improved cook stoves, biogas plants, waste to energy, small wind and other RE and EE technologies (except hydro) – although to date, funds have only been used for solar lanterns and biogas plants.

The MDRE&EEP programme uses specific financial intermediaries and financial instruments to remove financial barriers for RE and EE investment and improve access to credit (including access to foreign currency and collateral). The programme is financed by a US$40 million concessional loan from the World Bank to the DBE, with US$20 million allocated as part of the first tranche. Of this, approximately US$200,000 is being used to raise awareness and promote programme uptake at the national and regional level.

The MDRE&EEP programme builds on previous programmes that have aimed to enhance energy access to off-grid communities by moving from public approaches to private and market-led approaches for investment. These include the universal access programme led by EEPCo that aimed to subsidise investment in off-grid RE production and the RE fund programme (REF) that aimed to procure RE products and services based on specifications provided by rural cooperatives. These programmes have been unable to scale-up investment due to procurement barriers (Rahul Kitchlu, World Bank, personal communication, April 2015).

4.2 Actors in the MDRE&EEP financial landscape

A number of actors with a specific set of functions are involved in the programme's investment landscape (Figure 5). They include regulators, financial intermediaries, technical providers and end users comprised of households and private entities.

Regulatory Bodies

The National Bank of Ethiopia, the Public Financial Enterprises Agency (PFEA), the Ethiopian Conformity Assurance Enterprise (ECAE), and Lighting Africa regulate investment in the MDRE&EEP landscape. The national bank regulates the DBE and MFIs. The DBE is also regulated by the PFEA. Lighting Africa and the ECAE regulate the quality of solar energy products provided by private companies.

Financial Providers

For the MDRE&EEP, the flow of financial resources starts with the World Bank, which has provided a US$40 million long-term concessional loan to enable private sector investment in RE production and distribution. Funds from the bank flow to the Ministry of Finance and Economic Development (MoFED), which in turn transfers the funds to the DBE.

As noted earlier, US$20 million of the US$40 million has been allocated in the first tranche (2012–2017). Of this amount, loans worth US$18.8 million have been approved by the DBE, and US$10.3 million has been disbursed to MFIs (US$6.6m) and to PSEs (US$ 3.7m) (Ayana, 2015). The DBE channels the funds for investment in RE production and distribution of EE products through two credit lines:

1. A credit line to support working capital of project developers (e.g. PSEs) for investment in RE and EE products
2. A credit line to provide support to MFIs lending to small households for investment in RE and EE products. To date, two MFIs operating in the Oromia Regional State have acquired concessional loans from the DBE: Oromia Credit and Saving Share

Company (OCSSCO) and Wassassa Microfinance Institution. Applications from three MFIs in the regional states of Amhara, Tigray, and the Southern Nations, Nationalities, and Peoples' Region (SNNPR) are in the pipeline to access credit from the DBE. Each MFI expects to access about 50 million birr (approximately US$2.5 million).

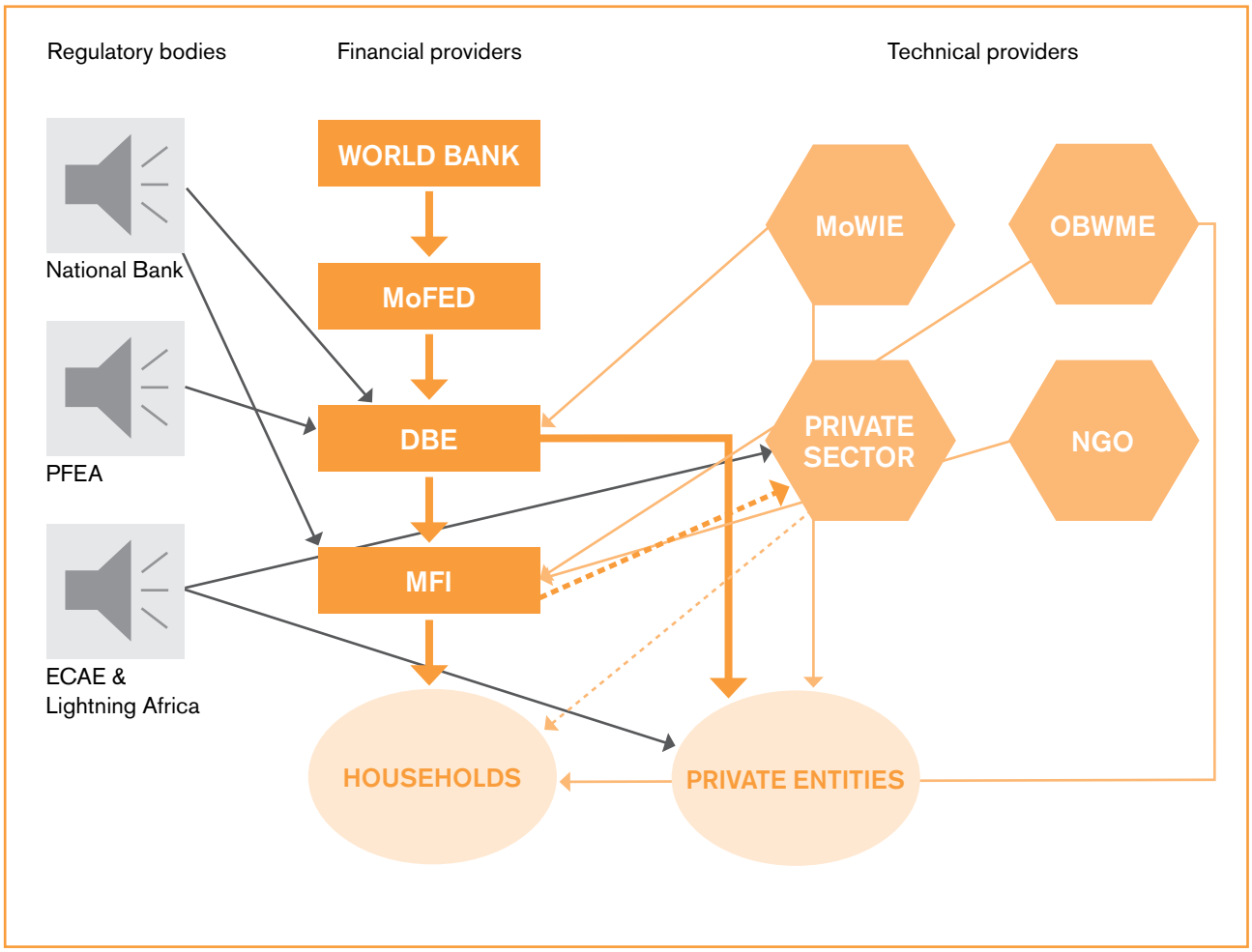
Technical providers

There are a number of technical providers in the MDRE&EEP investment landscape; each plays a specific role in the promotion, distribution and uptake of investment in RE and EE products.

Technical service provision includes:

1. **Technical assistance to identify credit-worthy households and develop credit-worthy applications:** MoWIE provides technical assistance to the DBE and those private companies accessing DBE credit. It appraises credit applications, including the energy product that is being proposed for importation. The Oromia Bureau of Water, Mines and Energy (OBWME) provides similar assistance to the MFIs, helping them identify households eligible to access credit for investment in RE and EE products. Households that own livestock are eligible to access credit for biogas digesters. In the case of solar lanterns, households must provide group collateral.
2. **Technical assistance to develop market linkages:** Non-governmental organisations play an important role in linking MFIs to private sector service providers.
3. **Technical assistance to distribute, implement and maintain investment in RE and EE products:** Private entities are responsible for distributing, implementing and maintaining investment in RE and EE products. The OBWME also supports MFIs by providing material, at a concessional price, to households for the construction of biogas digesters.

Figure 5: Actors in the MDRE&EEP investment landscape



End Users

The end users in this financial value chain include:

1. Households that access finance from the MFIs for investment in RE and EE products. To date, households have invested in biogas digesters, fuel-saving stoves, electric mitads and other stoves, and various types of solar systems such as solar lanterns.
2. Private sector enterprises that access finance from the DBE to purchase and distribute EE products and invest in RE production. To date, six private companies have accessed credit to invest in solar lanterns and energy saving lamps. MFIs also work with PSEs to install and maintain RE and EE products for households.

4.3 Financial and market development needs to support inclusive investment in RE and EE products

The MDRE&EEP is designed to address specific financial and market development needs of private sector investment in RE and EE products in rural off-grid markets. The programme aims to remove barriers to private investment related to accessing credit, foreign currency and collateral requirements.

Table 3 highlights the financial and market development needs of different actors in the MDRE&EEP investment landscape, based on interviews from our case study consultations. These actors emphasise the need for appropriate finance, including access to:

- *Concessional credit*, which enables households and PSEs to access finance for investment in RE and EE products

Table 3: Financial and market development needs for inclusive investment in RE and EE

ACTOR IN THE INVESTMENT LANDSCAPE	FINANCIAL NEEDS	MARKET DEVELOPMENT NEEDS
Development Bank of Ethiopia	Access to long-term concessional credit to promote and sustain investment in RE and EE	Promotion of new technology. Sufficient capacity of actors in the investment landscape to carry out their roles. Division of labour and coordination in the investment landscape to enable all elements to function.
Microfinance institutions	Access to long-term concessional credit to promote and sustain investment in RE and EE. Access to larger amounts of credit to finance start-up investment costs (RE and EE is a new investment area with many start-up costs, such as provider training).	
Households	Access to larger amounts of concessional credit to scale-up investment in RE and EE products.	
Private sector enterprises	Access to foreign currency to import RE and EE products. Access to credit with low collateral to enable start-up investment in RE. Access to concessional credit to enable investment in EE products.	

- *Long-term credit*, required to promote and sustain investment in RE and EE. Disbursed through a revolving fund, long-term credit enables MFIs to deliver finance to a greater number of investors. It also enables investors to engage with the different phases of the investment cycle associated with new products. These phases include feasibility assessment, promotion, development, deployment and maintenance. The uptake and financial viability of investment in RE and EE products will depend on how well they are promoted through awareness raising and training of RE and EE suppliers.
- *Collateral-free credit*, which incentivises investment in RE and EE products by transferring the risk of investment away from the investor.
- *Credit in foreign currency*, necessary for importing RE and EE products.

The programme aims to build the capacity of actors in the investment chain to promote and maintain investment in RE and EE products. Access to finance is seen as incomplete without the development of a market that will promote product uptake. Actors indicate that promotion of new products through awareness raising and quality assurance is essential for market development. Along with promotion, actors need to have sufficient capacity to carry out their roles. This includes technical capacity to implement and maintain RE and EE products and financial capacity to pick up the up-front costs of investment. Finally, actors indicate that division of labour and effective coordination between actors is essential to ensure uptake of RE and EE products.

4.4 Design choices in the financial landscape to support inclusive investment in RE and EE products

Actors in the RE and EE investment landscape work with specific financial intermediaries, instruments and planning systems to address the specific financial needs of private sector investment in RE and EE. Figure 7 provides an overview of these choices.

4.4.1 Financial Intermediaries

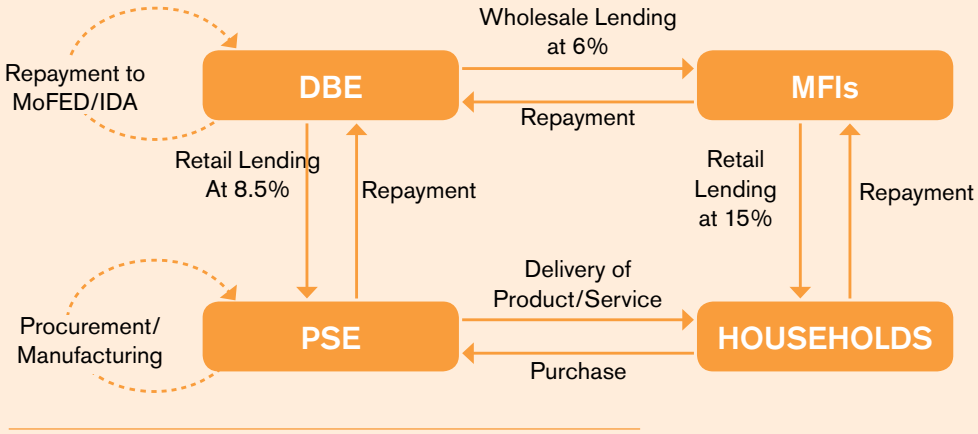
The DBE and MFIs are the financial intermediaries used to mobilise and deliver finance for private sector investment in RE and EE products. The DBE is a development finance institution with a mandate to deliver finance to households and private sector enterprises for investment in RE and EE products. Investment in off-grid RE and EE products is expected to improve energy access and its productive use, thereby contributing to the country's aim of achieving inclusive low-carbon climate resilient development by 2025. MFIs are also development finance institutions able to mobilise finance from public and private sources of domestic finance, including household savings. MFIs have a mandate and the capacity to deliver credit in rural areas to households and SMEs.

4.4.2 Financial Instruments

Loans (concessional and market rate) delivered through revolving funds are the main financial instruments used to finance investment in RE and EE products.

- **Concessional loans:** The DBE provides concessional loans to SME and PSE project developers to promote investment in RE and EE products. The bank provides 70 per cent working capital loans at an interest rate of 8.5 per cent with a 5 year repayment period. SME and PSE project developers are required to provide 30 per cent of the total project cost in the form of equity contributions and collateral in the form of fixed assets for movable projects. The collateral for non-movable power generating technologies is the project itself. The types of collateral accepted by the DBE are: urban (municipal area) registered fixed assets, government guarantees, and/or bank guarantees. The DBE provides concessional loans for on-lending to MFIs. These are provided at an interest rate of 6 per cent with a 10 year repayment period. MFIs are not required to provide collateral. The DBE bears the full risk of the loans to MFIs. Concessional loans, which are below the market rate, enable households and PSEs to access credit for investment in RE and EE products in rural off-grid areas. Concessional loans have a long repayment period, which enables access to long-term finance, thus promoting and sustaining investment in RE and EE products.

Figure 6: Transaction flow in the MDRE&EEP



Source: Ayana, 2015.

Figure 7: Design choices in the MDRE&EEP financial landscape

SOURCE	FINANCIAL INTERMEDIARY	FINANCIAL INSTRUMENT	FINANCIAL PLANNING SYSTEM	USE & USERS
Public multilateral sources (World Bank IDA Financing)	Financial intermediary: DBE & MFIs Technical intermediary: AETPDD	Concessional loan 2 credit lines provided by DBE 1. Credit line to support working capital of project developers (private sector enterprises; SME etc) • DBE provides 70% of working capital loan @ an interest rate of 8.5% & a repayment period of maximum 5 years. Investors are required to provide 30% equity contribution 2. Credit line to provide on-lending support to MFIs to lend to small households • Interest rate 6%; Repayment 10 years max; DBE will bear the full risk of the loans to MFIs	Development finance management systems; Group collateral Regulatory policy of the National Bank of Ethiopia	Use: Promotion of renewable energy and energy efficiency products Users: Project developers (PSE, SME etc) and rural households

- **Market rate loans:** MFIs use market rate loans to deliver finance to households for investment in RE and EE products. MFIs are free to set their own lending rates and repayment periods based on market conditions and are not bound by interest rate caps. For investment in biogas, MFIs provide a maximum of $500 per household at a rate of 15 per cent with a two year repayment period. Households are not required to provide collateral; however, they do make an equity contribution in the form of either a partial payment or labour for the installation of biogas digesters. For investment in solar lanterns, MFIs provide credit to households at a rate of 18 per cent with a one year repayment period. Households are required to make an equity contribution in the form of a partial payment and provide group collateral. Market rate loans enable households to access credit for investment in RE and EE products in rural off-grid areas. MFIs manage the 10 year concessional loan from the DBE as a revolving fund, and provide short-term loans to households. This enables MFIs to scale-up finance for investment in RE and EE products by a large number of investors.

In addition to the existing financial instruments available to end users, households and PSEs highlight the need for better targeted instruments to enable them to investment in CRGE. These actors require *risk management instruments like guarantees*, which transfer the risk of investment in RE and EE products from the investor to the financial supplier. According to PSEs, guarantees will remove the collateral requirement for accessing credit for investment in RE and EE products. In the current investment landscape, PSEs do not borrow project capital for investment due to the high collateral requirement. Households also highlight the need to introduce *long-term concessional loans of greater amounts* to enable scaled-up investment in RE and EE products. This includes scaling up investment from solar lanterns to solar home systems.

4.4.3 Financial Planning Systems

Policy frameworks and risk management tools are used to govern the flow of finance to the private sector for investment in RE and EE products.

1. **Policy frameworks:** The DBE relies on its credit policy and programme documents to govern the flow of finance to the private sector for investment in RE and EE. The credit policy provides a mandate to the DBE to provide finance for inclusive investment in rural and off-grid areas.
2. **Risk management systems:** MFIs rely on group collateral to manage risks related to financial default. Group collateral enables MFIs to provide finance to individual households for investment in RE and EE products. The DBE does not require MFIs to provide collateral because they are regulated by the National Bank of Ethiopia.

4.5 Incentives driving design choices

The choices actors make to deliver finance for inclusive investment in CRGE are driven by incentives they derive from their mandates, organisational structures, procedures, policies, resources and knowledge base. Incentives are classified into five categories:

1. **Policy incentives:** where a policy, regulation or institutional mandate shapes investment or design choices
2. **Economic incentives:** where resources, funds, etc. influence investment or design choices
3. **Capacity incentives:** where technical skills, evidence, knowledge and previous experience shape investment or design choices
4. **Reputational incentives:** where seeking positive reputational outcomes shapes investment or design choices
5. **Socioeconomic incentives:** when delivering socioeconomic benefits that improve wellbeing shapes investment and design choices.

4.5.1 Incentives shaping financial investment in RE and EE products

Policy incentives shape investment in RE and EE at the national and sub-national levels. The government of Ethiopia has developed policy documents to promote investment in RE and EE products. These include the Growth and Transformation Plan (GTP), the National Energy Plan (NEP) and the CRGES. All three policy documents promote investment by enhancing access to and the production of RE and EE. The government has also introduced finance enhancing regulatory instruments such as feed-in tariffs and power purchase agreements to incentivise private sector RE investment (refer to chapter 3 for details).

Socioeconomic incentives shape investment in RE and EE products at the household and enterprise level. The main beneficiaries of the programme are people who live in off-grid areas with no access to electricity. These households understand the potential of RE and EE technologies to improve their living standards through better health, education and communication, and to protect their environment through the provision of clean energy. The households note that they have seen improvements in these technologies.

4.5.2 Incentives shaping design choices in the financial landscape

Actors work with specific financial intermediaries and financial instruments to access and deliver finance (see Table 4). These choices are shaped by a range of political, policy, economic and capacity-based incentives.

Table 4: Incentives shaping design choices in the financial landscape

CHOICES IN THE FINANCIAL LANDSCAPE	INCENTIVES
Financial Intermediary	
DBE	Capacity-based incentive: the DBE has the mandate and capacity to mobilise and deliver finance for investment in RE and EE. Policy incentive: national policies and the DBE's credit policy provide it with a mandate to deliver finance to rural households and PSEs for investment in RE and EE.
MFIs	Capacity-based incentive: MFIs have the mandate and capacity to deliver finance to rural households for investment in RE and EE products. Policy incentive: the reform in financial service industry provides policy direction, encouraging MFIs to provide financial services to rural households.
Financial Instrument	
Concessional loans	Policy incentive: the DBE provides concessional loans to MFIs and PSEs in response to its credit policy. Economic incentive: the DBE requires PSEs to provide collateral in the form of equity, enabling it to leverage additional private sector investment in RE and EE.
Market rate loans	Policy incentive: MFIs use market rate loans to deliver finance to rural households. This is possible as MFIs are allowed to set their own lending rate. Economic incentives: market rate loans are responsive to the market demand for credit.
Risk management instruments (guarantee)	Economic incentive: PSEs have suggested the introduction of guarantees to enable project investment in RE and EE products. Policy incentive: the new CRGE Facility promotes the use of risk management instruments to incentivise investment in CRGE interventions.

Policy and regulatory incentives: Policy and regulatory incentives play a key role in shaping the choice of financial intermediaries, instruments and planning systems to finance inclusive investment in RE and EE. Policy incentives provide support for inclusive investment in RE and EE, while regulatory incentives affect producers' and consumers' behaviour by changing prices.

The choice to work with development finance institutions (DBE and MFIs), pro-poor financial instruments (concessional loans) and financial planning systems (group collateral) is shaped by policy incentives. The government of Ethiopia's ambition is to achieve inclusive and climate resilient growth, which has led them to provide a mandate to development finance institutions to mobilise and deliver finance to small-scale investors for investment in productive and climate resilient energy sources.

Under the MDRE&EEP, policy incentives shape the choice of financial intermediaries. The World Bank works with the DBE in response to the Ethiopian government policy of working with national development finance institutions to deliver finance for investment in key sectors. In turn, the DBE works with MFIs as a result of reforms to the financial service industry in the 1990s, which restructured government-owned financial institutions and led to the establishment of MFIs.

Policy and regulatory incentives also shape the choice of financial instruments under the MDRE&EEP. For instance, MFIs use market rate instruments in response to policy that allows MFIs to set their own lending rates. PSEs and the DBE are considering the use of risk management instruments such as guarantees in response to the capacity of the CRGE Facility to deliver finance through risk management and other instruments. The DBE is able to provide loans in foreign currency due to a memorandum of understanding signed between the World Bank and the Central Bank for lending in US dollars (World Bank, personal communication, DATE).

Economic incentives provide an economic return on investment, and shape the choice of financial instruments. For instance, the DBE uses concessional loans to leverage private sector investment in RE and EE products. The bank provides 70 per cent working capital loans to PSEs, which in turn unlocks 30 per cent equity contributions from PSEs. MFIs use market rate loans to deliver finance to rural households. They borrow finance from the DBE at an interest rate of 6 per cent and lend this money out to households at a rate of 15–18 per cent. PSEs have requested the introduction of risk management instruments like guarantees to address the collateral required to access project finance for investment in RE and EE products (see Table 6 for additional information on economic returns from various financial instruments).

Capacity incentives: The capacity to mobilise, manage and deliver appropriate finance to the private sector is crucial for investment in RE and EE products. The World Bank works with the DBE because of its capacity to deliver finance to PSEs investing in RE and EE products in rural areas. The DBE works with MFIs because they have the capacity to deliver finance to rural households. For instance, in the context of MDRE&EEP, MFIs are able to finance biogas digesters and solar lanterns due to their prior experience with these technologies.

Effectiveness of finance for inclusive investment in CRGE

5

In this chapter we assess the effectiveness of development finance institutions in financing inclusive investment in CRGE. As noted above, we define effectiveness as the "ability to produce a desired result" (Drucker, 2006). We focus on the following three desired results, identified during stakeholder interviews:

- **The ability to provide targeted finance for inclusive investment in CRGE:** If poor households, start-up PSEs, SMEs and women, especially in the rural and informal economy, are to invest in CRGE, existing barriers to credit will need to be addressed. Financial intermediaries need to have the mandate and capacity to deliver targeted finance to support inclusive investment in CRGE.
- **The ability to provide scaled-up, long-term and flexible finance for inclusive investment in CRGE:** CRGE investments have specific financial requirements. Scaled-up finance is required to support the current and projected cost of CRGE investments; long-term finance to sustain and incentivise investment in CRGE; and flexible finance to support investment pathways that respond to climate-induced uncertainty. Financial intermediaries need to have the mandate and capacity to mobilise, manage and deliver such finance for inclusive investment in CRGE.
- **The ability to provide finance for initiatives that deliver co-benefits:** Ethiopia's CRGES aims to integrate CRGE and development outcomes. Finance can be designed to incentivise investment in initiatives that deliver multiple co-benefits, including building the resilience of rural households and SME business models, reducing emissions, improving multi-dimensional indicators of poverty and so on. Financial intermediaries must have the mandate and capacity to structure finance such that it incentivises investment in initiatives that deliver co-benefits.

5.1 The ability to provide targeted finance for inclusive investment in CRGE

Based on our analysis of the DBE, we find that development finance institutions can be effective in providing targeted finance for inclusive investment in CRGE. There is scope to introduce additional options to support inclusive investment in CRGE.

Design choices in the financial landscape that deliver targeted finance include:

1. **Use of development finance intermediaries** that have the mandate and capacity to deliver finance to SMEs, start-up PSEs and rural households investing in new RE sources and EE products. By working with the DBE and MFIs, policymakers are able to address one of the main barriers to financial inclusion in Ethiopia. Both intermediaries are effective in delivering finance to rural households and small-scale investors.
2. **Use of financial instruments** to provide targeted finance to specific actors. The DBE provides *concessional loans* and *foreign credit* to SMEs and PSEs, which enables them to purchase and distribute RE and EE products. There is an additional need to introduce risk transfer instruments like *guarantees* so they are able to access collateral free credit and start investing in the production and distribution of RE and EE products. MFIs use *revolving funds* to introduce long-term concessional finance to enable households to scale-up investment in RE and EE.
3. **Use of financial planning systems** to provide targeted finance. Within the *policy framework* that governs the flow of financial resources in the DBE and MFIs, both intermediaries have a mandate to provide targeted finance for inclusive investment in sustainable development. Additionally, MFIs use *risk management systems like group collateral* that enable rural households to access credit.

5.2 The ability to provide scaled-up, long-term and flexible finance for inclusive investment in CRGE

We also find that development finance institutions can be effective in delivering scaled-up, long-term and flexible finance for inclusive investment in CRGE. There is scope to introduce additional options for scaled-up finance by leveraging investment from the DBE and MFIs, and for flexible finance by introducing risk management systems that are responsive to inclusive investment in CRGE.

Design choices in the financial landscape that deliver scaled-up and long-term finance include:

1. The DBE provides *long-term concessional loans* to MFIs, which enables them to provided sustained financing for investment in RE and EE products.
2. MFIs use *revolving funds* to manage funds received from the DBE. This enables them to deliver finance to a larger number of households for investment in RE and EE products.
3. The DBE's use of *concessional loans* and MFIs' use of *market rate loans* is effective in leveraging additional finance from PSEs and rural households for investment in RE and EE. The four points at which leveraging could potentially occur in the financial value chain are:
   a. At the level of the DBE, by contributing additional finance to that which it has received from the World Bank through MoFED;
   b. At the level of the MFIs, by contributing additional finance to that which they have received from the DBE;
   c. At the level of private companies, directly borrowing from the DBE (through equity contribution);
   d. At the level of households and micro and small enterprises (through contributions).

As highlighted in Table 5, the use of concessional and market rate loans delivered by the DBE and MFIs has been effective in leveraging additional finance from households and PSEs for investment in RE and EE. Two points of note in the leveraging potential are:

Table 5: Leveraging scaled-up finance for inclusive investment in RE and EE[3]

ACTOR	SOURCE	AMOUNT	OWN CONTRIBUTION	LEVERAGED FROM OTHER SOURCES AND IN OTHER FORMS
DBE	World Bank	US$20 million	X	X
Private Com_1	DBE	US$1.48 million	11 million	Commercial loan
	Leveraging ratio	1:0.37 (37%) excluding the commercial loan		
Private Com_2	DBE	US$1.02 million	X	X
MFI_1	DBE	US$2,297,371.81	X	X
MFI_2	DBE	US$916,058.51	X	X
HH_{bio4}	MFI	US$1,240.72	US$786.43	Labour
	Leveraging ratio	1: 0.63 (63%) excluding labour		
$HH_{solar\ 8}$	MFI	US$441.14	US$128.66	X
	Leveraging ratio	1:0.29 (29%)		

[3] Table 6 provides the leveraging result and ratio based on the samples studied

1. Leveraging is limited to ultimate users (the private companies and households); it does not occur at the level of the financial intermediaries.
2. The leveraging ratio between the two RE and EE technologies varies, with biogas digesters having higher leveraging power than solar lanterns. Possible reasons for this are twofold: first, biogas digesters have multiple uses (they can also be used for cooking), which may increase households' willingness to contribute to credit received. Second, to qualify for credit for biogas digesters, a household must have at least two cattle and be near a water source. There is no such requirement for solar lanterns. Thus, households accessing finance for biogas digesters are likely to be better off than those only using solar lanterns. This difference in economic status may explain their greater willingness to contribute to credit received from MFIs.

5.3 The ability to provide finance for initiatives that deliver co-benefits

CRGE investment has the potential to deliver multiple co-benefits, including building the resilience of rural households and SME business models, reducing emissions, and improving multi-dimensional indicators of poverty. Our study finds that investment in off-grid RE and EE products delivers both climate adaptation and mitigation benefits.

In terms of mitigation benefits, promotion of RE and EE technology reduces the use of fire wood, thereby decreasing emissions associated with deforestation and forest degradation. By also providing a cleaner alternative to kerosene lamps, solar lanterns reduce emissions. Furthermore, biogas digesters reduces emissions by replacing synthetic fertiliser with the by-products from the digesters. This ultimately has the added effect of improving the carbon capturing ability of the soil.

Investment in RE and EE also delivers social and economic benefits to households. These include:

1. Social benefits in the form of improved health, access to education and communication. Households with solar lanterns or biogas digesters with lamps are not only less exposed to pollutants from kerosene lamps and firewood, adults and children can also engage in education activities after dark. Their access to communication services, such as radio and mobile telephones, also improves. It should be noted, however, that the choice of technology affects how fully social benefits are realised: solar lanterns, which are cheaper and easier to operate, offer fewer benefits than solar home systems, which can be used, for example, for charging mobile phones.
2. Economic benefits in the form of improved household income, savings and business opportunities (profit). Households with biogas digesters can use the by-products to fertilise their farms, thereby saving on expenses otherwise needed to purchase synthetic fertilisers or, if the household had not previously used fertiliser, increasing productivity. Households can also reduce their expenditure on charcoal, firewood and kerosene through the use of digesters and solar lanterns. Households with biogas digesters also remarked on the potential to sell surplus gases (although there is no evidence that this has led to an economic benefit as yet).

Conclusion and recommendations

6

In this paper we assess the role of national development finance institutions in mobilising and channelling public and private finance for private sector investment in CRGE. We focus specifically on how the DBE, in partnership with microfinance institutions, mobilises and delivers finance under the MDRE&EEP programme to support investment by households, PSEs and SMEs in off-grid renewable energy and energy efficient technologies.

The case study illustrates the role that national development finance institutions can play in financing inclusive investment in Ethiopia's CRGE. The findings aim to contribute to ongoing policy deliberation in Ethiopia on financing inclusive investment in CRGE. Below we identify how the CRGE Facility can put in place policy instruments and incentive structures to strengthen the role of development finance:

1. **Address market development needs to promote inclusive investment in CRGE:** Market development needs include *the promotion of new products* through awareness raising and quality assurance instruments, and *implementation and maintenance of new products* by ensuring actors in the investment landscape have sufficient capacity to carry out their roles, including technical capacity to implement and maintain RE and EE products and financial capacity to cover the up-front costs of investment in this area. Finally, *division of labour* between the actors and *effective coordination* in the delivery of all functions is essential to ensure uptake of RE and EE products.
2. **Address financial needs to support inclusive investment in CRGE:** Financial needs include *access to concessional and long-term credit, access to credit without collateral, and access to credit in the form of foreign currency*. Structures in the financial landscape able to address these needs include:
    a. **Financial intermediaries:** National development finance institutions like the DBE and MFIs are important due to their ability to mobilise and deliver finance to households and PSEs for investment in RE and EE products.
    b. **Financial instruments: I**nstruments like loans (concessional and market rate loans), revolving funds and risk management instruments (guarantees) can deliver scaled-up and long-term finance for investment in RE and EE products. Loans, for example, have leveraged equity contributions from households and PSEs, while guarantees can deliver collateral-free credit to enable PSEs to invest in production or assembly rather than import RE and EE products with the use of working capital loans.
    c. **Financial planning systems** like policy frameworks that govern the flow of finance toward pro-poor investment in RE and EE products promote inclusive investment. Similarly, risk management systems like group collateral requirements enable the poorest households to access credit for investment in RE and EE products.
3. **Introduce incentive structures to support inclusive investment in CRGE:** Political, policy, economic and capacity-based incentives drive both investment in RE and EE products, as well as the choice of financial intermediaries and instruments to finance investment in this area by households and SMEs. Incentive structures that promote inclusive investment in CRGE include:
    a. **Political mandates:** Policymakers could consider replicating political incentives used in Ethiopia to promote investment in RE and EE products in rural areas. These include a political mandate to enhance access to energy and to work with national development finance institutions to deliver finance for investment in priority development sectors.
    b. **Policy frameworks:** Policymakers could consider using policy incentives to promote financial investment in RE and EE products. Examples include the use of policy frameworks that guide investment in RE and EE, and the use of specific financial intermediaries and instruments. In Ethiopia, the government uses policies to promote the use of national development finance institutions for financing inclusive investment in RE and EE.

c. **Economic incentives:** Policymakers could consider promoting economic incentives that provide socio-economic returns on investments in RE and EE. For instance, financial instruments like concessional loans leverage additional equity investment from households and PSEs. Risk management instruments like guarantees incentivise investment in the production and/or assembly of RE and EE products.

d. **Capacity-based incentives:** Policymakers could consider building on capacity-based incentives to finance inclusive investment in RE and EE products. For instance, in Ethiopia actors work with development finance institutions because they have the capacity to mobilise and deliver finance to households and SMEs for investment in RE and EE products.

By addressing the market and financial development needs through effective design choices in the financial landscape and introducing appropriate incentive structures, the CRGE Facility has the potential to use public sources of finance to unlock additional international and national sources of public and private finance for inclusive investment in CRGE.

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Supporting inclusive investment in Ethiopia's transition to a Climate Resilient Green Economy (CRGE) is a key policy priority for the government of Ethiopia.

To achieve this, policymakers will need to address financial and market development needs of prospective investors, including those of rural households, small and medium enterprises and start-up private sector enterprises.

In this paper, we focus on the role of national development finance institutions in mobilising and delivering finance for inclusive investment in CRGE. Based on a case study of the Development Bank of Ethiopia, we find that national development finance institutions have the potential to deliver scaled-up and long-term finance to those who need it most.

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