



# Financing inclusive low-carbon resilient development

Case studies of the Development  
Bank of Rwanda and the National  
Domestic Biogas Programme

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Working in collaboration with partner organisations and individuals in developing countries, the Climate Change Group has been leading the field on adaptation to climate change issues.

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Rwanda's National Strategy for Climate Change and Low-Carbon Development facilitates mainstreaming climate change into national policy and planning in all sectors to help it reach its vision of a developed, low-carbon, climate-resilient economy by 2050. Through two case studies, this paper looks at how Rwanda is using different financing channels and intermediaries to support the dual aims of delivering electricity or energy needs to poor communities and moving towards a low-carbon future. We use a political economy analysis to we examine the vertical chain of actors and delivery mechanisms and explore how incentives might be aligned to deliver effective low-carbon resilient development.

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# Executive summary

Rwanda's vision is to have a developed, low-carbon, climate-resilient economy by 2050. Through two case studies, this paper explores how the country is using different modes of financing to channel the funds to support this vision, and the range of political economy dimensions that are playing a role in shaping inclusive low-carbon resilient development outcomes.

Rwanda's Green Growth Strategy calls for the establishment of renewable energy feed-in tariffs and public-private partnerships to encourage private investment. The government aims to achieve 70 per cent access to electricity by 2017. Sustainable small-scale energy installation is an important strategy to promote this aim and reduce dependence on wood fuel, which will also enable socioeconomic development and energy diversification.

Like many Least Developed Countries, Rwanda is still in the early stages of disbursing climate finance for low-carbon resilient development objectives, but it has already established a domestic environment and climate change fund (FONERWA) to serve as a centrepiece for its national climate financing plan, attracting and streamlining climate finance and leveraging private investment for low-carbon initiatives.

This report explores channels of financing private investment in the energy sector using two case studies. The first case takes a comparative approach to understanding how the Development Bank of Rwanda is promoting low-carbon resilient development investments and how financing these private investments in the energy sector is benefiting poor communities. The second case study presents how the National Domestic Biogas Programme is attaining low-carbon resilient development objectives through existing financial systems.

## Case study 1. Rwanda Development Bank

The Development Bank of Rwanda (BRD) was established in 1967 to finance long-term national development priorities and is increasingly focused on financing rural development as a strategy to serve the majority of the population. The energy sector has

been one of the BRD's main investment priorities in the past few years. By funding this sector, it aims to help improve access to electricity and attract foreign direct investment.

We use a comparative approach to explore how BRD is promoting low-carbon resilient development investments through two main channels – normal and joint basket streams. The BRD study illustrates some differences between the two funding streams; the extra technical processes needed for joint stream approval and the more rigid funding timetable mean that incentives and discourses around it do not always align as well as those for the normal stream.

Incentives for private sector actors to get involved are mainly economic, which has shaped the design of the streams. We found therefore that, although both streams contribute to broad national aims of energy security and increasing renewable energy production, neither stream has specific aims to target the poor or leverage co-benefits and therefore any community benefits are indirect or a result of corporate social responsibility activities.

## Case study 2. The National Domestic Biogas Program

The NDBP was established in 2007 to substitute firewood with biogas as a source of cooking energy with the dual aim of protecting the environment and improving health and sanitation. The programme installs biogas digesters in homes to help develop, strengthen and facilitate a commercially viable and market-oriented Rwandan biogas sector. The digesters are part-funded by the government, with households contributing 50 per cent of the cost.

All stakeholders have different incentives for getting involved in the scheme. For the ministries and local government, the incentives to invest in the programme are to meet national biogas policy. For those implementing the project – the private sector companies and financial institutions – it is an economic transaction with financial benefits. The beneficiaries who can access this scheme recognised the benefits to health and agriculture.

The programme has undergone some quite radical changes since its inception, moving from a project-based model under the Ministry of Infrastructure to a decentralised one that operates through districts and local governments. Its targets and objectives are now set through the national planning process with funds for the subsidies earmarked in district budgets. But the choice of financial instruments for householders has remained a mixture of subsidies and loans. As a result, the programme does not target the very poor, who have neither the raw inputs nor the finance to access the scheme.

## Conclusions

Design choices in both programmes are often constrained within particular frameworks and are not necessarily the preferred choice of specific actors. Private energy companies, for example, felt that the terms of the loans did not match their needs, and the extra requirements of the joint basket stream created a barrier to take up. The NDBP's 50:50 subsidy and grant scheme, combined with the requirement for participating households to own two cows, places the scheme out of the reach of a portion of the population.

The incentives to get involved are not always aligned to deliver outcomes on the ground: economic incentives dominate choices and implementation, and it is not clear how these will support low carbon and resilience agendas. With outcomes of financing channels driven

by one primary objective – either economic or political/policy – there is little room for more general low-carbon resilient objectives. To ensure that the benefits of biogas digesters and/or renewable energy reach those who need it most, programmes will need to create incentives around multiple outcomes to prioritise all aspects of low-carbon resilient development. The case studies in this report do not seek to target or include the poorest in low-carbon resilient development, although other programmes in Rwanda do target these populations. This is because both our case studies are driven by a primary incentive – generating renewable energy or meeting national-level biogas targets – and so co-benefits with resilience were left more implicit.

Financing for low-carbon resilient development will be of increasing importance in the next decade. It is important that financing channels support and incentivise action in the area and secure climate-resilient outcomes for communities. Our two case studies show that we need to consider the extra challenges and requirements that come with adding climate change into investment decisions, and how actors can best be supported to meet those new capacity needs. For low-carbon resilient development to be achieved at national level, programmes need to be incentivised to include dimensions of both the economic and political agendas in a more strategic way to ensure that assumed co-benefits and synergies are being realised for vulnerable communities.

# Introduction

Rwanda's National Strategy for Climate Change and Low-Carbon Development sets out its vision of a developed, low-carbon, climate-resilient economy by 2050. This paper explores how Rwanda is channelling finance to support this vision, and the range of political economy dimensions that are helping to shape inclusive low-carbon resilient development outcomes through different channels.



The Government of Rwanda developed its first integrated low-carbon resilient development strategy in 2010/2011. The strategy reflects a significant level of political will to not only mainstream climate change mitigation and adaptation into the national development planning processes but also its commitment to green growth.

The main objective of the Rwanda's National Strategy for Climate Change and Low-Carbon Development (NSCCLCD)<sup>1</sup> is to guide the mainstreaming of the climate change into all sectors of the economy and enable Rwanda to access international funding to achieve low-carbon resilient development.

NSCCLCD's vision is to transform Rwanda into a developed country with a low-carbon and climate-resilient economy by 2050. In order to achieve this objective, Rwanda has adopted following strategic objectives:

- Achieving energy security and a low-carbon energy supply that supports the development of green industry and services and avoids deforestation;
- Achieving sustainable land use and water resource management that results in food security, appropriate urban development and preservation of biodiversity and ecosystem services; and
- Ensuring social protection, improved health and disaster risk reduction that reduces vulnerability to climate change impacts.

Like many Least Developed Countries (LDCs), Rwanda is in the early stages of disbursing climate finance for low-carbon resilient development objectives. However, it has already established a domestic environment and climate change fund (FONERWA) to facilitate the national climate financing plan, attract and streamline climate finance with the national priorities and leveraging private investment for low-carbon initiatives.

Rwanda's policy focus on extending energy access to rural households goes beyond the climate change agenda. Biomass remains the main source of energy in Rwanda: over 86 per cent of the population uses

firewood and agricultural residues as their primary fuel for cooking and 50 per cent of urban households use charcoal (Government of Rwanda 2013a). Rwanda has one of the lowest per-capita electricity consumptions in the world, with households consuming on average 42 kWh/day/capita<sup>2</sup> compared to 478 kWh for sub-Saharan Africa and to an average of 1,200 kWh for the developing countries (Government of Rwanda 2013a).

This paper uses two case studies to explore how Rwanda is channelling finance to support low-carbon resilient objectives:

- the FONERWA climate basket fund and its disbursement mechanism through the national development bank (the BRD/FONERWA case)
- the National Domestic Biogas Programme (NDBP), which uses national planning systems to channel finance down to the local level.

We focus on what we can learn from using different financing channels and intermediaries to support the dual aims of delivering electricity or energy needs to poor communities to improve resilience and moving towards a low-carbon future. Through a political economy analysis, we examine the vertical chain of actors and delivery mechanisms to explore how incentives might be aligned to deliver effective low-carbon resilient development.

The key questions we address are:

- Who are the actors involved in these chains and what instruments and systems have they chosen to channel finance to local communities and projects?
- How do incentives across the landscape enable inclusive investment and achieve delivery of low-carbon resilient development outcomes?
- How does the underlying political economy support or constrain delivery of effective low-carbon resilient objectives on the ground?

<sup>1</sup> The development of the NSCCLCD was a collaborative effort between the government of Rwanda, the University of Oxford's Smith School of Enterprise and Environment, UK DFID-Rwanda and the Climate and Development Knowledge Network (CDKN).

<sup>2</sup> Rural households consume below 30kWh/day on average.

# Analytical framework and methodology

Our two case studies explore different modes of financing. Using data from a review and analysis of policy documents, key stakeholder interviews and focus group discussions, we apply a simple framework of key themes and political economy dimensions to analyse the actors, discourses and incentives and how they align across the landscape.



This study uses the climate finance landscape framework (see Figure 1) to frame the overall context. This framework outlines the sources, financial intermediaries, instruments, planning systems and users involved in mobilising and channelling finance for climate-related investment (in this case, to promote renewable energy). It provides a snapshot of the vertical chain and shows each actor's role in promoting LCRD.

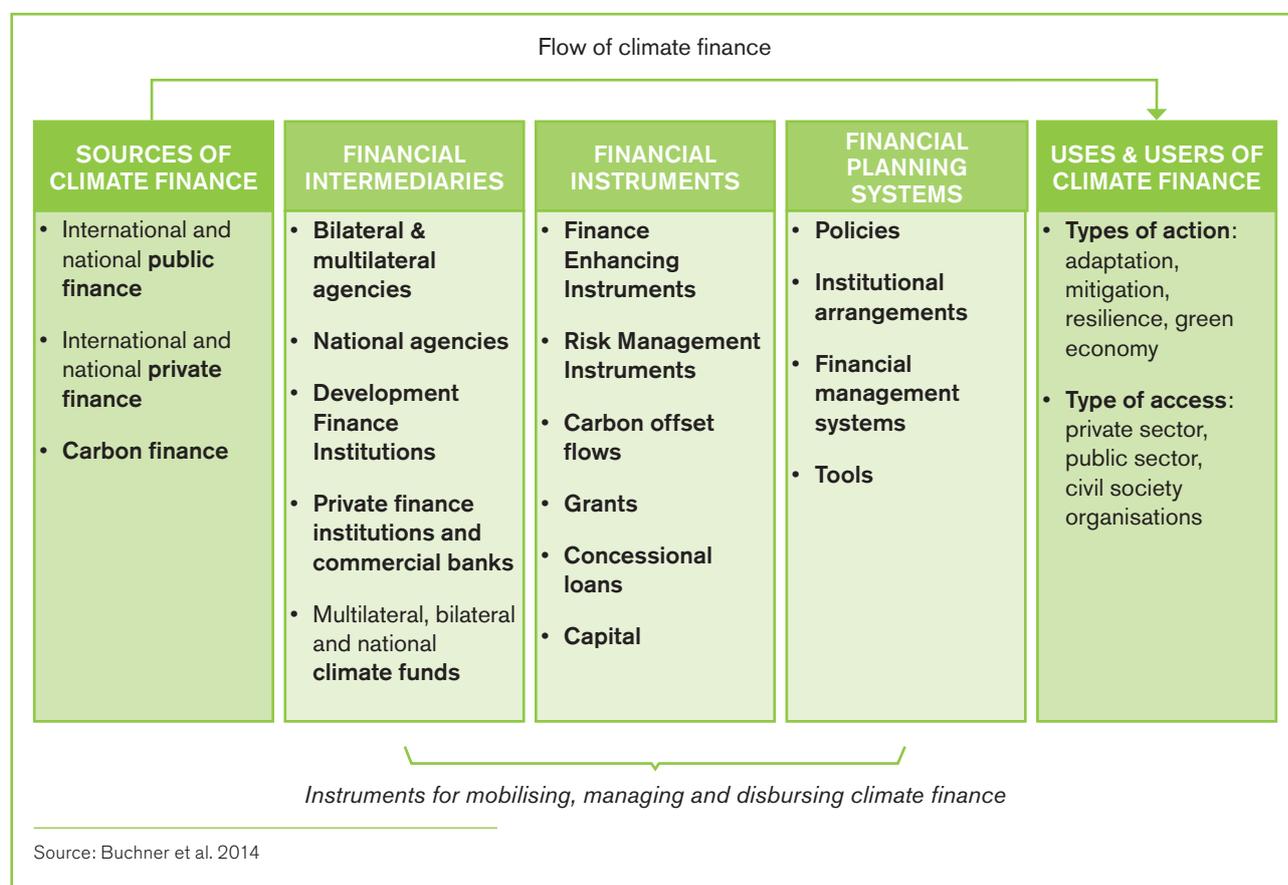
During the scoping phase of this study of the study, researchers carried out a number of interviews with key stakeholders in the sector to understand the climate finance landscape in Rwanda.

As mentioned above, this study also uses a political economy analytical framework to identify actors and the incentives that underpin decisions. Political economy analysis acknowledges that different actors have different understandings, knowledge and values (also known as discourses), and that their actions are influenced by different incentive structures. It is a combination of these three political economy factors – actors, discourses, and incentives – that leads to decisions being made.

For the purpose of this paper, we use a political economy approach to focus on the incentives of groups of actors in achieving low-carbon resilient development. We are particularly interested in the following key dimensions around the political economy of achieving low-carbon resilient development:

- How and why choices are made across the financial landscape. In other words, how the intermediaries, instruments and planning systems are chosen by actors and how their needs are aligned
- The incentives that structure actors decision making
- How the political economy dimensions across the vertical chain of actors supports the effectiveness of achieving low-carbon resilient development objectives on the ground. We define effectiveness in this context as:
  - Targeting the poor;
  - Offering co-benefits that build resilience and reduce emissions;
  - Offering appropriate finance for the poor – long-term, flexible finance at scale
  - Leveraging additional finance, or catalysing additional public and private finance.

Figure 1: Climate finance landscape framework



## 2.1 Case study selection

We explore different modes of financing low carbon resilient development initiatives through two case studies: the Development Bank of Rwanda (BRD/FONERWA case) and the National Domestic Biogas Program (NDBP).

Our first case study-the BRD/FONERWA case, examines two electricity production projects funded by the BRD. We explore how BRD plays an intermediary role in channelling joint FONERWA-BRD funding to private investment projects in the energy sector. This is referred to as the “*Joint Basket Stream*”. We compare this with a “*Normal Stream*” which consists of funding private initiatives in the same sector using ordinary BRD funds (without FONERWA support).

For the joint basket stream, we consider the case of Novel Renewable Energy Ltd (NRE), a registered medium-sized company owned by a Rwandan and an Indian entrepreneur. The NRE was the first private company to benefit from the joint basket fund. For the normal stream, we explore the case of Rwanda Mountain Tea (RMT) investment in construction of mini hydro power plant in Giciye (Nyabihu district, Western Province). RMT is a large company in Rwanda. It owns a number of tea plantations and factories in the Northern and Western Provinces.

Our second case study considers how the National Domestic Biogas Programme (NDBP), is attaining low-carbon resilient development objectives. The NDBP was established in October 2007 following the signing of a memorandum of understanding (MoU) between Rwanda’s Ministry of Infrastructure (MININFRA) and the Netherlands Development Organization (SNV). The NDBP’s main objective is to gradually substitute firewood with biogas for cooking, improving kitchen sanitation and protecting the environment and people’s health.

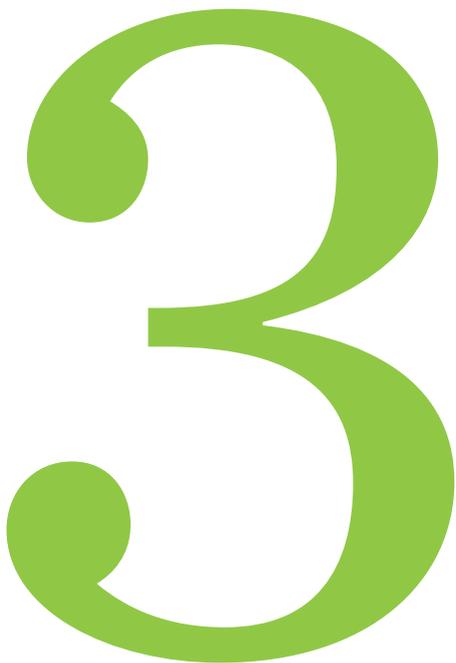
## 2.2 Methodology

We started by reviewing and analysing relevant policy documents and institutional structures. We then conducted 34 interviews with key stakeholders across the vertical chain of delivery, including national policymakers, non-governmental organisations (NGOs), implementing partners, local small and medium-sized enterprises (SMEs), district officials and Rwanda Energy Private Developers Association. We used a semi-structured interview schedule to explore how and why systems were designed, the appropriateness of financing modalities for different actors and their effectiveness (in targeting and co-benefits). We then used a simple coding framework of key themes and political economy dimensions to analyse the actors, discourses and incentives across the vertical chain of actors to assess how they align across the landscape.

We also conducted focus groups discussions with communities to better understand the local-level benefits of such programmes. In the case of RMT, the focus groups targeted community members living around the power plant and therefore with high potential of benefiting from electricity production at limited costs. In the biogas project, discussions targeted people living with domestic biogas beneficiaries, to capture their perceptions of the potential positive effects of biogas on beneficiaries’ livelihoods compared with non-biogas beneficiaries living in the same community. In both case studies, we ensured that both men and women are given opportunities to participate in the focus groups discussions and freely express their ideas.

# Overview of Rwanda's energy sector

Rwanda's Green Growth Strategy calls for the establishment of renewable energy feed-in tariffs and public-private partnerships to encourage private investment. We examine the structure of the energy sector, supply and demand and FONERWA's role in promoting the sector and channelling the finance for energy programmes.



Over the past decade, Rwanda has made significant improvements in transforming its population's socioeconomic outcomes. By implementing the Economic Development Poverty Reduction Strategy (EDPRS), Rwanda's economy has grown at an average rate of 8 per cent a year, which has translated into a significant reduction of poverty by 12 percentage points to 44.9 per cent.

The government recognises the importance of mainstreaming climate change, not only in its specific vision documents such as Vision 2020 and EDPRS2, but also in its sectoral strategies. The government introduced the NSCCLCD to guide the process of mainstreaming climate resilience and low-carbon development into key sectors of the economy.

Vision 2050 aims to transform Rwanda into a country with a strong service sector, low unemployment and low levels of poverty. This strategy also envisages that agriculture and industry will have a minimal negative impact on the environment, operating sustainably and enabling Rwanda to be self-sufficient around basic necessities. The government envisages that by 2050, Rwanda will have achieved development through low-carbon domestic energy resources and practices, reducing the country's contribution to climate change and removing its dependence on imported oil for power generation. Vision 2050 also aims to ensure that Rwanda has the robust local and regional knowledge to be able to respond and adapt to changes in climate and its resulting impacts, supporting other African countries as a regional service hub to do the same (Government of Rwanda 2011).

Vision 2050 is constrained by two major challenges: human capital and access to finance (Government of Rwanda 2011). But Rwanda recognises the existence of many sources of finance and a climate finance opportunities it can use to implement the strategy. FONERWA was established as a centrepiece of Rwanda's climate financing plan, to attract and streamline climate finance with the Green Growth Strategy, and leverage private investment for low carbon initiatives. The operationalisation of FONERWA is intended as one of the strategic quick wins to facilitate access to international climate finance, especially Fast-start Finance for adaptation. There needs to be both capacity and finance to start channelling climate finance into implementation planning.

Under the fifth programme of the Green Growth Strategy – the Low Carbon Energy Mix Powering the National Grid – there is a call for the establishment of renewable energy feed-in tariffs and public-private partnerships to encourage private investment. Sustainable small-scale energy installation, is proposed by the government, especially in rural areas, as an important strategy to promote access to electricity and reduce dependence on wood fuel. Rwanda intends

to use part of its public funds to serve as guarantee for investment in electricity generation projects and introduce terms that will attract private investment in the energy sector (Government of Rwanda 2013a).

### 3.1 Structure of Rwanda's energy sector

This section briefly describes the role and responsibilities of different stakeholders involved in the energy sector, some operate at policy and regulatory level, others operate at regulatory, implementation or investment levels.

A number of ministries and government agencies play important roles in the energy sector:

- MININFRA has primary responsibility for setting overall policies and strategies, coordinating the development of the electricity sub-sector and granting both concessions and Memorandum of Understanding (MoUs). It is the lead ministry responsible for developing renewable energy (methane, peat, geothermal, solar and wind energy). The Rwanda Energy Group, the MININFRA's implementing company provides both technical assessment and power purchase agreements.
- The Ministry of Local Government (MINALOC) and local government structures (in collaboration with the Rwanda Energy Group) are expected to play an important role in extending the power grid and promoting off-grid technologies, especially in remote rural areas.
- The Ministry of Natural Resources (MINIRENA), MININFRA and the Ministry of Agriculture and Animal Resources (MINAGRI) are largely responsible for biomass – wood fuel, charcoal, briquettes and producing energy from solid waste landfills –in coordination with MINALOC and local government structures. (African Development Bank Group 2013).
- The Rwanda Environment Management Authority (REMA), under the guidance of MINIRENA, is responsible for coordinating and implementing legislation and policies relating to the environmental impacts of energy production and consumption.
- The Rwanda development Board (RDB) is involved in the energy investment process. This implies that RDB provides facilitation and guidance and lead negotiations for strategic projects with private sector and foreign direct investment in the sector. RDB is also in charge of issuing the environmental impact assessment clearance as well as providing incentives.
- The Rwanda Utility Regulatory Authority is responsible for setting tariffs, regulate the sector and providing licenses to investors willing to operate in the sector.

International donor organisations provide technical and financial resources to support the implementation of the government's energy strategy. The Sector-Wide Approach is the basis of the partnership between the government and its development partners to ensure coordination, efficiency and effectiveness in the use of resources in the Rwandan energy sector.

The donor coordination mechanism is guided by the Division of Labour as agreed by the government and its development partners. This identifies the following multilateral and bilateral donors as Rwanda's main partners in the energy sector: the World Bank, the African Development Bank, the Arab Bank for Economic Development in Africa, the United Nations Industrial Development Organization, Cooperation Technique Belgium, the Governments of Netherlands and France, the Japan International Cooperation Agency and Société Tunisienne de l'Electricité et du Gaz (African Development Bank Group, 2013).

Rwanda's energy policy and strategy (2011) recognises the strong need for the private sector investment in the energy sector, and welcomes private sector participation in energy projects or public-private partnerships. It designates MININFRA as the main facilitator of private sector participation, responsible for providing transaction support and coordination among stakeholders. MININFRA works closely with other relevant government agencies including the Rwanda Revenue Authority and the Rwanda Development Board (RDB)'s Public-Private Partnerships Unit.

## 3.2 Energy demand and supply

The government of Rwanda sees the electricity sector as a critical factor in enabling socioeconomic development, and the main vehicle for energy diversification. It aims to achieve 70 per cent access to electricity by 2017, from 19 per cent observed in the 2012 census, and has a plan to increase electricity generation capacity from 100 MW in 2012 to 1,160 MW by 2017 (NISR, 2012, AfDB Group, 2013).

It is envisaged that installed capacity in 2017 would comprise of: 340 MW of hydropower, 310 MW of geothermal power, 300 MW of methane-based power, 200 MW of peat-based power and 20 MW of diesel thermal plants. The estimated investment cost is at least US\$500 million a year. About US\$200 million a year would come from the public sector and US\$300 million from the private sector (AfDB Group, 2013).

In order to achieve the above objective, the government envisages two main scenarios: the accelerated scenario and the delayed scenario. The former would need an estimated total investment of US\$4.4 billion between 2013–17, or an annual investment of US\$845 million. The latter requires an estimated investment of US\$2.5 billion for 2013–2017, or an annual investment of US\$510 million, which would then continue at the rate of \$550 million/year (AfDB, Group 2013). Potential sources of finance for this expansion include: electricity

Table 1. Roadmap for the development of physical infrastructure

YEAR	INVESTMENT REQUIREMENTS, BY SUB-SECTOR (US\$ MILLION)				INVESTMENT REQUIREMENTS, BY SECTOR TYPE (US\$ MILLION)		
	Generation	Transmission	Distribution	Total	Public Sector	Private sector	Total
2013	200	35	150	385	200	185	325
2014	250	35	150	435	200	235	480
2015	300	30	150	480	200	280	570
2016	350	20	200	570	240	330	679
2017	449	30	200	679	260	419	2,549
Total 2013–17	1,549	150	850	2,549	1,100	1,449	2,549
Total 2018–2025	2,796	250	1,400	4,946	1,946	2,500	4,446

Source: AfDB Group (2013)

tariffs, the internal resources of the electricity, Rwanda Energy Group<sup>3</sup>, government budgets, development partners and the private sector.

### 3.3 FONERWA's role in promoting the energy sector

FONERWA was established in 2013 as a vehicle to channel, programme, disburse and monitor environment and climate change finance in Rwanda. As a national basket fund, FONERWA is an instrument to facilitate direct access to international environment and climate finance while streamlining and rationalise external LCRD related aid and domestic finance.

Rwanda's motivation behind the establishment of FONERWA is to address the Rwanda's current and future needs for environment and climate change-related financing to support and accelerate the national development agenda for the sustainable development. The overarching objective of FONERWA is to contribute to sustainable wealth creation and poverty reduction through sustainable natural resource management and climate-resilient, green economic growth (Government of Rwanda, 2012b). The main intended outcome is to sustainably and equitably finance and strengthen national programmes and private sector initiatives in areas of environment and climate change.

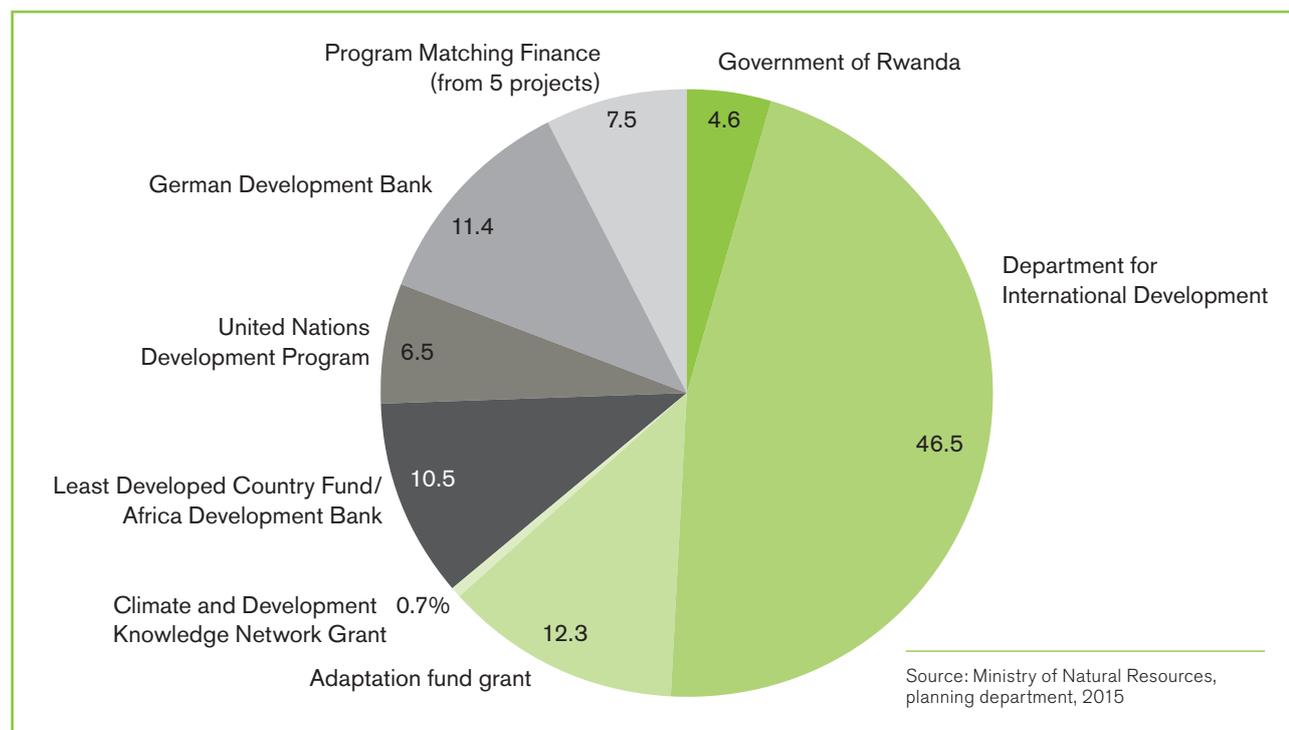
FONERWA's multiple funders include bilateral partners, UN agencies and the national government. Figure 2 below shows that the UK's Department for International Development (DFID) is the main contributor to FONERWA, with 46.5 per cent of all funds, followed by the Adaptation Fund grant, with 12.3 per cent. The government of Rwanda's contribution is limited to about 5 per cent.

Interventions under FONERWA framework are structured around four main thematic financing windows<sup>4</sup>:

- Conservation and sustainable natural resource management;
- Research and development, technology transfer and implementation;
- Environment and climate change mainstreaming; and
- Environmental impact assessment monitoring and enforcement.

FONERWA funding is open an accessible to ministries, government agencies, districts, civil society organisations, academic and research institutions and the private sector, as long as the proposed activities comply with its eligibility criteria. At its inception, FONERWA intended to earmark at least 20 per cent of its total resources to the private sector and 10 per cent to districts.

Figure 2. FONERWA funding sources, 2015



<sup>3</sup> A government-owned company, established by Prime Ministerial order N° 87/03 of 16/08/2014 to succeed the Energy, Water and Sanitation Authority (EWASA).

<sup>4</sup> FONERWA Final report, July 2012

The proposed types of instruments to be used under the FONERWA vary with its implementation phases. In the short-term (one year at most) FONERWA proposes two primary financial instruments: in-kind support for proposal development and grants. In-kind support includes mostly technical assistance for proposal development while the grants are offered to cover 100 per cent of a project's cost to public and private beneficiaries, unless they are offered on co-financing or top-up terms (Government of Rwanda, 2012b). In the middle term (2–5 years), the main instrument is low interest and/or concessional loans though the development Bank of Rwanda-the proposed custodian of the 20 per cent share of FONERWA funds allocated to the private sector (Government of Rwanda, 2012b). In the long term (over 5 years), various financial instruments such as investment and equity finance are expected to be explored.

# The Development Bank of Rwanda

This case study uses a comparative approach to explore how the Development Bank of Rwanda promotes low-carbon resilient development investments through two main channels – normal and joint basket streams. We assess the main incentives for stakeholders to get involved in different projects and whether financing private investments in the energy sector is benefiting poor communities.



The BRD was established in 1967 and is mandated to finance long-term national development priorities such as those reflected in the national development priorities (vision 2020 and EDPRS2). BRD is increasingly focused on financing rural development as a strategy to serve the majority of the population.

The energy sector is one of the main investment priorities the bank has been exploring in the past few years. By funding this sector, BRD intends to help improve access to electricity and attract foreign direct investment.

The government and its agencies own up to 77 per cent of the BRD total shares. Private investors – Belgium’s Administration Générale de la Coopération au Développement, the German Investment Cooperation DEG, Agence Française, Bank of Tokyo, I&M Bank, the Bank of Kigali and FONERWA – own 23 per cent of total shares.

Like all financial institutions in Rwanda, the BRD is regulated by the National Bank of Rwanda (BNR), the regulatory and supervisory authority for banking and microfinance, non-banking financial institutions (including insurance and pension schemes) and the payment system. As the BRD’s main shareholder, the government appoints its Chief Executive Officer. The BRD funds a range of financial products, including loans, leasing, equity, mortgage, guarantee funds and trade financing.<sup>5</sup>

Financing private sector investment in low-carbon and climate resilient initiatives is still new in Rwanda. BRD started financing the sector in 2012, using the energy sector as an attempt to increase the domestic capacity to meet the national energy demand.

We use a comparative approach to understanding how BRD is promoting low-carbon resilient development investments through two main channels – normal and joint basket streams – and how financing these private investments in the energy sector is benefiting poor communities. The findings from our analysis are briefly presented below.

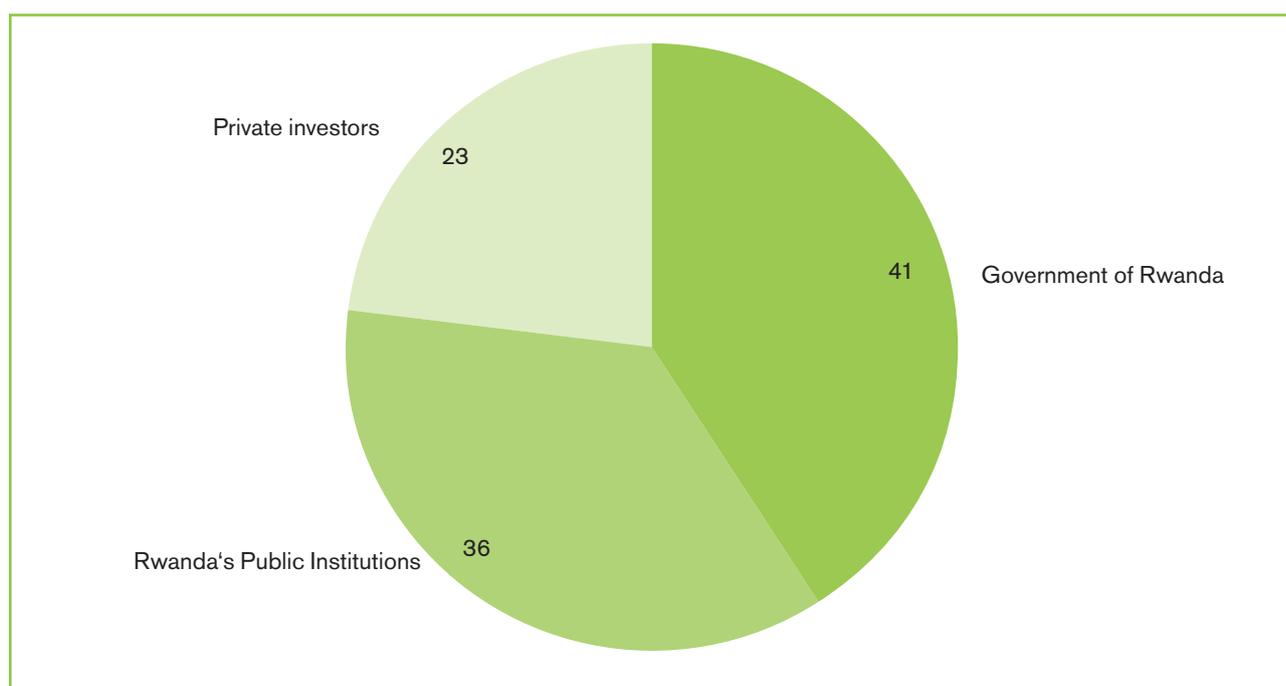
## 4.1 Design choices

There have been a number of design choices for the BRD/FONERWA joint stream and the normal stream. The details of the two streams and are below.

**Normal stream:** This stream is funded by BRD and all applications for funding under this stream, regardless of the sector of investment, are assessed on profitability of the submitted business plans (there is no specific sector investment preferential treatment in this case). This implies that all loans under this stream are granted at applicable market interest rate after a thorough risk profitability assessment.

**Joint basket stream:** This stream is co-funded by the BRD and FONERWA. This funding window was agreed at the inception of FONERWA as a key medium-term instrument that will be active for two-to-five years. The

Figure 3. BRD shareholders (%)



<sup>5</sup> At the time of interview, there were ongoing discussions in the government around establishing mechanisms to move the student financing scheme from the Rwanda Education Board to the BRD.

FONERWA Fund Management Team identified the bank as the most suitable financial institution with which to offer such instruments, given its comparative advantage over other commercial banks in managing government funds that target the private sector (Government of Rwanda, 2012b).

A key design choice has been the use of the BRD by FONERWA in the “joint basket stream” and the choice of a below market rate loan. Design choices have been made around about how to select (and therefore prioritise) projects.

### Selection criteria

The BRD alone assesses applications for the normal stream, whereas those for the joint basket fund undergo a two-stage evaluation, with proposals initially submitted to FONERWA, for a technical assessment. At this stage of the evaluation, the focus is on assessing the investment proposals against the following eligibility criteria<sup>6</sup>:

- The project matches one of the FONERWA thematic windows (conservation and sustainable management of natural resources, R&D and technology transfer and implementation, or environmental and climate change mainstreaming);

- Sustainability: Benefits (social, environmental, economic) from the project will be sustained after the lifetime of project activities;
- The project offers good value for money and activities are carefully designed to deliver results;
- Stakeholders, particularly local communities, have been consulted and there is a plan in place to communicate and consult with stakeholders throughout the lifetime of the project;
- The project can be linked with international, national and local strategies related to climate change and environmental management. If appropriate, the project builds on existing activities;
- The project conforms to existing legislation. In particular, there is no involvement or complicity in corruption

Projects that pass this first stage are then submitted to BRD for financial assessment.

Table 2. Project selection criteria

	PROJECT SELECTION CRITERIA	PROJECT ASSESSOR	FREQUENCY OF ACCESSIBILITY
Normal stream	Feasibility study, business plan, availability of site (district and BRD approval licences), purchasing power agreement (PPA), MoU with MININFRA, government responsibility to facilitate the project (eg. if the land affected belongs to the government or to citizens, whether it involves expropriation of proprieties) MINIFRA concessional hydro licence, collateral, insurance.	BRD	Year-round
Joint basket stream	Technical assessment: experience of project implementers, additionality of the project (existing initiative to make it more successful), value for money, alignment with national development priorities for environment and climate change.	FONERWA	Twice a year only (January and June)
	Feasibility study, business plan, availability of site (district and BRD approval licences) PPA, MoU with MININFRA, government responsibility to facilitate the project (eg. if the land affected belongs to the government or to citizens, whether it involves expropriation of proprieties), MINIFRA concessional hydro licence, collateral, insurance.	BRD	

Source: Interview with BRD and Fonerwa

<sup>6</sup> Fonerwa design project document, June 2012

## Choices of actors

**Normal stream funding:** Private sector investment in renewable energy is still new in Rwanda. The first normal stream-funded renewable energy project was Giciye I, a 4 MW mini hydropower plant initiated by RMT in Nyabihu District (Western Province). Giciye I received RWF 1.5 billion from the BRD trade facility to import plant machinery from Germany. The project, now in its second implementation phase (Giciye II), has received a BRD normal stream loan of RWF 8 billion to invest in producing an extra 4 MW.

**Joint basket stream funding:** FONERWA and BRD established this stream in June 2014 to facilitate private investment in low-carbon resilient development initiatives. Funds are accessible at a relatively low (below market rate) interest rate. At the time of the research, only two projects had been funded through this stream, both implemented by NRE:

- US\$1.6 million to a mini hydropower plant in Gakenke District (Northern Province) that should produce 500 kWh
- US\$270,000 to a biomass project that aims to produce 70–100 kWh from rice husks in the Eastern Province.

At its inception, FONERWA intended to allocate 20 per cent of its total resources to the private sector and 10 per cent to the districts, to sustainably and equitably finance national programmes and private sector initiatives that address climate and environment priorities. Co-funding of the private sector initiatives was intended to reach about US\$20 million between 2012 and 2017 (Government of Rwanda, 2012b).

## 4.2 Incentives and effectiveness of design choices

In this section, we present an analysis of the incentives behind BRD modalities to understand the factors that have led to specific funding choices and how effective these choices are in promoting private investment in Rwanda's energy sector and achieving low-carbon resilient development objectives on the ground.

A range of incentives and benefits need to align to support the effective delivery of low-carbon resilient development objectives, including policy, economic and knowledge incentives and reputational and socioeconomic benefits. We start by looking at incentives to invest in renewable energy in general and then consider the specific incentives behind the development bank's design choices.

### Incentives to invest in renewable energy

Table 4 summarises the main drivers for investment in renewable energy in Rwanda, based on stakeholder interviews.

For policymakers (ministries and government agencies) and policy implementers (BRD and FONERWA), investment in the renewable energy sector is driven by two main factors: policy and an overarching vision for sustainable socioeconomic transformation.

At policy level, investment decisions are underpinned by the EDPRS2's Priority 5 on green growth and innovation. According to EDPRS2, Rwanda intends to connect 70 per cent of its population to electricity by 2018 (from 19 per cent in 2012). Joint public and private sector efforts will be important to achieve this challenging objective.

Table 3. Sources of funds for RMT and NRE projects

PRIVATE INVESTOR		SOURCE OF FUNDS	AMOUNT (US\$) <sup>7</sup>
RMT	Giciye I	BRD normal stream	2.1 million
	Giciye 2	BRD normal stream	11.3 million
NRE		Joint basket fund	1.6 million
		Own funds	1.2 million

Source: Interviews with the RMT and NRE

<sup>7</sup> Exchange rate of October 2015

Policymakers and implementers also argued that the decision to invest in the energy sector is motivated by the national vision for sustainable socioeconomic transformation, as reflected in the NSCCLCD. Rwanda's vision is to be a developed country with a strong services sector, low unemployment and low poverty levels by 2050 (Government of Rwanda 2011). Other motives, such as building the private sector's capacity to invest in low-carbon resilient development

initiatives and maintaining a good reputation, are also key incentives to invest in the energy sector.

A number of overarching incentives explain the increasing interest among private sector stakeholders to invest in the energy sector. Some are linked to the rising national demand for electricity while others are driven by the government incentives such as feed-in tariffs and the tax-exempt 20-year PPA for investors.

Table 4. Incentives for investing in the energy sector, by stakeholder

STAKEHOLDER	INCENTIVE TO INVEST	DESCRIPTION
<b>Policymakers:</b> MININFRA REMA	Policy	Driven by government aspirations to bring electricity to 70 per cent of Rwandans by the end of EDPRS2 (2017/18).
	Sustainable development	Energy is key in the process of transforming Rwanda into a middle-income country (Vision 2020): agro-processing, value addition, employment, attracting foreign direct investment.  Intended development must satisfy the needs of present and future generations.
	Capacity building and knowledge	Through FONERWA, the government intends to build the private sector's capacity to invest in low-carbon resilient development initiatives through long-term concessional loans and grants.
BRD	Policy	National development agenda that prioritises the energy sector: EDPRS2, Vision 2020, 7 years government programme.
	Reputation	Only financial institution in Rwanda with the experience and capacity to manage government and donors funds with complex financial instruments.
FONERWA	Policy	Achieving green growth.
	Socio-economic development	Production of energy that protects the environment and promotes resilience
RMT	Economic	High demand for (clean) energy due to national energy shortage.
	Socio-economic	Investing in sustainable development through energy that protects the environment as provided for in the National Green Growth Strategy.
	Strategic	Producing electricity to be used in its own tea plants.
NRE	Economic	Rwanda Utility Regulatory Authority renewable energy feed-in tariff available to independent power producers at US\$20/kW  PPA for 20 years (contract with the government of Rwanda).
	Profit	Relatively low interest rate and high market demand.
Rwanda Energy Private Developers Association <sup>8</sup>	Economic	Subsidies play a very important role in attracting private investment in the energy sector (importing materials and other facilities such as loan and grant facilities in FONERWA).  Feed-in tariffs: US \$0.18/KW for solar and US\$0.8/KW for peat

<sup>8</sup> The Rwanda Energy Private Developers' Association is part of the Chamber of Industry, under the umbrella of the Rwanda Private Sector Federation (PSF). The association groups all Rwanda's energy developers and energy-connected service professionals, focusing on advocacy of its members, encouraging good collaboration and partnership among members and attracting foreign companies and investors to work with local companies.

## Actors and incentives behind the design choices

The selection of BRD as a channel for FONERWA basket funds was motivated by the fact that BRD has considerable experience working with the private sector and managing and funding big, long-term projects that are beyond the capacity of most local commercial banks.<sup>9</sup> BRD's relatively attractive interest rates of 15–16 per cent (compared to 18–19 per cent offered by other commercial banks) also placed it in a better position.

The joint basket stream only accepts applications twice a year, in January and June. Applicants for this stream need to undergo a technical appraisal by FONERWA technical team and a separate financial profitability assessment by the BRD team. The normal stream is open year-round and loan applications under this stream only need to undergo one appraisal—the financial profitability assessment by BRD. Joint basket stream applications therefore take longer to assess and offer less flexibility to applicants. Respondents indicated that this was extremely long and sometime disappointing with limited feedback. Because the private sector actors' choice of stream is guided by the availability and flexibility of the application process, most of the stakeholders we interviewed preferred the normal stream, for being more flexible, open year-round, having less demanding requirements and offering larger sums.

Private investors indicated that reducing the length of the process for accessing the joint basket fund would attract more private investors in the sector. They suggested a single evaluation body, composed of FONERWA and BRD representatives to help speed up the evaluation process. They also suggested that opening up applications year-around for the joint basket stream would make the funds more accessible to a big number of private investors.

Both streams use long-term loans as the main instrument for disbursing funds to the private sector. There are two main reasons for this choice of instrument:

- Part of the normal stream funds used by BRD to fund private investment is from concessional loans from multilateral institutions such as African Development Bank and European Union<sup>10</sup> and cannot therefore provide grants to the private sector.
- FONERWA and BRD intend to make the joint basket fund a revolving fund that will keep running and financing itself in the future. They envisage channelling funds to the private sector in the form of repayable loans as a sustainable strategy to meet the increasing

demand for private sector financing in environment and climate change. These are economic and policy incentives to use long-term loans.

Table 5 looks at the incentives behind the choices of financial instruments. It is clear that the availability of low-interest loans and levels of bureaucracy are both important factors.

For RMT, there was only one option available due to the limited diversification of funding sources and products. Investors in the energy sector have to use what is available.

Respondents expressed other reasons for choosing the instruments, including direct disbursement without intermediaries, being open to national and international actors (provided that the investment is in Rwanda and in line with national priorities) and the 10-year repayment period, which most actors found attractive.

The actors we interviewed were content to use loans but would have preferred grants. The biggest issue was the interest rate, which they perceived to be very high for these types of investment. Most respondents would have preferred to use more of these funding opportunities, but with a low interest rate. They suggested that a rate of 5 to 8 per cent would be affordable for these types of projects.

Discussions around the sustainability of design choices included the need to create revolving funds, loan affordability and availability and the transformative nature of investments for the low-carbon resilient development agenda. NRE's use of the joint basket stream was a result of economic incentives around the lower rate and having enough capacity and flexibility to work through this stream. For RMT, the scale of funds was not enough. RMT and other private sector stakeholders also highlighted the lack of detailed knowledge about the joint basket stream that hamper uptake of this new stream.

The BRD and FONERWA both have more policy incentives to work through the joint basket stream: the latter because this is one of their core aims and part of their mandate; the former because it has policy aims to meet as part of its mandate. Interestingly, only FONERWA highlighted the transformative agenda as being important. This suggests that incentives for low-carbon resilient development as a joint agenda are still quite weak.

Donors' support to the energy sector is mainly driven by the EDPRS2 priorities and the division of labour as defined by the Ministry of Finance and economic planning. The main objectives of donor division of labour in Rwanda are: reducing transaction costs for the

<sup>9</sup> Personal interview with FONERWA and BRD staff, March 2015

<sup>10</sup> BRD is not a government budget line and therefore is not included in the government's annual budget.

Table 5. Key actors and their choice of financial instruments

STAKEHOLDERS	INSTRUMENT USED/ ACCESSED	REASONS FOR CHOICE OF INSTRUMENT	INTEREST RATE APPLIED (%)	INTERMEDIARIES
<b>Normal stream</b>				
BRD	Loans to private sector companies presenting a technically sound and financially profitable project.	BRD is a profit-making bank that acquires part of its funds from concessional loans. It cannot use such funds to provide grants.	15	Funds accessed directly
RMT	Long-term loan (10-year repayment period).	This is the only choice available on the market (commercial banks are reluctant to fund big energy projects).	15	Funds accessed directly
<b>Joint basket stream</b>				
BRD	Long-term (10-year) loan leading to revolving funds.	The main objective is to make it a revolving fund that can sustain itself in the future, building internal capacity to invest in large project.	11.45	Funds accessed directly
NRE	Long-term (10-year) loan below market rate.	Targeted funding options with low costs.	11.45	Funds accessed directly
FONERWA	Revolving fund	Guided by the FONERWA design document, increase the number of people in the sector, raise awareness, build internal capacity to invest in large project, expected transformative impact.	2*	Fund accessed directly through BRD
<b>General energy sector</b>				
Energy Private Developers' Association	Long-term loan	There is no problem using loans – the issue is the high interest rate charged	15 (normal stream) and 11.45 (joint basket stream)	Funds accessed directly

\*Interest rate between FONERWA and BRD

government through more streamlined donor relations; reducing missions; improving coordinated policy dialogue; continuing to improve fund management and reporting while reducing multiple requirements; improving the quality of programme management; and reducing the risk of duplicating efforts (Government of Rwanda, 2013b).

### Effectiveness of choice: appropriate finance

Through the normal stream, the BRD offers large-scale finance to support renewable energy investments for productive use, at a relatively low interest rate and on flexible terms. Our analysis suggests that the normal stream is therefore appropriate for many users. Despite

considerable efforts to diversify the sources of low-carbon resilient development funding in the past couple of years, stakeholders in Rwanda have expressed a number of financial and market development needs that need to be catered for in the country's transformation process. These are summarised in the Table 6.

Table 7 summarises the challenges in investing in low-carbon resilient development through both streams. For example, the joint basket stream requires a high level of management skills and capacity for proposal writing and monitoring and evaluation that are not strong in the domestic private sector. Private sector actors would like more support for scoping investments in the early phases of an investment.

Table 6. Effectiveness of appropriate finance, by stakeholder

STAKEHOLDER GROUP	FINANCIAL NEEDS	DEVELOPMENT NEEDS
<p>Finance providers: BRD FONERWA</p>	<p>Grants: BRD does not channel any grant schemes to support private investments in renewable energy.</p> <p>Concessional loans: Implemented through the joint basket stream, they are at a very initial stage and can only fund a few small projects. There is need to strengthen this component to respond to increasing private sector demand. This requires exploring all the available low-cost funding opportunities, including international ones.</p>	<p>Building private investors' capacity to design and implement renewable energy projects.</p> <p>Revolving fund.</p> <p>Raising awareness among the private sector to exploit all available funding options (domestic and international).</p> <p>Incentives and de-risking measures to promote private investment in renewable energy.</p> <p>Establishing clear links with the national development agenda for green growth.</p> <p>Harmonising the selection criteria between the two available streams.</p>
<p>Private sector stakeholders: NRE RMT Energy Private Developers' Association</p>	<p>Long-term concessional loans: Private actors think the applied interest rate is high and suggest that 5–8% would be reasonable.</p> <p>Grants: Not available under the joint basket fund. FONERWA offers a grant component as co-financing or to top up a given proportion of the total project cost, with the project promoter providing the remaining funding.</p> <p>Subsidy: Private actors suggested the introduction of grace period to cover a period of six months to one year, until production is effective. They also suggested that taxes could be removed or reduced as an incentive.</p>	<p>Building capacity or technical skills to design and run renewable energy projects.</p> <p>Raising awareness among the private sector to exploit all available funding options (domestic and international).</p> <p>Access to an equipment subsidy.</p> <p>Incentivise commercial banks to engage in the renewable energy sector</p>

Table 7. The challenges of investing in low-carbon resilient development, by stakeholder

ACTORS	CHALLENGES REPORTED
FONERWA	<p>Proposal writing remains an issue for many in the private sector.</p> <p>FONERWA requests many details that most applicants fail to comply with – logframe, value for money, timeframe, innovation – this takes longer than expected from the private sector.</p> <p>The sector federation needs to play a key role in sensitising its members to invest in low-carbon resilient projects.</p>
RMT	<p>Investing in energy requires huge capital, most of which is invested in feasibility studies before submitting a proposal to the bank. No single bank funds this part of the project.</p> <p>Local technical skills are limited.</p>
NRE	<p>Investment in renewable energy requires big funds and BRD is the only bank willing to fund such projects. Commercial banks cannot fund this type of project due to the high investments required. If they were willing, they would charge around 20% interest rate, making it prohibitively expensive.</p> <p>Expropriation is very costly and time consuming (it took them about seven months to get land).</p> <p>High interest rates – although they are below the market rate, bank charges are high and this affects the overall amount to be paid.</p>
Energy Private Developers' Association	<p>Limited knowledge and skills to access available funding opportunities.</p> <p>Building confidence of the local private sector to help attract foreign direct investment.</p> <p>Increasing access to finance and information would help.</p> <p>Interest rates are still very high (they should not exceed 5%).</p>

## Effectiveness of choice: community benefits

Private sector investment in the energy sector has been driven by business motives and economic incentives. However, a question remains whether private investment in renewable energy is targeting and bringing benefits to poor communities. Interviews with stakeholders at national and local levels have confirmed that poor communities are expected to indirectly benefit from a range of opportunities offered through private investments in renewable energy – for example, the creation of off-farm income generating activities and the corporate social responsibilities (mutual health insurance to community member, building schools or health centres for communities).

RMT employed 2,000 people a day (mainly women) in the construction of their mini hydropower plant. According to the local leaders we interviewed, RMT has provided thousands of short-term jobs to people in the district, which has helped many households meet

their children's education and health needs. Corporate social responsibility (CSR) activities also offer benefits to poor communities, including small funds to support education and paying mutual health insurance for the very poor.

## 4.3 Case study summary

As highlighted in the analysis of this case study, the choices of different stakeholders are driven by different incentives and these vary based on whether they are policy makers, policy implementers, private investors or financial institutions. At the policy level, the common finding is that choices are mainly driven by the national development agenda reflected in the Rwanda's vision 2020 and in other documents such as EDPRS2 and the 7- year government programme. In this particular case, the priority 5 of the EDPRS2 on green growth and innovation provides attractive incentives to the private sector to take the lead inclusive green growth, including investing in the energy sector, through instruments such as feed-in tariffs and subsidies.

Table 8. Dimensions of effectiveness at community level

STAKEHOLDER GROUP	TARGETING THE POOR	CO-BENEFITS
Finance sources: BRD FONERWA	No deliberate targeting of the poor in selection criteria.	Expected indirect benefits (eg short-term employment, corporate social responsibility)
Local leaders in Nyabihu and Gakenke Districts	Private investment is driven by business motives and does not specifically target the poor.	Access to electricity, it is expected to: <ul style="list-style-type: none"> <li>• create off-farm income-generating activities for young people</li> <li>• increase district taxes</li> <li>• improve education (children will be able to study at night).</li> </ul>
Private investors: RMT NRE	Poor to communities to benefit indirectly. CSR: community education and health improvement initiatives.	Aimed at social outcomes, not low carbon.
Communities in normal stream project areas	CSR for education and mutual health insurance for very poor.	Women in particular to benefit from employment.  Communities in general to benefit from increased access to education and healthcare.
Community in joint basket stream project areas	CSR	Building community resilience to poverty through employment creation.

The BRD/FONERWA case study highlights some differences between the two funding streams, and shows that incentives around the joint basket stream are not the same as those for the normal stream. The study has shown that in both streams, private investors are mainly driven by economic incentives offered by the Government of Rwanda. These include for instance, the purchasing power agreements and tax related incentives for importing plant equipment. Other similarities between the two streams include the use of long term loans as main instrument for channelling funds to the private sector. In terms of targeting, the findings show that poor communities are not targeted as primary beneficiaries of the private investment under the two streams. Poor communities mainly benefit from short-term jobs creation and are expected to benefit from corporate social responsibility.

The differences between the two streams are the extra technical processes needed for approval and the more rigid funding timetable observed for the case of joint basket stream. This is coupled with a low interest rate that acts as an economic incentive for some to use this channel over the normal channel.

The findings also show that although the two streams contribute to broad national aims of energy security and increasing renewable energy production, there is no strong link with resilience objectives and securing co-benefits through the design and implementation of the projects.

# The National Domestic Biogas Programme

This case study explores the National Domestic Biogas Programme, which aims to substitute firewood with biogas as a source of cooking energy. We examine the NDBP's new decentralised structure, the programme's eligibility criteria and its choice of financial instruments and partners to assess the main incentives for all stakeholders and who is benefiting from the programme.



Over 85 per cent of Rwanda's primary cooking energy comes from biomass (Government of Rwanda, 2013a). Cooking efficiency is therefore low particularly in rural areas due mainly to lack of adequate technology.

The NDBP was established in October 2007 by MININFRA in partnership with SNV, to substitute firewood with biogas as a source of cooking energy, protecting the environment and improving health and sanitation. Specifically, the NDBP aimed to<sup>11</sup>:

- develop, strengthen and facilitate a commercially viable and market-oriented Rwandan biogas sector;
- increase the number of households that can access quality biogas;
- ensure the continued operation of all plants installed under the programme; and
- maximise the benefits of the installed digesters, in particular through the optimum use of effluent.

At its inception, the programme proposed installing 15,000 domestic biogas digesters by 2011 at an estimated budget of US\$14.9 million (SNV, 2008). But by the beginning of 2015, less than one-third of these had been installed.

The programme was funded by SNV through the German Development Cooperation GTZ's Energising for Development project. In the pilot phase (2008–2011) the Rwandan government and SNV agreed to respectively subsidise 25 and 75 per cent of the RWF 300,000 (about US\$ 450) given to beneficiaries towards the cost of a digester. Since 2012, NDBP has been fully funded by the government.

Along with installing biogas digesters, the programme also seeks to<sup>12</sup>:

- raise public awareness;
- train contractors, masons, plumbers (in partnership with Rwanda's technical colleges) and beneficiaries/users;
- ensure quality control of constructed biogas digesters;
- collaborate with local financial institutions to ensure beneficiaries get funds; and
- monitor the implementation of all the planned activities.

## 5.1 Design choices

There have been a number of design choices around this programme around how finance is channelled to fund the biogas digesters and how households are targeted.

### Decentralisation

In 2015, NDBP management was decentralised into national systems and moved from MININFRA<sup>13</sup> to MINALOC, specifically to the districts. Funds allocated to the project are now earmarked in district budgets, with the MININFRA and the Rwanda Energy Group remaining with provision of technical support and overseeing programme implementation. Under this decentralised NDBP management, districts are responsible for mobilising beneficiaries, managing government subsidies in collaboration with the BPR and SACCOs and ensuring that national biogas targets are on track.

A SACCO is a voluntary, autonomous association of people striving to meet their common economic, social and cultural needs and aspirations through a jointly owned and democratically controlled enterprise (Rwanda Cooperative Agency, Undated). It is a legal entity in which individuals can save and borrow money to invest in various activities. Each member has equal voting rights, regardless of their deposit amount or number of shares they own. SACCOs are an easy way to organise a community to save, with profits returned to members in the form of loans. The money stays within the membership and the area.

BPR is a licensed commercial bank known for its focus on retail banking activities – such as current and savings accounts and loans – and consumer banking tools such as mobile banking. Its customers include agricultural businesses, private individuals, micro enterprises and SMEs.

Rwandan Financial Cooperatives owns 65 per cent of BPR's shares and a Dutch cooperative bank, Rabobank, owns 35 per cent. Like all Rwanda's microfinance institutions and commercial banks, the SACCOs and BPR are regulated and supervised by the BNR through licensing, off-site surveillance and on-site inspections.

Each district's annual performance contract must include a target number of biogas digesters to be installed. The decentralisation of the biogas programme implementation is a strategy to not only simplify the

<sup>11</sup> Guy Dekelver, the Rwandan National Domestic Biogas Program: Creating a cheaper, eco-friendly energy source, 2008

<sup>12</sup> The government also runs an institutional biogas programme, equipping institutions such as prisons and schools with biogas as an alternative source of energy. This study focuses on the domestic biogas component of the NDBP.

<sup>13</sup> Before 2015, the NDBP was managed by the Rwanda Energy Group/Energy Development Corporation Ltd (REG/EDCL), the MININFRA agency in charge of producing and managing electricity and other forms of energy in Rwanda.

long proposal approval process (which now takes place locally rather than in Kigali) but also increases ownership and monitoring at local level. The resulting connection of sensitisation and funding should improve the monitoring of the programme's implementation.

The NDBP is embedded in overall national development planning coordinated by the Ministry of Finance and Economic Planning (MINECOFIN). Under the new decentralised structure, MINALOC coordinates NDBP at the central level, with technical support from MININFRA. The ministries jointly set national targets and design policies and strategies to meet these targets.

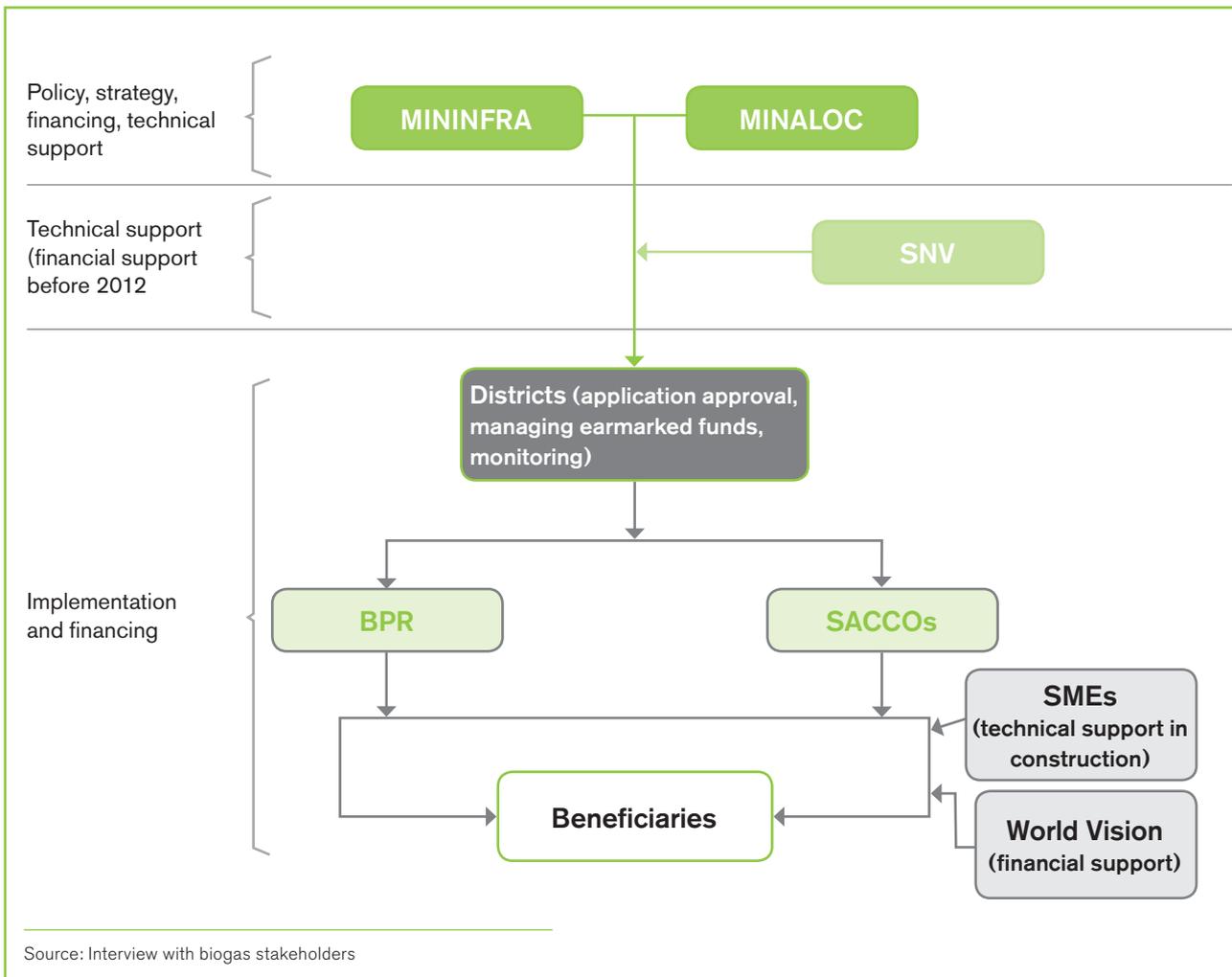
The districts coordinate programme implementation, managing earmarked funds from central level, working with sectors to sensitise communities and receiving and approving applications before sending them to the BPR or SACCOs for funding.

NBDP chose to work with SACCOs and BPR because they are present across the country and mainly in rural areas (there is at least one SACCO in each administrative sector) and they are commonly used by people with low income.

The districts facilitates the channelling of the funds through the SACCOs and BPR and ensuring that beneficiaries who meet the criteria can access funds.

After district approval of beneficiary funding proposals, BPR and the SACCOs disburse the government subsidy, not directly to the beneficiaries, but to the SMEs responsible for installing biogas digesters. Funds are disbursed in three instalments, as installation progresses. BPR and the SACCOs disburse loans to beneficiaries who apply for additional financial support to cover their co-payment. NDBP field technicians are responsible for inspecting the works and signing completion forms at each step before the bank proceeds with payments.

Figure 4. NDBP technical and financial support flows under the new structure



The two most active technical partners in NDBP are World Vision Rwanda (WVR) and SNV. WVR has been collaborating with the NDBP since 2011, supporting farmers to establish manure-based biogas cooking systems to provide an energy-efficient alternative to firewood and reduce pressure on very limited forest resources.<sup>14</sup> SNV provides technical support to the NDBP, training SMEs and recruiting field technicians to provide quality assurance to the installed biogas digesters. NDBP also consults with these development partners on central and local-level annual planning activities.

The NDBP is fully funded through the government budget to subsidise 50 per cent of each installed digester, with funding directly earmarked to districts budgets. Beneficiaries need to cover the remaining 50 per cent through self-funding or with a loan. Development partners such as SNV and WVR do not directly channel government funds; they use their own structures to fund beneficiaries in their areas of intervention. The source of funding for NDBP development partners vary: the Dutch government and SIDA are the main funders of SNV; WVR is mainly funded by the Australian Department of Foreign Affairs, World Vision Australia, World Vision United States and the Japanese government.<sup>15</sup>

### Targeting of households

To be eligible for the NDBP programme, households must:

- own at least two cows, the minimum number that can produce the required quantity of cow dung to operate a biogas digester;
- live in a place with easy access to water for mixing with cow dung;
- live in an area where construction is allowed;
- be able to contribute 50 per cent of the payment in cash or construction materials.

Participating households receive US\$ 450<sup>16</sup> towards the total cost of a household installation (US\$900 and 1300), with the beneficiary covering the remainder. Those with limited capacity are encouraged to apply for loans from a commercial bank or microfinance institution. Banque Populaire du Rwanda (BPR) and saving and credit cooperatives (SACCOs) are the two financial institutions approved to receive NDBP

funds for disbursement to applicants who meet the eligibility criteria.

Through the NDBP, MININFRA and SNV have played a very important role in building the capacity of local masons by training and sensitising them to create and register their biogas companies. At the time of interviews, a total of 41 biogas companies had been created and registered with Rwanda Development Board.

## 5.2 Incentives and effectiveness of design choices

### Incentives to invest in biogas

Table 9 summarises stakeholders' incentives for investing in NDBP. Ministries and local government are primarily driven by the national development agenda as reflected in Vision 2020 and EDPRS2 to protect the environment and promote clean, renewable energy. Under EDPRS2, the government aims to promote the use of biogas and other sustainable biomass sources by expanding access to biogas for households and institutions at district level. Its energy sectoral plan sees biogas as a "cost-effective source of energy for heating and cooking" and encourages "cleaner, more efficient and sustainable uses of bio-products by transitioning away from wood to more clean technologies such as biogas and promoting efficient charcoal harvesting and use." Biogas digesters represent an important long-term opportunity for households and communities if managed properly.

NDBP's development partners are strategically motivated. SNV and WVR use NDBP to target youth employment opportunities and empower farmers to manage natural resources. Financial institutions and SMEs invest for economic return: BPR and SACCOs charge interest on biogas loans, and SMEs are offered employment opportunities through digester installation contracts with beneficiaries.

<sup>14</sup> Although WVR operates in 17 districts, its biogas energy system was only introduced in four: one in each province. Biogas falls under the WVR's strategic objective of farmer-managed natural resources. To date, about 130 households have benefited from WVR's biogas programme. Unlike the NDBP, which funds beneficiaries through financial institutions, the WVR directly funds its beneficiaries without intermediaries.

<sup>15</sup> WVR has submitted a funding proposal to FONERWA. If approved, it will also be added to its list of funders.

<sup>16</sup> Exchange rate of October 2015 ([www.oanda.com](http://www.oanda.com))

Table 9. Incentives to invest in NDBP, by stakeholder

STAKEHOLDER	MAIN INCENTIVES FOR PROMOTING BIOGAS, WITH BRIEF DESCRIPTION
MININFRA MINALOC	Policy: Priority for national development agenda; national aspiration to address the issue of excessive use of biomass; environmental protection.  Socioeconomic: Improving beneficiary sanitation and health.
Local government	Policy: Implementing EDPRS2 priorities at local level, protecting forests.  Socioeconomic: Supporting beneficiaries to access clean energy at half cost; improving sanitation.
SNV	Strategic: Promoting clean, renewable energy and providing opportunities for youth employment through the creation of SMEs  Socioeconomic: Introducing renewable energy as a strategy to reduce firewood consumption; integrating agriculture and renewable energy (the bio-slurry from biogas digesters makes high-quality fertiliser.
WVR	Strategic: empowering farmers to manage natural resources; environmental protection.
Financial institutions	Policy: environmental protection.  Economic: interest charges on biogas loans; government subsidies guarantee the biogas businesses and help financial institutions to explore the renewable energy sector.
SMEs	Socioeconomic: Biogas reduces the cost of firewood, has a positive impact on health, sanitation and education as access to lighting enables children to study.  Economic: Offers contractual opportunities and therefore job creation.

All the stakeholders we interviewed underlined the important of socioeconomic incentives – improving beneficiary sanitation, health and education though these were not the primary objectives of the programme.

### Actors and incentives behind the design choices

As discussed above, the NDBP has been through several main design choices over time, including:

- moving to a decentralised model from a project model
- using SACCOs and BPR to provide loans;
- operating other programmes in conjunction with this one; and
- targetting families with two cows for the domestic programme.

The choice to decentralise was made to increase government ownership of the programme and streamline processes to make them quicker and more efficient. Consequently, all applications and services related to the biogas programme are approved and accessed at district level. This will also help in increasing the ownership by citizen and ease the

monitoring and evaluation of the implementation at district level.

NDBP uses two main financial instruments: grants and loans. The grants are in the form of a subsidy that is directly earmarked to district budgets and channelled through BPR and SACCOs to the SMEs that construct the biogas installations. This is not paid directly to the biogas beneficiaries. Beneficiaries, who co-fund the installations, can apply to local financial institutions for a loan to cover their part of the costs.

The number of intermediaries involved in the process varies depending on whether the actor is at national or local level. Based on the programme's current structure (managed at district level), two levels of intermediaries are involved in the process: financial institutions and SMEs (see Table 10).

### Effectiveness of choices

Our findings suggest that grants in the form of subsidies are the most appropriate financial instrument for a variety of actors, as it helps the poor access biogas digesters at half cost. But this is not enough to reach the poorest and for many the programme remains out of reach. Table 11 outlines the main stakeholders' views.

Table 10. Financial instruments and intermediaries

STAKEHOLDER	FINANCING INSTRUMENT USED	FIRST-LEVEL INTER-MEDIARIES	SECOND-LEVEL INTER-MEDIARIES	REASONS FOR CHOOSING THE INSTRUMENT
MINFRA MINALOC	50% grant: subsidy for the domestic biogas (US\$ 450) for each selected household	District budget	BPR SACCOs SMEs	An incentive/strategy to attract beneficiaries to the programme, enabling poor beneficiaries to access funds to invest in renewable energy.
Local government	50% grant: (US\$ 450) to subsidise the installation	BPR and SACCOs	SMEs	Mixed approach attracts beneficiaries and increase their ownership.  Grant helps attracting community member (Motivation strategy)
WVR	Grant: directly to beneficiaries	None	None	Helping poor beneficiaries access biogas.
Financial institutions	50% grant to beneficiaries  50% loans direct to beneficiaries	SMEs None	None None	Programme design
Beneficiaries	Subsidies and loans to finance 50% of installation costs, in cash or construction materials.	SMEs	None	The only option available and recommended by the NDBP

Table 11: Stakeholder views on appropriateness of finance

ACTORS	APPROPRIATENESS OF FINANCIAL INSTRUMENTS
MININFRA MINALOC Districts	Subsidies are an effective strategy to attract and improve ownership though co-funding, but funds are not reaching the extremely poor as the criteria is too high for them.
WVR	Does not have sufficient funds to support the poor in all our intervention areas (biogas is supported in only 4/17 districts).
BPR SACCOs	To date, there are enough funds to fund a big number of applicants. The big challenge for some applicants remains the low level of awareness and lack of collateral.  The mixture of subsidy and loan reduces the risk of default.
Beneficiaries	The set selection criteria are not accessible to the poorest, but suitable for other categories of people.

In terms of realising low-carbon resilient objectives, Table 12 shows that respondents see the NDBP as bringing a number of co-benefits, ranging from health and education to gender promotion and environmental protection.

Table 12. The effectiveness of NDBP's low-carbon resilience objectives, by stakeholder

STAKEHOLDER	TARGETING	CO-BENEFITS
NDBP	The poor, but not the extremely poor	<p>Reduces the use of biomass and therefore protects the environment and reduces emissions</p> <p>Helps build capacity in the private sector through training and financing</p> <p>Improves beneficiary health in communities and prisons (biogas is smoke-free so reduces the risk of respiratory disease)</p> <p>Increases educational impact through access to lighting</p> <p>Reduces the burden on women (collecting firewood is by culture a woman's activity)</p> <p>Provides high-quality fertiliser (bio slurry)</p>
SNV	Not reaching the poorest people in communities, but is tackling youth unemployment	<p>Protects the environment by reducing deforestation</p> <p>Offers an opportunity to integrate agriculture and renewable energy by using of bio slurry as a high quality fertilisers;</p> <p>Lighting improves education especially for girls as biogas reduces time for wood collection that is by culture reserved to women and girls (gender friendly)</p> <p>Biogas promotes clean cooking (no air pollution)</p>
WVR	The poor, but not the extremely poor, who do not fill the criteria	Protection of the environment
District officials	Those in participatory poverty category 3 and above <sup>17</sup>	Decreases deforestation through reduced firewood consumption
Financial institutions	The poor with the capacity to pay loans and maintain cows	<p>Improves beneficiary health</p> <p>Increases agricultural production</p> <p>Protects the environment</p> <p>Builds capacity for renewable energy in the private sector</p>
SMEs	Those who can access the opportunity	<p>Promotes agriculture by producing quality fertiliser</p> <p>Promotes the private sector and entrepreneurship</p>
Beneficiaries and communities	The poor but not the extremely poor	<p>Biogas improve people's health through clean cooking (reduces exposure to smoke)</p> <p>Biogas reduces the cost of buying firewood</p> <p>Biogas produces high quality bio slurry and therefore promotes agricultural productivity</p> <p>Biogas protects the environment</p>

<sup>17</sup> Rwandan population is categorised into 6 poverty categories ranging from extremely poor (cat.1) to very rich (cat.6). These are called participatory poverty categories as the placement into categories were done by communities themselves. In this case, category 1 & 2 are the extremely poor households.

## 5.3 Case study summary

The NDBP has undergone some quite radical changes since its inception, moving from a project based model under MININFRA to a decentralised one that operates through districts and local governments. In this new structure, targets and objectives are set through the national planning process and funds earmarked in district budgets for the subsidies.

But despite these changes, the choice of financial instruments for households has remained the same – a mixture of subsidies and loans. These instruments offer the option of domestic biogas to households with two cows but does not target the very poor, who have neither the raw inputs nor the finance to access the scheme.

For the ministries and local government, the incentives to invest in the programme are to meet biogas policy as set out in the EDPRS2. For those implementing the project – the SMEs and financial institutions – it is an economic transaction with financial benefits. The beneficiaries who can access this scheme recognised the benefits to health and agriculture.

# Discussion and conclusions

The primary incentives in both our case studies are to generate renewable energy or meet national-level targets, and any co-benefits to poor communities are indirect. If low-carbon resilient development is to be achieved at the national level, programmes targeting one dimension need to consider including more explicitly dimensions of both low carbon and resilience to ensure that assumed co-benefits and synergies are being realised for vulnerable communities.



Through our two case studies, we see that a range of incentives are playing a role in shaping inclusive low-carbon resilient development outcomes through different channels.

### Design choices

We see that design choices in both programmes are often constrained within particular frameworks and not necessarily the preferred choice. Private energy companies within the BRD/FONERWA case for example, felt that the terms of the loans did not match their needs, and the extra requirements of the joint basket stream created a barrier to take up. The NDBP uses a 50:50 subsidy and grant scheme for reasons for affordability. Combined with the requirement for participating households to own two cows, this positions the scheme in the reach of a certain group of the population. Participating households have had access to a range of support such as NGO financing and loans.

### Incentives

The incentives in both cases are not always aligned to deliver outcomes on the ground. Economic incentives are dominating choices and implementation, and it is not clear how these will lead to maximising other outcomes such as the resilience agenda.

The biogas case is now going through decentralised planning systems and so incentives for this are shaped by policy frameworks and targets in the national plan. This offers one way of incentivising an approach that is more inclusive (where feasible) or focuses on securing the co-benefits from the digesters. In the case of FONERWA, the joint basket scheme must fit with national priorities and the thematic financing windows.

Our case studies show that, for a variety of economic and political reasons, the finance for these particular programmes does not target or include the poorest in low carbon resilient development. Both cases are driven by one primary incentive – generating renewable energy or meeting national-level biogas targets – and any co-benefits have been indirect or assumed rather than strategically designed into the plans. It should be noted that this is partly a function of the case study choice and other programmes do target these groups, but equally for a transformative transition in Rwanda resilience may also need to be built into programme design even when this is not the primary objective.

### Effectiveness of outcomes

The outcomes of both these financing channels have been driven by one primary objective – whether economic or political/policy – and this has influenced the achievement of more general low-carbon resilient objectives. Although this is understandable within the contexts and specific aims of these channels, programmes will need to create incentives around multiple outcomes to ensure that those working with households and communities prioritise all aspects of low-carbon resilient development if outcomes are to be achieved for the most vulnerable populations. For example, the financial institutions are driven by economic incentives to build biogas digesters, but this is not linked to ensuring or supporting the socioeconomic outcomes at the household level – they are left implicit.

### Conclusions

Financing for low-carbon resilient development is a new area and one that will be of increasing importance in the next decade. It is therefore important that financing channels are able to support and incentivise action in the area and secure climate-resilient outcomes for communities. These two case studies show that we need to give attention to the extra challenges and requirements that come with adding climate change into investment decisions, and how actors can best be supported to meet those new capacity needs. While both programmes seek to address one main objective, it is clear that for low-carbon resilient development to be achieved at national level, programmes need to be incentivised to include dimensions of both agendas in a more strategic way to ensure that the assumed co-benefits and synergies are being realised for vulnerable communities.

# References

- African Development Bank Group (2013). Rwanda Energy Sector Review and Action Plan
- Buchner, B. *et al.* (2014) The Global Landscape of Climate Finance. Climate Policy Initiative
- Government of Rwanda (2000). Vision 2020 document
- Government of Rwanda (2011) Green growth and climate resilience: National strategy for climate change and low carbon development
- Ministry of infrastructure (2011). National Energy Policy and strategy, Kigali May 2011
- Government of Rwanda (2012a). Government of Rwanda Environment and climate change funds, Final report
- Government of Rwanda (2012b). Operations manual: Environment and Climate Change Fund (FONERWA) Design Project
- Government of Rwanda (2013a) Second Economic Development and Poverty Reduction Strategy (EDPRS2)
- Government of Rwanda (2013b) Division of Labour in Rwanda

# Acronyms

BNR	National Bank of Rwanda
BPR	Banque Populaire du Rwanda
BRD	Development Bank of Rwanda
CSR	corporate social responsibility
DFID	Department for International Development (UK)
EDPRS	Economic Development Poverty Reduction Strategy
FONERWA	Rwanda's domestic environment and climate change fund
MINAGRI	Ministry of Agriculture and Animal Resources
MINALOC	Ministry of Local Government
MINECOFIN	Ministry of Finance and Economic Planning
MININFRA	Ministry of Infrastructure
MINIRENA	Ministry of Natural Resources
MoU	memorandum of understanding
NDBP	National Domestic Biogas Programme
NGO	non-governmental organisation
NRE	Novel Renewable Energy Ltd
NSCCLCD	National Strategy for Climate Change and Low-Carbon Development
PPA	purchasing power agreement
RDB	Rwanda Development Board
REMA	Rwanda Environment Management Authority
RMT	Rwanda Mountain Tea Company
RURA	Rwanda Utility Regulatory Authority
SACCO	saving and credit cooperative
SME	small and medium-sized enterprise
SNV	Netherlands Development Organization
WVR	World Vision Rwanda

# Related reading

Steele, P., and Rai, N., 2015, Beyond Loans: instruments to ensure the poor access climate and development finance, IIED briefing, <http://pubs.iied.org/17318IIED>

Rai et al. 2015, Financing inclusive low-carbon resilient development: Role of Central Bank of Bangladesh and Infrastructure Development Company Limited, <http://pubs.iied.org/10139IIED>

Steinbach et al., 2015, Financing inclusive low-carbon resilient development: The role of the Alternative Energy Promotion Centre in Nepal, <http://pubs.iied.org/10140IIED>

Rai, 2015, Deepening readiness for climate finance: the role of the political economy, <http://pubs.iied.org/17290IIED>



Rwanda's National Strategy for Climate Change and Low-Carbon Development facilitates mainstreaming climate change into national policy and planning in all sectors to help it reach its vision of a developed, low-carbon, climate-resilient economy by 2050. Through two case studies, this paper looks at how Rwanda is using different financing channels and intermediaries to support the dual aims of delivering electricity or energy needs to poor communities and moving towards a low-carbon future. We use a political economy analysis to we examine the vertical chain of actors and delivery mechanisms and explore how incentives might be aligned to deliver effective low-carbon resilient development.

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