

Financing inclusive low-carbon resilient development

The role of the Alternative Energy Promotion Centre in Nepal

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Country Report

August 2015

Climate change

Keywords:

Low-carbon resilient development,
political economy, climate
finance, Nepal

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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.

Partner organisation

Clean Energy Nepal is an independent, non-profit, service-oriented, policy, research and implementation organisation focusing on issues related to sustainable energy use and environmental conservation in Nepal.

Acknowledgements

The authors would like to thank all of the individuals who participated in consultations and interviews for this study. We would particularly like to thank the Alternative Energy Promotion Centre for their input and review of the study. Any errors and omissions remain our own.

Acronyms

AEPC	Alternative Energy Promotion Centre
CREF	Central Renewable Energy Fund
DDC	District Development Committee
LCRD	low-carbon climate-resilient development
LDC	least developed country
MFI	microfinance institution
MSMEs	micro, small and medium-sized enterprises
NGO	non-governmental organisation
NRREP	National Rural Renewable Energy Programme
PEA	political economy analysis
RE	renewable energy
RSP	regional service provider
VDC	Village Development Committees

Published by IIED, August 2015

Dave Steinbach, Sunil Acharya, Ramesh Prasad Bhushal, Raju Pandit Chhetri, Basanta Paudel and Krity Shrestha. 2015. *Financing inclusive low-carbon resilient development: the role of the Alternative Energy Promotion Centre in Nepal*. IIED Country Report. IIED, London.

<http://pubs.iied.org/10140IIED>

ISBN: 978-1-78431-244-2

Fieldwork for this case study took place in February and March 2015 in Barpak village development committee (VDC), Gorkha District and Babiyachaur VDC, Surkhet District. On 25 April 2015, the first of two devastating earthquakes struck Nepal. The epicentre of the first earthquake was in Barpak VDC and initial estimates suggest that over 90 per cent of buildings were destroyed in this area. On 7 May, an AEPC assessment estimated that micro-hydro plants serving over 60,000 households were damaged during the earthquake. This initial assessment was made prior to the second earthquake, so the estimate is likely to be very low. Further, it does not capture damage to households with other renewable technologies, so the number of AEPC-supported households that no longer have access to electricity is probably much higher. We hope that this report can help highlight the importance of promoting investment in off-grid renewable energy in Nepal, and that it contributes evidence towards long-term sustainable (re) development planning, as efforts to rebuild following the earthquake move forward.

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Several of the world’s poorest and most vulnerable countries are leading the way in developing and implementing low-carbon climate-resilient development (LCRD) strategies. International and domestic climate finance can play an important role in implementing LCRD policies and plans in the least developed countries. This report analyses the new financial delivery structures in Nepal that have been set up to channel LCRD finance to the poor, focusing on the Alternative Energy Promotion Centre and its flagship initiative the National Rural Renewable Energy Programme. Using a political economy analytical approach, this report outlines the incentives shaping LCRD investment in Nepal, and whether these incentives have led to the design of new financing channels that are effective in delivering inclusive LCRD investment to the poorest and most vulnerable to climate change.

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Summary

Several of the world's poorest and most vulnerable countries are leading the way in developing and implementing low-carbon climate-resilient development (LCRD) strategies. LCRD strategies bring together the two main policy responses to climate change – adaptation and mitigation – to help promote poverty reduction and lead countries towards a pathway of long-term sustainable development.

International and domestic climate finance can play an important role in implementing LCRD policies and plans in the least developed countries (LDCs). Many LDCs are setting up new financial architecture to help access and deliver climate finance – including new funding institutions, financial intermediaries, instruments and financial planning systems. This report is part of a four-country research project that examines the new financial infrastructure LDCs are setting up to channel LCRD finance to the poor. In particular, it focuses on the role of new financial intermediaries to understand how they provide opportunities for financing inclusive LCRD investment that benefits the poorest and most vulnerable to climate change.

In Nepal, investment in renewable energy (RE) technologies to rural communities provides one of the greatest opportunities to shift the country to a low-carbon climate-resilient development pathway. The main agency responsible for promoting off-grid RE investment in Nepal is the Alternative Energy Promotion Centre (AEPCC), which provides LCRD finance under its

flagship initiative the National Rural Renewable Energy Programme (NRREP). Since its establishment in 2012, the NRREP has brought all of Nepal's small-scale RE projects together under a single programme modality. It has also adopted important new design features – new financial intermediaries (commercial banks) and new financial instruments (credit) – that have changed how RE finance is delivered to communities and households in rural areas.

Based on these new design choices, this report analyses the AEPCC and NRREP investment model to determine how effective it is in promoting inclusive LCRD investment. It begins with an analysis of Nepal's RE investment needs and the design choices in the financial landscape that have been selected under the NRREP. It then uses political economy analysis to analyse the incentive structures that have shaped the NRREP's design and the incentives that are shaping investment in LCRD under the programme. The report then turns to the question of effectiveness, to understand whether the incentives have shaped the design of new financial delivery mechanisms that are effective in delivering co-benefits, leveraging additional finance and delivering finance that is appropriate for the poor. It concludes with key findings and recommendations that aim to help policymakers in Nepal strengthen inclusive investment in renewable energy and climate-resilient development under the NRREP.

Introduction

1

Several of the world's poorest and most vulnerable countries are leading the way in developing and implementing low-carbon climate-resilient development (LCRD) policies. LCRD strategies bring together the two main policy responses to climate change – adaptation and mitigation – to help promote poverty reduction and lead countries towards a pathway of long-term sustainable development (Fisher *et al.* 2014).

International and domestic climate finance can play an important role for least developed countries (LDCs) to implement LCRD policies and plans. Many LDCs are setting up new financial architecture to help access and deliver climate finance – including new funding institutions, financial intermediaries, instruments and financial planning systems (Kaur *et al.* 2014). With the anticipation of new climate finance from the Green Climate Fund, and with LDC governments increasingly investing in climate-related initiatives from their national budgets, this new financial architecture will play an important role in delivering finance to those who need it the most.

This report is part of a four-country research project in Bangladesh, Ethiopia, Nepal and Rwanda that examines the new financial infrastructure LDCs are setting up to channel LCRD finance to the poor. The four case studies take new financial intermediaries as their focal point, to understand their role in financing inclusive LCRD investment. Financial intermediaries play a critical role in investing in inclusive LCRD projects and programmes because they can:

- Draw down funds from sources of finance that are targeted for the poor.
- Deploy instruments and blend finance that is most effective in reaching the poor.
- Engage other intermediaries that provide the best financial channels for the poor to access.

As countries move from LCRD planning to implementation it is important to ensure incentives are created and barriers removed to extend LCRD benefits

to the poor. However, choices in the financial landscape are shaped by underlying political economy factors. Different knowledge and incentive structures underpin the decisions of the policymakers who design LCRD financing channels, which in turn shape whether LCRD finance favours inclusive investment. With these case studies, we therefore take a political economy analytical approach to understand the incentive structures that have led policymakers to select new financial intermediaries and new financial instruments, and to understand whether these design choices are effective in promoting inclusive LCRD investment.

In Nepal, renewable energy (RE) is seen as an important LCRD investment priority. At the policy level, renewable energy is explicitly linked to poverty reduction and national development, so a significant amount of RE investment is delivered to off-grid communities in rural areas. The main agency responsible for promoting small-scale RE investment in Nepal is the Alternative Energy Promotion Centre (AEPC), which provides LCRD finance under its flagship initiative the National Rural Renewable Energy Programme (NRREP). AEPC and the NRREP are the focal points of this case study, since they are piloting the use of new financial intermediaries and instruments to promote investment in RE in Nepal.

The case study of AEPC and the NRREP begins with an outline of Nepal's RE investment needs and the design choices in the financial landscape that have been selected for this new initiative. We then use a political economy analysis (PEA) approach to outline the incentive structures that have shaped the NRREP's design and the incentives that are shaping investment in LCRD under the programme. Based on these incentive structures, we then analyse whether the selection of new financial intermediaries are effective in delivering co-benefits, leveraging additional finance and delivering finance that is appropriate for the poor. We conclude with key findings and recommendations that aim to help policymakers in Nepal strengthen inclusive investment in RE and climate-resilient development.

Approach and methodology

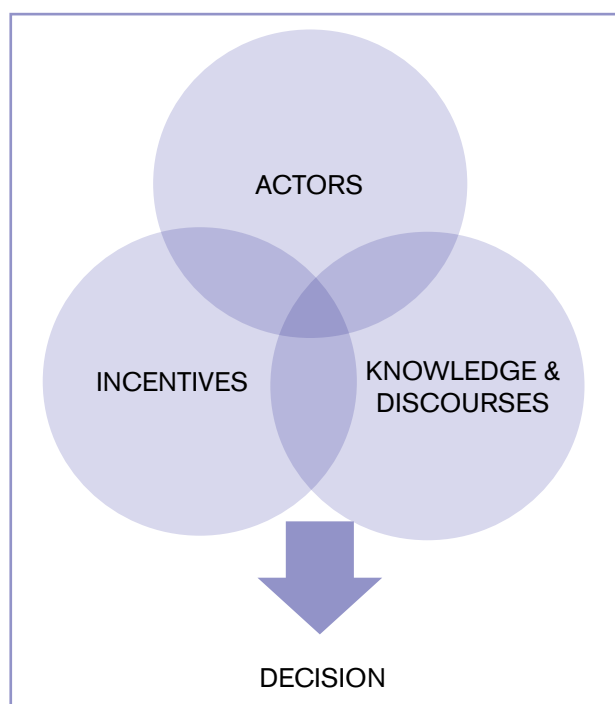
2

In this section we outline the two main analytical frameworks – political economy analysis and the climate finance landscape framework – that we use to analyse AEPC and the NRREP. We also provide an overview of the case study and interview methodology that we use in this report.

2.1 Political economy analysis

In this study, we use a political economy lens to understand the factors that drive or constrain investment in inclusive LCRD investment. 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. These underlying factors shape the choices actors make in designing LCRD policy responses and financial delivery mechanisms, and thereby determine how effective different financing arrangements will be in targeting the poor. It is the combination of these three political economy factors – actors, knowledge/discourses, and incentives – that leads to decisions (see Figure 1).

Figure 1: Political economy analysis



Actors: Planning and delivery of LCRD investments involves a wide range of actors including those who work at both policy and implementation level. Effective delivery of LCRD investments is shaped by the ways in which actors work with ideas, power and resources to make design choices and implement LCRD initiatives. We use a climate finance landscape framework (see Section 2.2) to identify the main actors involved in LCRD financing in Nepal, how they are connected in the financial value chain and what role they play in designing instruments and systems to channel finance to the poor.

Knowledge and discourses: The decision-making process of individual actors is shaped by the knowledge they acquire and use, as well as by discourses and narratives that they are exposed to. While knowledge and discourses is an important component of political economy analysis, our examination of knowledge and discourses in this report is limited to an analysis of how knowledge of financial and market development needs has influenced the choices of actors responsible for designing LCRD financial delivery channels in Nepal.

Incentives: The choices actors make to deliver inclusive LCRD investments are driven by incentives they derive from their mandates, organisational structures, procedures, policies, resources and knowledge base. In this report we analyse the underlying drivers and incentives that shape investment in LCRD as well as choices actors make when designing financing channels to deliver LCRD investments. We also outline how the lack of appropriate incentive structures can constrain inclusive LCRD investment. Incentives are classified into five categories:

- **Policy incentives:** where a policy, regulation or institutional mandate supports discourses and decisions.
- **Economic incentives:** where there are resources, funds, etc. that influence decisions.
- **Capacity incentives:** where there are technical skills, evidence, knowledge and understanding to enable or constrain decision making.
- **Reputational incentives:** when decisions are based on the perception that they will lead to positive reputations and goodwill for the actors/institutions involved.
- **Socioeconomic incentives:** when specific decisions are expected to deliver socioeconomic benefits that improve wellbeing.

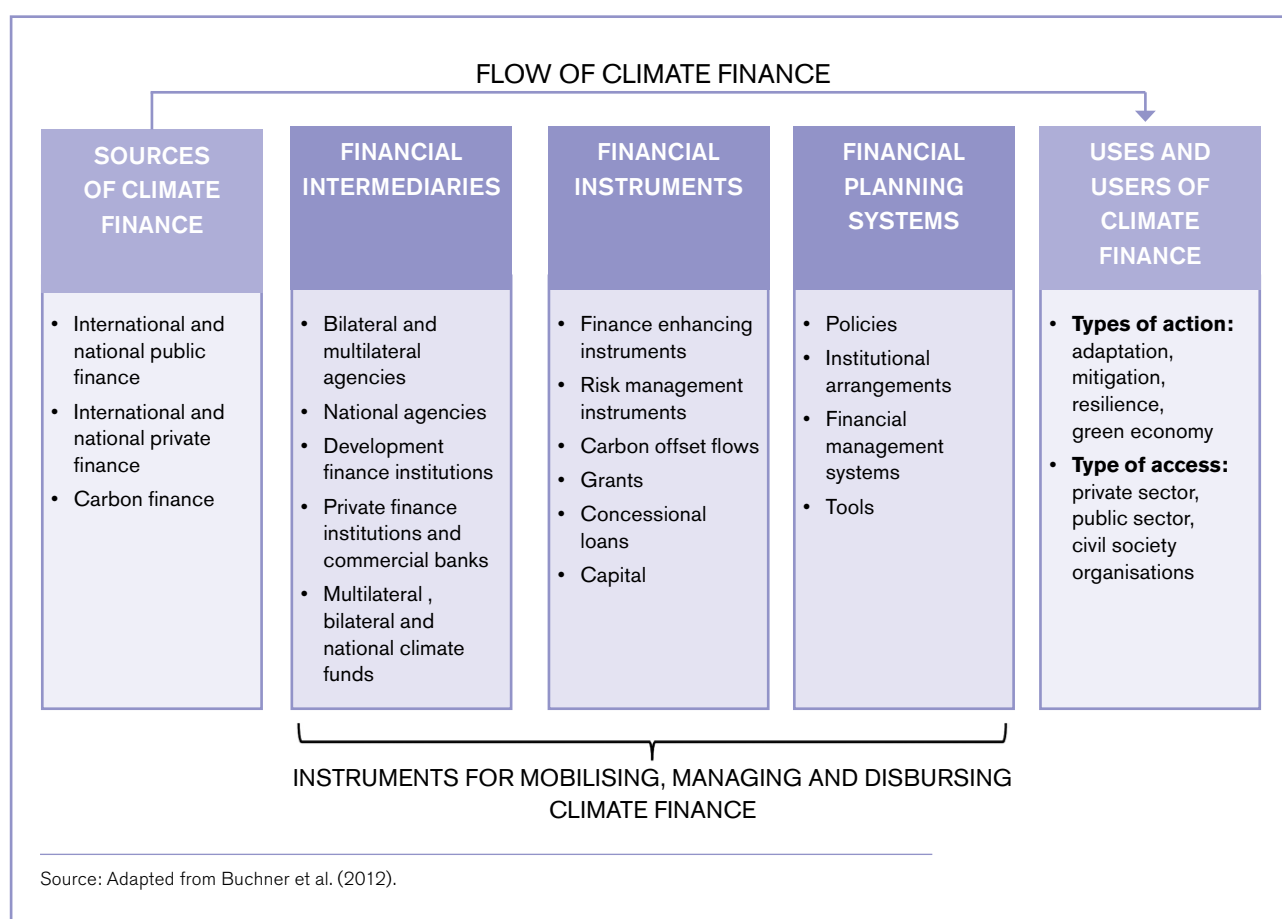
In sum, we use political economy analysis to examine actors in Nepal's LCRD value chain, the knowledge and discourses they use and the underlying incentive structures that drive decision making. In particular, we use the PEA lens to examine decisions on the design choices of the NRREP (in terms of intermediaries and instruments) and decisions that encourage various actors to invest in LCRD. This analysis concludes with an assessment of whether these decisions have been effective in promoting inclusive investment in LCRD in Nepal. We define effectiveness in three ways: that it improves development outcomes in rural areas, that it increases the scale of finance for investment in RE technologies and that it improves the ability of poor households and communities to access finance. These three dimensions of effectiveness were captured by asking respondents during the semi-structured interview process (see section 2.2 below) to explain whether decisions led to development co-benefits, leveraging of

additional finance, and finance that was appropriate for the poorest and most vulnerable.

2.2 Climate finance landscape analytical framework

The second analytical framework that we use in this report is the climate finance landscape framework, which we use to explain the design choices behind the development of the NRREP financing modality RE investment (see Section 3). This framework (see Figure 2) outlines the sources, financial intermediaries, financial instruments, financial planning systems and users involved in mobilising and channelling finance for climate-related investment.

Figure 2: The climate finance landscape framework



BOX 1: CLIMATE FINANCE LANDSCAPE TERMINOLOGY AS USED IN THIS REPORT

Sources: public or private, domestic and international origin of climate finance.

Financial intermediaries: institutions that channel finance from its source to end users.

Financial instruments: can be split into two categories – fiscal instruments and economic instruments. A fiscal instrument is a contract that gives one entity a financial asset and another a financial liability. Fiscal instruments that incentivise LCRD investments include risk management instruments like guarantees and insurance, grants, concessional loans, and capital instruments of equity and debt finance. Economic instruments (which include policy and regulatory frameworks) affect producers' and consumers' behaviour by

causing changes in prices. Economic and fiscal instruments provide incentives for climate-related investments, but different instruments will suit different investment needs.

Financial planning systems: policies, institutional arrangements and financial planning tools that play a key role in the management and governance of climate finance.

Uses and Users: uses refers to the types of investment targeted by climate finance (adaptation, mitigation, LCRD, etc). Users in this case study refer to the beneficiaries who use climate finance for investment in RE projects and income-generating activities at community and household levels.

2.3 Methods

Case study approach: We use a case study approach to examine how LCRD finance is channelled to the poor in Nepal. Based on a literature review of the main government and donor initiatives that are promoting LCRD outcomes, we selected AEPC and the NRREP as the most relevant example of financial intermediaries that use new instruments to promote LCRD outcomes. To conduct the research for this case study, we used a desk-based literature review (for example on RE policy in Nepal) and semi-structured interviews with actors involved in Nepal's RE financial landscape.

Semi Structured Interviews: We began our political economy analysis by mapping the different actors in the AEPC and NRREP value chain. We then collected data between January and March 2015 through a series of semi-structured interviews with more than

30 actors from across the NRREP financial value chain – from the designers and funders to village-level beneficiaries in Gorkha and Surkhet Districts. Each of these interviews included questions on the incentives that drive choices in the NRREP's financial landscape, the incentives that drive RE investment in Nepal and the NRREP's effectiveness in promoting inclusive LCRD investment. Researchers noted similarities in responses across four main actor groups in the NRREP value chain - those who represent sources of finance and were involved in the NRREP design; private sector and financial actors; organisations or institutions providing district and community-level technical support to enable the uptake of RE technologies; and community and household beneficiaries.

Table 1 lists the participating institutions, agencies, and communities from the four main categories of actors. See Annex 2 for a complete list of interviewees.

Table 1: Categorisation of actor groups

ACTOR GROUPS	SUB-GROUPS	LIST OF AGENCIES/STAKEHOLDERS INTERVIEWED
Sources of finance/ programme designers	Government ministries	<ul style="list-style-type: none"> • National Planning Commission • Ministry of Science, Technology and Environment • Ministry of Finance • Ministry of Federal Affairs and Local Development • Ministry of Energy
	International donors	<ul style="list-style-type: none"> • Danish Ministry of Foreign Affairs (Danida) • Norwegian Ministry of Foreign Affairs (NORAD) • UK Department for International Development (DFID) • Kreditanstalt für Wiederaufbau (KfW) • Gesellschaft für Internationale Zusammenarbeit (GIZ) • SNV Netherlands, • United Nations Development Programme • Scaling-Up Renewable Energy Programme (SREP)
	AEPC	<ul style="list-style-type: none"> • Assistant Director • Coordinators of different NRREP components • Central Renewable Energy Fund Secretariat
Private sector financial actors	Commercial banks	<ul style="list-style-type: none"> • Global IME Bank (handling bank) • Clean Energy Development Bank (partner bank) • APEX Development Bank (non-partner bank)
	Private technology providers installing solar and micro-hydro	<ul style="list-style-type: none"> • Hydro Energy Concern Pvt. Ltd • Surya Power Company Pvt. Ltd
Technical support	Regional service providers	<p>NGOs promoting RE technologies, income-generating activities and enterprise development under the NRREP</p> <ul style="list-style-type: none"> • Rural Enterprise Society, Tanahu • Aastha Nepal, Regional Service Centre, Surkhet
	District and Village Development Committees	<ul style="list-style-type: none"> • Actors involved in district and village-level development coordination in: • Barpak VDC, Gorkha District • Babiyachaur VDC, Surkhet District
Beneficiaries	Communities and individuals	<ul style="list-style-type: none"> • Households and local RE user groups in: • Barpak VDC, Gorkha District • Babiyachaur VDC, Surkhet District

Country context

3

In this section, we provide a background on the RE policy context in Nepal, an introduction to the NRREP, the financial and market development needs to promote RE investment in the country, and the financial delivery model that Nepal has developed to invest in off-grid RE as part of its efforts to promote low-carbon resilient development.

3.1 Renewable energy policy in Nepal

Renewable energy technologies provide one of the greatest opportunities for Nepal's transition to a low-carbon climate-resilient development pathway. Nepal has considerable RE generating potential from a number of different sources, including micro-hydro, large-scale hydro, solar, wind and biogas. But only 56 per cent of the population has access to electricity and those who do have access are subject to load shedding for up to 14 hours per day. In rural areas, home to 80 per cent of Nepal's population, access to electricity is even lower. Recognising this, the Government of Nepal has pledged to increase RE capacity from 1 per cent of primary energy supply in 2010 to 10 per cent by 2030 (Climate Investment Funds 2013).

To help meet these targets, the Government of Nepal has formulated a number of policies and strategies to promote RE. Its Rural Energy Policy (2006) is the primary policy concerned with the promotion of rural energy.¹ It is backed up by the Subsidy Policy for Renewable (Rural) Energy (2013) and the Subsidy Delivery Mechanism (2010), which provide policy direction and implementation guidelines for the delivery of RE technologies to the rural poor.

Several other policies and strategies provide policy coherence between Nepal's RE targets and other sustainable development priorities. These include:

- The National Climate Change Policy (2011), which has clear provisions to promote the use of RE.
- The National Adaptation Program of Action (2010), which has water resources and energy as one of its six thematic issue areas.
- The Low Carbon Economic Development Strategy (in progress), which aims to shift Nepal's development path towards low-carbon and sustainable development, based on its socioeconomic and development priorities.

3.2 The National Rural Renewable Energy Programme

Nepal has been promoting the use of small-scale RE for several decades. In 1996, AEPC was created as the country's lead agency for promoting off-grid RE technology. AEPC operates under the Ministry of Science, Technology and Environment with a specific mandate to promote technologies that generate up to 10 megawatts. AEPC acts as a technical intermediary between the Government and donors who provide policy direction and finance for RE in Nepal, and the financial intermediaries – banks, microfinance institutions (MFIs), private technology providers, non-governmental organisations (NGOs) and District or Village Development Committees (DDCs or VDCs) – that channel finance for RE investment to beneficiaries. AEPC's activities include RE policy formulation, planning and facilitating the implementation of policies and plans.

Prior to 2012, AEPC oversaw a number of projects funded by the Government of Nepal and international donors. These projects, built around a subsidy-based model, provided targeted support to rural communities and households that could not afford the commercial cost of investing in RE technologies. In 2011, the Government and major donors decided that Nepal needed a more coordinated approach for the RE sector to move from a project-based approach to a programmatic approach. In 2012, they launched the NRREP to bring all RE projects together under a single programme modality. This US\$170 million programme is jointly funded by the Government of Nepal and bilateral and multilateral development partners (see Table 1). It will run from 2012 until 2017 and is expected to fund the installation of:

- 25 MW micro/mini hydropower projects
- 600,000 solar home systems
- 1,500 institutional solar power systems
- 475,000 improved cook stoves
- 130,000 household, 1,000 institutional and 200 community biogas plants.

¹ The definition of 'rural energy' in the policy is interchangeable with the 'renewable energy'.

As well as delivering RE technologies to off-grid communities and households, the NRREP aims to achieve a number of development co-benefits, including promoting new income-generating activities for the rural poor; increasing rural employment; reducing dependencies on traditional energy sources; and improving socioeconomic indicators in the areas of health and education. Annex 1 provides a more detailed summary of the results that the NRREP aims to deliver.

3.3 Financial and market development needs for RE investment

Several factors can help create an enabling environment for RE investment in Nepal. Based on interviews with actors across the NRREP value chain, we identified a number of financial and market development needs that enable or constrain investment in RE technologies:

Financial needs

- **Accessible finance for the poor:** is needed to promote inclusive LCRD investment. Poor households and communities need subsidies to invest in RE technologies, since they often lack the capital to invest in RE or do not have access to credit.
- **Long-term finance:** is needed to ensure the long-term sustainability of the RE sector in Nepal. Credit is an important instrument for long-term financing, since it generates a return on investment that can be reinvested in the RE market. But credit needs to be made more accessible to rural communities in order to ensure inclusive investment in RE. Options to improve the flexibility of long-term finance for the poor include extending banking services to rural areas, encouraging MFIs to provide finance for investing in RE technologies and flexible collateral arrangements for the poor.
- **Scaled-up finance:** is needed to increase the reach of RE investment to more households and communities in Nepal. Concessional loans play an important role in scaling-up investment, since they incentivise private companies and banks to provide their own co-financing which means more funds are available to target a greater number of beneficiaries. Credit is also important for scaling-up finance, since returns on investment can be reinvested in new RE projects.

Market development needs

- **Private sector capacity:** needs to be developed to help new financial actors, such as commercial banks, to enter the RE market.
- **Rural banking services:** are not readily accessible to many rural communities, which means people struggle to access finance (particularly credit). Extending banking services to rural areas will allow households and communities to access loans.
- **Improvements in rural infrastructure:** Nepal's mountainous terrain makes it difficult to access many rural communities. This means there is a significant challenge in transporting and delivering products like solar panels or turbines to beneficiaries in remote areas.

3.4 Choices in the NRREP financial delivery landscape

Based on these financial and market development needs, the NRREP has been designed with a new financial delivery structure to promote investment in off-grid RE. In this section we highlight the choices in the financial landscape under the NRREP, focusing on the new financial intermediaries, financial instruments and financial planning systems that are being used.

3.4.1 Financial intermediaries

A significant innovation of the NRREP is its single programme modality for financing small-scale RE projects. Under the programme all RE finance is centrally managed and channelled to beneficiaries at the community and household level through a new financial delivery system that includes the following new financial intermediaries:

- **The Central Renewable Energy Fund (CREF):** is a financial intermediary that manages all the NRREP's funds, using both subsidies and credit to finance the installation of RE technology at household and community levels. The CREF is managed by a Secretariat that provides operational and managerial oversight, and is advised by an Investment Committee to help guide its financing activities. The Government of Nepal and donors provide direct funding to the CREF bank account.
- **Global IME Bank:** is a private bank that houses the CREF Secretariat and acts as handling bank for all NRREP funding. The bank is responsible for disbursing all subsidy-based finance under AEPC's

subsidy policy to private companies installing technology at the household level. It also acts as a lender to seven partner banks selected by AEPC to deliver credit-based finance for investment in off-grid RE technologies.

- **Seven partner banks:** have signed memorandums of understanding (MOUs) with AEPC to deliver credit-based finance under the NRREP. They receive concessional loans from Global IME Bank, and in turn, provide concessional loans at a higher interest rate to district and village-level cooperatives and microfinance institutions.
- **Microfinance institutions and cooperatives:** use the money that has been loaned by the NRREP's partner banks to provide market-rate loans to their members to invest in RE technologies such as solar home systems or micro-hydro installations.

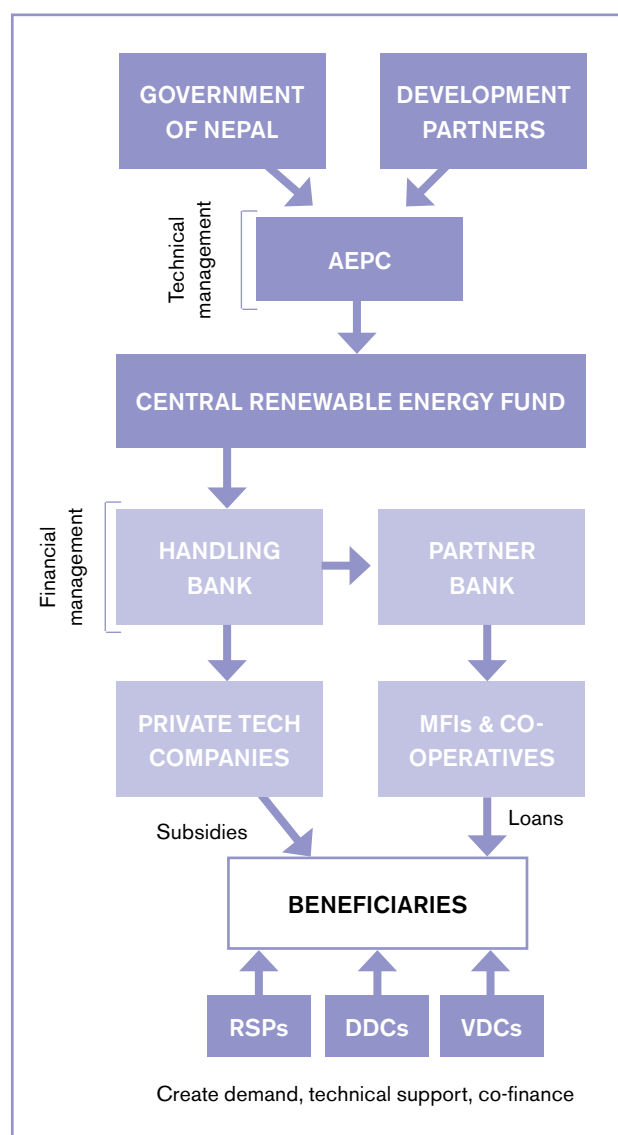
3.4.2 Financial instruments

The second innovation under the NRREP is its use of new financial instruments to promote RE investment. The NRREP has adopted a model that uses both subsidies and credit: 40 per cent of finance comes in the form of subsidies, 40 per cent as loans and 20 per cent through co-finance leveraged by local actors (Government of Nepal 2013).² Figure 3 illustrates the channels that the NRREP uses to deliver subsidies and credit.

Subsidies: Although the new financial landscape for RE investment in Nepal has introduced credit as one of the main financial instruments, subsidies still play an important role under the NRREP. They are the most effective way to provide targeted support to vulnerable and marginalised groups in rural Nepal. Global IME Bank delivers subsidies by transferring funds to private technology providers who have agents that promote RE technologies in rural areas. These private companies work with regional service providers (RSPs) – a group of 10 NGOs assigned to different regions of Nepal to promote the NRREP and encourage communities and households to invest in RE technologies such as biogas, solar home systems and micro-hydropower. When a beneficiary wants to invest in a specific technology, they buy the product directly from the technology provider at a cost below the market rate in accordance with AEPC's subsidy guidelines. Depending on the context 30–50 per cent of the cost is subsidised. The technology providers, RSPs and often the DDC or VDC are then responsible for documenting and providing evidence that the new technology has been installed. Once they have shown this to AEPC, the agency instructs Global IME Bank to release the subsidy to the technology provider so they can recuperate costs.

Credit: Global IME Bank provides seven partner banks with concessional loans to incentivise them to lend to microfinance institutions and other financial agents in rural areas. These concessional loans will help encourage partner banks to provide their own co-finance for RE investment, which would increase the overall volume of finance beyond the core Government and donor NRREP funding. MFIs and cooperatives use the concessional loans they receive to provide market-rate loans to households and communities in rural areas so they can buy RE technologies. RSPs and DDCs are involved in monitoring and reporting to AEPC to document progress in meeting the NRREP's targets (see Annex 1).

Figure 3: Diagram of financial flows under the NRREP



² In practice, most of the finance delivered to date has been through loans, since MOUs between AEPC and banks were not finalised until March 2015. It is anticipated that investments during the remaining two years of the NRREP will mostly be made through credit financing.

3.4.3 Financial planning systems

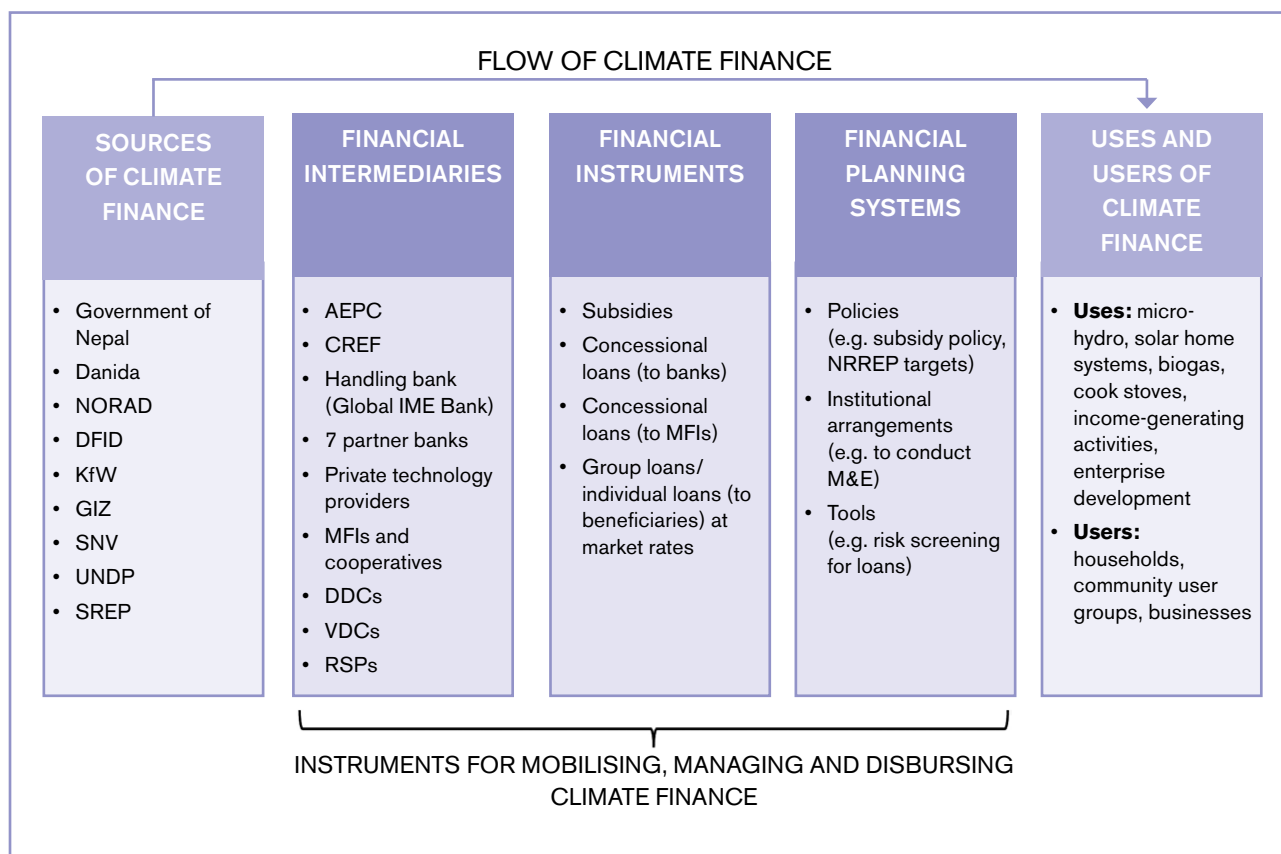
Under the NRREP, a number of important frameworks and institutional arrangements guide investment in RE technologies.

Policy frameworks: such as the Rural Energy Policy (2006) and the Subsidy Delivery Mechanism (2013) provide guidance to govern investment decisions by the CREF Investment Committee and Secretariat.

Institutional arrangements: have been established by AEPC and the Government of Nepal to effectively manage the NRREP. These arrangements provide technical guidance, compliance, fiduciary risk management, monitoring & evaluation and strategic programme oversight.

In sum, the financial delivery landscape for the NRREP incorporates new financial intermediaries, instruments and planning systems. Figure 4 illustrates these design choices using the climate finance landscape framework that was introduced in Section 2. Since the design of the NRREP incorporates important changes in the way RE finance is delivered in Nepal, it is important to understand the reason for these changes and to assess their impact. In Section 4 we turn to the first of these questions, and use political economy analysis to examine the incentive structures that drive investment in RE technologies under the NRREP's new investment model.

Figure 4: The NRREP's climate finance landscape



Incentives shaping LCRD investment in Nepal

4

In this section, we examine the incentive structures that are shaping LCRD investment under the NRREP financing modality in Nepal. The analysis consists of two main elements: the incentives that have driven design choices in the NRREP's financial delivery model and those driving investment in RE in Nepal. We collected data for this analysis from interviews with actors across the NRREP value chain. In the sub-sections below, we present a summary of these responses for each of the four the main actor groups to show the trends that emerge across the NRREP value chain. We then conclude with the main findings from our analysis of the interview responses.

4.1 Incentives driving design choices of the NRREP financing modality

The NRREP has adopted a number of new design choices which differ from previous funding mechanisms for RE in Nepal. These include using new financial intermediaries such as commercial banks and a move towards credit as the main instrument for financing RE projects. In this section, we aim to understand the reasons behind changes in Nepal's RE landscape. From a political economy perspective, we highlight the incentive structures that influence actors' decisions in designing the NRREP's new financial landscape, based on their knowledge of the financial and market development needs for RE investment outlined in Section 3.

Table 2 provides a summary of the different incentives that led to the adoption of these new design choices. The table is populated with responses from interviews with decision makers who were involved in designing the NRREP funding modality only (representatives of the Government of Nepal, the donor community and AEPC) as they are the primary actors responsible for the new design choices. Interview responses are grouped into categories based on the typology of incentives set out in Section 2.

Key findings

During the interviews there was broad consensus across representatives from government, donors and AEPC on the incentives that shaped the design of the NRREP.

- There was a consensus that prior to the NRREP, investment in off-grid RE in Nepal had been fragmented and suffered from a lack of coordination. As such, the NRREP uses a single programme modality to improve coordination and avoid project duplication.
- Actors agreed that introducing commercial banks as new financial intermediaries and using credit-based instruments under the NRREP was a design choice made to encourage the long-term sustainability of Nepal's RE market. Actors believed that the use of concessional loans would incentivise private banks to enter the RE market, gradually leading to the sector's full commercialisation.

Table 2: Incentives driving choices in new financial intermediaries and instruments under the NRREP

ACTOR GROUP	FINANCIAL INTERMEDIARIES	FINANCIAL INSTRUMENTS
Sources of finance	<p>Policy: NRREP's single programme modality selected to increase efficiency and avoid project duplication.</p> <p>Capacity: Financial management capacity in banking institutions led to selection of banks under CREF; DDCs and VDCs selected as best actors to provide local monitoring and evaluation due to local knowledge.</p> <p>Economic: Anticipation that banks will leverage their own finance; desire to promote private sector.</p>	<p>Policy: Choice of credit will ensure long-term sustainability and reduce reliance on donor/Government funding; choice of subsidy for targeted support to poor communities will help Government meet development objectives.</p> <p>Capacity: Knowledge of similar best practice models (eg Sri Lanka).</p> <p>Economic: Concessional loans to banks selected to incentivise the private sector to enter RE market, provide co-finance and lead to commercialisation in rural areas; subsidies still considered to be best for targeting the poor.</p>

- Government and donor representatives agreed that donor support to Nepal's RE sector would decrease over time. Commercialising the RE sector through new financial intermediaries is part of a strategy to reduce the funding burden on Government and donors in the medium-to-long term.
- Respondents highlighted the continued need to provide targeted subsidies to the poor under the NRREP, acknowledging that many intended beneficiaries would not have access to credit and would otherwise be overlooked by the programme.

4.2 Incentives driving RE investment under the NRREP

The second part of the study's analysis on incentives focuses on the incentive structures that are shaping and constraining investment in renewable energy under the NRREP. We asked interviewees a series of questions to understand the incentives driving investment in off-grid RE in Nepal and any gaps or disincentives constraining investment. The results from these individual responses are aggregated in Table 3 below, using the categorisation of actor groups and typology of incentive structures outlined in Section 2.

Table 3: Incentives and constraints for investing in renewable energy in Nepal

ACTOR GROUP	INCENTIVES	CONSTRAINTS/ DISINCENTIVES
Sources of finance	<p>Policy/economic: National development, energy access, sustainable development, market development.</p> <p>Capacity: Knowledge of similar best practice models (eg Sri Lanka).</p>	<p>Capacity: Inadequate financial management capacity in AEPC led to design of CREF, with banks taking fund management role.</p> <p>Economic: Instruments are not always suited for the extreme poor. AEPC is revising their subsidy policy to improve targeting of vulnerable groups.</p>
Banks and private sector	<p>Economic: Profit; desire to break into a new market; financial instruments provided by Government/AEPC (concessional loans, risk guarantees) attract international financial partners.</p> <p>Reputational: Desire to be seen as a market leader.</p>	<p>Capacity: Lack of borrower risk profile; lack of capacity in some MFIs to channel finance to rural areas; insufficient knowledge of RE sector.</p>
Technical support	<p>Policy/economic: District development priorities, community development and energy access.</p>	<p>Economic: Choice of financial instruments can exclude the poor who cannot access additional credit or provide co-finance.</p>
Beneficiaries	<p>Socioeconomic: Desire to access energy; start new enterprises or promote income-generating activities; improve livelihoods; importance of co-benefits (health, education, internet access).</p> <p>Economic: Choice of financial instruments (subsidies of 30–50% can help poor finance investment in RE); credit available to more middle-income households or those with collateral.</p>	<p>Economic: choice of financial instruments (subsidy of 30–50% not enough for poor people); struggle to access additional credit or provide co-finance; lack of collateral.</p> <p>Capacity: Lack of business skills hinders investment in enterprises and limits income-generating activities investment potential; lack of knowledge about AEPC subsidy provision limits investment; red tape in accessing loans/subsidies from banks and AEPC limits investment.</p>

Key findings

- At Government and development partner level, efforts to promote national development, poverty alleviation and energy access were the primary drivers behind investing in RE under the NRREP. A lack of financial management capacity within AEPC, along with a desire to commercialise the RE sector and leverage additional private finance all contributed to the decision to use commercial banks to deliver finance under the NRREP.
- Commercial banks are primarily driven by profit and a desire to expand their business operations into new areas. Some actors also highlighted their desire to be leaders in new sectors such as RE that were helping promote national development (reputational incentives). The financial opportunities provided under the NRREP also provided an incentive, enabling the banks to receive concessional loans at very low interest rates from AEPC and lend out this money (along with their own co-finance) to other financial institutions at higher interest rates. This shows strong alignment in incentive structures between sources of finance and financial intermediaries.
- At the beneficiary level, socioeconomic considerations were the main incentive behind investment in renewable energy. Socioeconomic incentives for beneficiaries include income-generating activities, entrepreneurial development support and improvements in education and health.
- Local-level intermediaries and beneficiaries all highlighted that investment in RE technologies was strongly shaped (and often constrained) by the ability of individuals, households or communities to access sufficient finance. In many cases, rural communities and households benefited from AEPC subsidies to invest in RE installations. But with subsidies only accounting for 30–50 per cent of the cost of RE technologies, the lack of rural banking services, collateral or personal co-finance has restricted many from investing in new technology and benefiting from the NRREP.
- Red tape and lengthy applications slow down the loan approval process at banks and the subsidy approval process from AEPC, creating barriers to investment in RE technologies for potential NRREP beneficiaries.

Effectiveness of the NRREP in financing inclusive LCRD for the poor

5

In Section 5, we analyse the effectiveness of the NRREP in promoting inclusive LCRD investment. Recalling the PEA diagram in Figure 2, we aim to understand whether the new choices in the NRREP's financial landscape (which are shaped by the knowledge and incentives of different actors) are leading to effective investment in renewable energy that benefits the rural poor.

In this analysis, we use the term 'effective' to assess whether the NRREP's new financial design choices promote rural development, increase the scale of finance for investment in RE technologies and improves the ability of poor households and communities to access finance. These three dimensions of

effectiveness roughly correspond to the financial needs outlined in Section 3.3, but add an additional focus on development outcomes. During interviews with different actors in the NRREP value chain, we used three proxies – development co-benefits, leveraging additional funds and the appropriateness of finance for the poor – to capture the three dimensions of effectiveness.³ Table 4 provides a summary of findings from different actor groups in the NRREP value chain.

Key findings

- Increasing energy access is the main priority for all actors in the NRREP value chain, who also emphasised the strong co-benefits to beneficiaries

Table 4: Effectiveness of investing in off-grid RE in Nepal

ACTOR GROUP	CO-BENEFITS	LEVERAGING ADDITIONAL FUNDS	APPROPRIATENESS OF FINANCE FOR THE POOR
Sources of finance	Energy access, health, education, internet, income, reduced kerosene use, adaptation, low carbon (lesser priority).	40–60% of finance from AEPC. DDC/VDC will leverage funding. Private sector will leverage own funds.	Poor may struggle to access loans under CREF. Flexibility of loan and subsidy. Revision of subsidy policy to target the poor.
Banks and private sector	Less emphasis. Some mention of energy access, health, income generation, carbon reduction, education.	Banks plan to invest their own money in addition to AEPC subsidy.	Responses from banks did not reflect pro-poor objectives. Banks may have too high interest rates for the poor.
Technical support	Income generation, energy access, health, education, gender, skills training, internet, employment.	DDCs and VDCs will provide some co-finance. But unlocking local finance is unlikely to happen in large volumes.	It is important that subsidy stays flexible to poor people's needs. CREF may improve access to finance, but MFIs need more capacity to deliver.
Beneficiaries	Education, income-generating activities, enterprise development, health, increased savings, female empowerment.	Unlocking local finance is unlikely to happen in large volumes due to lack of collateral and low levels of household savings.	Subsidies (usually 30%) are not enough, and the poor cannot raise additional finance. There are no local financial institutions. Finance is mostly short-term.

³ This is not a holistic review of the NRREP's performance to date. The assessment follows the same methodology as Section 4, reflecting the responses of actors across the NRREP value chain, rather than independent data on how the NRREP is performing against its targets. It is also important to recall that the shift towards new financial instruments (credit) and new financial intermediaries (commercial banks) under CREF only began in March 2015. The opinions of different actors therefore refer to how new financial instruments and intermediaries are expected to perform in relation to the three criteria of co-benefits, leveraging and inclusive investment.

of rural energy access, including: enterprise development, income-generating activities, employment, education and health. These co-benefits are all linked to positive developmental outcomes for the poor. Low-carbon development is considered a secondary objective to development outcomes.

- Most actors believe that the NRREP's use of new financial intermediaries will help leverage additional funds for investment in RE technology. For example, respondents outlined how concessional interest rates will incentivise banks to invest more, and that DDCs and VDCs will increasingly co-finance NRREP projects as a result. They also said that extending banking services to rural areas will increase household contributions to technology installations. But many beneficiaries dispute that they will have adequate resources to co-finance RE installations due to a lack of collateral and low levels of household savings.
- Results from AEPC's 2014 Annual Review show that progress has been made in increasing energy access through the subsidy model (though progress has been slower than expected). Despite this overall increase in access, the choice of financial instruments for investing in RE projects in Nepal may not be appropriate for the poorest under the new CREF model. Many community respondents highlighted that they had difficulty accessing subsidies for installing RE. In particular, the poor face barriers to investing in RE because subsidies usually comprise 30–50 per cent of the cost and they do not have access to credit or sufficient enough personal capital to cover the remaining 50–70 per cent.
- Most actors predict that the rural poor will find it difficult to access credit through the CREF due to the lack of rural bank branches, high interest rates, red tape and lack of collateral. Banks have committed to delivering finance to rural areas through existing microfinance and cooperative institutions to meet this challenge. However, there is concern that these institutions lack the financial management and human resource capacity to manage and deliver these funds.
- Targeting the poor is a priority for all actors except the private sector, whose focus is on increasing market access and profit-making. Although NRREP subsidies have improved energy access for the rural poor, a number of actors stated that there is still no clear vision on how it will reach the poorest of the poor. AEPC is revising its subsidy policy, which may lead to more targeted support to marginalised groups in the future, but in the meantime many beneficiaries are worried that the NRREP's move towards credit financing will result in less overall subsidy support to those who need it the most.

Summary of findings

6

Investing in rural energy access is an important part of Nepal's strategy to transition to a low-carbon resilient development pathway. In this case study, we have analysed how Nepal is promoting the uptake of RE technologies in rural communities under the NRREP. We have used political economy analysis to outline the knowledge and incentive structures that have led to new financial design choices in the NRREP, focusing particularly on credit-based financing instruments and banks as financial intermediaries. We have also outlined the incentive structures that are driving (and in some cases, constraining) investment in off-grid RE technologies at all levels of the NRREP value chain. Finally, we have analysed whether the financial design choices are sufficiently aligned with the knowledge and incentive structures of actors across the value chain to effectively promote inclusive LCRD investment.

The following summary of these three areas of analysis can serve as a useful guide to policymakers, development partners, investors, technology providers and end users who are interested in understanding how financial design choices influence investment in RE technologies.

Knowledge and incentives influencing the NRREP's financial design choices

- The introduction of credit-based financing under the NRREP was based on the desire to encourage the long-term sustainability of the RE market in Nepal. Credit is seen as more sustainable because it can incentivise private banks to enter the RE market, reduce the burden on government and donor financing and target more beneficiaries.
- Despite this gradual shift towards credit financing, there is broad consensus that subsidies will continue to play an important role in enabling poor communities and households in Nepal to invest in RE, as the rural poor are often constrained by their inability to access credit. AEPC is revising its subsidy policy to improve its ability to target vulnerable groups.
- The selection of commercial banks as financial intermediaries has been driven by a number of factors, which include the perception that banks have better financial management capacity; a desire to reduce Nepal's dependence on donor financing (leading to banks leveraging their own finance); and the desire to commercialise the RE sector through banks and other private actors.

Knowledge and incentives influencing investment in off-grid renewable energy

- For the Government of Nepal and donors, efforts to promote national development, poverty alleviation and energy access are the main drivers of RE investment under the NRREP.
- Commercial banks are primarily driven by profit and a desire to expand their businesses into new markets. Under the NRREP they have been given financial incentives to act as financial intermediaries in the form of concessional loans that they can pass on at higher interest rates to other banks, MFIs, and cooperatives who are directly supporting investment in RE technologies.
- The perception that investing in RE technologies brings socioeconomic benefits – such as income-generating activities, entrepreneurial development and improvements in education and health – is the main driving force behind investment by NRREP beneficiaries.
- For many beneficiaries, RE investment is constrained by the inability of individuals, households or communities to access finance. With subsidies accounting for only 30–50 per cent of the cost of RE technologies, the lack of rural banking services, collateral or personal co-finance has restricted many of the rural poor from investing in new technologies and benefiting from the NRREP.
- Red tape and lengthy applications slow down the loan approval process at banks and subsidy approval process from AEPC, creating barriers to investment in RE technologies for potential NRREP beneficiaries.

Aligning financial design choices and incentive structures: the effectiveness of the NRREP in promoting inclusive LCRD investment

- Increasing RE access in rural areas is a priority that has been articulated by all actors in the NRREP value chain. AEPC has been successful in improving rural energy access through a number of technologies in the NRREP's first two years, using subsidies as the main financial instrument. Integrating RE technologies with development outcomes – for example, through income-generating activities, enterprise development and the NRREP's productive end-use component – has had a positive impact on rural livelihoods.
- The use of new financial instruments – particularly concessional loans – has been successful in incentivising commercial banks to enter the RE market. The new NRREP design choices are therefore addressing the financial needs for long-term and scaled-up LCRD finance. Since Global IME Bank and its seven partner banks have only recently signed MOUs with AEPC, it is too early to determine whether the banks are actually scaling-up the volume and reach of their investments through co-financing.
- Although NRREP subsidies have improved energy access for the rural poor in Nepal, a number of actors stated that there is still no clear vision on how the programme will reach the poorest of the poor by making finance more accessible. AEPC is revising its subsidy policy, which may lead to more targeted support to marginalised groups in the future. But in the meantime, many beneficiaries are worried that the NRREP's move towards credit financing will result in less overall subsidy support for those who need it the most.
- Many beneficiaries have difficulty accessing subsidies to invest in RE technologies. In particular, the poor face barriers because subsidies comprise only 30–50 per cent of the costs, and they do not have access to credit or sufficient personal capital to cover the remaining 50–70 per cent.
- The low provision of banking services in rural areas could exclude the rural poor from accessing finance under the new CREF model. Banks have committed to delivering finance to rural areas through existing microfinance and cooperative institutions. But there is concern that these institutions may not have the financial management and human resource capacity to manage and deliver these funds.

Recommendations



Renewable energy investment will continue to play an important role in Nepal's transition towards low-carbon resilient development in the years ahead. This study has shown a major shift in the way off-grid RE infrastructure is being financed in Nepal under the NRREP – particularly through the use of new financial intermediaries and instruments.

Although changes in the financial design choices of the NRREP have the potential to bring long-term sustainability to Nepal's RE sector, we have identified several factors that may restrict inclusive investment as the NRREP moves away from a subsidy-based model towards one that focuses on credit financing. Based on our findings, the following recommendations can help strengthen the delivery of inclusive investment in RE under the NRREP.

- As part of the subsidy policy revision process, AEPC should provide clear guidance on how they will provide targeted subsidies to the poorest and most vulnerable communities and households as the NRREP moves towards credit-based financing. This guidance should include provisions to target ultra-poor households and individuals for whom 30-50 per cent subsidies are insufficient.
- AEPC should review the subsidy application process in an effort to reduce red tape and streamline the delivery of subsidies, to make it easier for communities and households to invest in RE technologies.
- AEPC should work more closely with DDCs, VDCs and RSPs to set subsidy delivery targets at national and sub-national levels. The lack of consultation on targets is leading some service providers to promote RE subsidies to non-target beneficiaries to meet their quotas. These incentives should be reversed so that subsidies can be targeted to the poorest and most vulnerable.
- Decision makers should examine what incentives need to be provided to encourage commercial banks and microfinance institutions to open new branches in rural areas and offer new financial products for RE investment that target the poor, to ensure they can access financing under CREF.
- AEPC should consider launching a programme to support existing rural microfinance institutions, which may not have the financial management, technical knowledge and human resource capacity to enter the RE market and provide new financial products that are targeted at the poor.
- AEPC should commission a study in 2016 to review lessons from the first year of providing credit financing under the NRREP with Global IME Bank and its seven partner banks. This review should specifically analyse how effective credit financing has been in reaching poor and marginalised households and communities.
- Government, AEPC and donors should indicate their future financing commitments beyond 2017, when the five-year NRREP comes to an end. They should provide an early indication of whether the NRREP will be renewed or replaced with a new programme or initiative. In either case, they should also outline probable financial arrangements beyond 2017, to provide clear policy signals to the private sector and potential beneficiaries so they can plan their investment decisions.
- The main actors involved in energy supply in Nepal – particularly AEPC and the Nepal Electricity Authority – should begin a dialogue to develop a long-term integration plan for AEPC's decentralised energy systems and the national grid as the grid expands. One option for fast tracking this integration in the short term is creating mini-grids from existing micro-hydro systems, which could optimise their use and ensure a more reliable supply of energy.

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Annex 1 – NRREP factsheet

The NRREP has three components:

- **The Central Renewable Energy Fund component:** to institute the CREF as the core financial institution responsible for the effective delivery of subsidies and credit support to the RE sector.
- **Technical support component:** to accelerate better quality RE service delivery to remote rural households, enterprises and communities, which benefits men and women from all social groups and leads to more equitable economic growth. The technical support component covers the following sub-components: biogas; biomass energy; solar energy; community electrification; outreach and local governance; and institutional support. It also provides funding for a monitoring and quality assurance unit, a climate change and carbon unit, and a gender equality and social inclusion unit.
- **The business development for renewable energy and productive energy use component:** to contribute to an increase in income and employment generation potential for micro, small and medium-sized enterprises (MSMEs) in rural areas, particularly for men and women belonging to socially and economically disadvantaged groups.

The programme's **key targets** are:

- 25,000kW new mini and micro-hydro generation capacity in Nepal
- 150,000 households benefiting from community electrification
- 4,000 improved water mills installed
- 600,000 solar photovoltaic home systems installed
- 475,000 improved cooking stoves installed
- 130,000 household biogas plants installed
- 1,300 new MSMEs
- 19,000 jobs provided by MSMEs
- 2,800 existing MSMEs upgraded
- 15,300 households benefiting from new income-generating activities.

Of the total budget, the government's contribution is 40 per cent, with 20 per cent support from Danida, 14 per cent from NORAD, 12 per cent from SREP, 4 per cent each from DFID and GIZ, 3 per cent from UNDP, 2 per cent from KfW and 1 per cent from the Dutch government.

Table A1. NRREP budget

COMPONENT	FUNDS (US\$ MILLIONS)	% OF TOTAL
CREF	113.1	66
Technical support	40.1	24
Business development for RE and productive energy use	8.4	5
NRREP management	5.1	3
Studies, audits and reviews	3.4	2
Total	170.1	100

Annex 2 – List of interviewees

The research team would like to thank the following individuals who participated in interviews for this study.

INTERVIEWEE	INSTITUTION	POSITION
Madhu Sudhan Adhikari	AEPC	National advisor
Chet Prasad Amagai	Barpak VDC	Secretary
Kosiram Bhattacharya	Bhanpurna Bakery	Owner
Sunita Bishwokarma	Sisno Powder Enterprise	Member
Rishi Raj Bhatta	Apex Development Bank	District general manager
Ram Bahadur Bista	LED Babiyachaur	Member
Kul Raj Chalise	Gorkha DDC	Environment officer
Focus group participants	Barpak VDC	Micro enterprise members
Focus group participants	Babiyachaur VDC	Small and medium enterprise members
Bir Bahadur Ghale	Hydro Energy Concern Pvt. Ltd	Chair
Ghamrani Ghale	LED Barpak	Chair
Mukesh Ghimire	AEPC	Solar energy division manager
Kalu Giri		Solar home beneficiary
Yogesh Giri	Surya Power Company Pvt. Ltd.	Operations manager
Kjartan Gullbra	NRREP	Advisor
Saran Singh Gurung	Rural Enterprise Society, RSC Tanahu	Enterprise and livelihood officer
Prithvi Gyawali	AEPC	Head of CREF Secretariat
Bhuwan Karki	Ministry of Finance	Under Secretary
Tikaram Khanal	Babiyachaur VDC	Social mobilisation officer
Raju Laudari,	AEPC	Assistant Director
Bhim Raj Jolmi Magar	Jana Jyoti HH School, Surkhet	Management coordinator
Pushkar Manandhar	Asian Development Bank	Energy officer
Jeebach Mandal	Ministry of Energy	Joint Secretary
Ananda Raj Maskey	AEPC	Component manager, Renewable Energy Fund
Keshab Raj Pathak	Khamari Khola MHP, Surkhet	Chair
Shiva Sharma Paudel	Danida	Senior programme officer

INTERVIEWEE	INSTITUTION	POSITION
Prem Raj Pokharel	Surkhet DDC	Environment officer
Gokarna Sedai	Clean Energy Development Bank	Senior-in-charge
Akhanda Sharma	Ministry of Science, Technology and Environment	Under Secretary
Chakra Pani Sharma	Ministry of Federal Affairs and Local Development	Under Secretary
Chabi Lal Sigdel	Bidyapur VDC	Micro-hydro power planning committee member
Kumar Prasad Thapaliya	Aastha Nepal	Team leader

Several of the world's poorest and most vulnerable countries are leading the way in developing and implementing low-carbon climate-resilient development (LCRD) strategies. International and domestic climate finance can play an important role in implementing LCRD policies and plans in the least developed countries. This report analyses the new financial delivery structures in Nepal that have been set up to channel LCRD finance to the poor, focusing on the Alternative Energy Promotion Centre and its flagship initiative the National Rural Renewable Energy Programme. Using a political economy analytical approach, this report outlines the incentives shaping LCRD investment in Nepal, and whether these incentives have led to the design of new financing channels that are effective in delivering inclusive LCRD investment to the poorest and most vulnerable to climate change.

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This research was funded by UK aid from the UK Government, however the views expressed do not necessarily reflect the views of the UK Government.



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