
Modalities to Operationalise the Nepal Energy Challenge Fund (NECF)

PIF Core Team and Practical Action Study Team

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Executive Summary

The Policy and Institutions Facility (PIF) engaged a team of national and international consultants during the period August 2018 to January 2019 to carry out a study on 'Modalities for Operationalising Challenge Fund in Decentralised Renewable Energy'. This effort was in the context of the planned Nepal Renewable Energy Programme (NREP) and the reorganisation of the Renewable Energy (RE) sector under the federalisation process as part of the new constitution. This study was designed to consider opportunities to mobilise a Challenge Fund (CF) to address RE financing barriers in Nepal and provide recommendations on operationalisation and implementation modalities of the CF. The study analysed secondary as well as primary information from interviews and consultations with key stakeholders at national and sub-national levels. An in-depth review of existing documents on RE financing in Nepal and challenge funds was also carried out. Inferences from literature review were further verified and validated using feedback from key informant interviews and stakeholders' meetings including local consultations in nagarpalikas and gaupalikas from Karnali Province and Province 2 .

These assessments and consultations resulted in the study team identifying a number of major challenges in the Nepal RE market for a potential CF to address viz. absence of business models, the limited level of participation by financial and private sectors and unmet thermal energy needs. Also identified through the study were potential opportunities for CF to utilise viz. financing with local governments and supporting municipal-level solar plants under the Harek Basti Urja Basti (HBUB) programme articulated in the Ministry of Energy Water Resources and Irrigation (MOEWRI) White Paper. Analytical work and consultations also helped in identifying best practices from existing challenge funds in Nepal such as the use of fund managers, use of independent experts, transparency of operations, use of performance-based incentives etc. Best practices from challenge funds globally, indicate that CFs can support local development; offer multiple financial instruments; financing can be linked to energy service delivery; use of strong M&E systems and catalysis of innovative and paradigm shifting initiatives.

The study team has developed the Nepal Energy Challenge Fund (NECF) and associated modalities proposed to support Government of Nepal (GoN) policies and programming in RE. NECF has been proposed as a CF modality integrated into the CREF mechanism of AEPC. NECF will address key challenges in the RE sector in Nepal and will reflect relevant global and national best practices in its modalities. The goals for NECF has been developed based on GoN policies and NREP to transform the energy sector and associated ecosystem in Nepal. Four initial challenge windows have been recommended under NECF targeting private sector; Banks and Financial Institutions (BFIs), local governments and offering technical assistance. The objectives of these challenge windows, operating principles, process & management and possible examples of competitions have also been elaborated by the study team.

Beyond the initial financing by NREP, NREF will need to seek funding nationally in partnership with Local Governments (LGs) to utilise financial grants from GoN. NREF will also need to attract international funding from other Development Partners (DPs), international climate change and development finance mechanisms and philanthropic foundations. Initial specifications of funding to be deployed and the possible technologies and applications of the CF and have also been suggested by the study team.

The team has also developed modalities for the NECF including governance arrangements involving integration within CREF mechanism of AEPC. The three external support groups that are needed - Management, Information Technology (IT), Independent technical experts were also detailed by the team with project development and results monitoring support envisaged to be provided by technical divisions at AEPC. The team has also provided details about various stages in the process of NECF. The study team has also made suggestions and provided details about the various support tools required for the NECF to operate such as the environmental and social safeguards; fiduciary standards; information management and disclosure practices as well as an initial set of assessment criteria.

The study team has proposed financial management arrangements with associated details for NECF including finance flows and monitoring and evaluation. A preliminary risk assessment has been carried out and an initial set of risks viz. financial, legal, operational and political in nature have been identified and possible mitigation arrangements have been proposed by the study team. Finally, the study team has also developed a roadmap that identifies and sequences a set of important activities that needs to be implemented over a 60-month period in three phases. The roadmap identifies responsibilities as well as the duration and timeframe of these activities.

The study team believes that if implemented strategically NECF offers an opportunity to address key long-standing challenges in RE sector in Nepal around financing and private sector engagement. The team believes that NECF has a potential to play a catalytic role in addressing present challenges the RE development in Nepal with a possibility to offer lessons globally.

Table of contents

Executive Summary	iv
List of tables, figures, and boxes	viii
List of abbreviations	ix
Vernacular	xii
1 Context.....	1
1.1 Renewable Energy in Nepal	1
1.2 Renewable Energy Finance and Private Sector Engagement.....	3
2 Scope of Study and Methodology.....	5
2.1 Background and Objectives	5
2.2 Methodology	5
2.3 Limitations of the Study	7
3 Challenges, Opportunities and Good Practices	9
3.1 Challenges to be addressed by the Fund.....	9
3.2 Opportunities for the Challenge Fund	11
3.3 Challenge Fund and Best Practices	12
4 Strategy and Structure	17
4.1 Strategy for the Challenge Fund	17
4.2 Goals and Vision	19
4.3 Initial Challenge Windows.....	21
4.3.1 Challenge Window for Private Sector	22
4.3.2 Challenge Window for Banks and Financial Institutions	23
4.3.3 Challenge Window for Local Governments	24
4.3.4 Challenge Window for Technical Assistance	26
4.4 Challenge Window Specifications	27
4.5 Resource Mobilisation	28
5 Modalities	32
5.1 Placement and Governance	32
5.2 Processes.....	37
5.3 Support Tools	40
5.3.1 Safeguards	41
5.3.2 Fiduciary Standards	42
5.3.3 Information Management and Disclosure	43
5.3.4 Assessment Criteria	44

5.4	Finances and Financial Management	46
5.4.1	Finances	46
5.4.2	Financial Management	48
5.5	Monitoring and Evaluation (M&E)	49
5.6	Risks and mitigation.....	51
5.7	Roadmap for Operationalising Challenge Fund	53
6	Conclusions and Outlook	58
	References	60
	Annex I: Research Framework.....	62
	Annex II: List of People Consulted	64
	Annex III: Interview Protocol and Checklists	69
	Annex IV: Technology Scope of the Challenge Fund	73
	Annex V: Considerations to be Made on EMT for NECF	75
	Annex VI: Elements of the Information System for NECF	76
	Annex VII: Information Requirements for Applications	78

List of tables and figures

Table 1: Provinces and Municipalities Consulted	6
Table 2: Initial Applications and RE Technologies relevant to NECF	28
Table 3: Short-listing Criteria.....	45
Table 4: Due Diligence and Assessment Criteria	45
Table 5: Pre-qualification Criteria	46
Table 6: NECF Risks	53
Table 7: Roadmap for operationalising NECF	57
Figure 1: Diffusion of Household Energy Systems in Nepal (2005-2016)	2
Figure 2: Diffusion of Thermal Energy Systems in Nepal (2005-2016)	11
Figure 3: Goal, Strategy and Challenges of NECF	21
Figure 4: Governance Structure of NECF	33
Figure 5: Support Arrangements for NECF	36
Figure 6: Process Stages for NECF Competitions.....	37
Figure 7: Process Stages for NECF Local Government Competition.....	42
Figure 8: NECF Financial Flows.....	49
Figure 9: Monitoring and Evaluation at NECF	51

List of abbreviations

ACF	Advocacy Challenge Fund
AECF	Africa Enterprise Challenge Fund
AEPC	Alternative Energy Promotion Centre
AML	Anti-Money Laundering
AUM	Assets Under Management
B-O-O	Build-Own-Operate
BAT	Best Available Technology
BGFZ	Beyond the Grid Fund Zambia
BLCF	Business Linkages Challenge Fund
CF	Challenge Fund
CFT	Countering Financing of Terrorism
CIF	Climate Investment Funds
CREF	Central Renewable Energy Fund
DfID	Department for International Development
DP	Development Partners
DRE	Decentralised Renewable Energy
EDA	Enhancing Direct Access
EFFCF	Expanding Financial Frontiers Challenge Fund
EMT	External Management Team
ERA	Electronic Reverse Auctions
ESP	Energy Service Providers
EU DevCo	European Union Development Cooperation
FDCF	Financial Deepening Challenge Fund
FGD	Focussed Group Discussion
GCF	Green Climate Fund
GDP	Gross Domestic Product
GEF	Global Environmental Facility
GJ	Gigajoules

GNI	Gross National Income
HBUB	Har Ek Basti Urja Basti
ICT	Information Communication Technology
IP	Indigenous People
IPP	Independent Power Producer
kW	Kilo-Watts
kWp	Kilo Watt-peak
LG	Local Government
LGOA	Local Government Operations Act
MOEWRI	Ministry of Energy Water Resources and Irrigation
MHP	Micro Hydro Power
MLF	Multilateral Fund for the Implementation of the Montreal Protocol
MW	Megawatt
MWp	Mega Watt-peak
NECF	Nepal Energy Challenge Fund
NGO	Non-Government Organisation
NNRFC	National Natural Resource and Fiscal Commission
NRB	Nepal Rastra Bank
NREF	National Renewable Energy Framework
NREP	Nepal Renewable Energy Programme
NRREP	National Rural and Renewable Energy Programme
OPM	Oxford Policy Management
PIF	Policy Institutions Facility
PJ	Petajoules
PLGSP	Provincial Local Government Support Programme
PPP	Public-Private-Partnership
PV	Photovoltaics
RE	Renewable Energy
RECF	Renewable Energy Challenge Fund, Uganda
REF	Rural Energy Fund

SDG	Sustainable Development Goals
SHS	Solar Home Systems
TA	Technical Assistance
UCF	UNNATI Challenge Fund
UNDCF	United Nations Capital Development Fund
VFCF	Vendor Finance Challenge Fund
Wp	Watt-peak

Vernacular

Crore	10 million or 10,000,000
Gavpalika	Rural Municipality
Harek Basti Urja Basti	Providing Energy Access to Every Settlement
Lakh	100,000
Nagarpalika	Urban Municipality
Purnima	Full Moon
Sakchyam	Capable
Terai	Southern Lowlands in Nepal
Urja Karja	Energy Loan

1 Context

1.1 Renewable Energy in Nepal

Nepal is a mountainous country with an estimated population of 29.3 million in 2017¹. The country has a total surface area of 147,181 km² bordered by China and India². The Gross National Income (GNI) per capita was \$ 790 in 2017, buoyed by a high rate of economic growth from a base level of \$ 310 in 2005 and grew at a high rate of 7.85% in 2017³.

The primary energy production in Nepal has also grown over the same period (2005-2017) from 349 PJ to 451 PJ with the per capita energy supply growing at a higher rate from 14 GJ to 19 GJ⁴. Indicating that both energy production and supply seem to be growing at a much lower rate than the economy. However, Nepal has made substantial progress with renewable energy access with 3.6 million households in the country⁵. The Alternative Energy Promotion Centre (AEPC), since its establishment in 1996, has been promoting and disseminating various renewable energy technologies such as hydro, solar, biomass etc. that have increased energy access in Nepal significantly through renewable energy sources. Decentralised Renewable Energy (DRE) systems supported by AEPC have played a significant role in this energy access achievement with over 30 MWs of Micro Hydro Power (MHP) and over 1.26 Million of household energy systems installed by 2018⁶. In addition to MHP and household energy systems significant numbers of improved watermills, improved cook stoves, solar dryers and coolers, institutional solar photovoltaic (PV) and biogas systems as well as solar mini-grids have been supported through AEPC programmes. Figure 1 shows the significant achievements in diffusion of household Solar Home Systems (SHS) and household biogas systems in Nepal over the last decade through the catalytic role played by AEPC.

The Constitution of Nepal⁷, which was enacted in 2015 (2072 AD), has underscored the prominent role of Renewable Energy (RE) as an important development priority which is consistent with these achievements. The article 51 of the Constitution of Nepal highlights generating and developing renewable energy as an important means of ensuring efficient, reliable, and affordable energy supply and its proper use for the fulfilment of the basic needs of citizens. The Constitution has also incorporated federalism as the foundation of Nepal's political governance system and established a

¹ World Bank - <https://data.worldbank.org> accessed November 2018

² UN Data - <http://data.un.org> accessed November 2018

³ World Bank - <https://data.worldbank.org> accessed November 2018

⁴ UN Data - <http://data.un.org> accessed November 2018

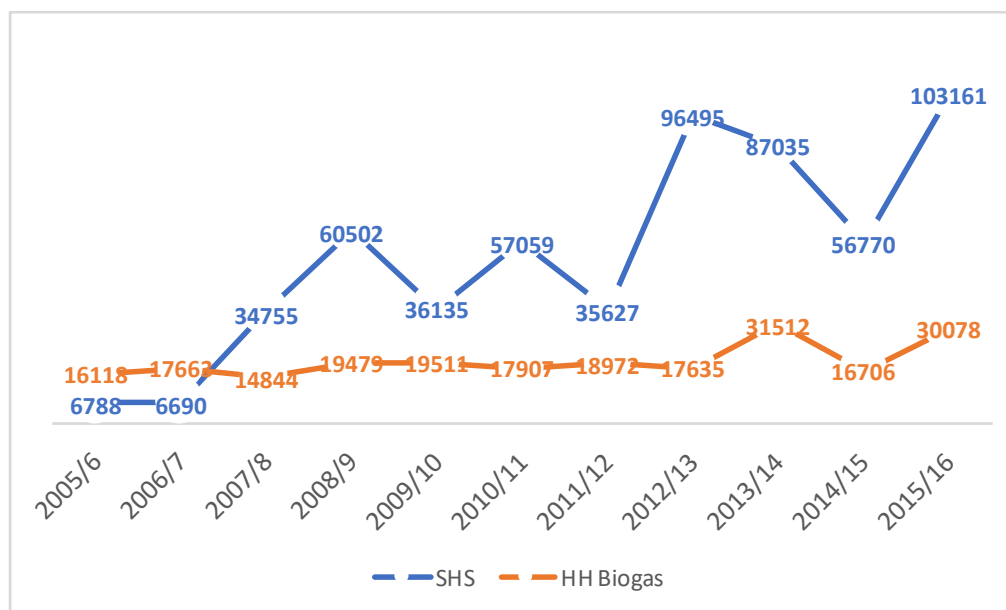
⁵ MOEWRI, 2018

⁶ AEPC, 2018

⁷ Constituent Assembly Secretariat Singha Durbar (2015), The Constitution of Nepal 2015, Unofficial translation by Nepal Law Society, IDEA and UNDP

federal, provincial, and local municipal level governmental structure decentralising the old structure but providing autonomy and authority in the new structure. As per the constitutional mandate, the local governments - Gaupalikas and Nagarpalikas have been delegated responsibilities for implementing alternative energy and other local level development projects. The subsequent Local Government Operation Act (LGOA)⁸ has also given importance to RE as a development priority.

Figure 1: Diffusion of Household Energy Systems in Nepal (2005-2016)



Source: Alternative Energy Promotion Centre, 2018

AEPC Board in 2017 approved National Renewable Energy Framework (NREF)⁹ which continues the integrated approach started in 2012 with the National Rural and Renewable Energy Programme (NRREP). NREF plans to coordinate the activities in the RE sector across all stakeholders particularly with the international Development Partners (DPs). Subsequently the White Paper¹⁰ - issued by the Ministry of Energy Water Resources and Irrigation (MOEWRI) in 2018 - also articulates plans to increase electricity access and continued development of other renewable and alternative energies that are sustainable, reliable, affordable, high quality and clean. The white paper also envisages establishment of a Challenge Fund (CF), which is expected to support generation of at least 200 MW from the installation of 100 kW to 500 kW solar systems in all 753 Local Governments (LGs). The White Paper also includes the plan to make Central Renewable Energy Fund (CREF) effective to mobilise and manage the funds that are received from the national and international sources.

RE has contributed to the increase in energy supply to support Nepal's development and to provide energy access in decentralised and rural parts of the country. The

⁸ Government of Nepal (2016), Local Government Operation Act 2074

⁹ AEPC (2017), National Renewable Energy Framework

¹⁰ Ministry of Energy Water Resources and Irrigation (2018), White Paper – 2075, Government of Nepal.

important role of renewable energy has been recognised in the constitution and has been delegated to local government.

1.2 Renewable Energy Finance and Private Sector Engagement

Conditions in Nepal for financial credit availability and access in general and specifically for access and availability of credit to private sector have been relatively strong. The total domestic credit provided by the Nepalese financial sector in 2017, as a share of Gross Domestic Product (GDP) was relatively high at 87.1% which was also higher than countries in the neighbourhood such as Bangladesh, Bhutan, India and Pakistan but lower than that of China¹¹. Nepal also scored a relatively high score of 50 in getting credit criteria in the World Bank's ease of doing business index which was also higher than the regional average for South Asia¹². There were a total of 149 Banks and Financial institutions including 28 commercial banks operating in Nepal in 2017¹³. The commercial banks dominate the financial sector landscape in Nepal accounting for over 83% of financial assets¹⁴. The banking sector asset portfolio is currently dominated by wholesale and retail, manufacturing and construction loans with about 87% of the portfolio secured against property as collateral¹⁵. Nepal is among the leading countries in South Asia for businesses and was ranked at 110 out of 190 in the World Bank's ease of doing business index with Nepal's score of 59.6 being higher than the regional average for South Asia¹⁶. The risk premium on lending¹⁷ in 2010 was 1.08% and the domestic credit provided to private sector as a share of GDP in 2017 was 81.1%¹⁸. This share for Nepal was again higher than countries in the neighbourhood such as Bangladesh, Bhutan, India and Pakistan but lower than that of China.

AEPC has historically used capital subsidy which offsets the investment cost of renewable energy systems as the major financial instrument to develop the renewable energy market and to catalyse the accelerated diffusion of DRE systems. Since 2000, the Subsidy Policy and the Subsidy Delivery Mechanism have been the major policy and institutional arrangements for delivering the financial grant. The subsidy was channelled through Rural Energy Fund (REF) and subsequently through CREF with a broader scope which also included use of debt finance for renewable energy systems and MHP in particular. Over the years CREF has worked in partnership with the banking sector for managing of both subsidies and credit funds supporting renewable energy

¹¹ World Bank - <https://data.worldbank.org> accessed November 2018

¹² World Bank (2018), Doing Business 2019: Economy Profile Nepal

¹³ Nepal Rastra Bank (2018), Bank Supervision Report 2017

¹⁴ Nepal Rastra Bank (2018), Bank Supervision Report 2017

¹⁵ Nepal Rastra Bank (2018), Bank Supervision Report 2017

¹⁶ World Bank (2018), Doing Business 2019: Economy Profile Nepal

¹⁷ Difference between the lending rate and treasury bill rate

¹⁸ World Bank - <https://data.worldbank.org> accessed November 2018

market. Since 2015, CREF has received NRs 4 billion and NRs 237.4 million for capital subsidies and for credit finance respectively¹⁹. From the funds received, CREF has disbursed NRs 2.1 billion for subsidy and NRs 230 million for credit so far, representing 53% and 97% utilisation respectively²⁰.

RE financing through AEPC and CREF has largely been subsidy-focused and efforts were mostly concentrated on managing the subsidy allocations from the government and grants from DPs. Financing through credit instruments have been rather limited despite the policy frameworks consistently encouraging credit financing and other innovative financing approaches. The NREF however aims to accelerate the process of transition from a subsidy centred to a credit-focussed model, together with smart subsidy provisions. The shift to federalism has also highlighted a need for innovative policies as well as institutional and delivery models that can attract and operationalise financing from the public and private sector for RE market expansion. The government's *White Paper* has also emphasised establishing a Challenge Fund as a means to expand the renewable energy development in partnership with the private sector and local governments.

¹⁹ CREF, 2018

²⁰ CREF, 2018

2 Scope of Study and Methodology

2.1 Background and Objectives

The Department for International Development (DFID) Nepal Renewable Energy Programme (NREP) which is expected to begin implementation in early 2019 will have a role in supporting the objectives of the NREF. DFID has committed about £18 million for activities in the small-scale renewable energy sector, on which up to £10 million may be channelled through the CREF.

This study is relevant in the context of plans to move from a capital subsidy model to a credit-based financing mechanism and where government budgetary resources are directly being channelled to local governments who are beginning to discharge their renewable energy mandates and utilise budgetary allocations. The study is also being carried out in parallel with another PIF supported study to analyse and make recommendations on how AEPC should re-organise itself in the context of federalism and decentralisation of renewable energy responsibilities.

The major objective of the assignment – “Modalities for Operationalizing Challenge Fund in Decentralised Renewable Energy” is to identify challenge fund options aligned with the NREF to address existing challenges in financing RE in Nepal. The specific objectives include:

- Understand the existing fiscal arrangements for subsidy, challenge fund and other RE financing;
- Compile learning of challenge funds in RE and other sectors in Nepal and abroad those are relevant to RE financing in Nepal.
- Identify opportunities for mobilising a challenge fund to address RE financing barriers in Nepal and leveraging investments.
- Provide recommendations on the institutional and governance mechanism, and fund flow process for operationalizing CF
- Operationalizing CF in the federal context and prepare detail implementation modality for the challenge fund.

The report covers the last three objectives to elaborate the modalities for establishing and operationalising challenge fund.

This report presents the results of the study carried out to analyse and recommend modalities in operationalising Challenge Fund in the RE sector in Nepal. This report builds on the Background Paper on Existing Experience already submitted and accepted.

2.2 Methodology

The study is based on secondary as well as primary information on the basis of interviews and consultations with key stakeholders at the national and sub-national levels. As mentioned previously, the background paper was prepared based on in-

depth review of existing documents on RE financing in Nepal and challenge funds. Findings of literature review were further verified and validated with information feedback involving key informant interviews and stakeholders' meetings. The framework used for the research is available at Annex I and consisted of:

Assessment of Secondary Data: In-depth reviews were carried out on documents on RE financing in Nepal and existing experience of initiatives that are comparable and relevant to the challenge fund. The review helped in identifying key challenges faced by the current institutional and financing arrangements for renewable energy and to be used as the basis in developing the challenge fund. Similarly, a review of the documents relating to resource allocation within the new federal structure and the technical capabilities of the local government level were also assessed mainly identify possibilities for mobilising co-financing for the challenge fund at sub-national levels.

Primary data collection through consultations: Consultations were carried out at federal, provincial and local levels with key informants and actors from entities responsible for promoting, implementing and financing the renewable technologies. Those consultations were held both at the federal level as well as at provincial and municipal levels. The details of stakeholders consulted is available at Annex II.

Consultations using the interview protocol and checklists available at Annex IV were carried out with key stakeholders at federal level mainly with the Government, BFIs, private sector, DPs, NGOs, existing challenge funds operating in Nepal and RE experts. The municipalities to be surveyed within the provinces were identified using the following criteria:

- The sampled municipalities should represent the general picture of whole of Nepal
- The municipalities should have local presence of private sector, banking and financial institutions and should also have relatively accessible locations to for RE projects;
- The municipalities should have significant energy access deficits and should be suitable for new DRE projects or already have implemented DRE projects.

Consultations were held with the two nagarपालिकाs and two गाउँपालिकाs from Karnali Province and Province 2 with details specified in Table 1. Of the two provinces, Karnali province has a lower penetration of energy services and therefore offers potential for future DRE programs. Province-2 is located in the *Terai* region which has a distinctly different set of energy needs and resources profile compared to other regions of Nepal.

Table 1: Provinces and Municipalities Consulted

Province	Rural Municipality Name	Urban Municipality name
Province 2	Basbariya (Sarlahi)	Brindaban (Rautahat)
Karnali Province	Barahtal (Surkhet)	Chandannaath (Jumla)

Interviews using protocol and checklist at Annex V were held with following key persons at urban/ rural municipalities:

- Elected members of urban/rural municipalities (Chairpersons, Vice-chairpersons and Ward Chairpersons)
- Chief Administrative officer and Infrastructure/ Environment Portfolio Holder and Programme Officers
- Renewable Energy User Committee/ Networks
- NGOs and private sector active locally

Similarly, interviews at the provincial level were held with following key stakeholders:

- Relevant Ministers and officials of the provincial governments
- Private sector
- NGOs and other development programmes/projects

A workshop to consult on the report and validate will be organised at with key stakeholders from the government, private sector, development partners, civil societies and bank and BFIs.

2.3 Limitations of the Study

The study objective is primarily to define the modalities to operationalise a challenge fund mechanism to address challenges to financing RE in Nepal. Therefore, the scope is primarily to define modalities based on best practices in Nepal and elsewhere to address specific RE financing challenges. The results of the study may be subject to the following limitations:

- The choice of challenge fund to address the RE financing challenges in Nepal was pre-determined based on policy statements by the government;
- There has been consultations and feedback from the private sector and financial sector to support a challenge mechanism and there were also requests to use challenge fund for technical assistance. However, the challenge fund window to support large-scale solar power plants in all local governments has been included based on government policy;
- There is an evidence gap about the performance and limited success of the credit financing of renewable energy in Nepal and the reasons for lower than expected performance;
- While the existing experience with challenge funds in Nepal and elsewhere indicate that a challenge fund mechanism can be an effective way to address financing challenges which involve the private sector, there is no guarantee that the RE financing challenges in Nepal will be solved by competitions under a challenge fund mechanism;

The renewable energy sector in Nepal is currently in a transition phase where the current centralised responsibilities for RE development and allocation of financial resources are being progressively channelled through local governments. This process

of decentralisation and establishment and capacity building of new local government institutions will happen over a long time and involves many uncertainties which will affect the RE financing in Nepal.

3 Challenges, Opportunities and Good Practices

3.1 Challenges to be addressed by the Fund

From the research, interviews, consultations and Focus Group Discussions (FGDs), during the study it was observed that the key stakeholders are facing a number of challenges in the renewable energy sector which have been identified. These challenges have been presented here for the Challenge Fund²¹ to address.

Absence of bankable projects and business models: One of the main challenges facing the RE sector and planned to be addressed through the challenge fund is the transition to a market driven model for renewable energy that is driven by private users and industry and increasingly financed by the Banking and Financial institutions. This has been also one of the objectives for RE financing frameworks such as NRREP in the past but hasn't had much success. This situation is consistent with the global experience where more commercial finance has been directed towards grid connected renewable Independent Power Producers (IPPs) than for DRE investments in mini-grids and off-grid technologies. There may be a number of factors which may have prevented development of a RE market in Nepal but one of the issues which have been highlighted in the discussions is an absence of financially viable and bankable models, led by private enterprises or Public-Private-Partnerships (PPPs). This unfulfilled objective of past RE financing frameworks presents an opportunity for using a challenge fund mechanism to organise competitions targeting the private sector to identify and finance bankable models for renewable energy business.

Limited participation by financial Sector: A closely related challenge has been about engaging BFIs in Nepal to invest own resources to finance renewable energy projects. There have been limited instances where Banks and Financial institutions have been involved in financing RE projects and many of these instances as part of an ongoing initiative by DPs. While such instances have been observed, most have not been replicated or scaled beyond the development initiatives in a self-sustaining manner. The higher levels of credit availability and ease of credit access²² prevailing in Nepal's financial sector has not been evident in the renewable energy sector. It is possible that a number of factors are responsible for this situation including the relatively high risks and low returns of DRE investments vis-à-vis the more secure investment opportunities available. This market failure presents an opportunity to use a challenge fund mechanism and to target the BFIs to offer higher risk tolerance to catalyse the use own financial resources to support renewable energy investments.

²¹ More details about these challenges are available in the background paper on existing experience with financing renewable energy.

²² World Bank (2018), Doing Business 2019: Economy Profile Nepal

Decentralisation of responsibility and resources: As a direct result of the constitution and LGOA delegating DRE responsibilities to the local governments and the government budgetary allocations to finance DRE systems being channelled to local government, the scope of central management and administration of financial resources for RE has now been limited to resources available from development partners. This transition of decentralisation of responsibility and resources may take years to be fully completed due to the need to build necessary institutional and human capacities at the local government levels and the institutional reforms needed at the federal level with AEPC and CREF. While the opportunity to blend international and national public finance at a federal level for RE may no longer be available, there exists an opportunity to blend international development finance with local governments and private sector to create opportunities which were not previously available.

Stakeholder challenges: the key renewable energy stakeholders at the federal and local levels consulted have expressed a number of difficulties with the existing system of centralised programme management and subsidy administration as well as with concerns with the ongoing transition to decentralised energy planning, implementation and financing. The renewable energy industry which is predominantly in the private sector expressed challenges with the process and delays in capital subsidy administration and welcomed the move to a performance-based payment system which would be results based but efficient. The private renewable energy industry is collaborating to establish a finance company to utilise the opportunities arising from a challenge fund mechanism. The local stakeholders also expressed support for the decentralisation and use of a challenge mechanism to bridge international finances and local finance to achieve optimal results. However, there were concerns about the limited capacity at the local levels to develop winning proposals, higher transaction costs for local participation and well as lack of clear specifications and criteria, opaque assessments, onerous access requirements. The centralised management of funds were also seen as a challenge from the perspective of local stakeholders. These concerns and challenges expressed by the stakeholders would be used as inputs in the design of the Challenge Fund with a view to addressing all such concerns. The positive response by the stakeholders – particularly private sector and local stakeholders offer the signal that a challenge mechanism if designed taking into existing concerns will gain acceptance with these important stakeholder segments.

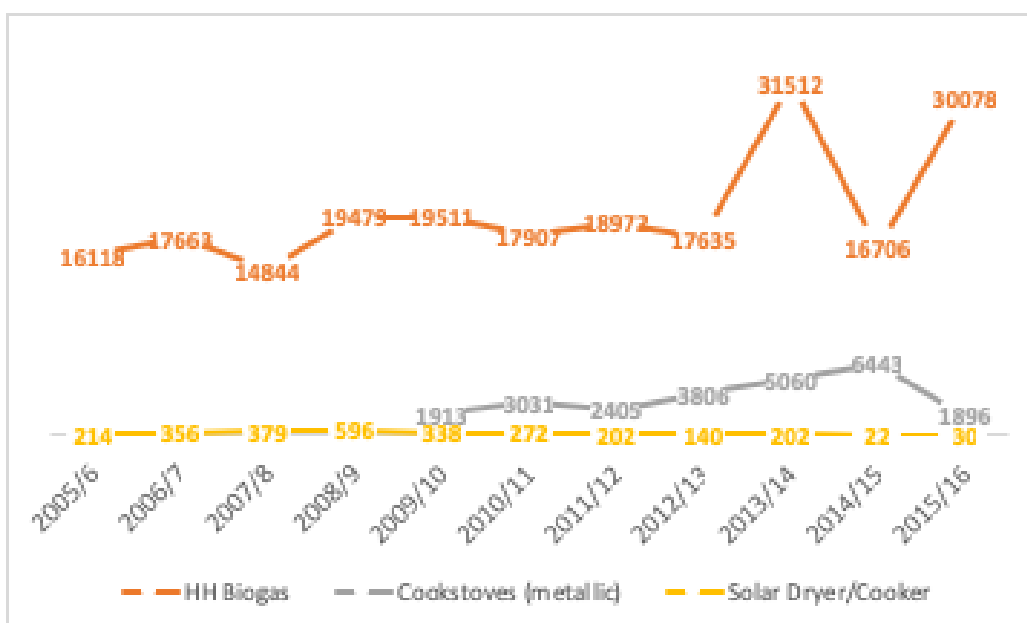
Unmet thermal energy needs: several stakeholders at the regional and local levels expressed concern about heating, hot water and cooking needs not being addressed sufficiently within the current renewable energy efforts and programme frameworks. The renewable energy initiatives thus far have resulted in offering subsidies to 474,703 thermal energy systems such as improved metallic cook stoves, solar cookers & dryers and biogas systems with over 88% of the systems being powered by biogas²³. This is shown in Figure 2. The Biomass Energy Strategy of 2017²⁴, recognises that 77% of energy needs in Nepal is still being met by traditional biomass such as firewood, cattle

²³ AEPC, 2018

²⁴ Ministry of Population and Environment (2017), Biomass Energy Strategy 2017.

dung and agricultural residue. This traditional biomass use is often through inefficient conversion technologies resulting in high levels of indoor air pollution and public health challenges. This situation is not limited to Nepal and is a global problem where the rate of thermal energy access and access to clean fuels is significantly behind the rate of electricity access. The traditional approaches to subsidising renewable energy-based systems seems unable to address the thermal energy challenges in Nepal and many countries around the world. The lack of progress with thermal energy access could be addressed through the challenge fund mechanism targeting issues around technology, fuels, efficiency, environmental impacts, business models and finance.

Figure 2: Diffusion of Thermal Energy Systems in Nepal (2005-2016)



Source: Alternative Energy Promotion Centre, 2018

3.2 Opportunities for the Challenge Fund

In addition to these challenges that could be addressed through a challenge fund mechanism, there may also be specific opportunities that may be relevant to a proposed challenge fund mechanism, which are:

White paper commitments: The government has committed in the white paper to install large scale solar power plants in the range of 100-500 kWp in all 753 local governments under the *Harek Basti Urja Basti (HBUB)* programme.²⁵ The white paper has also committed that 50% of the costs of these solar power plants totalling 200 MWp will be financed by the government through a challenge fund. This commitment offers the opportunity operationalise the challenge fund and organise competitions to pilot the effort in an initial group of local governments. The white paper does not give more specifics about the type of financial instrument or the source of this finance as well as other details. Generally, such financing is done within the framework

²⁵ Ministry of Energy Water Resources and Irrigation (2018), White Paper – 2075, Government of Nepal.

of public procurement rather than through a challenge mechanism. However, considering the government policy commitment, the innovative aspect of the commitment, the relevance to private sector and BFIs and the scale of resources that need to be managed²⁶, this could be considered as an opportunity. This white paper commitment also presents an opportunity to establish a challenge window which could direct the government financing towards energy performance rather than subsidising the investment cost.

Nepal Renewable Energy Programme: The new NREP will support the NREF and envisages a financial outlay of £18 million available for activities in the small-scale renewable energy sector. The advent of a new renewable energy programme provides an opportunity to address existing challenges in the renewable energy sector in Nepal through innovative financing and institutional approaches. The use of Challenge Funds in international development was pioneered by DfID as an approach to working in partnership with the private sector based on domestic experience in the 90s in supporting PPPs for urban regeneration in inner-city areas²⁷. Initial challenge funds like the Financial Deepening Challenge Fund (FDCF) and The Business Linkages Challenge Fund (BLCF) were used in the late 90s as open, transparent and competitive means to provide grants to the private sector. The experience and insights DfID have in the use of challenge funds for international development provides an opportunity for Nepal to establish a challenge fund for renewable energy development.

3.3 Challenge Fund and Best Practices

To set this section in context a characterisation of a challenge fund is provided for reference. A challenge fund based on its essential principles²⁸ and in the context of renewable energy in Nepal would be a financing mechanism which:

- Uses open competition with clear rules and objective procedures;
- Combined with high levels of efficiency, transparency and independence and imbibing other best practices;
- Challenging the private sector to implement innovative solutions through;
- Offering flexibility for the private sector to formulate and execute solutions and stimulate responses;
- To complex challenges and opportunities in the RE sector in Nepal and to
- Make competitively determined performance related payments and share risks with the private sector and
- Implements superior environmental and social safeguards and fiduciary standards.

²⁶ Approximately \$ 250 million for providing about 50% subsidy for 200 MWp

²⁷ Brain, Adam et al (2014), Meeting the challenge: How can enterprise challenge funds be made to work better, UK Aid

²⁸ Triple Line, 2014

We have analysed a number of relevant challenge funds to identify relevant practices and characteristics that are relevant to the proposed RE challenge fund in Nepal²⁹. Analysed were challenge funds such as the UNCDF/AEPC initiative the Vendor Finance Challenge Fund (VFCF) which ran through CREF a challenge on vendor financing for renewable energy suppliers, and the *Sakchyam* challenge fund which focuses on access to finance and which has implemented an end-user loan finance scheme for energy *Urja Karja*. The team held meetings and detailed discussions with the management teams of these challenge funds. In addition, reviews were also carried out for a number of challenge funds such as the UNNATI Challenge Fund (UCF), Advocacy Challenge Fund (ACF) and Expanding Financial Frontiers Challenge Fund (EFFCF).

Of particular interest is VFCF -a challenge fund competition run by CREF during 2017 to support renewable energy business models for vendor finance with funding from CREF Mechanism of AEPC, UNCDF and UNDP. In response to the competition, a total of 4 proposals were received from the private sector RE enterprises requesting matching financial support. The criteria for evaluating the proposals were pre-announced and 4 highly experienced independent experts carried out the evaluations. Three private companies out of four applicants were transparently selected through this process and were offered performance-based grants in the range of \$23,400³⁰ to \$27,900 covering 40-50% of market development costs and averaging 44%. The investments by VFCF totaled \$ 75,567 out of total investments of \$171,226 leveraging \$1.2 to each \$1 invested by VFCF. These private enterprises are currently under performance contract to train a total of 2350 clients and install 2250 PAYG solar energy systems, 300 RE based innovative drying systems and 150 solar pumping systems with 30% of all systems benefiting clients disadvantaged by social and gender considerations. The three contracted private enterprises are currently in the process of implementing their market development efforts and are being disbursed the grants on the basis of contracted and verified performance. The successful implementation of the VFCF in partnership with private sector by CREF Mechanism of AEPC underlines the potential for challenge funds to address RE financing challenges in Nepal.

These challenge funds offer valuable lessons and insights from implementation of challenge mechanism for agricultural development, advocacy and awareness creation as well as engagement of financial sector. In addition, the team reviewed challenge funds which are at an early stage such as the Purnima, Provincial Local Government Support Programme (PLGSP) Challenge Fund and Government Challenge Fund for Business Innovation. Our findings indicate that there is increased interest on part of government and DPs to use challenge mechanisms to support development and reconstruction at local levels and also to support innovative business approaches and entrepreneurship.

²⁹ More details about these challenges are available in the background paper on existing experience with financing renewable energy

³⁰ At an exchange rate of 1 US\$ = 114.87 on 7th February 2019.

In addition to the challenge mechanisms, a number of innovative financing approaches such as Micro-Hydro Debt Fund, Clean Start and Viability Gap Fund for Grid Connected Solar in the renewable energy sector in Nepal were also examined. The team held detailed interviews with the managers of these initiatives to identify lessons that could be used in the development of the proposed RE challenge fund for NREP and beyond. These innovative financing initiatives have had varying degrees of success in engaging the banking and finance sector and the private sector in renewable energy development on a commercial or near commercial basis.

The following best practices that are relevant can be noted from the review and analysis of challenge funds:

- The governance and management of the challenge fund mechanisms should be carried out by external management groups³¹ who bring the required business and process management skills. These groups will operate under the oversight of the government or investment or steering committees. This has been demonstrated by CREF in operating the VFCF;
- The evaluations of applicants for the competitions run by challenge funds should be carried out by independent experts who should remain anonymous to ensure the integrity of the process. This approach has been used successfully by Sakchyam and VFCF;
- The private sector has also adapted to this mode of performance-based incentives. The challenge funds have been able to shift the focus of renewable energy incentives and financial sector incentives from upfront capital subsidies or other forms of upfront financial grants to performance-based incentives where payments are only made on achievement of pre-agreed milestones.;
- The challenge funds have pre-defined the evaluation criteria³² which were made public increasing the level of transparency, which has resulted in innovative proposals being made by the target organisations. This higher level of transparency due to pre-defined and published evaluation criteria has helped in active engagement by private sector, proposing innovative approaches to the challenges/competitions;
- Most challenge funds in Nepal such as Sakchyam, VFCF, UCF and others haven't developed an on-line application and evaluation system but mostly rely on a manual system. Development of an on-line submission and evaluation portal will improve the efficiency and increase the transparency apart from bringing down the transaction and management costs. This will also help in access by sub-national and local stakeholders by reducing their transaction costs to access the challenge mechanism;
- The innovative financing mechanisms in renewable energy have had mixed results and partially due to the traditional approach of programme parameters being pre-defined as well as the existence of alternative financing mechanisms

³¹ Of specialised professional service providers

³² Such as VFCF specifying applicant capabilities and resources, key idea and impact the evaluation criteria

that can be accessed easily. These may also point to the need to have a challenge mechanism that encourages innovation and offers transparency and efficiency.

In addition to the challenge funds and renewable energy financing mechanisms in Nepal, the team reviewed the context and historical development of challenge funds in the UK for urban renewal and the replication of the challenge fund mechanism in international development to foster innovation and to engage the private sector. The team also analysed a number of global challenge funds that were relevant to the task of developing a challenge fund for decentralised renewable energy in Nepal. The team studied the FDCF, the pioneering challenge fund by DfID in the 90s in the use of challenge fund mechanism in development. Also examined was the Africa Enterprise Challenge Fund (AECF) - probably the largest challenge fund and considered to be a benchmark for other challenge funds to follow. The team also studies the Beyond the Grid Fund for Zambia (BGFZ) and Renewable Energy Challenge Fund (RECF) Uganda both of which offer useful lessons for Nepal in the use of challenge mechanisms in energy development in developing country contexts. A number of best practices that are relevant to the challenge funds in renewable energy in the Nepalese context were also identified:

- As indicated in the background paper, the experience in the UK with urban renewal challenge funds as PPPs for local area development is relevant to the current federalisation and decentralisation that is underway in Nepal. There are some efforts by Purnima and PLGSP challenge funds to address this opportunity in reconstruction and community development at local levels. These examples show that there clearly is an opportunity in the renewable energy sector to use challenge funds to support renewable energy PPPs in Nagarpalikas and Gaupalikas. So, the promotion of PPP structures in decentralised energy at the local government levels is a good practice that is relevant to Nepal today;
- While the traditionally Challenge Funds have been used to administer financial grants and this is still the case in Nepal, Challenge funds are being used to offer both grant and non-grant financial instruments and there is existing track-record in energy related challenge funds such as AECF in the use of non-grant instruments. This is an innovation that is relevant to Nepal considering the relative maturity of the financial sector as well as private sector and high levels of credit availability and access;
- Challenge funds are being used to provide energy access in service provision mode where the private sector is financed on the delivery of energy services than the delivery of energy conversion equipment. This is evident in BGFZ support to ESS through Energy Service Providers (ESPs). This practice is relevant to Nepal to ensure the sustainability of the systems that have been supported with government and DP resources and is particularly relevant to address the unmet thermal energy needs;
- Use of an external fund management team who brings the specialised skills for process management, financial management and results management has

been a key factor of successful challenge funds like AECF, FDCF etc. A similar arrangement has already been in use in Nepal by CREF in the use of handling bank and can easily be extended to challenge mechanisms;

- While the focus of the global energy sector and other challenge funds are on private enterprises, as presented in the background paper, there is strong body of experience in targeting challenge fund mechanisms at public sector and civil society. This might be relevant in the context of various Technical Assistance (TA) requirements such as institution building needs in Nepal relating to energy issues for Nagarpalikas and Gaupalikas, or the financial sector where civil society and training and capacity building organisations may have a role. The concept of cost-sharing and co-financing of TA projects could also lead to development of initiatives that are innovative and self-sustaining. This concept is further elaborated while conceiving the challenge fund.
- Strong monitoring and results measurement systems which allow accurate measurement of performance and results in an efficient manner are needed to ensure the delivery of outcomes contracted by challenge funds both at the level of the fund manager and the winning institutions. This has been a key feature and good practice of BGFZ and AECF and there need to be a central feature of the proposed challenge fund.

One of the major benefits of challenge funds have been incubating and supporting paradigm shifting innovations such as M-Pesa by FDCF and Pay-As-You-Go Solar by AECF and these challenge funds had included innovation as an important criterion for evaluations. There is an opportunity to use a challenge mechanism to encourage innovative thinking which could lead to transformative solutions in the renewable energy sector in Nepal. So, an important criterion for the challenge fund with adequate weightage could be innovation.

4 Strategy and Structure

4.1 Strategy for the Challenge Fund

The strategy for the proposed challenge fund has been developed based on the consultations and research that was carried out by the team during the period August to November 2018. During this period the team carried out extensive review of background material available on renewable energy market development, government policies, financing of renewable energy, institutional arrangements for renewable energy promotion and financing in Nepal. The team also held extensive consultations with the key stakeholders – AEPC, CREF, NNRFC, Banking Sector, Private sector, civil society, development partners and also various challenge funds that are being implemented in Nepal. In addition, as mentioned in previous sections the mission team also visited and held discussions with state government officials at two of the provinces - province 2 and Karnali. A number of meetings and discussions were also held with AEPC, CREF, OPM and DfID to align the efforts with expectations of PIF and the planned DfID support to NREF.

These consultations were aimed at analysing the existing policy and institutional framework, financing mechanisms for renewable energy promotion and the implications of recent mandate of local governments on policy, implementation and financial responsibilities for DRE with a view to identify the challenges that could be targeted by the proposed challenge fund mechanism. The consultations also provided insights into a number of concerns and challenges sub-national and local stakeholders have with the RE financing mechanisms that were summarised in the previous section, which will be utilised as design inputs for the Challenge Fund. The various consultations also offered significant inputs to define the opportunity space for the Challenge Fund and to make pragmatic recommendations for establishing and operationalising the Challenge Fund.

Based on the consultations, research on existing challenges with the RE financing mechanisms in Nepal and the good practices identified from challenge funds, the key elements of the proposed strategy for the challenge fund have been developed as:

- The Challenge Fund could be named Nepal Energy Challenge Fund (NECF) and could cover all energy³³ technologies relevant to Nepal but with an emphasis on RE. NECF would be technology neutral and allow the competitive nature of the Challenge Fund to ensure stakeholders competing to determine the Best Available Technologies (BATs) that offer superior and cost-effective performance. While the scope of the use of NECF in terms of energy technologies should be kept broad and neutral to allow technology innovation and future developments, it is expected that the focus of NECF will almost

³³ Energy includes both renewable energy and energy efficiency as well as cleaner fuels like biofuels and is listed in Annex II

entirely be on decentralised renewable energy and specific challenges would be organised in renewable energy technologies. A listing of possible energy applications that are either relevant to Nepal or already have a track-record in Nepal were compiled by the study team and is available at Annex V.

- The NECF would be supporting the energy and RE policies and programmes of the government of Nepal. These would include the current framework NREF, the HBUB programme of White Paper on Energy, Water Resources and Irrigation and energy provisions in Local Government Operation Act etc. The NECF will also continue to be influenced by future policy changes or introduction of new policies;
- The NCEF will be designed as a challenge fund that will offer high standards of governance and efficient management practices to attract additional funding from DPs, international climate finance mechanisms and international foundations to support clean energy development and climate change mitigation and adaptation in Nepal. International experience from challenge funds such as AECF show that this is feasible.
- The NECF will be designed to initially to address a set of important immediate challenges that has been identified and specified in the previous section viz. absence of bankable business models, limited participation by BFIs, decentralisation of RE responsibilities and resources to municipalities away from federal ministries, unmet thermal energy needs and stakeholder challenges with current renewable energy financing model. The NECF will also target opportunities presented by the HBUB programme and NREP. Different competitions or windows will be established to address each of the challenges;
- As NECF will make disbursements on the basis of energy performance and system output, it will establish strong performance and results monitoring systems to ensure energy service delivery verification which will be detailed in later sections. NECF will need a strong Information and Communication Technology (ICT) system with remote sensing and digital information capture to be established and supported by independent portfolio management and result monitoring support to manage the Fund.
- In line with the emerging trend for challenge funds, NECF should be designed to use a number of financial and policy instruments such as loans, equity, guarantee, public procurement in addition to grants based on the needs identified during the consultations and analysis.
- The NECF will be under the oversight of CREF mechanism of AEPC which will provide strategic oversight and act as the governance mechanism with AEPC and MOEWRI playing an administrative and control role through CREF. The management support for NECF will be by an external commercial bank responsible for process management³⁴, financial management and results management. The external manager will be competitively selected following

³⁴ Similar to the handling bank

public procurement principles and such an arrangement builds on the handling bank mechanism currently being used.

4.2 Goals and Vision

NECF has been conceived aligned with national policy priorities as well as international development and climate change priorities and commitments.

It is envisioned that the NECF will be able to transformational change in the *energy sector* and the *associated ecosystem* which will result in a fundamental change. The target sector will be RE and the target stakeholders would be consumers, policy makers, public sector and private sector organisations which are directly involved in the energy value chain.

The proposed goals of the NECF could be:

Transform the Nepalese energy sector and associated ecosystem to be innovative, efficient, transparent, market-enabled, environment and climate friendly, integrate gender equality and be socially inclusive to provide access to affordable, sustainable and modern energy for all in partnership with sub-national governments and private sector.

The vision and goals have been developed based on the aims of the National Renewable Energy Framework³⁵ but has been developed further to be strategic and long term.

The scope has been widened to include the *associated ecosystem* consisting of banks and financial institutions, sub-national governments, service providers, communities which have a role in enabling and supporting the actors who are directly involved in the energy sector.

The scope has been specified as energy to include all forms of energy including renewables but has been limited to being *environment and climate friendly* as well as being *affordable, sustainable and modern* which will ensure that renewable energy remains at the core foci of NECF. Refer to Annex V for a list of the energy technologies that are relevant to the challenge fund.

Based on good practices from experience with challenge funds in Nepal and elsewhere, it will be important to define the attributes that defines the NECF as *market-enabled, partnership with private sector and sub-national governments*³⁶. The *market-led* approach is central to the competitions that will be run by NECF and formation of PPPs between private and local governments a key element of NECF's strategy.

³⁵ AEPC (2017): National Renewable Energy Framework, approved by 71st AEPC Board Meeting dated 2074/07/16 (2nd November 2017)

³⁶ In the context of Nepal consistent with the division of governance responsibilities in energy, sub-national government primarily would be Gavpalikas and Nagarpalikas and to a lesser extent provincial/state governments.

The management of the NECF would need to match the service quality standards of good practices of challenge funds to be *efficient* in terms of business processes to optimise time and resources. The management of the challenge fund would also need to be open and *transparent* to ensure partners to have confidence and submit their best responses to competitions that will be organised by NECF. These attributes will also be important for mobilising additional resources from other DPs, foundations, international climate finance mechanisms as well as local governments.

Support for *innovation* should be at the core of NECF and a key reason why a new financing mechanism should be established. All proposals that will be supported by NECF will need to be significantly innovative³⁷ with the prospect of some outstanding innovations³⁸ being catalysed.

The NECF also needs to be operated according to global benchmarks for *transparency* and accountability in terms of compliance and conformity various fiduciary standards such as Anti-Money Laundering (AML). Combating Financing of Terrorism (CFT) etc. NECF will also need to integrate Gender Equality and Social Inclusion (GESI) as important decision-making criteria. NECF also needs to operate according to global accountability frameworks that ensure *transparent* audit and financial control frameworks as well as codes for ethical conduct and prevention of conflict of interests. Adherence to such global benchmarks will significantly increase the chances of NECF attracting external financial support including from international climate finance mechanisms such as Green Climate Fund (GCF)³⁹, foundations and trusts.

NECF's operations and the competitions to be organised will be aligned with global goals as defined by the Sustainable Development Goals (SDGs) and in particular SDG #7 Energy for Sustainable Development by ensuring *access to affordable, sustainable and modern energy for all* and SDG #13 by combating *climate change*. This will ensure consistency with national and global development plans and increase possibility to have synergies with efforts by government and DPs. This aspect should be taken care due to the anchoring to AEPC and MOEWRI.

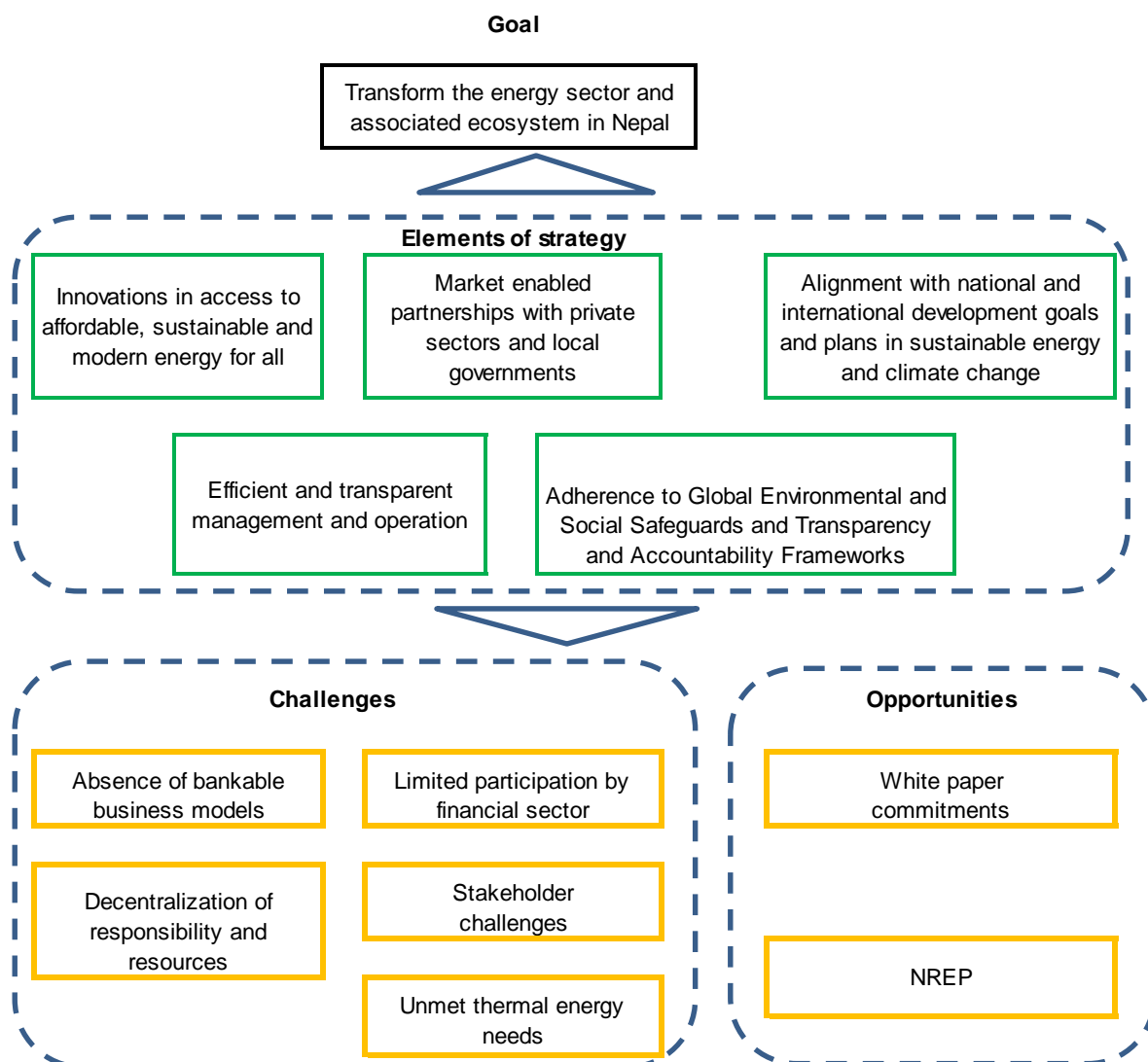
The proposed goals of NECF is expected to set the direction for its strategy, operations and organisational development. Figure 3 denotes a visualisation of the conceptual framework for the NECF.

³⁷ Including innovations based on existing projects.

³⁸ Such as M-pesa and Paygo solar innovations supported by FDCF and NECF respectively.

³⁹ Possibly through AEPC's accreditation scope

Figure 3: Goal, Strategy and Challenges of NECF



4.3 Initial Challenge Windows

NECF is likely to run a number of competitions to address specific opportunities to develop further the RE market and in particular the DRE market and support the policy priorities of GoN. Based on the research and consultations carried out during the course of the study it is suggested that the NECF is structured to implement four types of challenges as follows. While the underlying institutional structure and processes for these challenge windows remain the same⁴⁰, there are differences in the sub-objectives and the operating principles of these challenge windows. These features are explained below:

⁴⁰ Due to uniformity of the process and structural requirements

4.3.1 Challenge Window for Private Sector

This will be the main challenge window of NECF which will be in the classical challenge fund mold and directed at engaging the private sector to develop DRE markets in Nepal. This challenge window is at the core of the NECF and is expected to be relevant in the long-term. This window will be targeting to catalyse increased private sector involvement and investments in DRE and in particular to support the objectives of NREF⁴¹. As mentioned earlier the private sector is supportive of the establishment of a challenge fund and the renewable energy industry association is in the process of establishing a finance company to fully utilise this opportunity. In addition to the private sector, this challenge could be targeting PPPs – in particular partnerships between private sector and local or provincial governments. The objectives of the Private Sector Challenge window would be as follows:

- On a competitive basis, provide opportunities to private sector to propose highly innovative solutions to address a specific opportunity in the RE and DRE markets in a sustainable manner;
- Provide flexibility to the private sector to openly and transparently compete among themselves to propose solutions and implement them in an autonomous manner;
- Encourage innovative and ambitious initiatives led by the private sector and offer a range of financing and risk management instruments to be disbursed efficiently on energy service delivery.

Some of the key operating principles of the private sector challenge window would be as follows:

- Eligibility limited to private sector or PPPs with majority private sector participation and ownership.
- Financing could be in the form of grants, loans, equities, forfeiting etc. and private sector will have the flexibility to propose the required financial instrument.;
- There will be a minimum co-financing expectation of 50% from the private sector and can be blended with finance from central and federal levels of government and DP financing
- The financing will be provided on RE service delivery or linked to progression in physical achievements in RE and DRE with pre-agreed milestones which will be closely monitored with financing provided on achievement of milestones;
- The risks of implementation will be shared between the NECF and the private sector and the private sector may identify and propose the risk sharing mechanism, coverage etc. competitively.

⁴¹ Should the framework or policies be modified or change in the future, future challenge rounds would be adjusted accordingly.

Process and Management: The competitions organised under this window will be advertised and promoted widely to private sector organisations to generate a good number of targeted and innovative proposals to address the purpose. NECF may propose the eligibility criteria of private enterprises (minimum years of existence, business turnover requirements, geographical presence etc.) which may participate in each round of competitions depending on the context and competition objectives. However, in some competitions where established private sector may not likely provide the path breaking innovations, or activities that are of a highly risky nature, eligibility conditions could be eliminated to encourage start-ups and equity may be used as the financial instrument. Certain competitions that target sub-national action may also allow profitable cooperatives that meet eligibility conditions to participate competitively with the private sector. Examples of the type of competitions could be to provide a new business model for building and operating MHP projects or Solar Mini-grids in an area; Establish a market linked sustainable enterprise solutions for increasing demand to say 75% level in the existing mini-grid coverage area or provide energy solutions to cooking and heating needs using RE in a number of villages covered by a Gaupalika etc. The specific competitions will be defined by NECF and approved through the CREF governance mechanism and operated in accordance with operational principles and procedures. It is expected that majority of the funding deployed by NECF will flow through the challenge window for private sector.

4.3.2 Challenge Window for Banks and Financial Institutions

This challenge window of NECF will run competitions directed at engaging the Banks and Financial Institutions to increase the access to finance for RE projects and systems. This challenge window will be targeting the financial sector – primarily the commercial banks regulated by Nepal Rastra Bank (NRB) which account for the vast majority of the financial sector assets Strong Micro-Finance Institutions and Cooperatives may also be considered. Discussions with the current handling bank of CREF indicated significant interest from BFIs to such a challenge window. The competitions organised under this window will be a core element of NECF and second in importance only to the private sector window. This window would in particular be addressing the challenge of limited participation by the BFIs in supporting DRE projects. The objectives of the BFI challenge window would be as follows:

- On a competitive basis, provide financial and risk incentives to BFI to offer banking and finance products and services to key RE sector stakeholders – manufacturers, developers and end-users;
- Provide flexibility to the BFIs to develop and market financial products and services targeting RE and offer them in an autonomous manner under the supervision of NRB;
- Provide in an open and competitive manner identify opportunities for the BFIs to strengthen RE finance capacity and address barriers and risks that prevent RE financing.

Similar to the private sector Challenge Window this challenge window would offer the needed flexibility and ownership of the initiatives to the BFIs to define problems and

propose solutions in a competitive and meritocratic manner. The operating principle of this challenge window would be:

- Eligibility limited to BFIs supervised and regulated by NRB under the national financial supervision and control frameworks. Micro-Finance Institutions and Cooperatives with strong performance track-record and superior governance mechanisms may also be eligible;
- Financing could be in the form of grants, loans, equities, forfeiting etc. and financial sector will have the flexibility to propose the required financial instrument;
- There will be a minimum co-financing expectation of 50% from the BFIs in a competitive manner. The remaining finance could be a blend of DP finance and finance from both federal and sub-national levels of governments;
- The financing will be provided on RE finance delivery linked milestones or pro-rated to progression in financial disbursements for RE and DRE;
- The risks of implementation will be shared between the NECF and the BFIs and the mechanisms and coverage can be proposed by the BFI. If the financing initiatives are successful the financing will be repaid, else NECF will bear part of the loss⁴².

. The competitions organised under this window will be advertised and promoted widely to the BFIs through targeted outreach to generate a good number of targeted and innovative proposals to address the purpose. NECF may propose the eligibility criteria of BFIs (minimum years of existence, sizeable Assets Under Management (AUM) requirements, branch/non-branch geographical coverage etc.) which may participate in each round of competitions depending on the context. However, in some competitions where established private sector may not likely provide the path breaking innovations, eligibility conditions could be eliminated to encourage fintech start-ups that may not be regulated by NRB in partnership with BFIs. Examples of the type of competitions could be – development of a new financial structure for RE mini-grids or decentralised power generation; develop and offer a new finance or leasing mechanism for end-use energy system purchases; development of an electronic banking product that will increase access to credit for remote RE system retailers or end-users etc.

4.3.3 Challenge Window for Local Governments

This challenge window is being proposed in response to the HBUB programme in MOEWRI white paper and the expressed interest from the governmental stakeholders. Interest was expressed to use a challenge funding mechanism to drive innovation and allocate government resources for public purposes to develop and operate projects on a competitive basis. There may be value in carrying out a market assessment to gauge investment possibilities from the private sector and gauge the contours of an

⁴² The share of the loss to be covered will be determined during the competition and NECF will seek to offer the lowest possible risk coverage.

investment framework. This assessment may also cover the possibility of local market centers driven by strong demand for productive uses. The competitions under this challenge window will be aimed at supporting specific or a target number of renewable energy interventions by the stakeholders. The objectives of this challenge window would be:

- On a competitive basis, provide opportunities to private and public sector developers to Build-Own and Operate (B-O-O) specific RE power plants or offer RE services in a specified geographic area.
- The financial instruments are likely to be grants, loans, equity etc. and the NECF challenge window could provide a limited level of flexibility to the private sector to define the concessionality and the terms of the finance including timing and use⁴³ of finances. Opportunity should also be provided for the use of non-grant instruments such as equity or guarantees;
- Provide on an open platform RE stakeholders to move away from a capital-subsidy model and offer hardware-finance packages on a competitive basis and allow the market to determine the level of financial incentives required;

This challenge window would follow all the principles laid out in the Public Procurement Act 2063⁴⁴ in terms of processes such as open bids, pre-qualifications etc. This challenge window would offer more flexibility within the principles of the public procurement principles and will be competitive & open in nature. However, there may likely be restrictions on the scope as well as the level of autonomy on implementation due to the provisions of the public procurement principles.

This challenge window should be used selectively where there is considered by AEPC and MOEWRI to be a scope for driving innovation and there exists opportunity for financial gains for government and target beneficiaries through use of a challenge mechanism. Else it is recommended that a normal public procurement process should be used. The operating principle of this challenge window would be:

- Selective use in public purpose opportunities in RE that are first of its kind⁴⁵, where there is scope for innovation in business models or financing;
- Financing could be as grants with the flexibility to use non-grant instruments;
- The project will be financed by the private sector or the partnership, including PPPs and the government finances through NECF used to improve viability and bankability or mitigate risks;
- The financing will be provided on RE service delivery or linked to cost of investment;
- The risks of implementation will be shared between the NECF and the private investors and if the financing initiatives are successful part or the grants may be reimbursed, else NECF will bear the risk.

⁴³ Such as use of grant to bring down initial investment or the cost of energy service.

⁴⁴ GoN (2007), Public Procurement Act 2063

⁴⁵ Such as the 200 MWp solar power plans proposed in the white paper.

Process and Management: This challenge window will be used based only with opportunities that government considers where there is benefit through the use of a challenge type mechanism. This type of competitions will be driven by the government need for RE access and development related innovations and is different to the challenge windows for private sector and BFI. This window will follow all the publication and communication principles of public procurement Act and there could also be a pre-qualification stage based on technical and financial criteria. Examples of the type of competitions could be to determine the level of capital subsidy required to support energy service delivery in DRE market segments; identify and support implementation and financing models for first-of a kind RE interventions which could then be scaled up as public procurement packages; drive innovation to support DRE implementation models that blend federal and sub-national level resources with private investments to establish PPP models.

4.3.4 Challenge Window for Technical Assistance

There may be opportunities in RE and DRE related TA opportunities – relating to training and capacity building, awareness creation, stakeholder sensitisation, engagement and mobilisation in RE etc. where there may be opportunities for using a challenge type mechanism. This window is being proposed in response to feedback from sub-national level consultations with provincial and local governments. This challenge window could also be supporting the objectives of NREF and specific opportunities where the possible solutions are unclear or several possibilities exist. The objectives of the TA challenge window would be as follows:

- On a competitive basis, provide opportunities to service providers to offer innovative ways to address specific barriers and gaps to RE sector objectives in Nepal particularly aimed at local governments, community groups, small-and medium enterprises etc., including operation and maintenance of existing projects.
- Provide flexibility to development and application of TA solutions to address a particular challenge or a gap and implement them in an autonomous manner to meet the expected results;
- Encourage a transition to a result-based payment for TA services with cost-sharing, rather than the prevailing model of full payment for inputs.

Similar to local government window this challenge window will be used in a selective manner as opportunities arise and will differ to other challenge windows of NECF.

- Eligibility to all service providers from the public, private, non-profit, academia and other relevant type of organisations;
- Financing could be in the form of grants which will be payable on achievement of the necessary results;
- There will be a minimum co-financing expectation of 50% from the service providers in a competitive manner;

- Where the scope and nature of the deliverables are clear and the inputs can be valued and a clear terms of reference and budget can be estimated, regular public service procurement should be utilised rather than this challenge window;
- The risks of implementation will be shared between the NECF and the service providers where part of the costs may be off-set by NECF in the event of failure, whereas success will be rewarded;

The window will be announced and promoted in a targeted manner to all possible private research, NGO suppliers and service providers with the required skills. Since the financing is available only on the technical service or its impacts, eligibility conditions may be relaxed to encourage start-ups and new consortia to offer innovative responses. Examples of the type of competitions could be to develop and implement a financial sector capacity building programme on a fee-for-service basis; Development of RE service payment platforms for rural areas which will be self-sustaining through service fees; innovative solutions for operation and management of existing projects; development of self-sustaining marketing programmes for rural products that may create increased demand for RE in mini-grid service areas etc.

4.4 Challenge Window Specifications

Some of the aspects of the challenge window are specified below:

Limits for Individual investments: In terms of the upper and lower limits for financing from the NECF for individual investments the recommendation would be to keep the investment sizes as large as possible in a limited number of investments initially to minimise the transaction costs relating to the process and the challenge fund cycle and ensure value for money⁴⁶. The investment horizon may be increased to multiple years to increase the level of impact and associated commitment. However, there may be smaller opportunities that are exceptional in nature which exists particularly in local municipal level which may require lower levels of financing. Also, the matching financing requirements of the TA finance window is likely to be specific to the opportunities in question and the scale and coverage. CREF has managed VFCF to offer small grants in the range of \$ 30,000 which is considered to be exceptionally low. The local government finance window which could be piloted with HUBB may also offer government funding for renewable energy systems up to 500 kWp PV or 1000 kW hydro. A 50% level of funding for such solar and hydro installations could be in the range of \$ 700,000 to \$ 2,200,000⁴⁷. Considering these outer limits and allowing for some variations it is proposed that the range of financing available through NEFC⁴⁸ be up to \$ 1 million for each investment. Lower or higher levels of investment sizes may be made with approval from CREF governance structure with justifications. For the technical assistance challenge window, the level of co-financing is expected to be towards the lower end of this range and will be assessed during the definition of the

⁴⁶ Which could be piloted with HUBB programme

⁴⁷ Considering \$2.6/Wp for PV with storage and \$4.4/W for MHP in accessible locations. Based on author's estimates

⁴⁸ the private sector, BFI and public procurement windows

competition cycle. Where NECF uses non-grant instruments, the applicable scale of financing should be determined based on grant equivalents to be calculated using an appropriate methodology.

Technologies: While it is challenging to specify or limit the application of the challenge mechanism to specific technologies, especially when there are benefits to be gained from taking a technology neutral approach in many applications. One aspect to consider are the existence of the key challenges facing the renewable energy applications viz. lack of business models and participation of private sector as well as lack of participation by BFIs and reliance on a capital subsidy model. Also relevant is the challenge of unmet thermal energy needs. There are other challenges such as decentralisation which is not specific to any RE technology and the white paper commitment under HUBUB to use the challenge fund which is specific to PV power plants. Considering these factors, it is likely that the technologies providing electricity, lighting and thermal energy such as hydro, solar and biomass as well as productive end-use technologies⁴⁹ could be the initial focus of the NECF. These specifications being made with a caveat that NECF should adopt a technology neutral and more application-oriented approach.

Table 2: Initial Applications and RE Technologies relevant to NECF

#	Application	Technology
1	Lighting (home and pico)	Solar, hydro, hybrid
2	Electric Power (mini-grids and grid-connected)	Hydro, Solar, Biomass ⁵⁰ , wind hybrids
3	Thermal energy (cooking, heating, drying)	Biomass ⁵¹ , Hydro, Solar, other technologies.
4	Productive use and MSMEs	Agriculture, Agro-processing, extraction and processing, metal working, food-processing, supply chains, ICT etc.
5	Other energy applications (transport, energy efficiency etc.)	Hydro, Solar, Biomass

4.5 Resource Mobilisation

Based on the experience so far with challenge funds, it is assumed that the resources that will be made available to NECF will be in the form of grants without repayment conditionality. It is possible that in the long term NECF may be able to be a financial intermediary to channel loans, forfeiting or equities once required fiduciary standards and a strong track-record has been established.

⁴⁹ As specified in NREF

⁵⁰ Including waste-to-energy

⁵¹ Including waste-to-energy

Initial Resource Mobilisation: It is expected that initial resources to establish and institutionalise NECF and support initial set of competitions will be provided by NREP programme and GoN budgetary allocation through AEPC/MOEWRI. However, it is important for NECF to attract additional international and local financial resources in the medium to long term to ensure that finances are available to address remaining challenges with transforming the energy sector in Nepal as well as ensure sustainability of NECF operations.

External Resource Mobilisation: The modalities for operationalising NECF elaborated in the next sections have been developed keeping in mind prevailing international benchmarks for fiduciary standards and safeguards. This aspect of the modalities will help to ensure that the track-record of NECF when established will meet expectations of future supporters. However, the possibility of additional international support will depend on the initial track-record that NECF creates with its initial competitions and the specific innovations by private sector and BFIs that can be attributed to NECF. Future financial support from NECF could come from other DPs interested in supporting RE financing in Nepal⁵², as well as philanthropic foundations which may have similar objectives. Experience from other challenge funds such as AECF demonstrate that this is indeed feasible.

Internal Resource Mobilisation from Local Governments: It is also important for NECF to attract resources from the local governments – Nagarpalikas and Gaupalikas, who are responsible for RE under the new constitution. The local governments are responsible for RE and DRE but also education, health, agriculture and livestock and infrastructure. Consultations by the team with local governments in province 2 and Karnali found that local governments currently have limited capacity for planning, budgeting and programming for all the subjects that are under their responsibility including RE. Discussions also revealed that where possibilities of grid extension exists or distribution of portable RE devices like cookstoves, nagarpalikas and gaupalikas are likely to allocate budgetary resources towards such tangible and less risky RE options irrespective of national programming frameworks like NREF. While some nagarpalikas and gaupalikas expressed interest in partnering with a challenge fund, it is primarily driven from the perspective additional co-financing from DPs for the local government rather than addressing local RE finance or private sector challenges. Currently local governments are at an early stage of institutionalisation and with relatively low level of capacity and is not in a position to make legally binding administrative or financial commitment to NECF. This situation is along expected lines while the government machinery is being established at the local levels. At this stage NECF modalities should be developed for creating a role for local government in its governance and the structure and allow local governments to participate in NECF. The modalities should also allow for a local character for NECF to address aspirations by local governments during consultations that local funds should be managed locally and decisions taken

⁵² aided by MOEWRI and MOF while finalising cooperation agreements

locally. However meaningful participation by Nagarpalikas and Gaupalikas in NECF may only happen within 2-3 years of NECF establishment and after initial results have been show-cased. Some of the local governments may be early movers⁵³ in engaging and others will follow once the benefits of partnership for local governments are evident through impacts of NECF.

Internal Resource Mobilisation from Federal Government: Under the constitutional provisions, the government has established National Natural Resource and Fiscal Commission (NNRFC) as a finance commission⁵⁴ to make recommendations to ensure equitable distribution of natural and fiscal resources among federal, state and local governments. The NNRFC recommendations will result in revenue distribution, equalisation grants, conditional grant and sharing of revenues from natural resource endowments with local governments⁵⁵. NNRFC will be using an Infrastructure Index for allocating resources to local governments. This Index weights electricity access at 30% with 50 % weightage to the road density 20 % to access to ICT⁵⁶. Therefore, local governments with lower road density and low electricity access could be possible partners for NECF. NNRFC will also provide conditional grants to local governments for a number of special purposes including implementation of programmes operated with foreign aid and meeting international commitments by the national government⁵⁷. The conditional grants are additional to other fiscal transfers and will be disbursed based on results achieved. So conditional grants might be another avenue which may be relevant for NECF to engage with local governments to develop competitions linked to DP programmes on RE that have SDG and climate change commitments. This approach may also be of interest to Nagarpalikas and Gaupalikas as the conditional grants are additional and will increase the resource availability for RE development at local level. NNRFC also informed that PPPs may be added to the eligibility conditions for conditional grants in the future⁵⁸, which may also enhance the relevance of NECF to local governments especially as AEPC has already signed MoUs with 6 provincial ministries of Physical Infrastructure and Development. Therefore, channelling fiscal transfers and conditional grants to local governments for RE remains a distinct possibility which the NECF should pursue after the initial establishment period when there will be a better evidence base for a clearer engagement strategy.

In addition, if and when NECF manages large-scale public procurement programmes such as HBUB municipal solar power plants programme, the management fees that it receives may support institutional development and sustenance. However, local government challenge window should be used selectively where there is a clear value

⁵³ Such as Chandannaath Nagarpalika or Barahtal Gavpalika that the team consulted.

⁵⁴ GoN (2017), National Natural Resources and Fiscal Commission Act 2017 and GoN (2017), Inter-governmental Fiscal Management Act 2017

⁵⁵ NNRFC (2018), Recommendations on the Transfer of Fiscal Equalization Grant from Federal Government to the Province and Local Governments for the Fiscal Year 2018/19

⁵⁶ NNRFC (2018), Recommendations on the Transfer of Revenue Distribution from Federal Government to the Province and Local Governments for the Fiscal Year 2018/19

⁵⁷ NNRFC (2018), Recommendations on the Transfer of Conditional Grant from Federal Government to the Province and Local Governments for the Fiscal Year 2018/19

⁵⁸ During discussions with the team in September 2018

addition through a challenge mechanism and not only based on revenue generation considerations for NECF.

5 Modalities

5.1 Placement and Governance

The NECF is proposed as a modality of CREF mechanism under AEPC should be under the aegis of the MOEWRI. As CREF is de facto the financing/investment division of AEPC and the mechanism with a mandate to finance renewable energy, the NECF will be operated by the CREF. In the current organisational structure CREF functions as an independent mechanism which reports to the AEPC Executive Director with a firewall between the governance and operations of CREF and AEPC⁵⁹. It is understood that this separation independence in terms of governance and operation is planned to be maintained by the government. Since CREF is already operating a challenge mechanism VFCF with the support from UNCDF, it is familiar with Challenge Funding approaches. CREF already has a governance mechanism which consists of energy sector and finance related institutions such as MOEWRI, MoF, NRB etc. CREF also has the experience in working with BFI and private sector - two of the key stakeholders NECF will be targeting. Also, as the budgetary allocations for subsidies will be gradually channeled directly through Nagarpalikas and Gaupalikas the need for a centralised government capital subsidy management mechanism is no longer critical. Therefore, the NECF will be able to leverage the existing skillsets on RE financing and understanding about the financial sector and private sector that resides at CREF with significant mutual benefits.

However, the legal basis for CREF is rather weak and the mandate for CREF is linked to various government acts and renewable energy programmes and frameworks. While VFCF has been a good initiative, implementing the higher level of ambition in the NECF fund requires more organisational capabilities, stronger information, finance and administration, management skills and robust performance and results management. So, to effectively manage NECF, CREF mechanism of AEPC needs to be strengthened and established on a more permanent legal foundation and an institutional support and assistance programme⁶⁰. However, many of the capacity constraints at CREF can be resolved through engagement of an external management group similar to the handling bank arrangement currently being used, which is consistent with international best practice. An Information technology platform which offers string results monitoring capabilities⁶¹ should also be developed for submission of applications, carrying out the selection process and monitoring of management of results and finances.

The institutional positioning and Structure of NECF is given in Figure 4 and NECF will be integrated into the existing governance structure of CREF mechanism of AEPC

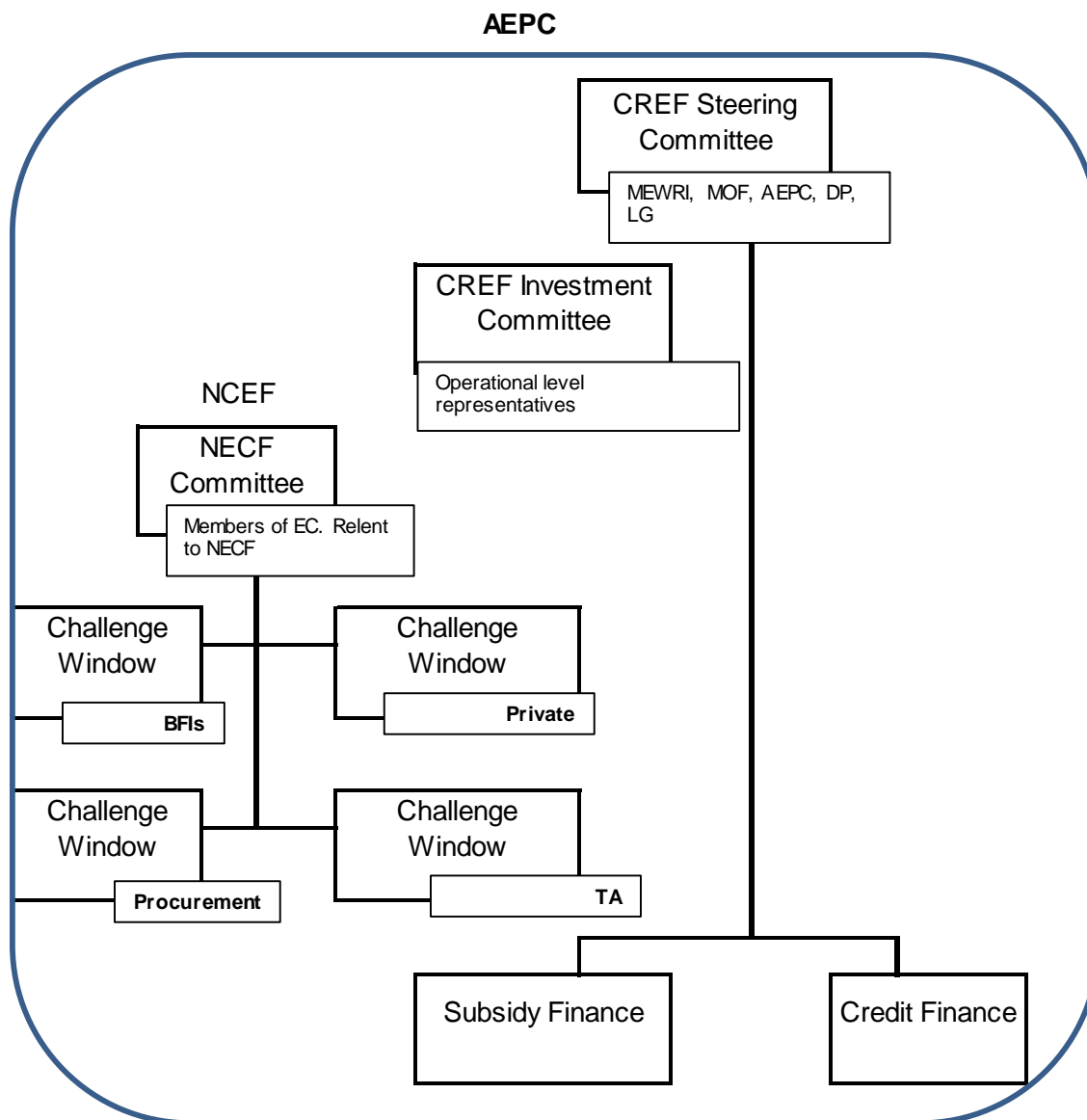
⁵⁹ 2018, AEPC Annual Progress report page 11

⁶⁰ The proposed AEPC Act which is under review is likely to offer a stronger legal basis

⁶¹ There are examples of such systems already under VFCF such as the one developed by Gham power – a private sector beneficiary of VFCF, which could be a model to build on.

while CREF’s current functions relating to credit and subsidy financing will continue under the current governance arrangements.

Figure 4: Governance Structure of NECF



The roles of the various governance mechanisms with respect to the NECF will be as follows:

CREF Steering Committee: The composition of the CREF Steering Committee in the present form is adequate and as the Board can continue to be strategic in nature vis-à-vis NECF. It is however suggested that from the NECF perspective the composition of the board be expanded to include representation from the local governance levels. This could be a senior representative self-selected by the participating municipalities which will be participating in the NECF or another appropriate government representative who can reflect the interest of the local governments in strategic decisions relating to NECF within CREF. It is assumed that the initial decision to operate NECF by CREF

with necessary amendments to the operation manual will be taken by CREF Steering Committee or the AEPC Board.

CREF Investment Committee: The investment committee currently has a broad oversight and management function which can be applied to NECF as well. It is suggested that the Investment Committee is strengthened by members representing the interests of the local governments and also the representatives of DPs who will be contributing to NECF⁶². The CREF Investment Committee will approve the launching of new competitions or additional challenge windows by the NECF and will in particular approve the budgetary allocations and conditions. The CREF Investment Committee will also approve operational procedures, major process changes with NECF as well as procurement of major services of NECF such as the external management contract; information system/portal development contracts etc. CREF Investment Committee will accord the final approval of the recommendations of the NECF Committee on the NECF challenge awards/results.

NECF Committee: will have a similar function like the investment committee of CREF. However, this will be a committee consisting of the members of the CREF Investment committee rather than independent experts as NECF will be using anonymous independent experts for assessments. The NECF committee may have the following membership:

1. Representative of MOEWRI in the CREF Investment Committee;
2. Representative of AEPC in the CREF Investment Committee;
3. Representative of DP supporting the Challenge Window;
4. Representative of the, provincial and local government(s) which the challenge window/competitions is targeting geographically;
5. Representative of civil society as observer.

The representative of the DP and local government will vary according to the challenge window or competition. It could be possible to have multiple DPs and multiple local governments for complex challenge windows in the future. The NECF committee will make the final recommendations on the organisations/consortia which will be provided the financing under each competition. The recommendations of the NECF committee will be considered and approved by CREF Investment Committee.

In addition to the governance structure there will be three groups which will be an important part of the NECF ecosystem, which are:

External Management Team (EMT): The EMT would primarily be function as the fund manager but in a supporting role to NECF/CREF. The NECF will be managed through such an EMT which will be procured and selected through an open call by CREF. The role of the EMT will go beyond that of the fund manager to include support to NECF on management of the competitions, investments and their impacts that go beyond the traditional financial management role. The procurement procedure can be similar to the

⁶² Starting with DfID as a contributor NREF and NECF.

selection of the handling bank to manage the subsidy and credit funds as is being practiced currently. Annex III provides some of the aspects to be considered in selecting the EMT. An EMT is being suggested to manage the NECF in keeping with the international best practice and the past arrangements that were being followed by CREF under NRREP. The role of the EMT is to support CREF team in the operational management the NECF by providing, financial management, treasury management and operational management of the finances. Some of the considerations to be made for engaging the services of an external management team is provided in Annex V.

Independent experts: NECF will also empanel a group of experts with skills such as renewable energy, technologies, climate change, international finance, legal issues, private finance, rural development. sub-national expertise⁶³, gender equality and social inclusion, indigenous people, environmental and social safeguards, risk management, PPPs etc. These experts will be remunerated for the assessments and reviews carried out on each of the proposals assessed in response to competitions organised by NECF. The independent expertise that these individuals will offer will aid the NECF committee in making funding recommendations to the CREF Investment committee. All the empaneled experts would sign a confidentiality and non-disclosure agreement with NECF. The identities and association with NECF by the independent experts will not be disclosed by both parties.

Information System Service Provider: NECF will automate the process of challenge fund applications, review, contracts management and results management through a bilingual portal available in Nepali and English. All applicants will submit applications on-line, reviews will be carried out online and progress reports, portfolio and results management will all be carried out with the support of this system. NECF will engage an IT service provider who will design and develop an ICT based process management system and portal and will continue to offer management support for the system. A website for NECF will also be developed and the application portal linked/integrated into the NECF website. All relevant updates on competitions, short-lists, results and progress made will be made available to the general public, government and DPs increasing the transparency and openness of NECF. Some of the key elements of the proposed information system is provided in Annex VI.

In addition, two important functions relating of origination and development of proposals particularly from local governments as well as portfolio management and results measurement can be accomplished using existing staff and consultants at AEPC. These are:

Proposal Development: AEPC offer its internal expertise and will also empanel a group of experts or firms who will be available to provide handholding support to applicants particularly from sub-national levels. This support will be available only to short-listed concepts with high potential and will be available to support opportunities which may need professional support to be developed into the standards expected by

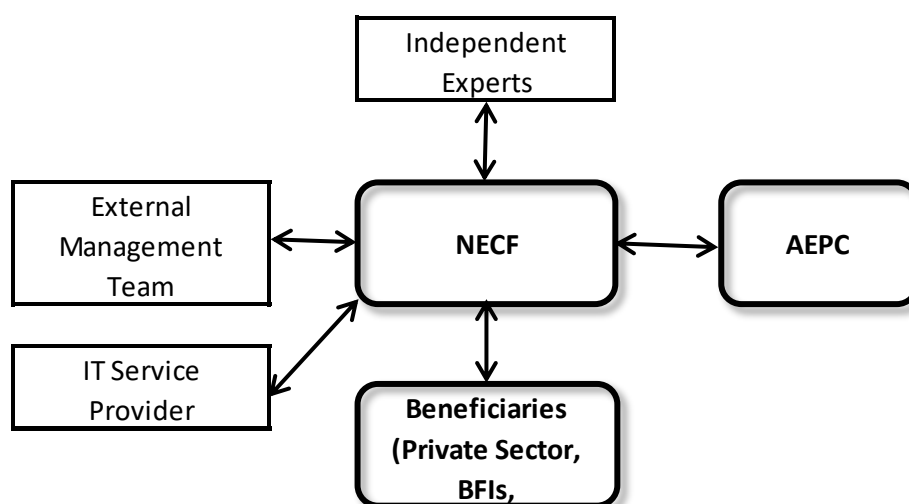
⁶³ Relevant to specific provinces and municipalities where NECF plans to operate.

NECF. This expertise is being proposed based on feedback from municipalities and is particularly relevant in the aspects of required high levels of fiduciary standards and safeguards that are expected by NECF as well as to meet the level of financial analysis and modelling as well as definition of metrics for results measurement required by NECF. This support will be delivered through a combination of direct interaction by AEPC staff and consultants with short-listed applicants and remote support.

Portfolio Management and Results measurement: To aid in strengthening the monitoring and evaluation capabilities, AEPC will offer support from its monitoring and evaluation section with additional external experts and consultants to provide support in management of contractual relationship with beneficiaries during the implementation stage well as post implementation. The services will be provided in tandem with the progress monitoring and results verification by the NECF and EMT to provide specific skillsets relevant to proposals. The support will be through a combination of remote review and recommendations of the progress reports as well as site visits⁶⁴;

The external support groups are being proposed in addition to use of AEPC staff and consultants due to the specialised level of skillsets required, independence, level of efforts required as well as the dynamic nature of the energy market in Nepal. All the three support groups will be procured by CREF mechanism of AEPC using open and transparent public procurement procedures consistent with the public procurement act and regulations and in a similar manner that has been used by CREF mechanism of AEPC in the past for VFCF and handling banks. AEPC will identify the need for external expertise and consultants on proposal development, portfolio management and results measurements based on an assessment of its internal skillsets. The relationship between NECF and the support groups is illustrated in Figure 5.

Figure 5: Support Arrangements for NECF

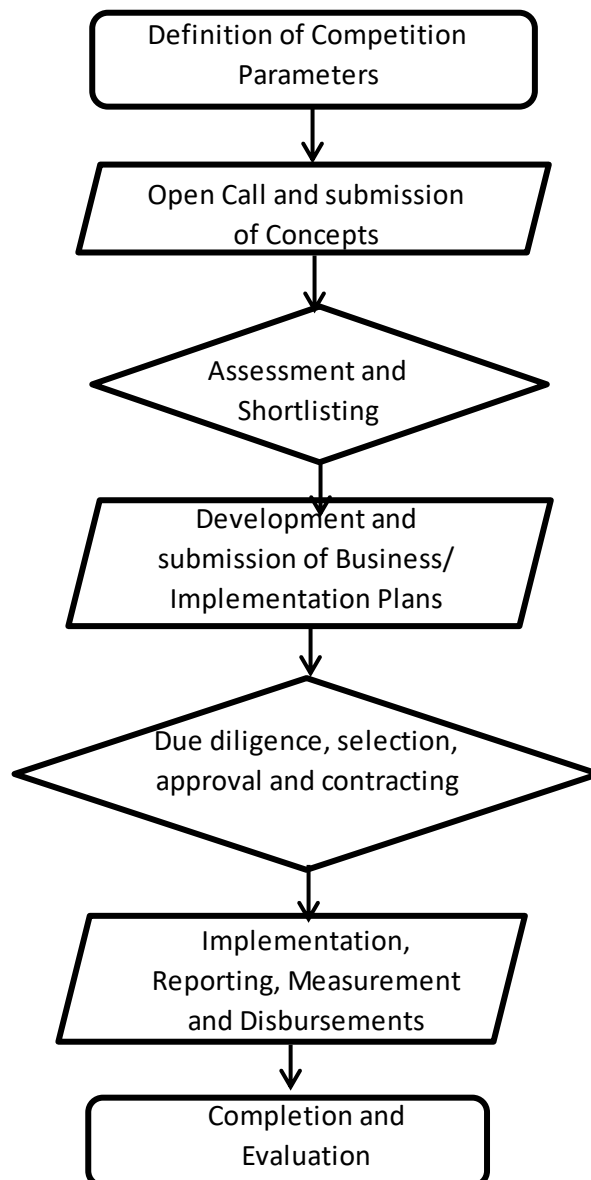


⁶⁴ Both planned and ad hoc.

5.2 Processes

The NECF will operate a number of competitions to address specific issues/challenges within the renewable energy sector in Nepal. The competitions may be targeting different stakeholder segments and/or specific geographical areas, use different financial instruments or a specific opportunity but the processes to be followed by NECF would broadly remain the same except for the local government window. The processes for the private sector, BFI and the TA windows will follow fairly similar processes. There are 7 stages in the process for each of the competitions to be run by NECF. These stages are illustrated in Figure 6.

Figure 6: Process Stages for NECF Competitions



Each of the stages in the process are described below:

Defining the competition: The initial step in the process is to define the scope of the competition by specifying the problem to be addressed, the target group (i.e., private sector, BFIs, local government and private sector, civil society etc.), geographical location (municipalities, provinces) sectors (household, village, commercial, industrial), technologies⁶⁵ (solar, hydro, biomass, technology neutral) etc. A budget for supporting the competition and making investments should also be agreed with DPs or government ministries/agencies financing the project and approximate number and sizes⁶⁶ of investments should be specified. The nature of the financial instrument (grants, loans, equity, forfeiting/securitisation etc.) and the specifications should be specified. A realistic timeframe for each step in the process should also be assessed and the milestones for submissions, result declaration, inception, completion etc. should be specified. The draft competition definition should be considered by the NECF committee and recommended to CREF Investment Committee for approval. Once CREF Investment Committee approves the defined parameters, the competition will be launched.

Open call and submission of concepts: The call for concept submission will be promoted through communication options relevant to the target beneficiaries through direct invitations, events, advertisements in relevant media⁶⁷, direct meetings etc. by NECF/CREF/AEPC/DP. There should be opportunities for NECF to provide clarifications to prospective applicants supported by the EMT. The plan should be to encourage a good number of high-impact targeted quality proposals rather than a large number of proposals of qualify and impacts. All proposals will be submitted on-line and it should also be possible to submit concepts in Nepali language particularly for participants in sub-national levels. Deadlines for submission should be complied with and immediately after the call period is over, NECF/CREF should publish an overview statistic of the concept submissions to inform applicants about the response to the open call.

Assessment and short-listing: All the submitted concepts will be assessed against pre-set criteria by independent experts engaged by CREF mechanism of AEPC whose identities will not be disclosed. The experts will also provide justification for their review scores and there should be checks and balances to deal with cases of conflicting interests. The information system should also have controls to flag and address review scores that are either very high or very low. The independent experts may also indicate whether the concepts need proposal development support if short-listed. It is recommended to short-list about 20-30% more concepts than the available budgetary resources. The short-list should be published in a pre-announced date and invitations to submit an implementation plan or a business plan should be sent out to short-listed applicants. A mechanism to share the scores of applicants who have not been short-listed along with specific recommendations on improvements may also be considered

⁶⁵ To be specified only if required and it is suggested to leave the technology choices to applicants

⁶⁶ Range of investments.

⁶⁷ Newspaper, radio, internet etc.

to build confidence in NECF. The short-list will be approved by the NECF committee before publication;

Development and submission of implementation/business plans: The short-listed applicants will have a specified timeframe to develop and implementation plan for the proposed concept. The plan which proposes specific achievements addressing the proposed challenge or problem through a solution should be aligned with NECF expectations and guidelines. Based on feedback during consultations, in kind support proposal development from empaneled advisory firms will be provided based on the short-listing assessment. This support will primarily be directed at applicants from sub-national levels and intended to help high-potential opportunities to highlight aspects that are relevant to NECF evaluation criteria. The proposal development support will include both visits and remote support by AEPC. The implementation and/or business plans will also be developed and submitted on-line along with supporting documentation, in a similar manner as the concepts.

Due diligence, selection, approval and contracting: The due diligence of the implementation and business plans will be carried out by NECF with support from the EMT and the independent experts. During the due diligence interaction between the applicant and NECF may be required including meetings, visit to the organisation, geographical area of implementation etc. NECF may also solicit opinion from external sources to validate the proposal and verify assumptions. Based on the due diligence process a ranking of proposals will be made. NECF committee will endorse the top ranked proposals for approval to the CREF Investment Committee. The CREF Investment committee will approve the top ranked proposals based on NECF committee recommendations and may also keep a limited number of proposals in a wait-list. Thereafter, NECF/CREF/AEPC will enter into a legally enforceable contract with the applicant which sets out the performance obligations on part of the recipient and the financing obligations on part of NECF. Some financial instruments may place repayment or reimbursable finance requirements on counterparties. All successful proposals and contracts will be made available on NECF portal with options for parts to be redacted which contain proprietary or confidential information. Where competition may have a sub-national character – like a focused competition in municipalities in a province or so, it is important for the NECF to hold local events, EMT to have strong local presence through branches and non-branches and for the NECF committee to have the selection meetings in the municipality.

Implementation and financing: The entities winning the challenge would thereafter implement the agreed contractual obligations and NECF and the EMT will provide agreed finance based on reports and verifications of agreed milestones. NECF and EMT will be supported during implementation by M&E team at AEPC and consultants to verify achievement of milestones, assess risks and revisions from agreed plans and propose mitigation measures. Successful implementation of agreed results and achievement of milestones will be a pre-condition to financing by NECF. Some contracts that require financial reflows to NECF will be valid even after physical implementation and till the reflow obligations are completed. All progress reports will be made available on the NECF portal in line with the information disclosure requirements

of NECF. Periodic analysis of the portfolio will also be carried out by NECF and results of such analysis will be published.

Completion and evaluation: While there will be an ongoing feedback mechanism and portfolio evaluations carried out during implementation. A targeted evaluation process will begin upon completion and will be carried out for all projects. While the primary reliance will be on AEPC M&E section and external consultants, independent experts may also be used by NECF for evaluations. Thematic (sectoral, technology, geographic etc.) evaluations may also be commissioned by NECF periodically. All progress and evaluation reports will be made available to the public on NECF portal. Feedback from the evaluations will be used by CREF Steering and Investment Committees to update and refine NECF policies and processes and may even be relevant to DRE and RE finance policies and programmes in Nepal by GoN and DPs.

A similar process with some variations will be used for the local government window of NECF. In the case of local government window, the short-list stage will be replaced by a pre-qualification and the government may define the pre-qualification requirements – both financial and technical for organisations to be eligible for submitting implementation plans aligned with the public procurement act. For the implementation plan two variables will be critical for selection of the organisation which will be awarded the implementation – the amount of grant requested and the size⁶⁸ of the RE systems to be supported. For achieving an optimum result for the government, this part of the competition will be through an Electronic Reverse Auction (ERA) where short-listed applicants will be able to see value of bids by other competitors over a specified period of time. Applicants are able to see the lowest amounts of grants requested and the winning bids in real time and are able to review and revise their implementation plans and offer a lower bid, if feasible. At the end of the ERA, the applicant requesting the lowest level of concessionality will be awarded the implementation⁶⁹. Multiple applicants may be awarded the implementation support if the size bid for is lower than the system capacities being supported through the Local Government challenge window. Such a process can be used to optimise government resources to organise competitions for solar power plants to be established in all the municipalities under HBUB or to provide capital subsidies for small-scale DRE systems in an open and transparent manner and optimal use of government or DP resources. This modified process for the Local Government window of NECF is shown in Figure 7.

5.3 Support Tools

The NECF will require a number of tools to ensure that the processes follow high professional standards and efficiency, openness and transparency as well compliance with international frameworks on governance and safeguards. Also, NECF needs to ensure that the financial resources it manages are utilised efficiently, professionally

⁶⁸ Either as installed energy generation capacity in kW or MW or number of systems – relevant for portable and household energy systems.

⁶⁹ Since NECF payments are linked to energy performance, it is assumed that the proponents will use technologies that are efficient and offering higher levels of performance.

and consistent with the international fiduciary standards expected. These tools are outlined in the following pages and would need to be developed by NECF during its initial stage of development.

5.3.1 Safeguards

The NECF should examine whether the AEPC environmental and social safeguards that cover small-scale projects⁷⁰, and limited environmental scope⁷¹ would be adequate for its operations and then consider developing a set of environmental and social safeguards that are relevant to the RE and DRE projects that it will be supporting. These safeguards could cover aspects such as environmental assessments and associated environmental management plans, Gender Equality and Social Inclusion (GESI), Indigenous People (IP) assessments and planning, labor and working conditions, land acquisition and settlement, community health, cultural heritage, biodiversity conservation etc. at an enhanced level to allow for large-scale and higher environmental scope as may be required by NECF⁷². The Green Climate Fund (GCF) Environmental and Social Safeguards⁷³ or the Environmental and Social Framework of the World Bank⁷⁴ can be used as references. Since AEPC is in the process of GCF accreditation with an intended accreditation scope of small-scale, environmental and social safeguards class B, NEFC may need to explore in the initial two years whether it can use the AEPC accreditation scope or whether AEPC needs an accreditation upgrade. NECF CREF/AEPC staff, stakeholders and external support groups should be trained on these safeguards and their application and these will be progressively introduced into NECF competitions over the next year or so. Implementation of such safeguards and establishing a track-record with challenge funded investments will help NECF to access international finance such as the climate finance from GCF through AEPC as well as the Global Environmental Facility (GEF).

⁷⁰ Less than \$50 million project size, as per GCF definition.

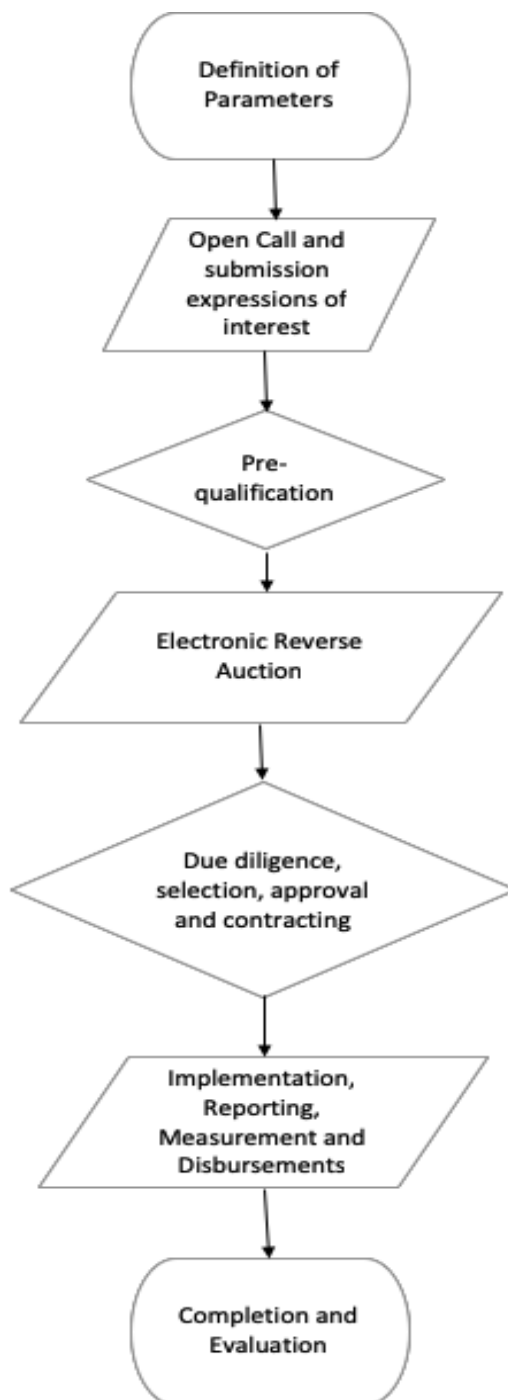
⁷¹ ESS category B

⁷² Need for enhancement of the safeguards will be clearer once the initial competitions are completed and results are available for the basis for decision.

⁷³ Green Climate Fund (2014), Interim environmental and social safeguards of the Fund

⁷⁴ World Bank (2016) 2016. "World Bank Environmental and Social Framework." World Bank, Washington, DC

Figure 7: Process Stages for NECF Local Government Competition



5.3.2 Fiduciary Standards

It is suggested that NECF may adhere to internationally accepted fiduciary standards to enhance its financial management and control systems. NECF may consider using AEPF fiduciary standards or establish systems that deal with audits through establishment of an audit committee as well as internal and external audits. Also recommended is to establish transparency and accountability standards that include code of ethics, management of conflict of interests, prevention of malpractices and

mismanagement and investigation functions. In line with developments in the global financial control frameworks, it is also suggested to put in place standards and procedures that address AML and CFT. Since the scope of the AEPC fiduciary standards only covers grants, there is a need to establish standards for the challenge fund operation of non-grant instruments such as loans, forfeiting and equities that cover aspects of transparency of decision making, public access to information, investment management and portfolio management as well as financial and project risk management. Similar to the safeguards, it is suggested that the additional fiduciary standards for non-grant financial instruments as be developed in the two-years of NECF operation and be implemented over the subsequent year. Once the fiduciary standards have been implemented across the NECF portfolio of non-grant financial instruments and a track-record created, AEPC may be able seek an upgrade of its GCF accreditation⁷⁵ and actively pursue accreditation GEF, European Union Development Cooperation (EUDevco) etc.

5.3.3 Information Management and Disclosure

All the information within NECF such as concept applications, pre-qualification requests, assessments & evaluations, business plan and implementation plan submissions, bids for ERAs, selection, contracting, portfolio management, monitoring, reporting, verification, financial transactions, evaluations etc. are to be managed using an information system. While the business language of the information system will be English, efforts should be made to allow for concept submissions in Nepali language as well as to provide updates in Nepali, particularly to ensure active engagement and participation from sub-national level from municipalities. Elements of the information system is provided in Annex VII. The information system should be integrated into the NECF portal.

Concept notes submitted to NECF for consideration and the business plans or implementation plans should contain certain information such as organisation details, project details, organisation financials etc. The pre-qualification expressions submitted will have the organisation details, financials and track-record. Subsequently the business plan will need more detailed logical framework, implementation plan, management team, financial model M&E plan, innovation, risks, safeguards etc. The implementation plan for local government window will contain details about implementation, M&E plan, risks, safeguards and a financial model as the basis of financial concessionality requested. It should be possible to re-submit the financial model and the financial support requirements a number of times during the ERA. Suggested information requirements for concept notes and business plans and implementation plans are available at Annex VII.

⁷⁵ Note that as of the time of report writing in January 2019, AEPC was yet to be accredited by GCF.

It is also suggested that NECF disclose all possible information on its website relating to each of the competitions it organises. It is suggested that the following information be disclosed for each of the competitions run by NECF:

- Announcement of the challenge rounds, with objectives, key milestones, financing available, expected number of awards etc. along with associated guidance for prospective applicants;
- Summary statistics of the applications such as number of submissions, funding sought etc. immediately after the closing of initial concept submissions, or pre-qualification submissions;
- List and the details of proposals short-listed upon completion of the evaluation and approval by NECF committee;
- Final results of the competition along with names and summary of the proposal, amount of funding awarded etc. after the selection has been approved by CREF investment committee;
- Copy of the contract and the winning proposals⁷⁶ will also be published after the contract has been signed;
- Progress reports and monitoring reports of ongoing investments will be published by NECF;
- Completion and evaluation reports of all the investments will also be published by NECF;

In addition, all evaluations and studies on the portfolio commissioned by NECF will also be made available on the website. Also, financial statements, audit reports and other fund level governance documents including reports of the NECF committee, CREF Investment Committee meetings and CREF Steering Committee meetings will all be disclosed publicly on NECF website. Over a period of time of two years, NECF will develop a more comprehensive information disclosure policy after evaluation of its experience and examining national, regional and international best practices.

5.3.4 Assessment Criteria

An initial set of criteria for shortlisting of concepts, pre-qualifying organisations and assessing business and implementation plans is proposed based on a review of criteria for VFCF, BGFZ and AECF criteria. The proposed criteria are generic and have been suggested based on existing practices and are meant to be suggestive rather than recommendations. These can be modified suitably by NECF to cater to the objectives of each of the competitions.

Concepts will only be assessed if they meet all the eligibility requirements such as institutional eligibility, completeness, co-financing. For short-listing the suggested criteria and the weightage are:

⁷⁶ Any financial and proprietary details in the proposal can be redacted before publication

Table 3: Short-listing Criteria

#	Criteria	Weight
1	Alignment with Government Development Priorities ⁷⁷ (Both National and Sub-national ⁷⁸)	30
2	Organisational capabilities (experience and capacity to implement)	20
3	Quality and strength of concept	20
4	Alignment with Development Partner priorities	20
5	Innovation	10
	Total	100

It is recommended that concepts should score a minimum score of 70 to be short-listed and that the total value of proposals short-listed be at least 20-30% more than the funding available for the competition. Some criteria like the alignment with government or DP priorities⁷⁹ or organisational capabilities may be defined as essential criteria where a minimum score is required to be short-listed. The short-listed concepts will also be shared comments on gaps that can be addressed during proposal development, from independent experts who will carry out the reviews. In kind proposal development support will also be offered by NECF to some of the concepts which are fundamentally sound and transformational but need handholding support in definition and elaboration to meet NECF expectations.

All the short-listed concepts which have been invited to submit business or implementation plans. All such business/implementation plans submitted will be put through a due diligence assessment through reviews, interviews with management team, possible inputs from third-parties⁸⁰, site visits as well as through assessments from independent experts. The suggested criteria for the assessment and weights are:

Table 4: Due Diligence and Assessment Criteria

#	Criteria	Weight
1	Innovation	20
2	Co-financing ⁸¹	20
3	Sustainability, replicability & Scalability	20
4	Management and Implementation	10
5	Risk Management	10
6	Safeguards compliance	10

⁷⁷ Should consider both the RE sector priorities as well as developmental priorities relating to poverty alleviation, socio-economic development etc.

⁷⁸ Where a competition is focused in a local area (Nagarपालिका or Gaupalिका) where the finances are from the municipality, the local priorities will determine the evaluation.

⁷⁹ Where competitions are financed by DPs

⁸⁰ From other DPs who have supported initiatives in the past, clients, auditors, regulators and government or law-enforcement agencies etc.

⁸¹ Score for more than 1:1 co-financing which will increase with co-financing.

7	Results M&E plan	10
	Total	100

After the assessment of business/implementation plans, a rank-list will be published and funding offered to the highest ranked proposals with a limited number of proposals being waitlisted.

For pre-qualification of firms for local government window will be carried out consistent with the public procurement act before the pre-qualified organisations can submit an implementation plan and participate in the reverse auction process. Independent experts will be carrying out the assessments for prequalification and it is suggested to use the following criteria and weights.

Table 5: Pre-qualification Criteria

#	Criteria	Weight
1	Management and Technical capability	30
2	Experience with similar projects	30
3	Track-record of the organisation ⁸²	40
	Total	100

During the second-stage of assessment of the local government challenge window, the final selection will be based on the reverse auction results. Once the reverse auction ends and the winners have been identified their implementation plans should be assessed for compliance with all the requirements before recommending the selection, seeking approvals and moving into contracting.

For each of the competitions, NECF should have the flexibility to revise the criteria and change the weightages proposed. For each challenge cycle NECF with the support of the EMT will develop guidance on the how the criteria will be applied during assessment by independent experts.

5.4 Finances and Financial Management

5.4.1 Finances

It is expected that CREF Mechanism of AEPC would initially channel public finances from DPs for RE and DRE projects in Nepal through NECF. It is also expected that DfID would channel resources from NREP through the supplier to NECF helping to establish initial track-record and establish and refine the operational management and governance arrangements at NECF. The NECF governance has been marginally updated from the

⁸² This could be based on the past experience of the organisation in its operations that goes beyond the projects similar to being pre-qualified for. Aspects such as scale – financial. Geographic, sectoral, years of existence, accreditations, market shares, rating of financial instruments by market rating agencies etc.

current CREF structure to give a more active role for local governments and DPs in the decision-making for individual competitions. It is expected that such measures will encourage more bilateral DPs to use NECF to address development gaps in RE that require a challenge type mechanism. It is also possible that international philanthropic foundations may also consider using NECF to address specific opportunities to use a challenge mechanism in the RE sector in Nepal.

The local government window has been established within the NECF to provide an opportunity for both local and federal government to use NECF to channel resources. The municipality level solar power plants announced under HBUB in the white paper offer an immediate opportunity to implement, validate and refine this window. This window can also be used by federal government organisations to allocate resources competitively to innovative local development projects in RE and an example could be the possibility of GoN to support PPPs in RE in sub-national levels and award conditional grants to municipalities using NECF. During the consultations, municipalities from some of the provinces like Karnali have indicated interest in partnering with NECF and the deployment of sub-national level budget allocations to support REC remains a possibility. NECF should follow through on such opportunities by designing competitions under the local government window and implement through strong EMT presence and decision making at the local level to create instances that could be replicated to other municipalities.

It is also important for the organisational sustenance and viability of NECF that it charges a fee for managing the challenge cycles from DPs, foundations and government. This fee should cover the general management and administration costs of NECF and CREF Steering Committee should establish an internal policy as well as a basis to establish such a fee. There will also need to be a programme management fee to cover the cost of the 5 external support groups – EMT, IT service provider, independent experts and advisers on proposal development and results monitoring. An analysis of a number of international organisations such as GCF, GEF, Adaptation Fund, Climate Investment Funds (CIF), The Multilateral Fund for the Implementation of the Montreal Protocol (MLF), The Global Fund etc. indicate that the current market practices for a fee covering both the general administration costs and the programme/project management costs are in the range of 15-18% of the value of funds managed⁸³. NECF may carry out internal assessments to determine the various components of its costs and establish a policy to be approved by CREF Steering Committee keeping these aligned with international practices.

Options for NECF has also been developed keeping in mind the possibility of accreditation to GCF, GEF⁸⁴ and the EU DevCo by recommending implementation of the necessary fiduciary standards and safeguards. This will allow for CREF/NECF to seek accreditation to these international climate finance mechanisms and mobilise additional resources. GCF in particular presents a relevant opportunity with its Enhancing Direct

⁸³ Green Climate Fund (2018), Policy on fees for accredited entities and delivery partners

⁸⁴ GEF is currently not accrediting new implementing entities but may restart accreditation in future.

Access (EDA) funding window which is targeting sub-national and national devolved decision making, where a local decision making and governance mechanism exists. As CREF is currently under the aegis of AEPC, it should also be possible for NECF to access EDA window of GCF once AEPC's accreditation process⁸⁵ is completed and legal arrangements with GCF are in place.

5.4.2 Financial Management

NECF/CREF will be managing the finances challenge windows from DPs, foundations, federal government and local governments as per the CREF Operation Manual⁸⁶ and as per the approvals from the CREF and NECF governance structures. The funds from international sources and GoN will be routed to CREF through AEPC. The financial management services through the EMT would be provided by the 'Class A' commercial bank⁸⁷ which will be selected competitively. A portion of the finances channeled would be retained by NECF to cover costs of management and support services. The services offered by NECF will cover the whole implementation cycle from announcement of competitions to completion and evaluation.

The NECF funds would be managed by the selected EMT under the financial control and regulation by NRB as applicable to commercial banks in Nepal. In addition, the more stringent and robust fiduciary standards that are required by NECF to meet international frameworks will also be implemented over a period of time by the EMT. Due disclosures of project level and fund level financial information will be ensured through the information disclosure policy to be developed by NECF, which will allow it to establish an open and transparent financial management system. These measures are likely to build increased level of confidence in NECF by prospective financing partners and provide opportunities for additional financial support flowing through NECF.

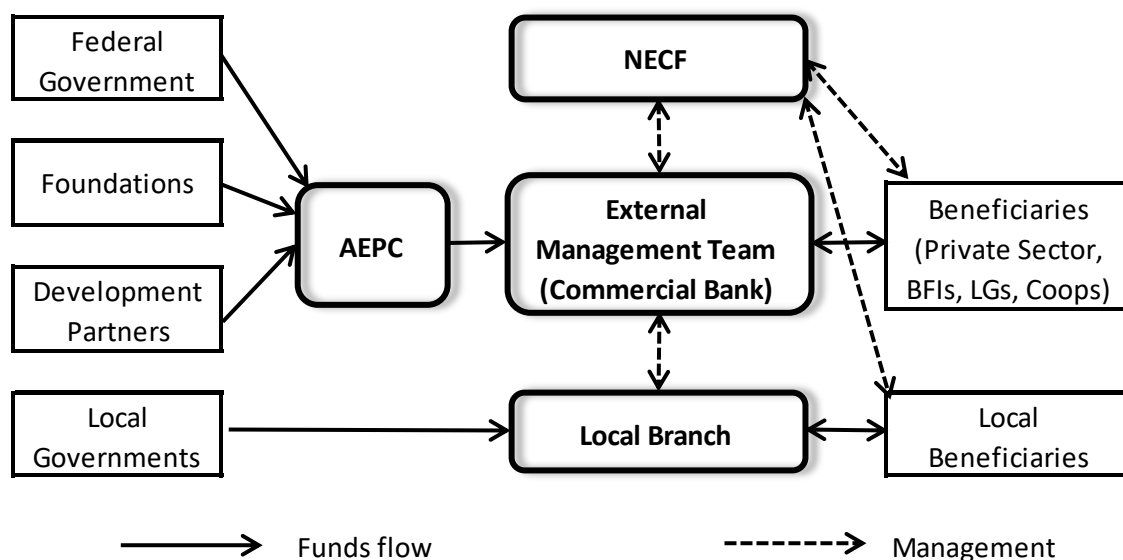
Some of the financial instruments such as loans, equity and forfeiting will result in repayments and reflow of finances back to NECF. These funds could be utilised to support additional competitions in consultation with the financing partner or other possibilities considered by the CREF Steering Committee. Any contributions made by municipalities to support competitions in their coverage area will also be routed through the CREF but in practice managed in local accounts held by the local branches of the EMT and decisions taken at local level with participation of the municipalities in the NECF committee. This aspect of local presence of the SMT, funds in local accounts, local decision-making meetings of NECF Committee may be important to engage municipalities to partner with NECF. The financial flows of NECF are shown in Figure 8.

⁸⁵ It was informed by AEPC to the team that AEPC is in advanced stage of accreditation by GCF with accreditation expected in 2019.

⁸⁶ AEPC (2018), Central Renewable Energy Fund (Operation) Manual 2017

⁸⁷ Under the regulatory purview of NRB

Figure 8: NECF Financial Flows



5.5 Monitoring and Evaluation (M&E)

NECF will have a robust performance and results monitoring system which is important to ensure that the impacts and the results on the basis of which applicants were awarded contracts are realised. Results are particularly important in the context of financial disbursements that need to be made upon verification of results. There are a number of elements such as ICT, external support ecosystem, data analysis capabilities which are expected to ensure that NECF monitoring and evaluation function meets the performance standards required for a challenge fund and follows global best practices. The M&E system proposed will be integrated into the information system and will leverage ICT to integrate automated performance monitoring supplemented by monitoring by NECF and EMT supported by M&E section at AEPC and consultants. Some elements of the M&E system that will be part of the ICT system to be developed by the service provider will be:

- All the proposals would clearly specify the indicators through which outputs and outcomes will be measured and specify when the results can be measured. How the NECF safeguards will be met, information disclosed will also be specified and can be monitored;
- Since all the business and implementation plans will be submitted on-line through the information system and since all contracted proposals would contain an M&E plan⁸⁸, NECF would be able to plan results monitoring and verification;
- The NECF information system should also have results monitoring module where energy generation, consumption, savings, energy meteorology, financial

⁸⁸ Support will be provided for development of M&E plans to short-listed applicants.

transaction related information can be captured through automated logging systems using Fourth Generation (4G) or Fifth Generation(5G) or the latest ICT systems. Such an ICT solution will capture energy system level monitoring data. Automated results monitoring and logging systems⁸⁹ using ICT should be used by NECF for all investments;

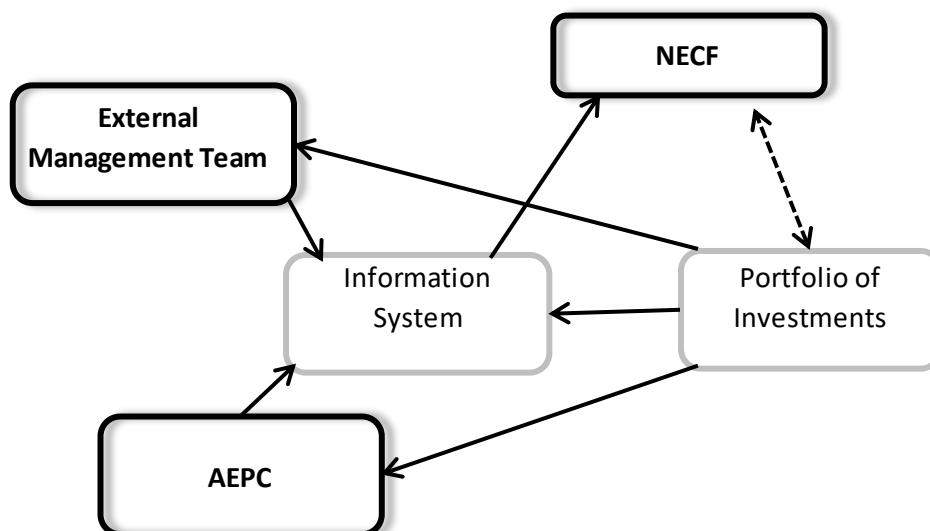
- The branch and non-branch network of the bank hosting the EMT can be used for regular monitoring visits and reporting on progress of activities and well as report on the degree of achievement of outputs and outcomes and status of risks to outcomes;
- NECF will work with M&E section of AEPC which will help with portfolio management and results monitoring. The AEPC staff and consultants⁹⁰ will work in partnership with the EMT to provide specific skillsets relevant to project implementation monitoring and evaluation. These firms will review the progress reports and field visit reports from EMT remotely as well as make site visits. It is suggested to ensure a geographical spread of such advisers to reduce the transaction costs relating to travel and also to ensure geographical balance and understanding.
- The EMT and M&E section at AEPC will collect digital evidence of results in addition to site visit reports. The information system should be able to accept inputs as audio, video or images relating to outputs and outcomes of the specific challenge fund investments through a handheld app on mobile phones such as part of the results monitoring by NECF;
- NECF will also commission periodic planned and adhoc visits and evaluations from its own staff and external consultants during and post implementation to monitor and verify the results that have been achieved. These visits, evaluations and studies may be specific to projects, a location/province, sector, donor or other aspects relating to the NECF portfolio.

The monitoring & evaluation arrangements by NECF is shown in Figure 9.

⁸⁹ One of the VFCF winners – Gham Power is using a similar system, which should be studied and built on.

⁹⁰ AEPC may engage consultants to support portfolio management and results monitoring and measurement.

Figure 9: Monitoring and Evaluation at NECF



5.6 Risks and mitigation

A number of challenge funds are already operational in Nepal as well as many more globally have been studied and best practices integrated to NECF. However, the operationalisation of the NECF modalities will face a number of risks. This section provides an identification of such risks that NECF will need to manage.

Financial: For sustainability of NECF attracting additional funding beyond the initial commitment from DfID would be important. Since the budgetary allocations to support renewable energy is being gradually allocated directly to local governments, NECF needs to attract and channel resources from local governments for competitions and may not be very successful in such efforts due to a number of factors. NECF also needs to attract other DPs in future as well as finance from international climate finance mechanisms to sustain its operations and relevance. The federal government also needs to allocate budgetary resources to support the NECF to ensure long-term sustainability. The probability of such risks is medium but the impact of these risks on NECF would be high. Greater role has been proposed for DPs in governance and NECF has been designed keeping global best practices in terms of process, transparency, superior fiduciary standards and adequate safeguards. Similarly, the structure of the NECF has been designed for accommodating the needs of LGs and giving LGs a role in its governance. NECF could also consider utilising the interest income generated from funds held with the commercial bank acting as the EMT to offset the operating expenditure of NECF and support ecosystem.

Legal: NECF is proposed to be integrated into CREF mechanism of AEPC which itself currently has a weak legal basis. It is understood that the government is considering an Act⁹¹, which will be considered for approval by the parliament in the near future. While

⁹¹ With a designated committee already providing recommendations to the government

the Act goes through the legislative process NECF will rely on the CREF Operations Manual. This legal risk is expected to be a short-term one and is expected to reduce once the Act is passed by the parliament. The impact of this risk on most operations of NECF is low and the probability of this risk continuing, i.e. the parliament not approving the act or considerable delays in the legislative process is also considered to be low. AEPC and MOEWRI will need to continue their follow-up and inputs to the cabinet to facilitate the passage of the act in the near future.

Operational: NECF operations will be more complex than the current financing mechanism which is focused on capital subsidy administration or VFCF implementation. Operationalising the NECF would require support services from a number of external service providers and the operations cost would also be higher than managing subsidies or VFCF. There is the risk of the complexity of a challenge fund mechanism and the availability of quality support service providers which could affect efficiency of NECF operations. The probability of such risks is low but the impacts would be medium. A sophisticated information system is being proposed to automate and handle most of the operations and CREF already has valuable experience gained from VFCF. It is also considered that NECF would be able to find competent external service providers to support its operations considering the RE sector experience and challenge funding experience that exists in Nepal.

Political: The NECF operations would be directly affected by the political commitment of the federal government to pass the Act which gives a legal mandate to CREF mechanism of AEPC as well as the political commitment to follow through and allocate significant resources⁹² to develop the flagship initiative of 200 MWp solar power plants through the challenge fund. NECF's ability to channel local government resources would also be dependent on the commitment of the local government to use the mechanism to engage private sector for local RE development to use conditional grants or fiscal transfers from federal government. The probability of the risk is considered medium but the impact on NECF will be high. The political risk is considered to be medium due to the uncertainties at the local government level where the LG institutions are at an early stage of development. NECF design has incorporated a local government window to cater to federal and local governments and it is expected that a number of LGs may show leadership in the use of NECF while other may take a more cautious and slow approach.

There is also an associated political risk of elected representatives from the local and federal governments trying to influence NECF decisions towards specific private sector organisations. The probability of such actions is low but the impact on NECF would be high. The design of NECF has integrated a process that is objective and transparent which prevents subjective influences on decision making. The higher levels of transparency and disclosure requirements specified for NECF will also make it challenging for elected officials to influence decisions. Table 6 presents the risk assessments and mitigation measures.

⁹² Estimated to be over \$ 250 million

Table 6: NECF Risks

Risk	Ownership	Probability	Impact	Mitigation Measures
Financial risk of attracting adequate resources	NECF	Medium	High	Modalities incorporate features to attract DPs, local governments and international climate finance mechanisms
Weak legal basis of CREF/NECF	MOEWRI/AEPC	Low	Low	MOEWRI and AEPC to continue follow up with the cabinet to support legislative process.
Complexity of modalities and availability of quality support services	NECF	Low	Medium	Use of information system to manage information and processes. Availability of quality service providers.
Political commitment to use NECF	MOEWRI	Medium	High	Modalities provide opportunities. MOEWRI to follow through on white paper. NECF to strategically engage local governments.
Political influence in decision making	NECF	Low	High	Modalities and processes prevent subjective influences. Transparency and disclosure requirements make influencing difficult.

5.7 Roadmap for Operationalising Challenge Fund

To operationalise and implement the challenge fund a number of steps need to be taken in the short term, within the initial 12 months. The key actions with need to be achieved in the immediate future would include be the following:

- **Administrative approvals to establish the NECF:** this could be done by the AEPC Board and CREF Steering Committee as well as MOEWRI by updates/amendments to the CREF operation manual⁹³. A better option would be to update the proposed Act of the parliament to integrate NECF in the legal constitution of CREF. The responsibility for these approvals will be with CREF/AEPC and the suggested timeframe for implementation is 3 months;
- **Financial commitments to NECF:** the financial commitments need to be made by NREP and GoN to support the establishment and institutional development costs of NECF and the resources to implement initial challenge rounds including capacity building of CREF and AEPC. These commitments are to be made under

⁹³ It is possible that NECF can be operated within the current approvals accorded to CREF

NREF and NREP with the responsibilities with MOEWRI and DfID. The timeframe for these commitments is expected to be 3 to 6 months;

- **Development of detailed operations manual for NECF:** An elaboration of the processes for NECF operation should be carried out as an operations manual specifying each step, checks and balances and governance arrangement. The responsibility for this manual will be with CREF/NECF and can be done over a period of 3 months following the administrative approvals to establish NECF. Option to revise the existing CREF operational manual should be considered against the need to develop a new stand-alone manual;
- **Supporting the human and institutional development:** CREF/NECF will also need institutional strengthening and capacity building to implement the challenge windows. The proposal development and M&E functions at AEPC will also need technical support to enhance their skillsets to support development of private, BFI, PPP proposals as well as monitoring of implementation of performance-based financing, especially relating to non-grant financial instruments.
- **Recruitment of the EMT and IT service provider:** CREF mechanism at AEPC will use applicable public procurement procedures to identify and contract a Class A commercial bank which will act as the EMT, as well as contract the IT service provider and start development of the NECF portal and website. The responsibility for this action will be with CREF/NECF and the recruitment processes is expected to take 3 months after the administrative approvals. The IT system and portal development, testing and implementation is expected to take 6 months;
- **Development of the initial competition:** CREF/NECF will develop the initial competition that will be launched by the challenge fund, preferably using the private sector challenge window. The NECF committee will be actively involved in the development of the initial challenge window. The final competition framework will be approved by the CREF Investment Committee before launching. The responsibility for this action will be with CREF/NECF and is expected to take 3 months.

It is expected that in a timeframe of about 12-15 months, NECF will be established with a legal basis within CREF mechanism of AEPC and will have the resources to develop the fund and launch competitions. NECF is also expected to have essential support arrangements on management and ICT services and would have developed the first of its competition. It is suggested that strategically, the first competition addresses a clear and specific challenge which can offer a good demonstration on the value of the NECF as a new financing approach.

After the initial period of launch the next 24 months would be one of consolidation and establishment. During this period the organisation of the NECF including the external ecosystem will be fully established, will create initial track-record of operation and will

start delivering results. The key actions which will need to be achieved during this period would be the following:

- **Engagement of advisers and experts:** using the prevailing public procurement procedures, CREF/NECF will complete the engagement of the remaining elements of the external support ecosystem viz. individual independent experts. The responsibility will be with CREF/NECF and the procurement process is expected to be completed in 3 months;
- **Completion of initial competition and starting implementation:** It is expected that the processes for the initial competition will be completed in 3 months and approvals and contracting can be completed in another 3 months. So, there is a distinct possibility of a 12-18-month implementation of selected investments from the initial competition and to deploy and refine all the processes and support mechanisms. The responsibility will be with CREF/NECF and completion of the competition is expected in 6 months and implementation expected to occupy the next 16 months.
- **Development and implementation of safeguards, information disclosure policy and enhanced fiduciary standards:** Once the investments under the initial project cycle is underway, CREF/NECF/AEPC should undertake the further development of the AEPC Environmental and Social Safeguards and the fiduciary standards that represent global best practices. Also developed and implemented would be an information disclosure strategy and policy for NECF that is consistent with global best practices on organisations of similar nature. These tools will be approved by CREF Investment committee and AEPC Board before implementation. The responsibility for the developments will be with CREF/NECF and the procurement of the organisations that will develop the safeguards and standards will be as per relevant public procurement procedures of AEPC. The procurement is expected to take 3 months, development another 3 months and implementation another 12 months.
- **Development and implementation of new competitions:** after the implementation of the first set of investments is well underway, the second set of competitions should be development and launched. It is suggested to launch competitions for BFIs and possibly local government window relating to the solar power plants under HBUB, articulated in the white paper by MOEWRI. In this phase of competitions NECF should try and ensure a balanced geographical distribution, diversity of applications/technologies and financial instruments. Some competitions for technical assistance may also be launched to address relevant issues that need innovative solutions. The results of this phase would form the basis of the future development of NECF. The responsibility will be with NECF and this period is expected to last 18 months.
- **Evaluation and refinements:** Towards the end of the second period when there is a significant body of experience with competitions and implementing relevant processes, an evaluation of NECF and the competitions already launched should

be carried out to review the implementation against plans and to identify opportunities for improvements. This evaluation is expected to last 3 months and is expected to be led by consultants reporting to the CREF Investment Committee or the NECF committee in an independent manner. The CREF Steering Committee will consider the evaluation recommendations and make appropriate changes.

After the second period of 24 months or a total of 36 months since establishment⁹⁴, NECF would have established a track-record of operating competitions which would have that are spread across Nepal with a diverse and innovative set of features. NECF should also have implemented and refined processes and would have already implemented superior safeguards and standards across the institution and its portfolio. It is possible that NECF may also have achieved some innovative and path breaking outcomes. The next phase following the initial 36 months would be one of growth and expansion where NECF will scale-up in terms of resources and the competitions and complexity. The key actions during this period are expected to be:

- **Increased partnership with local governments:** in this phase NECF is expected to launch⁹⁵ and/or increase the number of competitions with local governments as partners. This phase will see a significant scale of NECF's activities in partnership with local governments to use local government resources to form innovative partnerships with private sector and BFIs. This transition is important to the long-term relevance and sustainability of NECF. The responsibility for this period would be with NECF and this phase is expected to be of 24 months.
- **Increase of international donors:** in this phase, it is expected that based on its track-record NECF will be able to seek accreditation to GCF, GEF and possibly EU DevCo. NECF is also expected to attract financing from other multilateral and bilateral DPs while scaling up engagement with existing DPs. During this phase NECF may also be able to attract financing from international philanthropic foundations to augment international and national resources. The responsibility of this period will be with NECF and is also expected to be over a period of about 24 months.
- **Institutional development and positioning plan:** about 18 months into this phase GoN should carry out a review of the operations of NECF, considering the future opportunities and the growth prospects. The review should also consider the future role and institutional development of NECF including existing governance arrangements and organisational development issues. This review should among other things, consider whether some of the externally contracted skillsets need to be internalised as staff resources. The responsibility for this

⁹⁴ It is envisaged that about 3 years would be required to establish and create an initial track-record for NECF

⁹⁵ It's possible that NECF may be able to launch initial competitions in partnership with municipalities in the second phase.

review will be with GoN with support from NECF and is expected to take 6 months.

These activities, responsibilities and timeframes are shown in Table 7.

Table 7: Roadmap for operationalising NECF

Activity	Responsibility	Timeframe	Duration
Approvals and establishment of NECF	AEPC/CREF and MOEWRI	0-3 months	3 months
Financial commitments	MOEWRI and DfID	0-6 months	6 months
Development of Operations manual	CREF/NECF	4-6 months	3 months
Support for human and institutional development	CREF/NECF and AEPC	4-12 months	9 months
Recruitment of Service Providers	CREF/NECF	7-12 months	6 months
Development of initial competition	CREF/NECF	10-12 months	3 months
Engagement of advisers and experts	CREF/NECF	13-15 months	3 months
Development and implementation of initial competition	CREF/NECF	13-18 months	6 months
Development and implementation of safeguards, policies and standards	CREF/NECF	19-36 months	18 months
Development and implementation of new and additional competitions	CREF/NECF	19-36 months	18 months
Evaluation and refinements NECF strategy and operation	CREF/NECF	34-36 months	3 months
Increased partnership with local governments	NECF	37-60 months	24 months
Expansion of international donors	NECF	37-60 months	24 months
Institutional development and positioning plan	NECF	55-60 months	6 months

It is hoped that at the end of the initial 5 years, NECF would have emerged as a key challenge fund in Nepal and would be counted amongst the best practice globally. In this process NECF would also have make significant contributons to the RE sector in Nepal to achieve active participation by BFIs and the private sector to develop a sustainable RE market.

6 Conclusions and Outlook

Based on the research and analytical work carried out by the team, the following conclusions can be drawn. In addition, a number of key aspects that relate to the recommended modalities to operationalise the NECF are also summarised:

- Nepal has made significant achievements in renewable energy, particularly since the advent of AEPC. The focus on renewable energy is expected to continue under the NREF and even in the new federal arrangement where responsibilities have been delegated to the local governments;
- While the credit availability and access to credit for the private sector has been relatively easier and positive in Nepal, this is not reflected in RE financing which still remains largely capital subsidy driven. The efforts led by NREF will aim to transform this situation into a credit-focused model. The government also plans to use challenge funds to achieve some of its decentralised energy objectives;
- A number of challenges exist for a challenge fund to address longstanding challenges in the RE market viz. absence of business models; the limited level of participation by the stakeholders; unmet thermal energy needs. There are also opportunities that a challenge fund may cater to such as the municipal-level solar plants under HBUB and the new NREP programme;
- Best practices from existing challenge funds in Nepal include the use of external fund managers, use of independent experts, transparent operations, transitioning to performance-based incentives and the need for using an information system to manage competitions;
- Best practices from successful challenge funds elsewhere, indicate that challenge funds can support local development; offer multiple financial instruments; financing linked to energy service delivery; supporting innovative and paradigm shifting initiatives; using an external fund manager and having strong M&E systems;
- NECF has been developed as a challenge fund which is technology neutral and supporting BATs in RE to support GoN policies. NECF will offer high governance standards and efficient practices to attract additional DP funding. It will address the key challenges in the RE sector in Nepal and will integrate global and national best practices for challenge funds;
- The goals for NECF has been developed based on GoN policies and NREF to transform the energy sector and associated ecosystem in Nepal. Elements of the strategy have been defined for the NECF to address challenges and opportunities identified through the research and consultations;
- Four initial challenge windows have been recommended for private sector; BFI, local government and for technical assistance. The objectives of these

challenge windows, their operating principles and possible examples of competitions that may be organised have also been specified. Market assessments may be carried out to quantify the private sector interest in the local government and technical assistance challenge windows and use the results of the market survey to calibrate the parameters of the competitions.

- Beyond the initial financing by DfID, NREF will need to seek funding nationally in partnership with LGs to utilise conditional grants and fiscal transfers by federal government. NREF will also need to attract additional funding from other DPs, international finance mechanisms and foundations. The modalities for operationalisation integrates features to facilitate these plans.
- Initial specifications of the range of funding to be deployed through NECF and the possible applications and technologies that may be relevant to a challenge type mechanism has also been suggested;
- The modalities for the NECF including the placement within CREF mechanism of AEPC, the governance arrangements, the external support groups that are needed and their descriptions have also been developed. The various stages in the process of NECF competitions have also been detailed;
- The various support tools required for the NECF to function such as the safeguards; fiduciary standards; information management and disclosure practices; initial set of assessment criteria have also been suggested with specifications.
- Also defined are some of the financial management arrangements including finance flows, monitoring and evaluation arrangements. An initial risk assessment has been carried out and an initial set of risks and possible mitigation arrangements have been identified;
- A roadmap that identifies and sequences a set of important group of activities that needs to be implemented over a 60-month period in three phases has also been developed. The roadmap identifies responsibilities as well as the duration and timeframe of these activities.
- NECF offers a potential to address some of the long-standing challenges around financing models, engagement of BFIs and private sector in the RE sector in Nepal. After proving its value addition, NECF could also offer these solutions by leveraging resources available with LGs and international partners. It is hoped that NECF could in the long run catalyse a number of innovative solutions in Nepal that have a global relevance and emerge as a best practice in the use of challenge mechanisms to address RE challenges in a country context.

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Annex I: Research Framework

Objectives	Research Questions	Research Tools	Sources
1. Understand the existing fiscal arrangements for subsidy, challenge fund; analyse similar practices (of challenge fund) in other sectors	What are existing fiscal arrangements for subsidy, challenge fund; analyse similar practices (of challenge fund) in other sectors	Policy and plan analysis Literature review RE services trend analysis	Review of policy, plan and project documents of NRREP, NREF, RE Policy, Subsidy delivery mechanism; - Subsidy policy - UNCDF Challenge fund facility; UKAid, Sakchyam Program - GoN White paper; - RE Policy
	What are the fiscal arrangements for subsidy and RE financing in a changed context and what it implies for decentralized RE and financing?	Literature review & Stakeholders workshops, Conversational interviews with key persons RE services trend analysis Stakeholder analysis	<ul style="list-style-type: none"> Government agencies (AEP, MoEWRI, MoF, MoFAGA, National Natural Resource and Fiscal Commission etc.), Selected Provincial and Local Governments Banks and Financial Institutions (ADBN, NIBL, ACE, CEDBL/NMB, SKBB, JBS, NRB, CREF), Private sector renewable energy industry (RECON, WECAN, NMHDA, SEMAN etc.); Development Partners (ADB, WB, GIZ, UNDP, UNCDF, KfW, DFID, SNV etc.); (International) Non-Government
	What are the challenges different stakeholders are facing (community, ESCOs, other beneficiaries) with existing subsidy mechanism?	Focus group discussion, Conversational interviews with key persons, stakeholder consultation Transactional cost analysis	
2. Identify the opportunities and challenges for mobilizing challenge fund	Are there any lessons to be learned in terms of financial flow in RE?	Political economy analysis SWOT Analysis Literature review & Stakeholders workshops, Conversational interviews with key persons	
	What could be the possible challenges in the entire RE sector that could be addressed through the challenge fund?		

Objectives	Research Questions	Research Tools	Sources
	What are opportunities for mobilizing challenge fund (best modality and process)? what it tries to address, how its mechanism will look like, what are the incentives to be provided, what makes this a success- comparing with some international experiences or cases would be useful.	RE services trend analysis Conversational interviews with key persons	Organization (Winrock, etc.) • Civil society organizations and user associations
	- Analysis of information collected from the review and field survey		
3. Provide policy recommendations on the institutional and governance mechanism, fund flow process for operationalizing challenge fund in federalism context.	What is the interest of government (local and provincial) in contributing towards challenge fund through public, private partnership to resolve their locality's RE related challenges and also identify if they have the capacity to contribute (especially monetary contribution)?	Provincial and municipality level consultations Review of global experiences Transactional cost analysis	Stakeholders consultation workshop and validation workshop
4. Prepare detail implementation modality for challenge fund in federal context.	What could be the implementation modality for challenge fund in federal context?	Provincial and municipality level consultations	Stakeholders consultation workshop and validation workshop

Annex II: List of People Consulted

Table 2.1: Consultation at Federal Level

Name	Designation	Address
Prem Sagar Subedi	Clean Start Project Coordinator	United Nations Capital Development Fund, Central Business Park, Kathmandu
Nawa Raj Dhakal	Acting Executive Director	Alternative Energy Promotion Centre, Khumaltar, Lalitpur
Rudra Khanal	Director	Alternative Energy Promotion Centre, Khumaltar, Lalitpur
Satish Gautam	Project Manager	Rural Energy for Rural Livelihood, Alternative Energy Promotion Centre, Khumaltar, Lalitpur
Manu Binod Aryal	CREF Management & Monitoring Specialist (Head of Secretariat)	CREF, NMB Bank, Babarmahal, Kathmandu
Umesh Acharya	Energy Finance Expert	Rural Energy for Rural Livelihood, Alternative Energy Promotion Centre, Khumaltar, Lalitpur
Dinesh Dulal	Head, Energy Department & Development Organisation	NMB Bank Limited, Babarmahal, Kathmandu
Shasi Wagle	Challenge Fund Manager	Sakchyam- Access to Finance, Chundevis Marg, Maharajgunj, Kathmandu
Garry Whitby	Director of Challenge Fund	Sakchyam- Access to Finance, Chundevis Marg, Maharajgunj, Kathmandu
Pushkar Manandhar	Energy Specialist	Asian Development Bank, Uttar Dhoka, Kathmandu
Manoj Khadka	Energy Advisor	DFID- Nepal
Simon Lucas	Team Leader, Inclusive Growth & Resilience Team	DFID- Nepal
Annika Olsson	Economic Advisor	DFID- Nepal
Govind Nepal	Act. Chairperson	Institute for Strategic and Socio-Economic Research, Kathmandu
Mukesh Ghimire	Senior Officer	Alternative Energy Promotion Centre, Khumaltar, Lalitpur
Guna Raj Dhakal	Chairperson	Renewable Energy Confederation of Nepal, Kathmandu
Baikuntha Aryal	Secretary	National Natural Resources and Fiscal Commission, Singh Durbar, Kathmandu
Anita Bohara Thapa	Programme Coordinator	GIZ-Energising Development (EnDev) Nepal, Lalitpur
Peter Foerster	Chief Technical Advisor	GIZ-Energising Development (EnDev) Nepal, Lalitpur

Gyanendra Raj Sharma	Director	Ajummery Bikash Foundation, Lalitpur
Subarna Kapali	Executive Director	Ajummery Bikash Foundation, Lalitpur
Dr. Raghu Nath Shrestha	Senior Governance Expert	LGCDP, DP Cell, Kathmandu
Saroj Nepal	National Programme Coordinator	UNCDF, UN House, Lalitpur
Khadka Prasad Oli	Hon'ble Member	National Planning Commission, Nepal
Shovakanta Paudel	Joint Secretary	Ministry of Industry, Commerce & Supplies, Nepal
Bimal Regmi	Climate Change Specialist	Policy Institution Facility, Oasis Building, Lalitpur
Purusottam Ghimire	Governance Advisor	Policy Institution Facility, Oasis Building, Lalitpur
Mohan Das Manandhar	Political Economic Advisor	Policy Institution Facility, Oasis Building, Lalitpur
<i>Participants of the consultative meeting conducted on Sept 26, 2018 at Practical Action</i>		
Bala Ram Shrestha	Executive Director	BSP-Nepal
Krishna Prasad Devkota	Chairperson	Nepal Micro-hydropower Development Association
Purna N. Ranjitkar		Solar Energy Manufacturer Association Nepal
Kalidas Neupane		Water and Energy Consulting Association Nepal
Sunil Dhakal		Solar Energy Manufacturer Association Nepal
K R Khanal		Solar Thermal Association Nepal
Kiran Gautam	President	Solar Energy Manufacturer Association Nepal
Basanta Raj Lamichhane		Nepal Micro-hydropower Development Association
Reesab Raj Acharya		Nepal Biogas Promotion Association/RECON

Table 2.2: People consulted/interviewed at Province No. 2

Name	Designation	Address
Dr. Hari Bansh Jha, Mohan Lal Chaudhary	Honourable Deputy Chairperson and Member.	Policy Commission, State-2, Janakpur.
Jibachha Mandal	Secretary	Physical Infrastructure Development Ministry, State-2, Janakpur
Dr. Kiran Rupakhete	Secretary	Ministry of Economics Affairs and Planning, State-2, Janakpur
Vishnu Kunwar	Chairperson	Rural Development Foundation (NGO), Janakpur, Dhanusa
Sandeep Kantha, Bhupendra Chaudhary, Amit Gupta, Pramod Gupta, Firoj Chaudhary	President and others	Renewable Energy, Water Supply and Sanitation Promotion Centre, Chandranigahpur, Rautahat
Ram Ayodya Yadav,	Chairperson, and other members.	Basbariya Rural Municipality, Vabanipur, Sarlahi
Keshar Bahadur Shrestha	Chief Admin Officer	Basbariya Rural Municipality, Vabanipur, Sarlahi
Rajnish Misra	Accountant	Basbariya Rural Municipality, Vabanipur, Sarlahi
Kamal Shah Kalwar	Ward Chairperson	Basbariya Rural Municipality, Vabanipur, Sarlahi
Saroj Kumar Yahad	Ward Chairperson	Ward-6, Basbariya Rural Municipality, Vabanipur, Sarlahi
Saroj Ray	Ward Chairperson	Basbariya Rural Municipality, Vabanipur, Sarlahi
Ram Prakash Raya	Staff, Non Gazetted First Class Officer	Basbariya Rural Municipality, Vabanipur, Sarlahi
Mohan Kumar Misra	Health Coordinator	Basbariya Rural Municipality, Vabanipur, Sarlahi
Tinku Thakur	Assistant Health Coordinator	Basbariya Rural Municipality, Vabanipur, Sarlahi
Rakesh Ray	Sub-engineer	Basbariya Rural Municipality, Vabanipur, Sarlahi
Ganesh Kumar Mahato	Sub-engineer	Basbariya Rural Municipality, Vabanipur, Sarlahi
Sujit Kumar Karna	IT Officer	Basbariya Rural Municipality, Vabanipur, Sarlahi
Ram Chandra Yadav	Chairperson	Brindaban Municipality, Rautahat
Dukha Shaha	Local leader	Brindaban Municipality, Rautahat
Shivaji Raut	Local leader	Brindaban Municipality, Rautahat
Rattu Raya Yadav	Local leader	Brindaban Municipality, Rautahat
Somalal Shah	Local leader	Brindaban Municipality, Rautahat
Ramesh Mukhiya	Local leader	Brindaban Municipality, Rautahat

Balaram Sahani	Local leader	Brindaban Municipality, Rautahat
Rajkumar Raut	Local leader	Brindaban Municipality, Rautahat
Manoj Misra	Local leader	Brindaban Municipality, Rautahat
Pawan Kumar Raya	Local leader	Brindaban Municipality, Rautahat
Ram Govin Mukhya	Local leader	Brindaban Municipality, Rautahat
Banai Raya Yadav	Local leader	Brindaban Municipality, Rautahat
Amin Yadav	Local leader	Brindaban Municipality, Rautahat
Subhod Parel	Local leader	Brindaban Municipality, Rautahat
Arbind Sahani	Local leader	Brindaban Municipality, Rautahat
Sanjaya Sahani	Local leader	Brindaban Municipality, Rautahat
Subodh Prasad Patel	Ward Chairperson	Brindaban Municipality, Rautahat
Ram Prawesh Shah Rauniyar	Staff	EPC Nepal
Firoj lal Chaudhari	Staff	EPC Nepal
Ujjawal Raj Yadav		Brindaban Municipality, Rautahat

Table 2.3: People consulted/interviewed at Karnali Province

Name	Designation	Address
Prakash Jwala	Minister	Ministry of Economic Affairs and Planning, Karnali Province Government, Surkhet
Khadga Bahadur Shahi	Minister	Ministry of Infrastructure Development, Karnali Province Government, Surkhet
Apsara Devi Neupane	Deputy Mayor	Chandannath Municipality, Jumla
Shiva Raj Cahulagain	Chief Administrative officer	Chandannath Municipality, Jumla
Jaya Raj Rawal	Ward Chairperson	Ward 1, Chandannath Municipality, Jumla
Nanda Bahadur Upadhya	Ward Chairperson	Ward 3, Chandannath Municipality, Jumla
Narbir Rawal	Ward Chairperson	Ward 7, Chandannath Municipality, Jumla
Narjit Damai	Ward Chairperson	Ward 8, Chandannath Municipality, Jumla
Min Bahadur Dangi	Ward Chairperson	Ward 9, Chandannath Municipality, Jumla
Gyanendra Singh Budthapa	Pa. Bi. Aa.	Chandannath Municipality, Jumla
Krishna Bahadur Budthapa	Acting Ward Chairperson	Ward 2, Chandannath Municipality, Jumla
Mayalal Sunuwar	Proprietor	Karnali Bhiddhut Tatha Metal Works Private Limited, Jumla
Durga Pandey	Civil Society Leader	Himali Micro-hydro Electric Association, District NGO Federation
Kali Sharki	Member	Chandannath Municipality, Jumla
Binu Shahi	Member	Chandannath Municipality, Jumla
Bisnu Maya Shahi	Member	Chandannath Municipality, Jumla
Srijan Sunar	Acting Ward Chairperson	Ward 6, Chandannath Municipality, Jumla
Min Prasad Thapa	Treasurer	SEDA (NGO)
Dash Prasad Upadhya	Project Coordinator	SEDA (NGO)
Puran Rijal	Managing Director	Manikej Urja, Surkhet
Tej Bahadur Basnet	Chief	Barahtal Rural Municipality, Surkhet
Shova Kumari Sharma	Deputy Chief	Barahtal Rural Municipality, Surkhet
Yadav Chapagain	Administrative Officer	Barahtal Rural Municipality, Surkhet
Madi Raj Karki	Ward Chairperson	Barahtal Rural Municipality, Surkhet
Khagendra Deb Giri	Ward Chairperson	Barahtal Rural Municipality, Surkhet
Krishna Prasad Dhakal	Managing Director	KP Byabasyi Sewa Private Limited, Surkhet
Mohan KC	Managing Director	Tirshana Hydro, Surkhet
Bhupendra Kandel	Chairperson	Sundar Nepal Santha, Surkhet
Dhan Bahadur Malla	Private sector	Hillpower Multi service Pvt.ltd - Micro Hydro installer repair and maintenance
Binayak Shah	Private sector	Nano sunsine solar company
Govind Thapa	Private sector	Simtili Urja pvt ltd.
Tek Bahadur Shahi	Officer	ASTHA Nepal (NGO)
Sankar Pathak	Officer	ASTHA Nepal (NGO)
Raj Kumar Godal	Private Sector	Durlav Energy pvt ltd. Surkhet

Annex III: Interview Protocol and Checklists

Illustrative Evaluation Questions	Key Intended Respondent							
	Govt. Agencies	Local Government	BFI	Private Sector	Dev. Partner	(I)NGO	Civil Society Experts/Beneficiary	Existing CF Manager
Main Focus	Vision, plan, and strategies	Vision, plan, interest, and ability to contribute/participate	Willingness to participate, and factors that attract them to participate	On what area, they are able, willing and interested to participate, their expectations, and what they can contribute	Is CF their area of interest? What modality they are willing to follow and in which technical areas.	On what role they are fit in, and where they can contribute	Willingness to participate and on what conditions	Experience on CF, constraints and barriers
Objective 1: Understanding existing fiscal arrangements for subsidies and challenge fund								
What are the fiscal arrangements for the subsidy and RE financing in the changed context and what does it imply for decentralized RE and	✓	✓		✓				✓

Illustrative Evaluation Questions	Key Intended Respondent							
	Govt. Agencies	Local Government	BFI	Private Sector	Dev. Partner	(I)NGO	Civil Society Experts/Beneficiary	Existing CF Manager
financing? (Current practices)								
Are there any lessons to be learned in terms of financial flow in RE? (Major issues, best practices)	✓	✓	✓	✓	✓	✓	✓	✓
What are the challenges different stakeholders facing (community, private sector, ESCOs, other beneficiaries) with the current financing flow?	✓	✓	✓	✓	✓	✓	✓	✓
What are the practices on credit financing on RE?	✓	✓	✓	✓	✓	✓	✓	
What is the status of credit demand for RE?			✓	✓				
Objective 2: Compile learnings of challenge funds in RE and analyse similar practices in other sectors in Nepal and abroad those are relevant to RE financing in Nepal								
What if any are the incentives to be		✓	✓	✓				✓

Illustrative Evaluation Questions	Key Intended Respondent							
	Govt. Agencies	Local Government	BFI	Private Sector	Dev. Partner	(I)NGO	Civil Society Experts/Beneficiary	Existing CF Manager
provided? What could make the Challenge Fund a success?								
What are the national and international experiences and learnings on the implementation of challenge funds?	✓			✓	✓			✓
What are the factors that determine the success of challenge fund?	✓						✓	✓
Is RE sector in Nepal ready to handle challenge fund? If so, which are the most suitable technologies/sub-sectors within the RE?	✓		✓	✓				✓
What should be the focus in RE financing?					✓			

Illustrative Evaluation Questions	Key Intended Respondent							
	Govt. Agencies	Local Government	BFI	Private Sector	Dev. Partner	(I)NGO	Civil Society Experts/Beneficiary	Existing CF Manager
Objective 3: Identify opportunities for mobilising a challenge fund to address RE financing barriers in Nepal and leveraging investment								
Identify the opportunity space for a renewable energy challenge Fund	✓		✓	✓				✓
What could be the possible challenges in the entire RE sector that could be addressed through the challenge fund?	✓	✓	✓	✓		✓		✓
What will be its economic rationale (value for money)?			✓	✓				

Annex IV: Technology Scope of the Challenge Fund

Energy Technology/ Application	Sub-sector	Potential Investor/ Developer
1. Hydropower	1.1 Pico (up to 10 kW)	Community, Private, PPPs
	1.2 Micro (10 to 100 kW)	Community, private, PPPs
	1.3 Mini (100 to 1000 kW)	Community, Private, PPPs
2. Solar Photovoltaics	2.1 Home system	Individual
	2.2 Urban	Individual
	2.3 Municipal power plants	Local government Private, PPPs, Cooperatives
3. Wind	3.1 Isolated	Community, Private
	3.2 Grid connected	Private, PPPs
4. Mini-grid	4.1 Hydro	Community, Private, PPPs
	4.2 Solar	Community, Private, PPPs
	4.3 Wind	Community, Private, PPPs
	4.4 Hybrid	Community, Private, PPPs
5. Biogas	5.1 Household	Individual
	5.2 Urban	Individual
	5.3 Large commercial	Private, cooperative
	5.4 Municipal waste	Local government, cooperative, PPPs
6. Biomass	6.1 Improved cook stoves	Individual, Private, Cooperative
	6.2 Gasifier	Individual, private
	6.3 Briquettes/pellets/ Densification	Private
	6.4 Cogeneration	Private
	6.5 Biofuels	Individual, Private
7. Institutional solar	7.1 School	Public institution
	7.2 Health post	Public institution
	7.3 Irrigation	Community, cooperative
	7.4 Drinking water	Community
	7.5 Street light	Local government
	7.6 Religious institutions	Public institution
8. Solar thermal	8.1 Dryer	Individual, community, private
	8.2 Cookers	Individual, community, private
	8.3 Water heating system	Individual, community, private

	8.4 Concentrating Solar Power	Private, Community
9. Electric cooking (conventional, induction, infrared, hotplate)	9.1 Household	Individual
	9.2 Hotel/restaurant /Commercial	Private
10. Energy efficiency	10.1 Industrial/Commercial	Private, Public
	10.2 End-use	Individual, Private
	10.3 Demand and Supply Side management	Utility, Public
11. Improved water mill		Individual, Community
12. Distributed generation		Local government, Private, PPP
13. Productive end use		Private
14. Transportation	Electric vehicles, electric charging infrastructure	Public and private

Source: Author's Compilation

Annex V: Considerations to be Made on EMT for NECF

The External Management Team (EMT) will provide operational support to the CREF team for NECF. Some of the aspects to be considered:

- The EMT should be selected from the pool of Class A Commercial Banks regulated by NRB through an open process of procurement;
- The EMT should have a high density of branches, branchless banking centers and mobile and internet banking coverage in the provinces and nagarpalikas and gavpalikas and in particular those who may have shown an interest and will be targeted by NECF;
- EMT will provide the process management, funds management, financial management including disbursements, repayments (where relevant), portfolio and results management against performance indicators as well as financial control and audit services;
- The commercial bank hosting the EMT or affiliates will not be able to take part in the BFI challenge window of NECF or advise any banking clients who may be applicants to NECF;
- All information, intellectual property and knowledge generated in the operational support to NECF will remain the property of CREF, AEPC and GoN. The EMT will not have any claim on such intellectual property;
- CREF may devise a financial scheme for remunerating the EMT similar to the arrangement for handling banks where services provided are valued at market rates and offset by interest earnings from the deposits held by NECF;
- The EMT should have superior fiduciary standards which are comparable to the best in the industry and must cover Anti-Money Laundering (AML) and Countering Financing of Terrorism (CFT) provisions. Once the NECF fiduciary standards have been developed and approved the standards would be upgraded by the EMT. The EMT should have demonstrable superior level of cyber security provisions to protect the NECF related financial systems from external cyber threats;

Annex VI: Elements of the Information System for NECF

Some of the key elements of the proposed information system for NECF are:

- The objective of the information system would be to improve the efficiency of the process, reduce operating costs, reduce the transaction costs for NECF and the applicant, improve transparency and openness and enhanced results monitoring and knowledge management;
- An associated website and an App⁹⁶ will also be developed for NECF which will be bilingual – Nepali and English, with high levels of usability;
- The system will be integrated into the website and NECF app and should allow for proposals to be submitted by applicants using a computer or a handheld device. It should allow for management of all the information in the NECF challenge cycles from public launch to post-implementation impact measurement and knowledge management;
- The system should be capable of accepting concept proposal submissions from sub-national geographical areas of Nagarpalika and Gavpalikas where internet access or electricity availability may not be reliable.
- The system should allow for role-specific access and information review and inputs by external advisory firms and experts who are supporting the NECF challenge cycle;
- The system should allow for NECF to publicly make available results of various competitions or challenges as well as for NECF to facilitate process related communication, reporting and knowledge management;
- The system should allow for users belonging to MOEWRI, AEPC, NECF Committee, CREF Investment Committee and the CREF Steering Committee, DPs⁹⁷ and LGs to have varying levels of access depending on their role within the process. A number of management reports with varying levels of detail will be available for these categories of users;
- In addition to the information management, the system should also have a robust results monitoring module where energy generation, consumption, savings, meteorology, financial transaction related information from automated logging systems using 4G or 5G ICT systems to send system level monitoring data.
- The system should be able to accept inputs as audio, video or images relating to outputs and outcomes of the specific challenge fund investments through the handheld app on mobile phones such as part of the results monitoring by NECF;

⁹⁶ Available on Android and iOS platforms with different user levels and roles

⁹⁷ Who will be financing the challenge cycles;

- The feasibility of accepting data inputs in Nepali language at the concept stage should be explored to ensure access and participation by local municipalities and other sub-national level stakeholders in NECF;
- The system should incorporate higher security features to prevent cyber attacks and compromising of information provided to NECF by stakeholders;
- The IT service provide will provide the service in three phases – initial development, testing and launch phase, the second phase of improvements, upgrades and refinements and the final phase of maintenance and support;
- All the information relating to NECF will be hosted in servers located in Nepal or in compliance with data security provisions under relevant IT regulations in Nepal;

Annex VII: Information Requirements for Applications

The NECF would require information in two-stages – initially for short-listing of concepts and subsequently for the business or the implementation plan. All the submissions will be made through an easy to access information system and portal of NECF which will allow submissions remotely. Indicative information requirements for the concept notes, expressions for pre-qualification, business plans and implementation plans are specified here.

Concept Notes

Concept notes should contain the following information as a minimum:

- Details of the organisation, contact information, type of organisation, details of key managers;
- Track-record of the organisation in renewable energy or financial sector, details of financial accounts for the past 3 years, audit reports and how audit comments if any were addressed;
- Details of the proposed concept – how the concept addresses the NECF competition objectives of renewable energy, finance, geographical coverage etc. and why should NECF be supporting the concept;
- Details of funding required, with details of the co-financing by the applicants and contribution sought from NECF, explain the choice of the financial instrument (grants, equity, loans etc.) and provide justification.

Expressions for pre-qualification:

The expressions to pre-qualify for the local government window could contain the following information as a minimum:

- Details of the organisation, contact information, type of organisation, details of key managers;
- Track-record of the organisation in renewable energy details of financial accounts for the past 3 years, audit reports and how audit comments if any were addressed;
- Experience in the types of projects similar to the one where prequalification is sought, details of projects (client, technical specifications, cost, current status, role of organisation).

Business Plan

The concepts short-listed at the initial stage will be invited to submit detailed business plans to realise the concept and could contain the following information as a minimum:

- A logical framework detailing specific actions, outputs showing results against indicators and the projected impacts;
- A detailed implementation plan for achieving all the necessary activities to achieve the outcome – as a Gantt chart. Achievements against indicators should be shown as milestones specifying the months in which they will be achieved;
- A monitoring and evaluation plan explaining how the results will be measured against indicators and validated;
- A detailed financial spreadsheet specifying the type of expenses, quantities, basis for costing, details of co-financing provided against each type of expenses – including status of co-financing;
- Details of the project management team including brief CVs and role and details of the level of proposed involvement;
- Explanation about the market need that the proposal is addressing including quantification of the market assessment. Providing the basis for quantified market need such as a market assessment;
- Innovation that is being proposed and the differentiation from current baseline;
- Explanation of why the project would be self-sustaining after the NECF funding. What are the possibilities for replication? Can this proposal be scaled up?
- What are the implementation risks for the project (including details such as description, ownership, probability)? How will these risks be managed during implementation?
- How will the proposal meet the safeguards of NECF - environmental and social impacts – what are the possible positive and negative impacts. What is the management plan for the negative impacts?

Implementation Plan

The organisations pre-qualified at the initial stage will be invited to submit detailed implementation plans to achieve the RE project and could contain the following information as a minimum:

- A detailed implementation plan for achieving all the necessary activities to realise the RE project or installations – as a Gantt chart. Achievements against indicators should be shown as milestones specifying the months in which they will be achieved;
- A monitoring and evaluation plan explaining how the results will be measured against indicators and validated;
- A detailed financial spreadsheet specifying the type of costs, quantities, basis for costing, against each type of expenses as the basis for the financial contribution requested.

- Details of the project management team including brief CVs and details of the level of proposed involvement and roles;
- Innovation that is being proposed and the differentiation from current baseline;
- Explanation of why the project would be self-sustaining after the NECF funding. What are the possibilities for replication? Can this proposal be scaled up?
- What are the implementation risks for the project (description, ownership, probability)? How will these risks be managed during implementation?
- How will the proposal meet the safeguards of NECF - environmental and social impacts – what are the possible positive and negative impacts. What is the management plan for the negative impacts?

It should be possible to update the financial model and revise the financial contribution requested during the ERA process.