

CleanStart Detailed Business Plan – Nepal

Programme Outcome: By end of programme, more than 150,000 low-income households and micro-entrepreneurs (600,000 beneficiaries) will have sustainable access to clean energy through microfinance.

Programme Outputs:

1. **Finance for Clean Energy** to strengthen capabilities of up to three (3) financial service providers (FSPs) to provide microfinance for clean energy to low-income households and micro-entrepreneurs;
2. **Technical Assistance for Clean Energy** to remove barriers to the sustainable deployment of those technologies and services for which the selected FSPs will provide microfinance;
3. **Knowledge and Learning** to promote awareness and understanding of the potential for microfinance to stimulate adoption of clean energy, and to develop skills in clean energy microfinance;
4. **Advocacy and Partnership** to create an enabling policy and business environment to expand microfinance for clean energy.

Programme Duration: 4 years Anticipated start/end dates: 2012-2015	Total estimated budget*: US\$ 1,300,000 Out of which: 1. Funded Budget: US\$ 1,300,000 (CleanStart)
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Table of Contents

Executive Summary

Acronyms

1. Introduction.....	6
2. Country background.....	10
3. Situation Analysis	10
3.1 Lack of Access to Modern Energy	10
3.2 Potential of Decentralised Clean Energy	12
3.3 Need for End-User Finance	13
3.4 The Value of Clean Energy Products for FSPs.....	15
3.5 Need for sustainable energy value chain.....	16
4. Programme Strategy	17
5. Stakeholders, Target Groups and Ultimate Beneficiaries	24
6. Sustainability of results.....	25
7. Resources and Result Framework – Indicative	26
8. Management and Coordination Arrangements.....	31
8.1 Management Arrangements	31
9. Implementation Schedule – Indicative	34
10. Fund Management Arrangement.....	37
11. Monitoring, Reporting and Evaluation	37
12. Programme Monitoring Framework and Risk Assessment.....	38
13. Year One Workplan and Budget – Indicative.....	43
14. Annex	45

Acronyms

AEPC	Alternative Energy Promotion Centre
BoP	Base or Pyramid
BSP	Biogas Support Programme
BSP-	
Nepal	Biogas Sector Partnership Nepal
CCA	Common Country Assessment
CDM	Clean Development Mechanism
CER	Certified Emission Reduction
CPAP	Country Programme Action Plan
CREF	Central Renewable Energy Fund
DEES/U	District Energy and Environment Section/Unit
EAFS	Enhancing Access to Financial Services
EDI	Energy Development Index
FIPA	Financial Inclusion Practice Area
FSP	Financial Service Provider
GEF	Global Environment Facility
GJ	Gigajoule
GoN	Government of Nepal
IC	Investment Committee
ICS	Improved Cooking Stove
IEA	International Energy Agency
IWM	Improved Water Mill
kWh	Kilowatt hour
LFI	Local Financial Institution
LoA	Letter of Agreement
LPG	Liquefied Petroleum Gas
MFI	Microfinance Institution
MHP	Micro Hydro Project
MICS	Metallic Improved Cook Stove
MW	Megawatt
NPR	Nepalese Rupee
NRB	Nepal Rastra Bank
OSS	Operational Self Sufficiency
PAR	Portfolio at Risk
PBA	Performance-based Agreement
PIU	Programme Implementation Unit
PMF	Programme Monitoring Framework
PoA	Programme of Activities
POPP	Programme and Operations Policies and Procedures
REDP	Rural Energy Development Programme
RERL	Renewable Energy for Rural Livelihood
RESC	Regional Renewable Energy Service Centre
RET	Renewable Energy Technology
RETS	Renewable Energy Test Station
RFP	Request for Proposal
RREP	Rural and Renewable Energy Programme
RRF	Resources and Result Framework
SHS	Solar Home System
SMART	Specific, Measurable, Achievable, Relevant, Time-bound
SSHS	Small Solar Home System
UNCDF	UN Capital Development Fund
UNDAF	UN Development Assistance Framework
UNDP	United Nations Development Programme
WECS	Water and Energy Commission Secretariat

Executive Summary

Note: This document should be read in conjunction with the CleanStart global programme document.

Nepal is one of the candidate countries for CleanStart in Asia, pre-identified as having relatively the most developed microfinance and energy markets - which create an enabling environment for the programme's success. A scoping assessment was conducted in Nepal to finalise the country selection and detail out the country-specific business plan. CleanStart will invest US\$1,300,000¹ over a period of four years (2012-2015) to develop replicable business models for scaling up microfinance for cleaner and more efficient forms of energy for poor people. By end of programme, more than 150,000 low-income households and micro-entrepreneurs (or 600,000 beneficiaries) will have access to modern energy.

Nepal is currently experiencing an energy crisis of unprecedented severity. It ranks 53 out of 64 countries in the Energy Development Index (EDI) (0.102). Rural electrification stands at approximately 34 percent, but even urban areas face acute power shortages. Most of Nepal's total energy comes from traditional biomass fuels (87.1 percent), while the remaining is derived from commercial (12.2 percent) and renewable sources (0.7 percent). Fuel wood is by far the largest energy source of total energy consumption (77 percent). These patterns of energy generation and consumption – coupled with difficult geographical terrain in hilly and mountainous areas, socio-economic underdevelopment and a sparsely distributed population – present formidable challenges in providing modern energy solutions. It also limits socio-economic development, as unequal access to modern energy is closely correlated with wider inequalities in opportunities for human development.

A number of related policies and programmes for expedited and equitable promotion of renewable and efficient energy systems spurred important market and technology improvements. As a result, decentralised clean energy has become more available with better performance and operating life and progressively less expensive. There is still significant unexploited potential ahead. Between 2010 and 2013, the Government of Nepal (GoN) aims to electrify an additional 7 percent of the total rural population through alternative energy sources and “by the next 20 years, the share of renewable energy in total energy supply of the country will reach 10 percent and almost 30 percent of the people in the country will have access to electricity from alternative energy sources”. This requires up-scaling current activities and replicating successful models.

However, high upfront costs compared to traditional fuels, low purchasing power of poor people and lack of viable financing mechanisms are still major barriers to dramatically scaling-up access. **In Nepal, where the microfinance sector is maturing, microfinance institutions are well placed to supply finance schemes tailored to the needs of poor consumers at scale.** Currently, it is estimated that microfinance institutions collectively reach over 1.5m clients. The sector demonstrates features of a mature microfinance market through **outreach** (many of the larger microfinance banks reach over 100,000 clients), **profitability** (over 100% Operational Self Sufficiency) and good **key performance indicators** (Portfolio at Risk less than 30 days below 5% and case load of over 300 clients per field officer). Not least, it has access to a very mature wholesale financing market. At this stage, the growing challenge for MFIs is limited growth of their lending portfolio within the existing client base. Clean energy financing is a profitable and cost effective strategy for MFIs to introduce a new product to an existing client base in a market that has high-growth potential. **However, they may be reluctant to enter the energy market due to lack of familiarity and perceived high risk.**

While the price and payment terms are important factors, experience shows that even well designed financing schemes will not be enough to promote widespread adoption of clean energy systems. A number of complementary informational, institutional, regulatory, and behavioral instruments will be required to remove non-economic hurdlesⁱ. As such, a number of non-financial barriers at the **end-user, finance, supply chain and policy/regulatory levels** will have to be addressed concurrently for clean energy finance to be delivered at scale and have a market transforming effect.

¹ CleanStart will explore the possibility of mobilising additional funding for the Nepal business plan based on outcomes of the mid-term evaluation tentatively scheduled for 2014

Against this background, CleanStart will be delivered through **four outputs**:

1. **Finance for Clean Energy** to strengthen capabilities of up to three (3) financial service providers (FSPs) to provide microfinance for clean energy to low-income households and micro-entrepreneurs;
2. **Technical Assistance for Clean Energy** to remove barriers to the sustainable deployment of those technologies and services for which the selected FSPs will provide microfinance;
3. **Knowledge and Learning** to promote awareness and understanding of the potential for microfinance to stimulate adoption of clean energy, and to develop skills in clean energy microfinance;
4. **Advocacy and Partnership** to create an enabling policy and business environment to expand microfinance for clean energy.

CleanStart will be anchored in the Alternative Energy Promotion Centre (AEPC) which is the lead national agency mandated to promote and develop renewable energy through policy formulation, quality assurance and financial assistance (subsidy, credit). CleanStart will rely on AEPC support in ensuring subsidy distribution²; brokering partnerships between FSPs and energy suppliers; quality assurance and after-sales service; advocacy; and monitoring and coordination. This programme will be implemented within the framework of the National Rural and Renewable Energy Programme (NRREP), being implemented through AEPC under a single programme modality.

² Financed through the Rural Energy Fund and upcoming Central Renewable Energy Fund

1. Introduction

Nepal is one of the candidate countries for CleanStart in Asia, pre-identified as having relatively the most developed microfinance and energy markets – which create an enabling environment for the programme's success.³ A scoping assessment was conducted in Nepal⁴ to finalise the country selection. Findings of the assessment reaffirmed a strong need and interest among key stakeholders in expanding microfinance for clean energy; a mature microfinance market with institutional diversity and good performance; a growing energy sector that is spear-headed by an apex institution mandated to promote renewable energy; and an increasing availability of wholesale funds for clean energy lending. Below are salient points of the assessment which has informed the selection of Nepal as a pilot country and the design of the business plan.

Table 1. Key Findings of the Assessment

Category	Findings	Implications for CleanStart
Context	Lack of access to modern energy: Little over 40 percent of the population has access to electricity. Some 87.1 percent of the population still relies on traditional biomass fuels for cooking and heating.	Decentralised clean energy has an important role to play in electrifying rural areas and alleviating inefficient use of biomass. It can also possibly mitigate the negative impacts of load shedding in urban areas.
Energy sector	<p>Apex body: Alternative Energy Promotion Centre (AEPC) is mandated to promote and develop renewable energy through policy formulation, quality assurance and financial assistance (subsidy, credit). Following the approval of the AEPC Act, it will have greater autonomy and resources to promote RETs.</p> <p>Donor programmes: Energy sector development has so far been heavily donor-driven and uncoordinated. Harmonization of various programmes is envisaged under the upcoming National Rural and Renewable Energy Programme (NRREP, US\$184). There will be an increased emphasis in credit, private sector development and productive end-use. Key development partners include NORAD, Danida, DFID, EU, SNV, WB, IFC, ADB, KfW, GIZ and UNDP.</p> <p>Decentralized energy delivery through local governance systems: AEPC has local structures at the district level - namely District Energy and Environment Sections/Units (DEES/U) and Regional Renewable Energy Service Centres (RESC).</p> <p>Subsidy: Available for selected RETs (micro/mini-hydro, solar energy, biogas, improved water mill, improved cook stoves) through suppliers pre-qualified by AEPC.⁵</p> <p>Subsidy is distributed directly to vendors, and therefore lacks transparency for consumers. There was a brief discontinuation of subsidies in the past,</p>	<p>Partner with AEPC for quality assurance of technologies chosen for lending, provision of subsidies in programme areas, and field monitoring/coordination support.</p> <p>Closely align with RREP to create a more enabling policy and business environment for the programme's success.</p> <p>Leverage these local structures to promote loan opportunities and RETs, identify energy needs, and provide quality assurance at the community level on a sustainable basis.</p> <p>Ensure subsidies are provided in programme areas as a lack thereof may encourage end-users to delay purchase and therefore dampen demand for credit.</p> <p>Explore a tripartite model whereby the vendor, FSP and end-user become signatories to the subsidy disbursement.</p>

³ Refer to Global Programme Document, Section 3. Geographical Context for more details on country selection

⁴ The scoping assessment was conducted in 22 February until 2 March, 2012.

⁵ Rural Energy Fund has disbursed subsidy of NPR 448.8 million for Solar Home Systems (SHSs), NPR 12 million for Small Solar Home Systems (SSHs), NPR 12 million for Metallic Improved Cooking Stoves (MICSs) and NPR 327.5 million for Micro hydro/Mini Grid projects (Source: AEPC Annual Progress Report July 2010-June 2011)

	<p>and unequal distribution is a concern. AEPC has committed to reforming the subsidy system and financing a higher portion.</p> <p>Emerging market: A growing urban market is expected for renewable energy products due to regular and prolonged disruption of power supply.</p>	<p>CleanStart will target both rural and urban areas. This will mitigate risks for FSPs new to energy lending as many FSPs serve the urban poor and financial products can be introduced to their existing client base.</p>
Energy supply chain	<p>Pre-qualified suppliers: AEPC pre-qualifies technology suppliers eligible for subsidy against a set of criteria (organizational capacity, performance track record, financial strength, quality assurance and field monitoring system, business plan). Over 200 suppliers are pre-qualified to date.</p> <p>Quality assurance: AEPC performs this role by developing technical quality standards, setting up a quality monitoring system and establishing a reward and punishment system for pre-qualified companies. Although after-sales service is enforced, it still remains a key issue particularly in rural areas.</p> <p>Local intermediaries: There are many intermediaries ranging from manufacturers of clean energy utility products (assembled), retailers with low and high-end energy utility supplies to small repair and maintenance shops at the community or village level selling basic energy utilities (bulbs, wires, switches etc...) to rural households.</p>	<p>Broker partnerships with suppliers pre-qualified by AEPC. Introduce new suppliers or technologies that offer more efficient and affordable options through technology expo.</p> <p>Ensure technical assistance for energy supply chain is anchored in AEPC's quality assurance system.</p> <p>Provide technical assistance to local intermediaries to strengthen the supply chain, in particular after-sales. Also, explore with partner FSPs, as part of innovation, loan products for local intermediaries for business development.</p>
Support structures	<p>Technology testing: Renewable Energy Test Station (RETS) tests technology components. Currently, focuses primarily on solar technology. Envisions becoming national centre for quality assurance of RETs.</p> <p>Technology associations: Represents interests of manufacturers in micro-hydro, biogas, improved water mills, metallic cook stoves, solar energy. Active in technology promotion, R&D and training.</p> <p>Technology development: Local entities such as the Centre for Rural Technology (NGO) and university labs focus on adapting RETs to local realities.</p> <p>Carbon finance: Nepal has three validated Programmes of Activities (PoA): ICS, IWM, biogas. Carbon finance is considered another way to assure quality.</p>	<p>Partner closely with meso-level structures to improve hardware type and specification that is adapted to particular built environments, as well as improve installation and maintenance standards.</p> <p>Invite bundling agencies to raise awareness among suppliers and FSPs.</p>
Microfinance sector	<p>Central Bank (Nepal Rastra Bank): NRB policy has been positive towards the development of the microfinance sector. Energy lending is a priority area.</p> <p>Institutional diversity: Composed of microfinance development banks, financial intermediary NGOs, cooperatives and local financial institutions.</p>	<p>Select partner FSPs with strong performance track record and wide outreach.</p>

	<p>Strong performance indicators: Many large MFIs reach over 100,000 clients, are profitable (over 100% Operational Self Sufficiency) and have PAR less than 30 days below 5%</p> <p>Lending model: Grameen model of group lending. Credit duration is typically one year for microenterprise activities.</p> <p>Deposit mobilisation: Central Bank is granting approvals for public deposit-taking.</p> <p>Energy lending: Several end-user credit schemes have been tested, but most have not reached scale.</p>	<p>Clean energy loans may require new lending practice such as individual lending, consumption loans with lower interest rates, or longer credit period. May also require new credit assessment method based on savings costs (similar to assessments for consumer lending).</p> <p>This will provide new source of funding for lending portfolios.</p> <p>Partner with high-performing FSPs with wide outreach (50,000 plus borrowers). Develop profitable business models that will gradually build confidence of FSPs (e.g. target existing clients for ease of credit assessment and risk mitigation, develop risk-sharing agreements with suppliers).</p>
Wholesale funds	<p>Deprived Sector Credit Programme: Specialized microfinance wholesale banks and commercial banks provide funds to retail microfinance institutions under the mandatory Deprived Sector Credit Programme. MFIs have used this window to finance energy lending.</p> <p>Central Bank Directive on energy lending⁶: Commercial banks are obligated to make 10 percent of their total lending to the agriculture and energy sectors within the next three years</p> <p>Central Renewable Energy Fund (CREF): NRREP will establish CREF⁷ as the core financial institution responsible for delivery of subsidies and credit. CREF will ensure subsidies and long-term finance for energy lending for the next five years.</p>	<p>Concessional loans through the programme are not required as refinancing for clean energy lending is sufficiently available.</p> <p>Explore possibility of also partnering with refinancing institutions to achieve scale through a large number of small institutions with good rural outreach.</p> <p>Build capacity of FSPs to later secure financing through CREF.</p> <p>Contribute to building capacity of AEPC to better manage subsidies and credit through the CREF.</p>
Support structures	<p>Local consulting firms: Local consulting firms provide technical assistance to local financial institutions (LFIs) on behalf of AEPC and commercial banks that provide wholesale loans. They build capacity of LFIs in needs assessment, promoting benefits of RETs and loan opportunities and management of energy loans.</p> <p>Training and knowledge sharing: There are entities that offer training and knowledge sharing to strengthen institutional capacity of MFIs</p>	<p>Outsource technical assistance for partner FSPs and suppliers to local consulting firms in addition to sourcing technical assistance internationally.</p> <p>Identify international technical assistance providers that can further build capacity of local TA providers.</p> <p>Partner with local training facilities to provide training on clean energy lending to MFIs</p>

⁶ As of Jan 2012

⁷ The credit mechanism for CREF is currently under discussion. Volume is expected to be US\$ 300 million. Lending through CREF is expected to start in early 2013.

	<p>Microfinance networks: Wide outreach, but have not been active enough to promote interests of the industry. Typically focused on building organizational capacity of MFIs</p>	<p>Use as platform to disseminate information about the benefits of clean energy and loan opportunities</p>
<p>Relevant UNCDF and UNDP programmes</p>	<p>Enhancing Access to Financial Services (EAFS): Supported by UNCDF and UNDP, it supports MFIs to expand outreach to BOP clients. It partners with high-performing MFIs in Nepal (combined outreach approximately 80% of the market). Nepal Rastra Bank is the implementing partner.</p> <p>Renewable Energy for Rural Livelihood (RERL): Supported by UNDP and the World Bank, it focuses on local level capacity building to increase access to clean energy through community mobilization models. It works on community-managed mini and micro hydro. It has also supported solar home systems, biogas and improved cook stoves on a smaller scale typically for households outside the micro hydro area. AEPC is the implementing partner.</p>	<p>Relationships established with FSPs through EAFS will help in identifying appropriate partners for CleanStart. Also, incorporate lessons from EAFS implementation.</p> <p>RERL can train FSPs on demand collection through community mobilisation process.</p> <p>Innovative strategies can be piloted in overlapping programme districts (e.g. loans for community-based systems, productive end-use, household utilities, technology retailers/manufacturers).</p>

2. Country background

Nepal is a landlocked country in South Asia, bordered by the Republic of India and the People's Republic of China. Geographically, it is divided into three topographic regions: the high hills (mountains), the mid-hills and the Terai (plains). It has a population of 26.6 millionⁱⁱ and is a multi-ethnic, multi-lingual, religiously-diverse country. Nepal ranks 157 out of 187 countries in the Human Development Index (0.458).ⁱⁱⁱ Thirty one percent of the Nepalese population lives below the poverty line, and per capita income is USD 473.2^{iv}. Poverty remains severe and widespread in many rural areas, with significant disparities between groups and regions. Nepal has experienced rapid political change during the last two decades, ending a decade-long internal conflict in 2006 with a peace agreement signed between the major political parties. On 28 December 2007, the Interim Parliament declared Nepal a federal democratic republic. An interim constitution is currently in place, and the Constituent Assembly is in the process of drafting a new one.

3. Situation Analysis

3.1 Lack of Access to Modern Energy

Nepal is currently experiencing an energy crisis of unprecedented severity.⁸ It ranks 53 out of 64 countries in the Energy Development Index (EDI) (0.102)⁹. Per capita energy consumption (14GJ) is one of the lowest in the region.¹⁰ As of 2009, a little over 40 percent of the population has access to electricity.^v Rural electrification stands at approximately 34 percent, but even urban areas¹¹ face acute power shortages.^{vi} It has one of the world's lowest rates of per capita electricity consumption, with an average of 80kWh annually.^{vii} The gap between supply and demand of grid electricity is increasing every year, as the demand is growing more than 7% annually while hardly any new power plants are being commissioned¹². A steady rise in demand is caused by rapid urbanisation and increased industry growth rate, whereas the deficiency in (generation) capacity has been mainly due to frequent outages¹³ and high system losses, lack of investment resources and geography.

Nepal has a long history of hydropower and has the world's second-highest hydroelectricity potential¹⁴. However, this resource accounts for only 1 percent of Nepal's total energy supply. Most of Nepal's total energy comes from traditional biomass fuels (87.1 percent), while the remaining is derived from commercial (12.2 percent) and renewable sources (0.7 percent).^{viii} Fuel wood is by far the largest energy source at 77 percent of total energy consumption (Figure 1).^{ix} It is a major source of cooking fuel, followed by LPG (12%), cow dung (11%), biogas (2.4%) and kerosene (1.4%).^x Kerosene is more frequently used for lighting¹⁵, but it is costly and frequently unavailable and for rural villagers not readily accessible.

⁸ The Government of Nepal (GoN) declared a National Electricity Crisis in 2008

⁹ IEA, 2011. EDI is an indicator that tracks progress in a country's or region's transition to the use of modern fuels. It is composed of four indicators: (i) Per capita commercial energy consumption (ii) Per capita electricity consumption in the residential sector (iii) Share of modern fuels in total residential sector energy use (iv) Share of population with access to electricity

¹⁰ Asian average is 26 GJ

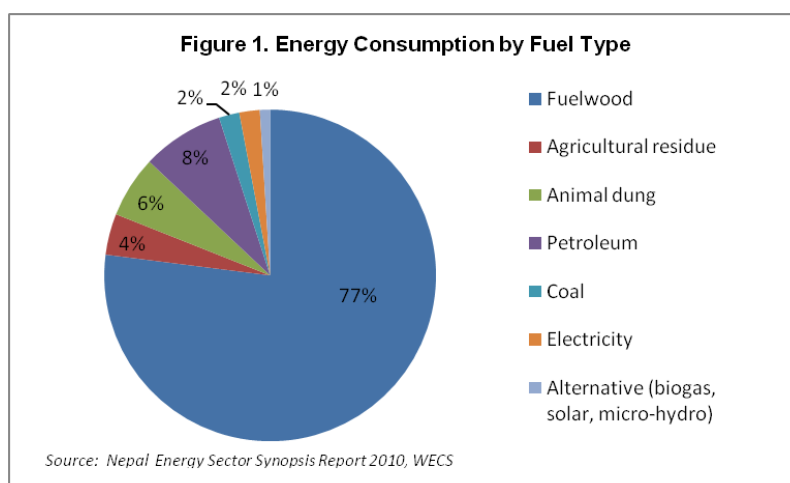
¹¹ Urban electrification rate is approximately 90 percent

¹² 70 to 80 MW of additional installed capacity should be realized every year to meet the growing demand

¹³ As many as 16 hours of electricity outage per day in dry seasons

¹⁴ Feasible hydropower of 42,000 MW

¹⁵ Average monthly demand per household at 3 litres



These patterns of energy generation and consumption – coupled with difficult geographical terrain in hilly and mountainous areas, socio-economic underdevelopment and a sparsely distributed population – present formidable challenges in providing modern energy solutions. It also limits socio-economic development, as unequal access to modern energy is closely correlated with wider inequalities in opportunities for human development (Box 1).

Box 1. Lack of access to modern energy and impact on human development

Impact on economy and household expenditure: Kerosene has become the principal source of cooking energy for the urban poor. However, due to the increase in the international prices of the petroleum products, much of the country's export earnings are being used up for importing them. In Nepal, households in non-electrified communities spend an average of \$41 annually to buy kerosene and dry-cell batteries, while those in communities with electricity spend an average of about \$19 to meet their energy needs – about \$11 for electricity and \$8 for kerosene and batteries.

Impact on education, gender and health: In rural poor households of Nepal, cooking often accounts for 92% or more of the total energy demand from traditional biomass of which fuel wood constitute 75.1%. The task of gathering fuel wood and carrying heavy load also falls mainly on women and children. Surveys show an average of 3-4 hours per day spent by women and children in fuel wood collection. This in turn prevents women from acquiring new skills or engaging in income-generating activities and limits access to schools (particularly among girls) and by association to improved literacy. On the health front, cases of prolapsed uterus from carrying heavy load is a common health problem among women of rural Nepal. Furthermore, biomass is typically burnt on open fires or inefficient stoves, and when used indoors it produces levels of indoor air pollution many times higher than international ambient air quality standards allow for, exposing women and children to a major public health hazard. Women exposed to heavy indoor smoke are three times as likely to suffer from chronic obstructive pulmonary disease (e.g. chronic bronchitis), than women who use cleaner fuels.

Impact on environmental sustainability: About 18 million tons of fuel wood is consumed annually in Nepal, out of which less than 1% is commercialized. Rest is collected by the users free of cost from forests or their own cultivated land. Increasing demand for fuel wood leads to deforestation (2.1% annually), causing further impacts on CO₂ emission and absorption and also contributes to the deterioration of biodiversity. Deforestation remains a serious local problem in many mountain and hill areas of Nepal and only 29% of the country remains forested, compared to 37% in 1990. Rural populations in Nepal pay the highest price for environmental degradation, as their livelihoods depend on the goods and services from ecosystems (e.g. water, non-timber products, soil fertility, and prevention of erosion). Moreover, many traditional energy sources are inefficient and result in higher CO₂ emissions than either grid electricity or modern, off-grid alternatives.

3.2 Potential of Decentralised Clean Energy

Since the establishment of the Alternative Energy Promotion Centre (AEPC, Box 2) in 1996, a number of related policies¹⁶ and programmes for expedited and equitable promotion of renewable and efficient energy systems have followed (Annex 1). It contributed to developing the market for cleaner energy systems, particularly among rural households, through policy development, pre-qualification of suppliers, establishing quality standards, building a decentralised structure for energy service delivery at the district-level and providing financial assistance through subsidy and to a limited extent credit. These conditions spurred important market and technology improvements, whereby decentralised clean energy has become more available with better performance and operating life and progressively less expensive (Annex 2). This is creating new possibilities for poor families to access clean energy and realise meaningful benefits (Annex 3).

Box 2. Alternative Energy Promotion Centre (AEPC)

AEPC is the lead national agency for promoting the use of renewable energy technologies in Nepal. It serves as an intermediary institution between the operational level (e.g. NGOs, private sector) and the policy decision levels in relevant ministries. AEPC is a semi-autonomous body established in November 1996, and is currently under the Ministry of Environment.

Its activities include renewable energy policy formulation, planning and facilitating the implementation of the policies/plans. It also is responsible for pre-qualification of suppliers of goods and services, technology standardization, quality assurance and monitoring as well as delivery of financial assistance including subsidies and credit. It also has established itself as a national focal point for coordinating and monitoring renewable energy related activities in Nepal, and has been actively promoting the use of these energy technologies through implementation of a number of programmes and projects to meet rural energy needs.

Over the years all these programmes have tried out several concepts and achieved various successes such as: establishing technical quality standards for certain RE systems, setting up of a quality monitoring system and a system of pre-qualifying of manufacturing and installation companies. AEPC also has established a reward and punishment system for companies. In cases of serious defects of RE systems, companies could be disqualified and taken off the register.

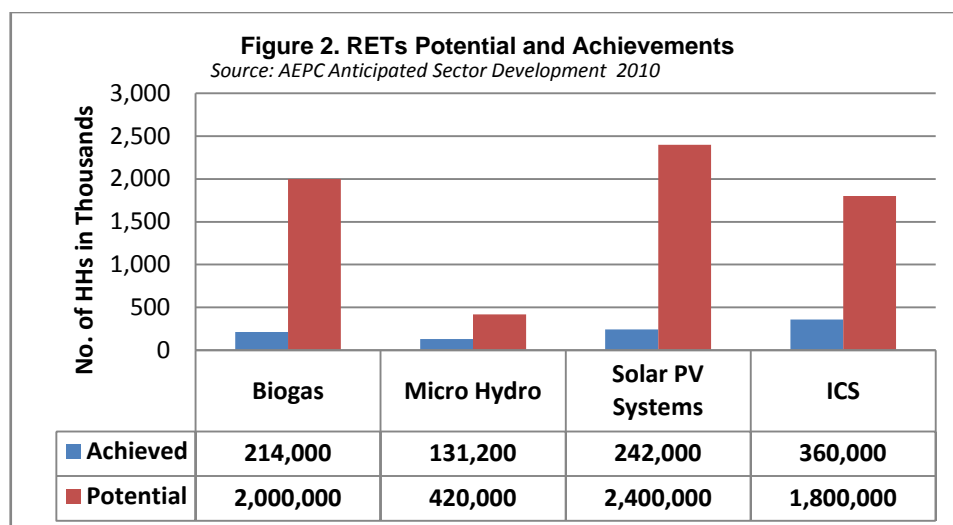
GoN has drafted an AEPC Act in order to strengthen AEPC and provide greater autonomy and resources in order to take the lead in the sector. With the approval of the AEPC Act in the Parliament, it is the plan of the GoN to converge all existing and future rural and renewable energy programmes and projects under AEPC which will be transformed into the Alternative Energy Promotion Board, responsible for all RE projects of up to 10MW in capacity.

Reference: AEPC website; Renewable Energy for Rural Livelihood (RERL) GEF Project Identification Form

There is still significant unexploited potential ahead (Figure 2). Between 2010 and 2013, the Government of Nepal (GoN) aims to electrify an additional 7 percent of the total rural population through alternative energy sources. This will have to be achieved via, amongst others, the installation of 15 MW of off-grid micro hydropower, 1 MW of wind power, and 90,000 household biogas plants, 4,500 improved watermills and more than 125,000 units of Solar PV home systems in the Hill districts of Nepal.¹⁷ It also plans to expand solar home systems in urban areas to mitigate the negative impacts of load shedding. The longer term vision of the Government is that “by the next 20 years, the share of renewable energy in total energy supply of the country will reach 10 percent and almost 30 percent of the people in the country will have access to electricity from alternative energy sources”. Complementing these goals, the government envisages investments worth USD 1,076 million in renewable energy by 2020 with the ultimate goal of every household having at least one renewable energy-based energy system installed.

¹⁶ Rural Energy Policy; Subsidy Policy for Renewable (Rural) Energy; Renewable (Rural) Energy Subsidy Delivery Mechanism

¹⁷ Three Year Plan of the Alternative Energy Sector (2010—2013). The total budget required to realize all targets set in the 3-year plan is 7,107.7 million Rs (around \$US 98 million), 19% of the required budget (around US\$19 million) will come from the GoN, the remaining 81% (US\$79 million) will have to come from development partners. GoN is committed to contribute a 10% subsidy for all distributed microhydro and solar power systems and a 30% subsidy for household biogas systems.



This requires up-scaling current activities and replicating successful models. This is challenging given inadequate institutional structure; lack of comprehensive framework for energy service delivery to the poor; efforts to promote RETs that have been largely technology and supply-side driven; weak supply chains particularly constraint by the geographical terrain, poor infrastructure, and insufficient local support service capacities such as after-sales; high upfront costs of alternative energy compared to traditional fuels; insufficient attention to productive uses that could pay for energy services; lack of awareness of the benefits of using cleaner energy by the end-users; and lack of harmonised and collaborative efforts among donors in national renewable energy programmes. In view of these barriers, a harmonised approach to support the renewable energy sector through a single programme framework for all development partner-supported renewable energy programmes called the National Rural and Renewable Energy Programme (NRREP, Annex 1) is being finalised, and will be implemented by the Alternative Energy Promotion Centre (AEPC) beginning mid-2012.

3.3 Need for End-User Finance

Clean energy systems are becoming increasingly reliable, available and affordable both in absolute terms and also relative to most popular fossil-fuel alternatives. However, high upfront costs compared to traditional fuels, low purchasing power of poor people and lack of viable RET financing mechanisms are still major barriers to dramatically scaling-up access. To help finance the remaining cost of the systems, several credit schemes have been piloted (Annex 4). However, most financing arrangements have yet to reach scale. Commercial banks have introduced loans for end-users, but are faced with the challenge of delivering and recovering credit to and from clients in remote areas. The transactional cost is high compared to the small margins made on micro-loans. Therefore, some banks have partnered with local financial institutions (LFIs)¹⁸ which act as financial intermediaries between banks and rural clients.¹⁹ However, most LFIs have weak capacity and require capacity building. Another model is vendor financing, whereby suppliers act as agents between banks and customers and even guarantee loan repayments. The inherent limitation of this model is that suppliers do not have specific lending expertise.

In Nepal, where the microfinance sector is maturing, microfinance institutions are well placed to supply finance schemes tailored to the needs of poor consumers at scale. Currently, it is estimated that microfinance institutions collectively reach over 1.5m clients. The sector demonstrates features of a mature microfinance market through outreach (many of the larger microfinance banks reach over 100,000 clients), profitability (over 100% Operational Self Sufficiency) and good key performance indicators (Portfolio at Risk less than 30 days below 5% and case load of over 300 clients per field officer). Some of the main microfinance development banks are also listed on the Kathmandu Stock Exchange. Furthermore, the Nepal Rastra Bank (NRB)²⁰ is granting approvals for public deposit mobilisation thus opening doors for a new source of funding for lending portfolios.²¹

¹⁸ LFIs are generally cooperatives. Cooperatives are independent legal entities and can borrow from financial institutions.

¹⁹ LFIs act on behalf of the bank providing and recovering loans

²⁰ Central Bank of Nepal

²¹ Two microfinance banks since January 2012

Nepal also has a very mature microfinance wholesale financing market which consists of specialised microfinance wholesale banks and commercial banks that provide funds to retail microfinance institutions under the mandatory Deprived Sector Credit Program. Furthermore, NRB has made it mandatory for commercial banks to make 10 percent of their total lending to the agriculture and energy sectors within the next three years.²²

Box 3. Overview of the microfinance sector

Over the past three decades, Nepal's financial sector has grown rapidly due to reforms and liberalization in the sector. The microfinance sector, in particular, has commenced from government-driven programmes into private sector-managed institutions, and has grown in terms of number and types of institutions. Microfinance loans are defined in the country as loans below NRs 200,000. According to the Central Bank Directive, regulated microfinance institutions can lend up to NRs 90,000 without any collateral and up to NRs 200,000 with collateral. MFIs serve clients for small loans generally below Rs 50,000.

Four types of **financial institutions** are identified under the current Bank and Financial Institutions Act according to the capital requirements.

1. Commercial Banks (A type): full banking license with foreign exchange transactions
2. Development Banks (B type): Partial banking license excluding foreign exchange transactions
3. Finance Companies (C type): Limited banking license
4. Microfinance institutions/ Banks (D type)

As per the NRB statistics (Jan 2011), four types of **microfinance institutions/banks** are recognized.

1. Microfinance Development Banks classified under category 'D' by the NRB (21)
2. Regional Development Banks (5)
3. Savings and Credit Cooperatives (over 20,000)
4. Financial Intermediary NGOs licensed by the NRB (45)

The microfinance sector has become more diversified in recent years because of the commercialization of microfinance NGOs and their transformation into microfinance development banks. Expansion in outreach on a sustainable basis and improvements in key performance indicators have been important features of the industry during the last few years. Microfinance institutions (MFIs) are the predominant direct providers of microfinance services to low-income households and rural people. Regarding the share of the market, MFDBs are the largest MFIs in the country. One MFDB serves 25,000 – 150,000 clients, a FINGO 2,000 – 30,000 clients, a SCC 50-1000 members, and a Small Farmers Cooperative Limited (SFCL) 200-1000 clients. Microfinance development banks (MFDB) largely serve in the Tarai, whereas financial intermediary NGOs (FINGO) and cooperatives are the largest service providers in the hills and mountains.

MFIs generally provide short-term loans of less than 18 months for productive uses such as agriculture, livestock, poultry, petty trading, and grocery stores. Except for SCCs, MFIs in general do not provide loans for consumption or social activities. Some MFIs have started extending credit for energy needs in the past but have not had any significant impact or scale. MFIs normally provide compulsory and voluntary savings products to its members in addition to loans. In 2012, NRB has authorised two MFDBs to mobilise public savings and may consider other MFDBs on a case by case basis. Due to the lack of insurance services available in rural areas, most MFIs have also offered institution-based protection schemes related to livestock death and life insurance. A few microfinance banks and cooperatives now offer remittance transfer services.

With the objective of supplying **wholesale funds** to retail MFIs, three wholesale lending agencies have been established in Nepal.

1. Rural Self-Reliance Fund (Managed by NRB)
2. Rural Microfinance Development Center
3. Sana Kisan Bikas Bank (Small Farmers Development Bank) which exclusively cater to small farmer cooperatives

The Rural Microfinance Development Centre Ltd. (RMDC) and Sana Kisan Bikas Bank Ltd. (SKBBL) are the two large wholesale lending organisations each serving over 100 microfinance institutions. The Rural Self Reliance Fund (RSRF), which is being managed by NRB, offers funds to NGOs and cooperatives on a small scale. Commercial and Development Banks (CB/DB) do not lend directly to the poor (CBs/DBs are the largest providers of loans larger than Rs 500,000), but rather provide wholesale funds to these retail MFIs under the mandatory Deprived Sector Credit Programme. CBs/DBs are the largest providers of loans larger than Rs. 500,000.

Reference: Microfinance Industry Report (Nepal), 2009

²² The Central Bank issued a new Directive to this effect in January 2012

3.4 The Value of Clean Energy Products for FSPs

The growing challenge for FSPs in Nepal is not liquidity to finance loan portfolios, but limited growth of their lending portfolio within the existing client base. Geographical terrain has caused most FSPs to be crowded in the Terai (plain) region as opposed to the hills and mountains. Opening branches in the Hilly areas of Nepal has only a moderate success rate due to low population density and the difficult infrastructure. Apart from the direct and organisational costs of new branch expansion, overlapping of FSPs has led to increased competition creating pressure to take on ever more risky loans. In simple terms, FSPs are beginning to face (in varying degrees) the problems of too much liquidity chasing too few investment opportunities among existing clients, and also too much liquidity chasing too few new clients as a result of growing competition.

Clean energy financing is a profitable and cost effective strategy for FSPs to introduce a new product to an existing client base in a market that has high-growth potential. The advantages of this strategy is that existing field network can be used to deliver the product without additional cost increases and loan officers can use existing credit history of active clients to assess and manage credit risk. Furthermore, FSPs can improve the viability and prospects of core loans and savings services since modern energy can reduce household outgoings or increase incomes through better productivity or longer working hours. Also, FSPs can mitigate the risk of over-indebting clients by carefully pricing and designing loan products and terms in line with clients' current expenditure patterns. This increases client ability to repay energy loans in addition to realising longer term savings and benefits from migrating to clean energy. In addition, FSPs can access a new revenue stream by selling carbon credits through the carbon market.

a. Addition of a new product-line in high-growth market segment

Clean energy financing presents a strong value proposition to FSPs in terms of adding a new product line with significant latent demand and high growth potential over the next 10-15 years. Such financing is also attractive in that by and large it can be delivered at reasonable costs by piggy-backing on existing lending services, although some upfront investment is necessary. Existing field network can be used to deliver the product without additional cost increases and credit evaluation is simple due to past track records of existing clients.

b. Greater viability and prospects for FSPs' core loans and savings services

The ability of clean energy technologies to either reduce household expenditure or to increase incomes presents a potential breakthrough solution for FSPs struggling with declining yields from their existing loan and client portfolios. Not only do the expenditure savings reduce the pressures of default as borrowers improve their net income balance, but such savings can also make a potentially unviable enterprise into something more viable or enable FSPs to market new savings products to help 'mop-up' the expenditure savings of low-income clean energy users.

c. Carbon Markets: A potential revenue stream and quality assurance mechanism

Carbon financing not only provides a potential revenue stream for FSPs, but also provides a natural incentive for suppliers to monitor the quality of the technology chosen for lending. Nepal currently has two biogas projects and one micro-hydro project registered under the Clean Development Mechanism (CDM), and is also planning to register improved cooking stoves. However, carbon finance requires specialized knowledge of rules and regulations and bundling small-scale energy applications is often complicated to structure and manage, especially vis-a-vis relationships with FSPs. Moreover, carbon revenues will be small compared to the time and effort that is required for registration and verification. Efforts to fill knowledge gaps are needed, as are support and incentives for those actors and agencies able to help FSPs form collaborative partnerships to explore their full potential.

Box 4. CDM Projects in Nepal

Biogas

Under the Biogas Support Programme (BSP) Phase IV¹, 19,396 plants have been registered with the CDM Executive Board.¹ It is the first programme in Nepal to have registered two CDM projects. Approval has been made for 93,883 tonnes of emission reduction per year. An Emission Reduction Purchase Agreement for the two projects was signed with the World Bank for the trading of the emission reductions for seven years, starting in 2004/2005, at the rate of USD 7 per tonne-CO2 equivalent of GHGs. The annual carbon revenue (net of verification expenses) from these two projects amounts to about USD 360,000. Annual CDM revenues are likely to rise to as much as USD 3.5 million by 2014, which would meet about 30-50 percent of the annual BSP budget (including subsidies). Additional 60,000 biogas plants have also been registered with the CDM Executive Board.

Micro-Hydro

The first micro-hydro based CDM project was registered on 18 October 2010. The Emission Reduction Purchase Agreement was signed between AEPC and the Community Development Carbon Fund/World Bank on 30 June 2007. The unit price for each certified emission reduction (CER) was agreed at USD 10.25 per tonne of CO2 for a total target of emission reductions of 191,000 tonnes of CO2 equivalent, with a possibility of an additional 100,000 CERs in 2012. This

While FSPs recognise the financial and social value of providing microfinance for clean energy, they may be reluctant to enter the energy market due to lack of familiarity and perceived high risk. Clean energy loans may require new lending practices such as individual lending for consumption purposes, lower interest rates, longer maturity, or non-conventional ways of assessing credit based on potential savings. This will incur additional operational costs and add on to the workload of field officers. FSPs are also afraid of putting their portfolio and reputation at risk due to technology failure - particularly given operations and maintenance is a key supply chain bottleneck. Moreover, FSPs are concerned about becoming dependent on suppliers given they lack technical knowledge and subsidy is channelled to suppliers under the current subsidy scheme.

3.5 Need for sustainable energy value chain

While the price and payment terms are important factors, experience shows that even well designed financing schemes will not be enough to promote widespread adoption of clean energy systems. A number of complementary informational, institutional, regulatory, and behavioral instruments will be required to remove non-economic hurdles^{xi}. Several projects have been successful such as solar home systems, household biogas units and community based micro-hydro power through a combination of technology promotion, technical assistance and financial support (Box 2). As such, a number of non-financial barriers at the **end-user, finance, supply chain and policy/regulatory levels** will have to be addressed concurrently for clean energy finance to be delivered at scale and have a market transforming effect.

Box 5. Biogas Support Programme (BSP)

The Biogas Support Programme (BSP) in Nepal, launched in 1992, provides a combination of subsidies and loans which make it affordable for rural households to purchase biogas plants from private sector suppliers. Subsidies are routed through biogas companies (30% of the plant cost), while wholesale loans are provided to microfinance institutions, who then on-lend to households. Generally, end-users contribute 20% of the cost in-kind (unskilled labour or locally available construction materials) and the remaining 50% in cash. For this cash, the end-user becomes eligible for a loan provided through the Biogas Credit Fund (revolving fund of USD 3.5 m). Under the programme, a 6m³ biogas plant costs about USD 600. The average loan per biogas plant is around USD 358. To date, about 30 percent of the biogas users have made use of loans, and this trend is growing. AEPC administers subsidies and the Biogas Credit Fund.

The Biogas Credit Fund provides wholesale loans to MFIs at a rate of 4 percent interest per annum, which the MFIs then on-lend to farmers at a maximum 14 percent interest rate. Four types of MFIs are involved in the programme 1) microfinance development banks; 2) cooperatives; 3) financial intermediary NGOs; and 4) rural self-help groups or CBOs. Support to the microfinance sector for 'energy lending' is provided by organisations such as Winrock International. Winrock has trained 300 MFIs in the financing of biogas plants and renewable energy, as well as providing capacity building and technical assistance. To date, this program has enabled 150 MFIs to provide loans to 5000 poor households to an amount exceeding USD 1 million.

Apart from providing financial incentives for take-up of biogas plants, BSP engages in plant promotion, marketing, quality control, and technical training of MFIs and plant suppliers. Plant costs include a one-year guarantee for appliances, a three-year guarantee for the civil work, and two after-sales service visits. Technical standards have been developed for more than 80 types of biogas plants, a minimum of 5 percent of newly constructed plants and all plants under the two-year guarantee period are inspected, biogas companies are classified according to plant performance and regular feedback is collected through user surveys. The Nepal Biogas Promotion Association (NBPA), an umbrella organization of approximately 85 private sector biogas companies and 17 workshops that manufacture plant appliances and accessories (e.g. stoves, lamps, gas taps and dome gas pipes) provides skill-enhancement packages for masons and technicians, and undertakes promotional work for the programme.

As of December 2010, 225,356 biogas plants have been constructed throughout all 75 districts in the country. Currently, nearly 20,000 plants are being constructed every year. This has directly benefitted around 1.3 million people – with 14,000 people directly or indirectly employed as a result of the programme. The success of the model used in Nepal has provided opportunities for households in terms of the sale of biogas slurry as well as carbon financing.

BSP is being undertaken under the auspices of a programme of the Alternative Energy Promotion Centre (AEPC), established by the Government of Nepal, which is implemented by the Biogas Sector Partnership Nepal (BSP-Nepal) and with the assistance of international organisations such as SNV and Winrock International.

Source: Making Energy Markets Work for the Poor: Large-Scale Dissemination of Biogas Plants in Nepal, UNDP, 2012

4. Programme Strategy

CleanStart aims to increase access to clean energy²³ through microfinance by more than 150,000 low-income households and micro-entrepreneurs (600,000 beneficiaries) by end of programme. This will be achieved through **four outputs**:

1. **Finance for Clean Energy** to strengthen capabilities of up to three (3) financial service providers (FSPs) to provide microfinance for clean energy to low-income households and micro-entrepreneurs;
2. **Technical Assistance for Clean Energy** to remove barriers to the sustainable deployment of those technologies and services for which the selected FSPs will provide microfinance;
3. **Knowledge and Learning** to promote awareness and understanding of the potential for microfinance to stimulate adoption of clean energy, and to develop skills in clean energy microfinance;
4. **Advocacy and Partnership** to create an enabling policy and business environment to expand microfinance for clean energy.

The design of the programme ensures close integration between the four outputs. The key insight that lack of access to modern energy is an important obstacle to the achievement of the MDGs will inform all aspects of programme implementation.

CleanStart will be anchored in the Alternative Energy Promotion Centre (AEPCC) which is the lead national agency mandated to promote renewable energy through policy formulation, quality assurance and financial assistance (subsidy, credit). CleanStart will rely on AEPCC support in ensuring subsidy distribution²⁴; brokering partnerships between FSPs and energy suppliers; quality assurance and after-sales service; advocacy; and monitoring and coordination.

Output 1: Finance for Clean Energy

Finance for Clean Energy output aims to build confidence of FSPs in introducing clean energy lending at scale. FSPs will be assisted to take advantage of opportunities and mitigate risks associated with clean energy finance. CleanStart will rely on AEPCC support in ensuring subsidies are distributed in programme areas as a lack thereof may encourage end-users to delay purchase and therefore dampen demand for credit.²⁵

CleanStart will strengthen the capabilities of selected FSPs by providing:

- Pre-investment technical assistance to build awareness and confidence based on existing international experience and to develop outline business plans;
- Risk capital grants to a select number of high-performing FSPs to cover the up-front cost of introducing a new product line

Output 1.1: Pre-Investment Technical Assistance

A. Request for Proposal

A Request for Proposal (RFP) will invite interested and eligible FSPs to submit business proposals outlining their strategy for introducing clean energy financing. Selected FSPs will initially be invited to participate in a structured course of awareness and confidence building on a no-commitment basis and assisted to develop outline business plans.

²³ In the context of CleanStart, clean energy includes renewable energy solutions, low-GHG emitting fossil fuels (e.g. LPG), and traditional fossil fuels that, through the use of improved technologies and practices, produce less CO₂ emissions (e.g. improved cook stoves).

²⁴ Financed through the Rural Energy Fund and upcoming Central Renewable Energy Fund

²⁵ Subsidies are currently not provided in urban areas

Eligibility criteria

Minimum eligibility criteria for financial service providers will include, but not limited to:

1. Licensed with the Nepal Rastra Bank;
2. At least five-years experience providing financial services for the poor;
3. Profitable over last two years (OSS over 100%);
4. Good lending portfolio quality (PAR>30days less than 5% last 12 months);
5. Client base of at least 50,000 borrowers at the time of application reaching directly or through partner institutions;
6. Demonstrated management commitment and capacity to manage financial support and to achieve desired objective of the programme;
7. Willingness to institutionalize products, systems and practices as a result of technical assistance;
8. Must have adequate financial information systems in place to provide accurate financial statements in a timely manner.

Up to three FSPs will be selected for risk-capital grants based on pre-identified selection criteria and due diligence process. CleanStart will consider partnering with MFIs and refinancing institutions that provide access to a large number of smaller institutions (over 100) with good rural outreach. This strategy will enable institutional diversity, wide outreach and testing of different lending models.

Selection criteria

The selection criteria for all applications will include, but not limited to:

1. Soundness and sustainability of the institution as demonstrated by good key performance indicators;
2. Willingness and ability of the institution to introduce energy lending and scale up in the target market segment within 2-3 years;
3. Proven or likely market demand and growth potential;
4. Feasibility of business plan and likelihood of success;
5. Willingness to enter into strategic partnerships with energy suppliers;
6. Ability to raise refinancing for lending portfolio;
7. Commitment to understand impact of energy lending on clients over time and adjust operations accordingly;
8. Demonstration of commitment to knowledge management and sharing;
9. Demonstration of commitment to client protection and transparent pricing as demonstrated by endorsing the Client Protection Principles of the Smart Campaign (<http://smartcampaign.org>)

Preferences will be given to applicants who have previous experience in energy lending

Partnership with selected FSPs will be governed by a Performance-based Agreement (PBA) which will include initial process milestones and key performance targets. A thorough due diligence, including reference and data checks and on-site visits to the FSPs under consideration, will be made to verify management and operational abilities to perform according to the anticipated agreement.

B. Building awareness and confidence

Selected FSPs expressing an initial interest in the programme will be invited to send staff to participate in a structured course of awareness and confidence building. This course and associated events will be designed to demystify clean energy finance and to understand the potential value for clients and FSPs. This will involve in-class orientation to provide an overview of technologies and different delivery models available in Nepal and other countries, as well as extended field visits to FSPs with a significant track record in clean energy lending. The course will also serve as a discussion space where participants can openly and critically think through issues among a group of peers and experts.

C. Technical assistance to develop business plans

FSP staff participating in the course will be assisted to prepare an outline business plan for their organization to develop and roll out finance for clean energy products. These business plans will be used to identify the most appropriate grantees for CleanStart.

Output 1.2: Risk-capital grants for market entry

Risk-capital grants will cover the upfront costs of market research, product development and roll-out, upgrading systems, product marketing, and designing appropriate results-based staff incentives and staff capacity enhancement. By definition, the risk-capital grant would be for a limited duration until the FSPs reach a critical mass (to generate positive returns) needed for product and process standardisation, which is estimated to be a maximum of three years.

Risk-capital grants will be disbursed against an agreed work plan and SMART results to be achieved over a period of up to 3 years. The amount of each grant will vary according to the outreach anticipated, but it is envisaged that the average amount will be around \$US 100,000 per FSP, bringing the total facility to approximately \$300,000.

CleanStart will explore the possibility of providing additional risk capital grants for innovation to test and develop new business models. These can potentially include carbon finance; expansion to new technologies or project areas; loans for productive end-use, household utilities, or community-based systems; or loans for local energy retailers or manufacturers.

Responsible finance

CleanStart will partner with FSPs that are committed to introducing financial products and adopting practices that serve the best interest of the clients. This will include:

- Commitment to client protection and transparent pricing (demonstrated by endorsing the Client Protection Principles of the Smart Campaign - a global effort to embed client protection practices into the institutional culture and operations of the microfinance industry);
- Commitment to promote financial literacy to ensure clients make informed financial decisions;
- Commitment to understanding the impact of clean energy lending on clients over time and adjust operations accordingly

Output 2: Technical Assistance for Clean Energy

Technical Assistance for Clean Energy output aims to remove barriers to the sustainable deployment of technologies and services for which the selected FSPs will provide microfinance. It will move away from a technology-driven approach to become more technology-neutral and client needs-oriented. In practice, this will mean rigorous diagnostic to identify client need and demand and deploying technical assistance to remove supply chain barriers that in effect fail to match supply with latent demand.

Close partnership with AEPC will be particularly important for the success of this output. CleanStart will rely on AEPC support in linking FSPs to district-level structures²⁶; brokering partnerships between FSPs and energy suppliers; quality assurance and after-sales of technologies chosen for lending; and field monitoring.

This output is expected to lead to the development of:

- customised energy solutions for the low-income market segment;
- sustainable risk-sharing arrangements between FSPs and energy suppliers;
- basic knowledge of clean energy technologies by relevant FSP staff;
- more cost-effective systems for delivering, maintaining and financing clean energy systems and services at scale

Output 2.1 Technical assistance to participating FSPs and key stakeholders in the energy value chain

A. Market research

To establish a good understanding about energy needs and resource availability in FSP operating areas, as well as current energy expenditures, client willingness and ability to pay for clean energy. It will also help to identify technology options and providers that can address the demand for energy services. Technical assistance will involve:

- training FSPs in needs assessment methodologies and tools already piloted by relevant programmes²⁷;

²⁶ District Energy and Environment Sections/Units (DEES/U) and Regional Renewable Energy Service Centres (RESC)

- sharing existing needs assessment results e.g. district energy plans;
- supporting market research through experienced technical assistance providers;
- facilitating access to district-level structures such as District Energy and Environment Sections/Units (DEES/U), Regional Renewable Energy Service Centres (RESC) and community mobilisers²⁸

B. Brokering partnerships between FSPs and energy suppliers

To facilitate early relationship building and help FSPs and technology providers reach a viable risk-sharing agreement. It will involve a range of activities including scoping opportunities and helping partners develop an initial outline of collaboration. FSPs will partner with suppliers pre-qualified by AEPC. Technical assistance will involve:

- mapping of suppliers in FSP operating areas;
- organising a technology expo where FSPs will be invited²⁹ to explore technology options and partners;
- assisting in the choice of technologies to be commercialized;
- developing the most appropriate business model for a given customer base; and
- developing a tripartite agreement (supplier-client-FSP) for subsidy distribution

C. Financial product development and roll-out

To assist participating FSPs develop clean energy financing products in partnership with suppliers of clean energy. FSPs will also be assisted to understand the fundamental features and profiles of the energy assets and services for which they will provide finance. Technical assistance to FSPs will involve:

- designing and pilot testing lending product;
- collecting feedback on pilot test and fine-tuning the product;
- managing delinquencies in energy portfolio;
- developing staff capacity (e.g. product marketing, credit assessment, technology);
- developing results-based staff incentives;
- rolling-out product on a wider scale; and
- exploring possibility of introducing insurance products to protect technology assets in case of natural disasters

D. Strengthening energy supply chain

To ensure technologies and services for which end-user financing will be made available through FSPs can be delivered sustainably. Technology providers will be assisted to improve understanding about client energy needs and address gaps in the supply chain. Quality assurance will be supported by AEPC's system of pre-qualifying suppliers; monitoring installations and after-sales service; rewarding and penalising pre-qualified companies based on performance; and developing technical quality standards. Technical assistance to technology providers will involve:

- organising technology expo to showcase latest technologies from Nepal and internationally;
- facilitating partnerships with FSPs for credit financing;
- developing local capabilities in installation, maintenance, after-sales service and other identified weak links in the supply chain;
- establishing simple feedback mechanism for customers;
- adapting hardware type and specification to particular built environments;
- identifying new suppliers that offer efficient and affordable technologies currently not offered in the market; and
- feeding-back piloting experience to AEPC to improve relevant policy and industry standards

²⁷ E.g. RERL uses community mobilisers, ESAP trains local financial institutions

²⁸ UNDP RERL project team and AEPC will provide support

²⁹ AEPC also regularly holds technology expos

E. End-user awareness

To build awareness among end-users about the benefits of using clean energy as well as financing opportunities. Clients will also be educated about the fundamental features and profiles of the energy assets purchased. This will involve:

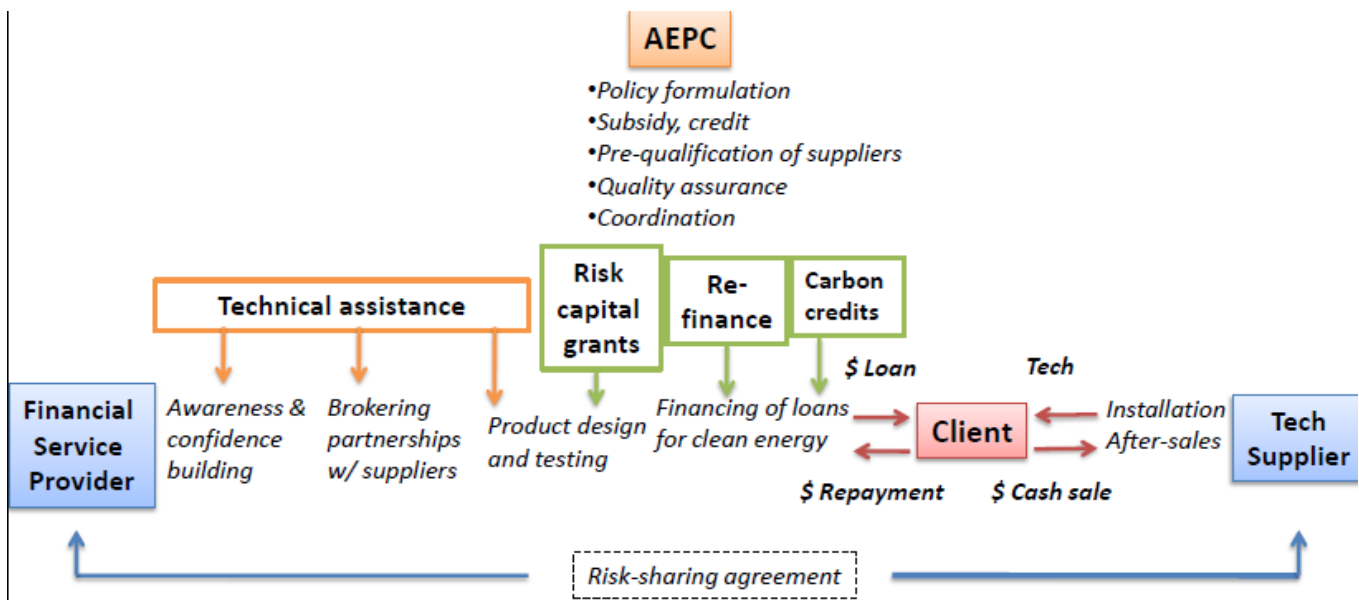
- promoting technologies and loan opportunities through various channels³⁰;
- developing user-friendly manuals; and
- promoting feedback mechanism to report technology failure

Output 2.2 Technical assistance to develop innovative business models

To develop new forms of energy lending or to develop other financial products to meet the need for other forms of financial services as a result of greater savings generated from the use of clean energy systems and services. These can potentially include:

- carbon finance;
- expanding to new technologies or project areas;
- developing loan products for productive end-use, household utilities, or community-based systems; or
- developing enterprise loan products for local energy retailers or manufacturers

Figure 1: CleanStart Business Model



³⁰ Promoting RETs and loan opportunities can potentially be done through training of trainers in end-user awareness to partner FSPs, suppliers, community mobilisers, DEES, RESC, or industry networks. Local media such as FM radio will also be a useful medium.

Output 3: Knowledge and Learning

Knowledge and Learning output will promote awareness and understanding of the potential for microfinance to stimulate adoption of clean energy, and to develop skills in clean energy microfinance. It will make available knowledge and tools needed to adopt clean energy finance with lending portfolios. This is both practically and strategically important in developing a sustainable financing market, particularly given its embryonic stage and knowledge gaps.

Output 3.1: Increased knowledge in clean energy microfinance

Grants for research will be awarded to local research institutes that are experienced in documenting good practices and conducting impact assessments.

A. Grants for research into practice

To document good practices and lessons learned in the course of programme implementation. Research areas will include:

- Financial products focusing on market research, product development, product features across varying contexts and client profile; and product management
- Delivery models and partnerships focusing on arrangements for delivering financial services and energy products to clients; factors for successful partnerships between FSPs and energy companies; and good practices in stimulating demand
- Business processes focusing on internal business processes in respect to FSP's overall portfolio of products and services

B. Grants for research into impact

To study the impact finance for clean energy has on clients, supply-side actors and policy. Research areas will include:

- Impact on clients to assess the impact on technology up-take, energy usage patterns and improvements in livelihoods. This may involve comparative research on the impact of using clean energy relative to existing energy practices.
- Impact on supply-side actors to assess the impact sustainable finance has on energy supply chains and technology development. Also, to study innovative business models, including carbon financing.
- Impact on policy and regulation to assess the extent to which relevant policies and regulations encourage, or impede, adoption of clean energy technologies by the poor.

Output 3.2: Improved skills in clean energy microfinance

To develop a training course on clean energy microfinance that will be offered through local training institutes as part of their broader microfinance training offering. The training will draw on lessons learned from relevant programmes and provide context-specific information on applicable technologies, quality control measures and successful business models that have already been piloted. A training of trainers will be offered initially to two institutions.

Output 3.3: Communication of knowledge

To share knowledge and experience generated through the programme using various platforms for wide dissemination among stakeholders. This will involve:

- publishing research outcomes;
- organising and participating in events to exchange experiences in clean energy finance

Output 4: Advocacy and Partnerships

To influence and develop partnerships with key actors to create an enabling policy and business environment for scaling-up clean energy finance. A number of broader interventions are needed to create a more enabling environment for the programme's success. These partnerships will enable CleanStart to build on upstream policy support and reform initiatives. This will involve:

A. Collaboration with AEPC and donor programmes that are working on energy policy and regulatory regimes, as well as expanding finance and capacity development support for energy value chains

- NRREP/CREF: National Rural and Renewable Energy Programme (NRREP) will serve as a single programme framework for all development partner-supported renewable energy programmes. NRREP will establish a Central Renewable Energy Fund (CREF)³¹ as the core financial institution responsible for delivery of subsidies and credit support to the renewable energy sector. CleanStart will strengthen AEPC's capacity to effectively manage the credit facility through the CREF which will enable AEPC to build investor confidence and mobilise additional resources.
- RERL: Renewable Energy for Rural Livelihood (RERL) is a UNDP supported programme implemented by AEPC in collaboration with the WB. The programme focuses on central and local level capacity building to increase access to clean energy services through community based decentralized renewable energy models. Building on the success of the current RERL programme, UNDP is currently developing the RERL II programme document in partnership with AEPC to be funded by GEF. UNCDF and UNDP will be working closely to ensure that the Nepal business plan and the UNDP/GEF RERL programme complement each other within the overall framework of the NRREP CleanStart as an approach will be integrated with the UNDP/GEF RERL programme. In addition, the CleanStart business plan will seek to achieve convergence with and complement the UNDP GEF RERL programme, and vice versa, wherever operationally possible.
- CleanStart will provide, where necessary, limited direct funding to partially cover the additional costs involved in orientating existing energy programmes to support the efforts of financial service providers in lending to poor people.

B. Collaboration with national and international commercial banks and wholesale financing institutions that refinance microfinance portfolios

CleanStart will facilitate linkages to later secure refinancing available through various sources:

- Deprived Sector Credit Programme: Specialized microfinance wholesale banks and commercial banks provide funds to retail microfinance institutions under the mandatory Deprived Sector Credit Programme. MFIs have used this window to finance energy lending.
- Central Bank Directive on energy lending: Commercial banks are obligated to make 10 percent of their total lending to the agriculture and energy sectors within the next three years
- Central Renewable Energy Fund (CREF): CREF will ensure subsidies and long-term finance for energy lending for the next five years.
- International Development Banks: A number of international development banks provide refinancing to FSPs in energy lending.

C. Collaboration with carbon brokers that are working on energy projects and trading on major carbon markets

Carbon financing not only provides a potential revenue stream for FSPs and energy companies, but also provides a natural incentive for suppliers to monitor the quality of the technology chosen for lending. Efforts to fill knowledge gaps are needed, as are support and incentives for those actors and agencies able to help FSPs form

³¹ The credit mechanism for CREF is currently under discussion. Volume is expected to be US\$ 300 million. Lending through CREF is expected to start in early 2013.

collaborative partnerships to explore their full potential. CleanStart will invite carbon aggregators specialised in micro-level clean energy projects raise awareness about carbon financing and facilitate partnerships.

Leverage Potential

Through this approach, CleanStart aims to leverage resources that are already available and realise the full potential of these resources by providing sustainable approaches to end-user finance. Based on an initial investment of US\$ 1.3m, CleanStart will leverage, at a minimum, US\$ 321m (1:247) in additional funding through refinancing available for FSPs, government subsidy and support to enhancing clean energy financing through the UNDP/GEF project.

Additional Resources		Assumptions	Amount (US\$)
1. FSP refinancing		<ul style="list-style-type: none"> · Average # of loans disbursed during programme: 150,000 loans · Average loan size: US \$100 · CREF estimated volume: US\$ 300m 	307,500,000
2. Government subsidy		<ul style="list-style-type: none"> · Average # of loans disbursed during programme: 150,000 loans · Average subsidy amount: US \$50 	7,500,000
3. UNDP/GEF project		Renewable energy financing component	6,100,000
Total additional resources			321,100,000
Total programme budget			1,300,000
Total leverage ratio			1:247

5. Stakeholders, Target Groups and Ultimate Beneficiaries

Stakeholders	End-users	<ul style="list-style-type: none"> ▪ communities, low-income households, micro-entrepreneurs
	Micro-level	<ul style="list-style-type: none"> ▪ microfinance institutions; ▪ private sector, specifically clean energy suppliers;
	Meso-level	<ul style="list-style-type: none"> ▪ wholesale financing institutions; ▪ microfinance training institutes; ▪ providers of business support services; ▪ industry associations; ▪ market research institutions; ▪ technology research institutions; ▪ carbon finance brokers;
	Macro-level	<ul style="list-style-type: none"> ▪ central and local government; ▪ national government agencies; ▪ development partners, including donor and UN agencies;
Target groups		<ul style="list-style-type: none"> ▪ microfinance institutions and clean energy suppliers; ▪ low-income households and micro-entrepreneurs
Ultimate beneficiaries		<ul style="list-style-type: none"> ▪ low-income households and micro-entrepreneurs

6. Sustainability of results

The programme approach includes a strong advocacy component to influence the enabling national policies and the business environment. It is expected that (i) a regulatory environment based on policy makers who are more knowledgeable and able to respond to FSPs; (ii) a stronger financial sector infrastructure offering products and services based on tried and tested financial products for energy services, as well as delivery systems and partnerships that both meet the financial service needs of poor households and micro-entrepreneurs; and (iii) FSPs that are capable of generating sufficient income to sustain and grow their services, with additional funding mechanisms to support new FSP market leaders will ensure the sustainability of development results beyond the life of the programme.

Additionally, the programme makes a strong value proposition to FSPs with the introduction of a new product in a high growth market as clean energy adoption increases, and an additional potential revenue stream from carbon markets. This will enable selected FSPs to further sustain and grow their services.

Through access to end-user finance, low-income households and micro-entrepreneurs will break out of the vicious cycle of energy poverty, increasing their productivities and ability to repay microfinance loans resulting in higher rates of return for FSPs.

7. Resources and Result Framework – Indicative

Outcome (Purpose)		By end of programme, more than 150,000 low-income households and micro-entrepreneurs will have sustainable access to clean energy through microfinance.								
Programme Outputs	Indicative activities for each output	Budget description	Implementing Partner	Responsible party	Resource Allocation and Indicative Timeframe (USD)				Total USD	Assumptions
					Y1	Y2	Y3	Y4		
Output 1:										
Finance for Clean Energy aimed at strengthening capabilities of up to three (3) financial service providers (FSPs) to provide end-user finance for decentralized clean energy to low-income households and micro-entrepreneurs	-	-	-	-	77,000	150,000	150,000	0	377,000	
<i>Output 1.1: Pre-investment technical assistance to FSPs</i>	1.1.1. Awareness and confidence building course (course development and training)	international consultant, national consultant, training	UNCDF	-	37,000	-	-	-	37,000	course development and delivery; logistical cost for study tour/workshop; travel and DSA for FSPs
-	1.1.2. FSPs assisted to prepare business plans	PIU travel and DSA	UNCDF	-	10,000	-	-	-	10,000	PIU will provide TA; 3days*5 FSPs
<i>Output 1.2: Risk-capital grants to FSPs to cover market entry and start-up costs</i>	1.2.1. Risk-capital grants to cover market entry and start-up costs	grant	UNCDF	-	30,000	150,000	120,000	-	300,000	3 FSPs*100,000
-	1.2.2. Additional risk-capital grants for innovation	grant	UNCDF	-	-	-	30,000	-	30,000	
Output 2:										
Technical Assistance for Clean Energy aimed at removing barriers to the sustainable deployment of technologies and services for which the selected FSPs will provide microfinance					118,400	115,000	100,000	35,000	368,400	
<i>Output 2.1 Technical assistance to participating FSPs and key stakeholders in the energy value chain</i>	2.1.1. Training on needs assessment methodologies and tools	international consultant, local consultant, training	UNCDF	-	20,000	-	-	-	20,000	3 FSPs*3staffs; 5 days training, including field visit
	2.1.2. Market research in FSP operating areas (needs assessment)	international consultant, local consultant, workshop	UNCDF	-	25,000	-	-	-	25,000	
	2.1.3. Identify technology providers dealing in FSP operating areas	local consultant, DSA	UNCDF	-	2,400	-	-	-	2,400	10 days*3 FSPs

-	2.1.4. Technical assistance to FSPs to develop partnerships with clean energy suppliers	international consultant, local consultant, workshop	UNCDF	-	24,800	-	-	-	24,800	<i>orientation on AEPC subsidy, credit mechanisms; financing models; assistance in tech selection; risk-sharing agreement</i>
-	2.1.5. Technical assistance to FSPs to develop financial products and business systems	international consultant, local consultant, training	UNCDF	-	-	40,000	20,000	-	60,000	
-	2.1.6. Local technical assistance providers are trained in areas where local expertise is not available	international consultant, DSA	UNCDF	-	5,000	5,000	5,000	-	15,000	<i>5 days training per year; e.g. needs assessment, carbon finance</i>
-	2.1.7. Technology expo to broker partnerships	conference	UNCDF	AEPC	41,200	-	-	-	41,200	
-	2.1.8. Identify gaps in the energy supply chain of technology chosen for lending	international consultant, local consultant, workshop	UNCDF	-	-	25,000	10,000	-	35,000	<i>share and agree on gaps to be addressed; develop TA plan</i>
-	2.1.9. Technical assistance to address gaps in the energy supply chain of technology chosen for lending	international consultant, local consultant, travel and DSA for suppliers, training, grant	UNCDF	-	-	30,000	30,000	10,000	70,000	<i>installation, maintenance, introducing new more efficient and affordable technologies, R&D, developing technical standards, areas defined through gap assessment</i>
-	2.1.10. Promote RETs and loan opportunities on a wider scale	local consultant, training, DSA, printing	UNCDF	AEPC	-	10,000	10,000	5,000	25,000	<i>train DEES/U, promoters and local leaders</i>

-	2.1.11. Establish client feedback mechanism for programme beneficiaries	local consultant, workshop, DSA, printing	UNCDF	AEPC	-	5,000	5,000	-	10,000	<i>use DEES/U, community mobilisers, pilot other mechanisms</i>
<i>Output 2.2: Technical assistance to FSPs to develop innovative business models</i>	2.2.1. FSPs assisted to develop innovative business models	international consultant, local consultant, workshop	UNCDF	-	-	-	20,000	20,000	40,000	<i>e.g. carbon financing, loans for productive end-use, household utilities, community-based systems, local energy enterprise; new technology; expanding piloting areas</i>
Output 3: Knowledge and Learning to promote awareness and understanding of the potential for microfinance to stimulate adoption of clean energy, and to develop skills in clean energy microfinance					15,000	99,000	48,000	41,000	203,000	
<i>Output 3.1: Increased knowledge in clean energy microfinance</i>	3.1.1. Grants for research on good practice	grants	UNCDF	-	-	26,000	26,000	-	52,000	
-	3.1.2. Grants for research into impact	grants	UNCDF	-	-	30,000	-	30,000	60,000	<i>Y2:baseline study</i>
<i>Output 3.2: Improved skills in clean energy microfinance</i>	3.2.1. Develop training course on clean energy microfinance	international consultant, local consultant	UNCDF	-	10,000	15,000	-	-	25,000	
-	3.2.2. Identify partner training institutions and conduct training of trainers	local consultant, training	UNCDF	-	5,000	-	-	-	5,000	<i>2 institutions</i>
<i>Output 3.3: Communication of knowledge</i>	3.3.1. Publish research outcome	publication	UNCDF	-	-	14,000	14,000	7,000	35,000	
-	3.3.2. Organise events to promote dialogue on clean energy financing	conference	UNCDF	-	-	4,000	4,000	4,000	12,000	

-	3.3.3. Develop communications material	communication, audio-visual	UNCDF	-	-	10,000	4,000	-	14,000	
Output 4: Advocacy and Partnership to create an enabling policy and business environment for scaling-up clean energy finance					58,400	75,000	30,000	5,000	168,400	
<i>Output 4.1. Advocacy activities to influence various actors to develop complementary activities in the clean energy sector</i>	4.1.1. Partner programmes are supported to more effectively integrate clean energy microfinance into programme design	international consultant	UNCDF	-	28,400	40,000	-	-	68,400	<i>including, TA to AEPC to build capacity to effectively manage credit facility under CREF</i>
-	4.1.2. Map FSP operating areas vis-à-vis RERL project areas	local consultant	TBC	-	5,000	-	-	-	5,000	
-	4.1.3. Integrate CleanStart into RERL UNDP/GEF project	international consultant	TBC	-	20,000	20,000	20,000	-	60,000	
-	4.1.4. FSPs invited to form partnerships with refinancing institutions and carbon brokers	international consultant, workshop	UNCDF	-	-	10,000	5,000	-	15,000	
<i>Output 4.2. Leverage international/regional initiatives and forums to contribute to wider policy environment and dialogue</i>	4.2.1. Share achievements and lessons from Nepal pilot	travel, DSA	UNCDF	-	5,000	5,000	5,000	5,000	20,000	<i>including, sponsoring participants from Nepal</i>
Output 5: Effective programme implementation and management					19,800	55,800	55,800	51,800	183,200	
Output 5.1: Effective programme implementation and management	5.1.1. Organise and participate in National Advisory Board meetings	PIU travel and DSA	UNCDF	-	2,000	4,000	4,000	4,000	14,000	<i>y1: once; y2-3: twice a year</i>

	5.1.2. Annual feedback workshop with partner FSPs, suppliers and AEPC	workshop	UNCDF	AEPC	-	1,000	1,000	1,000	3,000	<i>to share progress, promote collaboration, influencing policy and industry standards</i>
	5.1.3. Appoint CleanStart focal point(s) in AEPC	salary	UNCDF	AEPC	7,800	33,800	33,800	33,800	109,200	<i>\$1,300/month (plus \$1,300 one month additional salary for festive season) ; y1: 6 months, 1 staff; y2-3: 2 staffs; Sr. Officer (technical, policy/planning) Officer (Financing/Credit)</i>
	5.1.4. Day-to-day monitoring and coordination of activities	DSA, miscellaneous	UNCDF	AEPC	3,000	7,000	7,000	7,000	24,000	
	5.1.5. PIU coordinates programme activities for Nepal	consultant, travel, DSA, advertisement, overhead	UNCDF	-	7,000	10,000	10,000	6,000	33,000	<i>announce RFP and review proposals; translation; monitoring; technical backstopping</i>
<u>Total Programme Cost</u>					288,600	494,800	383,800	132,800	1,300,000	
<u>Total Commitment (CleanStart)</u>					288,600	494,800	383,800	132,800	1,300,000	

8. Management and Coordination Arrangements

8.1 Management Arrangements³²

A. Implementation Modality

Direct implementation (DIM) will be the implementation modality for the UNCDF and UNDP managed activities under the global programme. UNCDF and UNDP will programme the funds and manage the activities specified in the Resources and Result Framework (RRF) in line with its established rules and regulations. The administration of this programme shall be governed by UNCDF and UNDP's policies, rules and regulations, including UNDP's Programme and Operations Policies and Procedures (PoPP) and UNCDF's Operations Manual.

B. Investment Committee (IC)

The Investment Committee (IC) will oversee the implementation of the programme, including deciding on all capital grants or loans to institutions. It will comprise of senior managers from UNCDF Financial Inclusion Practice Area (FIPA), UNDP Environment and Energy Group and stakeholders that represent the interests of senior beneficiaries such as relevant Ministries from pilot countries, practitioners in a relevant field of their associations.³³ Donors funding CleanStart will be invited to the IC to review progress and provide feedback on proposals.

B. Programme Implementation Unit (PIU)

The Nepal Business Plan will be managed globally by UNCDF through a Programme Implementation Unit (PIU) based in the UNCDF Regional Centre in Bangkok. The PIU will be headed by a Programme Manager, with primary supervision by the UNCDF Senior Regional Technical Advisor based in Thailand and secondary supervision by the UNDP Regional Technical Advisor based in South Africa.

D. National Advisory Board

CleanStart will use the Steering Committee of the National Rural and Renewable Energy Programme (NRREP), where there will be a representative from UNCDF and UNDP to avoid duplication and share experiences on a wider scale. National Advisory Board responsibilities will include:

- review project progress every six (6) months;
- review annual work plan and provide recommendations;
- share lessons learned;
- mobilise government and development partner support to scale-up proven business models

E. Responsible Parties

a. Alternative Energy Promotion Centre (AEPC)

Alternative Energy Promotion Centre (AEPC) has been identified as a responsible party to carry out selected activities given its core mandate to promote renewable energy technologies in Nepal, including policy formulation, quality assurance and financial assistance (subsidy and credit). Partnership with AEPC will be governed by a Letter of Agreement (LoA) signed between AEPC and UNCDF on behalf of CleanStart. AEPC will recruit or assign staff(s) to serve as focal point(s) and provide support on a day-to-day basis. AEPC roles and responsibilities will include the following and detailed out in the LoA:

1. Brokering partnerships	<ul style="list-style-type: none">▪ invite suppliers and industry associations to CleanStart trainings and events;▪ organize a technology expo to showcase latest technologies from Nepal and internationally;▪ facilitate access to District Energy and Environment Sections/Units (DEES/U) and Regional Renewable Energy Service Centres (RESC);
2. Selection of pre-qualified technology providers	<ul style="list-style-type: none">▪ conduct due diligence of suppliers selected to partner with CleanStart FSPs;
3. Quality assurance and oversight	<ul style="list-style-type: none">▪ address gaps in the supply chain of technologies chosen for lending;▪ monitor installations and maintenance (through District Energy and Environment Section/Units);

³² Refer to Section 6. Management and Coordination Arrangement of the global programme document for more detail

³³ The Programme Manager will be responsible for coordinating the RFP, vetting FSP proposals, conducting due diligence and presenting applications to the Investment Committee (IC).

	<ul style="list-style-type: none"> ▪ establish feedback mechanism for clients; ▪ act as mediator between technology suppliers and FSPs;
4. Financing	<ul style="list-style-type: none"> ▪ ensure subsidy reaches programme areas; ▪ ensure distribution of subsidies to clients in consultation with technology suppliers and FSPs; ▪ ensure long-term refinancing for FSPs to scale-up lending; ▪ support carbon financing
5. Policy and advocacy	<ul style="list-style-type: none"> ▪ advise on relevant policies and regulations and implications for CleanStart; ▪ reflect lessons from CleanStart in policy formulation and technology standard development; ▪ promote sustainable business models; ▪ advocate CleanStart in various forums;
6. Implementation support	<ul style="list-style-type: none"> ▪ recruit staff(s) to serve as a focal point for CleanStart; ▪ monitor programme activities; ▪ coordinate with relevant programmes and key stakeholders; ▪ report progress of activities and fund use

b. UNCDF and UNDP

UNCDF will be responsible for:

- Initial capital contribution and raising additional funding to cover the costs of implementing the Nepal business plan;
- Risk capital grants to FSPs to cover upfront costs of product development;
- Catalysing liquidity support for FSPs;
- Technical assistance for financing components;
- Overall technical oversight and quality assurance;
- Overall programme implementation and management;
- Programme funds management;
- Programme oversight and quality assurance;
- Monitoring and evaluation

UNDP will be responsible for:

- Advisory support on energy policies and value chains;
- Coordination with other UNDP programmes/projects;
- Leveraging synergies with UNDP/GEF energy projects, where relevant;
- Joint resource mobilization

c. Technical Assistance Providers

Technical support to FSPs and programme partners will be provided by the PIU and technical assistance providers specialising in clean energy finance. Technical assistance in areas such as market research, business plan development, brokering partnerships with suppliers, product marketing, end-user awareness building and research are expected to be available locally. In areas where local expertise is not available, technical assistance will be sourced internationally and training will be offered to local technical assistance providers. The PIU will establish a roster of national and international consultants through framework agreements outlining specific deliverables.

FSPs, energy suppliers and AEPC will be assisted in:

FSPs	<ul style="list-style-type: none"> ▪ building awareness and confidence in clean energy lending; ▪ conducting strategic market research; ▪ developing business plans; ▪ developing risk-sharing agreements with technology suppliers; ▪ selecting technologies; ▪ developing and rolling out financial products; ▪ promoting loan opportunities to end-users; ▪ understanding features of technology chosen for lending; ▪ developing training course on clean energy financing; ▪ exploring innovative business models e.g. carbon finance;
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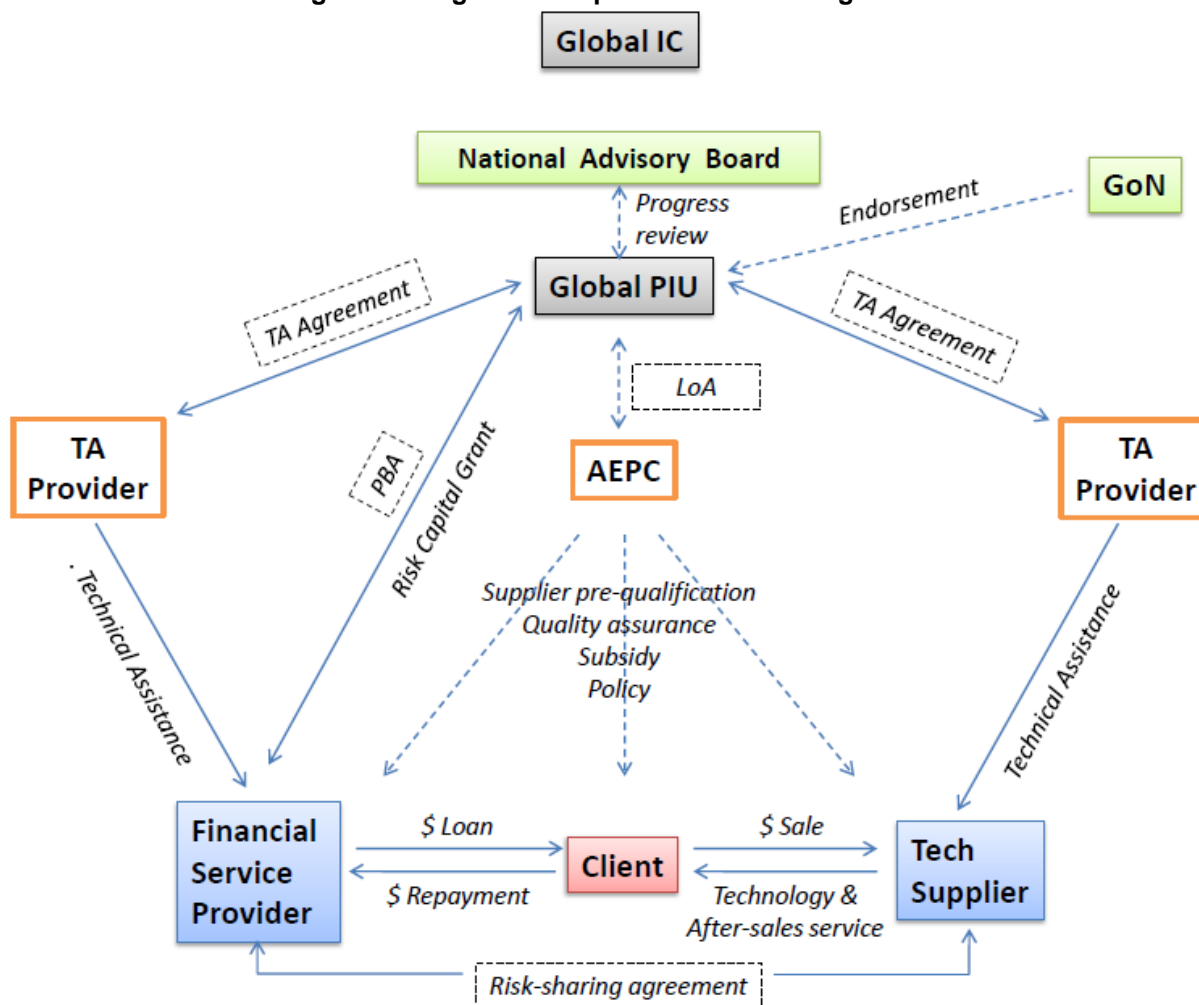
Energy suppliers	<ul style="list-style-type: none"> ▪ promoting benefits of RETs in communities; ▪ developing local capabilities in installation and maintenance; ▪ establishing customer feedback mechanism; ▪ adapting technology to end-user needs; ▪ educating clients about how to use and maintain energy asset purchased;
AEPC	<ul style="list-style-type: none"> ▪ effectively managing credit facility under CREF

8.2 Endorsement by the Government of Nepal

A. Project implementation

The programme will conform to the Standard Basic Assistance Agreement (SBAA) between the host governments and UNCDF. CleanStart will request endorsement of the Nepal business plan from the Government of Nepal (GoN) to implement CleanStart in Nepal. Government buy-in will facilitate the project's ability to encourage policy changes in favour of developing clean energy supplies and access to appropriate and sustainable energy finance in particular. Where constraints emerge to the expansion of services, the host country also agrees to make a best effort to address those constraints.

Figure 2: Programme Implementation Arrangements



9. Implementation Schedule – Indicative

Indicative activities for each output	Description	Role of PIU	Role of UNDP	Role of AEPC	Year One				Year Two				Year Three				Year Four			
					Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Conduct country scoping	to finalise Nepal as pilot country	draft ToR, hire consultants,	advise on country context, provide inputs	provide inputs																
Develop Nepal business plan		develop business plan	advise on country context, provide inputs	provide inputs																
Seek no-objection to announce RFP	letter has been sent to AEPC – approval pending	draft letter		approve announcing RFP																
Announce RFP and short-list FSPs		advertise RFP																		
Seek Government endorsement	to implement Nepal business plan	draft letter, share business plan		facilitate approval from Ministry of Environment, Ministry of Finance																
Seek Project Board (Investment Committee) endorsement	to implement Nepal business plan	draft ToR, organise meeting, share business plan	member of Project Board	approve business plan																
Sign MOU with AEPC		draft ToR, MoU	provide inputs	review and endorse																
Appoint focal points at AEPC	to monitor, coordinate activities			nominate staff																
Organise National Advisory Board Meeting	meets twice every 6 months	draft ToR, appoint members, organise meeting	member of Board	member of Board																
Conduct awareness and confidence building course		draft ToR, hire consultants,	provide inputs																	
FSPs assisted to prepare business plans		provide TA	provide inputs																	
Evaluate FSP proposals, due diligence	identify 3 most promising proposals	review proposals, due diligence	provide inputs																	
Seek Investment Committee endorsement	to approve grantees	organise meeting	member of Investment Committee																	
Sign PBAs for risk capital grants, ta		draft PBA																		
Disburse risk-capital grants to cover market entry and start-up costs		disburse grants																		
Additional risk-capital grants for innovation		vet proposals	provide inputs																	
Training on needs assessment methodologies and tools		draft ToR, hire consultants	RERL will present community mobilisation method; share needs assessment results	share methodologies; coordination																
Strategic market research in FSP operating areas (needs assessment)		draft ToR, hire consultants	provide inputs	share district energy plans; facilitate access to pre-qualified suppliers, DEES, Regional Renewable Energy Service Centres...																
Identify technology providers dealing in FSP operating areas		draft ToR, hire consultants	provide inputs	provide inputs																
Organise Technology Expo		provide support	provide support	organise expo																

10. Fund Management Arrangement

10.1 Management of Disbursements

A. Disbursements to FSPs

Funds will be released in tranches over the grant period by UNCDF, based on the FSP's meeting targets and disbursement conditions in the PBAs. In addition, PBAs will ensure that FSPs set aside sufficient resources to ensure internal monitoring of the results of the grant. In this way, UNCDF will be able to hold grantees accountable to results and to minimize investments in grantees who do not manage to yield success results with initial grant funds. Risk capital grants will be transferred to selected FSPs through wire transfers to their bank accounts, only after representatives of all parties have agreed to the nature of the collaboration and the use of the grant funds.

B. Disbursements to AEPC

Partnership with AEPC will be governed by a Letter of Agreement (LoA), under which AEPC will be fully responsible for 1) carrying out, with due diligence and efficiency, all agreed activities in accordance with its Financial Regulations and Rules; 2) submitting a cumulative financial report each quarter; and 3) submitting progress reports relating to the agreed activities as may reasonably be required by the Programme Manager in the exercise of his or her duties.

11. Monitoring, Reporting and Evaluation

The PIU, CleanStart focal point(s) housed at AEPC, Regional Technical Advisors, and field partners will play a key role in regularly monitoring the programme. In particular, AEPC will support day-to-day monitoring of the programme activities at the country level. Monitoring, reporting and evaluation arrangements will be streamlined with the arrangements outlined in the global programme document. This means monitoring will be conducted through the Programme Monitoring Framework (PMF) in the global programme document (indicators for the Nepal business plan are indicated in the PMF below which is aligned with the global PMF); reporting will be done through bi-annual and annual reports of the global programme; and evaluation will be done as part of mid-term and final evaluations of the global programme.³⁴

FSPs receiving assistance under CleanStart will be required to submit quarterly progress reports to the PIU on performance against standard indicators and targets as outlined in the Performance Based Agreement (PBA). AEPC will be required to submit progress reports relating to the agreed activities as may reasonably be required by the Programme Manager in the exercise of his or her duties.

³⁴ Refer to Section 9. Monitoring, Reporting and Evaluation of the global programme document

12. Programme Monitoring Framework and Risk Assessment

Table 2: Programme Monitoring Framework

EXPECTED RESULTS (Outcomes and Outputs)	INDICATORS (with baselines & indicative timeframe)	MEANS OF VERIFICATION	COLLECTION METHODS
OUTPUT 1: Finance for Clean Energy to strengthen capabilities of 3 FSPs to provide microfinance for clean energy to low-income households and micro-entrepreneurs	1. Number of FSPs that participate in Awareness and Confidence Building Training Target Y1: Up to 5 FSPs	Application, course evaluation survey	PIU compiles all relevant data
	2. Number of partner FSPs competitively selected for risk-capital grants and technical assistance Target: Y1: UP to 3 FSPs	FSP business plans, due diligence report, Investment Committee minutes, PBAs	PIU compiles all relevant data
	3. Number of clients that receive energy loans through partner FSPs Target: Y2: 20,000 clients Y3: 50,000 Y4: 80,000	Quarterly reports submitted by FSPs, Research reports	PIU compiles quarterly progress reports and research reports
OUTPUT 2: Technical Assistance for Clean Energy to remove barriers to the successful deployment and commercialization of those technologies and services for which the selected FSPs will provide microfinance	1. Number of market research conducted by partner FSPs Y1: Up to 3 researches	Market research reports	Partner FSPs are assisted in conducting market research
	2. Expo to showcase renewable and efficient technologies organised in each pilot country Target: Y1: 1 expo	Event proceedings	PIU (with support from AEPC) compiles all relevant documentation
	3. Number of risk-sharing agreements signed between partner FSPs and energy providers Target: Y1: Up to 9 agreements	Signed risk sharing agreements, joint business plan	PIU compiles all relevant documentation
	4. Number of partner FSPs that roll-out energy lending products that are sustainable over time Target: Y2: Up to 3 FSPs	Quarterly reports submitted by FSPs, Research reports	PIU compiles quarterly progress reports and research reports
	5. Number of training organized to build partner suppliers' capacity in operations and maintenance, and other areas identified through gap analysis Target:	Training report, Research reports	PIU compiles all relevant documentation

	Y2: 1 training Y3: 1 Y4: 1		
	6. Number of events organized to promote end-user awareness on technology/service options and financing opportunities Target: Y2: 2 events Y3: 2 Y4: 2	Event proceedings, outcome report, consumer demand survey	PIU (with support from AEPC) compiles all relevant documentation
	7. Number of Local Technical Assistance Providers (TSP) trained and certified Target: Y1: 1 training Y2: 1 Y3: 1	Training material, course evaluation	PIU compiles all relevant documentation
	10. Number of innovative models of collaboration between FSPs and actors in the energy value chain supported Target: Y3-4: 1 innovative model	Business plans, Risk-sharing agreements	PIU compiles all relevant documentation
OUTPUT 3: Global Knowledge and Learning to promote awareness and understanding of the potential for microfinance to stimulate adoption of clean energy, and to develop skills in clean energy microfinance	1. Number of knowledge products produced and disseminated Target Y2: 1 report Y3: 1 Y4: 1	Research report	PIU compiles research reports
	2. Training curriculum on energy lending developed for national microfinance association Target: Y1: 1 curriculum	Training curriculum	PIU compiles training curriculum
	3. Number of Master Trainers trained through Training of Trainers Target: Y1: 3 Master Trainers	Training curriculum, course evaluation	PIU compiles relevant documentation
	4. Number of FSP staff trained on clean energy microfinance Target: Y2: 100 staff Y3: 100 Y4: 100	Course evaluation	Information sharing agreement will be stipulated in the MoU with training institutions
	5. Number of events organised to promote dialogue on clean energy financing	Event proceedings, outcome document	PIU compiles relevant documentation

	Target: Y2: 1 event Y3: 1 Y4: 1		
OUTPUT 4: Advocacy and Partnerships to create an enabling policy and business environment to expand microfinance for clean energy	1. Complementary energy programmes are assisted to build a conducive environment for end-user financing Target: Y1: Technical assistance to AEPC to manage credit facility under CREF/NRREP Y2: Technical assistance to AEPC to manage credit facility under CREF/NRREP	Technical assistance report, minutes of the meeting	PIU compiles relevant documentation
	2. CleanStart is integrated into UNDP/GEF project Target: Y1-3: Map out overlapping project areas and contribute to developing project document	UNDP/GEF project document	PIU compiles relevant documentation
	3. Number of workshops organised to facilitate partnerships with refinancing institutions and carbon brokers Target: Y2: 1 workshop Y3: 1	Workshop material and outcome report	PIU compiles relevant documentation
	4. Achievements from Nepal pilot is disseminated regionally and globally Target: Y1: 1 event Y2: 1 Y3: 1 Y4: 1	Presentation, minutes of the meeting	PIU compiles relevant documentation

Table 3: Risk Assessment

Risk	Description	Probability of Risk Occurring (High, Medium, Low)	Mitigation Strategy
FSP	Partner FSPs do not perceive clean energy lending as core business	Medium	<ul style="list-style-type: none"> Conduct due diligence to select partners that are committed to introducing clean energy financing (business plans should be endorsed by senior management) Gradually build FSP awareness and confidence through various capacity building activities and grant support
	Portfolio quality is affected due to technology failure before loan repayment or technology performing below client expectations	High	<ul style="list-style-type: none"> Assist FSPs to broker partnerships with suppliers that have been pre-qualified by AEPC and assist suppliers to strengthen capacities in operations and maintenance Provide TA to build FSP capacity in delinquency management and technical knowledge
	Partner FSPs do not have access to refinancing	Low	<ul style="list-style-type: none"> A number of refinancing sources exist, including the upcoming Central Renewable Energy Fund (CREF) under the NRREP. CleanStart will facilitate access to local and international refinancing funds and build capacity of FSPs to build investor confidence
Supply chain	Risk of technologies or services becoming supply-driven as opposed to end-user demand and needs based	High	<ul style="list-style-type: none"> Assist partner FSPs to conduct market research to identify client energy needs and develop financing products that most meet the demand from poor clients Assist partner suppliers to conduct financial viability assessments for technologies/services to be deployed
	Remoteness of project sites, difficult geographical terrain and poor infrastructure affects timely distribution or installation of products and services	High	<ul style="list-style-type: none"> Initially, cluster project sites for commercial viability and identify local partners for distribution and repair. Over time, add more difficult project sites as the business model is proven and widely adopted
End-user	Lack of client demand for clean energy and financing	Medium	<ul style="list-style-type: none"> Partner with local actors such as community mobilisers, NGOs and industry networks for awareness building activities FSPs will conduct market research to assess market potential as well as client's willingness and ability to pay.
	Energy loans can add to clients' financial burden and cause indebtedness	High	<ul style="list-style-type: none"> Enforce client protection and transparent pricing through Performance-based Agreements with partner FSPs Link energy services to productive end-use
Policy and regulation	Political instability poses challenges for policy making and enforcement	High	<ul style="list-style-type: none"> Work closely with private sector actors and pursue market-based solutions
	Government announces plan to connect programme areas to the grid during implementation or there are delays, reduction or discontinuation of subsidies	Medium	<ul style="list-style-type: none"> Work closely with AEPC to ensure programme is aware of policy changes and implications GoN will provide increased subsidies

			under the Rural and Renewable Energy Programme (RREP) and will expand to more credit
	Weak coordination between different energy programmes causes duplication of efforts and systems	Low	<ul style="list-style-type: none"> CleanStart will be implemented within the framework of the National Rural and Renewable Energy Programme (NRREP) which aims to harmonise various energy programmes. CleanStart will use the Programme Steering Committee of the NRREP.
Programme management	Political instability delays programme implementation	High	<ul style="list-style-type: none"> Partner with Alternative Energy Promotion Centre (AEPD) which is semi-autonomous and therefore relatively less affected by political forces Recruit local CleanStart focal point that can engage with relevant government actors on a day-to-day basis to seek government endorsement and support

13. Year One Workplan and Budget – Indicative

Outcome (Purpose)	By end of programme, more than 150,000 low-income households and micro-entrepreneurs will have sustainable access to clean energy through microfinance.								
Programme Outputs	Indicative activities for each output	Budget description	Implementing Partner	Responsible party	Indicative Timeframe (2012)				Resource Allocation (USD)
					Q1	Q2	Q3	Q4	Y1
Output 1: Finance for Clean Energy aimed at strengthening capabilities of up to three (3) financial service providers (FSPs) to provide end-user finance for decentralized clean energy to low-income households and micro-entrepreneurs		-	-	-	-	-	-	-	77,000
<i>Output 1.1: Pre-investment technical assistance to FSPs</i>	1.1.1. Awareness and confidence building course (course development and training)	international consultant, national consultant, training, miscellaneous	UNCDF	-			X		37,000
-	1.1.2. FSPs assisted to prepare business plans	PIU travel and DSA	UNCDF	-			X		10,000
<i>Output 1.2: Risk-capital grants to FSPs to cover market entry and start-up costs</i>	1.2.1. Risk-capital grants to cover market entry and start-up costs	grant	UNCDF	-				X	30,000
Output 2: Technical Assistance for Clean Energy aimed at removing barriers to the sustainable deployment of technologies and services for which the selected FSPs will provide microfinance									118,400
<i>Output 2.1 Technical assistance to participating FSPs and key stakeholders in the energy value chain</i> - -	2.1.1. Training on needs assessment methdologies and tools	international consultant, local consultant, training	UNCDF	-				X	20,000
	2.1.2. Strategic market research in FSP operating areas (needs assessment)	international consultant, local consultant, workshop	UNCDF	-				X	25,000
	2.1.3. Identify technology providers dealing in FSP operating areas	local consultant, DSA	UNCDF	-				X	2,400
	2.1.4. Technical assistance to FSPs to develop partnerships with clean energy suppliers	international consultant, local consultant, workshop	UNCDF	-				X	24,800
	2.1.6. Local technical assistance providers are trained in areas where local expertise is not available	international consultant, DSA	UNCDF	-				X	5,000

-	2.1.7. Technology expo to broker partnerships	grant	UNCDF	AEPC				X	41,200
Output 3: Knowledge and Learning to promote awareness and understanding of the potential for microfinance to stimulate adoption of clean energy, and to develop skills in clean energy microfinance									15,000
<i>Output 3.2: Improved skills in clean energy microfinance</i>	3.2.1. Develop training course on clean energy microfinance	international consultant, local consultant	UNCDF	-			X		10,000
-	3.2.2. Identify partner training institutions and conduct training of trainers	local consultant, training	UNCDF	-				X	5,000
Output 4: Advocacy and Partnership to create an enabling policy and business environment for scaling-up clean energy finance									58,400
<i>Output 4.1. Advocacy activities to influence various actors to develop complementary activities in the clean energy sector</i>	4.1.1. Partner programmes are supported to more effectively integrate clean energy microfinance into programme design	international consultant	UNCDF	-		X			28,400
-	4.1.2. Map FSP operating areas vis-à-vis RERL project areas	local consultant	TBC	-			X		5,000
-	4.1.3. Integrate CleanStart into RERL UNDP/GEF project	international consultant	TBC	-			X		20,000
<i>Output 4.2. Leverage international/regional initiatives and forums to contribute to wider policy environment and dialogue</i>	4.2.1. Share achievements and lessons from Nepal pilot	travel, DSA	UNCDF	-		X			5,000
Output 5: Effective programme implementation and management					19,800				
Output 5.1: Effective programme implementation and management	5.1.1. Organise and participate in National Advisory Board meetings	PIU travel and DSA	UNCDF	-				X	2,000
	5.1.3. Appoint CleanStart focal point(s) in AEPC	salary	UNCDF	AEPC			X		7,800
	5.1.4. Day-to-day monitoring and coordination of activities	DSA, miscellaneous	UNCDF	AEPC			X	X	3,000
	5.1.5. PIU coordinates programme activities for Nepal	consultant, travel, DSA, advertisement, overhead	UNCDF	-	X	X	X	X	7,000
Total Programme Cost									288,600
Total Commitment (Funded)									288,600

14. Annex

Annex 1: Programmes and projects to promote RETs

The development of the RE sector has been dependant on donor support. AEPC plays a central role in this regard as it coordinates interventions and manages several projects/programmes. These programmes include:

- 1) **Energy Sector Assistance Programme (ESAP):** Funded by Danida, Norwegian, DFID, KfW/Germany and Government of Nepal, this programme focuses on the promotion of more efficient biomass energy technologies for cooking and heating, solar home systems and mini and micro hydro power installations. Through ESAP, the Rural Energy Fund (REF) was established for subsidy support to the RET systems/technologies. The ESAP project is scheduled to end in 2012.
- 2) **Renewable Energy for Rural Livelihood (RERL):** Supported by UNDP and World Bank, it focuses on local level capacity building to increase access to clean energy through community based decentralized RE models. It works on community-managed mini and micro hydro. It has also supported solar home systems, biogas and improved cook stoves on a smaller scale typically for households outside the micro hydro area. The project is scheduled to end in 2012.
- 3) **Biogas Support Programme (BSP):** Presently known as Biogas Sector Partnership – Nepal. It is supported by KfW, DGIS/SNV and the Government of Nepal. It aims to develop a sustainable domestic biogas sector in Nepal. Phase IV is scheduled to end in 2012.
- 4) **Renewable Energy Project (REP):** A joint effort of the European Union and the Government of Nepal that focuses on institutional solar energy systems for public services (schools, hospitals, etc.), for pumping water (both for drinking and irrigation purposes) as well as for income generating activities. The project ended in August 2011.
- 5) **Improved Watermill Programme (IWM):** Funded by Netherlands Development Organization (SNV) and the Government of Nepal and implemented by the Centre for Rural Technology Nepal (CRT/N), it focuses on the improvement of the sustainability of the improved water mill sector through institutional and local capacity development. The project ended in 2010.
- 6) **Specific Small Programmes:** Besides the above large programmes, there are special smaller programmes of the Government, such as the Ujalo Nepal Programme (provision of RE in Rukum and other districts) and the Bio-fuel Project within AEPC.

All of the above programmes/projects have already concluded or are scheduled to end in 2012. For the future, AEPC would like to build on the successes achieved from these previous and ongoing initiatives, to promote the development of a more sustainable RE sector which is gradually less dependent on donor support, with increasing private sector participation. In this regard, harmonization of the various programmes/projects is envisaged through the National **Rural and Renewable Energy Programme (NRREP, USD 184m)** which is a multi-donor consortium (GoN, Danida, DfID, NORAD, KfW, SNV, UNDP, ADB, WB) to support the RE sector. It will enhance the organizational performance of AEPC and AEPC-linked organizations (District Energy and Environmental Units and Regional Service Centres), as well as institute the Central Renewable Energy Fund (CREF, USD 113.5m) as the core financial institution responsible for effective delivery of subsidies and credit. It will support three main RETs: improved cooking stoves and biogas (biomass); domestic solar electric systems and solar thermal applications (solar); and micro-hydro (community electrification). It will also contribute to increasing the income generation potential of micro, small and medium sized enterprises and households. Implementation will begin in July 2012, with a duration of five years.

In addition, the GoN is currently in consultations with the WB, ADB, Norway and the Netherlands for a “**Scaling-up of Renewable Energy Programme (SREP)**”, targeting \$20 million for small, mini and micro-hydro, solar power and biogas systems. SREP will focus on leveraging complementary credit, grant and private sector equity co-financing for the scaling up of renewable energy technologies (RETs) to scale-up energy access and mainstream commercial lending through financial institutions. It will rationalize fund delivery for mini and micro energy projects through the Central Renewable Energy Fund. In addition, it will also focus on sustainable operations through technical assistance and capacity building.

Source: Renewable Energy for Rural Livelihood (RERL) GEF Project Identification Form; Scaling-Up Renewable Energy Programme Investment Plan for Nepal

Annex 2: Technology price range

Technology	Price range (Nepalese Rupee)
Pico hydro	Rs. 150,000 per Wp
Micro-hydro	Rs. 250,000 - Rs. 600,000 per kilo watt (40kw is the average size)
Biogas plant	Rs. 20,000 - Rs. 40,000 (depending on size and location)
Solar Home System	Rs. 500-700 per Wp (typical 20Wp would cost Rs. 11,000 in Kathmandu, Rs.14,000 in rural areas)
Improved Water Mill	For electrification - Rs. 60,000 per kilowatt Not for electrification - Rs. 40,000 per system
Improved cooking stove	For individual household, about Rs. 300
Metallic improved cooking stove (for high-altitude areas)	Rs. 8,000 (cost may vary with location)
Institutional cooking stove	Rs. 30,000 - Rs. 50,000

Annex 3: Socio-economic benefits of using modern energy

Technology	Livelihood	Productivity	Education	Women empowerment	Health	Environmental sustainability
Micro-hydro	<p>Savings on kerosene (up to 54 percent), diesel (up to 23 percent) and batteries (up to 15-30 percent)</p> <p>Income-generation through productive end-use or selling basic energy utilities (e.g. bulbs, wires, switches)</p> <p>Increased average household income (up to 52 percent)</p>	<p>Improvements in agricultural productivity (e.g. powering agro-processing, poultry farming, irrigation pumps)</p> <p>Better working conditions through lighting</p>	<p>Improvements in school enrollment, in particular among girls</p> <p>Electric lighting increases the number of studying hours</p> <p>Improved access to communication (radio)</p>	<p>Reduced daily time spent on fuelwood collection (by an average of three hours)</p> <p>Increased participation in community-level activities</p> <p>Increased involvement in small-scale and cottage enterprises</p> <p>Changes in gender relations (participation of men in cleaning, agro-processing and cooking)</p>	<p>Reduced indoor smoke contributing to fall in maternal and child mortality rates</p> <p>Improved intake of nutritious foods and vegetables</p> <p>Time saved used for recreation and socialization</p>	<p>Significant reductions in consumption of fuelwood, kerosene, diesel and batteries</p>
Solar Lantern / Solar Home Systems	<p>Savings on monthly fuel expenditure</p> <p>Increased earnings by extending productive hours after nightfall</p> <p>Quality of illumination boosts sales</p>	<p>Better working conditions through lighting</p>	<p>Solar lighting provides brighter light than kerosene lamps, which help children study after nightfall</p> <p>Improved access to communication (radio)</p>	<p>Reduced daily time spent on fuelwood collection (by an average of three hours)</p> <p>Increased involvement in income-generating activities</p>	<p>Reduced indoor smoke contributing to fall in maternal and child mortality rates</p> <p>Less incidences of accidents</p> <p>Time saved used for recreation and socialization</p>	<p>Significant reductions in consumption of fuelwood, kerosene, and dry cells</p>
Biogas	<p>Savings on fuelwood (up to USD 218 per year)</p> <p>Improved local employment through proliferation of biogas companies</p>	<p>Improvements in agricultural productivity through biogas slurry which acts as a high-quality fertilizer</p> <p>Better working conditions through lighting (biogas lamps)</p>	<p>Biogas lamps provide brighter light than kerosene lamps, which help children study after nightfall</p>	<p>Reduced daily time spent on fuelwood collection (by an average of three hours)</p> <p>Changes in gender relations (participation of men in cooking)</p> <p>More time for leisure, recreation and socialization</p>	<p>Reduced indoor air pollution</p> <p>Improved sanitation through installation of toilet-linked biogas plants</p>	<p>Biogas plant replaces 2.5 to 3 tonnes of fuelwood, and 6.5 litres of kerosene annually (this is equivalent to around 3 tonnes of CO₂ emissions reduction)</p> <p>Biogas slurry reduces use of</p>

				Women participation in user training, and development of women biogas technicians		chemical fertilizer, reducing land degradation
Improved water mill (IWM)	<p>Each long-shaft IWM creates at least one job</p> <p>On average, the income of a mill owner rises four-fold per year (EUR 108 to EUR 461) due to improvements in quantity and quality of grains processed</p>	<p>Quantity of wheat flour ground increases ten-fold</p> <p>Better working conditions through lighting</p>	<p>Children's time spent on labour-intensive agro-processing activities is reduced (by 185,983 days per year)</p> <p>Electric lighting increases the number of studying hours</p> <p>Improved access to communication (radio)</p>	<p>Women are freed from manual grinding and hulling</p> <p>Women can be trained to operate as entrepreneurs</p>	<p>Time and effort carrying heavy loads for long distances for agro-processing is reduced</p> <p>Improved performance increases the availability of food in communities</p> <p>Time saved used for recreation and socialization</p>	<p>CO2 emission reduction is up to 6.2kg CO2 (calculated on the basis of fuel savings in existing diesel mills and replacement of kerosene for lighting)</p>
Improved cook stoves	<p>Reduced household expenditure (up to 40 percent of fuelwood saved)</p> <p>Improved employment through proliferation of local manufacturers or distributors</p> <p>Reduced health expenditure</p>	<p>Reduced cooking time (20 to 40 percent)</p> <p>Improved kitchen conditions</p>	<p>More time to attend school (time spent on collecting fuelwood is reduced)</p> <p>Less time off from school due to illness (less respiratory infections & burns)</p>	<p>Reduced daily time spent on fuelwood collection (by an average of three hours)</p> <p>Changes in gender relations (participation of men in cooking)</p> <p>Reduced cooking time allows more time for family or social activities</p> <p>Women can be trained to operate as entrepreneurs</p>	<p>Reduced indoor air pollution results in less respiratory and eye disease</p> <p>Safer way to cook prevents injuries</p>	<p>Less fuel is used compared to traditional cook stoves, and fewer pollutants are emitted (up to 2.5 tonnes of CO2 emissions reduction per year per stove)</p>

Reference: Towards an 'Energy Plus' Approach for the Poor: A review of good practices and lessons learned from the Asia and the Pacific, UNDP, 2012

Annex 4: Existing credit delivery models

Credit delivery models	Examples
<p>a. Direct lending: Commercial banks lend directly to the end user. The concept of lending directly to individuals who are end-users of micro energy systems is relatively new and untried. Credit delivery and recovery to/from customers in remote areas is a major challenge for commercial banks.</p> <p><i>(Source: Scaling-up Renewable Energy Programme - Investment Plan for Nepal)</i></p>	<p>Agriculture Development Bank Limited (ADBL) provides loans directly to end-users for micro-hydro projects. As of FY 2008/2009, ADBL had installed 1084 MHPs (6272 kW), and disbursed NPR 181 million in total credit out of which NPR 0.19 million was outstanding.</p>
<p>b. Direct lending through agents - Vendor financing: Initially, a vendor obtains a loan from a bank to acquire working capital. The vendor settles its loan through cash and credit sales by becoming an intermediary between its customers that need credit and the bank. In effect, the vendor ensures the repayment of the loans from the end-users. The constraint of this model is that vendors do not have expertise in credit assessments.</p>	<p>Clean Energy Development Bank (CEDB) applies the vendor financing model to household biogas plants. It provides working capital loans to biogas vendors registered under the Biogas Support Programme (BSP). As of mid-May 2012, CEDB provided loans to 350 households to install biogas plants - a total loan amount of over NPR 5 million. The total loan to the biogas companies is over Rs. 10 m.</p>
<p>c. Wholesale financing to MFIs - Deprived sector credit programme: Commercial banks provide wholesale loans to microfinance institutions (in particular cooperatives otherwise known as local financial institutions), for energy lending through the mandatory Deprived Sector Credit Programme³⁵. Lack of expertise in energy lending and RETs by the microfinance retailers is a key barrier. LFIs in particular only have basic capacity in delivering and managing credit.</p>	<p>Energy Sector Assistance Programme (ESAP) applies this model for solar home systems (SHS) by partnering with commercial banks³⁶ who then on-lend to LFIs (35 cooperatives) for credit financing and monitoring of systems. As of July 2011, 5921 SHS has been installed. An additional 3000 SHS will be installed via credit by mid-July, 2012. Total wholesale loans from commercial banks are NPR 10 million out of which NPR 7 million is outstanding. LFIs have disbursed NPR 41 million in credit, out of which NPR 29 million is outstanding.</p>
<p>d. Wholesale financing to MFIs/LFIs - Technology fund: A credit fund dedicated to a specific RET is set up to provide wholesale financing to MFIs.</p>	<p>Biogas Credit Fund (BCF) is a revolving fund (USD 35 m) established under the Biogas Support Programme. It provides wholesale loans to MFIs at an interest rate of 6 percent per annum which MFIs then on-lend to clients at a maximum 14 percent per annum. Participating MFIs are required to finance at least 10% of the loan amount with matching funds. As of 2011, total credit amounting to NPR 292 million through 238 institutions across 42 districts has been channeled through the Fund. Out of the total amount disbursed, NPR 161 million has been collected with NPR 131 million outstanding (among 151 institutions).</p>

ⁱ Financing off-grid sustainable energy access for the poor, Yannick Glemarec, UNDP, 2012

ⁱⁱ National Population Census, 2011

³⁵ Nepal Rastra Bank has issued a new directive effective as of January 2012 obligating commercial banks to make 10 percent of their total lending to the agricultural and energy sectors within the next three years.

³⁶ BoK, CEDBL, Cooperative Bank, SFDB, HBL, ACE, CNT, Nabil, Kumari, KIST Bank

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- ⁱⁱⁱ UNDP, 2011
 - ^{iv} Ministry of Finance, 2009
 - ^v IEA World Energy Outlook 2011
 - ^{vi} IEA/OECD, 2009
 - ^{vii} UNDP MDGs Needs Assessment for Nepal , 2010
 - ^{viii} Energy Sector Synopsis Report, 2010
 - ^{ix} Nepal Energy Sector Synopsis Report, Water and Energy Commission Secretariat, 2010
 - ^x Central Bureau of Statistics, 2009
 - ^{xi} Financing off-grid sustainable energy access for the poor, Yannick Glemarec, UNDP, 2012