Common Format for Project/Program Concept Note for Applying Resources from the SREP Competitive Set-Aside

1. **Country/Region**:	NEPAL	2. **CIF Project ID#**:	
3. **Project/Program Title:**	*Program for Supporting Private Sector Led Commercially Viable Business Models for Off-Grid Energy Access in Nepal*		
4. **Date of Endorsement of the Investment Plan:**	November 2011		
5. **Funding Request (in million US$ equivalent):**	*Grant: US$6 million (grant/loan ratio TBD)*	*Non-Grant (loan, equity, guarantee, etc.): US$2 million (grant/loan ratio TBD)*	
6. **Implementing MDB(s):**	IBRD	☐ Private sector arm XX Public sector arm	
7. **Executing Agency:**	Alternative Energy Promotion Center (AEPC)		
8. **MDB Focal Point and Project/Program Task Team Leader (TTL)**:	*Headquarters- Focal Point:* *Gevorg Sargsyan, CIF Program Coordinator (World Bank)*	*TTL:* *Mohua Mukherjee, Senior Energy Specialist (World Bank)*	

I. Project/Program Description: Provide a summary description of the project, objectives, and expected outcomes. Which sectors would be targeted?

The **objective** of this Project is to support the development of a local market for private-sector led off-grid energy provision using the innovative and renewable energy (RE) based[1] business models, including but not limited to the 'Anchor-Business-Community (A-B-C)'[2] business model. The Anchor customers currently use diesel-based energy and are looking for reliable and lower cost greener solutions. The Business customers do not have access to electricity and are using small generators or battery powered devices. The Community customer does not have energy access and currently has minimal energy demand. The business model first identifies (through GIS-based mapping techniques) areas where these three types of demand are located within close geographical proximity, and then bundles these three distinct customer categories to create continuous energy demand and predictable revenue stream. This approach, based on financial modeling and cash flow forecasting, results in commercial viability for the enterprise and a lower cost, cleaner energy option for the customers. Off-grid energy investments in Nepal have traditionally been public-sector led, and therefore not primarily concerned with demand forecasting and cash flow projections whose reliability depends on accurately estimating demand and promoting productive uses of power. This project will represent a major cultural shift if it can successfully introduce private sector-led investment in off-grid energy, and can stimulate the creation of commercially viable small and medium local energy entrepreneurs.

[1] The business model is technology agnostic and could use solar PV, hydro, and biomass, as well as hybrid power systems. Technology selection will be based on the availability of renewable energy resources at the project site.
[2] A detailed description of the 'A-B-C' business model is provided in Annex 1.

Since 2011, movements in the price of renewable energy technologies, the cost of fossil-fuels based small-scale generation and the availability of mobile-linked services have resulted in an increasing interest from private enterprises and investors in this area. Private enterprises and investors are recognizing the business case for serving the 'Anchor' customer. The socially-oriented private investors are keen to explore opportunities to serve the 'Business' (which can be both formal businesses as well as micro-enterprises), and 'Community' customers. Consultations[3] with the private sector indicate five major barriers, namely *awareness* of geographical target market locations & new business solutions, *local technical capacity*, *policy & regulations*, *market intelligence* on customer demand profiles, and *access to finance*. The Nepal project aims to directly address these barriers to the creation of local renewable energy enterprises, and will implement financial risk mitigation measures and technical capacity development to support such companies. There will be three components designed to address the barriers: (i) **technical assistance** to address the first four barriers listed above; (ii) **results based finance (RBF) to mobilize and leverage additional investment resources,** to address limitations in access to finance, which is the fifth barrier; and (iii) **financial guarantees and other de-risking instruments** to allow newly formed energy enterprises to enter into medium and long-term contracts with third parties.

The **outcomes** of this Project are expected at two levels, local, and country. At the local level, the Project will enable off-grid kerosene and diesel users to affordably and conveniently shift to lower cost, cleaner energy options involving a mix of technologies ranging from hand-held rechargeable solar lanterns for lowest income customers, to pay-as-you go solar rooftop panels for medium income customers, to micro-grids for businesses and high income households whose power demand justifies the investment in such a distribution system for decentralized, locally generated renewable energy. In addition, the Project will provide energy services based on the energy needs and affordability of the different customers. As a private enterprise is likely to continuously look for new customers, new employment opportunities and productive uses are likely to be identified once the business model is operational. An important outcome is therefore expected to be local development impact from the creation of local energy entrepreneurs.

At the country level, the collective of newly formed local energy entrepreneurs will enhance the well-established existing and ongoing public sector strategies for RE based rural electrification, and will serve to establish new private sector-led models for replication in other countries. The Nepal SREP project will result in a country-wide portfolio of private enterprises implementing various business models and combinations of generation technology, communications technology (to minimize transactions cost with BOP customers, most of whom have mobile phones), and all manner of distribution technologies and power availability (such as battery charging services, solar lanterns, DC micro-grids, AC micro-grids, continuous power, restricted power, etc).

As noted above, the project will also test guarantee and Results Based Financing (RBF) mechanisms to build confidence of the Anchor customers and reduce financial risk of connecting community-level customers, respectively.

II. Rationale: Provide the rationale behind the idea in the national context, and from a local market perspective. Also, provide an explanation as to why it should receive the funding and how it would further advance the objectives of the endorsed investment plan.

Rationale behind the Project

[3] Detailed information on the consultations is available on the online collaboration platform (https://collaboration.worldbank.org/groups/incubating-innovation-for-rural-electrification-the-telecom-energy-initiative)

Modern energy access is the key to the economic development and improving livelihood. Large groups of the off-grid or "low-grid" population in rural Nepal lack access to clean and efficient basic energy services. Nepal has already gathered vast experience with large-scale, public sector led programs to expand rural electrification, mainly through the internationally recognized efforts of its Alternative Energy Promotion Center, or AEPC. This proposed Project seeks to complement the on-going public sector led efforts by attracting private sector efforts and investment, to provide energy services to rural, off-grid communities. This Project will specifically target and seek to remove the barriers which have been identified as holding back the growth of such energy enterprises, and will seek to demonstrate the "Proof of Concept" for commercial viability and sustainability of the business model to build confidence of the private sector. Building on the achievements of this Project, Nepal's other donors and financing partners for the ongoing, ambitious National Rural and Renewable Energy Program (NRREP) may also be persuaded to invite the private sector to play a bigger role in increasing energy access in rural areas.

Availability of electricity is important to allow for productive uses and day-time supply is especially important to support income generation activities for off-grid businesses and community members, as well as to ensure technical and financial sustainability for the private sector energy provider. A majority of *community-owned projects* operate only in the evenings to serve household uses for lighting and mobile phone-charging, while *private sector projects*, with a greater emphasis on maximizing revenue collection and greater sensitivity to serving all categories of demand, tend to cater to continuous demand from either the power grid or a large private sector consumer. Pockets of such demand exist in off-grid rural areas in the form of Anchor customers like mobile phone towers, agri-businesses, service industry and other private operations.

This Project seeks to leverage the demand from Anchor customers to attract the private sector to supply energy to local businesses and homes in off-grid areas that are geographically close to the Anchor customer. The proposed Project in Nepal will test different financing mechanisms to support the private sector energy entrepreneur in acquiring additional capacity to expand its commercially viable energy sales and associated services to the local business and community customers. This Project will also contribute to the broader RE based energy access discussion by establishing a proof-of-concept for the business model and addressing the key barriers that currently restrict private sector engagement.

Rationale for funding

As discussed earlier, a new opportunity for harnessing private sector interest in accelerating the pace of energy access has emerged in recent years. This new opportunity is created due to a combination of economic, technological and entrepreneurial efforts, and a global recognition for shifting to cleaner and more affordable energy options. A number of private start-up enterprises[4] are now emerging in this field, mostly in India and also in East Africa. These enterprises are still at the pilot stage, mostly surviving on capital provided by investors with high risk capacity (known as "angel investors") and demonstrating that their business model and their technology works. While commercial banks are not yet ready to lend to these new enterprises, consultations have indicated that a new category of investors is emerging and is interested in investing in local enterprises providing energy services. This category of investors is generally known as "Impact Investors". They seek a social and environmental return on their investment along with a financial return. Impact Investors face barriers that are similar to the ones faced by the private enterprises and discussed above. In addition, impact investors are unable to deal with individual, small transactions, and therefore require local support in the development of a portfolio of enterprises. As this is a new business area, building the confidence of the private sector requires a comprehensive demonstration program that addresses the barriers and creates a proof-of-concept portfolio of private enterprises. Funding from this Project for Nepal will be used to address the key barriers, develop a portfolio and demonstrate how financial instruments like RBF and guarantees could be used to mobilize

[4] Please refer to Annex 1 for information and web links for some of these companies

private enterprises and investors to accelerate the pace of provision of energy access to the off-grid communities in SREP pilot countries and throughout the developing world. Nepal is well-placed in being at the start of a new NRREP program, which however is fully public-sector led at present. The rationale for trying this Proof of Concept to develop financially viable private sector energy entrepreneurs and investments in rural off-grid energy to compete with and displace kerosene and diesel, is that the Government may subsequently decide to reallocate a portion of its NRREP funds to scale up the program of support to private energy entrepreneurs, alongside its ongoing national programs for rural electrification.

Supporting the Investment Plan

The approved Investment Plan for Nepal has a strong emphasis on energy access through multiple technologies: small hydro, micro-hydro, solar PV and expanded biogas/waste to energy. The removal of barriers to creation of energy entrepreneurs, who will complement ongoing efforts and particularly emphasize daytime productive uses of energy since their revenue streams depend on it, is an appropriate complement to the very well-formulated investment plan. The objectives of this additional SREP financing request are perfectly consistent with the original Investment Plan objectives, but they are proposed to be delivered with strong private sector participation, which will have added the benefits of enterprise development and strong sustainability as well as employment creation, both direct and indirect, and last but not least, a very important "capacity building effect" in the local financial sector through first-time exposure to new financial instruments.

III. Consistency with Investment Criteria: Provide information how the proposed project meets the investment criteria for the SREP Investment Program, including:

As mentioned in earlier sections, the ABC business model enables private enterprises to provide renewable energy services to anchor customers, local businesses and communities in off-grid, remote areas. In implementing the ABC model, the private enterprise and the Project are likely to achieve the following:

Investment Criteria	Description
Increased installed capacity from renewable energy sources	Enable an increase in the renewable energy capacity by up to 5MW, including switching of current diesel-based generation by 'Anchor' and 'Business' customers to hybrid systems
Increased access to energy through renewable energy sources	Provide energy services to up to 25,000 off-grid rural 'Community' customers (125,000 people) by directly addressing the affordability challenging and offering a mix of services, lanterns, Solar Home Systems, battery-based or mini-grid connection, as appropriate for the socio-economic, geographic conditions.
Low emission development	Enable the localized economy, including the 'Anchor', 'Business' and 'Community' customers to switch from kerosene or diesel to renewable energy sources for their current demand while providing a cleaner energy solution for future increase in consumption for home or commercial use.
Affordability and competitiveness of renewable sources	The private enterprise will be able to provide a combination of technical solutions to address the affordability of the customer. In addition, as the clean energy source will be directly competing with expenditures on fossil fuels, it will have to be priced competitively to provide an incentive for customers to switch.
Productive use of energy	The private enterprise is likely to actively promote productive uses of

	energy as it will result in increased consumption of energy, which will increase their revenues and improve commercial viability.
Economic, social and environmental development impact	Positive economic, social and environmental development impact from introduction of daytime energy availability, increased energy input to productive uses and livelihood support, and shift from traditional fuel, kerosene and diesel to low carbon technology based on the locally available RE resource. (The TA component of the Project will develop a Monitoring & Evaluation (M&E) framework to capture these benefits as private impact investors are keenly interested in quantifying, reporting and certifying these benefits.)
Economic and financial viability	Economic and financial viability is the cornerstone of the ABC model. If the enterprise is financially viable, sustainability of the energy supply is increased, meaning that the community energy source will remain in place and its local customers, who use energy as an input, will also be financially viable.
Leveraging of additional resources	Private sector investors and commercial capital to the tune of up to US$30 million will be leveraged to deliver off-grid energy.
Gender considerations	The Project will build around 10 local energy enterprises and create local employment opportunities. At a minimum, women and girls will benefit from clean and safe lighting and improved income generation opportunities. Potentially women/girls can play a significant role in the management of local energy systems set up by the enterprises. In addition, women and children are direct and significant beneficiaries as access to clean energy services provides greater health benefits at home, improved access to health and educational services, more local economic opportunities. During the preparation phase of the Project, the Project team will undertake a detailed impact assessment and explore opportunities to develop capacity and create favorable conditions for women entrepreneurs and technicians.
Co-benefits of renewable energy scale-up	There are numerous co-benefits of renewable energy scale up. Apart from increased livelihood opportunities and improved social environment, access to energy is also likely to allow diversification of income. The private enterprise is likely to explore options for additional revenue streams by supporting new business ideas. Supporting the development of private enterprises, with decentralized small scale power generation will increase utilization of locally available resources, such as hydro, biomass or solar. For Biomass projects, fuel from locally sourced sustainable non-timber forest resources (managed by community forest user groups) and agricultural residues can increase the local incomes while improving the local economy and supporting conservation of resources. Renewable energy also reduces local and indoor air pollution and when replacing fossil-fuels leads to avoidance of fire hazard from fuel spillage.

IV. Type of Private Sector Engagement: Provide information whether this will be a solely private sector project, a public-private partnership, or a public sector project financing private sector entities.

This will be a public sector program financing private sector entities. The Project, to be coordinated

through a new unit in the existing Alternative Energy Promotion Center, will implement activities to support private enterprises through capacity development, creation of awareness and market mobilization and provide financial support through RBF and guarantee mechanism. There will be no public sector ownership or management of enterprises and assets created. All the financial and non-financial support is directed towards addressing key barriers faced by the private sector and building private sector confidence in new business models, which could significantly accelerate the pace of energy access using renewable energy sources.

V. Innovation: Explain how the project is innovative in terms of technology, business model, financial instruments or structure, and how the innovation will add value to the project.

This proposed Project is innovative at both local and country level, as it supports the proof-of-concept of a new 'ABC' business model for private-sector led off-grid electrification; provides a holistic approach to address the barriers face by the private sector; and tests new RBF and guarantee mechanisms to reduce performance, payment and connection risks faced by the customers and the private enterprise. As described earlier, a confluence of factors has opened the door for greater private sector engagement in serving the rural customer using clean energy sources. As also mentioned earlier, there is a growing interest from investors, technology providers and entrepreneurs. This Project in Nepal creates a unique opportunity to pursue a local level proof-of-concept and to complement the ongoing public sector efforts with the efforts of private-sector local enterprises.

At the country level, the project supports a first effort to create a portfolio of local private enterprises focusing on off-grid energy access as a viable business case. The project will not only attempt the innovative approach to identify local small enterprises through business plan competitions but will also support the development of a new RBF based 'inclusion incentive' to support private enterprises in reaching the community 'C' customers and in creating a guarantee mechanism to build confidence of the Anchor 'A' customers. The project will create the awareness, information flow and technical capacity at the national level, and will make it possible, through additional resources currently available to the Government, to attract other private enterprises and investors into this sector, even after this proof-of-concept project is over. At the local level, the off-grid customer will receive professionally delivered clean energy services. Using the A-B-C model, the energy enterprise will be able to create commercial viability and therefore business sustainability.

VI. Technology, Product, and/or Business Model: Provide description of the technology, the technology provider if identified, whether it has been tested, commercialized and viable commercially. If the project does not involve a technology, provide a description of the business model and its structure.

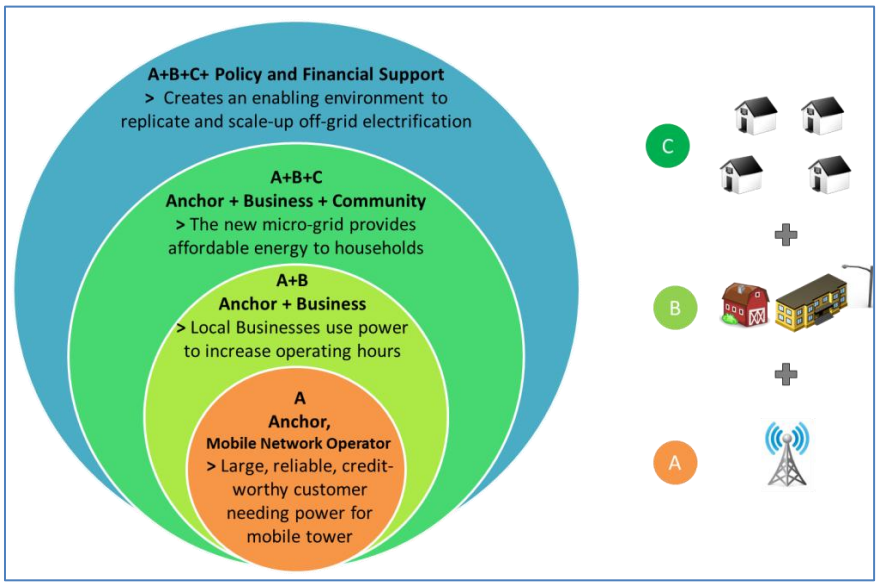
This proposed Project provides market mobilization, technical capacity development and financing support to attract private-enterprises to serve off-grid customers using the innovative A-B-C business model. A detailed description of the business model is given below. The Project seeks to build confidence, reduce risks and promote commercial viability for private enterprises and investors interested in this business model. If successful, the Project will have demonstrated a concept that can be scaled up with additional rural and renewable energy resources that have been pledged to the Government, initially only to scale up existing public sector programs, but, at Government's discretion, some portion of these existing resources can then also be channeled to support more private sector-led programs alongside the national programs. In effect, the Government will then be leveraging its own donor-funds to "crowd in" more private sector investor funds and entrepreneurship in order to achieve the same objectives as those of its current national programs, i.e. improving access to sustainable and reliable renewable energy.

Technology & Products

The business model proposed under this Project is technology and product agnostic and can be designed to utilize the locally appropriate renewable energy generation sources, distribution system and business solutions. Decentralized micro grids or battery based systems operated by a commercially oriented private enterprise depending on the customer's preferences, affordability and compatibility with their energy requirements – using the ABC model – is showing the promise of being a suitable business opportunity for the private sector. As part of the market mobilization and technical capacity development activities, this project will support private enterprises to design appropriate technology and business solutions packages based on an accurate and well-informed market assessment based on market intelligence, demand profiles and data on current energy expenditures (against which savings must be offered to the customer in order to incentivize a switch to clean energy).

The Business Model

The business model has been developed based on knowledge gathered from the private sector and through extensive consultations with the telecom, energy and financial sector as part of the World Bank Institute (WBI)-hosted 'Incubating Innovations for Rural Electrification – the Telecom-Energy Initiative'. This initiative has been supporting a continuous dialogue with a wide-range of stakeholders through its online platform (link: https://collaboration.worldbank.org/groups/incubating-innovation-for-rural-electrification-the-telecom-energy-initiative). The information collected from the market indicates several companies that have either demonstrated the potential for the 'A-B-C' business model and are operational, or are at advanced stages of funding and design. A list of companies and their websites is provided as Annex 1.



The business model identifies three sets of customers:

Anchor customers represent day/night time load, predictable in nature, requiring continuous power delivery. Examples of potential "Anchor" customers in off-grid areas include e.g. mobile telecom towers; dairy farms with continuous refrigeration requirement; or poultry farms which require constant electricity to maintain uniform temperature and lighting conditions, etc.

Business customers are local commercial establishments, for whom power is a critical input to improve productivity and income; they also require mainly daytime delivery but not necessarily continuous power. Examples of potential "Business" customers include local micro-enterprise establishments such as a carpenter, a tailor, a hair-dresser, a laundry service, a welder, a retail kiosk with a small fridge or cooler, a pharmacy, etc.

For **Community** customers, affordability is a major issue; they may have many other pressing needs in addition to power; for the low income segment of the community, their main requirement is evening power delivery for lighting and phone charging, while for community health post and schools etc. it might be lighting, basic health related and IT equipment. Examples of "Community" customers include health posts, education institutes, and all types of households from the wealthy to the poorest.

The business model builds on the profitability and bankability of the three customer categories:

Customer Type	Profitability	Bankability	Attractiveness	Risk Impact
Anchor 'A' Customer (e.g. telecom tower, petrol station, mining site)	LOW – telecom tower can squeeze the Enterprise on prices	YES	Telecom tower does not offer high margins but if it signs a contract to buy multi-year power, having such a contract makes the energy entrepreneur "bankable"	PPA with a Telecom Tower gives Enterprise access to Banks as the future revenue stream from a telecom tower reduces riskiness of the unknown energy entrepreneur
Business 'B' Customer (e.g. local shopping center, internet café, etc.)	HIGH – it is very expensive for local business to supply itself with power, manage fuel logistics etc. and therefore these customers are used to paying very high prices for energy already. Even a generous reduction in energy price offered to these customers will still be very profitable for the energy entrepreneur	NO	Local business is highly profitable as a customer of the energy enterprise but not bankable; banks do not consider these local businesses to be very creditworthy and regard them in a different category compared to more established Anchors	PPA with local businesses gives high margins, most profitable, reduce payback period on energy enterprise's capital investment, and are a growth segment
Community 'C' Customer (e.g., House-holds, local health clinic, school)	Variable, as household demand is small and variable, whereas other community use is limited	NO	Household is neither bankable nor profitable	Supply to local customers gives roots in the community, potential growth and protection of assets

The Anchor **'A'** customer segment brings the **lowest profit margins** for the private enterprise. This is because the Anchor customer is typically an established operation and is well-informed on the cost of self-generation of electricity and able to negotiate accordingly. Unless the private enterprise offers a highly competitive rate with adequate quality assurance, the 'Anchor' could continue to self-generate. However, the value to the private provider in pursuing a contract with a demanding Anchor customer is credibility and "bankability". A contract with the 'A' customer will change the risk profile of the private enterprise due to the assurance of receiving regular payments from a creditworthy 'Anchor' customer. For

a commercial lender, a multi-year contract with an Anchor customer could provide similar level of assurance as a conventional Power Purchase Agreement (PPA) with a well-established power off-taker.

The Business **'B'** customer segment brings the **highest profit margins** for the private enterprise. Most local business customers operate small, inefficient generators in an irregular manner with frequent breakdowns while paying a high price for diesel. Typically, their unit cost of electricity is astronomical and their productivity is severely limited and strained due to their own power supply constraints. Given the business case for efficient and reliable energy service, this customer segment is likely to pay a much higher per unit cost of electricity than an 'Anchor' customer even if the new cost is significantly lower (perhaps half or so) than their own generation. Converting the cost of power supply from capital expenditure (generator) + operating expenditure (diesel), to only operating expenditure (buying kWh) will also greatly improve the cash flow position for the Business customers. The Business customer is also a growth segment because the Business is likely to consumer more energy for extended operations or productivity. However, even a lucrative price contract with Business customers will not serve to make the private enterprise bankable, unlike with the Anchor. Commercial lenders may not consider small local businesses creditworthy enough to make the private energy enterprise bankable.

The Community **'C'** customer is central from the energy access perspective. However, from a strictly commercial perspective, the community customer neither helps with bankability nor with reducing payback period. The Community customer, however, gives the private enterprise local legitimacy, creating roots in the local community, and offering a degree of protection from vandalism and theft of assets. In addition, the community or household customer is also a growth segment as availability of energy services could potentially begin a virtuous cycle of improved productivity, diversification of incomes and increased access to opportunities and resources.

VII. Market: Provide an overview of the market, product nature, supply and demand status, prices, and competition. In the absence of other comparable products, provide a brief explanation on how the proposed product will substitute for existing products and the benefits from a climate standpoint, and the prospects of commercial viability. Also, provide an overview of current market barriers and how will they be reversed by the proposed project.

This Project is supporting an innovative business model as a private-sector led solution to the challenge of off-grid energy access in Nepal. This business model is not expected to substitute the current public sector-led models for off-grid electrification; instead this model provides a private sector-led approach that **can contribute to and complement the ongoing efforts to expand energy access**. The Project enables local private enterprises to reduce barriers to starting up, and supports them to find market opportunities to replace diesel based generation systems with lower carbon energy systems, all of which provides a strong climate change benefit. Bundling three customer demand categories will provide the continuous demand that is important for sustainability and commercial viability.

As part of the process of development of the ABC business model and subsequent extensive consultations with private sector enterprises, five "global" market barriers have been identified, all of which apply to the Nepal context as well. The TA component of this Project would systematically address these barriers at country and enterprise level.

Barrier	Description
Access to Finance	The overall barrier arises from the fact that it costs a lot of money to prepare projects to the stage where a commercial bank can be approached for a loan. There is no money available from anywhere for project preparation in this very new field. The few enterprises who have successfully raised funds from angel investors for demonstration

	of their project concept, find that they are spending most of this money in project preparation before they can get to the stage of construction, which is what they thought they would use the funding for. So access to funding for project preparation and achieving readiness for construction, is the single largest barrier, mainly due to lack of understanding of the role of private enterprises and private capital into the nascent market for private enterprises in off-grid areas.
Market Intelligence	The project preparation resources are primarily spent on gathering detailed market information in terms of household energy expenditure on fossil fuels; business customers' load patterns; assessment of demand fluctuation and appropriate sizing of the generation investment. This is needed for financial modeling which is an input to preparation of a business plan. All this represents a complete culture change in Nepal, as indeed in most other developing countries too, where all energy access projects in living memory have been done by the public sector, and the public sector never employs such project finance methodology in formulating its approach to investments. Therefore, no public sources exist to provide market intelligence information. Lower income off-grid communities are particularly neglected and are mostly not "on the map" as far as consumer information and market intelligence is concerned.
Policy & Regulations	Private enterprises struggle with understanding the policy environment, which in many cases is unclear as the governments have not considered the role of the private sector in off-grid energy areas. In countries where governments have incentive programs, enterprises are faced with lack of information on how to access government incentive. Enterprises also face lack of clarity in terms of import duties on renewable energy components, whether a license is needed (suppose the law says no license is needed for generation under 1MW, but is silent on distribution of that power—what should they assume?) Small local enterprises also typically do not have access to policy makers for a dialogue.
Technical Capacity	Training of local staff at various skills levels is a major barrier for many enterprises who cannot find appropriately trained local staff in rural areas. Paying for training of the staff is a major financial burden and risk for the enterprise, especially at early stages of operations.
Communication and awareness	Communication and awareness building with customers, and with professional services such as legal, accounting, marketing and PR officials, NGOs, etc. Several pioneering entrepreneurs report the challenges of working in a nascent market where the role of the private enterprise in selling electricity is not clear and a huge amount of time, resources and managerial time is spent on simply communicating what they are doing. The enterprise could hire a communications officer, but again, they usually don't have resources for this upstream activity.

VIII. Financial Plan (Indicative):

The indicative financial plan given below is for implementation of the project in Nepal. This financial plan includes expected investment into the enterprises that the Project would seek to leverage from private investors and local commercial banks in the country. The SREP funding includes the awards for the business plan awards/grant competition (to pay for enterprise-specific TA inputs required), the Results Based Financing (RBF) incentive for connecting small business and community customers and the guarantee funds to support the Power Purchase Agreement (PPA) between the private enterprise and the Anchor Customer. Additional country-level TA funds will also be used for market mobilization activities, which include communication, outreach and training. (The impact of country-level TA funds is to raise awareness of and interest in this Proof of Concept Project, so that its future success may lead to

Government and its financing partners deciding to allocate some portion of the available NRREP resources to scale up this Project and provide additional support to creation of local energy entrepreneurs).

Source of Funding	**Amount (US$ million equivalent)**
Private investors, foundations, lenders and developers, including local banks	32
MDBs	--
SREP	8
Bilateral	--
TOTAL	**40**
Leverage (SREP : Other sources)	**1 : 4**

IX. Expected Results and Indicators

Results	**Indicators**
Annual electricity output from RE as a result of SREP interventions (MWh)	4-5MWh/year • 3-3.5MWh/year (Anchor customers) • 0.8-1 MWh/year (Business customers) • 0.2-0.5MWh/year (Community customers)
Number of women and men, businesses and community services benefiting from improved access to electricity and fuels as a result of SREP interventions	25,000 'Community' customers (households, with five members each) being served by the 10 private energy enterprises
Increased public and private investments (US$) in targeted subsector(s)	US$32 million
Increased capacity of commercially available renewable energy	Up to 5MW
Commercially viable business model piloted for energy delivery	Up to 10 Private sector enterprises providing off-grid energy solutions
GHG emission savings (mtCO2e/year)	8mtCO2e/year • 6mtCO2e/year (from displaced diesel by Anchor and Business customers) • 2 mtCO2e/year (from displaced kerosene by Community customers)
Replacement of Kerosene use by households	Displacement of approximately 100L/year of kerosene per household for lighting purposes, with equivalent generation from renewable or hybrid energy systems
Replacement of diesel use by Anchor and Business customers	Displacement of 1000L/year of diesel used for power generation with equivalent generation from renewable or hybrid energy systems

X. Implementation Feasibility and Arrangements: Provide information on the implementation feasibility of the proposed project and a timeline by when the project can start implementation on the ground and when the project will be completed.

The implementation feasibility of this Project is high as it is not creating any new institutions or implementation systems. The Project will use a rapidly implementable competitive process to identify existing private enterprises to provide energy services in selected priority areas. The existing SREP-supported Expanded Biogas and Waste to Energy Market Development project has already piloted and demonstrated a very high degree of response to a competition for innovative concepts from local entrepreneurs. The approach is therefore already familiar, and the World Bank staff on the Nepal SREP team have also spent the last 9 months holding regular dialogues with existing and potential energy entrepreneurs, who cannot grow due to the barriers which have been identified above. They are well positioned to respond quickly if these barriers are addressed and the required support is provided to them.

Expected SREP Sub-Committee approval date: August 2014
Expected MDB Approval date: November 2014

Program Implementation Structure
The Project's TA component will include a market mobilization, awareness, capacity development and communication activity. The project will be implemented in three phases and will implement the following activities to support private enterprises in adapting the A-B-C model.

- Market mobilization (Awareness, grant competitions, technical capacity building)
- Guarantee mechanism (Build confidence in the PPA between private enterprise and Anchor customer, especially on the issue of reliability of power supply)
- RBF grants for connecting local small businesses and community customers

Approximately, US$1 million out of the total requested grant of US$8 million will be set aside for TA support activities for the entire Project duration. These funds will be used to ensure adequate participation of private sector investors, Anchor customers, financial institutions and technology providers to support local projects and the portfolio of private enterprises. US$5 million will be allocated to the RBF mechanism and US$2 million to Guarantees respectively (these are indicative estimates).

Preparatory Phase
The preparatory phase will be implemented within 6 months after approval of this concept. During this phase the Project will implement a series of market mobilization activities ending with a grant competition. The investment criteria mentioned above will form the key eligibility criteria for the private enterprise to receive funding support from this Project. It will proactively support development of ABC model based implementation plans so that enterprises receive effective guidance in designing their business plans to maximize the benefits mentioned above. The competitions will result in the identification of up to 20 enterprises (this could be increased depending on market response). These enterprises will be awarded a grant of up to US$12,000 to develop a bankable business plan for adapting and implementing the ABC business model in pre-defined priority areas in the country. The business plans will be reviewed for appropriateness, accuracy and techno-commercial design. The enterprises with the best business plans will be added to the demonstration portfolio in that country. The Project will engage private investors and financial institutions in assessing the quality and creditworthiness of the business plans. The data from the business plans and consultation with the stakeholders will determine the RBF mechanism and the financing support required to enable connection of small businesses and homes. The Project will also engage the Anchor customers in understanding the risk perception and potential

mitigation measures using guarantee mechanisms. At the end of the preparatory phase, a portfolio of business plans will be ready for investment and implementation.

Implementation Phase

This phase will support the financing, implementation and performance assessment of the portfolio of business plans, which were developed in the preparatory phase. The enterprises will receive training, capacity, communication and advisory support, as required. While the enterprises are responsible for raising the capital, the country-level project will provide some initial advisory support as well as create a platform for meeting of the investors and financiers with the private enterprises. This platform will not only create a match-making space for investors and business plans but also for showcasing of technology options and business solutions and for information sharing.

Each selected enterprise or sub-project will implement two financing mechanisms. The first is a guarantee mechanism designed to build the confidence of the Anchor customer in engaging with the private enterprise. As mentioned earlier, reliable energy supply is a critical operational requirement for the Anchor customer. Telecom towers have a stated requirement of 99.99% reliability, which makes it difficult for them to trust another enterprise. This mechanism will be used to facilitate the signing of the PPA by guaranteeing the reliability of the energy supply. The guarantee funds will assure payment of penalty if the private enterprise fails to ensure power supply as per the agreed reliability and the penalty clause is enforced. The second is the RBF mechanism developed during the preparation phase to reduce the cost and risks to the private enterprise in providing energy services to small Business 'B' and 'Community' customers. The Project will develop a calculation method to determine the per connection incentive (US$200-300 per new customer) that can be customized for each project location depending on specific characteristics that influence the local cost of a connection. The private enterprise will receive this incentive for connection of B and C customers.

Throughout the implementation phase, the Project will undertake an extensive Monitoring & Evaluation process to capture the direct and indirect benefits accruing to the activities at local and global level. This will contribute to emerging discussion in the impact investment to improve the system of indicators for defining and assessing the 'impact' of these investments. This M&E system would enable private investors to report on their investments using a common set of indicators and benefits.

At the end of the implementation phase, the Project will have enabled local enterprises in providing energy services to the A, B and C customers and demonstrated proof of concept for the business model. The Project will also have established communication platforms and other tools for continued private sector engagement in provision of energy access, through each country project and at a global level.

Nepal is a strong candidate for this Proof-of-Concept project approach because it has large population concentrations in the Terai (plains) region in the south, with very low electricity access rates, high solar irradiation, and a large number of mobile telecom towers consuming diesel, with an interest in buying solar kWh from a third party supplier. Nepal has justifiably earned a reputation for strong community focus and a leadership role in construction of community micro-hydro power (MHP). However, there are a few inherent limitations of the community ownership model, which inhibit the optimal use of the renewable energy source. In particular, there is a lack of daytime operation for productive uses in most locations as the community typically decides that the plant should be operated only after dark, for lighting and mobile phone charging, and everyone should pay a uniform, flat rate and receive the same amount of power. In one particular case where a sawmill operates all day long on diesel generators close to a MHP, community members have stated that they do not wish to run their plant in the daytime to sell power to the sawmill. The stated reason is that daytime operation will cause wear and tear on the plant and they, as the owners, will be forced to pay for maintenance and repairs, which is difficult for them as they do not have the capacity to know what parts to order and how to procure them and install them, if the plant

breaks down. In Nepal, this appears to be a standard scenario behind so many MHPs being used only for lighting and phone charging, and additional productive uses not arising from the investment in community electrification. Anecdotal evidence suggests that community owned and managed projects in many other countries face similar constraints. Engaging the private sector could overcome this constraint as the community will receive professional energy service, while the private enterprise will have a profit-motive to attract as many productive use applications and new customers to maximize around-the-clock power sales.

XI. Potential Risks and Mitigation Measures: What are the risks that might prevent the project development outcome(s) from being realized, including but not limited to, political, policy-related, social/stakeholder-related, macro-economic, or financial?

Potential risks and mitigation measures for this Program are as follows and the risks are considered to be manageable.

Risk	Level	Description	Mitigation measures
Political	Medium	Off-grid energy access provision is an issue on which all political parties agree and are therefore likely to support.	The Project will define appropriate measures based on nature of the identified risks
Policy-related	Medium	Lack of clarity related to plans for expanding the grid and how private developers who are seeking to compete only with kerosene, will require certainty regarding the timeline for arrival of the grid in their selected location and what is expected of them at such time, in order to protect their investment.	The project will create a forum for dialogue between policy makers and private enterprises to help with information flow and dialogue. The forum for private enterprises has already been created through a series of Roundtable meetings held at the World Bank office in Kathmandu on a regular basis since September 2012. Policymakers would be invited to join the dialogue
Social/stakeholder	Low	Customer engagement	Participation as a customer is entirely optional and voluntary
Macro-economic	Low	Competitiveness with fossil fuel prices	The business plan projections will have to include kerosene/diesel future price sensitivity in pricing renewable based supply
Financial	Medium	Failure of the enterprise	Ensuring the financial assumptions of the enterprise are fair, by providing upfront support for business plan development
Financial	Medium	Inability to raise capital	The project will work with banks and investors to ensure that the enterprises are able to raise the capital
Financial	Medium	Interest of Anchors and Business customers, and investors	The project will engage anchors, banks investors to better understand their country-specific risk perceptions and

			address them. There is already a strong partnership with one of the telecom providers in Nepal, and others have also expressed interest to share the locations of their highest diesel-consuming towers for mapping purposes and invitation to investors to provide renewable energy solutions.

Annex 2 contains the map of a single district—called Rautahat-- in the Terai, which has been selected due to reported low electrification and high diesel usage by telecom towers and other businesses.

The table in Annex 2 following the Rautahat district map, provides data on the power supply and power source for rural telecom towers of a private mobile network operator company that has been partnering with us in constructing the ABC model. The company has shared this commercial data with us because it is interested in finding a private vendor for cheaper power supply through solar technology, which in itself is a strong validation of the proposed model.

The table therefore permits the required analysis and mapping exercise for identification of potential Anchor customers in relatively-highly populated areas of districts with low electrification. The table shows the geo-coordinates of high diesel consuming towers and corresponding population statistics (number of households) at the Village District Committee in which those towers are located. This table therefore gives an indication of potential A and C customer categories; wherever there are more C customers, we are assuming an associated higher percentage of Businesses (B customers) as well, to serve those consumers.

Annex 1: List of companies that are operating businesses similar to the 'A-B-C' model

India:

- OMC Power supplies telecom towers and local community needs through leasing charged appliances, including lighting, mobile phone charging and fans. (www.omcpower.com)
- Gram Power constructs mini-grids to deliver 24/7 grid-equivalent power to off-grid communities. (www.grampower.com)
- MeraGao Power provides household lighting and mobile phone charging services through connection of solar rooftop panels via a micro grid. (www.meragaopower.com)
- MindaNexGen provides household lighting. (www.mindanexgentech.com)
- Husk Power Systems (HPS) uses a biomass gasification based proprietary electricity generation process that generates electricity using 100% producer gas based system ("single fuel mode"). (www.huskpowersystems.com)
- Selco and Simpa networks are collaborating on a pay-as-you go financing mechanism for solar rooftop panels so that the consumer does not have to take a loan. (www.selco-india.com) and (www.simpanetworks.com)

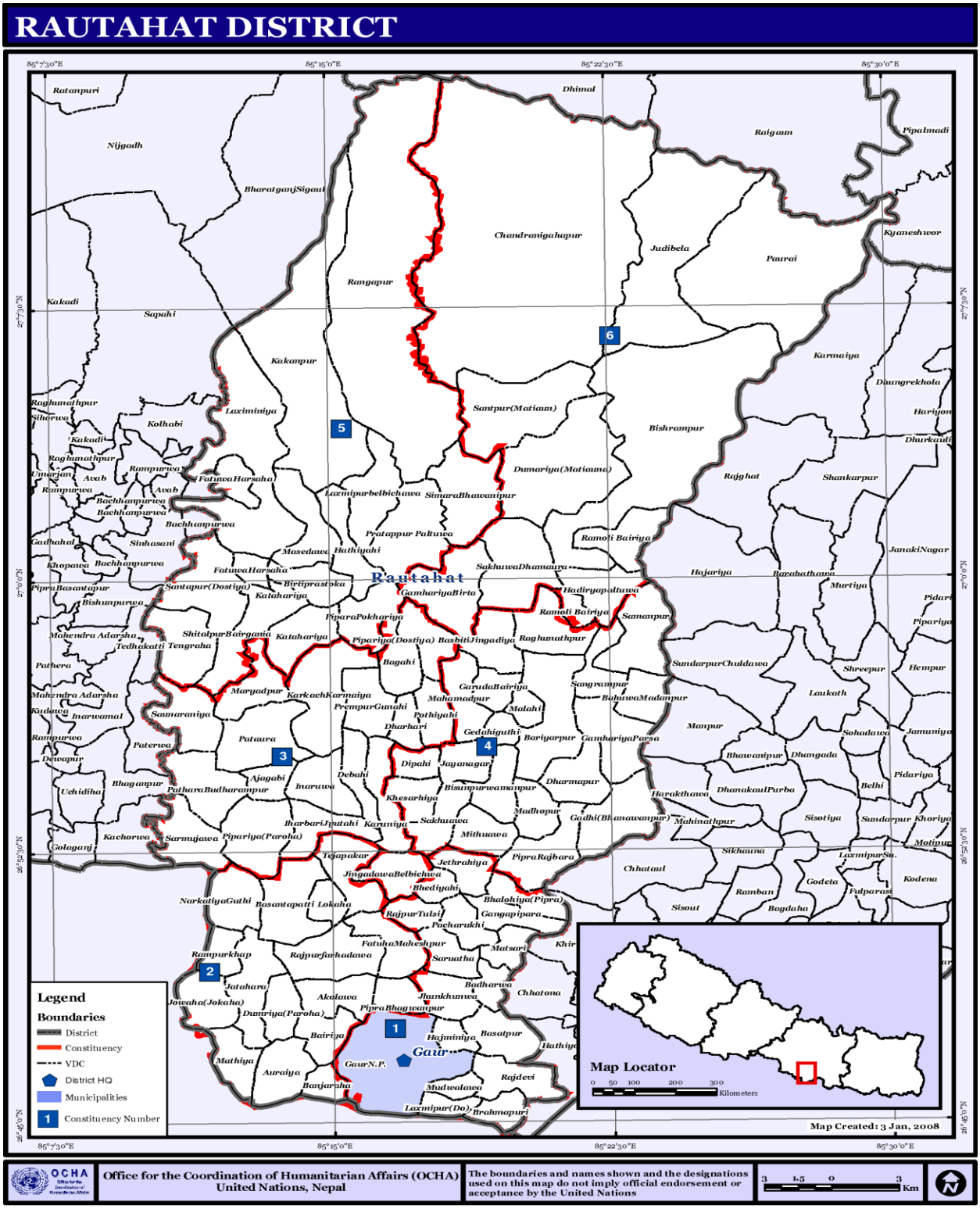
Africa:

- **M-KOPA** provides affordable solar-powered lighting and mobile charging to rural Kenyans on a pay-as-you-go basis, with payment via M-PESA. (www.m-kopa.com)
- **Mobisol** combines solar energy with innovative mobile technology and microcredit to provide high quality solar home systems to developing countries. (www.plugintheworld.com)
- **Sincronicity** Power is planning to specialize in becoming a third party power provider at the first 18 locations for which it has completed the market study. (www.youtube.com/watch?v=fkpmnEzpnL0)
- **Azuri** has developed – and manufactures – *Indigo*, a revolutionary solar power technology and business model that is transforming the opportunity in off-grid emerging markets. (azuri-technologies.com/about)

Other Country Examples:

- **Haiti**. Earthspark International partners with entrepreneurs and organizations to develop local businesses and country-scale supply chains for clean and efficient energy technologies. See (www.earthsparkinternational.org)
- **Nepal**. Gham Power's *Community Micro-grid* systems use 100% solar energy to supply core energy needs, with options to add low-power equipment for lighting, communication, and health care. Gham Power is a fully private sector solar integrator. (www.ghampower.com)

Annex 2: Potential "A" customers in the Rautahat District in the Terai



Capacity	Type	Longitude	Latitude	ID	Site Name	Diesel hrs last 5 months	Avg diesel hrs per day	Location	District	VDC	Total Households in VDC
15 KVA -72 DBM	Grid+DG	85.15589	26.91331	NAR469	Kuchurwa	370	12.3	SouthWest1	Bara	Bhaganpur	921
15 KVA 72 dbm	Grid+DG	85.18081	26.93428	NAR442	Sonarniya	352	11.7	SouthWest2	Rautahat	Saunaraniya	838
15 KVA -72 DBM	Grid+DG	85.25515	27.01923	NAR152	TRISHAKTI NAGAR	153	5.1	NorthWest1	Rautahat	Hathiyahi	759
10 KVA 67 dbm	Grid+DG	85.25711	27.04993	NAR062	Kanakpur	459	15.3	NorthWest2	Rautahat	Kakanpur	1619
3P-15 KVA	Grid+DG	85.3657	27.0154	NAR057	Ramauli	332	11.1	CentreEast1	Rautahat	Ramoli Bairiya	918
15 KVA -72 DBM	Grid+DG	85.34238	26.98986	NAR164	Raghunath Pur	301	10	CentreEast2	Rautahat	Raghunathpur	915
15 KVA 72 dbm	Grid+DG	85.38478	26.96684	NAR143	Samanpur	386	12.9	CentreEast3	Rautahat	Samanpur	1290