ABC Business Models for Off-Grid Energy Access Nepal

Country / Region: Nepal | Project Id: XSREN504A | Fund Name: SREP |

MDB : International Bank for Reconstruction and Development

<table>
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<tr>
<th>Comment Type</th>
<th>Commenter Name</th>
<th>Commenter Profile</th>
<th>Comment</th>
<th>Date</th>
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| Comment 1    | Simon Ratcliffe | United Kingdom    | Thanks you for this well written proposal. The UK has a number of questions related to the proposal and wonder whether the project team would mind answering them. These are:  
Q1) Regarding Sustainability, we note that the budget for this project is relatively small and that the transformational challenge is large. Is the World Bank confident that the project will get to the desired point, where the mini-grid sector can scale leading to the transformation envisaged? If so, what are the grounds for this confidence? What would happen it the project fails to create the transformation desired with the available funds?  
Q2) Regarding the alignment with the Economic, Social and Environmental Development Impact investment criteria, would it be possible to include Jobs Created, and disaggregated by gender as an Economic Benefit of the project? | Jun 29, 2017 |

| Response 1   | Joonkyung Seong | IBRD              | The objective of the project is to increase electricity delivery from renewable energy mini-grids in selected areas by mobilizing private energy service companies. Demonstrating financial viability of mini-grids (financed through combinations of subsidy from public sector, marginally commercial debt, and equity) and building confidence of commercial lenders in project-financing mini-grids is the essential change required for achieving the project’s objective. Currently, the mini-grid sector is subsidy-dominated and mini-grids are largely under community-ownership. This small operation envisages demonstrating viability of privately owned and operated mini-grids. The project’s approach is well aligned with the strategy of the government, which has recently removed policy barriers for private sector to own and operate mini-grids with limited public-sector support. Public sector support is contingent on private sector demonstrating the ability to arrange the gap financing through equity or debt investment. By de-risking debt investment from commercial lenders, this project supports mobilization of (marginally) commercial capital on project-finance basis for mini-grid development. To improve the revenue-stream of mini-grids, the project will improve the load factor (with Anchor, Business, Community model) of these renewable energy mini-grids. Similarly, interconnection with grid of existing mini-grids will improve their operational and commercial performance.  
The SREP grant will be a sustainable revolving fund in the AEPC’s Central Renewable Energy Fund (CREF) to mobilize loans to private energy service companies (ESCOs), so new mini-grid subprojects could be financed once the loans are paid back by the early borrowers. Given that SREP resources will be recycled after repayment, up to 20 years, the revolving fund will be able to support about 20 mini-grids over the same period. If the model is proven successful, the financing mechanism will attract more commercial capital from the Bank or other development partners to further scale up renewable-based mini-grids in Nepal.  
The grounds for confidence are: (i) government’s commitment to move from subsidy to credit driven sector; (ii) successful cases in Nepal, India, and Bangladesh of financially viable privately-owned mini-grids; (iii) availability of technology solutions such as affordable solar panels, power electronics, and pre-paid meters; (iv) advent of advanced mini-grids and their ability to deliver adequate, reliable, and quality power – as increasingly observed in developed countries; (iv) economic advantage of mini-grids compared to grid extension in remote and rural areas of Nepal; and (v) World Bank’s experience and expertise in renewable energy and energy access projects. The team has received support, funding, and expertise from Energy Sector Management Assistance Program for technical and economic due diligence of mini-grid technologies and subprojects, especially for pilot subprojects. Various Bank experts have been assigned to the project, such as rural electrification, financial | Jul 18, 2017 |

The Climate Investment Funds (CIF) provides 63 developing and middle income countries with urgently needed resources to mitigate and manage the challenges of climate change and reduce their greenhouse gas emissions.
technical assistance and project management. Therefore, the Bank team has confidence that the project will establish new private sector-led mini-grid sector. If the designed transformation does not work well, the Bank team will analyze the reasons and adjust the project. For example, terms of the loans to private sector can be revised based on demand and feedback and financing plans at subproject level can be adjusted. In the design of the project, there are several avenues to make incremental adjustments and test the viability of the subprojects based on risk-perception of the developers and lenders and requirements of the beneficiaries. The Bank team considers this project as potentially low risk and high return.

A2) In the subproject areas, one of the core customer groups are businesses. Availability of adequate, affordable, and reliable electricity is expected to increase productivity of commercial and (small) industrial customers and contribute to economic development and employment opportunities. However, the project is not directly financing end-use enterprises; and thus, jobs created are not solely attributable to the project. The team would prefer leaving 'jobs created' out of the results framework for monitoring.

We are grateful to the reviewer for highlighting this important issue. As part of project evaluation, the impact of subprojects on economic development and job creation should be assessed. Similar impact evaluations have been carried out in the past (for example: (i) Nepal, Govind; V. B Amatya. 2006. Understanding Rural Energy Programme and Poverty Reduction Linkage : An Empirical Study of Nepal. 1st ed. Lalitpur: Energy Sector Assistance Programme, Alternative Energy Promotion Centre; (ii) Banerjee, Sudeshna Ghosh; Singh, Avjeet; Samad, Hussain. 2011. Power and people: the benefits of renewable energy in Nepal. A World Bank study. Washington, DC: World Bank). The project team will learn from previous studies and evaluate impacts of the project's slightly larger mini-grids on end-use enterprises, economic development, and job creation.

Response 2 Simon Ratcliffe United Kingdom

Thanks for submitting the request for an extension we are still slightly unclear around the rationale and reasons behind doing this;

• We are slightly unclear about the change in project design and how will this hope to “increase liquidity to support commercial banks”? at what point was this decided to be made as a change and was there new evidence that suggested this was the case?
• Could more information and rationale be provided for the changes to the financial intermediary mechanism, the changes to where the debt financing of subprojects interconnecting existing mini-grids with the utility grid comes under component wise and the change to selective and partial risk-mitigation instead of a guarantee fund?
• Could we also have some further information to how these changes may affect the results of the programme and what these are?

Response 3 Monyl Nefer Toga Makang IBRD

#1. Change in project design and how will this hope to “increase liquidity support to commercial banks”? at what point was this decided to be made as a change and was there new evidence that suggested this was the case?
The decision to change the project design was based several rounds of consultations with the implementing agency (AEPCC), the Government of Nepal (GoN) and commercial banks. The revised design is better aligned with GoN's decision to open up the mini-grid market to private developers after a decade of attempting to develop them through community ownership approaches. Due to the significant performance risk of small scale of community owned projects, GoN elected to put more emphasis on the introduction of private sector management techniques and efficiency by enabling access by private developers eligible capital grants and loans. Commercial banks cited unfamiliarity with the sector, high risk perception and insufficient track record as barriers to commit sufficient funding to the sector. The revised design mitigates this financing risk more effectively and supports GoN's effort to open the market to private developers by providing long term financing (rather than liquidity support) to commercial banks which will provide debt financing to mini-grid private sector developers (also known as Energy Service Companies -- ESCOs).

#2. More information on rationale for changes to the financial intermediary mechanism
The main rationale for the changes to the financial intermediary mechanism was to foster a better alignment with GoN's objective to provide financing to limited number of ESCOs, with a view to demonstrate the viability of the development of RE mini-grids and interconnections systems by private sector companies which in turn, would contribute to reducing the high risk perception from commercial banks (especially for interconnection projects ).

It is hoped that outcomes achieved through this project will provide a demonstration of the viability of such business model and ultimately increase commercial banks' appetite to lend to the sector. Given the novelty of this approach and its potential
impact on the creation of a new market for commercial banks and private
developers, a larger allocation of the funding has been allocated to project
management and technical assistance, compared to the previous design, to provide
adequate support the main stakeholders (including AEPC, commercial banks and
ESCOs) to maximize the achievement of the project’s development outcome.

#3 Changes to selective and partial risk-mitigation instead of guarantee fund
Given the relatively small transactions size (individual subproject total costs ranging
from approximately US$60,000 to US$1.2 million), a partial risk mitigation within this
debt financing structure was deemed to be more efficient and less transaction-
intensive than the creation a separate guarantee facility. The partial-risk mitigation
(for specific risks that lie outside the control of the sub-borrower, specifically force
majeure events and grid availability which render the mini-grid business non-viable
and unsustainable) is provided on sub-loans for all three sub-project types, which
expands coverage compared to previous offerings that covered only one type of
sub-project (grid interconnection). This Project will support three types of sub-
projects: (i) construction of new mini-grid sub-projects; (ii) rehabilitation of existing
but under-performing mini-grid sub-projects; and (iii) connection of mini-grids to the
utility’s grid. Long term funding will be available to commercial banks to support
debt financing of the three types of sub-projects.

<table>
<thead>
<tr>
<th>S R E P approved allocation</th>
<th>Proposed allocation</th>
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<tbody>
<tr>
<td><strong>Components</strong></td>
<td><strong>New allocation</strong></td>
</tr>
<tr>
<td><strong>1. Support to RE mini-grid projects</strong></td>
<td><strong>$4.6m</strong></td>
</tr>
<tr>
<td><strong>Project Management</strong></td>
<td><strong>$0.46m</strong></td>
</tr>
<tr>
<td><strong>Components</strong></td>
<td><strong>New allocation</strong></td>
</tr>
<tr>
<td><strong>1. Credit Facility Support to RE mini-grid subprojects</strong></td>
<td><strong>$5.61m</strong></td>
</tr>
<tr>
<td><strong>Technical assistance to the mini-grid sector, ESCO and partner</strong></td>
<td><strong>$2m</strong></td>
</tr>
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The Climate Investment Funds (CIF) provides 63 developing and middle income countries with urgently needed resources to mitigate and manage the challenges of climate change and reduce their greenhouse gas emissions.

4. Changes to where the debt financing of sub-projects interconnecting existing mini-grids with the utility grid comes under component-wise (see table below)

5. Further information to how these changes may affect the results of the program and what these are?

The changes will strengthen the results and focus of the Project. The table below shows the changes in targets of key project indicators. The key changes reflect the Project’s sharper focus on sub-projects that will provide new electricity service. In the previous design, it was assumed that 60 existing mini-grid sub-projects would seek loans for interconnection equipment to the network. In the revised design and results framework, the Project team and implementing agency expect around nine interconnection sub-projects. The table below presents a comparison between the previous target-values and those envisaged under the revised project design.

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Target (old)</th>
<th>Target (new)</th>
<th>Comment</th>
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<tbody>
<tr>
<td>Generation capacity of energy constructed or rehabilitated (MegaWatt)</td>
<td>2.10</td>
<td>3.80</td>
<td>In the previous design, 1.5MW of 'new mini-grid subproject' class were expected. In the current, updated Project design, 3MW are expected in this subproject class.</td>
</tr>
<tr>
<td>Number of households provided with new or improved electricity service</td>
<td>20,400</td>
<td>27,000</td>
<td>In the updated Project design, more subprojects are expected to provide &quot;new electricity service&quot;; and fewer interconnect...</td>
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</tbody>
</table>
subprojects are expected to be in the "improved electricity service" subproject class. Therefore, more households are expected to receive electricity services.

In the current design more new subprojects and fewer interconnections are expected to seek loans. Due to the subsidy-debt-equity structure of the new subprojects, new subprojects will mobilize less private capital.

Private capital mobilized by the Project (Old: Private capital mobilized to renewable energy mini-grids) (US$)

5,280,000
(Out of this interconnection subprojects were expected to mobilize US$3,600,000)

3,363,000

Thank you for the comprehensive answers to our queries. These have raised a number of further questions. These are:

1. From the first table provided in the answer to Question 3 you have split down the cost between the components. The text seem to suggest more technical assistance would be required for these new proposed changes, however it seems as though the funding for TA has gone from $2m to $0.46, is there more TA now in the components of support to RE Mini-grid projects and interconnections?

2. From the table in answer 5 it is suggested more capacity will be rehabilitated or installed, however it also suggests there will be less mobilised private leverage... from this we assume there is overall less funding for the project? If so how does this stack with the ability to improve the amount of capacity? How does the change to this project enable this to happen and what analysis has been undertaken to
Please find below the responses to additional questions.

#1 - Technical assistance

In the current project design, the resources required for TA and project management support for the Project has been combined as the part of the component 2 (Technical assistance to the mini-grid sector, ESCOs and partner banks and project management). In the original design, approximately USD 0.5 million and 0.3 million had been allocated for TA support for Component 1 and 2 respectively. This together with the project management support of USD 0.46 in the component 3 amounted the total of USD 1.26 million in the form of TA and project management support.

In the original design, under the component 1 and 2, the TA support was mainly envisioned for training, advisory support, project studies & preparation, project development etc. The training and advisory support was mostly targeted for AEPC, ESCOs, and local stakeholders in the field. However, in the current design, based on the discussion with the stakeholders, in addition to the support envisioned in the original design, the team was also requested to include support: i) to the Partner Banks for them to be able to select and finance sub-projects complying with the Project’s eligibility, safeguards, and fiduciary requirement and ii) for sub-project supervision by independent technical specialists in order to ensure that the sub-projects are being implemented/constructed based on the agreed design, standards, and guidelines. These added requirements increased the total cost for Technical Assistance and Project Management cost to approximately USD 2 million in the proposed design (under component 2).

#2. More capacity rehabilitated or installed and less private financing mobilized

There are two underlying reasons for decrease in the estimate for private capital mobilized.

a. Instead of 60 interconnection sub-projects supported by partial risk guarantee, the new design envisages 9 interconnection sub-projects supported by sub-project loans.

b. In guarantee mechanism, both debt and equity were counted as private capital leveraged. Contrary to that, in the new design, where sub-project loans are mobilized through financial intermediaries, only equity investment from private sector are counted as private capital leveraged.

In the original project design, about 60 interconnection sub-projects were estimated to mobilize approximately USD 3.6 million in private capital -- both debt and equity part. The Project was designed to only support the partial risk guarantee for interconnection sub-projects. The remaining capital USD 1.68 (5.28 million minus 3.6 million) million was expected to be mobilized as equity for 7 new mini-grid sub-projects. However, based on the discussion with the stakeholders during the project preparation, it was suggested that due to ambiguity on the existing interconnection policy and guidelines, the appetite among the private sector to undertake the interconnection project is low. As of now, only about 2 interconnection schemes have been implemented in the country. Thus, instead of interconnection sub-projects,ESCOs are more interested in implementing mini-grid sub-projects. Hence, in the current design the numbers of mini-grid sub-projects and interconnection sub-projects have changed. In the current design it is envisaged that 19 mini-grid sub-projects will be implemented (including 4 sub-projects that will be rehabilitated) and only 9 interconnection sub-projects will be implemented. It is assumed that, these interconnection sub-projects will be 70 percent debt financed, with funds mobilized by the Project, while remaining 30 percent will be equity. Thus in the current design, the private funding for mini-grid projects has increased (USD 3.12 million – in the form of equity) while the funding for interconnection sub-projects has reduced (approximately to 0.24 million – also in the form of equity).

#3 Impact on GHG emission savings

The total Greenhouse gas emission reduction or avoided estimation is as follows:

- Original design: 16226 tons/year
- Current design: approx. 20155 tons/year – of these 9225 tons/year by interconnection sub-projects and 10930 tons/year by mini grids sub-projects