

CLIMATE INVESTMENT FUNDS

May 24, 2017

[[APPROVAL BY MAIL]: HAITI: RENEWABLE ENERGY AND ACCESS FOR ALL (WORLD BANK) (SREP) (XSREHT047A) AND HAITI: RENEWABLE ENERGY FOR THE METROPOLITAN AREA (WORLD BANK) (SREP) (XSREHT050A)

RESPONSE FROM WORLD BANK TO COMMENTS RECEIVED FROM SWITZERLAND

Thank you for your follow up questions. Kindly find below our answers.

I. Re. Answer to 2.b: From your explanation, we understand that Project I will be limited to a demonstration project in a still to be selected isolated grid from EDH with a capacity of 5 MW (without the reinstatement of the \$1.38 million reduction of SREP contribution) which should demonstrate to EDH that adding solar PV on its grids is possible and reduce private sector risks for replication.

a.

(Q) Is our understanding correct?

(A) The remaining funding portion of this project is \$1.5 million (the \$1.38 million relates to the RE and Access for All project).

The understanding is partially correct. The Project I will be implemented in two phases. Phase 1 will indeed be a public sector demonstration project in one isolated EdH grid. Phase 2 will then expand investment to 1-2 additional isolated EdH grids, attempting to attract private sector investment. Thus, Phase 2 is intended to be the first element of replication, with increased private sector participation, if feasible at that point. We hope that the demonstration impact of Phase 1 and technical assistance work carried out in parallel will open way to private sector participation. Haiti, however, is a fragile country, and in addition prone to natural disasters. Conditions in place 2 years from now are difficult to predict. In addition, private sector investors might install a much higher amount of MWp per project investment (in case of leverage), and will also reserve the right to optimize (ex ante) system design based on their own weight of financial KPI (and WACC), so that the final design may vary with investor (but within good practice limits defined before), just as it will vary with site and final (feasibility-stage) data on exact numbers of users and state of power grid. Therefore, because the extent of private sector participation (and the final technical design) is unknown, the exact "optimal" amount of MWp expected for Project I has an unusually high range uncertainty (as reflected by the many scenarios we have modelled with Homer and other tools), and accordingly we have set the KPI to be delivered by Project 1 as a range: 5-12MW. 5MWp is the lowest which we are able to promise as the "bare minimum", which assumes (i) only public sector investment and (ii) a high RE penetration case (which is more costly in terms of \$/Wp), aimed at demonstrating the dual benefit of reducing diesel fuel and improving service on the EDH grid - and assuming the reduced funding (by \$1.5 million).

b.

(C) The overall cost of \$15.5 million seems very high for a solar PV plant with 5 MW installed capacity, even with battery storage. Please provide details on the projected budget for this plant.

(A) The overall cost corresponding to the 5 MWp worst case scenario is indeed conservative, for the reasons explained in our answer to 1.a. In addition, (i) the actual mark-up of that EPC contractors will apply for the first pilot projects in Haiti is unknown (the soft costs for small systems even in some US States, for example, are more than twice as high as in Germany); (ii) the sites are remote; (iii) the exact state of the local grid is not 100% known, and (iv) the final site selected may be a high penetration site, with the optimal selection requiring sophisticated metering and dispatch solution as well as additional investments in DSM – which would drive investment cost well above standard international benchmarks. Finally, the number of Tier 5 users in situ will also determine Capex. This being said, Capex are in line with recent isolated grids in several other projects (e.g. GIZ). A typical worst case Capex including soft cost related to the 5 MWp minimum target could for example be (out of many, see Economic Analysis tables): (i) \$12.5M for a 5 MW solar plant including soft cost

and basic balance-of-system (so, 2.5 \$/Wp instead of about 1\$/Wp Capex in the EU) + (ii) \$3M for the battery and dispatch automatization needed in case this is a “high share” site.

c.

(Q) (also re. to answer to 2c) Please explain how the private sector risk for replication will be reduced by that project.

(A) The risk will be reduced in several ways. For now, the private sector faces a multitude of risks which are constraining their interest to invest in Haiti grid-connected RE sector. First is the technical risk – Haiti grids are old and weak and there is a perceived risk whether they will be able to absorb renewable energy generated. This risk is addressed through the demonstration project, which will show that adequate technical design – right sizing of the plant and battery and targeted grid improvements – will enable the absorption of the RE generated. The second risk is related to the utility’s interest to support RE investments (again to be mitigated by the demonstration project). The third is related to off-taker risk, which will be partially mitigated by the demonstration project (piloting of administrative isolation of the grid from the rest of EDH and an escrow account), and partially by the guarantee, which the SREP funds will be used for to mobilize private sector investment for Phase II. In addition, the TA component will be used to build supportive enabling framework during Phase I, further reducing risks of private sector investments in Phase II and beyond.

II.

Re. Answer to 2.d: Sorry, the question got truncated. It reads: “ What is the absorption capacity of the EDH isolated grid for a scaling up of RE such as the one foreseen beyond the SREP financed project?

(A) The exact technical absorption capacity for average and peak feed-in of variable Renewables (vRE - mainly PV and wind) - cum project as well as post project – differs for each of the 9 isolated EDH grids, and depends on to the detailed system design chosen in implementation stage. However, this is no additional risk to post project market growth: while the absorption capacity maximum absorption capacity for higher shares of variable Renewables (vRE - mainly PV and wind) of weak power grids can indeed be an issue in general terms, so that annual energy amounts above 30% can be hard to achieve on national level today without significant additional investment in dispatch and transmission (because system stability and service quality shall not be allowed to decrease with added VRE) - especially when the base case has only very few thermal generators, which makes smart dispatch of volatile RE more difficult (for illustration, think of in the extreme case of only one 100 kWp diesel generator, which – on top of the obvious spinning reserve issue in case of clouds / wind dips- needs at least 60% part load or so for satisfactory heat rates, so that vRE could never be more than 40 kWp or 40% of capacity (that is, about 10% of annual energy) in this case), this general variable RE issue has already been reflected in the local and national market growth scenarios for post-project variable RE scale-up which form the basis for the corresponding SREP indicators. In this context, the following main issues are of importance:

(i) On national level, post-project scale-up will include replication of the component 1 subprojects in more of the isolated EdH projects, including Port au Prince, which will by then have a high absorption capacity due to the fully operational Peligre hydropower plant.

(ii) In addition, due to the fast falling Capex of Li-Ion storage systems, also the component 1 subprojects will allow for much higher PV shares (wind is only an option for Port au Prince and in North-West, which are not component 1 pilots) at project end, because the batteries solve the spinning reserve issue as well as the black start and diesel part load issues. Therefore, by project end, much higher PV shares are easily doable.

(iii) Finally, all options for the short list candidates for component 1 have already been pre-sized by us with relatively conservative PV sizes (up to twice the high share could in theory be possible even at 2017 battery capex) so that there is ample leeway for more aggressive investment in PV and batteries (or even smarter dispatch) post project. As the short list grids are relatively small, so that local load control and investment in improved dispatch can be done easier than in Port au Prince, even RE shares above 95% energy (that is, around 400% capacity) should be easily feasible for most by project end.

III. Re. Answer to 3c: (C) We understand from your answer that you give priority to (improved) energy access over increased electricity generation from RE. We do not object to this given the particular situation of Haiti but would like to remind that SREP is primarily about scaling-up renewable energy, not energy access.

(A) Thank you for the comment. This is well noted. We also aim at scaling up renewable energy, but adopting a longer-term perspective. Renewable energy is currently not exploited in Haiti. This will not change, unless stronger stakeholder support for RE is built, which is best achieved by demonstrating its benefits – including in terms of improving energy access. Therefore, the prioritized investments are not those that lead to the highest RE penetration in the short term (within the SREP project), but rather the largest replication potential and likelihood of success in the long term (beyond SREP funding).

III. Re. Response to 4: (C) We did object to the split-up of project applications in the framework of the updated SREP Pipeline Management Policy and we consequently also object to the proposed reinstatements of \$1.38 million for Project I and \$1.5 million for Project II. In the latter case, we would also have trouble to support a reallocation of a grant component from an IFC project which was clearly intended to motivate private sector investments to an IBRD project which is not (at least in the proposed configuration). Besides, the IFC project to which this grant pertains is not part of the sealed pipeline and thus has no priority on other projects in the reserve pipeline.

(A) The concern is well noted. We wish to advise that the reduced amounts are \$1.5 million for project I (RE for metropolitan area) and \$1.38 million for project II (RE and access for all project).

The amount for which reinstatement is sought in June is \$1.38 million. World Bank will be guided by the final decision of the SREP sub-committee in that regard.

We would like to re-iterate the fact that reallocation of the \$1.5 million resulted from a thorough discussion and agreement between the World Bank and IFC, based on current investment opportunities. We agree that this funding allocation is not in the sealed pipeline and does not have priority over other projects on the reserve list. Should the MDB Committee reach an agreement to include it in the sealed pipeline in June and subject to resource availability, the World Bank would like to consider submitting a new funding request equivalent to that amount.

Also, we would like to reiterate that the re-allocation of the \$1.5 million from IFC to the World Bank is consistent with the endorsed IP, which has allocated US\$21-23 to the World Bank and US\$7-9 to IFC.

Furthermore, this amount (if available and approved) will be added to Phase I of Project I, which aims to leverage private sector investment, if feasible.