

1. Title of the investment plan: SREP Investment Plan for Kenya
2. Program under the SCF: Scaling-Up Renewable Energy
3. Name of the reviewer: Lennart Bangens
4. Date of submission: June 3rd, 2011
5. Part I: General criteria

The Kenya SREP investment proposal is well written and captures rationale, problem areas, key intervention areas in an adequate way. The proposal boils down to three projects selected for funding and implementation; Geothermal, hybrid mini-grids, and SWH systems. In the evaluation process improved cook stoves and small hydro projects scored far less than the three selected projects. One of the key objectives of the SCF is to provide incentives for increased diffusion (short term) and at the same time transforming the societies towards preserving and building climate resilient eco systems (long term). The challenge for any decision maker in the targeted countries is to find a development path that allows for GDP growth, reduction of poverty, etc and at the same time does not contribute to climate change. The SERP in particular stresses the need to bring the private sector on board for any action proposed. Renewable energy must – in the long run – become a financially viable option in order to attract private sector investment.

Main issues: 1) the country's capacity to drive the uptake of renewable energy in a sustainable way. There are few if any country that can build sustainable RE sectors solely based on domestic resources, which is not a goal in itself. The challenge is rather to strike a balance between technology transfer (imports) and locally available resources to enable a swift adoption and adaptation of technologies. E.g. the Government of Kenya's decision to establish the GDC draw from the vision to lessen the dependence on foreign firms but also to have a better control of the development process and speeding up project implementation. Hence, the capacity of GDC is and will be critical for the roll out of geothermal plants in Kenya. However, GDC's capacity is assumed rather than discussed in the proposal.

2) Rationale for and use of SREP funding: SREP funding is mainly complementary and additive to already ongoing efforts. However, the link to existing activities should have been explained more to understand the synergy and role of SREP fund in reaching targets. The actual use of SREP funds is actually not well presented. E.g. for mini grids it is found in table 3 on financing that USD 9 million are earmarked for –mini grid' whereas in the text capacity building and preparatory work are only mentioned. SWH systems may seem a top priority for cutting down your electricity bill but diffusion has been slow in Kenya. A smart financing scheme may attract certain market segments but it all depends on how attractive the deal is. Further, how the USD 10 million will be used for exactly what activities is not obvious in the IP. The SREP geothermal funding focuses on drilling and power plant construction. The reason given is to shorten time from initial preparation to production of electricity. The role of SREP and other donors are to fill the GoK financing gap. That GoK decision to establish the GDC will minimize commercial risk but not the technical risk per se.

3) Risk analysis: Since most SREP funded activities are not 'stand-alone', program outcome depends significantly on the delivery of other stakeholders. We may use GDC as an example. The reasons for slow gestation periods in the geothermal sector are not discussed at length. The assumption made is that if GDC does the initial stages such as feasibility, drilling, etc the private sector will be more interested in investing and building the actual power plant. The GDC is a government owned agency which is quite new in the geo market and still heavily dependent on foreign expertise such as Chinese expatriates. Likewise for the SWH program, the success relies on how the SWH private sector responds and also the users' view of the financing scheme (until the new law forces SWH procurement). Hence, for all three selected projects there is need to conduct thorough risk analyses and what if scenarios.

4) Private sector's interest and willingness to invest. One of key tenets of the SCF is the engagement of the private sector. The major weakness of the IP is how this should be organized. An illustration from geothermal: Normally, high capital costs for constructing the power plant and the associated electricity tariff required remain core problems. Uncertainty in the PPAs also contribute to investors' (un) willingness to seize the business opportunity. The long-term financial capacity of Kenyan Power and Lighting Company (KPLC) to settle the bills from the power plant must be sustained and payments honored. The pricing of steam and electricity may turn out to be the main obstacle to the development of geothermal energy in Kenya. The price (read feed in tariff) needs to be competitive with other energy alternatives, and at the same time offer the contractor or producer an attractive rate of return.

5) Poverty reduction strategies not clear for geothermal and SWH systems. There is a more straight forward link in building hybrid mini grids. Will a better supply of electricity necessarily spill over to the poor? Geothermal energy is a base for economic development – like any source of electricity – but the role of electricity in triggering economic growth goes beyond this particular program.

6) The selection of projects: The IP simply states, "This program proposes the development of solar, wind, hydro, biomass, geothermal and transmission line projects." How these five areas were chosen is not disclosed; in a consultative manner with key stakeholders including private sector? These are five highly relevant projects but the IP should list the criteria for this initial selection. Out of these, three were selected according to seven criteria. The criteria and assessment seems sound though some of the ratings appear arbitrary e.g. mini grids impact on base load is viewed as 'high', potential of small hydro for new beneficiaries is low, etc.

7) M&E etc: Some of the indicators are outside the scope of SREP funding (but within the overall program) but I interpreted that IP focuses on the specific SREP funding of USD 85 million not the USD 928 million.

8) Presentation of SREP program vs SREP funding: The IP must be very transparent and pedagogic in presenting the overall program (928 million) vs the USD 85 million comprising SREP funds. There is confusion in some sections that solely bring up the SREP funded project components whereas other sections, e.g. results framework include the overall program. There should be a specific results framework for the three SREP projects. E.g. the number of new connections is not controlled under the SREP funding, similarly diffusion of lesson learned, enabling environment, are not explicitly SREP funded activities (but under the SREP program).

9) From a cost effectiveness and technical point of view, both SWH and Geothermal are appropriate investments from a societal perspective. Mini grids depend on the selected energy source. Equipping the grids with 150kW PV systems at commercial conditions will surely lead to extremely high tariffs. However, interpreting the IP the investment in the equipment is a sunk cost covered by grant funds. Are the tariffs expected to contribute to paying back the capital cost? The IP only discusses O&M costs that for sure will go down but it is not sustainable as long as depreciation and capital costs are not included in the LCC.

Part II: compliance with the investment criteria or business model of the relevant program

General comment on IP: limited description of the subcomponents makes it difficult to evaluate whether the IP will comply with the criteria or not.

1. Catalyze increased investments in renewable energy in total investment: It is not clear what investments will act as a catalyst to other investors, or vice versa. It is however evident that the MDB and other development partners are willing to invest in Kenya's green path. To conclude to what extent the SREP funding is the trigger for additional funding is maybe not a critical issue. What is more worrying is the relatively (projected) minor share of private sector engagement. The private sector can for good reasons not guarantee its co-funding which depends on future business opportunities. For SREP as a whole private

sector funding is estimated to around 15 per cent which in the end comes down to the number of successful IPPs in geothermal sector and the growth of the SWH market.

2. Enabling environment: The enabling environment is not explicitly elaborated on in the document. Though the results framework defines it in two dimensions; i) adoption of low carbon development plans, ii) Enactment of policies and regulations for RE. First, an enabling environment involves more than the 'policy environment' and should address e.g. the rules for private sector engagement, access to knowledge, R&D, etc. Secondly, the SERP does not fund any of these dimensions so there are two indicators out of the control of the program. Thirdly, there are activities that promotes the enabling environment such as the financing scheme under the SWH program, capacity building of mini grid system and SWH installation companies that are not being measured in the results framework.

3. Increase energy access: The SERP directly expands access in the mini grid project but for Geothermal and SWH the link to access is indirect. Geothermal is basically a generation project as there is activities that increase access. These fall under other GoK programs. Indirectly, SREP can claim that the expanded RE generation will enable further expansion of the grid. The main obstacle for poor households; i.e. the high connection fee is not addressed.

4. Implementation capacity: Who will host and own the SREP? The organizational design of the program is not presented at all. It is stated in the IP that the MDB will jointly manage the SREP which must mean that the MDB will prepare the documents for approval but the actual implementation and ownership is handed over to Kenya. The counterpart is probably MoE whose main responsibility is policy and not implementation. First, to straighten out, who owns the program? Second, do this or these agencies have the required capacity? The SCF will surely need some answers on these questions. Thirdly, as I will come back to later are the models for engaging the private sector. For all three subcomponents this must be explained more in detail as it is simply stated that the 'private sector will be encouraged to participate'. But how do you provide incentives and encourage private companies to build RE markets? There are no models in the IP.

5. Improve the long-term economic viability of the renewable energy sector: The long term viability hinges on the creation of sound energy markets in which private sector companies play a dominant role though guided by government policy and regulations. There is no thorough analysis and way forward to how the private sector should work in these projects but more importantly how private sector should continue investing in the energy sector with diminishing foreign aid. Is there a post-program, non-aid scenario where the private sector is the engine of growth? For PV there is already a case for pursuing a market-driven models as Kenya is one of the most successful PV markets in the world. The emerging wind and SWH markets could soon follow suit with the proper incentives. For Geothermal the GoK has decided to intervene in order to facilitate for private investment in power generation only. The IP lacks substantial detailed information and approaches on how GoK (plus the intl donor community) should team up with private companies.

6. Transformative impact: The real challenge is to find a model for large-scale replication that depends less on foreign grants or loans. Transformative impact comprises building an energy sector that is sustainable on its own with decreasing subsidies as a driver being replaced by market opportunities. The transformative impact as defined in the IP comprises only whether RE is increasing or not. The transformative impact of RE on economic development and poverty reduction are not considered. Though the SREP does contribute to a

transformation as such but whether this transformation is self-sustained in the post program period is not focused on.

Part III. Recommendations and additional comments

1. The Kenya SREP is a step forward to building a greener energy system. The three selected components will surely contribute to accelerate the generation and use of electricity from renewable energy in Kenya. The main weakness of the IP comprises the generality and use of anticipated outcomes and lack of specific information on how to implement in a way that overcomes existent barriers and challenges. Hence, problems that the investment plan claims to address are not adequately described and discussed. This stems from an overly 'what to do' character of the IP providing less insights on how to implement and more importantly who is going to do it. This is in particular obvious for how the cooperation with private sector should be designed.

2. The role of SREP: Although the SREP is only one program out of several in the identified project areas, the investment plan must convincingly present how (and who) these issues will be addressed. More specific issues will be discussed below.:

i) Diffusion and investment in renewable has been slow in Kenya for decades so how could the SREP succeed where other programs have failed? There is very little risk analysis in the document.

ii) The views and 'readiness' of private sectors not clear. The incentives for private sector involvement not properly discussed. There has to be renewable energy targets for the private sector to act on.

iii) Feed-in tariffs and setting the right energy price are key to private investment to allow for a return on investment. Further, the contracts, PPAs for private IPPs are as important for sustainability. Secondly, Presenting a clear road map for private investors would also contribute to an investment climate that goes beyond a particular project.

3. The national capacity in Kenya should be analyzed in terms of innovation systems that would provide the proper platform for Kenya to take charge of the development in the renewable energy sectors selected. Academia, R&D institutes, training institutions, private sector, etc must all become part of a concerted and purposive action to transform the energy system. Rather than national capacity it is more pertinent to evaluate the overall capacity of the national innovation system to sustain a 'green' and climate change resilient development path. Local R&D capabilities are instrumental to support the transformation towards a 'greener' society.

4. The SREP approach: The methodology for designing, preparing, and implementing project activities should be as consultative and interactive with key stakeholder as possible. The long-term impact of projects will in the end increasingly draw on how things are done rather than what is done. E.g. the private sector must be on board early in the process, not just for installing equipment and O&M. To use the private sector for advisory services in early preparatory stages will add value to design but also lessons learned for participating firms.

5. The link and synergy to other projects should be highlighted such as AFD's mini grid project, support to GDC, credit lines for RE, etc. The IFC's funded advisory services on barriers for the private sector is another example.

6. Specific design and implementation issues for the three projects:

i) Mini grids: The organization of the mini grids is lacking in the project description. Ownership and billing in the mini grids depends on the business model; community-, utility, or private operator based. It sounds like a donor-driven model – with heavily subsidized mini grids - where the private sector comes in marginally in later stages. In many countries, the tariffs are set on case-by-case basis for isolated mini grids.

Energy price for the renewables in relation to the required investment, Does the FiT apply to mini grids? If so, US cents 20 are probably not enough for PV. Mini grids are prone to fail unless ownership, O&M, billing systems, etc are transparent and well organized.

Cost of PV and wind vs diesel generators. Are subsidies necessary to fuel the transition?

ii) SWH systems: The proposed financing mechanism is a very delicate system in the sense that it does not address the prevalent attitude to bank loans. There must be a link between e.g. KPLC and the user on how set up repayments. Repayment can be done thru the electricity bill as in the case of Tunisia (This model is right now used in Rwanda for a SWH program , SolaRwanda). The proposed model does not address the handling of defaulters and make sure payments are done promptly. No payment no electricity! Unless there is a safety mechanism in the financing scheme, very few local banks would be interested. Further, this scheme doesn't have a subsidy component for the SWH system. The Rwanda program includes a voucher scheme. How will the anticipated USD 47 million earmarked as financing gap/private sector be managed?

The market is fairly well developed with 5-6 larger suppliers that import most system components. Can these 5-6 suppliers handle a 100% growth rate? Are there any supplier credits in the design or this is left to the importers? Most probably the majority of importers do not have the required liquidity to import more than one container at a time

The market so far has been for the wealthy segments of society and private and tourist lodges, missions, etc. Hence, in the middle class and poor segments of society the uptake is extremely low. To reach wider segments to program must – at least initially – offer a financially attractive loan/credit scheme for users as well as suppliers. To rely on the new regulations will take time which once in place depends on how strict the enforcement will be to measure consumption and force the house owner to install SWH system. From a pure technical viewpoint it is not easy to measure hot water consumption as the water meter measures total consumption of cold water. This means, hot water will be estimated based on total consumption.

iii) Geothermal: FiT cap is set at US cent 8.5 per Kwh which is marginally higher than the production cost. However, the cost presented in the IP of US c 7/kWh includes all stages before plant installation which means that for an IPP only covering the plant (surface equipment) will land at a much lower cost. Hence, having set the FiT may seem a bit rushed before having the total cost picture. E.g. currently the Indonesian utility PLN is trying to renegotiate the FiT down to US c 4/kWh. The challenge is to determine a FiT which favors KPLC as well as the IPP. Hence the PPAs and contracts crucial for private sector engagement and these must be flexible to cater for conditions that will have an impact on the cost such as steam characteristics (e.g. temperature and chemistry), depth of well.

7. Project organization: A specific unit must be established within MoE for overseeing the implementation of the SREP program. Each project will need at least a coordinator, procurement staff, and additional project implementers. This unit will work closely with other stakeholders such as KPLC, GDC, REA, private sector.