

Responses to the SREP Sub-Committee

Geothermal Sector Development Project (GSDP) SREP (World Bank)

1. We do not see an Independent Technical Review of this Project Proposal as is required by the SREP procedures. We would appreciate if this could be forwarded for our consideration in this process.

WB: There is no requirement from SREP to submit independent technical reviews for individual projects; it only applies to country investment plans. The WB, as part of its usual due diligence, reviewed this project in a Decision Meeting; where the project was reviewed by WB technical specialists outside of the Africa Region, on its technical design and scope, financial and economic feasibility, environmental and social safeguards, financial management, and other fiduciary aspects.

2. It appears that in spite of SREP's design principle to encourage private sector investments and recent shifts by the Government of Ethiopia in the structure of the market - this proposal excludes the possibility of private investment. In the context of the SREP objectives and the sector shift already in progress – why is it proposed that the SREP funds are used for an entirely donor-funded, state-delivered project? Might this in fact have a negative impact on market perception and investment?

WB: Consistent to the SREP Sub-Committee approved *Investment Plan for Ethiopia*, the Aluto project, first significant geothermal project in Ethiopia, is designed as a public sector financed project. The purpose of SREP support to develop the geothermal and wind projects is to show the technical and financial viability of long-term geothermal and wind power development in the country, thus opening the way for the sustainable improvement of the energy mix of the national grid by reducing over-dependence on hydro power, and consequently achieving a degree of climate resilience for the national power system. The goal of using SREP funding for grid connected renewable energy projects is to unlock the future potential of private sector investment in the sector which will have long-term benefits for reducing energy poverty in Ethiopia. The GoE has the intention of making this field a training center to enhance the national capacity to execute similar projects in other sites of the country by both the public and the private sector. This will add value to the local components of similar projects in the future and thus reduce costs and increase viability of geothermal projects in the country. Please also find attached the Q&A from the Investment Plan review stage which also addresses this point.

3. The PAD mentions in several places that the tariff is not at economic levels and that this should be reconsidered such that the energy sector can move towards financial viability. We would appreciate some information on the GoE's position on this, given that at present it appears that SREP is being asked to contribute financing to a power project in a non-viable market context - which does not match with SREP's ambition to support sectors which have transformational potential.

WB: The Bank shares the concern on the depressed domestic tariff rate and the overall financial viability of the sector. The Bank has raised these issues as part of the ongoing policy level dialogue with GoE authorities; and GoE plans to address this issue as part of its ongoing power

sector transformation program. It must be noted that the sector is able to meet all operating expenses from the operating revenue and generates operating profit (before interest, tax, and foreign currency fluctuation). The main concern to the sector's financial viability stems from the debt service obligations, as the sector financed its long term infrastructure investments through short term financing.

As the project will start generating revenue after commissioning the planned power plant, and the economic life of the project is assumed to be about thirty years after commissioning, the analysis assumed a conservative growth in tariff over the next few years, which is: US\$ 0.03/kWh (2014) increasing to US\$0.05/kWh (2017), increasing to US\$0.07/kWh (2020).

4. The PAD suggests that Geothermal is a “relatively new technology in the region” however geothermal exploration has been ongoing in East Africa since the 1970’s. The capacity issues of the proposed lead entity EEP with regards to geothermal, procurement and financial management is noted in several places. What evidence is there that the proposed delivery approach can overcome earlier barriers faced by the same (or predecessor) entities?

WB: Despite early stage activities ongoing in the rift valley, and in Ethiopia, the geothermal technology (assessment of resources, including exploratory drilling, harnessing of steam to generate power, etc.) remains a relatively new technology from an implementation expertise standpoint. In Ethiopia, there is only one experimental power plant that can generate 3MW when operating. In addition, the implementation capacity of EEP, being a new institution, are also concerns shared by the Bank. In this regard, the project will provide comprehensive capacity building and technical assistance support (funded by IDA, Component 4) to bolster the implementing agency as well as provide the appropriate international expertise, as appropriate. Furthermore, the project implementation design requires that EEP appoints a full service drilling contractor to drill and test the geothermal wells; assigns owner's engineer with on-site Advisor and off-site Advisory Committee to support implementation of the Aluto geothermal project.

5. While the PAD makes brief reference to a number of other initiatives, it is not evidenced that this project is fully co-ordinated and complementary to these – including the existing SREP support to the Geothermal Sector Strategy via IFC. Can the alignment between this proposal and the Geothermal Sector Strategy be explained more clearly (including the proposed \$3m Legal, Institutional and Regulatory Framework Development work)? How does this project link to the Geothermal Risk Mitigation Facility (this is referenced only once, in Annex 3)?

WB: The proposed project is the result of a coordinated sector approach amongst several donor partners. IDA and Government of Japan (GoJ) financed exploration activities at Aluto through a different project. To advance the Aluto project further; and to support geothermal sector development in future; GoE requested SREP financing. The SREP financing allocated to Aluto leveraged financing from IDA, ICEIDA, GoJ and GoE. While IDA and ICEIDA are supporting the upstream activities of developing the geothermal steam field, GoJ plans to support the proposed project through financing power generation and evacuation facilities. To support future geothermal sector development the IFC, using SREP fund, is supporting the GoE in the

preparation of a Geothermal Sector Development Strategy to attract private sector investment. GoE has started discussions to develop its Corbetti geothermal site through private sector and have received support from USAID for this transaction. Corbetti project sponsor has requested support from Geothermal Risk Mitigation Facility (GRMF). The IDA/GoJ supported Aluto exploration project couldn't benefit from the GRMF as the facility was not in place when that project was prepared. The current phase of the Aluto project is not eligible for GRMF as the exploration phase has already been financed by IDA/GoJ.

6. The requested SREP support is for 'drilling consumables'. We would appreciate further information on what is included in this, why this is considered the best use of SREP resources, and why SREP support in this area is additional.

WB: Drilling consumables are essential technical equipment (such as drill bits, drilling pipes, etc.) that are core parts of the cost, and hence the risk of exploration of geothermal sites. SREP's financing is proposed to be earmarked for the highly specialized and costly component of exploration which will assist the GoE in mitigating the inherent risk of geothermal development.

SREP funds have truly catalyzed additional resources for the geothermal development and helped to initiate long term transformational development of the sector including the role of the private sector in it.

GoE allocated the SREP fund first to support this phase of Aluto geothermal project and effectively used it to leverage additional financing. At the time of SREP IP approval only US\$ 10 million of WB co-financing was secured for resource development phase with an indicative amount of US\$ 50 million for power plant construction phase. SREP supported Investment Plan was used as a strategic framework to mobilize additional funds. The Bank worked closely with GoE and through its compact with Government of Iceland, ICEIDA committed US\$ 3.5 million to GoE. Bank has proposed about US\$ 179 million to support geothermal development in Ethiopia and a discussion with Government of Japan is ongoing to finance about US\$ 110 million to Ethiopia.

This project has two transformative effects, (i) introduction of geothermal as a viable alternative source of electricity generation and (ii) introducing private sector participation in Ethiopia energy sector.

At present 99 percent of Ethiopia's electricity is generated from hydropower. Several years ago, Ethiopia was not eager to invest in geothermal development, given its relatively higher cost than hydropower and involvement of private sector in Ethiopia energy sector was not part of the dialogue.

The Aluto geothermal project is the first significant size geothermal project that is now being developed. GoE has acknowledged geothermal as a viable alternative energy resource and have allocated its financial resources to develop this sector. Introducing geothermal energy in Ethiopia's energy mix is the first transformative impact of the project.

The sector dialogue that commenced through SREP in Ethiopia, resulted not only IFC supporting the GoE in developing a strategy document to attract private sector in the geothermal

development in future, but GoE has started discussion with a private sponsor to develop 1,000 MW of IPP in Corbetti geothermal field. The introduction of this IPP is the result of government's interest to develop geothermal sector and to gain experience from private sector participation in one geothermal field.

The GSDP also needs to be seen as part of the global support of Climate Investment Funds to development of geothermal project globally. Along with engagements in other Rift Valley countries, Indonesia, Chile, Mexico it would contribute to substantial advance of geothermal development and will generate tremendous amount of lessons relevant not only to SREP countries but beyond them. It would be important to support different business models to allow cost and performance benchmarking, improve planning and help with the scale up phase.

7. We would appreciate seeing the evidence to back up the 25% dry well assumption. The recent IFC proposal in Ethiopia on the Geothermal Sector Strategy cited 50-70% dry wells being typical.

WB: Overall, a failure rate of 50-70% has been factored in the number of planned wells to be drilled and in the economic analysis. For instance, for the planned 70 MW Aluto site, 14 wells will be needed (assuming 5MW capacity per well), whereas the project plans to support drilling of 26 wells. This will be clarified in the PAD.

8. We request that the expected financing from the Government of Japan to build the power plants should be counted in a consistent way and that the WB approved co-financing numbers match the TFC approved co-financing numbers.

WB: GoE plans to develop the Aluto geothermal project in two phases. The first phase focuses on upstream geothermal steam resource development with financing support from SREP, IDA, ICEIDA and GoE. The power plant and associated evacuation facilities will be developed in the second phase. The proposed GSDP development objective is limited to scope of the first phase only; and financing for this phase has been confirmed. GoE is in discussion with GoJ for a soft loan of up to US\$ 110 million to finance the second phase development. The PAD explains this two phase project design in detail. As the power plant will only be constructed after the completion of the first phase, GoJ financing is not included in the first phase financing plan.

Questions (Q) and comments (C) regarding the project

9. (C) The project appraisal document (PAD) is inconsistent with the Project Approval Request (PAR), notably with regards to project scope (PAD includes other components) and total investment (PAD: USD 215.1 million of which USD 125.3 million for Aluto Geothermal Site development - but not the power plant; PAR: USD 326 million of which USD 23.6 million - raised to 24.5 million - SREP contribution). All these figures also differ from those submitted with the Investment Plan (USD 231.6 million including power plant and transmission line). Please clarify these differences and the scope of the project to be supported by the SREP grant.

WB: At the time of preparing the Investment Plan, the financing plan included amounts that were indicated by different development partners as potential sources of funding. The Investment Plan allocated US\$ 24.5 million from SREP to the Aluto geothermal project. The Project Appraisal Document (PAD), includes appraised project cost and financing plan includes committed financing obtained from different development partners. In addition, the PAD presents an indicative cost for financing the power plan. The financing from the Government of Japan for power plant is contingent upon successful upstream work.

10. (Q) It is stated in the PAD (p.8) that the GoE has invited the private sector to develop geothermal resources in another site. Which site is this and how appropriate is this site for electricity generation from geothermal resources, in comparison to Aluto Langano? How was the reaction of the private sector to that invitation?

WB: Ethiopia has identified 22 geothermal sites. GoE has concessioned 5 geothermal sites to private sector several years back; but none of the private sector sponsors have carried out any surface explorations on their respective sites. The sponsor of Corbetti geothermal site has started discussions with the GoE and has agreed on Head of Terms of a Power Purchase Agreement (PPA) to develop a 1000 MW power plant. USAID, through its Power Africa Initiative (PAI) is providing transaction advisory support to EEP to negotiate a PPA with this sponsor.

11. (Q) It is stated in the PAD (p.2) that after the commissioning of three large hydro power plants, the installed capacity of EEP Co was increased from about 850 MW to over 2000 MW, while the peak demand was 1100 MW in 2011. It is also stated (p.4) that in the context of the GTP (Growth and Transformation Plan) the installed capacity shall be raised to 8000 MW by 2015 (that means by the end of next year).

- a. How reasonable is this objective?
- b. What major power plants are foreseen to be commissioned until the end of 2015?
- c. What is the expected (peak load) demand by the end of 2015 and to what customers (urban, rural, export) is this related?
- d. What about the realism of the other stated objectives (table 1, p.4), i.e. 258'000 km of distribution lines (vs 126'038 km in 2010), 18'000 km of transmission lines (vs 10'500 km in 2010), 4 million consumers (vs 2 million in 2010) and a coverage of 75% of the population (vs 41% in 2010).
- e. How consistent is the figure of 41% coverage in 2010 with conflicting information from other sources, stating that only 23% of the population have access to electricity (World Bank data sheet)?

WB: (a) This section of the PAD discusses the current status of the Ethiopia power sector and the Government's Growth and Transformation Plan (GTP). This is not directly related to the proposed Geothermal Sector Development Project (GSDP), but explains the environment and context within which the GSDP would be implemented. While some of the GTP targets can be considered aggressive, they are all pushing the sector in the right direction and even if GoE partially achieves its targets, it will help create new jobs and reduce poverty in Ethiopia.

(b) GoE plans to commission Gibe III hydro power plant (1870 MW), Genale Dawa 3 hydro power plant (258 MW), Ashegoda wind power plant (120 MW) and Adama wind power plant (100 MW) by the end of 2015.

(c) Estimated peak demand in 2015 is about 1,600 MW.

(d) World Bank is one of the development partners supporting some of these objectives. There are other development partners financing other parts of this objective. The km of distribution lines and other indicators are not directly relevant for this geothermal project, but indicates GoE target for the sector development.

(e) These are measures of two different indicators. *Coverage* refers to share of villages electrified stated as percentage of total number of villages in Ethiopia. *Access to electricity* refers to share of households with electricity connection stated as percentage of total number of households in Ethiopia.

12. (C) During the IP endorsement process, various Subcommittee members, including Switzerland, raised the issue of electricity export, as not being the right strategy to reduce domestic energy poverty. In the PAD, the increase (and improvement of reliability) of electricity exports is stated at various points (p.4,5,6,10) as an objective of the project. In our opinion, this is not consistent with the conditions under which the SREP IP for Ethiopia was approved. In our eyes the additionally produced electricity should be destined with priority to increase electricity access and productive use in Ethiopia. Only surplus electricity should be exported.

WB: The World Bank and the GoE, both consider access to electricity as a priority. While the World Bank, the African Development Bank, the Kuwait Fund, the Arab Bank for Economic Development in Africa (BADEA), and the Indian Government have been financing the GoE's Universal Electricity Access Program (UEAP) over the last several years; GoE remains the major financier of this program. In addition to grid based electricity access, GoE is also implementing off-grid electrification projects by providing financing to the private sector, through another World Bank financed project. This project is now under implementation and over the last 8 months the private sector has connected about 100,000 households with off-grid modern lighting facility under this project.

The GSDP Project Development Objective is to develop geothermal resources in Ethiopia. Once the geothermal resource is confirmed then under GSDP Phase II the power plant will be constructed. Given the estimated timeline and GoE power plant expansion plan, at that time, while GSDP will have a production capacity of 70 MW, Ethiopia's total power generation capacity will be around 10,000 MW. This is considerable higher than Ethiopia's domestic peak demand, and GoE plans to export the surplus power to neighboring countries. The GSDP 70 MW project is not linked with GoE's electricity export program.

13. (C) In the SREP IP, as endorsed by the Subcommittee, the power plant (Phase II) was explicitly included with its corresponding objectives in the Results Framework. It is therefore not understandable that this component is explicitly excluded in the PAD (Nr34

p.10). Although the SREP financing was already in the IP primarily destined to finance the field development (Phase I), the objectives in the Results Framework (+552 GWh/y from RE; + 1.1 million people benefiting from improved access to electricity; +USD 301.5 million increased public and private investments; -438'122 tons CO₂/y i.e. -8'762'440 tons CO₂ over 20 years) can only be achieved if the power plant is included.

WB: The Investment Plan considered SREP fund will be used for (phase 1) geothermal field development; the power plant was considered to be developed at phase 2. The proposed project design is consistent to the Investment Plan. While the Annex 1 Results Framework measures the outcome of Bank financed activities which is the upstream development, the Annex 9 on SREP financing measures the results indicated in the Investment Plan and consistent with the SREP results framework. .

14. (C) As a consequence to our comment nr.5, the project's Results Framework (Annex 1) is not consistent with the SREP Results Framework and should be adapted. The SREP objectives related to this project should be added.

WB: Please refer to the response on no. 16. The SREP objectives are measured in the SREP Annex.

15. (C) Also as a consequence of our comment nr.5, we do not support the proposed reallocation of USD 0.9 million from Phase II project preparation to Phase I.

WB: When the Investment Plan was finalized, financing for the (Phase II) power plant was not secured. Hence, US\$ 0.9 million was allocated in Phase I to finance activities to secure full financing for the Phase II power plant. The World Bank worked closely with GoE to raise financing for the Phase II power plant of the project. Government of Japan is in advanced discussion with GoE to finance the full cost of Phase II power plant. Hence the US\$ 0.9 million to finance activities to secure funding for the power plant is no more required.

16. (Q) According to table 3 p.13, the financing gap for the Aluto Geothermal Site Development, is USD 132.9 million, of which USD 110 million is expected to be filled by a soft loan from the Government of Japan (GoJ). How strong is the commitment of the GoJ to that project? What sources does the GoE intend to tap to fill the remaining gap of USD 22.9 million?

WB: Financing for the power plant can only be confirmed after a significant portion of required geothermal wells have been drilled. So the financing commitment is more technical in nature. The GoJ is not only in discussion with GoE to finance the power plant, but also the transmission evacuation system. The remaining financing gap (US\$ 22.9 million) is related to the Alalobad geothermal site – which is beyond the SREP project scope. The financing for Alalobad will be required after completing Phase I of the project and based on the findings of Phase I, World Bank or any other development partner may finance that gap.

17. (Q) Who is responsible for procurement (EEP or EEPCo)? How will the governance related risks be mitigated in addition to the capacity building of staff and stakeholders? On

what basis was this risk appraised at "moderate" in view of the size and complexity of the involved contracts?

WB: EEP will be responsible for procurement. The project is receiving technical assistance from ICEIDA. Consultants from ISOR (Iceland Geothermal Development) are helping EEP in preparing the procurement documents, technical specifications, cost estimates, etc. They will also support the project through technical evaluation of the bidding documents. However, the overall risk rating of the project based on its complexity has been appraised as *High*.

18. (Q) It is stated that EEP (the EEPCo spinoff in charge of the project) has adequate internal controls (p.84). How consistent is this statement with the fact that EEPCo was continuously late with accounting and repeatedly received qualified audits?

WB: Due to repeated qualified audits of EEPCo, the Bank carried out a detail assessment of EEPCo financial management and governance structure in 2012. The recommendation of this study has been discussed and agreed with the GoE. As part of the EEPCo transformation, GoE will appoint a qualified firm to review EEPCo accounts, and split into EEP and EEU, the two new entities. GoE will also ensure that EEP and EEU will start operation with clean balance sheet and issues related to EEPCo qualifications are not repeated in EEP and EEU.

EEP though took over EEPCo Generation and Transmission Projects, the management is different from EEPCo. All managers and staff of EEP and EEU have been competitively selected. The financial management procedure and procurement manual are now in the process of updating and Bank has reviewed these new procedures and found the systems being put in place in EEP are adequate.