

CLIMATE INVESTMENT FUNDS

June 29, 2017

**[APPROVAL BY MAIL]: TANZANIA: GEOTHERMAL ENERGY DEVELOPMENT PROJECT
(SREP)(AFDB)-XSRETZ027A**

AFRICAN DEVELOPMENT BANK RESPONSE TO COMMENTS FROM UNITED KINGDOM

Project Rationale

a. (Q) What has been achieved as a result of the SREP USD 0.7 million as a Project Preparation Grant (PPG) on geothermal strategy, regulation and capacity development in Tanzania. And how does this SREP project at the Ngozi site fit with the proposed strategy, regulation and capacity?

[AfDB]: The SREP PPG was used to hire Norton Rose Fullbright LLP. The final report should be available any time soon. Once finalized and available, the outputs of this consultancy will be discussed among the GoT, development partners and key energy sector stakeholders before being formally adopted by local authorities. The strategy, for example, will provide detailed technical and economic information on the geothermal resources of the country. In addition, drilling rules being also developed will have an impact on the exploration activities proposed under the project. Last but not least, the legal and regulatory framework will provide for detailed roles of key stakeholders (TGDC, TANESCO, private sector) that are (and will be) involved in geothermal activities across the country. The existing legal and regulatory framework surrounding mobilization of private sector investment in the country in general, and in the energy sector in particular, is considered adequate for the deployments of IPPs in geothermal generation further down the road.

Justification for SREP Intervention

a. (Q) Do the necessary transmission and distribution systems already exist to connect power generated at Ngozi to where it is needed? If not how will the transmission and distribution systems be funded?

[AfDB]: A substation owned by TANESCO exists in the city of Mbeya that sits around 23km from the Ngozi geothermal site. Given this short distance, it is reasonable to believe that the future power plant will be connected to that substation. At this early stage, it is still unclear who will fund the transmission infrastructure needed to inject the power generated from the plant into the national grid even though it is very likely that either TANESCO or the private sector will fund it.

Project Description

a. (Q) The proposal says that “Upon completion of phase two, TGDC in partnership with AfDB and other DPs would tender out the construction, operation and maintenance of a 100MW geothermal power plant to an Independent Power Producer (IPP)”. What will be the TGDC business model for power generation? Will TGDC be responsible for selling steam to an IPP that will then generate power? Or would the IPP be responsible for generating steam and power generation? What evidence is there that the preferred TGDC business model will be viable and commercially attractive to prospective IPPs? An IPP might be more attracted by generating the steam and power, where they have control over the resource.

[AfDB]: TGDC business model to manage the steam has not yet been confirmed even though it is very likely that the Kenyan model (state-owned company owns the steam and enters into a sale agreement to supply the steam needed for power generation) will most likely be adopted. A final decision will be made once the work of Norton Rose Fullbright LLP is completed and the GoT formally adopts the sector key documents. There is no evidence that one model is better than the other in attracting IPPs for power generation as both will involve risks that must be either allocated among key project parties or fully mitigated.

One key factor of the project is that no private sector companies are willing to take the risk of geothermal exploration and therefore the only solution is for the GoT to undertake the process and own the resource. As such, either TGDC will have to enter into a sale agreement of the steam or enter include in the concession agreement a mechanism that allows the IPP to collect and transfer the steam to the power plant against agreed payments.

b. (Q) What is the immediate market for the power generated by the IPP – who will purchase the power?

[AfDB]: The IPP would sell the generated power to TANESCO under the provisions of a Power Purchase Agreement. The purchased power would be injected in the national grid.

Project Components

a. (Q) Will the exploratory drilling and infrastructure development be done in-house by TDGC or will it be contracted to specialist geothermal developers? If in-house, does TDGC have the specialist technical and project management skills to undertake it effectively?

[AfDB]: TGDC does not have the capacity to undertake the exploratory drilling in-house. This will be done by a well experienced firm selected through an international competitive process with the hiring process being supervised by the AfDB's independent procurement department. Nonetheless, TGDC staff will benefit greatly from the implementation of these activities and in the future may be ready to implement such activities on its own.

Brief Description of Expected Outcomes

a. (Q) The proposal says that the GoT will competitively tender out the construction of a geothermal power plant. As in the comment above, will the IPP contractor generate the steam and power, or just be responsible for the power generation using steam supplied by TGDC?

[AfDB]: As stated on a previous answer, while still to be decided, it is very likely that the IPP will purchase steam to TGDC, generate power and sell it to TANESCO under a Power Purchase Agreement.

b. (Q) The proposal says that the Project will “develop geothermal steam fields that are capable of generating up to 100 MW”. This is the maximum that could be available. What provisions are made if the test drilling reveals a much lower resource, say the 30MW that is mentioned later in the proposal? Will it still be attractive to an IPP?

[AfDB]: Based on preliminary studies and assessments, the envisaged capacity of the Ngozi geothermal site is expected to be 100 MW but it can be higher or lower depending on the results of the drilling activities. If the capacity ends up being smaller (e.g. 30MW) and depending on the modalities of engagement being considered by the GoT with the private sector, AfDB believes that based on previous IPPs it funded and the estimated CAPEX per MW for geothermal generation, even a minimum power plant size of 10MW could be considered to be delivered in the form of an IPP. Many variables (e.g. transaction costs, technology costs, creditworthiness of the off-taker, government support, capital costs, etc.) can influence the minimum size and attractiveness of an IPP scheme.

Description of Project Costs

a. (Q) Will the SREP test drilling project be phased so that if the first test drillings do not demonstrate a good enough geothermal resource then the project can be stopped, without drilling all five test holes?

[AfDB]: The test holes will be installed by order of priority and initially shall target the most promising area of the field moving subsequently to less promising areas and so on. In case the results of the first and second holes are disappointing, AfDB, TGDC and other development partners will seriously consider abandoning the exploration of the field.

b. (Q) The budget includes “Compensation of Project Affected People”. What does this entail? There is limited information later of people being affected. How much of a social impact appraisal been done so far? And if not there should be one before the work commences.

[AfDB]: Information available on the compensation of Project Affected People is limited for the simple reason that the full Environmental and Social Impact Assessment (ESIA) and the Resettlement Action Plan are not yet finalized. Figures provided in terms of the total number were provided in the proposal following the conclusions of a preliminary assessment. Being a category 1 project, the beneficiary of the project must undertake a full social appraisal in line with AfDB’s Internal Safeguards System. This process is overseen by a team of safeguards that operate independently of AfDB’s energy department. The full ESIA must be published for consultations at least 4 months before approval by AfDB’s Board of Directors and no disbursements shall be made until the GoT compensates all Project Affected People. These compensations include physical and economic displacement.

Risks and Mitigation Measures

a. (C) Private sector investment will only happen if 1. there is a sufficient geothermal resource for viable power generation, and 2. the business model is attractive. These are significant risks that should be included.

1. Phasing the test drilling, and only proceeding with all test drilling if the first holes demonstrate a viability is one risk reduction strategy.

[AfDB]: Agreed. The geophysical exploration already undertaken has located a geothermal reservoir with suitable and promising conditions for test drilling. To reduce the risks further, a prioritization of the holes starting with the most promising will be put in place.

2. SREP must be confident that there is a viable potential business model, likely to be commercially attractive for an IPP to invest.

[AfDB]: This is one of the key objectives of all development partners, including MDBs, as well as key stakeholders involved in the energy sector in Tanzania. While the business model is not yet defined, the risk that this will not happen is very limited for a few reasons: (i) there are a number of IPPs already operating in Tanzania, (ii) the non-IPP solution entails the GoT allocating its own budget to the construction of the power plant which is unlikely given the Low-Income Country status of Tanzania.

SREP Investment Criteria

a. (C) The “affordability and competitiveness of renewable sources” is not adequately addressed. It only provides the general, global cost range for geothermal power. The actual cost at a geothermal site is location specific. The proposal should provide an estimated cost of

geothermal power at the Ngozi site, based on the likely geothermal resource (for example drawing on existing site specific survey information) and the likely cost of all geothermal development from test drilling to power generation. This will allow a proper assessment of whether this particular resource is affordable and competitive.

[AfDB]: The amounts provided in section 5.5 of the PAD are best estimates for geothermal exploration per MW and take into account the fact that some of the wells drilled may end up being dry. The cost should not be perceived as the sole driver in establishing the affordability of the resource but one should also consider the levelized cost of fossil-fuel based power generation in Tanzania that is currently estimated to equal USD 0.169 per kWh when compared to the estimated levelized cost for geothermal generation which equals USD 0.062 kWh.

b. (C)The “Economic and Financial Viability” criteria is not adequately addressed. There is only a very general statement about geothermal power, and there should be a statement as to the economic and financial viability of the proposed Ngozi site.

[AfDB]: The economic and financial viability analysis for this project is not yet finalized. However, its finalization is a pre-condition for internal review by a number of AfDB’s internal committees and approval by the Board of Directors.

Financial Viability?

c. The text says “enable IPPs to be competitively involved in the development of geothermal power generation”. As noted in other comments, what is the evidence that an IPP will find this geothermal site sufficiently attractive to invest?

[AfDB]: Please see previous answers on this matter.