

Clean Technology Fund

Indonesia: Geothermal Energy Upstream Development Project (GEUDP)

Responses to Comments from the UK and US

March 2016

#	Comment	Response
Comments from the UK		
1	<p>Learning</p> <p>We are pleased to see that the proposal draws on similar work that the World Bank and others have done in other countries (eg. Turkey, Armenia and Mexico) and from the work of other, well positioned entities such as the GEF, ASTAE and ESMAP and is mobilising their resources appropriately to support this project. It is important that lessons from other projects are learned and incorporated into new projects as they emerge. However there is little in the project documentation to show that the team have learned lessons from other geothermal investments in Indonesia (particularly CTF ones). Given that the vast majority of the revised Indonesian IP is for geothermal development, we'd expect to see more evidence of learning from other geothermal investments and on sharing lessons with other MDBs from other programs. For example, we know that there have been considerable delays and slow disbursements to other CTF geothermal projects in Indonesia- have any</p>	<p>Previous geothermal development-focused programs supported by MDBs, including CTF engagements in Indonesia, have focused on public sector (i.e. Pertamina GE) led geothermal production. The lessons learned, especially from the ongoing WB/CTF supported project for Ulubelu and Lahendong, are related to the risk of substantial delays associated with the confirmation of the geothermal resources. For both the mentioned plants steam yields turned out to be lower than expected and therefore drilling of more wells were needed and more funds from Pertamina has to be mobilized - which took much time. This project addresses these very risk by focusing on exploration.</p> <p>Recent policy and regulatory reforms have provided a framework for public sector contributions to support geothermal development. In response to the key lessons learned from geothermal development globally and Indonesia specifically, this proposed project places emphasis on public sector support for geothermal exploration - the riskiest phase of the entire development process. This would allow Indonesia to begin to address the challenges of financing early-stage resource exploration, and the difficulty of financing such projects by the private sector alone, given the resource risk, high upfront costs and long lead times.</p> <p>In addition, in the on-going CTF supported Indonesia Geothermal Project the CTF and World Bank support is primarily focused on downstream investments resulting in more back-loaded disbursements. The proposed project focuses on upstream investments consistent with projects in Turkey, Armenia, Mexico, and Ethiopia.</p> <p>Throughout preparation for this project, the task team has worked to front-load the required tasks along three main areas to ensure project readiness and incorporation of lessons</p>

	<p>lessons been learned from this, or have policy reforms made a difference to this recently? What reassurance can you give that this project won't be similarly delayed?</p>	<p>learned from previous projects: (i) carrying out preliminary geotechnical surveys to support decision-making for drilling location and drilling targets early on, (ii) preparing frameworks for addressing the environmental and social safeguards issues and monitoring plans throughout the project cycle, and (iii) coordinating closely with the client and the implementing agency to ensure adequate capacity to undertake the project in accordance with the provision of new laws and regulations.</p>
2	<p>Project developer On page 32 it mentions that the project developer does not have to bear any risk in the exploration phase: "If developers do not secure project financing, they would not be required to pay back the cost of exploratory drilling activities carried out by the government- neither in full nor in part as that would discourage private participation, which is key to furthering the sector"</p> <ul style="list-style-type: none"> • Is this fair? How does this compare to cost sharing mechanisms in other countries such as Japan or US? • How much will the risk premium (that the developer has to pay if the exploration is successful) be? How does this compare to other projects e.g. is there a comparable premium in the recent IDB geothermal project? 	<p>The policy direction outlined in the Ministry of Finance's forthcoming regulation guides PT SMI on the use of geothermal development-dedicated funds (\$220m) that were transferred from GFF to the so-called Geothermal Support Facility (GSF). The regulation provides that developers are to repay the full costs of exploration drilling plus a premium to cover the costs of government-sponsored drilling.</p> <p>It has now been decided by MoF that developers will have to pay the exploration costs at licensing rather than financial closure – this would be better in line with international best practice and will prevent developers from "sitting on the license". This change will be reflected in the final PAD.</p> <p>This is consistent with the geothermal development market's appetite for risk. The recent financial closure of the 300 MW Sarulla project demonstrates that developers are prepared to make substantial payments to access de-risked geothermal field sand that local banks are willing to finance the deals.</p> <p>With a portfolio approach, the high risk on an individual project is distributed across the board. Judging from the general risk profile of Indonesia and taking into account that this project will focus on exploration in Eastern Indonesia the team estimates that the premium to be paid by successful bidders on top of the actual exploration costs could be up to 30% (nonetheless, the precise premium would need to be set by the Ministry of Energy and Mineral Resources in their forthcoming regulation). This level is consistent with the premium expected to be paid in the Turkey and Mexico projects.</p>

	<ul style="list-style-type: none"> • What do developers have to do to be awarded a license? Do they have to pay for it, or are there conditions attached to the license itself (e.g. if developers cannot show that they have started production drilling within, say, a year of being awarded the license then they lose it or pay a penalty)? • Could you provide more detail on the incentives that ensure that reaching financial close & paying back the exploration drilling costs doesn't become less attractive to developers than simply sitting on the license and not spending any more of their own funds – for example on slightly more difficult sites, or if they run into financial difficulties. • Could you provide some more information on the local banking market, is there an appetite to support geothermal? Are there any risks around a potential lack of local financial support? 	<p>The Gol (Ministry of Energy) is drafting a new indirect user regulation, expected in the coming month, to provide a legal framework and basis for the tendering process, power purchase agreement and related issues. According to the latest draft regulation, the winning bidder is expected to pay for the full costs of exploration drilling, as well as establish an escrow account, from which a specified percentage will be taken out by the government as penalty if a feasibility study is not completed, and/or the site is not developed within a certain number of years after the award. The regulation is also expected to set standards for the tendering process, including quality of bidding document and 3G data package, in efforts to attract and improve quality of bid submissions. This project precisely seeks to support the government in obtaining the reliable resource data – presented in international standard format – to enable better cost assessments by developers for high-risk green-field development.</p> <p>The local banking sector has enough liquidity and overall interest in geothermal energy. However, it is not willing to take exploration/resource risk which is consistent with experience elsewhere. The proposed project will address the exploration/resource risk, thereby helping to unlock local debt financing. In addition, the follow up WB's operation will further help with crowding in commercial financing.</p>
3	<p>Additional WB funding</p> <p>The proposal is ambiguous with regard to the \$300 million from the World Bank. At times it is included as a subsequent investment under component 3 (page 19) and is included in the leveraging calculations. On page 34, it states that the World Bank is “considering” the \$300</p>	<p>The World Bank will provide financing for downstream development, the target of which will be informed by the successful completion of the Phase 1 and 2 activities. The US\$300 million is expected to be approved by the World Bank Board by the end of 2017. Part of this funding will support wells identified within the first five years of implementation while the rest will finance wells identified during the later cycle of the proposed facility. We expect that roughly 50% of the World Bank financing will be invested during the first five years, though the proportion for the period is subject to the progress of upstream development. It is certain that</p>

	<p>million investment and that these resources would only be committed upon successful completion of the exploratory drillings. The Results Framework on page 41 seems to split the \$300 million into 2 parts, one within a 5 year implementation period and one within a 15 year period. This appears to be portraying a best case scenario only. What might a worst case scenario look like, or is it not likely?</p>	<p>the entire World Bank financing will be spent to support fields identified during the 15 year operation of the facility. Given the project-specific characteristics, it is not possible to portray best and worst case scenarios with a relative degree of confidence. A possible scenario based on factoring in a 71% success rate for geothermal exploration well is presented in the PAD.</p>																																																
4	<p>Results Page 45 - “Based on unlocking 65MW of geothermal capacity per cycle, and given the revolving nature of the proposed facility, it is expected that funds will flow back every three years over a 15 year cycle, therefore enabling the aforementioned capacity of 260MW over the lifetime of the facility.”</p> <ul style="list-style-type: none"> • Please could you provide more detail on how this is calculated? We calculated $65\text{MW} * (15/3) = 65\text{MW} * 5 = 325\text{MW}$, not 260MW. • Was this based on region-specific data? • We think that recycling the funds this number of times feels quite ambitious as there may be a number of factors that could prevent projects from reaching financial close and repaying the costs of exploration drilling. We understand that successful projects are expected to pay a premium to address this risk so could the project team 	<p>The calculations are based on a 15-year time horizon with five three-year cycles, each of which is indicative of the time it takes to go from start of civil works to securing a financing package for a given geothermal project – this is not Indonesia-specific. No MWs are envisioned to come on-line as a results of the project activities over the first cycle (or three year period). These assumptions are captured in the following table:</p> <table border="1" data-bbox="877 836 1921 987"> <tr> <td>Cycle</td> <td>0</td><td>0</td><td>0</td><td>1</td><td>1</td><td>1</td><td>2</td><td>2</td><td>2</td><td>3</td><td>3</td><td>3</td><td>4</td><td>4</td><td>4</td> </tr> <tr> <td>Year</td> <td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>7</td><td>8</td><td>9</td><td>10</td><td>11</td><td>12</td><td>13</td><td>14</td><td>15</td> </tr> <tr> <td>MW</td> <td>0</td><td>0</td><td>0</td><td>65</td><td>65</td><td>65</td><td>130</td><td>130</td><td>130</td><td>195</td><td>195</td><td>195</td><td>260</td><td>260</td><td>260</td> </tr> </table> <p>As mentioned above, the forthcoming geothermal regulation would hold developers to pay the full costs of exploration plus risk premium upon concession award. The risk premium, which will be set by the Ministry of Energy and Mineral Resources in the forthcoming regulation, is expected to be up to 30% of the cost of exploration. In the next version of the PAD the Team will include sensitivity analysis of several scenarios including some with slower recycling of funds.</p>	Cycle	0	0	0	1	1	1	2	2	2	3	3	3	4	4	4	Year	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	MW	0	0	0	65	65	65	130	130	130	195	195	195	260	260	260
Cycle	0	0	0	1	1	1	2	2	2	3	3	3	4	4	4																																			
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MW	0	0	0	65	65	65	130	130	130	195	195	195	260	260	260																																			

	<p>provide more detail on how the premium will be sized in order to help recover the funds?</p> <ul style="list-style-type: none"> • Are we right in assuming that the calculation of “GHG emissions reduced or avoided” based is based on 65MW rather than 260MW? • What is the expected success rate of exploration / drilling programs? How does this compare to other projects • What is the expected public/ private split of the \$390m leveraged from the Private/Public sector? • Could you explain how the cost effectiveness Investment Cost per Tonne has been calculated? (7.5 US\$/tCO₂e for CTF funding and 75.6US\$/tCO₂e for total funding) • Given that the GEF is funding the TA element of the fund, how will the results be attributed to the two projects to ensure that there is no double counting? 	<p>The project’s GHG emission reductions were estimated based on the electrical outputs and net emission factors associated with installing 65MW and 260MW of new geothermal power capacity over a five-year period and 15-year period, respectively. Based on the observed success rates of exploration drilling for other developments in Indonesia, the financial and economic analyses were run on a 72% success rate input (80% success rate of a three-well exploration program and 90% success of successful delineation drilling after that). This is in line with the rates observed globally – please refer to <i>Success of Geothermal Wells: A Global Study</i>.</p> <p>At this time, it is not possible to provide a detailed breakdown of the public and private investment resulting from leveraging US\$390 million for 65MW of new geothermal capacity. However, it is possible that this will include US\$150 million in IBRD financing.</p> <p>CTF cost effectiveness was calculated as the CTF contribution divided by the tCO₂e avoided. Thus, during the five year implementation period, US\$49 million in CTF financing divided by 6.54 tCO₂e gives a CTF cost effectiveness of 7.5 US\$/tCO₂e. Total project cost effectiveness was instead calculated as the total project contribution divided by the tCO₂eq avoided. During the same five-year project implementation period, this translates into US\$494.25 million divided by 6.54 tCO₂e, which equals 75 US\$/tCO₂e.</p> <p>GEF support will focus on the TA program which has elements that goes beyond the exploratory drilling support – including advisory services and capacity building for the main stakeholders. The issue about double-counting is not specific to this project will be discussed with GEFSEC and CTF TF committee in a more holistic way.</p>
5	<p>Investment Criteria Part of the CTF Investment criteria is an analysis of the expected reduction in the cost of the technology due to technological progress and scale effect at a global level,</p>	<p>Geothermal power technologies are mature and commercially viable, and have been under operation worldwide for more than a century. It is expected that the project will contribute to the reduction of cost of technology through identifying innovative financial mechanisms for de-risking the early-stage exploration and drilling phases. In addition, the proposed project in</p>

	<p>and/ or through organisational learning and scale effects at the country level. Could you provide more information on this and add it to the proposal?</p>	<p>Indonesia is part of an overarching endeavour led by the Climate Investment Funds (CIFs) in the geothermal sector, whereby CIFs mobilized co-financing is expected to increase by a quarter the current geothermal world installed capacity, which will likely lead to technology cost reduction. As a world leader in climate finance for early-stage geothermal development, the CIFs will support the scaling-up of geothermal resources through removing investment barriers, creating enabling environments, and identifying innovative risk mitigation instruments for early-stage exploration and drilling. The proposed project in Indonesia will contribute to the CIF endeavour in the geothermal sector by testing an innovative risk mitigation mechanism to address key barriers inhibiting the deployment of geothermal technologies in the country. There may be an opportunity for geothermal development cost reductions from the effective implementation and replication of similar mechanisms in other countries.</p>
6	<p>Risks Generally we think that more detail should have been provided in the risk section of the proposal.</p> <ul style="list-style-type: none"> • Does the fact that Indonesia is located in a seismically volatile region pose a risk to the project? Is there a reason why this risk has not been included? • Given the inherent uncertainty with this technology, could you provide more detail on how the risks around exploration / drilling is being managed (is it possible that no geothermal resource will be discovered?)? • Also if the corruption/fiduciary risk is substantial then there should be more evidence of how this will be managed at a project level – references to close engagement and a possible GAF seem quite vague. • Could you provide more detail on the technology risks? 	<p>The risk of seismic activities taking place in the project areas will be considered as part of comprehensive risk assessments at the sub-project level. Given the specific geological conditions Indonesia finds itself in, it is worth noting that the country’s building codes already factor in seismic risk-related provisions.</p> <p>The technology is mature and commercially proven. Resource risk is the real challenge this project attempts to address by using CTF funds. Preliminary surveys will be undertaken as early on as possible in the project life to ensure that the drilling decision will be supported by relatively strong indications of inferred resources, and to minimize resource risks.</p> <p>The WB fiduciary safeguards standards will be enforced to address governance and fiduciary risks. This will be clarified in the pertinent risk section of the Project Appraisal Document.</p> <p>Please refer to the answer above on the technology vs. resource risks.</p> <p>The project is subject to due diligence by the WB safeguards specialists. As part of project preparation, the team has actively provided support to the designated implementing agency in the preparation of a number of safeguards instruments to address these issues, including the Environmental and Social Management Framework, incorporating a Land Acquisition and Resettlement Policy Framework and Indigenous Peoples Planning Framework, which would be prepared and disclosed prior to project appraisal. These safeguards frameworks will be</p>

	<ul style="list-style-type: none"> Similarly, we had some concern over “Induced development could lead to land disputes, illegal land uses, damage or loss of natural habitats and forests, and reduced watershed.” Could you provide more explanation on how such a risk would be managed before approval (currently it says that “impacts will need to be considered, and mitigation planned for, during the project”) 	<p>prepared to prescribe a process for site screening and proposed development sites, as well as templates and guidance for preparing site-specific safeguards instruments. They will be accompanied by clear monitoring plan to be abided by throughout the project life.</p>
Comments from the US		
7	<ul style="list-style-type: none"> What are the plans for conducting environmental and social due diligence for the exploratory drilling, including collecting baseline data? The proposal notes that ESIA’s will be conducted during implementation; how will this allow for consultation with potentially affected persons? Will these ESIA’s come back to the World Bank Board 120 days in advance of the vote? 	<p>The project is subject to due diligence by the WB safeguards specialists. As part of project preparation, the team has actively provided support to the designated implementing agency in the preparation of a number of safeguards instruments to address these issues, including the Environmental and Social Management Framework, incorporating a Land Acquisition and Resettlement Policy Framework and Indigenous Peoples Planning Framework, which would be prepared and disclosed prior to project appraisal. If the present classification as Category A is maintained the necessary safeguards document will be reviewed and endorsed by the WB’s Regional Safeguards Secretariat and consulted with PAPs and stakeholders 120 days in advance of Board presentation to comply with US ED requirements.</p>
8	<ul style="list-style-type: none"> Because the region in question has such low electrification rates (p. 15), will using new geothermal plants to expand energy access require building new distribution networks? Will the Environmental and Social Management Framework and related analysis include the impacts of building distribution networks for the new geothermal plants? 	<p>New power plants may require strengthening of the transmission/distribution networks and the ESMF will cover the evacuation of electricity from the geothermal power plant.</p>
9	<ul style="list-style-type: none"> Does GoI have a sense of how many private developers will be looking to take 	<p>Regarding developers’ investment appetite, previous consultations with private sector stakeholders in November 2015 indicate strong interest in the Eastern region provided that</p>

	<p>on these projects? How will GoI solicit applications/bidders/interest for licenses?</p>	<p>licensing procedures will be preceded by government-funded drilling, and as long as it is backed by PLN's PPAs. For the sites financed by the GSF/CTF funds, it is expected that bidders will be assessed based on technological knowledge, relevant experience, financial means and commitment to repay the costs of exploration as prescribed by the government regulations.</p>
10	<ul style="list-style-type: none"> The project proposal mentions an existing geothermal fund, the Geothermal Fund Facility (GFF). The proposal says GoI plans on transferring about \$220 million from the fund to the national implementing entity to mitigate risk in exploratory drilling (p. 14). What is the relationship between the GFF and the revolving facility the CTF is helping establish? Are there plans for the existing fund to learn from the CTF-backed facility? 	<p>The \$220 million have already been transferred from GFF to the newly established Geothermal Support Facility within PT SMI. \$49 million of these funds will be used together with CTF funds for exploratory drilling. When the funds starting flowing back following licensing/concession awards these will be deposited into a revolving fund and made available to finance the next round of exploration.</p>
11	<ul style="list-style-type: none"> We would also like to see a bit more detail about how financially sustainable these geothermal plants will be, particularly in regards to potential market size given that Eastern Indonesia has high poverty rates and low electrification rates (p. 15). However, we do note that existing infrastructure, distribution networks, and demand will be included in the assessments of possible development sites (p. 32). 	<p>The licensing of geothermal work areas explored under this project will be backed by Power Purchase Agreements signed by PLN. The tariff level will be set by secondary regulation for Geothermal Indirect Use under the new Geothermal Law and is expected to be around the avoided cost of diesel generation for work areas in Eastern Indonesia. The calculations presented in the PAD indicates a positive rate on return at such tariff levels. Electricity consumers will continue to buy at PLN's standard rates. The financial viability issues will be presented in more detail in the final PAD.</p>