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Att: CDM Executive Board

Your ref.:  
UNFCCC Ref 4722

DNV responsible ref.:  
MLEH

Date:  
11 August 2011

QUESTIONS RAISED BY CDM EXECUTIVE BOARD MEMBERS	RESPONSE SUMMARY FROM DNV	ACTION TAKEN (IF APPLICABLE)
1. The DOE shall further substantiate: (i) the appropriateness of benchmark applied as per paragraph 12 of “Guidelines on the assessment of investment analysis”, version 3.1 given that the identified financial indicator is Project IRR whereas the applied benchmark is equity benchmark (Capital Asset Pricing Model);	The project has no debt which means that the benchmark determination is confined to the cost of equity. Due to this the project IRR is equal to the equity IRR. To make things clear, the selected financial indicator has been revised to equity IRR. The absence of debt funding has been appropriately validated by DNV using evidence /8/ and /11/ and stated and confirmed in the Validation Report through evidence for CL7 (p.A-44) and CL38 (p. A-62). The determination of the company internal benchmark has been revised according to the guidance provided in the “Guidelines on the assessment of Investment Analysis, v.5” and is based on the parameters that are standard in the market as provided by Appendix A in the Guidelines. Note that this value is very conservative as it is in real terms whereas the economic analysis has been performed in nominal terms i.e. including inflation. DNV has validated the correctness of the revised benchmark determination.	The PDD and validation report have been updated to clarify that the selected financial indicator is an equity IRR which is compared with an expected rate of return on equity. Moreover, the funding structure of the project entity is highlighted The PDD and validation report was updated to apply as benchmark the CDM EB default factor for expected return on equity. The PDD, sensitivity analysis spreadsheet and validation report has also been updated to reflect the changes to the sensitivity analysis from the change of the benchmark.
(ii) correctness of the calculation of the benchmark in line with paragraph 111(d) of VVM v1.2;	The project benchmark is based on the cost of equity (see above response). The determination of the benchmark has been revised according to guidance provided in the “Guidelines on the assessment	The PDD and validation report has been updated to reflect the use of the default value for expected return on equity for “Group 2” projects

and	of investment analysis” (version 5) and the default expected return on equity for “Group 2” projects in Ecuador stated Appendix A of the guidelines were applied for the benchmark rather than, as earlier, using best financial practices. As a result of these changes the benchmark has been revised from 16 to 18%. In DNV’s opinion the revised benchmark determination conforms with the “Guidelines on the assessment of investment analysis” (version 5).	in Ecuador using Appendix A of the “Guidelines on the assessment of investment analysis (version 05).
(iii) suitability of risk premium and the adjustment factor (beta) of the CAPM in line with paragraph 111 (a) of VVM v1.2. Please also provide the spreadsheet of the benchmark calculation.	The risk premium and Beta calculations for CAPM have been replaced by the CDM EB default factor for expected return on equity for “Group 2” projects in Ecuador using Appendix A of the “Guidelines on the assessment of investment analysis” (version 5). The value provided in Appendix A has therefore been used as a simple default option to determine the returns on equity expected by the market. DNV has reviewed the change to a default benchmark factor and has validated the correctness of the choice and conservativeness of the benchmark.	The PDD and validation report has been updated to reflect the use of the default value for expected return on equity for “Group 2” projects in Ecuador using Appendix A of the “Guidelines on the assessment of investment analysis (version 05).
2. The DOE shall further substantiate the suitability of: (i) crude oil price given that the cost saving of the crude oil is not included in the project revenue, in particular the market price of crude oil;	In line with economic theory reflected in the additionality tool’s financial analysis, only incremental cash flows at the time of investment decision accruing to the project proponent need to be considered. The price of crude oil is not relevant because under its operating license PETROAMAZONAS can use crude oil for power generation at no cost whereby it is not eligible for any revenues from crude oil not used for power generation (savings do not accrue to PETROAMAZONAS). Reference is to the resolution of CL 38 in Table 3 of Appendix A to the validation report where DNV concludes as follows: DNV was able to confirm that given the legal framework for oil exploration in Ecuador and the approval from the Ministry of Mines and Petroleum, via the Directorate of Hydrocarbons, PETROAMAZONAS EP has no direct economic benefits from savings in crude oil. DNV’s further investigations also confirmed that while PETROAMAZONAS EP is owned 100% by the State (Government) of Ecuador, PETROAMAZONAS EP is responsible	PDD has been updated in section B.5 (substep 4b) to include an explanation why cost saving of the crude oil have not been considered The validation report was revised in section 4.6.3 to include DNV’s assessment of the suitability that cost saving of the crude oil have not been considered

	<p>for proposing and developing the business within the mandate laid out in the corresponding Decree. PETROAMAZONAS EP is run by a management overseen by a Board of Directors presided by the Minister of Petroleum and Mines. It is thus in DNV's opinion acceptable that the investment analysis, which represents the economic attractiveness of the project in the perspective of PETROAMAZONAS EP, does not consider crude oil savings as a result of the project activity.</p> <p>DNV's further investigation showed that while PETROAMAZONAS EP has no direct economic benefits from saving in crude oils, the crude oil production rate is one of the main key performance indicators for PETROAMAZONAS EP. However, DNV's calculation showed that the crude oil savings achieved as a result of the project at Eden Yuturi, Pañacocha and Block 31 only represent 2-3% of the total crude oil production at Eden Yuturi, Pañacocha and Block 31. The savings are thus rather insignificant and it is in DNV's opinion reasonable to assume that it is not likely that the project would be implemented only to improve the key performance indicator of crude oil production. Moreover, to increase crude oil production, the project would have to compete with other investment opportunities, such as investing into further drilling and exploration.</p>	
<p>(ii) the assumed amount of gas available for power generation given that the gas production estimates after 2013 reduced about 50% from the level of the years 2009-2013; and</p>	<p>Oil companies, including PETROAMAZONAS, update gas production estimates on a continuous basis whereby numbers can vary significantly within a relatively short time period. As was validated by DNV, the forecast productions for 2009-2013 were the best available at the time of the investment decision, which is the data required in line with the EBs guidance on investment analysis. Production figures for the period after 2013 only became available after the time of the investment analysis, which explains the drop in the time series.</p> <p>As is indicated in the sensitivity analysis contained in section B.5 of the PDD, "An increase in the Project returns could also be triggered by an increase in gas volumes". However, this is technically unlikely as the amount of gas that can be utilized is capped by the total</p>	<p>The validation report was revised to in section 4.6.3 elaborate on DNV's assessment of the assumed amount of gas.</p>

	<p>amount of gas-based generation capacity installed under the Project Activity”.</p> <p>Please refer to the resolution of CL 41 in Table 3 of Appendix A to the validation report where reference is made to a letter from the Ministry of Non Renewable Natural Resources /2/ validating the production forecast issued by PETROAMAZONAS EP in connection with the CDM project activity.</p> <p>Please note, that the eventuality of the gas generation levels staying on the 2013 level for the remainder of the period of analysis is already covered in the sensitivity analysis, where it is shown that the benchmark can not be reached with increases in gas volumes given the limitation imposed by the available gas-based generation capacity installed by the project.</p>	
(iii) the investment cost. Please refer to paragraph 111 (a) & (b) of VVM v1.2.	<p>The investment costs have been suitably assessed in line with paragraph 111 a and b of the VVM, i.e. a thorough assessment based on evidence and expertise as well as by cross-checking against third party evidence as reported in section 4.6.3 of the validation report. As stated, PETROAMAZONAS has spent 66.4% of the budgeted amount already until the end of 2010. The total investment costs are \$81 671 975 USD and are budgeted to be spent up to 2012.</p> <p>The remaining funds will be provided by the Ministry of Finance and income from CERs as is validated by the signed ERPA.</p>	Not applicable
3. The DOE shall further substantiate the validation of identified baseline, in particular, how the DOE has justified the elimination of alternative G4, G7, G8 and P3 as per the AM0009 v4 (page 6) given that these alternatives have not been eliminated based on either prohibitive barriers or investment comparison analyses as required by the methodology and the	<p>G4 “Onsite use of associated Gas for Liquefied Natural Gas (LNG) production” is not a viable alternative for the following reasons:</p> <ul style="list-style-type: none"> <li>– At any given site the maximum amount of associated gas available is 7 - 8 mmcfpd which is far below any threshold to justify the investment of an LNG facility (lack of “economy of scale”).</li> <li>– Long term stable associated gas supply is by no means guaranteed.</li> <li>– At the time the investment decision was made there was no LNG market in Ecuador.</li> </ul> <p>G 7 “Recovery, transportation and compression of the associated gas</p>	Section B.4 of the PDD has been updated to elaborate on the prohibitive barriers faced by alternatives G4, G7, G8 and P3.

<p>associated gas has been partially processed to produce diesel in the pre-project scenario.</p>	<p>and / or gas lift gas into a gas pipeline without prior processing without being registered as a CDM project activity” is not a viable alternative for the following reasons:</p> <ul style="list-style-type: none"> <li>– Due to lack of critical mass, long distances to potential processing facilities and uncertainty of future associated gas volumes and composition this alternative imposes such investment risks and hurdles making it impossible to obtain required funds.</li> </ul> <p>P 3 “ Supply recovered gas to an existing gas processing plant and constructing the necessary infrastructure, without being registered as a CDM Project Activity” is not a viable alternative due to the reasons laid out in CL 19 in Table 3 in Appendix A of the validation report. DNV has received a copy of the legal mandate for PETROAMAZONAS EP and can confirm that the mandate for PETROAMAZONAS EP is the exploration and production of hydrocarbons within the allocated blocks/areas. Moreover, DNV has been able to confirm via the evidence presented that the Sushifindi plant (owned by EP PETROECUADOR through its daughter company Petroindustrial) - although originally designed to process the associated gas produced in neighbouring oil fields, among other the Limoncocha field - has not been receiving the gas volumes projected earlier for reason laid out below. The government support to the project activity is a proof that there are no intentions to pursue the original intention of sending the gas from Limcocha oil field to be processed in the Sushifindi plant.</p> <p>The main reasons the original plan has not been pursued over the past years are the following:</p> <ul style="list-style-type: none"> <li>– PETROAMAZONAS EP cannot guarantee a long term gas volume and gas composition to justify the investment for the infra-structure required to take the gas to the processing plant.</li> <li>– By sending gas to the processing plant PETROAMAZONAS would obtain no benefits, and for this reason this investment is not likely to be approved. The alternative was evaluated to</li> </ul>	
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	<p>receive residual gas in exchange for raw gas to be used as power generation but, based on the engineering study undertaken in 2008/2009 by TECNA, the residual gas received back from processing plant would be of such poor quality that it would not meet minimum requirements (LHV) for power generation. Moreover, the residual gas supply would not be stable.</p> <p>– Based on the existing mandate assigned to PETROAMAZONAS by the Government of Ecuador, the company must focus on operating the corresponding oil production facilities.</p> <p>G 8 “Consume on Site to meet energy demands without being registered as a CDM Project Activity” is not a viable alternative due to the project not meeting hurdle rate (see Investment Analysis). Less than 1% of the available associated gas within the project boundaries is used for producing approximately 50% of PETROAMAZONAS’s diesel demand at an existing topping plant whereby, even in the event of producing 100% of the diesel demand, it would require less than 2% of the total amount of associated gas available. As such there is little or no incentive to implement this expansion given the fact that PETROAMAZANAS purchases diesel at a heavily subsidized price.</p>	
<p>4. The DOE shall further substantiate that:</p> <p>(i) the project emission from consumption of electricity is in line with AM0009 v4 (page 9) given that the project emission due to the use of electricity for the associated gas recovery and transportation etc are not included; and</p>	<p>Electricity consumption is included in the ER calculation and is in line with AM0009 and the “Tool to calculate baseline, project and/or leakage emissions from electricity consumption”.</p>	<p>The PDD was revised in section B.6.1 to describe the type of equipment used for associated gas recovery and transportation, etc, which is being considered in the determination of project emissions from consumption of electricity.</p>
<p>(ii) the project emission has been calculated correctly in line with paragraph 92 (d) of VVM v1.2</p>	<p>The PDD has been revised; the measurement/calculation of project emissions from electricity consumption by the gas processing equipment is now in line with the “Tool to calculate baseline, project</p>	<p>The PDD has been updated in parts B.6.1-B.6.3 and B.7.1 and the validation report was updated accordingly.</p>

given that an “Approach 1” is introduced by the project participant to calculate the electricity consumption by the gas processing equipment (validation report, page 31 & 32).	and/or leakage emissions from electricity consumption”.	
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