

December 10, 2008
Bogota, Colombia

Mr. Kai-Uwe Barani SCHMIDT
Secretary to the CDM Executive Board
UNFCCC
cdmregistration@unfccc.int

Ref: Documented Responses to Request for Review, Fedepalma Sector CDM Project

Dear Mr. Schmidt,

The Project Participants of the FEDEPALMA SECTORAL CDM UMBRELLA PROJECT FOR METHANE CAPTURE, FOSSIL FUEL DISPLACEMENT AND COGENERATION OF RENEWABLE ENERGY welcome your requests for further information on baselines, additionality, technology selection and monitoring. We share the UNFCCC's concern that every CDM project must be fully additional, in order to preserve the integrity of the CDM. Our guiding principles have been balanced along two tracks: On one hand, the project has to be fully transparent, completely additional, and comply with all the rules and regulations of the CDM. On the other hand, it has to carefully manage the enormous regulatory and carbon market risks that early movers have faced in this carbon market during its infancy and early development.

This sectoral project was conceived and has been developed by FEDEPALMA to lead member oil extraction plants from very high WWT methane emissions towards zero emissions, and from the use of fossil energy towards auto-generation of renewable energy. We ask that the Executive Board consider this leadership process and the investment decision from the perspective of the investors—the extraction plant managers, owners and boards, who have been interested but skeptical of this exotic new market for the sale of certified emissions reductions. One should take into account that the FEDERATION began leading this process in 2001 after the Marrakesh Accords, first through extensive capacity building, then by carrying out a technical and regulatory pre-feasibility study in 2004 before the KP had even come into force, and has since been attempting to lead these decision makers to invest millions of dollars into GHG mitigation projects during a period of enormous CDM regulatory and carbon market risks. The investors fear many CDM-related regulatory risks, including the possibility that nations may not reach agreement for the post-2012 model and targets; they also fear many market and price risks, having witnessed the carbon price collapse in 2007, having observed the great volatility in CER prices over time, and being cognizant that Annex B governments may eventually decide to comply with “hot air” AAUs or severely restrict the import of CERs for compliance, leading CER prices downward (among other market risks).

FEDEPALMA's responsibilities to manage the investors' regulatory and carbon market risks on the one hand, and to ensure project additionality on the other, have been manifested in a clear policy:

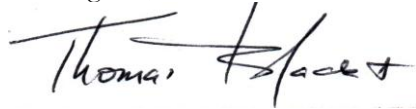
- no plant is to build the new covered anaerobic digesters (Technology Option I, the project activity) to capture and mitigate the methane flows until the project has been officially approved and registered by the CDM Executive Board.
- After the first year of operation of the project activity, *if and only if* Technology Option I successfully generates the expected volume of CERs and these are all sold at acceptable price levels, then the 32 plant owners will each select and design either Technology Option II (generation of renewable energy for own use) or Technology Option III (optimized co-generation and sale of excess electricity to the grid).

As was documented in the DOE Validation field visits, BAU in these 32 plants is WWT with open anaerobic lagoons that emit methane, a very strong and well documented emissions baseline that is operating and in full evidence today at every plant. This BAU condition is documented at each plant photographically, and the compendium of photographs and schematics of each open lagoon WWT treatment system is part of the documentation validated by DNV and is available.

The construction and implementation strategy for Technology Option I (Methane Capture and Mitigation only) depends solely and completely on CDM Registration and CER sales. Without CDM Registration, this project activity will not be built or implemented at the extraction plants because the only source of income is CER sales, and the investment and operating costs of the project activity are very high. Without CDM Registration, approximately 750,000 tons of CO₂e annually will continue to flow into the atmosphere from the WWT open lagoons at the 32 interested plants. With CDM registration, the sales of CERs will cover the costs of capturing and mitigating these greenhouse gases, allowing construction to begin.

Below, please find the responses, documentation and modifications to fully address the 4 points from the RR in the most transparent way. We hope this will address any concerns, and remain at your disposal to address any further questions.

Best regards,

A handwritten signature in black ink, appearing to read "Thomas Black-Arbeláez". The signature is written in a cursive style with a long horizontal stroke extending to the right.

Thomas Black-Arbeláez
Project Participant

RESPONSES TO THE 4 POINTS IN THE RR FROM THE PROJECT PARTICIPANTS

Each of the 4 points included at the end of the F-CDM-RR form received from the UNFCCC have been addressed below in two parts: A and B.

- In Part A, the Project Participants (PP) provide clarification and justification of how and why the PDD has been presented and documented in the actual version.
 - In Part B, Project Participants (PP) provide responses to each point, along with modifications and supporting documentation including a modified version of the PDD.
1. *The PP/DOE should further clarify the additionality of the project activity, in particular, the financial analysis conducted for: a) 16 plants rather than 32 plants, and b) a 10-year period whereas the project lifetime is of 30 years.*

A. PP Clarification and Justification of this issue as addressed in the PDD:

The PDD was written to transparently represent the process by which the 32 plant managers have been led by FEDEPALMA through the incremental decision making progression to develop this CDM sectoral project. The CDM technical and financial prefeasibility study conducted in 2004 was an essential part of the investment decision making process, because the financial analysis for the 16 plants was conducted jointly with the FEDEPALMA Environmental Division and the plant owners to determine the viability of the project activity without and with CERs for the sector. Because all the plants in the sector use the same basic production process and exactly the same set of waste water treatment (WWT) and energy technologies in BAU, differing only in size and capacity, the plant owners were absolutely confident that the financial analyses of the 16 plants that they selected for the study were fully representative of the 32 plants. This financial analysis was discussed with all decision makers and was the basis for the decision by the plant owners to join, or not join, the FEDEPALMA Sectoral Umbrella CDM project. The logic was strong and clear then, just as it is today: the net cash flow and NPV for Technology Option I were negative without CERs, because the investment and operating costs were high but there was no source of income associated with capturing and mitigating methane, in the absence of the CDM and CER sales. BAU is established by the national regulations for WWT, which specifies anaerobic lagoons.

Regarding the 10 year time frame used in the original financial analysis, it is common practice because all analyses are subject to high levels of country risk, interest and discount rates. Any project that is not profitable within the first 10 years will not be so in 30, especially if there are no income streams.

B. PP Response, documentation and modifications:

In 2008, in preparation for CDM Registration and subsequent project implementation, FEDEPALMA contracted an expert WWT consulting firm, Proyectos Civiles y Ambientales (PCA), to design the new covered anaerobic digesters (Technology Option I) for each of the 32 plants taking into account all the equipment and technologies that are required by the approved methodology AM 0013.v4. The Federation then hired a leading investment bank, INCORBANK, to undertake a complete financial feasibility study of Technology Option I with current price levels, based on the PCA designs, including cash flow analyses for the 30 year lifetime of the project. Due to the extensive requirements of the methodology, the actual investment costs are today several times higher than were originally estimated in 2004. As was found in the 2004 financial analysis study, the absence of incomes from capturing and

mitigating the methane result in negative cash flows and NPV, in the absence of CDM registration and CER sales. Application of the 30 year project lifetime without CER sales makes it even more negative than a 10 year time frame. This updated and complete financial analysis confirms the original financial analysis finding from 2004, that this project is completely and fully additional. It will not take place without CER incomes.

The 2008 financial analysis carried out by INCORBANK for Technology Option I at each of the 32 plants is provided as additional documentation in the excel spreadsheet entitled “cash flow 32 plants INCORBANK”. Dr. Jaime Ricaurte, President of INCORBANK, welcomes any additional questions that the UNFCCC may have regarding the financial analyses of the 32 plants interested in undertaking the project activity. His contact data are found on the excel spread sheet.

2. *The PP/DOE should clarify the starting date of the project activity, as per CDM glossary of terms.*

A. PP Clarification and Justification of this issue as addressed in the PDD:

November 15, 2006 was the date that FEDEPALMA finished signing contracts with the 32 participating plants in the CDM umbrella project. The contractual commitment to participate in the CDM project by the entire set of plants was considered by the PPs to be a clear milestone, officially beginning the project. However, this is not in line with the CDM glossary of terms and the date has been modified.

B. PP Response, documentation and modifications:

According to the CDM glossary of terms, the starting date of a CDM programme activity is the earliest date at which either the implementation or construction or real action of a programme activity begins. Therefore, the estimated date for project construction, which will not begin until after the project has been registered, is estimated to be January 1, 2009, or the date of registration, whichever comes later. As indicated above, FEDEPALMA policy has dictated that no new anaerobic digesters will be built until after the project is Registered by the CDM EB.

3. *The DOE should clarify the technological choice for each plant and validate the applicability of the baseline methodology for each plant.*

A. PP Clarification and Justification of this issue as addressed in the PDD

As indicated above, FEDEPALMA’s responsibility to manage the investor’s regulatory and carbon market risks on the one hand, and to ensure CDM Additionality on the other, has been manifested in a clear policy in the development of this project:

- No plant is to build the new covered anaerobic digesters (Technology Option I, the project activity) to capture and mitigate the methane flows until the project has been officially approved and registered by the CDM Executive Board.
- After the first year of operation of Technology Option I, *if and only if* it successfully generates the expected volume of CERs and these are all sold at acceptable price levels, then the 32 plant owners will each select and design either Technology Option II (generation of renewable energy for own use) or Technology Option III (optimized co-generation and sale of

excess electricity to the grid).

Because investors face high levels of uncertainty regarding the project performance (eventual volume of CERs produced) and eventual CER incomes (quantity * prices of CERs to be sold) from the implementation of Technology Option I, ex-ante they are uncertain as to whether it will be financially feasible to implement Technology Option II (generation of renewable energy for own use with biogas power plants) or Technology Option III (optimized co-generation with high efficiency biomass & biogas boilers, new steam turbines and sale of excess electricity to the grid).

Risk management decisions led to a flexible approach in the PDD, based on stepwise implementation of the project in stages, leaving eventual selection of the energy generation technologies to be based on the real CDM outcomes: if CER production volumes and CER sales prices from Option I resulted low, investors would not implement options II or III. On the other hand, if CER production volumes and CER sales prices were high enough, owners would implement one of the two renewable energy production technologies that was most financially feasible for each plant.

On the assumption that the displacement of fossil fuels with renewable residual biogas and biomass is a leading objective of the UNFCCC and the CDM; considering that the cogeneration technology options identified in the PDD are commonly applied in many of the UNFCCC-approved CDM project activities around the world; and taking into account that the AM 0013.v4 clearly allows for the implementation of these technologies, the PDD and the Validation provided flexibility for step-by-step implementation based on the eventual real CER incomes resulting from the implementation of Technology Option I.

The future Verifications by DOEs, which by rule must be different than the Validating DOE, would have the responsibility to document which of the two generation technology packages would have been implemented at each plant over time, always determining whether the eventual choices are consistent with the Technology Options II and III as presented in the PDD, which clearly comply with the applicability conditions of the methodology.

B. PP Response, documentation and modifications:

The PPs understand and respect the UNFCCC's request for specificity in the choice of the technology packages to be implemented with the project activity at each of the 32 plants.

Therefore, we have modified the scope of the PDD to only request CDM Registration and Accreditation for Technology Option I, the implementation of new covered anaerobic digesters to capture and mitigate the biogas with high-efficiency flaring systems.

After registration and implementation of the project activity Technology Option I, ***if and only if*** Technology Option I is technically successful and the incomes from CER sales are sufficient to support further investments in cogeneration of renewable energy, **then the PPs will either present a second PDD (or request permission to modify this one if that is permitted by CDM regs at that time)**, to present in very specific terms the individual technology packages which will have been chosen by each of the 32 participating plants for generation of renewable energy.

The modified PDD includes complete references to Technology Options II and III, in order to represent the financial decision-making process of the sector in the most transparent and historically correct manner possible, but only seeks CER accreditation for Technology Option I, which is described in detail in the PDD and in Annex I of this document.

As indicated in response 1.B above, in 2008 FEDEPALMA contracted the WWT consulting firm PCA to carry out the engineering design for this Technology Option I for each of the 32 plants. Each plant now has its anaerobic digester design and its financial feasibility study, and is awaiting UNFCCC approval and Registration before beginning to build and implement the project activity for capturing and mitigating the methane flows from the existing open lagoon WWT systems.

4. *The DOE should further clarify the monitoring plan for each plant.*

A. PP Clarification and Justification this issue as addressed in the PDD

The monitoring plans and technologies for each plant as stated in the actual PDD include all III Technology Options, and are based on the same explanations related to risk management for investors and assurance of project additionality as were presented in section 3.A, above, in strict accordance with the approved methodology. The comprehensive monitoring plan and technologies allow plant managers to incrementally select and monitor either of the two energy production technologies that they choose to implement, and allows the Verifier to ensure that the technology choices and related monitoring technologies comply with the approved methodology.

B. PP Response, documentation and modifications:

The PPs understand and respect the UNFCCC's request for specificity in the choice of the monitoring technology and monitoring plans to be implemented with the project activity at each of the 32 plants.

The PDD has been modified to specify the monitoring technology and monitoring plan for implementation of Technology Option I, the implementation of new covered anaerobic digesters to capture and mitigate the biogas with flaring systems. The monitoring plan will include the elements to be used in Technology Options II and III, clearly indicating that those will only be included as those Technology Options are implemented in the future.

After registration and implementation of the project activity, *if and only if* Technology Option I is technically successful and the incomes from CER sales are sufficient to support further investments in cogeneration of renewable energy, then the PPs will either prepare a second PDD (or request permission to modify this one if that is permitted by CDM regs) and present in very specific terms the individual technology packages which are chosen by each of the 32 participating plants for generation of renewable energy, **which will include the specific monitoring technologies and monitoring plans for each of the individual technology choices that will have been made and specified by the 32 plants.**

CONCLUSIONS FROM THE PROJECT PARTICIPANTS:

In the responses above, the project participants have addressed all 4 points from the RR in a transparent and documented fashion. The financial analyses to demonstrate additionality have been

updated and made comprehensive as requested, confirming that the project is just as financially additional today as it was when the initial analyses were made for decision makers in 2004. This document demonstrates that the project is environmentally additional and sequentially additional as well, because no covered anaerobic digester will be built until this project is registered by the CDM EB. Without CDM Registration, approximately 750,000 tons of CO₂e annually will continue to flow into the atmosphere from the WWT open lagoons at the 32 interested plants. With CDM registration, the sales of CERs will cover the costs of capturing and mitigating these greenhouse gases, allowing construction to begin.

The PDD has been modified to limit the scope to Technology Option I – Capture and Mitigation of Methane with Covered Anaerobic Digesters and High Efficiency Enclosed Flaring Equipment. As requested, the monitoring package and plan have been specified for technology option I.

Finally, the starting date has been modified to comply with the definition in the CDM glossary of terms.

Registration, implementation and verification of this sectoral project offers the UNFCCC an opportunity to observe, document and verify a sectoral model that was designed “bottom up” and fully complies with all written CDM regulations. It supports an incremental approach to multiple investment options that documents the decision making process and allows flexibility over time in implementation by stages, based on effective CDM incomes. In the context of rising criticism of the CDM system from entities like the US GAO, most analysts seeking to improve the CDM point to sectoral models because of their ability to generate economies of scale that reduce costs and increase benefits, increase transparency, and allow developing countries to more greatly contribute to the mitigation of climate change. (please see annex II, THE FEDEPLAMA UMBRELLA PROJECT AS A CASE STUDY FOR DESIGN AND IMPLEMENTATION OF A BOTTOM-UP SECTORAL MODEL FOR CDM)

The project participants welcome the opportunity to serve as a case study for the UNFCCC in the implementation and verification of this “bottom-up” sectoral model for CDM, which may be useful for replication in other sectors and other developing countries.

The Project Participants and member firms look forward to your comments and decision on this matter and look forward to working together in the implementation, documentation and verification of this sectoral model.

Best regards,

Jens Mesa-Dishington
Executive President
Federation of Colombian Palm Oil Producers
Project Participant

Thomas Black-Arbelaez
Director
The Andean Center for Economics in The
Environment
Project Participant

ANNEX I. TECHNOLOGY CHOICE FOR EACH OF THE 32 PLANTS FOR THIS PDD

Technology Option I: METHANE CAPTURE AND MITIGATION ONLY. A covered anaerobic digester must be built to optimize wastewater treatment efficiency and to capture the entire biogas/methane flow produced. This will be done in one of two ways: A) Retrofit and cover the existing methanogenic lagoon, to convert it into a covered anaerobic digester with adequate sludge management capability, and capture and burn the methane in a high efficiency flare or in the industrial oven. B) A new covered anaerobic digester is built and the old anaerobic lagoon is decommissioned. The new digester is built to conform to national waste water treatment laws and regulations, and is designed on the basis of the acceptability criteria of the approved methodology AM0013. To burn the methane, firms will choose between either an enclosed flare system or by adapting existing industrial burners to burn the biogas. New technologies required to implement this option include:

- *Anaerobic digesters equipped with high-density geomembrane and structural supports to ensure that waste waters are fully contained and controlled in within the digester .*
- *Encasing the digester perimeters to contain the wastewater in a rigid manner and to provide stable and solid surfaces to attach the geotextile digester cover in an airtight manner, in order to capture the entire biogas-methane flow.*
- *Continual flow meter and COD Analyzer at the entrance and exit of the anaerobic digester to measure the amount of COD before and after anaerobic treatment, to determine the amount of COD decomposed by the treatment system.*
- *Real time temperature meters to monitor the ambient temperature of the anaerobic digester.*
- *Real time biogas flow meters to measure the flow of biogas being transported from the digester outlet to the biogas cleaning and filtering system.*
- *Real time gas analyzers to determine the composition of the biogas flow being transported from the digester outlet to the biogas cleaning and filtering system consistent with the methodology AM0013 v.4 and the latest version of the “tool to determine project emissions from flaring gases containing methane”.*
- *A modern sludge extraction system with pumping and field management equipment;*
- *Continual flow meter and COD analyzer at the exit of the sludge dewatering facility.*
- *Biogas cleaning and filtering systems. These filters are required to remove unwanted components commonly found in biogas (CO₂: 30-40%; H₂S: 0.10-0.20%) in order to burn the methane flow efficiently in flares or in the industrial ovens. Various types of filtering system technologies are available.*
- *Biogas storage tank systems to store cleaned gas generated during hours that plant is not operative, for burning in boilers or gensets when the plant is operating.*
- *Gas analyzers to determine the composition of the biogas and the amount of methane at the outlet of the biogas cleaning and filtering systems.*
- *High efficiency burners adapted into existing industrial ovens to mitigate methane during plant operations.*
- *High efficiency enclosed flares to fully mitigate the residual methane when plant is not operating.*
- *Real time flow meters to measure the amount of methane entering each destination: flares and ovens.*
- *Run time meter to measure the duration of burning by the enclosed flares and ovens.*
- *Real time flow meters to measure the amount of residual methane being emitted after burning the methane, placed in the stack of the enclosed flare or in the stack of the industrial oven.*
- *Gas analyzers to determine the composition of the biogas gas after burning by the enclosed flares or in the oven stacks consistent with the methodology AM0013 v.4 and the latest version of the “tool to determine project emissions from flaring gases containing methane”.*
- *Data monitoring, recovery and transmission systems to central databases. These automated systems will gather data flows of waste water COD, temperature in the digester, and gas flows and composition before and after burning. They will organize it according to AM0013 monitoring requirements, and transmit it by hard line to data bases in plant offices and by internet to FEDEPALMA CDM UMBRELLA PROJECT operating center.*

Annex II: THE FEDEPLAMA SECTORAL UMBRELLA PROJECT AS A CASE STUDY FOR DESIGN AND IMPLEMENTATION OF A “BOTTOM-UP” SECTORAL MODEL FOR CDM

This project represents an opportunity to implement, observe and verify a sectoral model that was designed from the ground up (as opposed to top-down models) and fully complies with all written CDM regulations. In the face of criticism of the CDM system from entities like the US GAO¹, most analysts seeking to improve the CDM point to sectoral models because of their ability to generate economies of scale that reduce costs and increase benefits, increase transparency, and allow developing countries to more greatly contribute to the mitigation of climate change.

The FEDEPALMA project, validated by the DOE and ready to build and implement, is a CDM sectoral model designed from the bottom up with a strong Producer Association and member firms, with policies to assure additionality, with a very clearly documented baseline at its foundation, completely transparent in its decision making process, that is leading an entire agro industrial sector towards zero GHG emissions and towards a remarkable sectoral cogeneration project with residual biogas and biomass. This sectoral model was conceived from within the existing set of written CDM regulations and fully complies with them. It allows investors to mitigate high regulatory and market/price risks through a flexible, transparent and verifiable approach, based on incremental responses to effective CER generations and sales from previous stage investments that permit optimized decision making regarding each successive stage of investment.

The research, transactions and information costs of large scale emission reduction projects can be too costly for plants to apply CDM individually. Under this sectoral model, many of the high transactions costs so criticized by GAO are distributed over the 32 plants, substantially reducing per-firm costs. Centralizing complex approval processes, audits and emissions monitoring programs through the producer association provides more efficiency than the individual firm can. Centralized purchasing of CDM equipment and technology in large quantities for multiple participant firms will significantly reduce investment and operating costs. Continued market analysis permits effective and fair CER pricing strategies. Consolidation of CER offerings into large annual volumes by the Producer association is more attractive to international CER buyers than multiple offerings of very small quantities, permitting a better price. The added value permits additional investments in new technology, better trained professionals and a cleaner environment in developing countries. The added value also permits the Project Proponents to formulate new, additional CDM sectoral projects in other areas.

This sectoral approach also offers environmental and social benefits than individual projects may obtain. The producer association's research center CENIPALMA will provide expertise and carry out applied research for technical decisions as needed to promote efficiency and environmental effectiveness. As high efficiency covered anaerobic digesters replace convention open lagoon systems, there will be substantial improvements in the quality of water effluents and air quality for the entire sector. As efficiently designed cogeneration systems with residual biogas and biomass displace diesel and grid electricity, the spatial distribution of the Palm Oil Extraction Plants throughout the country will supply electricity to municipalities not connected to the Grid. Because these municipalities currently generate with petrodiesel, three times more CO₂ emissions will be displaced per MWh

¹ US GAO report 09 151, “Lessons Learned from the European Union’s Emission Trading Scheme and the Kyoto Protocol’s Clean Development Mechanism”, Washington DC, November 2008.

produced of renewable energy from the project. This provides an important social benefit since many of these towns do not have a stable electricity supply and only receive electricity for at most 6 hours a day. Developing country governments have to subsidize off grid energy and absorb high diesel transport costs to secure electricity generation in these areas. The sectoral model can reduce these costs to national budgets, and improve the stability and coverage of electricity supply in rural areas. When fully implemented, this sectoral project may contribute between 150 and 200 MW on nominal installed capacity to these areas, all with residual biogas and biomass cogeneration.

Large CDM sectoral approaches offer more efficiencies, can be more robust and additional than individual projects, and can bring to bear research centers and best available technologies in a more cost effective manner than individual projects can. They can dramatically reduce transactions costs while greatly improving total emissions reductions in developing countries. Producer associations like FEDEPALMA with strong environmental programs can provide assurance on additionality, while lending transparency, investment risk management and economies of scale to GHG reduction investments.

FEDEPALMA welcomes the opportunity to serve as a case study for the UNFCCC in the implementation and verification of this “bottom-up” sectoral model for CDM. This case study could be very useful for replication in other sectors and other developing countries.

The Project Participants and 32 member firms look forward to your comments and decision on this matter and look forward to working together in the implementation, documentation and verification of this sectoral model.