

OFFICE MEMORANDUM

DATE: February 15th, 2008

TO:  Alan Miller, IFC GEF Regional Coordinator, CESGE

FROM:  Sandeep Kohli, Sr. Project Officer, CESSE

EXTENSION: 35317

SUBJECT: **Country Name: Brazil Project Name: Externally Fired Combined Cycle Tech. PPG (Former PDF Block C) Final Completion Report - TF 052369**

1. Please find the completion report for above mentioned PPG (PDF Block C) which was approved on April 10th, 2003 with a funding of USD300K. The grant was fully disbursed. It closed on April 30th, 2005.

2. The grant was used to prepare a feasibility study for an externally fired combined cycle (EFCC Technology), 80 MW, 200 tons/hr. steam co-generation plant at the Costa Pinto sugarcane processing facility in Piracicaba, Sao Paulo, Brazil. Per agreement, the following activities were to be financed under the PPG (PDF C):

- a. Costa Pinto Facility Operations
- b. EFCC/DFCC Site Selection and Suitability
- c. Environmental Regulations and Requirements
- d. EFCC/DFCC System Configuration, Performance and Cost
- e. EFCC and DFCC System Component Sourcing
- f. Project Financing Strategy
- g. Energy Sales and Supply Strategies
- h. Cosan Agreements in Principle for Bagasse Supply, Site Access and Energy Use
- i. Project Proformas
- j. Project Implementation Strategy
- k. Summary Report

The specific activities and outputs funded under the PPG (PDF Block C) grant originated 21 disbursements as follows:

1. First withdrawal 10% of total grant. USD30K
2. Project evaluation model. USD24K
3. Project proformas. USD24K
4. Site selection. USD9K
5. Definition of the power system and power plant design basis. USD24K
6. Project financing strategy. USD18K
7. Preliminary design of the gas turbine generator, air heater, turbine control valve and high pressure piping. USD30K
8. Preliminary design of the integrated steam generator. USD15K
9. Final report of the power plant system and power plant design basis. USD3K
10. Final report of the gas turbine generator, air heater, turbine control valve and high pressure piping. USD6K

11. Preliminary report of the steam turbine generator, condenser and cooling tower. USD6K
12. Preliminary report fuel preparation, storage and handling; gasifier and synthesis gas clean up, and external combustor. USD15K
13. Final report integrated steam generator. USD3K
14. Final report steam turbine generator and condenser. USD3K
15. Final report fuel preparation, storage and handling; gasifier and synthesis gas clean up, and external combustor. USD6K
16. Preliminary and final report of steam turbine generator, cooling tower, fuel supply and grid connections. USD21K
17. Final report project proformas. USD6K
18. Export energy market development and natural gas supply USD 15 K
19. Environmental regulations and requirements. USD9K
20. Final report. USD18K
21. Cosan Agreements. USD15K

3. The recipient has successfully completed all the activities funded under the PPG (PDF Block C), and all the outputs are satisfactory. A brief summary of the outputs/disbursements has been attached to this memorandum. Copies of the reports are available upon request.

4. I have reviewed the statement of expenditures and disbursements for the PPG (PDF Block C), and found it to be a fair representation of the activities and outputs for which the grant was given. The PPG (PDF Block C) grant was executed by Environmental Power Piracicaba Participacoes S/C Ltda., and disbursed through the SAP system. All pertinent documentation was submitted with each disbursement request.

Distribution:

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EFCC Summary of Outputs and Disbursements PDF Block C Grant
(TF-052369)

The outputs/disbursements were as follows:

1. **First withdrawal.** Per terms of the agreement, 10% of total grant (on or after effective date). USD30K.
2. **Project Evaluation Model.** Report that contains information on the process followed to determine the feasibility of the Project and the most appropriate level of involvement of Cosan in the Project. The focus of the report is on the key issues that the parties confronted and the resolutions arrived at. USD24K.
3. **Project Proformas.** Preliminary report which analyses the project's economic and financial performance projections to determine its profitability. USD24K.
4. **Site Selection.** Report assessing the site location in terms of bagasse fuel supply; proximity to existing bagasse handling and storage facilities; water availability; surface and sub-surface conditions, prevailing winds, proximity to other activities; floods, and surface drainage; proximity to fuel supply, to natural gas pipeline, to transmission connection; road and railroad access; special environmental conditions or concerns; personnel and sourcing maintenance support. USD9K.
5. **Definition of the Power Plant System and the Power Plant Design Basis.** Preliminary report that contains drawings and scenarios on the cogeneration plant configuration, its interface with the sugar mill, the mill interface design, bagasse fuel analysis, fuel handling and storage, the master equipment list for the cogen plant, and the overall heat and mass balance schematic. USD24K.
6. **Project Financing Strategy.** Report that analyses the different components of the financing strategy like: potential sources of project debt and equity; security requirements for the project's debt; needs for third party reviews, guarantees and/or insurance; preferred financing structure; impact assessment of various mixes of debt and equity; and the summary of the Overseas Private Investment Corporation (OPIC) financing. USD18K.
7. **Preliminary Design of the Gas Turbine Generator, Air Heater, Turbine Control Valve and High Pressure Piping.** Report that contains the preliminary design, schematics, budgetary quotations and sourcing plan for the above indicated equipment. USD30K.
8. **Preliminary Design for Integrated Steam Generator.** This report defines the Integrated Steam Generator (ISG) portion of the two EFCC power trains. It contains the description, schematics, functional specifications, arrangement, terminal points, equipment installation cost, sourcing plan and the preliminary operating and maintenance costs information. USD15K.
9. **Power Plant System and the Power Plant Design Basis.** Final report. Draft accounted under numeral 5 above. USD3K.
10. **Gas Turbine Generator, Air Heater, Turbine Control Valve and High Pressure Piping.** Final report. Draft accounted under numeral 7 above. USD6K.
11. **Preliminary Report Steam Turbine Generator, Condenser, and Cooling Tower.** Report contains description, schematics, functional specifications, arrangement, terminal points, preliminary operating and maintenance costs, sourcing plan and

preliminary schedule of order/delivery/installation & commissioning, in addition to the cost of installed equipment. USD6K.

12. **Preliminary Report Fuel Preparation, Storage and Handling, Gasifier and Synthesis Gas Clean-Up, and External Combustor.** Report defines the Gasification Islands portion of the cogeneration plant. It contains the description, schematics, functional specifications, arrangement, and testing certification. In addition to its terminal points, scope of supply, cost of installed equipment, sourcing plan, and the preliminary operating and maintenance costs. USD5K.

13. **Integrated Steam Generator.** Final report. Draft accounted for under numeral 8 above. USD3K.

14. **Steam Turbine Generator and Condenser.** Final report. Draft accounted for under numeral 11 above. USD3K.

15. **Fuel Preparation, Storage and Handling, Gasifier and Synthesis Gas Clean-Up, and External Combustor.** Final report. Draft accounted for under numeral 12 above. USD6K.

16. **Auxiliary Steam Generator, Cooling Tower, Host Interface, Fuel Supply and Grid Connections.** Preliminary and final reports include the selection, budgetary estimates and sourcing plans for the above equipment. USD21K.

17. **Project Proformas.** Final report. Draft accounted for under numeral 3 above. USD6K.

18. **Export Energy Market Development and Natural Gas Supply.** Report contains information on the electricity market in Brazil and recent legislative initiatives at the federal level that have an impact on the project. It also includes information on the requirements of ANEEL for the licensing of the proposed power generation facility, and contains a letter of interest from COMGAS regarding the supply of natural gas to the Project. USD15K.

19. **Environmental Regulations and Requirements.** The report contains information on environmental regulations and requirements obtained from IFC and WB documents for waste management facilities and thermal power plants, and on environmental impact assessment (EIA) requirements obtained from Brazilian sources. USD9K.

20. **Final Report.** Completion of feasibility study of employing advanced technology for the production of energy from biomass in Brazil. USD18K.

21. **Cosan Agreements.** Report contains the agreements reached on the resolution of key project issues like technology, capital cost, bagasse supply, mill requirements, facility site, ownership and project finance and economics. USD15K.