

**Dinesh  
Aryal@WORLDBANK**

06/17/2003 06:36 PM

To: Birama Nayagam Subramanian/Person/World Bank@WorldBank  
cc: Samuel G. Wedderburn/Person/World Bank@WorldBank, Eloisa  
Lu/HQ/IFC@IFC, Sharon Sullivan/HQ/IFC@IFC, Sandeep  
Kohli/HQ/IFC@IFC, Envgc Isc Files/Service/World Bank@WorldBank  
Subject: Re: TF052369 - GEF3 IFC-BRAZIL:FEASIBILITY STUDY FOR AN  
EXTERNALLY FIRED COMBINED CYCLE CO-GENERATION PLANT  
- TF Number Assignment.

Birama,

Please note that we have received a PDF B completion report for this project this afternoon.  
Please let me know if you have quesitons.

Dinesh

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----- Forwarded by Dinesh Aryal/Person/World Bank on 06/17/2003 06:34 PM -----

**Dinesh Aryal**

06/17/2003 03:19 PM  
88323 ENVGC

To: Birama Nayagam Subramanian  
cc: Samuel G. Wedderburn, Eloisa Lu, Sharon Sullivan, Sandeep Kohli,  
Envgc Isc Files/Ou=Service  
Subject: Re: TF052369 - GEF3 IFC-BRAZIL:FEASIBILITY STUDY FOR AN  
EXTERNALLY FIRED COMBINED CYCLE CO-GENERATION PLANT -  
TF Number Assignment. 

Birama,

Please note that this project has used a PDF Block B grant of \$0.22 mil (TF027717) which was  
approved by the GEF CEO on 1/10/2001. ENVGC has not yet received a completion report for it.

Dinesh

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Birama Nayagam Subramanian

**Birama Nayagam  
Subramanian**

To: Sandeep Kohli  
cc: Eloisa Lu, Obinna Ugochuku, Sharon Sullivan, Rohit Khanna, Dinesh



# OFFICE MEMORANDUM

DATE: June 17, 2003

TO: *Lars Vidaeus/Warren Evans*

FROM: Dana Younger/Sandeep Kohli

EXTENSION: 35317

SUBJECT: **Brazil EFCC Block B Grant (Trust Fund No. 027717)**  
**PDF Block B Final Completion Report**

1. Please find the completion report for above mentioned PDF Block B which was approved on January 8, 2001 with a funding of US\$ 220,000.
2. The recipient has successfully completed all the activities funded under the PDF Block B, and all the stated outputs are satisfactory. A brief summary of the outputs have been attached to this letter. The actual outputs are as follows:

Section 0: Executive Summary and Introduction  
Annex

Section 1: Mill Site Description  
Annexes

Section 2: Legal Issues and Arrangements  
Annexes

Section 3: EFCC Project Design  
Annexes

Section 4: Balance-of-Plant, Equipment and Costing Issues  
Annexes

Section 5: Economic Assessment  
Annexes

Section 6: Water and Environmental Issues and Permits  
Annex

Section 7: Risks

Section 8: Conclusions and Recommendations

There is no variance between the actual outputs from those listed in the PDF Block B request.

3. The PDF Block B funds have been used to carry out the activities as per the grant agreement between the Bank and the recipient. The specific activities funded under the PDF Block B grant are:

#### Task 1 - Design Basis

The project team (PT) will examine the site in detail and provide a detailed assessment of the suitability of the site for the proposed EFCC co-generation plant.

The information developed for the conventional Rankine cycle plant under the TDA sponsored study will provide some of the information needed for the GEF funded study. Please refer to Attachment VII "TDA Terms of Reference".

#### Task 2 - Agreements, Including Letters of Intent and Legal Opinions

Agreements on:

- Power sales with CPFL and UAE
- Fuel supply with UAE and auxiliary
- Fuel supplier
- Land lease
- Interconnection
- Operating and maintenance

Legal opinions on:

- Taxes and import duties pertaining to project
- Environmental, construction
- Water utilization and others
- Equipment import permits

#### Task 3 - Project Definition

Project Team (PT) is to prepare documentation, heat and mass balance, specifications, drawings, diagrams for major systems and equipment representing 80% of project costs.

##### 3.1 Site Specific

Site Access: height/weight and other limitations for physical access to proposed site; current and planned interconnections and access to the grid; and current and planned fuel supply rights-of-way;

Land Use: current and planned land use adjacent to, and in the immediate vicinity of the proposed site; evidence of existing contamination, if any, existing or

planned land use restrictions in the vicinity of the site construction impediments;

Site Features: topography, wind regime, precipitation regime, drainage and flood regime, special storm or weather event history;

Existing Environmental Conditions: air quality, water availability and quality, wastewater disposal options and capacity, landfills or land-based disposal uses, ecological setting, cultural and historic resources, and other data which may be needed to determine site suitability and later environmental impact evaluations;

Sub-surface Conditions: geology and seismicity, hydrogeology, groundwater hydrology, and sub-surface soils and characteristics; and

Fuel supply storage and handling to the "day storage bin" on the gasifier and auxiliary fuel supply and storage.

### 3.2 Balance of Plant (Equipment & Services)

- Interconnection and transmission
- Land and land improvements
- Foundations
- Utilities including communications
- Structural steel and platforms
- Lighting
- Fences
- Insulation and lagging
- Painting
- Fire protection
- Water supply (raw, potable, and treated)
- Buildings
- Plant maintenance facility
- Exhaust stack
- Furniture and fixtures
- Office equipment (computers)
- Compressed air service
- Overhead crane
- Tools and spares
- Transportation access
- Forced draft wet cooling tower

### 3.3 Power Plant System

Fuel Group - gasifier, refractory, start-up burners, flare, gasification air blower, cyclone, ash handling, syngas cooler/evaporator, particulate filter.

Turbine Group - gas turbine, steam turbine package, and local control.

Air Heater Group - main combustor, turbine control valve, H.P. piping, blow off, and local control.

IDF Group - I.D. fan, back end scrubber/SCR and stack.

ISG Group - integrated steam generator, superheaters, evaporators, economizer, feedwater heater, make up water systems, pumps, valves, trim, and local control.

Central Control & Instrumentation - data recording, emissions monitor.

#### Task 4 - Cost Estimates

Prepare a master list of equipment, and using the information developed in Task 3, determine the Total Project Investment (TPI); state margins for error.

Based on EPRI standards, adjusted for Brazil and information obtained from similar operations in the Campinos area on labor/skill rates, determine the Operating and Maintenance costs and state probable error margins.

#### Task 5 - Economic Evaluation

Using the information generated in Tasks 3,4 and 5, obtained from U.S. TDA funded study and current economic forecast for Brazil; prepare Operating Pro-formas through the term of the project secured loan. Conduct sensitivity analysis on principal project economic parameters, including capital cost, fuel cost, rate of inflation, and selling price of power.

Make a comparison of a conventional Rankine cycle solution, developed for the U.S. TDA sponsored UAE study, to the proposed EFCC solution in terms of the Cost of Electricity (COE) at the plant terminals over 15 years.

#### Task 6 - Environmental Impact Study

Using data from the above tasks and available information on the site and its surroundings, prepare an assessment of the impact for the EFCC option on the environment and compare the results with the conventional Rankine solution. The study will comprise:

- Characterization of the environmental interfaces (i.e., emissions, effluents, land use, and water requirements) of the proposed project;

- Definition of the existing environment at the site;
- Evaluation of the impact on the environment;
- Identification of mitigating measures that may be taken, their effectiveness and costs, where they are appropriate, and other areas that require additional study, if any.

The environment assessment will include issues identified by UAE or that are specified in Brazilian or local environmental laws and regulations in the guidelines of the World Bank, or that are commonly applied in U.S. or international industry practices.

#### Task 7 - Risk Assessment

Evaluate all generic and specific background factors that might impact the EFCC project, including political trends, sector reform and regulatory issues and requirements, local and country economic factors, and relevant commercial, monetary, trade and investment policies, practices and rules. In addition, quantify all technological and financial risks associated with the EFCC option and develop practical strategies for minimizing these risks. These strategies will consider alternative fuel options and flexible adjustments in operations. In addition, the availability of capital risk insurance through organizations such as the World Bank's MIGA subsidiary, or Overseas Private Insurance Corporation in the U.S., will be examined, as applicable.

#### Task 8 - Schedule

A Project implementation plan and a detailed schedule will be developed.

#### Task 9 - Ownership Options

Develop ownership options and a management structure for the project. Potential equity investors in the U.S. and Brazil in addition to potential financiers of debt will be identified.

#### Task 10 - Project Financing

A Financial Memorandum will be prepared for the purpose of providing a preliminary evaluation of the UAE Co-generation Project by private banks, the IFC, and other potential equity investors or lending agencies.

#### Task 11 - Final Report

The final feasibility report will include a comprehensive description of the proposed Project and a summary of the results of the individual components of the study. The report will include a detailed Project finance strategy and recommended course of action for Project implementation.

The amount of the grant, US\$ 220,000 was a lump sum payment and was used to pay for all the above activities.