E7 FUND FOR SUSTAINABLE ENERGY DEVELOPMENT

ELECGALAPAGOS S.A.

San Cristobal Island – Galapagos Wind Repowering Project

EXECUTIVE SUMMARY

PUBLIC AUDIENCE

For the presentation of the Terms of Reference for the Environmental Impact Assessment and Management Plan

Puerto Baquerizo Moreno, San Cristóbal Island
November, 2003

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For the presentation of the Terms of Reference for the Environmental Impact Assessment and Management Plan

The Terms of Reference

In accordance with articles 16 and 23 of the Book VI – Environmental Quality of the Unified Text of the Environmental Secondary Law, the Terms of Reference (TOR) for the Definitive Environmental Impact Assessment (EIAD) of the San Cristobal Island Wind Repowering Project have been prepared, which are being presented for a Public Audience, following the forthcoming regulations, in order to receive the criteria and comments from the public to the draft version of such document, before submitting it to final approval of the corresponding authorities.

As an appendix, the TOR are included, with the following content:

1. Introduction and general data
2. Project background
3. Focus
4. Objectives and scope
5. Methodologies and techniques
6. Determination of areas of study and direct and indirect influence
7. Environmental base line description
8. General description of the project
9. Analysis of alternatives
10. Identification, Prediction and Evaluation of Environmental Impacts
11. Environmental Management Plan (EMP)
12. Environmental Legal and Institutional Referential Frame
13. Public Participation Mechanisms
14. Report
15. Time frame for the EIAD execution

Legislation ruling the Public Audience

The Constitution of the Republic of Ecuador

Art. 88.- Every state decision that could affect the environment, must receive the criteria from the community which shall be previously informed. The Law shall guarantee its participation.

Environmental Law

Art. 28 .- Every natural or juridical person has the right to participate in the environmental management, through the mechanisms to be established for this purpose in the By-Law, which shall include consultations, public audiences, initiatives, proposals or any other way of association between the public and the private sectors…"

Environmental By-Law for Electricity Activities

Art. 21.- Before the submittal of the EIA the public criteria shall be considered and incorporated, especially from the population directly affected or favored, in compliance of Art. 88 of the Constitution of the Republic of Ecuador and Art. 28 of the Environmental Law. For that purpose, the project owner shall permit the access to the corresponding study, shall promote its dissemination and shall conduct public audiences or other mechanisms for information and criteria collection, whose minutes shall be incorporated to the corresponding EIA. The audiences shall have the participation of delegates from CONELEC and the Ministry of Environment and shall be carried out in accordance with the procedures established by CONELEC through the related regulation. The public criteria shall be incorporated, provided it is technically and economically feasible and if it contributes to improve the environmental conditions for the development of the project.

Unified Text of the Secondary Environmental Legislation
Book VI - Environment Quality

Art. 20.- Public participation in the environmental management has the purpose to incorporate the criteria and observations from the public, especially from the population directly involved with a work or project, regarding the relevant environmental parameters for the environmental impact assessments and environmental management plans, provided they are technically and economically feasible……

The project or activity proponent, in coordination with the Environmental Authority Responsible for the Application (Autoridad Ambiental de Aplicación Responsable, AAAr), shall conduct on a minimum and compulsory basis the public participation at following stages:

a.1) during the preparation of the Terms of Reference and before its presentation for revision and approval to the authority; and,

a.2) before the presentation of the environmental impact assessment to the application environmental authority based on a draft of such study……

The mechanisms for the public participation could be……..

b.4) Presentation or Public Audience….

The Project

The Electricity Generation Project with a Wind Energy System, to be developed under the Memorandum of Understanding signed between the Government of the Republic of Ecuador and the "e7 Fund for Sustainable Energy Development" (e7 Fund) [(1)], has as main objective to replace in the maximum amount as technically and economically feasible, the existing generation system based on diesel combustion in the San Cristobal Island – Galapagos, by a clean energy source based on wind turbines, in order to make use in an optimal condition of this renewable resource and to avoid the environmental risks caused by the current system. For the development of this project a joint venture between e7 Fund and Empresa Eléctrica Provincial Galápagos S.A. (Elecgalápagos S.A.) is under consideration. This project is a part of the Renewable Energy Program managed by the United Nations Development Program (UNDP) for the four inhabited islands and has been qualified as a priority by the Ecuadorian Government.

Objectives of the Project

The objectives of the Project are:

- Reducing the risks of oil spills associated with transportation and delivery of fuel to San Cristobal;

Diesel transportation (A. Baer)

- Reducing fossil-fuel emissions and greenhouse gases;
- Making San Cristobal less dependent on the supply of diesel fuel for the generation of electricity in the Island;
- Providing the local electric utility, Empresa Electrica Provincial Galapagos S.A, with the operational, technical, environmental and financial knowledge necessary to operate a fleet of wind turbines on a sustained basis;
- Providing valuable experience for the global promotion of small-scale power generation and distribution systems;
- Contributing to the protection of unique animals and plants;

San Cristobal's Fauna (A. Baer)

- Increasing the access of the local population to renewable energy; and
- Developing public awareness of effective demand side management and energy conservation practices.

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(1) e7 Members are: American Electric Power (USA) – Electricitè de France (France) – Enel (Italy) – Hydro-Québec (Canada) – Kansai Electric Power Company (Japan) – Ontario Power Generation (Canada) – RWE (Germany) – Scottish Power (United Kingdom) – Tokyo Electric Power Company (Japan)

Project Background

a. The Ministry of Energy and Mines (MEM) of the Republic of Ecuador, has defined several strategic objectives for the energy sector, among them: to reduce the dependency on fossil-fuel for the generation of electricity in isolated and remote areas

b. In 1995, MEM, developed a small project for studying the renewable energy potential in the Galapagos Islands and recommended to perform a detailed investigation of the barriers for the utilization of renewable energy in Galapagos.

c. The World Bank's Global Environmental Facility - GEF, approved in 1997 a Project Development Fund for the identification of such barriers. In year 2000 under UNDP coordination, a pre-feasibility study was conducted for the development of electricity generation projects with renewable energy systems for each one of the inhabited islands in the Archipelago

d. In September 2001, the Board of Elecgalapagos S.A., requested to UNDP assistance to get support for the project from GEF and other agencies currently helping to renewable energy programs and asked to CONELEC the corresponding permit to develop this project, what was favorably accepted by those agencies.

e. INGALA included this project in the Regional Plan for Conservation and Sustainable Development of Galapagos.

f. In July 2002, the Planning Office attached to the Presidency of the Republic (ODEPLAN), declared the Project as a national priority.

g. In February 2002, the Government of the Republic of Ecuador and UNDP signed a Memorandum of Understanding for the development of the global project for re-powering with renewable energy the inhabited islands of Galapagos.

h. Within the frame of this MOU, UNDP committed the participation of the e7 Fund for the development of the project in the part corresponding to San Cristobal Island. For this purpose a Memorandum of Understanding was signed on April 25, 2003, between the Government of the Republic of Ecuador and the e7 Fund.

i. Based on this document, the e7 Fund continues performing several engineering and environmental studies, and is working together with Elecgalapagos S.A. for structuring the most convenient Joint Venture for the execution and the operation of this project in San Cristobal Island.

j. One of these activities is the execution of the Definitive Environmental Impact Assessment (EIAD) for the project, whose Terms of Reference shall be considered in this Public Audience.

Project Outstanding Features

Geographical location: San Cristobal Island, Galapagos Province.

Type of system: the generation of electricity shall be achieved by means of a hybrid wind-diesel system, in such a way that the contribution of the renewable wind component be as high as possible, provided it's technically and economically feasible.

Wind Park: the Wind Park shall be installed on the ridge line of Cerro El Niño and will be composed of a number of wind generators with a total rated power up to 2.7 MW. The energy produced in each generator shall be collected by means of an underground cable system and conducted to a 13.8 kV substation to be installed in the same area as the Wind Park. The equipment to be installed shall require the construction of concrete foundations, drainage works, fences, signals and an access road to link the existing road with the facilities area.

Transmission Line: form the substation at the wind park, a 13.8 kV, 13 km length transmission line shall be installed, ending at the existing step-up substation at the diesel generating power plant in Puerto Baquerizo Moreno, owned by Elecgalapagos S.A. This transmission line shall use the same right of way as the existing line located in this route and owned by Elecgalapagos S.A.

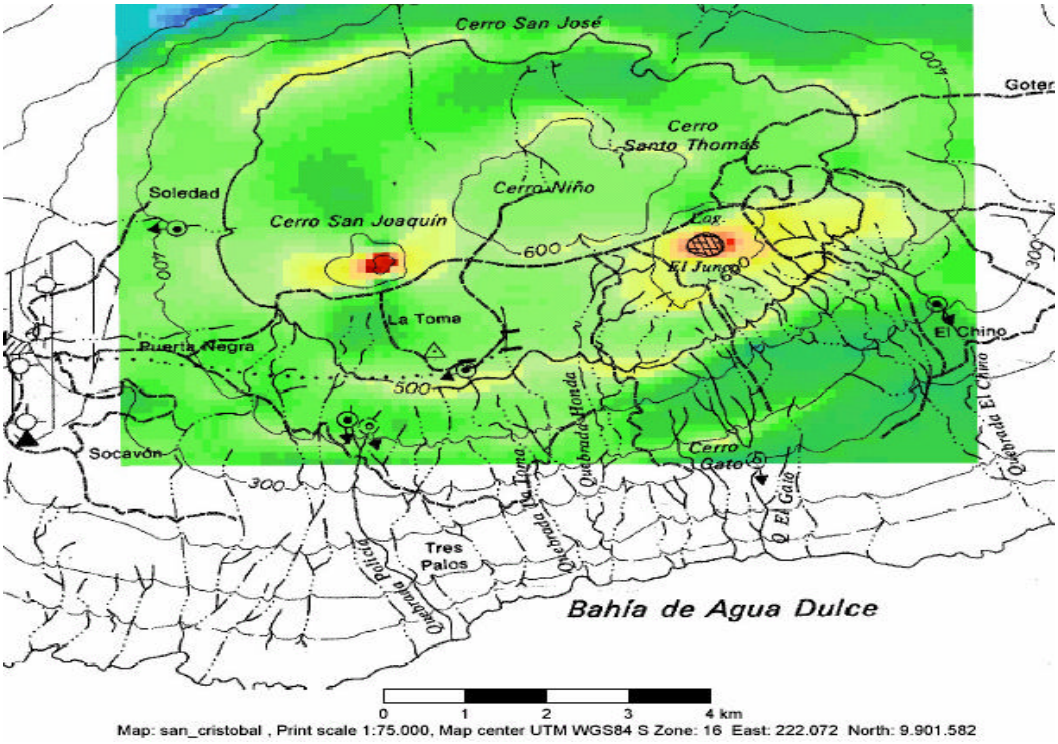
Complementary equipment: in a piece of land adjacent to the Elecgalapagos diesel generating power plant, in Puerto Baquerizo Moreno, some complementary equipment shall be installed. These are required for the proper operation of the generating system.

Diesel generators: existing diesel generators owned by Elecgalapagos S.A. complete the hybrid generating system. These units shall be subject to a maintenance overhaul and a refurbish process.

Typical wind generators

Site Selection for the Wind Park

As a part of the pre-feasibility study performed by Lahmeyer, the ridge area of Cerro San Joaquin was identified and recommended as the site for the development of the Project; however, in a later stage, it was determined that this area represents a high risk for the bird specie "Galapagos petrel" (pata pegada), and this situation obligated to analyze alternative sites, offering reasonable wind conditions and with lower risks for the mentioned bird, as well as for the other animal and vegetal species.



Potential sites for the Wind Park

E7, together with the Galapagos National Park (GNP) have identified Cerro El Niño and Cerro Santo Tomas as alternative sites of Cerro San Joaquin for the wind park, whose characteristics and potentialities were studied by the GNP and e7 Fund missions in 2002 and 2003, and as a result confirmed the potential high impacts in San Joaquin against the very limited impact that could occur in Cerro El Niño. On these basis, Cerro El Niño has been determined as the most suitable site and therefore is acceptable for the installation of the wind park for this project.

Environmental Studies

Based on the above mentioned considerations, the environmental study for the wind park will concentrate the attention to Cerro El Niño.

Since the probable impact to the petrel's habitat has been the most important focus point in the process for the Project definition, a comparison and analysis was made of three potential sites for the wind energy project. Cerro El Niño is considered the best site for various reasons, and the least impact site environmentally based on the result of a preliminary environmental assessment undertaken by the e7 Fund in 2002 with the help of the Galapagos National Park (GNP). As a complement to the studies already performed, the first week of September 2003, through an agreement signed between the e7 Fund and GNP, a search program has started to investigate the flight pattern of this bird in the mentioned mountain and in the immediate adjacent area, in order to reinforce the information supporting this decision and to minimize the possible impacts to be caused by the project.

The analysis and final conclusions regarding the wind park influence on the "petrel" shall be an important chapter of the EIAD, which shall be complemented with the treatment of the other matters described in the Terms of Reference being analyzed in this Public Audience.

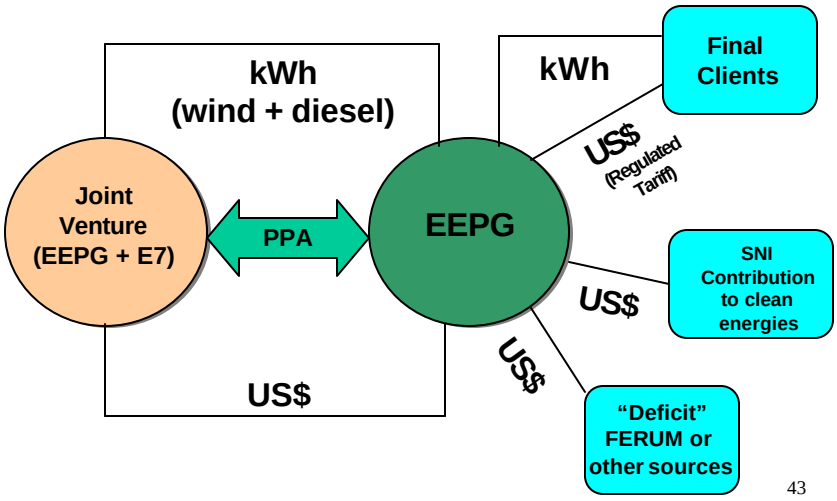
Petrels in nest (Francisco Cruz - GNP

Joint Venture under consideration

The required investment for the project shall be covered by a contribution of Elecgalapagos S.A. with resources coming from the Rural and Urban Marginal Electrification Fund (FERUM), an important refundable contribution from the e7 Fund on a non-for-profit basis and contributions from third parties to be defined.

Under these considerations, the most convenient scheme for a Joint Venture is being analyzed between Elecgalapagos and the e7 Fund for the development and further operation of the Project. All the facilities involved within the project shall be totally transferred to Elecgalapagos S.A. at the end of the recovery period of the e7 Fund contribution. The Joint Venture shall sign a power purchase agreement (PPA) with Elecgalapagos S.A. to guarantee the energy supply and the related payments.

The tariffs to final users won't be altered because of the incorporation of this new generating source, since the corresponding costs shall be covered in a similar way to the current system; i.e., through the contribution of users by means of the usual tariff, with a contribution to the operational deficit through FERUM funds or other similar mechanism; and, additionally for the wind energy component, through the contribution of all the mainland users of the National Interconnected System, as a supportive assistance to clean energies, based on a current CONELEC's regulation, as shown in the next graph.



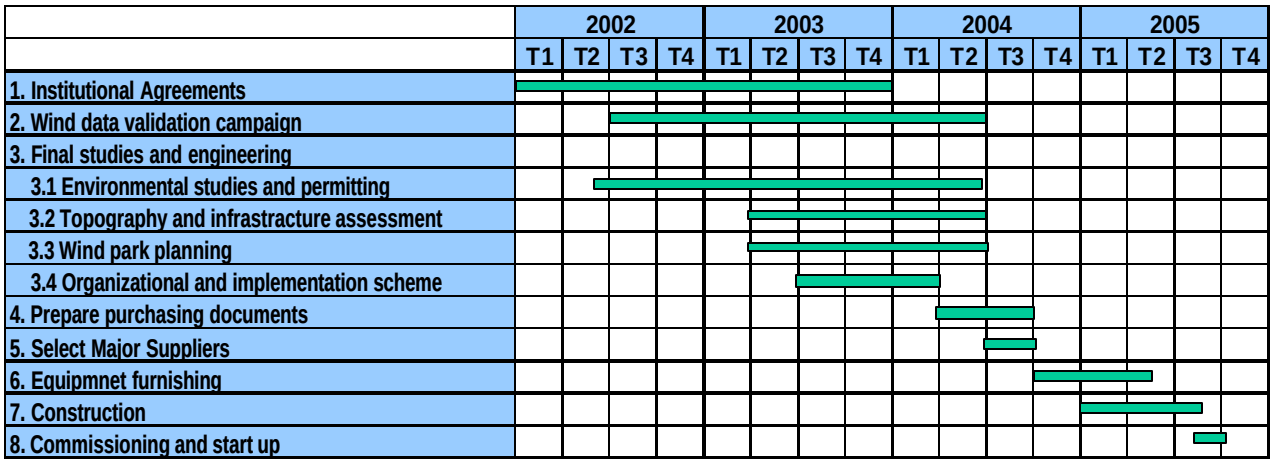
Budget and Financial Scheme

- Budget estimated by e7: 8 – 10 million US$, depending on % of diesel generation to be replaced
- Elecgalapagos S.A. shall contribute with approximately 1.1. million US$ with FERUM funds
- The portion to be covered by the e7 Fund is a contribution in very soft conditions to be recovered in a period enough large to be mutually agreed. Additionally the e7 Fund shall make "pro-bono" contributions (donations) through the participation of its experts and in another project issues.
- The participation of other investors and/or donors shall be defined.

Main Pending Issues

Following are the main milestones and approvals required for the execution of the project:

- Finish the Project feasibility study
- Complete the field study and reports regarding the petrels flight pattern
- Complete the EIAD and obtain the Environmental License
- Get the approval of FERUM funds for the Elecgalapagos S.A. contribution
- Define how to cover the "tariff gap"
- Define the agreement for the Joint Venture between the e7 Fund and Elecgalapagos S.A. and agree about the conditions for the power purchase agreement (PPA)

Estimated Schedule

The Project activities, until the Project starts operation shall be completed in accordance with the following preliminary estimated schedule