



Global Environment Facility

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January 17, 2006

Dear Council Member,

UNDP, as the Implementing Agency for the project, *Ecuador: Renewable Energy for Electricity Generation—Renewable Electrification of the Galapagos Islands*, has submitted the attached proposed project document for CEO endorsement prior to final approval of the project document in accordance with UNDP procedures.

The Secretariat has reviewed the project document. It is consistent with the proposal approved by the Council in December 2001, and the proposed project remains consistent with the Instrument and GEF policies and procedures. The attached explanation prepared by the UNDP satisfactorily details how Council's comments and those of the STAP have been addressed. I am, therefore, endorsing the project document.

We have today posted the proposed project document on the GEF website at www.theGEF.org. If you do not have access to the Web, you may request the local field office of the World Bank or UNDP to download the document for you. Alternatively, you may request a copy of the document from the Secretariat. If you make such a request, please confirm for us your current mailing address.

Sincerely,

A handwritten signature in black ink, appearing to be 'L. Good', written in a cursive style.

cc: Alternate, Implementing Agencies, STAP



20 December, 2005

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Dear Mr. Good,

**Subject: CC/OP-06 Ecuador: "Removal of Barriers to Renewable Electrification
Of the Galapagos Archipelago" Full Project – PIMS No.1295**

I am pleased to attach herewith the above-mentioned project document. The brief was approved at the GEF Council Meeting in December 2001. Also attached are the co-financing letter(s):

1. CONELEC to Elecgalapagos S.A., issued on September 28th, 2005, Letter DE –05-1772 certifying the amount of FERUM funding that is going to be channeled to the San Cristobal Wind Project.
2. Cover page of the UNF-funded San Cristobal Wind Power Project, signed.
3. Summary of contributions that financed the Floreana PV project, signed by the coordinator of the project.
4. Ministry of Energy and Mines, issued on August 13, 2002, Letter 686-DM-2002 certifying that the Ministry of Energy and Mines will contribute with a cash amount of 1.7 million dollars to the project.
5. Non-reimbursable loan agreement signed between the German Bank for Development (KfW) and Elecgalapagos S.A. for the re-electrification of Isabela and the Parque Nacional Galapagos premises in Santa Cruz with solar energy.

Response to Council's comments is attached as part of the prodoc.

As per paragraph 29 and 30 of the GEF Project Cycle, we are submitting this project document for circulation to the members of the GEF Council and, subsequently, for your final endorsement.

Thank you in advance for expediting the review and endorsement of this project.

Yours sincerely,

Warm regards.

Frank Pinto
Executive Coordinator

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cc: Oliver Page, GEF Regional Coordinator LAC



UNDP Project Document

Government of Ecuador

United Nations Development Programme

Title of Project: Renewable Energy for Electricity Generation-Renewable Electrification of the Galapagos Islands

Brief Description

The project aims at supporting sustainable development in Ecuador by reducing energy-related CO₂ emissions through the introduction of PV and wind energy as a substitute for fossil fuel (mainly diesel) utilized in electricity generation, specifically for the Galapagos Archipelago. In addition, the project will substantially decrease the volume of diesel annually shipped to the islands, thereby decreasing the environmental threat of an oil spill that can cause great damage to the biodiversity found in and around the coastal ecosystem of the islands. The activities proposed in the project are designed to remove barriers to the development and utilization of renewable energy for electricity generation, initially in Galapagos but eventually in the nation as a whole.

The project will develop local capacity to identify technical and financing options and to formulate the regulatory, institutional and financial instruments necessary to demonstrate the technical, economic, and financial viability of establishing joint ventures to generate electricity utilizing renewable energy to supply mini-grids or feed into large grids.

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Response to Comments from Council Member(s)

Ecuador: Renewable Energy for Electricity Generation ---Renewable Electrification of the Galapagos Islands.

Country	Comment	Response
Germany	Given the limited resource base of wind and solar, it is not possible to completely replace the fossil energy generation. Moreover, the higher the share of wind and solar, the more expensive is the electricity generation. It seems very unlikely that consumers are able or willing to pay the full cost of electricity supply based on the proposed concept.	The project does not aim at completely eliminating fossil fuel-based electricity generation through the utilization of renewable energy. However, it does propose utilizing solar and wind energy to the extent that it is technically feasible and economically viable so as to reduce the share of diesel fuel for electricity generation, thus reducing GHG and the risks of oil spills. In this regard, the renewable energy penetration ratio for each island is clearly spelled out in the project brief and on pages 16 and 17 of this document. It is documented that consumers on Galapagos have a higher per capita income that those on continental Ecuador. The Government proposes in the long-term to achieve full cost recovery. However, it is recognized this may take several years to achieve.
	On the other hand, it is not yet clear, who will bear the cost of the subsidies that are required to keep the system running.	The subsidies presently made available to Galapagos by FERUM are not direct Government subsidies; rather, they are cross-subsidies provided by electricity consumers on the mainland.
	There are also specific problems related to technologies applied: In case of the use of wind energy there is a risk of negative impacts on some bird species at some of the proposed sites. Furthermore, the environmental risk from the disposal of a large number of batteries that are needed to store electrical energy cannot be neglected.	This issue has been discussed with the Parque Nacional Galapagos; the preliminary findings are that the sites selected for wind monitoring and eventual installation of wind generators are not along the paths of migratory birds, nor are they the breeding sites of bird species (in both cases, mainly the “pata pegada”). These preliminary findings are being confirmed through additional studies. Also, the sites were chosen for minimal visual impact. With regard to batteries, arrangements will be made during implementation for used batteries to be transported to the mainland for recycling. Again, this is clearly mentioned in the brief.

Country	Comment	Response
	<p>According to the project concept, it is intended to realize the project by funding through sponsors and financiers from the private sector. The e7-group of major utilities has signaled interest in taking part in the UNDP project. However, it appears that their participation could be limited to the island of San Cristóbal, which would represent “cherry-picking” since the economic conditions regarding the use of renewable energies are significantly worse on other islands. As a consequence, the chances to attract private investors for the other islands would deteriorate. In the absence of major subsidies, investments on the other islands are far from being profitable for private investors. Therefore, their interest would be limited to the marketing of their engagement as eco-sponsoring.</p>	<p>It is unfortunate that the selection of San Cristóbal for repowering by e7 is being perceived to be the result of “cherry picking”. Only the financial envelope that the e7 group was willing to put together motivated the selection and this matched the resource requirements for San Cristóbal.</p> <p>In addition, in discussions with the Government, e7 has confirmed its interest and willingness to support initiatives on the other islands. Moreover, grant funding being ascertained from other donors for Isabela and Santa Cruz will make these islands also attractive to potential investors.</p>
	<p>In our view, the options to be included in the supply concept should be extended to other renewables such as hydro power and the use of biomass so as to increase reliability of supply, and to reduce generation costs. The use of biomass for power production by biogas plants (supplied by communal solid waste) or waste incineration plants, given that these activities are environmentally sound in terms of emissions, would have the added advantage to provide a solution to the hitherto unsatisfactory waste disposal.</p>	<p>The wind/PV/diesel hybrids, as the case may be, proposed for the islands do not preclude the introduction of other forms of renewable energy, subject to their technical feasibility and economic viability. Additional studies are required on the hydropower and biomass resources and, if proved feasible, they can be easily incorporated into the hybrid systems to further decrease the role of diesel fuel in the electricity generation mix.</p>
	<p>In addition, one should consider also the substitution of fossil fuels. An Israeli investor intends to supply the Galapagos islands with liquefied gas (LPG). Although the use of liquefied gas presents, likewise, environmental risks, these are considerably less</p>	<p>The LPG option is clearly a better one environmentally, when compared to the 100 % diesel option. However, this option has not been retained by the Government for two reasons: It was conditional upon the FERUM providing a higher subsidy than at the present time;</p> <p>On balance, the Government prefers to substitute a fossil fuel option (diesel) with a renewable energy option, rather than with another fossil fuel option (LPG).</p>

Country	Comment	Response
	damaging than those of diesel supply and the CO ² emissions are much lower for LPG than for diesel. Therefore, this option should not be excluded from the outset, since it cannot be assumed that the entire power requirement may be covered by renewable energies.	In this connection, a Memorandum of Understanding (Convenio) was signed by the Ministry of Energy and Mines, Ministry of Environment and UNDP on 20 February 2002, stating, among others, that “the Government has expressed its interest in repowering Galapagos with renewable energy in view of the risks associated with transportation and transfer of fuel oil for operating the present system of thermal generation (diesel) and the emission of GHG at the local and global levels”.

Acronyms

BMZ	German Ministry of Development Cooperation
CENACE	Centro Nacional de Control de Energía
CFL	Compact Fluorescent Lamp
CONELEC	Consejo Nacional de Electricidad
CONAM	Consejo Nacional de Modernización
DEREE	Dirección de Energías Renovables y Eficiencia Energética
e7	e7 Network of Expertise for the Global Environment
EEPG	Empresa Eléctrica Provincial Galapagos S.A.
FERUM	Fondo de Electrificación Rural y Urbano Marginal
FS	Fondo de Solidaridad
GEF	Global Environment Facility
GNPS	Galápagos National Parks Service
INECEL	Instituto Ecuatoriano de Electrificación (now defunct)
INGALA	Instituto Nacional Galápagos
IPP	Independent Power Producer
KfW	German Bank for Reconstruction and Development
MEM	Ministerio de Energía y Minas
MAE	Ministerio del Ambiente
PPA	Power Purchase Agreement
TTA	Trama TecnoAmbiental
UNDP	United Nations Development Programme
UNF	United Nations Foundation

OTHER PARTNERS:

Ministry of Energy and Mines	(Government Implementing Agency)
Ministry of Environment	(GEF Technical Focal Point)
Instituto Nacional Galapagos	(INGALA)
e7 Network of Expertise for the Global Environment	
TramaTecnoAmbiental	

SECTION I: ELABORATION OF THE NARRATIVE

PART I: SITUATION ANALYSIS

Context and Global Significance

1. The project brief for this full project was approved by GEF in December 2001 following completion of activities under a PDF-B which became operational in 1997¹. However, as the total initially estimated co-financing of \$ 21,310,000 was not secured then, GEF agreed to allocate \$ 560,000 under a PDF-C to enable project activities to continue seamlessly, while simultaneously providing project authorities with the opportunity to pursue their efforts to put together the total financial package. The PDF-C became operational in October 2003.
2. Co-financing for a total of \$23,171,135 has been secured so far for project implementation activities. This is sufficient to cover all costs related to the implementation of the wind project on San Cristobal and the solar PV projects on Floreana, Isabela, and the Galapagos National Park areas in Santa Cruz. Revised project costs have revealed that an additional \$3,225,000 will be needed to implement the wind project on Santa Cruz, expected to supply electricity to urban areas outside the Galapagos National Park. The additional co-financing required to implement this component will be fully secured by June 2006 (see paragraphs 50-56 for details). All GEF funds allocated to the Santa Cruz project investment (estimated at \$2.5 million) will be unavailable for project activities until the UNDP/GEF Executive Coordinator authorized the release of the funds. This will be done upon receipt of written assurance from UNDP Ecuador and the co-financing entity that the required funds are secured.
3. UNESCO designated the Galapagos archipelago as a World Heritage site in 1978. This group of islands some 1000 km (600m) to the west of the Ecuadorian mainland arouses great interest within the international community for its vast wealth of diverse biological species. The archipelago's small economy depends mainly on tourism and, to a lesser extent, on fishing for its livelihood. The archipelago has four inhabited islands: Floreana (140 inhabitants), Isabela (1,619 inhabitants), San Cristóbal (5,633 inhabitants) and Santa Cruz (11,388 inhabitants)².
4. Small isolated diesel-based grids supply electricity to consumers. Diesel is transported from continental Ecuador in small tankers requiring frequent deliveries, in view of the small storage capacity on the islands. For example, some 5.78 million gallons were transported to Galapagos in 2001³. Out of this amount, approximately 1.684 million gallons, representing 29%⁴ were utilized for electricity generation, resulting in the emission of 19,200 tons of CO₂ annually. The electricity tariff is highly subsidized, as is the case in much of mainland Ecuador as well. For example, the diesel subsidy at the national level in 2004 was \$ 260 million.

¹ PDF-B activities were completed in December 2000. Since then, additional studies have been undertaken by potential donors/investors and this project document reflects the latest available information. Hence, this explains any discrepancy between info/data presented in the attached brief and this project document.

² December 2001 census figures.

³ Source: Petrocomercial

⁴ Source: Fundación Natura, Galapagos Report 2001

5. Fuel spills are relatively frequent in the Galapagos and its number will probably increase if strong measures to curb the amount of fuel transported to the archipelago are not taken soon. On 16 January 2001, the tanker Jessica ran aground at Bahia Naufragio in the coast of San Cristobal, spilling 75,000 gallons of fuel oil and 70,000 gallons of diesel. Meteorological conditions and the relatively quick action taken to control the spill lessened the damage, but evidence of severe effects on the marine iguana population on Santa Fe island nearby where reported one year later. The costs of proposed compensatory restoration measures were estimated at over USD 9 million⁵. Local population was affected mainly through the diminished affluence of tourists that resulted from the adverse publicity caused by the spill. Other islands have suffered the impact of smaller spills. It is only a matter of time until more serious damages result.

6. The goal and objectives of the project correspond to the priorities for UN assistance as stated in the Common Country Assessment (CCA) and the United Nations Development Assistance Framework (UNDAF) agreed between UNDP and the Government of Ecuador. One of the main goals of UNDP Ecuador is to achieve environmental sustainability through the introduction of environmentally friendly principles in the productive sector, as stated in the CCA and the UNDAF. Outcome 20 of the UNDAF is the “promotion of environmentally sustainable practices and models in the productive sector”, and result 20.9 is the “Implementation and use of renewable energies in Galapagos”.

7. A Strategic Area of Support identified in the Country Programme Outline for Ecuador 2004-2008 is the formulation of an “Institutional framework for sustainable environmental management and energy development”. Intended outcome 2.2 is the “Improved capacity of local authorities, community-based groups and private sector in environmental management and sustainable energy development”. This outcome is re-stated in the Second Multi-year Funding Framework (MYFF), 2004-2007, in Goal 3, “Energy and environment for sustainable development”, service line 3.3 “Access to sustainable energy services”, where the Core result 3.3.3 “Low emissions energy technologies, including renewable energy, energy efficiency and/or advanced fossil fuel introduced” underlines the concordance between the UNDP’s, the project’s goals, and existing national priorities.

8. Finally, the Ministry of Energy and Mines, Ministry of the Environment and UNDP signed on 20 February 2002 a Memorandum of Understanding (Convenio) which states, among others, that “the Government has expressed its interest in repowering Galapagos with renewable energy in view of the risks associated with transportation and transfer of fuel oil for operating the present system of thermal generation (diesel) and the emission of GHG at the local and global levels”.

Threats, Root Causes and Barriers Analysis

9. In 1995, the Ministry of Energy and Mines (MEM) launched a project to study the potential of renewable energy in the Archipelago in collaboration with the research community present on the islands and with support from UNDP, UNIDO and UNESCO. The objectives were to

⁵ Source: Valuation of Environmental damages from the Jessica Oil Spill, Galapagos Islands, Jacobs Gibb, final draft May 2002

undertake renewable energy data collection, determine potential sites for renewable energy utilization, select technologies that were appropriate for introduction in Galapagos and determine institutions that could be responsible for implementation of activities. This study was completed in 1996 and recommended a thorough investigation of the barriers to renewable energy utilization in Galapagos.

10. GEF approved a PDF B in 1997 to identify the barriers to the electrification of the Galapagos Archipelago, in the short term, and of rural continental Ecuador, in the long term, through renewable energy, with the objective of substantially reducing the volume of diesel utilized for electricity generation and decreasing the related greenhouse gas emissions. This activity was implemented by Lahmeyer International with the participation of local institutions like EEPG, INGALA and the Galapagos National Park Service and was conducted with a view towards presenting a full-sized project for GEF funding. The study showed that in Galapagos alone, CO₂ emissions could be reduced by approx. 210,000 tons over a 20-year period.

11. Through implementation of the PDF B, the following were identified as major barriers to the utilization of renewable energy for electricity generation in Galapagos:

- Limited experience with renewable energy technologies, especially with regard to electricity generation;
- Lack of familiarity with the operation and maintenance of renewable energy and hybrid (renewable/conventional) electricity systems;
- High initial capital cost of renewable energy technologies;
- No experience with power purchase agreements and independent power generation;
- Lack of experience with project finance investments and joint venture operations between electric utilities and the private sector; and
- Difficult access to finance for renewable energy technologies that are new to Ecuador due to high perceived risks.

12. To overcome these barriers, the present full project will establish demonstrations of state-of-the-art PV/Wind/Diesel hybrid systems, as appropriate, on each of the four inhabited islands of Floreana, Isabela, San Cristóbal and Santa Cruz. As part of the PDF B and PDF C, pre-feasibility studies to implement such hybrid systems were carried out. This full project will seek to implement as large a share of the renewable electrification as is considered feasible, in order both to encourage the adoption of these technologies and to establish a replicable framework for future projects in the electricity sector. Thus, the proposed demonstration investment project is designed not only to demonstrate the sustainable use of renewable energy in an ecologically fragile remote area—the Galapagos—but also to provide a framework that can be pursued to further promote renewable electricity generation in continental Ecuador.

Institutional, Sectoral and Policy Context

13. In the last decade, Ecuador has made several positive policy changes in the energy sector. Unfortunately, the country experienced substantial economic slow-down over the same period, with, for example, the poverty incidence increasing from 34% in 1995 to 69% in 2000, while the

number of people in extreme poverty doubled from 17% in 1997 to 34% in 1999⁶. In March 2000, to restore confidence in economic management and stem the decline of economic activity and living standards, the Government decided on an array of structural reforms that included “dollarization” of the economy, complemented by an enhanced role for the private sector.

In this connection, legal measures defining the framework for private capital participation in the electricity sector have been adopted. The first step was made in December 1993, when the Congress approved the Privatization and State Reform Law (Ley de Modernización del Estado, Privatizaciones y Prestación de Servicios por Parte de la Inicativa Privada). This law establishes the legal basis to open the market for private sector participation in the provision of public services.

14. Another law that regulates the electricity sector is the Electric Sector Framework Law (Ley de Régimen del Sector Eléctrico) that was approved in October 1996. This law created the National Electricity Council (Consejo Nacional de Electricidad, CONELEC) --- the regulatory body that sets electricity tariffs, supervises their application and is responsible for rural electrification programmes. Subsidies, (cross-subsidies, in reality) for rural electrification, are provided through the Fund for the Electrification of Rural and Marginal Urban Areas (FERUM), from which electricity consumers in Galapagos directly benefit. This law also makes provision for unbundling generation, transmission and distribution in the electricity sector and defines the procedures for transferring capital stocks to the private sector.

15. In addition, the Government approved in March 1998 the Special Framework Law for Conservation and Sustainable Development for the Province of Galapagos (Ley de Regimen Especial para la Conservación y Desarrollo Sustentable de la Provincia de Galapagos) setting up the legal and administrative framework for policy and planning in Galapagos. This Law also strengthened the Instituto Nacional Galapagos (INGALA) in its capacity to serve as the focal agency for development and conservation within the province.

16. A Memorandum of Understanding (Convenio) was signed by the Ministry of Energy and Mines, the Ministry of Environment and UNDP on 20 February 2002, stating, among others, that “the Government has expressed its interest in re-powering Galápagos with renewable energy in view of the risks associated with transportation and transfer of fuel oil for operating the present system of thermal generation (diesel) and the emission of GHG at the local and global levels”.

17. With a view to promoting the utilization of renewable energy for electricity generation, CONELEC has established tariffs to be paid to independent power producers using these technologies as follows (recently revised under Regulation 004/04): PV --- 28.37 c/kWh; Wind -- - 9.31 c/kWh; Biomass --- 9.04 c/kWh, etc. These tariffs are valid for continental Ecuador; for renewable energy-based electricity generation in Galapagos, the tariffs are 30 % higher for wind and 10 % higher for other technologies. The tariffs are applicable for 12 years for renewable energy systems that sign contracts by 31 December 2006; after this period, the tariffs will be reviewed.

⁶ Source: World Bank Power and Communications Sector Modernization and Rural Services Project, 2001

18. As a complementary measure to reinforce its policy engagements vis-à-vis the development and environmental protection of the Islands, the Government, through an MOU signed by five Ministers (Foreign Affairs, Finance and Economy, Energy and Mines, Environment, and Housing), has committed not to deploy new electricity generation capacity based on fossil fuels in the Islands. This implies that any additional capacity to meet new electricity demand requirements will be generated from renewable energy systems.

19. Another regulation recently issued by CONELEC (Regulation 02/05) clears the way for the financing of renewable energy projects in the Galápagos by establishing that these projects can receive capital funding coming from the Fund for the Electrification of Rural and Marginal Urban Areas (FERUM). Even more, the regulation establishes a method for calculating the amount of funding that will be channelled to the re-electrification of San Cristóbal Island with wind. Following this method, CONELEC will contribute an amount of 3.2 million dollars from FERUM funding for the San Cristóbal Wind Project.

20. The Santa Cruz Project, which will receive most of the GEF funding allocated, is in a PDF-C phase of advanced pre-feasibility studies.

Stakeholder Analysis

21. Implementation of initially the PDF-B and the on-going PDF-C has benefited from extensive consultation and participation of stakeholders active in the area of energy/climate change and international collaboration. They all unanimously support this full project. They are the following:

22. Ministry of Environment (MA) – This Ministry is the Technical Focal Point for GEF matters and main authority for environmental policy, strategy, regulations, inspection, management and education.

23. Ministry of Energy and Mines (MEM) – It has responsibility for policy formulation and defining strategic objectives in the Energy (and Mining) Sector.

24. MEM's Dirección de Energías Renovables y Eficiencia Energética (DEREE) is entrusted with national renewable energy (and energy efficiency) research, development and implementation programmes.

25. National Modernisation Council (CONAM) – It is responsible for the overall design and oversight of reform and modernisation of, among others, the electric power sector, including privatization of this sector.

26. National Electricity Council (CONELEC) -- Electricity regulator that is entrusted with the responsibility to set electricity tariffs and supervises their application; has also responsibility for rural electrification programmes and administration of subsidies for rural electrification through the Fund for the Electrification of Rural and Urban Marginal Areas, (FERUM). The Electricity

Law grants CONELEC specific attributions to supervise environmental management in the sector, in coordination with the Ministry of Environment.

27. Galapagos National Institute (INGALA) -- Archipelago institution, which acts as the focal agency for development and conservation in Galapagos and oversees public investment in the islands. As such, it deals with an array of issues, including the formulation and follow-up of the Regional Plan, migration control and policies, promoting widespread participation on major decisions related to the islands' development, etc.

28. National Energy Control Centre (CENACE) -- Exercises control and supervision over the correct operation of the electrical system in terms of standards for voltage, frequency, installation, etc. and administers the electricity wholesale market in continental Ecuador.

29. Empresa Electrica Provincial Galapagos S.A. (EEPG) -- Electrical utility in the Archipelago. It has a leasing contract to operate and maintain the electrical system which is owned by the Fondo de Solidaridad.

30. Galapagos National Park Service (GNPS) -- a decentralized branch of the Ministry of Environment in Galapagos, directly responsible of managing the terrestrial national park, which encompasses 97% of the territory of the Islands, and the Marine Reserve, of 140,000 square km. Being the biggest institution of the Islands both in terms of personnel and infrastructure, it is also one of the main public consumers of energy. Its installations will be repowered with a PV system financed by KfW, the German Development Bank.

31. Charles Darwin Research Station -- Research centre for local scientists and international scientific community. Offers a programme on environmental education for scholars and disseminates scientific information on environmental issues.

32. E7 and American Electric Power (AEP) – AEP is the project leader for the San Cristobal Wind Project. The Project is implemented by a legal entity, the San Cristobal Wind Commercial Trust, that in turn will establish a Corporation (Sociedad Anónima as per Ecuadorian Law) as an Independent Power Producer (IPP) which will generate renewable energy and sell it at the wholesale level to Elecgalápagos (Distribution Company), thus complying with Ecuadorian regulations.

33. The discussions that were held with the above stakeholders during the PDF-B and PDF-C phase brought to light two important considerations. The first is that there is considerable opposition to continued studies of the energy system. The local population is supportive of the renewable re-powering of the islands and would like the work to begin as soon as possible. Hence, several studies that were proposed have been curtailed. Second, the Charles Darwin Foundation, among others, expressed concern that a proposal to use the biomass from invasive tree species being eradicated might create a sustainable use for these otherwise undesirable invasive species. As a result of this opposition, all consideration of the biomass option has been dropped from the current proposal.

34. Joint venture companies or Independent Power Producers, as appropriate, will implement renewable energy schemes to re-power electricity generation on each of the four inhabited islands and sell electricity to EEPG under a power purchase agreement. These companies will work in close collaboration with INGALA to ensure that local communities fully participate in the decision-making process.

35. Public participation is vital in the whole electricity repowering process. It is important that the Galapagos residents as well as the whole of Ecuador be briefed on the complete exercise and their support secured. In Galapagos, the Project Manager will need to maintain very close contact with INGALA and the local communities on each of the islands. The Project Manager will organize meetings with the local institutions to secure their concurrence and support to the activities proposed for implementation and to explain to them the benefits that the islands would derive from such activities.

Baseline Analysis

36. This project is designed to remove barriers to the renewable electrification of the Galapagos Archipelago. In so doing, it will achieve the stated objectives of GEF Operational Program #6: Promoting the adoption of renewable energy by removing barriers and reducing implementation costs, and falls under GEF Strategic Priority 3 (SP 3); Power Sector Policy Frameworks supportive of Renewable Energy and Energy Efficiency. In addition, the project has a secondary objective of reducing the risks to the rich Galapagos biodiversity from potential future oil spills. As it is unlikely that the project activities would be implemented in the absence of UNDP and GEF support, the project can largely be considered to be incremental.

37. A detailed assessment of incremental costs is discussed in Section II, Part I of the current Project Document. According to this matrix, the baseline costs of continuing to generate power for the Galapagos Archipelago using diesel fuel come to approximately \$17,010,000. (Note that this measure contains no attempt to estimate the potential costs of future environmental damage to the biological resources of the archipelago due to future oil spills. In such a case, the baseline costs would be much higher.) Based upon the information provided during the PDF B and PDF C and subsequent studies by other donors/investors, the costs of re-powering the Galapagos using the scenarios specified are \$30,496,135 (Table 1 below). This makes the incremental costs equal to approximately \$14 million. Given the high importance accorded to the Galapagos by the world community and the strong interest expressed in supporting the project, the GEF is only being asked to supply one third of this total, or \$ 4.1 million (including the PDF B and C).

38. In terms of global benefits, the re-powering of all four electricity systems at the level targeted in this proposal will result in a net GHG emission reduction of 10,500 tons of CO₂ per year, or nearly 201,600 tones over the twenty-year lifetime of the project. To the extent that the success of the Galapagos project can be replicated to other unelectrified or remote areas of Ecuador, this figure will have a multiplying effect starting from approx. 50 % of increase in emission reduction and going up to some 300 %, 10 years after project completion.

39. In terms of the quality of electricity service provided to the electricity consumers of the Galapagos, the quality should be similar, if not improved, following the re-powering effort. Part

of the re-powering will involve undertaking a demand-side management review and appropriate action to ensure that an optimum amount of electricity is required. This will also help hold demand growth in check. Moreover, new tariffs will be established by the National Government in November 2005.

40. In addition to the above, there is an additional global environmental benefit of reducing the risks to local biodiversity from future oil spills. By reducing the diesel requirements of the archipelago by nearly 1 million gallons per year, both the probability and intensity of future oil risks is reduced.

41. In terms of the local environment, using renewable energy in place of diesel generation will reduce emissions that might be of local concern if population and demand growth were to continue unabated. With reference to the local environmental implications of the renewable re-powering, all local environmental regulations will be observed. In addition, all batteries used for energy storage will be transported to the mainland for recycling. The aesthetics of wind turbines have been considered in siting and wind-speed measurement to identify sites with minimal visual impact. In addition, known bird flight paths have been avoided in choosing potential wind turbine sites.

42. As mentioned previously, this project proposes a programme to re-power all 4 inhabited Galapagos Islands using renewable energy. UNDP is working with the Government to pursue this goal both for global environmental and national reasons. Implementation of the repowering exercise is divided into two phases: Phase 1 covers Floreana and San Cristobal, while Phase 2 will deal with Isabela and Santa Cruz. This phased approach was adopted in order not to overburden the resources of EEPG. The bulk of the activities required for repowering Floreana (already completed), Isabela and San Cristobal will be undertaken using funds from other sources under the parallel financing modality. For Santa Cruz, in addition to GEF funding, funds have been secured from MEM, FERUM and KfW.

43. The Floreana Project (PIISIF), co-founded by the Spanish Agency for International Cooperation (AECI), the Galapagos National Park, the Parish Council, the GEF, and WWF and executed by SEBA, a Spanish NGO, is complete and the system is in operation. The Isabela Project, funded entirely by the German Ministry of Development (BMZ) through the German Development Bank (KfW), has received clearance both from the German and Ecuadorian Governments and design has started. The San Cristobal Wind Project, co financed by e7, the United Nations Foundation, the Ecuadorian Government and Ecuadorian taxpayers, was signed in September, 2005 and is expected to be constructed by late 2006/early 2007.

The overall financing of the project is summarized in Table 1 below.

TABLE 1: Co financing of the re-electrification of the Galapagos Islands with Renewable Energy

Project Activity/ Component	GEF	Government	(Source)	Others	(Source)	Total
Activities 1&2. Technical assistance to MEM/EEPG						
PDF-B	300,000					300,000
PDF-C	515,832	250,605	in kind			766,437
Total	815,832	250,605	in kind			1,066,437
Activity 3. Construction of Generating Plants (Phase 1)						
(i) Floreana	44,168	200,000	GNPS	320,723	Asociación SEBA	564,891
		55,000	FERUM	31,137	JPF	86,137
		75,000	MEM	18,000	WWF	93,000
				5,000	Araucaria	5,000
Total Floreana						749,028
(ii) San Cristobal		3,193,901	FERUM	5,978,087	e7	9,171,988
				350,000	UNF	350,000
				368,682	Income tax	368,682
Total San Cristobal						9,890,670
Total	44,168	3,523,901		7,071,629		10,639,698
Activity 4. Construction of Generating Plants (Ph.2) on:						
(i) Isabela				7,260,000	KfW	7,260,000
Total Isabela						7,260,000
(ii) Santa Cruz (PV)				2,790,000	KfW	2,790,000
(iii) Santa Cruz (Wind)	2,955,498	1,625,000	MEM	650,000	UNF	5,275,000
				3,225,000	Others	3,225,000
Total Santa Cruz						11,290,000
Total	2,955,498	1,625,000		13,925,000		18,550,000
Activity 5. Monitoring , Evaluation and Dissemination						
	240,000					240,000
Total	240,000					240,000
GRAND TOTAL	3,239,666	5,399,506		20,996,629		30,496,135

PART II: STRATEGY

Project Rationale and Policy Conformity

44. Within the context of the Privatization and State Reform Law and the Electric Sector Framework Law, the Government decided in late 1998 to convert the former Electric Utility Company in Galapagos -- which was part of the then continental-based electricity company and now defunct (INECEL) -- into a private, public-owned company called Empresa Eléctrica Provincial Galapagos S.A. (EEPG). The shareholders of EEPG are: Fondo de Solidaridad (majority shareholder with 98 % of the shares), the Galapagos Provincial Council and the Municipalities of the islands Isabela, San Cristóbal and Santa Cruz. The privatized EEPG inherited the poor operation and maintenance capability of its predecessor, which, together with its small size, makes it an unattractive target for private sector purchase. In order to reduce operating costs, EEPG is interested in introducing renewable energy for electricity generation. It plans to achieve this, whenever possible, through joint ventures with private companies/independent power producers interested in sustainable development and the reduction of greenhouse gases through the utilization of renewable energy and, more importantly, in preserving the rich biodiversity wealth found in the Galapagos archipelago.

45. For its part, the Ministry of Energy and Mines (MEM) has defined several strategic priorities for the energy sector, viz. to reduce the fossil fuel dependency of isolated grids and remote locations, to promote private participation in the energy sector, to introduce energy efficiency measures and to study the potential role of renewable energy, particularly in rural electrification initiatives, and has entrusted its Dirección de Energías Renovables y Eficiencia Energética (DEREE) with the responsibility to move this agenda forward.

46. For each of the four inhabited islands, the pre-feasibility study undertaken under the PDF B considered 3 different renewable energy penetration scenarios: High (90-100%), Medium (70-89%) and Low (50-69%). Additional work undertaken subsequently has identified the most financially viable renewable energy penetration scenario for each of the islands. It is this best-case scenario that is proposed to be pursued under this project. In all cases, the existing diesel generators will be rehabilitated/replaced and will operate in a hybrid mode to meet any shortfall in electricity generation that may be the result of transient unfavorable solar/wind conditions.

The scenarios to be pursued are as follows:

47. Floreana: Medium penetration factor of 80% achieved with 22.5 kWp of PV and 0.4 kW of Wind.

Present Status: The repowering exercise on Floreana has been completed in August 2005, with financing provided by Spanish Cooperation, Parque Nacional Galapagos, FERUM, UNDP GEF and Consumers. The hybrid system is now fully operational. However, in order to meet the unexpected growing electricity demand the system power capacity is being increased by 3 kWp. Funds are provided by the Ministry for Energy and Mines through the umbrella project ERGAL. A management system, including a power purchase agreement with EEPG for the sale of electricity produced, a contract with EEPG for maintaining the renewable energy generation equipment in operational condition, and tariffs to be paid by consumers, is being worked out.

48. Isabela: Medium penetration factor of 70% achieved with 700 kWp of PV.

Present Status: Funding for Isabela is provided by the German Ministry for Development Cooperation (BMZ) through KfW. EEPG, as the executing agency, has recently awarded a contract to a consultancy firm for assisting EPPG in system design and equipment procurement and installation. Activities have been started in October 2005. Completion of the repowering exercise on this island is scheduled for April 2007. Investments under this project component include new facilities for better management of petroleum products, better spill prevention and containment, proper handling of wastes, and disposal of accumulated industrial waste.

49. San Cristóbal: Low penetration factor of 50% achieved with 2.4 MW of wind power.

Present Status: The repowering exercise is being executed by the San Cristobal Wind Commercial Trust, a joint venture partnership formed by e7 companies with the participation of EEPG. Funding is provided by e7 members, FERUM, and the United Nations Foundation; in addition, e7 has mobilized resources from large taxpayers in Ecuador under a law (Directed Income Tax Payment) that allows the latter to write-off these grants for the development of Galapagos. As of November, 2005, full feasibility and design studies have been completed⁷, the environmental license has been secured, and the Trust Committee of the San Cristobal Wind Project Commercial Trust has authorized the Trustee to finalize and sign contracts with the wind turbine supplier and constructor for the San Cristobal Wind Project. As soon as the contract is signed, the project will enter in a Limited-Notice-To-Proceed phase, with payment to the wind turbine seller and constructor for certain defined project activities.

50. Santa Cruz: Low penetration factor of 50% achieved with 120 kWp of PV and 3.2 MW of wind.

Present Status: BMZ, through KfW, is financing the repowering component dealing with the installation of the grid-connected 120 KWp of PV at the premises of the Galapagos National Park Service. This component also includes the rehabilitation/replacement of existing EEPG diesel generators, the construction of new facilities for better management of petroleum products and better spill prevention and containment as well as measures for proper handling of wastes, and disposal of accumulated industrial waste.

51. The “wind” component of the repowering exercise is in its feasibility study phase. Wind monitoring campaign is on-going on three sites (two on Santa Cruz and one on Baltra) and preliminary results show favorable conditions for the installation of a wind farm. Feasibility and engineering studies are expected to be completed by July 2006. Total cost for this component is expected to be approximately \$8,500,000. Currently, \$5,275,000 is available for this effort (\$ 3,000,000 from GEF, \$1,625,000 from the Government of Ecuador and \$ 650,000 from UNF). The remaining \$3.225 Million will be secured during 2006 from one of the following potential sources:

52. FERUM Subsidy – As described previously, this cross subsidy scheme currently in operation in Ecuador is already financing the San Cristobal effort. Existing regulations allow the Santa Cruz to apply to these funds using a similar calculation as the one applied in the San

⁷ This explains the difference between the penetration factor of 97.5% indicated in the brief and based on the Lahmeyer pre-feasibility study and the figure of 50% based on the full feasibility and design study.

Cristobal case. This would allow Santa Cruz will receive approximately \$4,200,000 from the fund. Since FERUM has a ceiling on the amount it can fund per year, the 2005 effort was geared towards obtaining financing for San Cristobal. However, UNDP is confident that the FERUM fund will provide the necessary funding for Santa Cruz in the 2006 disbursement.

53. CEREPS - The Government of Ecuador has established the Special Fund for Fostering Productivity, Scientific and Technological Development (Cuenta Especial de Reactivacion Productiva, del Desarrollo Cientifico y Tecnologico, CEREPS). This Fund is aimed at financing projects dealing, among others, with power generation based on solar PV, wind and small-scale hydro technologies. According to MEM officials the Santa Cruz wind project will receive high priority in the allocation of CEREPS funds in 2006. A request for funds must be presented to the Ministry of Economy and Finance during the second quarter of year 2006.

54. kfW Grant – The UNDP/kfW partnership in Ecuador is very strong and has already resulted in substantial financing for this effort. kfW has expressed interest in providing an additional \$3,000,000 for Santa Cruz; however, final confirmation of grant approval will not occur until mid 2006. kfW and the Government of Ecuador have confirmed that this is a priority request, increasing the likelihood of its approval.

55. JICA Grant – JICA has confirmed its interest in providing up to \$5,000,000 in equipment for Santa Cruz. The request for funding has been filed as a national priority. Prior to funding, a feasibility assessment will have to be conducted. In all likelihood, the funding will not be available until 2007, and would probably be best used to finance a second phase of wind turbine installation to meet increasing demand.

56. UNDP is fully confident that the remaining financing needs for Santa Cruz will be raised through one or more of the abovementioned sources. UNDP will not commit or disburse \$2.5 million of the GEF funds assigned to the Santa Cruz re-electrification effort until the remaining financing is in place. The UNDP/GEF Executive Coordinator will be responsible for authorizing the disbursement of the \$2.5 million GEF funds based upon receipt of supporting documentation assuring that the additional \$3.225 million in co financing are in place.

57. The total investment cost of repowering on all the four islands, excluding soft costs related to technical assistance, monitoring, evaluation, etc., as per the scenarios outlined above and inclusive of incremental cost, is estimated at \$ 29,189,698. The cost breakdown for each island is summarized in Table 2 below.

Table 2: Scenario Summary

Island	Scenario (% Renewable)	Technology	Installed Capacity	Cost (\$)
Floreana	60%	PV Wind	25.5 kWp 0.4 kW	749,028
Isabela	70%	PV	700 kWp	7,260,000 ¹
San Cristóbal	50%	Wind	2.4 MW	9,890,670
Santa Cruz	50%	PV Wind	120 kWp 3.2 MW	2,790,000 8,500,000
Sub-Total				29,189,698
Technical Assistance to MEM/EEPG				815,832
In-Kind contribution from Government of Ecuador				250,605
Monitoring, Evaluation and Dissemination				240,000
Total				30,496,135

1) Includes \$1,000,000 for rehabilitation of diesel plants and diesel storage and handling facilities

Project Goal, Objective, Outcomes and Outputs/Activities

58. The project's goal is to address a key issue in the reduction of greenhouse gas emissions in Galapagos by substituting PV and wind energy for fossil fuel (mainly diesel) utilized in electricity generation. This is proposed to be achieved through support to the Government to develop the regulatory, institutional and financial instruments necessary to demonstrate the technical, economic, and financial viability of establishing joint ventures or facilitating independent power producers to generate electricity utilizing renewable energy to supply mini-grids or feed into large grids.

59. The development objective of the project is to promote the utilization of renewable energy (PV and Wind) for electricity generation, thereby reducing Galapagos' dependency on diesel shipped from continental Ecuador. This will enable Galapagos to benefit from a clean, modern and reliable source of energy for electricity generation with decreased power-related operation and maintenance costs, while, at the same time, reducing energy-related CO₂ emissions associated with the burning of diesel. A secondary objective is to substantially decrease the volume of diesel annually shipped to the islands, thereby reducing the environmental threat from an oil-spill that can cause great damage to the rich mix of species found in and around the islands. GEF support will remove major existing barriers in Galapagos and provide for replication of defined approaches and measures in continental Ecuador, thereby enhancing the dissemination of such a model in the Andean countries and elsewhere.

60. On all the islands, repowering will be accompanied by measures to reduce the demand for electricity while at the same time providing an improved quality of service. A comprehensive diagnosis of energy consumption by sectors and uses is being undertaken in Santa Cruz, in order to determine the most cost-effective DSM measures to be applied. A DSM plan will be

elaborated with EEPG under leadership of the ERGAL. This plan will include an education and information campaign and the establishment of a permanent consulting infrastructure at EPPG, as part of the Environmental Management System to be implemented by EEPG.

61. The repowering exercise has five primary outcomes; these are summarized below.

62. **Outcome 1:** National partners are supported to implement re-powering of electricity generation on each of the islands. Outputs contributing to this outcome will be directed towards assisting stakeholders (MEM, MA, CONELEC, etc.) to finalize policy, legal and operational regulations enabling the participation of the private sector in renewable energy-based electricity generation, and completing the feasibility and design studies, including more accurate costs estimates and an implementation schedule for repowering electricity generation on each of the four islands.

Note: Implementation of the above activities commenced under the PDF-C and they either have been or are in the process of being completed.

63. **Outcome 2:** EEPG's participation in the repowering exercise is facilitated through strengthening of its institutional, technical and operational capability. This outcome is expected to be achieved through the reinforcement of EEPG's technical capacity to implement renewable-energy-based electricity generation projects and at the same time strengthening its institutional structure and management capabilities to design and negotiate joint ventures/Independent Power Producer schemes as well as contractual arrangements for operation and management.

Note: A comprehensive study on EPPG re-engineering, as the basis for strengthening both institutional and technical structures, did commence under the PDF-C. The restructuring process will be given high priority under the full-size project.

64. **Outcome 3:** Repowering on Floreana and San Cristobal with PV/wind/diesel hybrid electricity generating systems is facilitated through ensuring the full operation of the hybrid systems in the islands, and supporting EEPG on the design of contractual arrangements for the management, operation and maintenance of the hybrid systems.

65. **Outcome 4:** Repowering on Isabela and Santa Cruz with PV/wind/diesel hybrid electricity generating systems is facilitated. Outputs contributing to this outcome include undertaking and completing the feasibility study, procurement and installation of the wind park in Santa Cruz, assisting the EEPG to initiate an energy efficiency programme in partnership with local institutions, and supporting EEPG on the implementation and design of management schemes of the hybrid system at Isabela.

Note: A pilot programme to increase efficiency of lighting systems in households and small businesses has been launched under the PDF-C. The design of a more comprehensive programme on demand side management and rational use of energy on the four islands is being worked out.

66. **Outcome 5:** To build capacity for replication of project experiences/best practices and dissemination of lessons learned throughout Ecuador and in other countries in the region.

Note: The process of strengthening EEPG technical structures commenced under the PDF-C with the attendance of EEPG technical staff to training seminars on new and renewable energy systems and photovoltaic systems.

Project Indicators, Risks and Assumptions

Indicators

67. Key indicators of the project's success by its completion will include:

- CO₂ emissions in Galapagos are reduced by 210,000 tons over the project life cycle.
- At least 6.6 MW of Renewable Energy (wind, solar, and hybrid systems) is installed and used to generate electricity in the Galapagos islands by the end of the project according to the indicator targets included in the log-frame.
- The technical and management capability of EEPG to utilize renewable energy in a hybrid mode with diesel generation and to implement energy efficiency measures on the (consumer) demand side is enhanced.
- EEPG's capacity to negotiate PPAs with IPPs is developed and strengthened.
- Lessons learned and results of the repowering exercise are documented and distributed, to promote and support replication, both within and outside Ecuador through publications and the project web site.

Assumptions

68. The assumptions are outlined in the Logical Framework Analysis at the end of this document.

Risks

69. Potential risks associated with the project are discussed below:

Regulatory risk or the risk related to the framework within which EEPG operates. The Law on the Regime of the Electric Sector clearly set the legal framework for promoting private participation of the private sector and ensuring capital investment under rules of efficiency and competitiveness. Non-national-grid-integrated systems such as the Galapagos have been allowed to retain a vertical integration utility structure where all services (generation, transmission, and distribution) are provided by a single utility. Accordingly, concession contract issued by CONELEC establishes the right to EEPG to generate electricity as well as its capacity to associate with other developers to enhance the power generation capacity. It is this legal context which has enabled the e7 Project Team to establish the San Cristobal Wind Project Commercial Trust. Further, the CONELEC regulation concerning prices for non-conventional power generation technologies has established prices for both wind and photovoltaic systems. Price for wind systems in Galapagos has been fixed at \$0.121/kWh, and for solar photovoltaic at 0.312/kWh. These prices will be valid for a period of 12 years counted from the date the Permit

Contract is signed by CONELEC. In conclusion, the legal frame prevailing in the country does not pose risks to the project.

70. Technical risk, or the risk that the hybrid systems could result in an over-extended technology in relation to the EEPG's technological, skilled labour and managerial capabilities. This risk implies that emission reductions and diesel fuel savings could be lower than the amounts initially expected. The introduction of these technologies represents a major change in both the organizational and technical practices existing at EEPG. The operation of hybrid systems involves, among others, modifications of existing planning procedures, the alteration of dispatching routines, the adaptation of analytical tools for optimal power evacuation, and new technical solutions for the prevalent grid integration problems due to the fluctuating power output. Additionally, the viability of wind and solar electricity-generation technologies depends heavily on the existence of an articulated web of functions (service-supplier network) to support these technologies and, at the same time, capable of assimilating the changes they bring about.

71. Interventions to improve the limited organizational environment and lack of experience of EEPG, and to secure the human resources needed to manage the technological change have been undertaken during the PDF C phase and will continue throughout the execution of the full project. A program to improve the organizational structure and management capabilities of EEPG is being designed. Key staff has attended seminars and workshops, both in Galapagos and in South America. Regarding the electrification of each Island, external partners have committed to make available their technical expertise and strengthen capacity building efforts. In San Cristobal, the e7 will provide on-going (1-3 years) technical expertise and training to increase the competence and professionalism of the Elecgalapagos staff, supplemented by on the job training to be provided by the wind turbine supplier under a planned extended service contract (1-5 years). In Isabella, the consultancy firm in charge of the design will exert due diligence during PV installation and will secure that Elecgalapagos technical staff is trained in the operation of the system. Additionally, KfW grant allocated to PV projects in Isabela and Santa Cruz (PNG) includes an important budget line to support capacity building interventions at EEPG.

72. Implementation risk or the risk that the project will not be fully implemented even though necessary resources have been engaged. This risk is considered low. The project has been developed in close consultation with various key Government Ministries and is supported at the highest political level. Laws are in place to facilitate private sector participation in the provision of public services, including electricity services. The electricity tariff structure has been revised to take account of long run marginal costs. In addition, the Government has adopted a policy to reduce fossil fuel dependency for electricity generation and use renewable energy as a substitute, where feasible. Moreover, development costs related to contractual agreements in respect of joint ventures/independent power producers will be financed under the present project. This risk is further mitigated by the fact that repowering on the island of Floreana is complete and repowering in San Cristobal, Isabela and Santa Cruz (PNG) is currently being implemented.

73. Increased Demand Risk: This risk stems from natural population growth and immigration. It is also due to changes in consumption patterns as people become more affluent and adopts a more "continental" way of life. This risk is mitigated by the fact that INGALA, created as the sustainable development leading agency for Galapagos, is entrusted both by the National

Constitution and the Galapagos Special Law with the authority to control immigration to the islands. In addition, re-powering will be accompanied by measures to reduce the demand for electricity through demand side management and rational use of electricity efforts. The Government has committed to halt the installation of new power generation thermal units in the islands and the Project will advocate that new grid loads, such as the new potable water systems on San Cristóbal and Santa Cruz, operate during off-peak hours when excess wind energy is available.

74. Replication risk: This risk is considered quite small. After the successful demonstration of solar PV and wind electricity generation systems, it is expected investors, both local and foreign, will find the projects and their implementation modalities interesting and worth replicating. Already, there is interest to set up grid-connected wind farms in the provinces of Imbabura and Loja on continental Ecuador. Hence, a positive experience in Galapagos will go a long way towards generating investor confidence in IPP/PPA arrangements in the electricity sector in Ecuador.

Expected Global, National and Local Benefits

75. In 2004, approximately 6.45 million U.S. gallons of diesel were transported to Galapagos from continental Ecuador for use mainly for electricity generation, ferries and land vehicles, by the Armed Forces and for industrial purposes. Of this, some 29% was used to power diesel generators for electricity generation on the four inhabited islands of Floreana, Isabela, San Cristóbal and Santa Cruz.

76. Galapagos enjoys a very good solar regime (average of 5.5 kWh/m²/day). The wind regime is quite good on San Cristóbal (6.8 m/s) and there are promising prospects on Floreana, Santa Cruz and Isabela. Introducing renewable energy technologies (PV and wind), either individually or in a hybrid mode, would make it possible for around 60% of the electricity needs of Galapagos to be met from locally available solar and wind resources. This will have the effect of substantially reducing the amount of diesel used annually for this purpose, leading to significant global benefits by reducing greenhouse gas emissions. It is expected that the introduction of renewable energy for electricity generation in Galapagos will generate a reduction of 210.000 tons of CO₂ over a 20-year lifetime of the equipment.

77. In addition, the introduction of renewable energy technologies for electricity generation would decrease the amount of diesel to be transported to Galapagos by around 1 million gallons, in terms of 2004 figures. This would represent a reduction of approximately 20% in the amount of diesel shipped to the islands. This transportation often takes place in small tankers that are prone to oil leaks and are more vulnerable to running aground in heavy seas, thus causing oil spills (e.g. Jessica, January 2001 and Taurus in July 2002) and damaging the unique species and delicate ecosystem found in and around the islands. Consequently, renewable energy-based electrification of Galapagos will have the net effect of decreasing the volume and frequency of oil shipment to the Archipelago, thus, reducing the probability of oil spills. Furthermore, the regular handling of oil on the islands when loading and unloading frequently leads to smaller spills that contaminate the soil and water. The project will also reduce these spills.

78. While national coverage of electricity is relatively high (80% of the total population), 45% of the rural population living in dispersed communities far from the grid have no access to electricity services. Many of these rural communities may not get connected to the grid for the next 15-20 years because of the high investment that is required for grid expansion. Thus, removal of the identified barriers to renewable energy-based electricity generation in Galapagos will provide the private sector with the necessary confidence to set up mini-grids based on renewable energy technologies to supply these rural consumers in continental Ecuador with electricity services. The net result will have a three-fold effect: provide rural consumers with a better quality of life, create opportunities for income-generating activities based on the availability of electricity services, thus assisting in poverty reduction, and generate the potential to substantially reduce the electricity sector carbon emissions. In addition, it will create opportunities for grid-connected electricity generation through renewable energy.

79. The primary beneficiaries will be the 5,581 EEPG customers⁸ on the four inhabited islands who will receive electricity services mainly from locally available and environmentally clean solar and wind energy, thus promoting sustainable development through reliable electricity services that will support growth, while substantially decreasing CO₂ emissions and reducing the risk of oil spills related to the transportation of fossil fuel from the mainland. In addition, the capacity of EEPG to negotiate Power Purchase Agreements with Independent Power Producers and to provide quality service to its consumers will be strengthened. Finally, Government institutions like the Ministry of Energy and Mines and CONELEC will be better prepared to enact policy and regulatory frameworks governing the electricity sector.

80. In addition to bringing about local, national and global benefits, the project is consistent with Ecuador's national development priorities. It will increase the use of renewable energy and decrease the consumption of imported diesel.

Country Ownership: Country Eligibility and Country Drivenness

81. The Government of Ecuador signed the United Nations Framework Convention on Climate Change on 23 February 1993 and it entered into force on 21 March 1994. Moreover, it signed the Kyoto Protocol on 15 January 1999 and ratified it on 13 January 2000.

82. In addition, the Government approved in March 1998 the Special Framework Law for Conservation and Sustainable Development for the Province of Galapagos (Ley de Regimen Especial para la Conservación y Desarrollo Sostenible de la Provincia de Galapagos) setting up the legal and administrative framework for policy and planning in Galapagos. This Law also strengthened the Instituto Nacional Galapagos (INGALA) in its capacity to serve as the focal agency for development and conservation within the province.

83. Moreover, in order to reduce operating costs associated with the provision of electricity services to consumers on the inhabited islands, the Government is interested in introducing renewable energy for electricity generation. It plans to achieve this through joint ventures with private companies/independent power producers interested to utilize renewable energy to reduce

⁸ Source: EEPG, Oct. 2004

emission of greenhouse gases and, more importantly, to preserve the rich biodiversity wealth found in the Galapagos archipelago.

84. The Government of Ecuador will contribute to this project through several sources: first, by a direct allocation of \$ 1.7 million to the project; second, through the allocation of FERUM funds by CONELEC. FERUM has already contributed \$ 55,000 for the repowering of Floreana and is contributing \$ 3.2 million towards repowering San Cristobal. Additional funds are expected to be allocated for the repowering of Santa Cruz.

85. The Government of Ecuador will implement the project under the National Execution modality (NEX) and will provide both in-kind and cash contributions for project activities. National and international consultants/consultancy firms will be identified and recruited to participate in the development of specific project activities, as required.

Sustainability

86. From a technical point of view, the viability of renewable energy to supply grid electricity has been proven in several developed countries. However, there is very limited experience in developing countries with renewable energy, working in hybrid modes with diesel generation, to supply mini-grids. By addressing the barriers that impede the wide-scale utilization of renewable energy in hybrid modes with diesel generation to supply mini-grids, the project will build upon the experience achieved and lessons learned during the recent repowering exercise on Floreana to first create a momentum for repowering the remaining 3 inhabited islands, then a sustainable niche for such activities in mainland Ecuador and eventually throughout the region. The project will also strengthen the policy, institutional, legal, regulatory and operational capabilities of key national institutions to promote private sector participation in renewable energy electricity generation and to develop an energy efficiency awareness programme among consumers on the islands, accompanied by information dissemination to promote replication. These efforts should ensure the long-term sustainability of renewable energy based electricity generation in Ecuador.

87. From a financial point of view, the project will aim at making, in the long term, the Galapagos Electricity Company (EEPG) a financially more responsible Utility. Traditionally, EEPG has relied on Government grant efforts for expansion and replacement of assets. However, under this project, the following financial modality is proposed:

88. The funds made available by GEF (excluding PDF-B funds which have already been spent) are earmarked for two main components that can be generally categorized as technical assistance and equity investment. The technical assistance component in the amount of \$ 515,832 (\$ 560,000 have already been available for the on-going PDF-C) will fund such activities as international/local individual consultancies, project management, travel, consultancies provided under sub-contracts, training and project running costs covering, initially, Floreana and, subsequently, the remaining three islands of Isabela, San Cristóbal and Santa Cruz.

89. With regards to the equity investment component in the amount of \$ 3,000,000, it is allocated specifically to support repowering of electricity generation on Santa Cruz. These activities are scheduled for implementation during Year 2 of the full project. The funds from the

GEF will be managed in a way so as to maximize the chances of achieving sustainable renewable re-powering of the archipelago; hence, these funds will not be used as a capital-cost subsidy. The funds will, as usual, be a grant to the Government who will use them as an equity investment to increase its shares on EEPG. The revenues from electricity generated (sell of electricity minus operating costs) will capitalize a fund which will provide the financial resources for (i) maintenance and acquisition of replacement parts; (ii) following up the monitoring of the endemic bird populations around the project area and provide working capital for environmental mitigation; (iii) to serve as a capital seed to continue the repowering effort in Galapagos; and (iv) to establish a demonstration and training center on renewable energy technologies in Galapagos. It is expected that revenues from PV solar projects on Isabela and Santa Cruz (PNG) will be part of this fund.

Replicability

90. The World Bank-funded PROMEC project implemented by CONAM has identified numerous opportunities in the remote areas of continental Ecuador where local communities have no access to electricity services. These communities can potentially be electrified in a cost-effective manner through renewable energy-based mini-grids and the Government is interested in creating a conducive environment to attract the private sector to complement its own rural electrification initiative. Consequently, the repowering exercise in Galapagos is expected to provide lessons learned on an appropriate modality, not only with regard to solar and wind energy, but also with other sources of renewable energy such as micro-mini-hydro and biomass to generate electricity to supply isolated mini-grids and support the national grid. As indicated earlier, there are new initiatives in place in the provinces of Imbabura and Loja, where wind parks will soon be started.

91. It is evident that the effective replication of the Galapagos experience will require a combination of policy related changes as well as targeted dissemination of lessons learned and project achievements, thereby providing concrete examples of practical implementation. Accordingly, the project will facilitate continuing contacts and collaboration among the different stakeholders through the organization of seminars, workshops, site visits and other events. In addition, the project will set up a web site that stakeholders can consult to follow progress in project implementation and learn about problems encountered and the solutions proposed, results achieved, etc.

PART III: MANAGEMENT ARRANGEMENTS

92. The project will be implemented by the Dirección de Energías Alternativas y Eficiencia Energética (DEREE) of the Ministry of Energy and Mines (MEM), under the national execution (NEX) modality. For this purpose, a Project Management Unit (PMU) will be responsible for the project's direction, planning strategies and efficient overall implementation. The PMU will consist of a National Project Manager, a Project Officer and an Administrative Assistant. The Project Manager will be responsible for day-to day operations and will also act as a liaison/facilitator among the various local stakeholders, both in Galapagos and in continental Ecuador, and with donors/investors. The Project Manager will prepare an updated implementation schedule for the entire project and a detailed work plan for the first 12 months of

implementation. Upon completion of the initial 12-month cycle, the Project manager will prepare implementation work plans for the subsequent 12 months until project completion.

93. In addition, a Project Steering Committee, consisting of representatives of CONAM, EEPG, CONELEC, MEM and MA, co-chaired by INGALA and UNDP, will provide overall guidance to project execution. The Ministry of Environment will also supervise and monitor the project as the GEF national focal point. The private sector investors participating in the joint ventures or as independent power producers may be invited to participate in the meetings of the Steering Committee on an ad-hoc basis.

94. EEPG, either on its own or in partnership with local/external investors, will implement renewable energy schemes to re-power electricity generation on the four inhabited islands. In doing so, it will work in close collaboration with INGALA and other relevant institutions such as Municipalities to ensure that the views of the local communities are taken into consideration.

95. Community participation is vital to the success of the whole electricity repowering exercise. It is, therefore, important that the Galapagos residents as well as the whole of Ecuador be briefed on the complete process and their support secured. In Galapagos, the Project Manager will need to maintain very close contact with INGALA and the local communities on each of the islands. The Project Manager will organize meetings with the local institutions to secure their concurrence and support to the activities proposed for implementation and to explain to them the benefits that the islands would derive from such activities.

96. In order to accord proper acknowledgement to GEF for providing funding, a GEF logo should appear on all relevant GEF project publications, including among others, project hardware and vehicles purchased with GEF funds. Any citation on publications regarding projects funded by GEF should also accord proper acknowledgement to GEF. The UNDP logo should be more prominent -- and separated from the GEF logo if possible, as UN visibility is important for security purposes.

PART IV: MONITORING AND EVALUATION PLAN AND BUDGET

General

97. As indicated earlier, a Project Steering Committee, consisting of representatives of CONAM, EEPG, CONELEC, MEM and MA, co-chaired by INGALA and UNDP, will provide overall guidance to project execution. The Ministry of Environment will also supervise and monitor the project as the GEF technical focal point. The private sector investors participating in the joint ventures or as independent power producers may be invited to participate in the meetings of the Steering Committee on an ad-hoc basis.

98. The project will be monitored and evaluated according to standard UNDP rules for nationally executed projects. For each of the project components, a detailed monitoring plan will be prepared during project inception. And as part project inception, the Project Logical Framework may be revised; specifically, the detailed indicators will be revisited and adapted as necessary, including measures to track the major external project risks. These indicators will

draw upon all sources of information, including those of other donors active in the energy/renewable energy field in Ecuador. Appropriate and specific performance benchmarks will be established prior to project implementation to effectively monitor project progress and to make crucial management decisions. An annual reporting cycle will be established that will provide progress reports to be shared among all participants in the project. The proposed monitoring and evaluation activities will follow the guidelines contained in the UNDP/GEF Information Kit on Monitoring and Evaluation.

Following its emphasis on results-based management, UNDP has developed a new format for work plans as part of its corporate policy. This format emphasizes achievements (benchmarks and milestones) as well as cost per output/result. This format will allow for a critical assessment of programme performance as it shows, at a glance, what activities are to be implemented and when, the cost for each activity, the responsible agent for implementation, progress at the end of every quarter, and will facilitate the preparation of the work plans for the subsequent quarters.

99. In addition to normal Government monitoring, UNDP will have the monitoring and reporting obligation for the programme, in accordance with the GEF Monitoring and Evaluation (M&E) guidelines. In this connection, additional M&E missions will be undertaken by UNDP when this is judged to be required, as for example when there is a need for an intermediate assessment of progress or impact before a decision is made as to the continuation of any given activity. This will be done in collaboration with the Executing Agency (MEM) as well as with the implementing partners/stakeholders.

100. In order to accord proper acknowledgement to GEF for providing funding, a GEF logo should appear on all relevant GEF project publications, including among others, project hardware and vehicles purchased with GEF funds. Any citation on publications regarding projects funded by GEF should also accord proper acknowledgment to GEF. The UNDP logo should be more prominent and separated from the GEF logo if possible, as UN visibility is important for security purposes.

Monitoring and Evaluation

101. The Executing Agency (MEM) will be responsible for regularly monitoring progress in project implementation. In undertaking this, it will be supported by the Project Management Unit (PMU). Progress will be measured against targets set out in the Work Plan and Project Logical Framework. PMU will be required to report relevant progress to the Director of Renewable Energy and Energy Efficiency of the MEM and UNDP on a quarterly basis. Regular monitoring of the project will occur through this reporting mechanism as well as through site visits, as required. Disbursements of UNDP-GEF funds will be dependent upon the project's ability to establish a well designed reporting mechanism.

102. Annual Tripartite Review meetings (TPRs), with the participation of the Executing Agency, project team, stakeholders and UNDP, will be held to review progress, identify problems, and agree on solutions to maintain timely provision of inputs/achievement of results. The Project Steering Committee will review annual work plans as well as provide strategic

advice on the most effective ways and means of implementation. Reporting to GEF will be accomplished through annual Project Implementation Reviews (PIRs).

103. Additionally, the project will be the subject of two independent evaluations: the first one will be half way through implementation, and the other at project completion. These independent evaluations will review progress in project implementation and make recommendations, where appropriate, to improve timeliness, relevance and impact of project inputs. They will also assist project stakeholders to draw lessons learned for use in improving the quality of future development interventions with similar activities and could be undertaken in collaboration with other development partners to the project. Such multi-stakeholder and partner evaluations could be a useful learning experience for all parties, where a 360-degree approach could be taken to evaluate all parties' inputs to the project. The results of the final evaluation will be incorporated in the publication on lessons learned for dissemination both within and outside Ecuador. All reports will be posted on the project web site.

Monitoring and Evaluation Budget

103. The costs for Monitoring, Evaluation and Dissemination activities will be paid for by the project budget, for which \$ 240,000 (Table 1) have been allocated in appropriate budgetary account codes under Outcomes 1 to 5 of the total project work plan and budget. This budget allocation includes activities related to preparing quarterly progress reports, undertaking Project Implementation Reviews, Annual Project Reviews and mid-term/final evaluations, and organizing/participating in Steering Committee Meetings, as required.

PART V: LEGAL CONTEXT

104. This Project Document shall be the instrument referred to as such in Article I of the Standard Basic Assistance Agreement between the Government of Ecuador and the United Nations Development Programme, signed by the parties on March 8, 1989 and renewed on January 19, 2005, published in the Official Gazette N. 526 on February 17, 2005. The host country implementing agency shall, for the purpose of the Standard Basic Assistance Agreement, refer to the government co-operating agency described in that Agreement.

105. The UNDP Resident Representative in Ecuador is authorized to effect in writing the following types of revision to this Project Document, provided that he/she has verified the agreement thereto by the UNDP-GEF Unit and is assured that the other signatories to the Project Document have no objection to the proposed changes:

- a) Inclusion of additional annexes and attachments only as set out here in this Project Document
- b) Revision of, or addition to, any of the annexes to the Project Document;
- c) Revisions which do not involve significant changes in the immediate objectives, outputs or activities of the project, but are caused by the rearrangement of the inputs already agreed to or by cost increases due to inflation;

- d) Mandatory annual revisions which re-phase the delivery of agreed project inputs or increased expert or other costs due to inflation or take into account agency expenditure flexibility; and
- e) Inclusion of additional annexes and attachments only as set out here in this Project Document

SECTION II: STRATEGIC RESULTS FRAMEWORK AND GEF INCREMENT

PART I: INCREMENTAL COST ANALYSIS

Baseline

106. The baseline scenario assumes that re-powering of Floreana, Isabela, San Cristobal and Santa Cruz will be carried out directly by EEPG using the current diesel technology. This publicly-owned private company has inherited poor management from the past and is internally short of human capacity and financial resources to simultaneously improve operation and maintenance on the islands. Therefore, re-powering will be based entirely on the re-installation (replacement) of diesel engines, a technology known to EEPG with a relatively low investment cost.

Global Environmental Objective

107. The ultimate goal of the project is to address the issue of reducing greenhouse gas emissions through the removal of institutional, economic, technical and financial barriers to the nation-wide development of renewable energy for isolated systems as well as main grid connected. The development objective of the project is to effectively promote renewable energy use through re-powering 4 islands of the Galapagos Archipelago with wind/PV diesel hybrid systems, thereby providing a model that can be used to promote renewable energy throughout the rest of mainland Ecuador.

108. This will allow reducing greenhouse gas emissions associated with electricity generation by 10,500 tons per year on the four inhabited islands of Galapagos Archipelago. Over a 20-year project lifetime of the installed equipment, the Unit Abatement Cost of the GEF contribution amounts to approx. \$ 20 per ton of CO₂.

109. A secondary objective is to reduce oil spill risks by the reduction of the frequency of boat trips needed to transport oil products to the islands by 15.7% overall (from the current 6.45 million (2004 figures) US gallons of diesel, 1.01 million gallons/year will be avoided with the project), therefore improving biodiversity safeguard.

110. If these results can be replicated to mainland Ecuador, there exists the potential to reduce greenhouse gas emissions associated with electricity generation by potentially 0.5 to 1 million tons per year through the deployment of renewable energy in Ecuador (20% of the rural population or 80,000 households do not have access to electricity to date).

Alternative

111. The project will launch a comprehensive barrier removal effort in order to lay the groundwork for the construction and operation of four hybrid renewable-based electricity systems in the inhabited islands of the Galapagos Archipelago. The project has three components and will be carried out in two phases: The first component will initiate the process of barrier

removal by laying the groundwork for the effective construction of generating capacities on the islands. This will include capacity building and strengthening of EEPG, detailed feasibility studies, establishment of joint ventures and signature of the Power Purchase Agreements with the utility EEPG. The second component, Phase 1, involves, among other activities, financial closure of projects and the construction of wind plants and PV systems on Floreana and San Cristobal (financed by private investors). Lessons learned from these two islands will benefit the electrification of Isabela and Santa Cruz, which are the focus of the third component, or Phase 2.

Systems Boundary

112. The geographical boundary is limited to the four Galapagos Islands. However the project is expected to have a strong impact on Ecuador energy sector development as a whole. It may also have positive impacts on the development of renewable energy in South America, especially since synergy will appear with other projects in neighboring countries. Renewable energy based electrification is first implemented in the Galapagos Islands, given the very unique situation of this Archipelago from a biodiversity standpoint. The idea is that the successful development of renewable-based energy systems in the Galapagos will have provided the contracting bases (Joint Venture legal set-up, Purchasing Power Agreement model and bidding procedures for renewable energy related equipment and services), and will allow partnership development with private project stakeholders from major utilities world-wide. The project will focus on off-grid generation, but will most likely have positive spill-over effects on the development of on-grid renewable energy in Ecuador as well.

Additional Benefits

113. Additional benefits of the project include reduced oil spills risks, reduced dependence on fossil fuels and therefore price fluctuations and scarcity, improved quality of electricity for the islanders and reduced subsidy needs due to lower operation costs, consistent with government objectives. The project is envisioned, at the state and local levels, as an opportunity to stimulate integrated natural reserve management patterns. This project will be marketed so as to enhance tourism interest for new renewable, environmentally-friendly technologies.

Summary of Costs

114. The total estimated costs of the project amount to \$30,496,135 (including \$ 283,100 for PDF B activities), as per Table 1 above. Of this total the estimated baseline costs are \$17,010,000 while \$13,486,135 is the estimated incremental costs of the project. From the GEF, the amount of \$ 3,239,666 (excluding PDF B resources) is sought to cover approximately 30% of the incremental project intervention costs. The Government of Ecuador will provide \$ 5,180,000 through its own resources and FERUM and \$ 250,605 in kind. In addition, \$ 20,965,530 will be funded from national and international private sources of funding.

PART II: Logical Framework Analysis

Logical Framework and Objectively Verifiable Impact Indicators

Project Strategy	Objectively Verifiable Indicators				
Goal	To address the issue of reducing greenhouse gas emissions through the utilization of renewable energy for electricity generation, initially in Galapagos and later throughout Ecuador and the region.				
	Indicator	Baseline	Target	Sources of Verification	Assumptions
<p>Objective: To promote the utilization of renewable energy (PV and Wind) for electricity generation, thus reducing Galapagos' dependency on diesel shipped from continental Ecuador.</p>	<p>Quantity of fossil fuel displaced by renewable energy generation and the resulting GHG emission reductions. MWh of renewable energy production. MW and MWh of renewable energy based generation in the Galapagos system.</p>	<p>Floreana - 22.5 kWp of PV and 0.4 kW of Wind energy under operation Isabela – Financing for 700 kWp of PV secured. Commissioning of systems expected in 2007. San Cristobal: Financing for 2.4 MW of wind power secured. Commissioning expected in early 2007. Santa Cruz – Financing for 120 kWp of PV secured. Commissioning expected in mid 2007. Full financial package for 3.2 MW of wind expected in June 2006.</p>	<p>Mid-term: Investment of at least \$ 10 million, 11,600 MWh annually produced from renewable energy, 10,500 tons of CO₂ reduced annually. End-of Project: Investment of at least \$ 30 million by end of project, electricity generated from renewable energy increased from the present 0% to 60%, to at least 6.6 MW. 10,500 tons of CO₂ avoided (from baseline) annually.</p>	<p>Data generated from the performance reports on new renewable facilities, plus data from annual electricity production and fuel consumption.</p>	<p>A regulatory framework that is fully supportive to the project objectives.</p>

Project Strategy	Objectively Verifiable Indicators				
Goal	To address the issue of reducing greenhouse gas emissions through the utilization of renewable energy for electricity generation, initially in Galapagos and later throughout Ecuador and the region.				
	Indicator	Baseline	Target	Sources of Verification	Assumptions
Outcome 1: To support national partners in implementing re-powering of electricity generation on each of the islands.	Plan of action for repowering exercise.	Renewable energy plans for all four islands are in place. Floreana system under operation, San Cristobal and Isabela systems in early construction phase, Santa Cruz system in full feasibility study phase.	Mid-term: Repowering of Floreana and San Cristobal completed. End-of Project: Repowering of Isabela and Santa Cruz also completed. Operational guidelines for private power generation from renewable energy available to project developers.	Project report.	Cooperation and commitment from all involved stakeholders.
Output 1.1: Policy, legal and operational regulations enabling the participation of the private sector in renewable energy-based electricity generation finalized. MEM to initiate an energy efficiency programme in partnership with EEPG.	Sample documents available.	MEM, CONELEC, and FERUM actively involved in design of policies and mechanisms to facilitate investment in renewable energy.	Completion within the first year of project of support to: MEM for policy issues, and CONELEC for any additional regulatory and tariff issues. Mid-term: EEPG has initiated energy efficiency programme. End-of-Project: Energy efficiency programme incorporated into EEPG's business plan.	Sample documents.	Supportive country's regulatory framework.
Output 1.2: Full feasibility and design completed, including more accurate cost estimates and an implementation schedule for repowering electricity generation on each of the 4 islands.	Completed feasibility reports.	Floreana – Renewable systems under operation. Isabela – Full feasibility completed San Cristobal – Full	Mid-term: Feasibility studies for all 4 islands completed. Environmental licenses secured.	Feasibility reports.	

Project Strategy	Objectively Verifiable Indicators				
Goal	To address the issue of reducing greenhouse gas emissions through the utilization of renewable energy for electricity generation, initially in Galapagos and later throughout Ecuador and the region.				
	Indicator	Baseline	Target	Sources of Verification	Assumptions
		feasibility completed. Santa Cruz – Full feasibility under development			
<p>Outcome 2: To support repowering through strengthening the institutional, technical and operational capability of EEPG.</p>	EEPG trained and able to implement renewable energy-based electricity generation projects.	Institutional assessment of EEPG in process, to determine capacity strengthening needs.	<p>Mid-term: EEPG organizational structure assessed and institutional strengthening in process with the establishment of technical unit endowed with the appropriate technical staff.</p> <p>End-of-Project: EEPG better managed and operating efficiently, e.g. reduction in generation equipment downtime to levels specified by manufacturers, decrease in distribution losses to, improvement in service to customers and bill collection, and minimizing subsidies.</p>	Reports of strengthening activities.	EEPG culture amenable to change.
<p>Output 2.1: EEPG’s capacity related to design and negotiate Independent Power Producer (IPP) schemes and Power Purchase Agreements (PPAs) strengthened.</p>	Existence of management procedures for PPA contracts.	Capacity does not exist at the present time.	Mid-term: Capacity development activities related to IPPs/PPAs completed (within first year of project).	Reports of capacity development activities.	EEPG’s structure to deal with IPP/PPA issues in place.

Project Strategy	Objectively Verifiable Indicators				
Goal	To address the issue of reducing greenhouse gas emissions through the utilization of renewable energy for electricity generation, initially in Galapagos and later throughout Ecuador and the region.				
	Indicator	Baseline	Target	Sources of Verification	Assumptions
Output 2.2: EEPG's capacity to implement repowering and negotiate contractual arrangements for operation and maintenance strengthened.	Number of personnel trained in planning, management, operation and maintenance of renewable energy systems for repowering.	No such training taking place.	Mid-term: Capacity development activities related to O&M going on.	Reports of capacity development activities.	EEPG's structure to provide additional services in place.
Output 2.3: Power purchase and operational agreements between each external entity and EEPG signed.	Signed agreements.	No such activities being implemented.	Mid-term: Signing of at least 2 agreements (by first year of project). End-of –Project: All 4 islands operating under clear institutional arrangements, together with PPAs.	Signed PPAs.	EEPG's commitment to work with private sector investors is maintained.
Outcome 3: To facilitate repowering on Floreana and San Cristobal with PV/wind/diesel hybrid electricity generating systems.	Repowering activities successfully completed.	Repowering activities taking place in Floreana and Santa Cruz.	Mid-term: Completion by beginning of 2007.	Report of monitoring mission and project report/EEPG annual report.	There is sustained interest on the part of stakeholders.
Output 3.1: PV/Wind/diesel hybrid system repowered and in operation on Floreana.	Completed repowering activity.	22.5 kWp of PV and 0.4 kW of Wind energy under operation	Mid-term: Already completed in August 2005. End-of Project: Repowered system operating without any technical and management hiccups. Additional capacity of 3 kW installed by March 2006.	Report of monitoring mission/project report.	Proper management structure in place.

Project Strategy	Objectively Verifiable Indicators				
Goal	To address the issue of reducing greenhouse gas emissions through the utilization of renewable energy for electricity generation, initially in Galapagos and later throughout Ecuador and the region.				
	Indicator	Baseline	Target	Sources of Verification	Assumptions
			Renewable energy penetration of 80%.		
Output 3.2: Wind-diesel hybrid system repowered and in operation on San Cristobal.	Completed repowering activity.	Financing for wind/diesel hybrid system secured, and pre-construction activities underway.	Mid-term: Completion by December 2006. End-of Project: Repowered system operating flawlessly. Renewable energy penetration ratio of 50%.	Report of monitoring mission/project report.	Proper management structure in place.
Outcome 4: To facilitate repowering on Isabela and Santa Cruz with PV/wind/diesel hybrid electricity generating systems.	Repowering activities successfully completed.	Repowering activities taking place on Isabela and Santa Cruz.	End-of Project: Completed in July 2008.	Report of monitoring mission and project report/EEPG annual report.	There is sustained interest on the part of stakeholders.
Output 4.1: PV-diesel hybrid system repowered and in operation on Isabela.	Completed repowering activity.	Financing for system secured and design completed.	Mid-term: Completion in June 2007. End-of Project: Repowered system operating flawlessly. Renewable energy penetration ratio of 70%.	Report of monitoring mission.	Proper management structure in place.
Output 4.2: PV system installed at premises of Parque Nacional Galapagos.	Completed repowering activity.	Financing for system secured and design completed.	Mid-term: Completed in June 2007. End-of Project: Repowered system operating flawlessly.	Report of monitoring mission.	Proper management structure in place.
Output 4.3: Wind/diesel hybrid system repowered and in operation for Santa Cruz.	Completed repowering activity.	Full feasibility studies underway.	End-of Project: Completed in July 2008. Renewable energy penetration ratio of 50%. Repowered system	Report of monitoring mission.	Proper management structure in place.

Project Strategy	Objectively Verifiable Indicators				
Goal	To address the issue of reducing greenhouse gas emissions through the utilization of renewable energy for electricity generation, initially in Galapagos and later throughout Ecuador and the region.				
	Indicator	Baseline	Target	Sources of Verification	Assumptions
			operating flawlessly.		
Outcome 5: Replication of project experience/best practices and lessons learned throughout Ecuador and in other countries in the region.	Project experience compiled, analyzed and disseminated.	Lack of sufficient information on utilization of renewable energy for electricity generation.	End-of Project: At least 3 projects initiated in other provinces of Ecuador and region. EEPG to incorporate renewable energy-based electricity generation in its future expansion plans.	Project final report. EEPG expansion plan.	Solid replication efforts are sustained.
Output 5.1: Materials on project experience/best practices and lessons learned prepared.	Project experience and best practices compiled.	Lack of information on best practices and lessons learned.	Mid-term: Materials being compiled. End-of Project: All materials compiled within 3 months of project end.	Project documentation.	
Output 5.2: Project overall results, experiences and lessons learned disseminated at the national and regional levels.	Discussions on project results, experiences and lessons learnt prior to dissemination.	No experiences and lessons learnt disseminated.	Mid-term: Workshop to discuss results achieved to date. End-of-Project: Draft final report disseminated to the stakeholders. Regional seminar organized to present and discuss the results/lessons learned. Public outreach activities through news media/web site.	Project reports and publications/web site.	Supportive institutional, legal and regulatory framework.

Project Strategy	Objectively Verifiable Indicators				
Goal	To address the issue of reducing greenhouse gas emissions through the utilization of renewable energy for electricity generation, initially in Galapagos and later throughout Ecuador and the region.				
	Indicator	Baseline	Target	Sources of Verification	Assumptions
<p>Output 5.3: Consultations/dialogue for replicating project experiences in other provinces of Ecuador completed.</p>	<p>Number of agreements / expressions of interest for project replication at national level.</p>	<p>No replication and effective follow up of the results of the project.</p>	<p>End-of-Project: Indications of several expressions of interest to replicate project activities at the national level. Support network to assist stakeholders and project promoters established.</p>	<p>Final evaluation.</p>	

SECTION III: TOTAL BUDGET AND WORK PLAN

Award ID: 00042428

Award Title: PIMS 1295 FSP: RE Barriers in Galapagos

1. Project ID: 00048857

Project Title: PIMS 1295 CC FSP: Renewable Energy for Electricity Generation-Renewable Electrification of the Galapagos Islands

Implementing Partner/ExA: NEX-Ministry of Environment

GEF Outcome/Atlas Activity	Responsible Party/Implementing Agency	Source of Funds	ERP/ATLAS Budget Description		2006 (USD)	2007 (USD)	2008 (USD)	Total (USD)		
Outcome 1: Policy, legal framework and capacities in place for national partners to implement re-powering exercise.	MEM	62000	71400	Contractual Services- Indiv.	16,320	32,640	32,640	81,600		
			71600	Travel	10,256	9,400	10,600	30,256		
			72300	Materials & Goods	10,000	7,500	7,166	25,000		
			74200	Audio Visual & Print Prod	1,728	7,456	9,600	18,784		
			74500	Miscellaneous Expenses	3,000	5,000	2,000	10,000		
			Sub-total	41,304	61,996	62,006	165,306			
Outcome 2: Institutional, technical and operational framework in place for EEPG's participation in the repowering exercise.	MEM	62000	71400	Contractual Services-Indiv	6,120	12,240	12,240	30,600		
			71600	Travel	3,846	3,525	3,975	11,346		
			74500	Miscellaneous Expenses	648	2,796	3,600	7,044		
			Sub-total	10,614	18,561	19,815	48,990			
Outcome 3: Repowered systems in place on Floreana and San Cristobal	MEM	62000	71400	Contractual Services-Indiv	2,040	4,080	4,080	10,200		
			71600	Travel	1,282	1,175	1,325	3,782		
			72500	Miscellaneous Expenses	216	932	1,200	2,348		
			Sub-total	3,538	6,187	6,605	16,330			
Outcome 4: Repowered systems in place on Isabela and Santa Cruz.	MEM	62000	71400	Contractual Services-Indiv	12,240	24,480	24,480	61,200		
			71600	Travel	7,692	7,050	6,450	21,192		
			74500	Miscellaneous Expenses	1,296	5,592	1,500	8,388		
					72100	Contractual Services		2,845,400	7,200	2,852,600
		62040			72100	Contractual Services	597,000	1,028,000		1,625,000
		62040			72100	Contractual Services		650,000		650,000
31700			72100	Contractual Services		3,225,000		3,225,000		
			Sub-total	618,228	7,785,522	39,630	8,443,380			
Outcome 5: Framework in place for replication of project experiences/best practices and dissemination of lessons learned.	MEM	GEF	71400	Service Contracts	4,080	8,160	8,160	20,400		
			71600	Travel	2,564	2,350	2,650	7,564		
			74200	Audio Visual & Print Prod	432	1,864	2,400	4,696		
			71200	International Consultants	10,000	10,000	13,000	33,000		
			Sub-total	17,076	22,374	26,210	65,660			
TOTAL					690,760	7,894,640	154,266	8,739,666		

	Summary of Funds:							
				GEF	93,760	2,991,640	154,266	3,239,666
				MEM	597,000	1,028,000		1,625,000
				UNF		650,000		650,000
				Others		3,225,000		3,225,000
				TOTAL	690,760	7,894,640	154,266	8,739,666

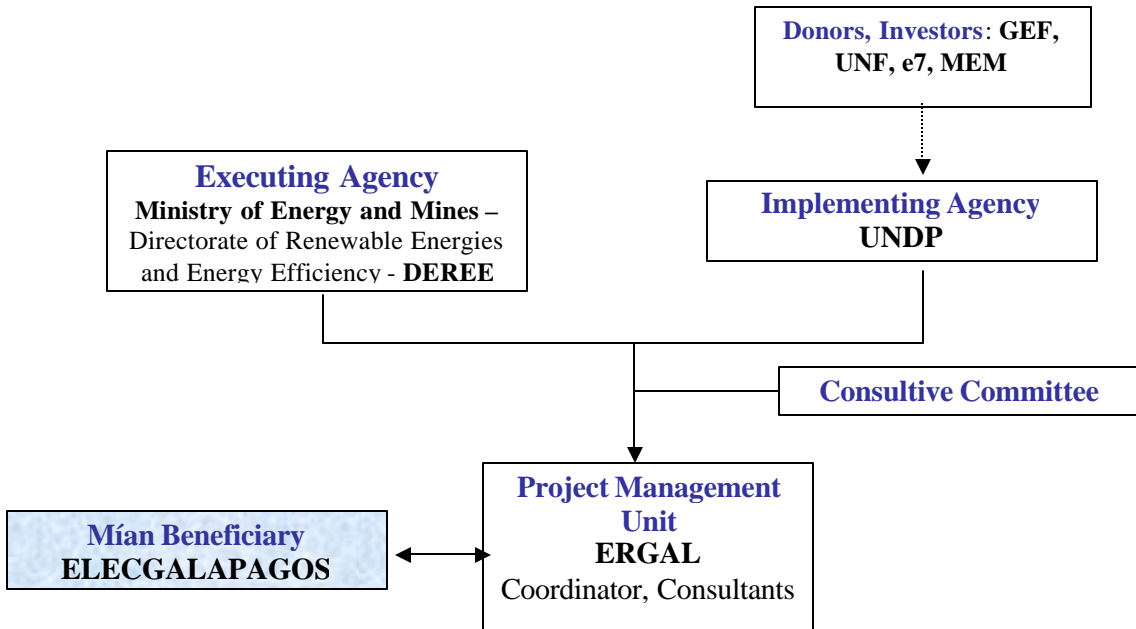
SECTION IV: ADDITIONAL INFORMATION

PART I: Other Agreements

Agreements and documents attached:

1. Letter DE -05-1772 from CONELEC to Elecgalapagos S.A., issued on September 28th, 2005, certifying the amount of FERUM funding that is going to be channeled to the San Cristobal Wind Project.
2. Cover page of the UNF-funded San Cristobal Wind Power Project, signed.
3. Summary of contributions that financed the Floreana PV project, signed by the coordinator of the project.
4. Letter 686-DM-2002 from the Minister of Energy and Mines, issued on August 13, 2002, certifying that the Ministry of Energy and Mines will contribute with a cash amount of 1.7 million dollars to the project.
5. Non-reimbursable loan agreement signed between the German Bank for Development (KfW) and Elecgalapagos S.A. for the re-electrification of Isabela and the Parque Nacional Galapagos premises in Santa Cruz with solar energy.

PART II: Organigram of Project



PART III: Terms of Reference for key project staff and main sub-contracts

1. National Project Manager

Post Title:	Project Manager
Organization:	Project Management Unit
Department:	Dirección de Energías Renovables y Eficiencia Energética (DEREE), MEM / Empresa Eléctrica Provincial Galapagos, EEPG
Duration:	3 years
Duty Station:	Quito and Galapagos

The Project Manager (PM), in addition to having technical expertise in the area of renewable energy-based electricity generation, especially in relation to policy, regulatory and tariff issues, should facilitate relations and coordination between the stakeholders and the local community, and ensure that the repowering initiatives implemented in the Galapagos occur coordinately and in coherence with the needs and conditions of the region. In this regard, the PM will determine the strategic repowering objectives of all the islands with renewable energy, including the removal of barriers for renewable energy-based electricity generation in Ecuador, in general, and in the Galapagos, in particular and will contribute to their achievement.

Duties: The Project Manager will:

- Lead, manage and coordinate the day-to-day activities of the work team (a Jr. Consultant and an Administrative Assistant), including planning, programming and implementing activities, requests for funds and reports on disbursements, preparation of reports and all other activities conducive to proper project implementation.
- Act as a link/facilitator among the various participants, including securing the concurrence and support of the local communities to proposed activities and cooperation among the project partners to ensure smooth progress and achievement of the strategic objectives.
- Analyze the different barriers encountered or than can arise during project execution and formulate and implement a strategy to overcome them in order to guarantee success of the project. The barriers include: restrictive regulations, customs duties, taxes, insufficient local capacity, etc.
- Undertake activities necessary for achieving technical progress, including drafting of terms of reference for sub-contractors, identification and selection, as per UNDP regulations, of sub-contractors and national/international consultants.
- Coordinate the activities of consultants, including administration of contracts, direction and supervision of field work, logistical support, review of technical outputs/reports, assessment of project achievements and cost control.
- Assist in the design, supervision and, where appropriate, implementation of capacity development activities and dissemination.
- Support the functioning of the Project Steering Committee.
- Provide technical assistance in discussions and development of renewable energy policies.
- Plan and coordinate the approved workshops.
- Assume responsibility for the quality and timing of project objectives and outputs.
- Assist in overall project monitoring and evaluation; and

- Support the development of various activities designed to ensure the development of all the renewable-energy based Galapagos repowering projects.

Qualifications and Experience:

- Post-graduate degree in engineering, administration or economics with strong background on planning and management of energy projects.
- Minimum five years of experience in the energy field, preferably dealing with renewable energy systems, in the public or private sector.
- Minimum five years of work experience in the coordination and management of development, environmental or conservation projects, with demonstrable project level management skills and ability to coordinate activities involving a contingent of professional sub-contractors/consultants drawn from around the country and/or internationally.
- Proven ability to negotiate and manage conflicts.
- Excellent Spanish and English, both oral and written.

Duty Station:

The PM will be based in Quito. During transfers to Galapagos, s/he will be based at the project office located in Puerto Ayora and will travel to the inhabited islands as required by the project.

The PM's travel/mission costs in Galapagos will be covered by the project, against presentation of valid invoices and expenditure reports following each travel. Expenditures incurred in respect of residence, meals and travel in Quito will not be covered.

Reporting and Supervision:

The NPM will have a service contract with UNDP. S/he will be under the direct supervision of the Director, DERE and will submit quarterly reports for his approval.

Performance under the terms of reference of the contract will be supervised by the UNDP official having responsibility for monitoring this project.

2. Jr. Consultant

Post Title: Jr. Consultant

Organization: Project Management Unit

Department: Dirección de Energías Renovables y Eficiencia Energética (DEREE), MEM / Empresa Eléctrica Provincial Galapagos, EEPG

Duration: 3 years

Duty Station: Quito and Galapagos

Duties: Under the overall supervision of the Project Manager, the Jr. Consultant will:

- Manage, on a day-to-day basis, communication with project stakeholders regarding all aspects related to follow-up on commitments, coordination of transmittal, delivery or receipt of reports and other documentation;
- Perform as the focal point for communication on project implementation with stakeholders;

- Interface between PMU and stakeholders on all phases of project implementation to ensure that activities are efficiently managed. This includes workshop planning, mission travel and financial reporting on the use of project resources;
- Planning and handling funding budgets;
- Help the National Project Manager prepare communications with the national and international stakeholders;
- Travel to Galapagos according to project requirements;
- Ensure that all administrative procedures related to project implementation are complied with;
- Assist the PM in the elaboration of terms of reference;
- Monitor, evaluate and follow up the work performed by consultants and sub-contractors recruited under the project. In addition, s/he will offer her/his support to the local electricity company;
- Assist in procurement of goods and services.
- Prepare draft budget revisions to re-allocate/re-phase project resources;
- Organize, screen and follow-up on incoming correspondence (including faxes, e-mail, mail and voicemail);
- Organize courses, seminars and workshops in order to strengthen local capacity;
- Draft letters of invitation and agendas for meetings and dispatch documentation;
- Prepare background information, briefing materials, reports, etc., as required;
- Support the Administrative assistant in the administrative project management.

Qualifications and Experience:

- Engineering background in energy related subjects
- Master’s degree in engineering/environment/management;
- Experience in the development of energy and environment projects;
- Good interaction with Senior and Technical managers;
- Minimum five years of experience in program support work and administration, with UNDP, other UN agencies or the public sector;
- Knowledge of UN rules and regulations and administrative practices;
- Computer competency: excellent knowledge and experience with software for project management, MS Word, Excel, Power Point, etc.
- Ability to cope with changes;
- Excellent command of Spanish and English, both oral and written;
- Excellent drafting and communication skills;
- Knowledge of handling budgets.

3. Administrative Assistant

Post Title: Administrative Assistant

Organization: Project Management Unit

Duration: 3 years

Duty Station: Empresa Eléctrica Provincial Galapagos, Puerto Ayora Santa Cruz

Duties: Under the overall supervision of the Project Manager, the Jr. Consultant will:

- Administrate information from the project generated in the PMU and registered in the UNDP information system.
- Manage revolving funds
- Coordinate administrative, logistic duties from the , communication with project stakeholders
- Interact as administrative link among the Project, UNDP and stakeholders
- Prepare memorandums and official letters for the project operation
- Coordinate the required procedures in order to perform workshops and seminars.
- Carry out acquisition process to buy office materials
- Register the equipment and materials input and output
- Provide administrative and financial support to the different projects

Responsibilities in acquisition

- Provide administrative support to buy goods and material required in the project
- Prepare legal documentation to delivery/reception provisional and/or operation according to the kind of equipment, good and materials

Administrative support to he project

- Support in the delivery, reception and compilation of technical, financial reports

Qualifications and Experience:

- Professional with administrative, financial, or commercial background
- Minimum five years of experience in administration tasks.
- Good knowledge in Ecuadorian and Galapagos situation
- Knowledge of administration from UNDP, other UN agencies or the public sector
- Background in conservation, biodiversity and institutional development management
- Communication proficiency, specifically to prepare clear and consistent reports
- Basic knowledge of English.

4. International Consultant(s) for Mid-Term and Final Evaluations

Duration: 15 days (mid-term evaluation)

20 days (final evaluation)

Duty Station: Galapagos/Quito

Duties: Under the overall supervision of the DERE and UNDP Quito, the Consultant(s) will:

A: Mid-Term Evaluation:

- Assess the achievements of the project with regard to the stated objectives for repowering Floreana and San Cristóbal;
- Assess the impact of the activities implemented to date with regard to benefits to local communities;
- Assess the cost-effectiveness of the activities implemented to date and the results they produced/are likely to produce with regard to sustainability and replication on Isabela and Santa Cruz;

- Identify strengths and weaknesses of the activities implemented to date and formulate recommendations for implementation during the repowering of Isabela and Santa Cruz.

B: Final Evaluation:

- Assess the achievements of the project with regard to the repowering of all four inhabited islands;
- Assess the impact of the activities implemented with regard to benefits to local communities;
- Assess the cost-effectiveness of the activities and the results they produced with regard to sustainability and replication in continental Ecuador;
- Assess the effectiveness of the project in disseminating lessons learned, best practices created and new knowledge generated;
- Identify strengths and weaknesses of the project and formulate recommendations for implementing decentralized systems in continental Ecuador to meet the basic electricity needs of rural/remote communities.

Qualifications and Experience:

- Post-graduate degree in engineering, energy economics or natural sciences;
- Minimum five years of work experience at senior management level with a national/international development organization;
- Proven experience of having undertaken evaluations of development projects;
- Excellent command of Spanish and English, both oral and written.

Note: It may be desirable, but not necessary, for the same consultant(s) to undertake both the mid-term and final evaluations.

5. National Consultant on Lessons Learned and Dissemination

Duration: Retainer contract over a 1-year period

Duty Station: Galapagos/Quito

Duties: Under the overall supervision of the DERE and UNDP Quito, the Consultant will:

- Design a dissemination programme related to the Galapagos repowering exercise with renewable energy;
- Compile model IPP schemes and PPA agreements for decentralized systems for use both nationally and outside Ecuador;
- Prepare publication on lessons learned and results of the repowering exercise in Galapagos for distribution both within and outside Ecuador;
- Prepare dissemination material on the results achieved in Galapagos for presentation at national and international seminars/workshops;
- Organize site visits to the islands for other investors and electricity utilities interested in implementing similar concepts nationally or internationally;
- Design, implement and maintain a web page for posting progress in project implementation and posting project reports.

Qualifications and Experience:

- Post-graduate degree in communications with major in technical writing;
- Minimum five years of work experience in drafting technical publications;
- Experience in designing and maintaining web pages;
- Excellent command of Spanish and English, both oral and written.

LIST OF SUB-CONTRACTS**Sub-Contract 1:** Feasibility studies for the wind energy project in Santa Cruz.

This sub-contract will be used to:

- Evaluate wind resource
- Review available wind turbine candidates
- Review of general system baseline and architecture modeling
- Estimate the energy production in the wind farm
- Wind farm configuration, turbine arrangement
- Estimate the wind potential at a given site based on topographic conditions, obstacles, etc.
- Review costing completed to date

Additionally, this study will include a Power quality assessment in the Santa Cruz Hybrid Project to determine the maximum penetration with wind energy that the utility grid can afford without sacrificing power quality. This study will cover:

- Power system baseline assessment
- Grid robustness assessment
- Dynamic power quality assessment
- Dynamic and transient stability analysis
- Power and voltage fluctuations prediction
- Assessment of installing storage systems to improve power quality and increase the participation of renewable in the electricity generation system.

Sub Contract 2: Detailed Environmental Impact Assessment in Santa Cruz

This sub-contract will address the following:

- Perform an environmental baseline analysis
- Apply solutions for the project execution including impacts mitigation measurements that the project could cause
- Evaluate the environmental, socio economic situation of the region where the project will be built.
- Find out technical and economic solutions feasible to implement and apply in order to mitigate the possible environmental impacts that could be generated during the construction, operation and commissioning of the project.

PART IV: Stakeholder Involvement Plan

The project has been designed initially to undertake the repowering of the Galapagos with renewable energy, but within the context of a larger national programme to accelerate the development of renewable power technologies to meet both the needs of rural communities for electricity services for improved quality of life and income-generating activities and of the Provincial Utilities for additional generating capacity utilizing a locally available and environmentally neutral energy resource. Stakeholder participation involving the public and private sectors as well as civil society has played an essential role in the development of the project and will continue to play a significant role during its implementation.

At the conceptualization stage of the project, the Ministry of Energy and Mines, with the support of UNDP, launched a Preparatory Assistance mission in 1997 to carry out extensive consultations with various stakeholders and evaluate the feasibility of innovative institutional and investment models for renewable power generation in Galapagos. A team was constituted to steer the mission and to develop this project. The first meeting of the Stakeholders was held in 1998, and included Central and Provincial Government agencies, investors, project developers, industry associations, financial institutions, donors and others. Several meetings were subsequently held and they focused on issues of policy, regulations, financing, tariffs, capacity development, technologies, community participation, etc. The experience and the expectations of the stakeholders were considered during project conceptualization and definition.

The preparation of the full project brought together all key stakeholders during discussions leading to the preparation of the UNDP Country Programme Outline for Ecuador (2004-2008). This latest Country Programme envisages support to the Government to meet the objectives of global conventions and mobilize resources from diverse sources, including the Ecuadorian private sector, to address national/regional concerns such as the management of globally significant biodiversity areas, renewable energy, land degradation, desertification and climate change; and demonstrate technologies, including traditional technologies and innovative approaches, to address linkages between global environment issues and national developmental challenges.

The indicative roles of different stakeholders have been identified to minimize project implementation risks, and thereby ensuring its sustainability. Typical roles of different category of stakeholders are discussed below:

The Government Agencies (MEM, MA, CONELEC, CENACE, etc.) are expected to facilitate project formulation and implementation. In this connection, they will actively liaise with various departments and institutions, including the Provincial Utilities, financial institutions, banks and private project developers. While their capacities to effectively network with various partner institutions would be enhanced through the project, the Government Agencies by themselves, except for MEM, would not implement projects.

Industry Associations would network with existing entrepreneurs and promote renewable energy power projects resulting in a rolling projects pipeline for financial institutions.

Government Agencies and concerned departments will ensure an enabling environment for project developers and other stakeholders, especially with regard to speedy agreements on energy purchase, wheeling and banking at the tariffs decided by the regulators. They would participate in the capacity development programmes planned under the project.

Regulators would be responsible to allow grid and non-grid power generation and distribution from these projects through speedy regulatory processes including technical validation, public hearings and issuance of fair tariff orders.

Non-Governmental and Community based Organizations would actively participate in the setting up and management of energy efficiency/demand side management at the electricity consumer level.

Industry comprising of the manufacturers of equipment, technology suppliers and service providers would proactively participate in ensuring quality performance of the projects.

MEM will have direct responsibility for implementation of the project. In this, it will be assisted by a Project Management Unit (PMU) based in Quito/Galapagos, as indicated in the respective terms of reference. The PMU will consist of a National Project Manager, 1 Project Officer and 1 Administrative Assistant who, in addition to performing their assigned project management functions, will maintain constant dialogue with the above stakeholders and solicit their assistance and support, as required, to undertake key roles in project implementation.

Table 3 gives an overall plan for stakeholders' involvement. A report detailing the extent and nature of involvement of stakeholder participation will be prepared and submitted periodically to the Project Steering Committee.

Table 3: Plan for Stakeholder Participation

Type of Stakeholder	Contributions to Key Outputs	Frequency (Periodic = once in six months)
Government Agencies	Short/mid/long term perspective plans for development and utilization of renewable energy resources for power generation. Active participation in the workshops and other meetings on policy deliberations – energy markets, renewable energy resources development, environmental impact assessments, investment promotion, and other institutional issues.	Periodic
Regulator	Participation in Steering Committee meetings, environmental impact assessment and tariff determination.	Periodic
Financial Institutions and Banks	Innovative Financing Schemes for replication in and Credit lines to operate innovative financial schemes for continental Ecuador.	Continuous
Technical Institutions	Benchmarking and validation -Performance monitoring and evaluation. Resource for capacity development/information dissemination.	Continuous
Investors	Projects pipeline.	Continuous
NGOs/CBOs	Support to project/Ensure that rural consumer's benefit from project activities and outputs.	Continuous
Bilateral and other donors	Implementation /Replication.	Periodic

SIGNATURE PAGE

Country: Ecuador

UNDAF Outcome(s)/Indicator(s): Outcome 20: Promotion of environmentally sustainable practices and models in the productive sector
Result 20.9: Implementation and use of renewable energies in Galapagos

Expected Outcome(s)/Indicator (s): MYFF 2004-2008
Goal 3: *Energy and environment for sustainable development*
Service line 3.3: *Access to sustainable energy services*
Core result 3.3.3: *Low emissions energy technologies, including renewable energy, energy efficiency and/or advanced fossil fuel introduced.*

Expected Output(s)/Indicator(s): _____
(CP outcomes linked to the SRF/MYFF goal and service line)

Implementing partner: **Ministry of Energy and Mines**
(Designated institution/Executing agency)

Other Partners: **Elecgalapagos S. A.**

Programme Period: 2002-2006
 Programme Component: OP-6
 Project Title: Renewable Energy for Electricity Generation-Renewable Electrification of the Galapagos Islands
 Project ID: tbd
 Project Duration: 3 years
 Management Arrangement: NEX

Total Budget:	30,496,135
<i>Allocated resources:</i>	
Government	5,180,000
GEF	3,239,666
Others	22,076,469

Agreed by **(Government)**: _____
 Agreed by **(Implementing partner/Executing agency)**: _____
 Agreed by **(UNDP)**: _____