

GOVERNMENT OF COSTA RICA
MINISTRY OF ENVIRONMENT AND ENERGY
(MINAE)

UNITED NATIONS DEVELOPMENT PROGRAMME
(UNDP)

GLOBAL ENVIRONMENT FACILITY
(GEF)

PROJECT DOCUMENT

*National Off-Grid Electrification Programme
based on Renewable Energy Sources, Phase 1
COS/02/G31
00034921*

The overall objective is to reduce Greenhouse Gas Emissions by promoting the use of decentralized renewable energy systems in areas isolated from the National Interconnected System of Costa Rica. The project will help remove existing barriers that prevent the utilization of renewable energy sources in remote rural areas that are inaccessible through conventional grid extensions. This will be achieved in two phases. Phase I will focus on the creation of a systematic approach within the Costa Rican energy sector to rural electrification with renewable energy. This will include the creation of an institutional, financial, and regulatory environment supportive of renewable energy. Phase II will focus on the implementation of this approach by including renewable energy projects within the national initiative to reach all Costa Rican households with modern sources of electricity. As a result, it is expected that 329 communities will receive electricity through either micro hydroelectric plants or photovoltaic systems, reducing CO₂ emissions by an estimated 210 thousand tons over the project lifetime.

This document corresponds to the Phase I of the project. Nevertheless, it introduces the necessary conditions that will have to be fulfilled for the approval of the Phase II.

List of Acronyms and Abbreviations:

ARESEP	Autoridad Reguladora de los Servicios Públicos
BOT	Build, Operate, Transfer
BUN-CA	Biomass Users Network - Central America
CCSS	Caja Costarricense del Seguro Social
CENPE	Centro Nacional de Planificación Eléctrica
CNFL	Compañía Nacional de Fuerza y Luz
CO ₂	Carbon Dioxide
CONACE	Comisión Nacional de Conservación de Energía
DSE	Dirección Sectorial de Energía
ESPH	Empresa de Servicios Públicos de Heredia
GEF	Global Environment Facility
GHG	Greenhouse Gases
GWh	Gigawatt - hours
HDI	Human Development Index
ICE	Instituto Costarricense de Electricidad
JASEC	Junta Administrativa del Servicio Eléctrico de Cartago
kW	kilowatt
kWh	kilowatt-hours
LAC	Latin America and the Caribbean
Min	Minimum
MINAE	Ministerio del Ambiente y Energía
MW	Megawatts
NGO	Non Governmental Organization
NPD	National Project Directorate
OP	GEF Operating Programme
PDF B	Preparation Development Facility, block B
PSC	Project Steering Committee
PV	Photo Voltaic
RCU	Regional Coordination Unit
RECOPE	Costa Rican Oil Refinery
SEN	National Electric System
SIEN	National Energy Information System
SINAC	Sistema Nacional de Areas de Conservación
SNE	National Electricity Service
SNI	National Grid
TOR	Terms Of Reference
UEN	Unidad Estratégica de Negocios within ICE
UNDP	United Nations Development Programme
UNFCCC	United Nations Framework Convention on Climate Change
Wp	Peak Watts

Table of Contents

List of Acronyms and Abbreviations:	12
Part I. Situation Analysis	14
Part II. Strategy	15
<i>Country Strategy</i>	15
<i>Project Strategy</i>	17
Part III - Management Arrangements	21
Part IV. Monitoring and Evaluation Plan	25
Part V. Legal context and prior commitments	33
Section II. Results and Resources Framework	35
Section III. The total workplan and budget	40
<i>Total Budget</i>	40
<i>Work Plan</i>	41
<i>Budget according to source of funding and component</i>	44
Section IV. Other Agreements	45
Signature page	47
Annexes	48

Annex I:

Annex A. Terms of References	49
<i>Decision making bodies</i>	49
<i>Project Personnel</i>	51
<i>Subcontracts</i>	56
Annex B. Description of Equipment to be acquired	99
Annex C. Training and Capacity Building	101
Annex D. Experiences with Micro Hydroelectric Plants	104
Annex E. Risk, sustainability and critical assumptions	106
Annex F. Demonstrative Projects: Prior experiences	1
Annex G. Programme Preparatory Phase (PDF-B)	4

Annex II – Project Brief *

Annex III – Response to council comments*

** Annexes II and III can be found in a separate document due to the size of this one.*

Section I, Part I. Situation Analysis

1. The Government of Costa Rica is strongly determined to provide access to electricity to 100% of the country's population within the next 10 years. This commitment is clearly expressed in the National Development Plan and the Fourth National Energy Plan. Since most of the areas currently without access to modern energy sources lie in remote, low population density areas, this effort will include an aggressive rural electrification programme led by the Energy Sector Directorate of the Ministry of Environment and Energy, and implemented by the eight electricity distributors in the country¹.
2. According to ongoing rural forecasts by the eight distribution companies throughout the country, the rural electrification programme through conventional means expect to reach 99% of Costa Rican families by 2010. Therefore, 12,000 households will still be left without electricity. The possibility to have access to public services such as education, health and communications is seriously limited by the absence of a locally produced, reliable and cost-efficient source of electricity. At the same time there is an unexploited renewable power potential to generate electricity², namely with micro hydroelectric plants³ and solar home systems.
3. While the political will to reach these households with modern electricity exists, it is evident that traditional grid extension to these areas is prohibitively expensive. Furthermore, the barriers identified during the PDF-B (financial, institutional, educational, communication, training, and technical) prevent the implementation of decentralized renewable energy systems, which are the most efficient method of providing energy access to these sectors. Therefore, without the implementation of this project, it is highly probable that these communities will meet their energy consumption needs in the future by purchasing diesel generators. While such generators are unreliable, costly to maintain and operate, and environmentally degrading, they are the only technology that is currently available in the current situation.
4. The preparatory phase of this Project determined that, among these 12,000 households, for 7,273 of them located in 329 rural communities, its relative isolation and the availability of local resources make renewable energy systems the cost efficient alternative. For the remaining 4700 households, another type of approach will be needed to achieve the electrification and they will have to be considered in the future plans after 2010 for grid extensions.

¹ The electricity distribution network is operated by eight companies: two are state-owned (Costa Rican Institute of Electricity and National Power and Lighting Company), two are municipal companies and the remaining four are rural energy private cooperatives.

² Laws No. 7200 and No. 7508 allow electric generation by private entities that operate with renewable energy sources whose capacity is below 50 MW. Private generators are required to sell their energy to the Costa Rican Institute of Electricity.

³ The micro hydroelectric plants considered for this project are classified as such since their energy produce is less than 100 kW.

5. The project aims to provide electricity with renewable energy to those 7,273 households: by removing the barriers⁴ that currently inhibit the introduction and use of these technologies, the project will allow such communities to enjoy a reliable and cost-effective source of energy. The global environmental benefit resides in the mitigation of an estimated 210 thousand tons of CO₂ emissions over a 10-year impact analysis period. Phase I of this project will result in an estimated reduction of 5.700 tons of CO₂ during a period of analysis of impact of 10 years⁵.
6. Additionally, the project carries a series of benefits for the communities chosen for the programme, and because of that the project is considered as a way towards sustainable human development. Among the expected benefits, it is worth mentioning the improvement of the quality of life of the community members, through the substitution of the use of hydrocarbons that threaten human health and pollute the environment, by the utilization of photovoltaic and hydroelectric energy sources that do not produce carbon dioxide emissions (CO₂) to the atmosphere and whose levels of noise are almost imperceptible (even more for the small scale facilities).
7. It is expected that health sector institutions would be able to offer better community service, given that, among other things, electricity supply will make possible to store medicines that need to be refrigerated. As for education, children will be able to acquire a larger and better knowledge since teachers will teach their classes using equipments like VCRs, televisions and computers.
8. Likewise it is foreseen that energy supply will promote the development of productive uses of electricity that will generate economic benefits for men and women, in activities like production and storage of dairy products, growing of ornamental plants and development of tourism activities, among others.
9. *According to the STAP Roster Technical Review for the GEF Secretariat, presented by Dr. Ashok Gadgil from Lawrence Berkeley National Laboratory (USA), this is a thoughtfully written and strong project proposal: "it is especially well written in the societal and institutional aspects of introducing renewable energy technologies for full electrification of 100% of households in Costa Rica".*

Part II. Strategy

Country Strategy

10. The national strategy for this programme is based on the government's commitment towards sustainable development. Costa Rica's ***National Development Plan*** was launched in 1998 by the government "to face the challenges and make good use of

⁴ For details on the barriers identified during the PDF-B phase, see Annex II paragraph 36.

⁵ CO₂ emission reduction as a direct result of the present project will be estimated for a 10 year period although the project is to last only 2 years. This is normal practice within GEF projects and justified by the fact that investments will deliver the energy service for a minimum period of 10 years (PV panels are expected to last at least 10 years since battery replacement is contemplated within the project, and micro hydro plants can usually deliver energy up to 50 years).

available opportunities in Costa Rica today, reactivating the economy with stability, equity, and sustainability". Understanding that providing access to modern energy sources is essential to the economic development of the rural sector, one of the plan's main objectives is to provide energy access to 100% of the Costa Rican population by 2010. The government has therefore allocated public resources to ensure that electricity is provided to isolated rural communities that currently rely on fossil fuels such as kerosene, diesel, liquid gas and firewood to meet their energy needs.

11. The new National Development Plan 2002-2006 reinforces these commitments indicating that: " the aim is to assure the use of energy, in order to strengthen national economy and promote a greater well-being of the Costa Rican people". In the same way among its aims it is indicated: "Achievement of access for all the Costa Ricans to the electricity service" within the indicated period. And related to the aim of "continuing the development of electric generation based on renewable resources", the plan presents the following policies:
 - The development of renewable energy sources and encourages the use of non-polluting, clean energy technologies. energetic clean technologies not pollutants.
 - Rational and sustainable use of the country's renewable energy resources, mainly water.
12. **The Fourth National Energy Plan 2002-2016** was developed by the Ministry of Environment and Energy (MINAE) in order to meet Costa Rica's upcoming energy needs. The primary objective of this plan is to "assure the supply and use of energy in the quantity, quality, and diversity of sources, compatible with the sustainable development of Costa Rican society". The Plan strives to meet the country's needs through "a timely, reliable, economic and high quality energy supply, less dependent on external sources and with the less possible environmental impact ". Within this framework, the *National Rural Electrification Programme* is in charge of meeting the energy needs of isolated rural sectors that are currently not connected to the National Interconnected System (SNI).
13. The MINAE is responsible for the policies of the energy and environment sectors. MINAE presides over the National Commission for Energy Conservation (CONACE, the entity that coordinated the PDF-B), whose members are the Energy Sector Directorate (representative of the government) and the commercial energy companies (including the electricity generation and distribution companies).
14. Following the experience and policies of the Costa Rican Institute of Electricity (ICE) related to the accomplishment of integral studies of technical viability prior to initiating any project - independently of its size; the National Off-Grid Electrification Programme based on Renewable Energy sources will establish the following policies for environmental protection and conservation:

- The project developers will have to implement environmental impact assessments, pursuant to the limits established by the Technical Environmental Secretariat (SETENA), which is the state authority in this matter.
- Furthermore, they will have to prepare and execute an environmental management plan, which details the activities that would be needed, taking into account the necessary mitigation measures to reduce impacts.
- All the environmental aspects will be coordinated together by an employee of the Unit of Environmental Management of ICE, and the environmental regent assigned to the project, who in turn will coordinate correspondingly with SETENA.
- With regards to the environmental awareness of those who will execute the activities in the field-, and for the importance of this project in the national area, a training programme will be undertaken for the staff that will take part both in the phase of construction and in the operation and maintenance of the equipment being installed. The programme will include induction workshops on: participating institutions in the project (Ministry of Environment and Energy, Global Environment Facility, National Commission for Energy Conservation), the protection and conservation of natural resources, the project's socio-economic significance for the country, and the legal and regulation framework regarding environment, energy and development issues.

Project Strategy

15. Based on that structure, involving the key actors from the energy sector, this UNDP-GEF supported programme will help remove existing barriers that prevent the utilization of renewable energy (RE) sources in remote rural areas that are inaccessible through conventional grid extensions.
16. From the preparatory phase of this project, it was concluded that the equipment cost, absence of funding due to lack of profitability from the economic and financial standpoint and low payment capacity of the rural population are impacting the development of small-scale RE. The **institutional barriers** identified during the preparation are small public budgets, lack of knowledge and motivation by officials causing delays in operational measures. And among **educational, communication and training barriers**, two showed the greatest impact: lack of awareness by public institutions that periodically visit isolated sites and limited availability and access to system information in isolated sites. The outstanding **technical barrier**, among the four studied, is restricted knowledge of comparative renewable energy system technologies.
17. The development objective of the project is to validate renewable energy technologies as a viable option for rural electrification, in isolated areas that will not have access to the connected system in the 10 coming years but for the development of these communities as well. It is expected that the cost frontier between grid extension and renewable energy based electrification will move in favor of the second as the market develop, experience and know how is gained and the implementation cost reduces. A cost reduction of 20% can reasonably be expected.

18. A secondary development objective of the project is to enhance the capacity of currently under-exploited natural reserves to be integrated in the eco-tourism dynamic currently present in Costa Rica. A total of 66 natural reserves will benefit from renewable energy based electricity as a first step toward, environmentally sound local economic development (if phase II is implemented).
19. It is also expected that this project will serve as an example for Central American neighboring countries which are currently struggling to simultaneously reform their energy sector and provide basic services to their poorest population, as a precondition for national development goals.

The immediate objectives of the project are:

1. *Establishment of a regulatory framework conducive to the use of renewable energy in electrification projects*
 2. *Strengthening of the capacity of institutions, companies and communities to develop RE projects*
 3. *Promotion of investment in RE projects by developing innovative financial mechanisms*
 4. *Demonstration of the validity of decentralized RE systems as a marketable option for electricity generation*
 5. *Assessment of Costa Rica's rural electrification programme and confirmation of sites that may benefit from the use of renewable energy*
 6. *Evaluation of Phase I's accomplishments and release of funds for Phase II*
20. Each component is composed of one immediate objective, specific outputs, and a number of activities designed to achieve the given outputs. By addressing these six components, the project will set the stage for a successful nation-wide rural electrification campaign with renewable energy.
 21. The main challenge of the Project is two-fold: First of all, to raise the trademark of small-scale RE projects within the technical scene in Costa Rica utilities. Secondly, to broaden the technical knowledge to take into account socio-cultural factors in rural areas. So while the technical base is there, awareness of the interest and challenges both technical and socio-cultural, of renewable energy based off-grid electrification is still lacking. The aim of the present initiative is to address the above through workshops as well as hands-on training on the topic. It should be added that currently many private companies selling renewable energy-related equipment, materials and services in the country, and it is expected that the market will be further developed and strengthened as a result of this project. Additionally, the technical level of employees within utilities is traditionally high. However, the country's electricity sector is operating in a highly centralized way and heavy infrastructure projects are the day-to-day for these employees. Recent experience shows that acquired knowledge in a new technology for Costa Rica is possible and

- indeed has happened. The GEF supported wind project known as Tejona, is now being replicated.
22. This programme's design has been formulated taking into account the different risks to which projects of this nature (rural electrification with of alternative energy sources) are subject. From the revision of possible scenarios of project execution, the identified risks and their respective mitigation measures have been incorporated. More details are found in Part VIII.
23. During PDF-B execution it was determined that the best option to guarantee project development and **long-term sustainability** is for the Costa Rican Institute of Electricity co-financing to cover equipment investment. Having ICE playing the role of market developer within the framework of this initiative, the allocation of subsidy funds through the different bidding processes opened to a wide range of suppliers and developers, together with the Government's financial commitment towards supporting off-grid renewable energy based rural electrification, will provide excellent conditions to assure that the achievements of this initiative will be sustained and replicated in the long term once the UNDP-GEF assistance has come to an end. This will be complemented with the efforts to engage financial institutions to generate partnerships with other local stakeholders for the development of the electrification projects.
24. As a consequence of the implemented assessments, the basic principle of subsidy to the poorest rural population of Costa Rica has been confirmed by the government and is the basis for the present project. In this respect, the project will be focused on concession schemes (direct contracting and biddings). Within the limits of national legislation, the proposed contracts include among others:
- Contracting "keys-in-hand" projects, including equipment, operation and maintenance
 - Contracting installation of PV Systems and construction of Micro hydroelectric Plants only
 - Schemes such as "Build, Operate and Transfer" (BOT), "Build, Lease and Transfer" (BLT), pursuant of the existent laws and regulations
25. The contract schemes will be tested during Phase I of this project⁶. This will allow the participation of third actors that, together with the utility companies in the

⁶ One option for Costa Rica is where the equipment supplier will be responsible for sub-contracting for civil work and installing as well as testing and commissioning the equipment. Supervision will be carried out by the three largest utilities, also called distribution companies in the Brief (Annex II). These utilities are the largest in Costa Rica and have an extensive experience in project supervision although "normal projects" are of larger size. The actual construction of micro hydro power plants will be carried out by the winner of the bid. Another option could be for a consortium of companies to provide full energy service. This would imply a local structure to operate the hydro plant and the mini-grid in the case of micro hydro power plants. A third option could be to foster local community organizations to operate the system once installed. These options as well as others will be further developed and assessed during the course of the project. Capacity building will be provided in each case, adapted to the nature of the local operator and the specific requirements of the technology used at the location.

sector, could co-finance the development and financing of rural renewable energy projects, by means of the combination of public and private resources⁷.

26. Thus, UNDP-GEF's support will allow for a substantial portion of the rural electrification budget to be dedicated to renewable energy. This will be achieved in two phases. Phase I will focus on the creation of a systematic approach within the Costa Rican energy sector to rural electrification with renewable energy. This will include the creation of an institutional, financial, and regulatory environment supportive of renewable energy, by means of policy and law revisions, capacity building activities, demonstrative projects, reallocation of subsidy⁸ (directly or indirectly, always complying with national legislation) and national coordination efforts. Sixteen demonstrative projects and two educational facilities using micro hydroelectric plants and photovoltaic systems will be developed to raise awareness and demonstrate the feasibility of technologies that are virtually unknown in the country. (The work plan can be found in Section III, and details on the demonstrative projects are given in Annex II – Annex III – Demonstrative projects, -Project Brief.
27. During PDF-B execution (see Annex B for details about equipment to be acquired) it was determined that the best option to guarantee project development and long-term sustainability is for the Costa Rican Institute of Electricity co-financing to cover equipment investment, because the Government of Costa Rica is committed to support off-grid renewable energy based rural electrification with clear subsidies. Nevertheless, a number of private and NGO players are also active in rural electrification based on renewable energy. UNDP-GEF funds will be used for institutional, information and training barrier removal. UNDP-GEF financial support will be fundamental in all of the programme components for Phase I, i.e.:
28. From a solid and deep evaluation of the results of the Phase I, the approval of the Phase II will be pursued. Phase II will focus on the implementation of this approach by including renewable energy projects within the national initiative to reach all Costa Rican households with modern sources of electricity. (For more details on Phase II, see Annex II, paragraphs 72-75).
29. The rationale behind the phasing of the project is to incorporate a set of intermediate benchmarks that will allow an evaluation of the accomplishments by the end of Phase I. Phase II will proceed after an external evaluation of the Phase I results is conducted. The results of such an evaluation will indicate the extent to which Phase I has successfully removed the subset of barriers that could prevent Phase II's success. Should the results of this evaluation indicate that, despite the efforts of

⁷ The recent approval of the law titled "Participation of the electrical rural cooperatives and municipal utility companies in the national development", which will allow electric cooperatives and municipal companies develop hydroelectric projects without legislative authorization for water concessions, is a very favourable precedent to this program's goals as for promoting the participation of third parties in the electrification process.

⁸ Different options will be studied. An alternative model could be the one used in the FOCER-project in Costa Rica (RLA/99/G35), where third parties are paying the higher price in exchange for biodiversity conservation efforts by the beneficiaries in relevant area.

- Phase I, the conditions are not appropriate to launch a full-scale rural electrification project based on renewable energy, Phase II will be appropriately modified to continue with efforts to remove the prevailing barriers. If, as expected, the execution of Phase I lowers some of the barriers to the extent where a full-scale rural electrification campaign based on renewable energy is feasible, then Phase II will continue to improve upon these achievements and address the remaining identified barriers.
30. For phase 1, ICE covers investment cost as reported in the project budget and co-financing letters. For Phase II GEF cover incremental cost of investment in renewable energy systems. Phase II will facilitate the inclusion of renewable energy sources in the country's rural electrification strategy by co-financing the incremental costs associated with the implementation of renewable technologies rather than conventional energy generation systems. This linkage to a national development policy ensures the compatibility of the project's goals with national priorities and will play a key role for sustainability and replicability. This way, implementation costs are also expected to follow a downward trend as the market for RE develops at a national and regional level.
 31. It has been estimated that the execution of Phase I of the National Off-Grid Rural Electrification Programme based on Renewable Energy Sources, will have an associated investment of US\$945.824⁹ from local financing, including US\$694.624 for investment in all of the 18 electricity generation projects (16 demonstrative and 2 educational) and approximately US\$981.530 in GEF funds, resulting in a estimated reduction for Phase I of 5.700 tons of CO₂ during a period of analysis of impact of 10 years (approximately 3.120 tons from hydroelectric projects and 2.580 tons from photovoltaic projects).
 32. The estimated reduction for both Phases of the Programme is 210 thousand tons of CO₂ during this 10-year period (approximately 185 thousand tons of hydroelectric projects and 26 thousand tons for photovoltaic projects). Based on a total contribution by GEF for Phases I and II of approximately US\$4.2 millions, the avoided cost amounts to US\$ 20.1 per ton of CO₂.

Part III - Management Arrangements

The *Project Steering Committee*:

33. The project will be supervised by CONACE –the National Commission for Energy Conservation- acting as *Project Steering Committee (PSC)*, and UNDP. The very nature of CONACE, involving actors from the government and the electricity sector, including the cooperative sector, will ensure a participatory process at the highest level in the project. CONACE is made up of the following members: the Energy Sector Directorate from MINAE; Costa Rican Oil Refinery (RECOPE); the two state-owned electric companies: Costa Rican Institute of Electricity (ICE),

⁹ The national co-financing is 39,045 US\$ higher than anticipated in the Project Brief (Annex II), and the additional cost will be cover by ICE-MINAE.

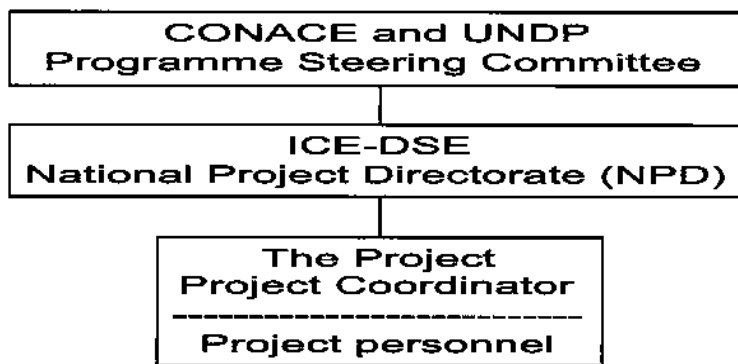
National Power and Lighting Company (CNFL); two municipal companies: Administrative Board for the Electric Service in Cartago (JASEC), Heredia's Public Service Company (ESPH); four private rural energy cooperatives: CoopeGuanacaste, Coopelesca, CoopeSantos and CoopeAlfaroRuiz; and the Public Service Regulatory Authority (ARESEP).

34. The Project Steering Committee (PSC) will be set up to provide guidance to the NPD, Project Coordinator and the executing agency on the direction of project development and implementation. All decisions involving GEF-funds will be taken in consultation with UNDP, who has to approve utilization of GEF-funds.

35. Among the responsibilities of the PSC are the following:

- Promote strategic partnerships
- Give broad strategic guidance
- Reviewing reports on the project's progress,
- Designate one representative of the PSC, who will participate in tripartite reviews of the project

Organizational Chart for the Project



36. **National Project Directorate (NPD):** The responsibility of the NPD is to supervise all the project-related activities, and to ensure that the expected outputs are completed on time and they comply with the GEF and UNDP procedures. It will be comprised by the Director of the Energy Sector Directorate (DSE), the Director of the Customer Service-Strategic Business Unit of ICE (its electricity branch) and the Director of the ICE Project Management Unit; and it will facilitate information management and exchange among all participants, ensure effective and efficient project development, and maintain permanent communication with Project Steering Committee.

37. The NPD will be responsible for:

- The centralized financial supervision of the Project, managing directly the resources provided by ICE

- Implement GEF resources through the UNDP administrative procedure of "National Execution (NEX)"¹⁰.
- Appoint a full-time Project Coordinator from ICE core staff (in-kind contribution) subject to the requirements established in the Terms of Reference (See Annex A), and who will be physically located at ICE.
- The National Director will be the link of communication between the NPD and the Project Coordinator. He or she will be responsible for the NPD and will assure the internal communication within the NPD.
- Supervise the formulation of the equipment specification in coordination with the Project Coordinator for the purchase of equipment.
- The NPD will, in coordination with the UNDP CO, be able to adjust the different activities as progress is made in the different project development phases (demonstration, feasibility, installation-construction, training, negotiation).
- Submit semi-annual progress reports to the Steering Committee and the Tripartite Review Meetings, according to the format established by the UNDP country office in Costa Rica. It shall also coordinate the preparation of additional reports, as requested by UNDP and GEF officers.
- The NPD will be responsible for obtaining the signature of the designated person for the following documents: (Combined Delivery Report (four times a year) and Budget Revisions (initial, substantive, mandatory and final)).
- The NPD will notify the UNDP CO when the Project is operationally closing its activities, and following in UNDP procedures, the NPD will make sure that the proper final documents get signed by the designed person (CDR and final mandatory revision).

38. The specific terms of reference for the NPD are included in Annex A.

39. **Executing Agency**: ICE will be the executing agency for the proposed project and it will be responsible for carrying out and completing the project in accordance with the activities as they are laid down in this project document; and it will be responsible for the day-to-day implementation of the project.

40. The Executing Agency will:

- Provide as in-kind contribution the Project Coordinator, Field Projects Officer and the administrative support staff.
- Appoint one of the ICE-members of the NPD as the National Director of the Project.
- Provide office space for the Project Coordinator, who will be physically located at ICE, and assure that he/she will get the necessary technical and administrative support.
- Have the flexibility to conduct a voluntary audit of the Project following national legislation, in case it is deemed necessary

¹⁰ In the meantime, other options will be studied regarding the possibility of: 1) combining resources from ICE and GEF in one only financial instrument at UNDP and 2) undertaking all contracting (consultancies, procurement of equipment, etc.) in an easier and faster way through the UNDP procedures. 3. etc.

41. **GEF Implementing Agency:** UNDP-Costa Rica will act as the GEF implementing agency for the project. The project will be administered in accordance with UNDP established regulations and administrative procedures. UNDP will administer and allocate the funds of the project on behalf of the GEF Secretariat. It will provide assistance in the procurement process for any acquired equipment if requested, and will assure that the selection process for national and/or international consultants as well as subcontracts will be following competitive and transparent processes.
42. UNDP CO will provide assistance on the formal GEF procedures that apply to reporting and UNDP will be the formal channel of correspondence between the project and the UNDP/GEF. Technical backstopping through a GEF specialist will be provided to the Project as appropriate.
43. The UNDP country office will be responsible for continuous monitoring of the project's advancement.
- UNDP will convene tripartite reviews at least every 12 months during project implementation.
 - Designate a Programme Officer as the focal point of the Project.
 - Give administrative support and financial and budgetary follow up to the execution of the Project.
 - Provide accounting, financial and budgetary documentation to the NPD.
 - Conduct the annual audit of the Project following GEF procedures.
- May Charge a fee for providing services according to UNDP Corporate Guidelines on Cost Recovery (Mid-High Cost level on the Universal Price list).
44. ***Project Coordinator:*** In consultation with the NPD and UNDP, the Project Coordinator is responsible for the day-to-day management, coordination and supervision of the implementation of the project activities during the 2 years programmed for the Project activities.
45. Among others, some of the responsibilities of the Project Coordinator are:
- Prepare a detailed work plan at the outset of the implementation
 - Responsible for all contracting (personnel and subcontracts) funded by GEF funds following UNDP procedures.
 - Supervise, coordinate and facilitate the work of all personnel (including subcontracts) hired by the Project.
 - To keep the NPD, PSC and UNDP fully informed of the progress of the Project Implementation
 - To prepare the reports required by the NPD, UNDP and GEF such as the yearly Project Implementation Report (PIR), APRs and QORs, among others.
 - Prepare and send the duly signed payment requests to the UNDP CO
 - Implement activities related to technical and financial barriers.
 - Coordinate activities related to removal of political, institutional and information barriers
 - Maintain a detailed register of all equipment purchased by GEF funds, and submit annually an updated inventory list to the UNDP CO.

46. A more detailed description of the Terms of Reference of the Project Coordinator is found in Annex A. Additionally; the Terms of Reference of the Task Manager as well as the Field Projects Officer are included in the same Annex.

Part IV. Monitoring and Evaluation Plan

47. Project monitoring and evaluation will be conducted in accordance with established UNDP and GEF procedures and will be provided by the project team and the UNDP Country Office (UNDP-CO) with support from UNDP/GEF. The Project Results and Resources Framework Matrix provides *performance* and *impact* indicators for project implementation. These will form the basis on which the project's Monitoring and Evaluation system will be built.
48. The following sections outline the principle components of the Monitoring and Evaluation Plan and indicative cost estimates related to M&E activities. The project's Monitoring and Evaluation Plan will be presented and finalized at the Project's Inception Workshop Report and following a collective finetuning of indicators, means of verification, and the full definition of project staff M&E responsibilities.

1. Monitoring and Reporting

1.1. Project Inception Phase

49. A Project Inception Workshop will be conducted with the full project team, relevant government counterparts, co-financing partners, the UNDP-CO and representation from the UNDP-GEF Regional Coordinating Unit, as well as UNDP-GEF (HQs) as appropriate. A fundamental objective of this Inception Workshop will be to assist the project team to understand and take ownership of the project's goals and objectives, as well as finalize preparation of the project's first annual workplan on the basis of the project's logframe matrix. This will include reviewing the logframe (indicators, means of verification, assumptions), imparting additional detail as needed, and on the basis of this exercise finalize the Annual Work Plan (AWP) with precise and measurable performance indicators, and in a manner consistent with the expected outcomes for the project. Additionally, the purpose and objective of the Inception Workshop (IW) will be to:
- (i) introduce project staff with the UNDP-GEF *expanded team* which will support the project during its implementation, namely the CO and responsible Regional Coordinating Unit staff;
 - (ii) detail the roles, support services and complementary responsibilities of UNDP-CO and RCU staff vis a vis the project team;
 - (iii) provide a detailed overview of UNDP-GEF reporting and monitoring and evaluation (M&E) requirements, with particular emphasis on the Annual Project Implementation Reviews (PIRs) and related documentation, the Annual Project Report (APR), Tripartite Review Meetings, as well as mid-term and final evaluations. Equally, the IW will provide an opportunity to inform the project team on UNDP project related budgetary planning, budget reviews, and

mandatory budget rephasings. The IW will also provide an opportunity for all parties to understand their roles, functions, and responsibilities within the project's decision-making structures, including reporting and communication lines, and conflict resolution mechanisms. The Terms of Reference for project staff and decision-making structures will be discussed again, as needed, in order to clarify for all each parties responsibilities during the project's implementation phase.

1.2. Monitoring responsibilities and events

50. A detailed schedule of project reviews meetings will be developed by the project management, in consultation with project implementation partners and stakeholder representatives and incorporated in the Project Inception Workshop Report. Such a schedule will include: (i) tentative time frames for Tripartite Reviews, Steering Committee Meetings, (or relevant advisory and/or coordination mechanisms) and (ii) project related Monitoring and Evaluation activities.
51. *Day to day monitoring of implementation progress* will be the responsibility of the Project Coordinator, Director or CTA (depending on the established project structure) based on the project's Annual Workplan and its indicators. The Project Team will inform the UNDP-CO of any delays or difficulties faced during implementation so that the appropriate support or corrective measures can be adopted in a timely and remedial fashion. The Project Coordinator and the Project GEF Technical Advisor will fine-tune the progress and performance/impact indicators of the project in consultation with the full project team at the Inception Workshop with support from UNDP-CO and assisted by the UNDP-GEF regional Coordinating Unit.. Specific targets for the first year implementation progress indicators together with their means of verification will be developed at this Workshop. These will be used to assess whether implementation is proceeding at the intended pace and in the right direction and will form part of the Annual Workplan.
52. The local implementing agencies will also take part in the Inception Workshop in which a common vision of overall project goals will be established. Targets and indicators for subsequent years would be defined annually as part of the internal evaluation and planning processes undertaken by the project team. Measurement of impact indicators related to global benefits will occur according to the schedules defined in the Inception Workshop. The measurement, of these will be undertaken through subcontracts or retainers with relevant institutions or through specific studies that are to form part of the projects activities or periodic sampling.
53. *Periodic monitoring of implementation progress* will be undertaken by the UNDP-CO through quarterly meetings with the project proponent, or more frequently as deemed necessary. This will allow parties to take stock and to troubleshoot any problems pertaining to the project in a timely fashion to ensure smooth implementation of project activities. UNDP Country Offices and UNDP-GEF RCUs as appropriate, will conduct yearly visits to projects that have field sites, or more

often based on an agreed upon schedule to be detailed in the project's Workshop Inception Report/Annual Workplan, to assess first hand project progress. Any other member of the Steering Committee can also accompany, as decided by the SC. A Field Visit Report will be prepared by the CO and circulated no less than one month after the visit to the project team, all SC members, and UNDP-GEF.

54. *Annual Monitoring* will occur through the *Tripartite Review (TPR)*. This is the highest policy level meeting of the parties directly involved in the implementation of a project. The project will be subject to Tripartite Review (TPR) at least once every year. The first such meeting will be held within the first twelve months of the start of full implementation. The project proponent will prepare an Annual Project Report (APR) and submit it to UNDP-CO and the UNDP-GEF regional office at least two weeks prior to the TPR for review and comments. The APR will be used as one of the basic documents for discussions in the TPR meeting. The project proponent will present the APR to the TPR, highlighting policy issues and recommendations for the decision of the TPR participants. The project proponent also informs the participants of any agreement reached by stakeholders during the APR preparation on how to resolve operational issues. Separate reviews of each project component may also be conducted if necessary.

Terminal Tripartite Review (TTR)

55. The terminal tripartite review is held in the last month of project operations. The project proponent is responsible for preparing the Terminal Report and submitting it to UNDP-CO and LAC-GEF's Regional Coordinating Unit. It shall be prepared in draft at least two months in advance of the TTR in order to allow review, and will serve as the basis for discussions in the TTR. The terminal tripartite review considers the implementation of the project as a whole, paying particular attention to whether the project has achieved its stated objectives and contributed to the broader environmental objective. It decides whether any actions are still necessary, particularly in relation to sustainability of project results, and acts as a vehicle through which lessons learnt can be captured to feed into other projects under implementation of formulation. The TPR has the authority to suspend disbursement if project performance benchmarks are not met. Benchmarks will be developed at the Inception Workshop, based on delivery rates, and qualitative assessments of achievements of outputs.

1.3. Project Monitoring Reporting

56. The Project Coordinator in conjunction with the UNDP-GEF extended team will be responsible for the preparation and submission of the following reports that form part of the monitoring process. Items (a) through (f) are mandatory and strictly related to monitoring, while (g) through (h) have a broader function and the frequency and nature is project specific to be defined throughout implementation.

(a) Inception Report (IR)

57. A Project Inception Workshop Report will be prepared immediately following the Inception Workshop. It will include a detailed First Year/ Annual Work Plan divided in quarterly time-frames detailing the activities and progress indicators that will guide implementation during the first year of the project. This Work Plan would include the dates of specific field visits, support missions from the UNDP-CO or the Regional Coordinating Unit (RCU) or consultants, as well as time-frames for meetings of the project's decision making structures. The Report will also include the detailed project budget for the first full year of implementation, prepared on the basis of the Annual Work Plan, and including any monitoring and evaluation requirements to effectively measure project performance during the targeted 12 months time-frame. The Inception Workshop Report will include a more detailed narrative on the institutional roles, responsibilities, coordinating actions and feedback mechanisms of project related partners. In addition, a section will be included on progress to date on project establishment and start-up activities and an update of any changed external conditions that may effect project implementation. When finalized the report will be circulated to project counterparts who will be given a period of one calendar month in which to respond with comments or queries. Prior to this circulation of the IR, the UNDP Country Office and UNDP-GEF's Regional Coordinating Unit will review the document.

(b) Annual Project Report (APR)

58. The APR is a UNDP requirement and part of UNDP's Country Office central oversight, monitoring and project management. It is a self -assessment report by project management to the CO and provides input to the country office reporting process and the ROAR, as well as forming a key input to the Tripartite Project Review. An APR will be prepared on an annual basis prior to the Tripartite Project Review, to reflect progress achieved in meeting the project's Annual Work Plan and assess performance of the project in contributing to intended outcomes through outputs and partnership work. The format of the APR is flexible but should include the following:

- An analysis of project performance over the reporting period, including outputs produced and, where possible, information on the status of the outcome. The constraints experienced in the progress towards results and its reasons
- The three (at most) major constraints to achievement of results
- AWP, CAE and other expenditure reports (ERP generated)
- Lessons learned
- Clear recommendations for future orientation in addressing key problems in lack of progress.

(c) Project Implementation Review (PIR)

59. The PIR is an annual monitoring process mandated by the GEF. It has become an essential management and monitoring tool for project managers and offers the main

vehicle for extracting lessons from ongoing projects. Once the project has been under implementation for a year, a Project Implementation Report must be completed by the CO together with the project. The PIR can be prepared any time during the year (July-June) and ideally prior to the TPR. The PIR should then be discussed in the TPR so that the result would be a PIR that has been agreed upon by the project, the executing agency, UNDP CO and the concerned RC. The individual PIRs are collected, reviewed and analysed by the RCs prior to sending them to the focal area clusters at the UNDP/GEF headquarters. The focal area clusters supported by the UNDP/GEF M&E Unit analyse the PIRs by focal area, theme and region for common issues/results and lessons. The TAs and PTAs play a key role in this consolidating analysis. The focal area PIRs are then discussed in the GEF Interagency Focal Area Task Forces in or around November each year and consolidated reports by focal area are collated by the GEF Independent M&E Unit based on the Task Force findings.

60. The GEF M&E Unit provides the scope and content of the PIR. In light of the similarities of both APR and PIR, UNDP/GEF has prepared a harmonized format for reference.

d) Quarterly Progress Reports

61. Short reports outlining main updates in project progress will be provided quarterly to the local UNDP Country Office and the UNDP-GEF regional office by the project team. See format attached.

(e) Periodic Thematic Reports

62. As and when called for by UNDP, UNDP-GEF or the Implementing Partner, the project team will prepare Specific Thematic Reports, focusing on specific issues or areas of activity. The request for a Thematic Report will be provided to the project team in written form by UNDP and will clearly state the issue or activities that need to be reported on. These reports can be used as a form of lessons learnt exercise, specific oversight in key areas, or as troubleshooting exercises to evaluate and overcome obstacles and difficulties encountered. UNDP is requested to minimize its requests for Thematic Reports, and when such are necessary will allow reasonable timeframes for their preparation by the project team.

(f) Project Terminal Report

63. During the last three months of the project the project team will prepare the Project Terminal Report. This comprehensive report will summarize all activities, achievements and outputs of the Project, lessons learnt, objectives met, or not achieved, structures and systems implemented, etc. and will be the definitive statement of the Project's activities during its lifetime. It will also lay out recommendations for any further steps that may need to be taken to ensure sustainability and replicability of the Project's activities.

(g) *Technical Reports* (project specific- optional)

64. Technical Reports are detailed documents covering specific areas of analysis or scientific specializations within the overall project. As part of the Inception Report, the project team will prepare a draft Reports List, detailing the technical reports that are expected to be prepared on key areas of activity during the course of the Project, and tentative due dates. Where necessary this Reports List will be revised and updated, and included in subsequent APRs. Technical Reports may also be prepared by external consultants and should be comprehensive, specialized analyses of clearly defined areas of research within the framework of the project and its sites. These technical reports will represent, as appropriate, the project's substantive contribution to specific areas, and will be used in efforts to disseminate relevant information and best practices at local, national and international levels.

(h) *Project Publications* (project specific- optional)

65. Project Publications will form a key method of crystallizing and disseminating the results and achievements of the Project. These publications may be scientific or informational texts on the activities and achievements of the Project, in the form of journal articles, multimedia publications, etc. These publications can be based on Technical Reports, depending upon the relevance, scientific worth, etc. of these Reports, or may be summaries or compilations of a series of Technical Reports and other research. The project team will determine if any of the Technical Reports merit formal publication, and will also (in consultation with UNDP, the government and other relevant stakeholder groups) plan and produce these Publications in a consistent and recognizable format. Project resources will need to be defined and allocated for these activities as appropriate and in a manner commensurate with the project's budget.

2. *Independent Evaluation*

66. The project will be subjected to one independent Final external evaluations.

Final Evaluation

67. An independent Final Evaluation will take place three months prior to the terminal tripartite review meeting, and will focus on the same issues as the mid-term evaluation. The final evaluation will also look at impact and sustainability of results, including the contribution to capacity development and the achievement of global environmental goals. The Final Evaluation should also provide recommendations for follow-up activities. The Terms of Reference for this evaluation will be prepared by the UNDP CO based on guidance from the Regional Coordinating Unit and UNDP-GEF.

Audit Clause

68. The Government will provide the Resident Representative with certified periodic financial statements, and with an annual audit of the financial statements relating to the status of UNDP (including GEF) funds according to the established procedures set out in the Programming and Finance manuals. The Audit will be conducted by

the legally recognized auditor of the Government, or by a commercial auditor engaged by the Government.

3. Learning and knowledge sharing

69. Results from the project will be disseminated within and beyond the project intervention zone through a number of existing information sharing networks and forums. In addition:

- The project will participate, as relevant and appropriate, in UNDP/GEF sponsored networks, organized for Senior Personnel working on projects that share common characteristics.
- UNDP/GEF shall establish a number of networks, such as Integrated Ecosystem Management, eco-tourism, co-management, etc, that will largely function on the basis of an electronic platform.
- The project will identify and participate, as relevant and appropriate, in scientific, policybased and/or any other networks, which may be of benefit to project implementation though lessons learned. The project will identify, analyze, and share lessons learned that might be beneficial in the design and implementation of similar future projects. Identify and analyzing lessons learned is an on- going process, and the need to communicate such lessons as one of the project's central contributions is a requirement to be delivered not less frequently than once every 12 months. UNDP/GEF shall provide a format and assist the project team in categorizing, documenting and reporting on lessons learned. To this end a percentage of project resources will need to be allocated for these activities.

General

70. The Project shall be monitored according to UNDP control, monitoring and evaluation procedures and following the internal evaluation and control regulations of the Executing Agency (ICE). ICE and UNDP will be jointly responsible for continuously monitoring Project progress.
71. The UNDP Office in Costa Rica will monitor performance during the execution with technical backstopping from the UNDP-GEF Offices in Mexico City and New York.
72. The Project Coordinator will internally review and make comments on performance to provide feedback and aim efforts in the desired direction. The National Project Directorate (NDP) will review and comment the advancement. The executing and implementing agencies will require NPD to approve its progress and to inform them accordingly. Besides, the Project Coordinator will present semi-annual project and activity progress reports that will be circulated among those parties involved in the execution. If necessary, and after discussion decisions can be made to update or modify the Project work plan and budget.
73. The Project Coordinator will appoint someone responsible for gathering, processing and periodically presenting data on project activity, such as sales of PV systems,

number of installations made, kWh generated as part of the programme, and so forth. An initial snapshot of this information will be taken as part of the process of work plan finalization. As project development proceeds, these numbers will be closely monitored throughout project life. The Project Coordinator will pay special attention to reviewing and updating these indicators and reports on an annual basis. In particular, annual reporting will comply with PIR requirements.

74. Each demonstrative and educational project will present a quarterly report to the Project Coordinator. This will help Field Project Coordinators to have their own monitoring and compliance evaluation system and will allow the Project Coordinator to identify specific needs, to revise and improve local capacity-strengthening strategies. This tool to record, learn from and disseminate experiences accumulated from demonstrative projects will be fundamental for the nation-wide execution of the electrification phase that follows.
75. The Project will be subject to tripartite reviews at least once every 12 months, the first such meeting to be held within the first 12 months of the start of full implementation. In these reviews UNDP-GEF will be informed about the progress, which will be evaluated by the Project coordinator together with the local UNDP Programme Officer.
76. The NPD representatives from MINAE (through the Energy Sector Directorate, as the politically responsible party) and all parties playing high-level roles in programme execution will be invited to participate in these meetings.
77. During the tripartite meetings, programme performance will be compared to established work plans, costs will be reviewed and overall technical performance will be monitored. The Project Coordinator, in consultation with the UNDP Programme Officer, will draft and submit a Progress Report for each tripartite review meeting following the format dictated by UNDP rules. During Programme implementation, additional reports can be requested, if necessary.
78. A Project Conclusion Report will be drafted for consideration during the final Tripartite Review meeting. The rough draft must be presented in advance to be reviewed and technically supported by the Executing Agency (ICE) at least two months before the last Tripartite Review.
79. Once the Project Document (ProDoc) is signed and the work plan is defined in its initial phase, the NPD and the GEF Programme Officers from the local UNDP Office, the Mexico Office and the New York Office will review the plan to ensure there are no gaps, duplications or other risks that might affect successful implementation and to ensure that the work plan includes the recommendations coming from the different PDF B consultancies and reviews.

Part V. Legal context and prior commitments

80. This project document shall be the instrument referred to as such in the Standard Basic Assistance Agreement between the United Nations Development Programme and the Government of the Republic of Costa Rica PNUD signed by the parties on August 7th, 1973, and enacted by the Law 5878 published in "La Gaceta" on January 31, 1976.
81. The following types of revisions may be made to this project document with the signature of the UNDP Representative only, provided he or she is assured that the other signatories of the project document have no objections to the proposed changes:
 - a. Revisions in, or addition of, any of the annexes of the project document;
 - b. Revisions which do not involve significant changes in the immediate objectives, outputs or activities of a project, but are caused by rearrangement of inputs agreed to or by cost increases due to inflation; and
 - c. Mandatory annual revisions, which rephrase the delivery of agreed, project inputs or increased expert or other costs due to inflation or take into account agency expenditure flexibility.
82. The Republic of Costa Rica ratified the United Nations Framework Convention on Climate Change (UNFCCC) on August 26, 1994 as a non-Annex I country, and signed the Kyoto Protocol to the UNFCCC as a Party to the Convention on July 3, 2002. In addition, several decrees, agreements and laws have been recently approved, in a significant contribution to international environmental commitments. Some examples are the Organic Law for the Environment, the Law of Rational Energy Use and its regulations, and the new Forestry Law. Moreover, the Consultative Commission on Climate Change was created in 1998 with the objective of arranging and maintaining a permanent dialogue among all sectors of society on mitigation policies and measures as well as adaptation to climate change.
83. The Government will provide the Resident Representative with certified periodic financial statements, and with an annual audit of the financial statements relating to the status of UNDP (including GEF) funds according to the established procedures set out in the Programming and Finance manuals. The Audit will be conducted by the legally recognized auditor of the Government, or by a commercial auditor engaged by the Government.

Section II. Results and Resources Framework

PROJECT RESULTS AND RESOURCES FRAMEWORK

Intended Outcomes as stated in the Country Results Framework:

G3-SGN1-SASN1 – Sectoral planning and programmes for sustainable use of key natural resources in Costa Rica
 G3-SGN1-SASN2 – Improved capacity of national/sectoral authorities to plan and implement integrated approaches to environmental management and energy development that respond to the needs of the poor.

Applicable Strategic Area of Support (from SRF) and TTF Service Line: Sustainable environmental management and energy development to improve the livelihoods and security of the poor

MYFF Service line 3.3: Access to sustainable Energy Services

Partnership Strategy Partnership between UNDP, the Costa Rican Institute of Electricity and the Ministry of Environment and Energy

Project title and number: 00034921 -COS-02-G31. National Off-Grid Electrification Programme based on Renewable Energy Sources

PHASE I

Intended Outputs	Indicators and Targets	Indicative Activities	Inputs
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Development Objective:

The development objective of the project is to validate renewable energy technologies as a viable option for rural electrification, in isolated areas that will not have access to the connected system in the 10 coming years but for the development of these communities as well. It is expected that the cost frontier between grid extension and renewable energy based electrification will move in favor of the second as the market develop, experience and know how is gained and the implementation cost reduces. A cost reduction of 20% can reasonably be expected.

A secondary development objective of the project is to enhance the capacity of currently under-exploited natural reserves to be integrated in the ecotourism dynamic currently present in Costa Rica. A total of 66 natural reserves will benefit from renewable energy based electricity as a first step toward, environmentally sound local economic development (if phase II is implemented).

It is also expected that this project will serve as an example for Central American neighboring countries which are currently struggling to simultaneously reform their energy sector and provide basic services to their poorest population, as a pre-condition for national development goals.

This project will result in an estimated reduction of 5.700 tons of CO₂ during a period of analysis of impact of 10 years

Outcome indicators: 5.700 tons reduction of CO₂ emissions after 10 years (calculated value)

16 communities electrified with Renewable Energy at the end of Phase I.

Third party access to a well functioning small scale Renewable Energy Market

An inception workshop will take place within the first 3 months of implementation.

<p>Component 1: The immediate objective is to support the implementation of policies and regulations that establish a regulatory framework conducive to the use of renewable energy in electrification projects</p> <p>Outcome Indicators: Laws and Norms that regulate the energy sector include provisions that allow the development of small scale RE-projects by the end of face one</p>			<p>GEF: Sub-contract 1: 61.000 USD Workshops: 5.000 USD National co-financing: 81.000 USD</p>
<p>1.1 An established normative and legal framework that allows development of small-scale RE systems is approved and implemented</p>	<p>By the end of the Year 1: MINAE implements a simplified procedure (e.g. administrative executive mandate) for water concessions for private hydroelectric project developers. MINAE sends at least one proposed amendment to the Law of Waters to the Congress.</p>	<p>1.1.1. Evaluate current energy legislation 1.1.2. Gather support from decision makers at the Congress and the Executive Power to formulate the required legislation 1.1.3. Provide elements for improving the hydroelectric concession process</p>	
<p>1.2 National technical norms and standards for RE are developed, implemented and disseminated</p>	<p>Executive Decree on technical specifications for small hydro and PV systems produced and adopted by the end of Year 1</p>	<p>1.2.1. Preparation of norms and standards for RE technology 1.2.2. Dissemination of official norms and standards</p>	
<p>1.3 Fiscal incentives for the development of RE projects are in place</p>	<p>Revisions of Law 7447-Rational energy use- Approved by Congress by the first quarter of Year 2</p>	<p>1.3.1. Revision and enhancement of legal exemptions and incentives</p>	
<p>1.4 A national rural electrification programme that incorporates RE systems into national energy planning is established</p>	<p>MINAE approves incorporation of a RE programme to the existing Rural Electrification Plan by the end Year 1</p>	<p>1.4.1. Design of a Renewable Energy Programme</p>	
<p>Component 2: The immediate objective is to strengthen the capacity of institutions, companies and communities to develop RE projects</p> <p>Outcome Indicators: Standardized procedures to analyze RE potential in electrification projects in place by the end of year 1</p> <p><i>Level of participation in awareness-raising workshops</i></p>			<p>GEF: Strengthening DSE per: 25.000 USD National Campaign: 29.500 USD Workshops: 30.000 USD Sub-contract 2-3: 165.000 USD National Co-financing: 44.000 USD</p>
<p>2.1 Professionals and technicians are trained in RE technology</p>	<p>200 employees of utilities, NGOs and private firms trained by the end of Year 1 (7 workshops)</p>	<p>2.1.1. Evaluation of human resources needed for the programme 2.1.2. Organization of 7 training workshops for power utilities 2.1.3. Strengthening of DSE on RE</p>	
<p>2.2 The National Energy Information System is strengthened incorporating RE information</p>	<p>RE website developed and published and STEN info documents modified to include RE technology by the end of Year 1</p>	<p>2.2.1. Standardization and classification of available and new data on small scale RE. 2.2.2. Development of a regional info network on RE 2.2.3. Creation of a web site</p>	

<p>2.3 National population is informed and aware of the benefits of decentralized RE systems</p>	<p>At least three TV spots, five radio ads and ten press releases by the end of Year 2</p>	<p>2.3.1. Launching of a nation-wide dissemination campaign 2.3.2. Conduct seven promotional workshops</p>	
<p>Component 3: The immediate objective is to promote investment in RE projects by developing innovative Financial mechanisms that are accessible to third parties</p> <p>Outcome Indicator: Amount of private capital invested in Renewable Energy projects by the end of Phase I.</p>			
<p>3.1 National energy bidding processes are adapted to facilitate small scale RE projects</p>	<p>At least three bidding processes for small scale RE project evaluated and validated and reduced to 4 months by the end of Phase 1</p>	<p>3.1.1. Evaluation of different bidding schemes 3.1.2. Validation of proposed schemes</p>	<p>GEF: Sub-contract 4: 26,000 USD Workshops: 4,000 USD</p>
<p>3.2 A set of possible Financial mechanisms that are accessible to third parties is developed and validated</p>	<p>At least 3 financial schemes developed, Year 1</p>	<p>3.2.1. Design of financing mechanisms for rural users 3.2.2. Implementation of different mechanisms during Phase I demonstration projects.</p>	
<p>3.3 Raised awareness and involvement of financial sector in RE</p>	<p>At least 20 bank officials trained in RE, Year 1</p>	<p>3.3.1. Training workshops to financial sector officers</p>	
<p>Component 4: The immediate objective is to demonstrate the validity of decentralized RE systems as a marketable option for electricity generation.</p> <p>Outcome Indicators: 16 demonstration sites and 2 training facilities fully operational by the end of Phase I.</p> <p>Total execution costs of completed demonstration projects are lower than alternative electrification options.</p>			
<p>4.1 Sixteen pilot projects in rural communities using RE systems and two demonstration and training facilities developed</p>	<ul style="list-style-type: none"> o 16 feasibility studies for pilot projects prepared during first 6 months o At least 3 different bidding schemes tested after 8 months o 8 pilot projects finished and operating after 14 months o 8 additional projects finished and operating after 20 months 	<p>4.1.1. Design of a detailed electrification plan for each facility 4.1.2. Purchase of appropriate equipment and services through an open bid process. 4.1.3. Installation of photovoltaic and construction of micro hydroelectric plants. The three sites to be electrified with micro hydroelectric plants will be chosen from the results of the project preparatory phase: there are projects identified whose capacity varies from 15 to 38 kW that will be able to produce between 123.2 kWh -- 172.6 kWh daily, and will provide electric services to approximately 180 people. 4.1.4. Training of community members in daily management, operation and maintenance</p>	<p>GEF: Workshops: 20,000 USD Sub-contract 5: 160,000 USD National Co-financing: 650,624 USD</p>

<p>4.2 Pilot project results are evaluated and disseminated</p>	<p>One evaluation seminar conducted in each demonstration project site by end of Phase 1.</p> <p>Publication of demonstration project reports.</p> <p>Level of attendance to on site information workshops</p>	<p>4.2.1 Evaluation of system and human resources performance 4.2.2 Dissemination of pilot project results</p>	
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Component 5: The immediate objective is to assess Costa Rica's rural electrification programme and confirm sites that may benefit from using RE			
Outcome Indicators: A Rural Electrification Plan that specifies the number of sites to be electrified with RE is published by the end of Phase I.			
5.1 An updated portfolio of sites that demonstrates the overall potential use of decentralized RE systems is developed	100% of site feasibility studies for 313 sites developed by the end of Year 2	5.1.1. Reassessment of PDF-B portfolio 5.2.1. Feasibility studies for the 313 sites	GEF: Sub-contract 6: 340.000 USD
Component 6: The immediate objective is the evaluation of Phase I's accomplishments and release of funds for Phase II			
Outcome Indicators: GEF and Government of Costa Rica respond to third party evaluation report by the end of phase I.			
6.1 A full evaluation of the Phase I results is conducted	A third party evaluation report is produced by the end of Year 2	6.1.1. Conduct an internal evaluation of Phase I achievements 6.1.2. Subcontract a third party evaluation of Phase I	GEF: Sub-contract 7: 40.000 USD Local Consultant: 21.000 USD
6.2 Phase II Project Brief and Document developed and finalized	Costa Rican Government confirms availability of co-financing for the project, by the end of Year 2	6.2.1. Negotiate financial resources for Phase II, both national and GEF funds 6.2.2. Prepare Project Brief and Document	
Project Management			
Some of the expenditures for the budget are not tied to one specific component. The budget for these expenditures has been grouped under the category "Project Management", and it includes a part of the national contribution to the project (e.g. the Project coordinator and Field Projects Officer).			
			GEF: Monitoring and eval.: 20.000 USD Travel: 5.900 USD Office Equipment: 9.000 USD Audits: 6.000 USD Workshops: 4.000 USD Communication: 4.315 USD Miscellaneous: 5.815 USD National Co-financing: 170.200 USD

Please see Annex II – paragraph 66 - 71 for a more detailed description of the activities related to each of the Components and outcomes.

The Project Results and Resources Framework-table will be used as a tool for the on-going monitoring and evaluation of the project.

Section III. The total workplan and budget

84. The input budget of the GEF funds in the Projects is described in the forthcoming table:

Total Budget

Proj. ID	Expected Output	Key Activities	Timeframe			Total	Resp. Partner	Planned Budget				
			2004	2005	2006			Fund	Donor	Account and Budget Description		
00034921	Development Objectives: Validate RE technologies as a viable option for rural electrification in isolated areas that will have no access to the connected system in the 10 coming years, and for the development of these communities as well. It is expected that the cost frontier between grid extension and RE based electrification will move in favor of the second as the market develops, experience and know-how is gained, and the implementation cost reduces. A cost reduction of 20 % can reasonably be expected.	Project Management and Monitoring	4.000 9.000 0 1.000 915	13.000 0 2.000 2.000 2.900	8.900 0 4.000 1.315 2.000	25.900 9.000 6.000 4.315 5.815	ICE-MINAE ICE-MINAE ICE-MINAE ICE-MINAE ICE-MINAE	62000 62000 62000 62000 62000	10003 10003 10003 10003 10003	71600 72200 74100 72400 74500	Travel Office Equipment Audits Communication Miscellaneous	
	Component 1: Support the implementation of policies and regulations that establish a regulatory framework conducive to the use of RE in electrification projects.		15.000	46.000	0	61.000						
	Component 2: Strengthen the capacity of institutions, companies and communities to develop RE-Projects.		0	0	29.500	29.500	ICE-MINAE	62000	10003	72100	74200	Sub-contract 1 National Campaign
	Component 3: Promote investment in RE projects by developing innovative financial mechanisms.		30.000	135.000	0	165.000	ICE-MINAE	62000	10003	72100	72100	Sub-contract 2-3
	Component 4: Demonstrate the validity of decentralized RE systems as a marketable option for electricity generation.		5.000	21.000	0	26.000	ICE-MINAE	62000	10003	72100	72100	Sub-contract 4
	Component 5: Assess Costa Rica's rural electrification programme and confirm sites that may benefit from using RE.		0	80.000	80.000	160.000	ICE-MINAE	62000	10003	72100	72100	Sub-contract 5
	Component 6: Evaluation of Phase I and release of funds for Phase II.		0	5.000	16.000	21.000	ICE-MINAE	62000	10003	72100	72100	Sub-contract 6
	Training and Capacity Building		0	0	40.000	40.000	ICE-MINAE	62000	10003	71300	71300	Local Consultant
			3.000	13.000	12.000	28.000	ICE-MINAE	62000	10003	72100	72100	Sub-contract 7
			5.000	20.000	15.000	40.000	ICE-MINAE	62000	10003	71300	71300	Local Consultant
			3.000	10.000	7.000	20.000	ICE-MINAE	62000	10003	71600	71600	Travel
	TOTAL		75.915	549.900	355.715	981.530						

The description of the equipment to be acquired during project implementation is described in detail in Annex B.

85. Work Plan

TENTATIVE ACTIVITY SCHEDULE

<i>Pre-project phase</i>	
Signing of project document	MONTH 1
Setting up of National Project Directorate and Project Steering Committee	MONTH 1
Start of project	MONTH 1
Request for proposals - Subcontracts	MONTH 1
Submission deadline for proposals	MONTH 2
Evaluation of proposals	MONTH 3
Selection, contracting of consultants	MONTH 3
<i>Project Implementation Phase-I</i>	
Design of detailed weekly work plan	MONTH 2
Inception Workshop	MONTH 3
Revision of legislative/regulatory framework	Whole project phase
Site visits and electrification design	MONTH 3-5
Development of rural financing mechanisms	MONTH 4-8
Development of alternative bidding schemes	MONTH 5-17
Selection and purchase of equipment	MONTH 6-10
Installation of equipment	MONTH 9-14
Start measuring performance indicators	MONTH 14
Development of renewable energy info systems	MONTH 14-19
Institutional strengthening (DSE)	MONTH 14-19
Formulation of a national renewable energy strategy	MONTH 13-14
Capacity building	
For power utilities' employees	MONTH 19-21
Promotional workshops at national level	MONTH 19-21
For financial sector officers	MONTH 16-18
For community members (beneficiaries)	MONTH 8-15
Launching of a nation-wide dissemination campaign	MONTH 19-24
Reassessment and feasibility studies for 313 sites	MONTH 10-23
Revision of project document for Phase II	MONTH 23
Formulation of an investment plan for Phase II	MONTH 23
Monitoring and evaluation	Whole project phase
End of this project phase	MONTH 24

86. Graphical description of Work plan

National off-grid RE electrification program		Project Time Table (Year One)												Project Time Table (Year Two)											
CONACE-UNDP-GEF: Phase I		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
1	1.1.1. Evaluate current energy legislation	DSE Project Coordinator																							
2																									
3	1.1.3. Provide elements for improving the hydroelectric concession process	DSE-ICE Project Coordinator																							
4																									
5	1.2.2. Dissemination of official norms and standards	ICE - MINAE Project Coordinator																							
6																									
7	1.4.1. Design of a renewable energy programme	ICE - MINAE Project Coordinator																							
8																									
9	2.1.2. Organization of seven training workshops for employees of power utilities	DSE Project Coordinator																							
10																									
11	2.2.1. Standardization and classification of available and new data on small scale RE	DSE Project Coordinator																							
12																									
13	2.2.3. Creation of a web page to access available information	DSE Project Coordinator																							
14																									
15	2.3.2. Conduct seven promotional workshops	DSE Project Coordinator																							
16																									
17	3.1.2. Validation of proposed schemes	ICE Project Coordinator																							
18																									
19	3.2.2. Implementation of mechanisms during Phase I demonstration projects	ICE Project Coordinator																							

19	3.2.2. implementation of mechanisms during Phase I demonstration projects	ICE Project Coordinator
20		
21	4.1.1. Design of a detailed electrification plan for each of the 18 facilities	ICE Project Coordinator
22		
23	4.1.3. Instalation of photovoltaic and micro-hydraulic plants	ICE Project Coordinator
24		
25	4.2.1. Evaluation of system and human resources performance	NPD Project Steering Committee
26		
27	5.1.1.Reassessment of PDF B portfolio	ICE Project Coordinator
28		
29	6.1.1. Conduct an internal evaluation of Phase I achievements	NPD Project Steering Committee
30		
31	6.2.1. Negotiate financial resources for Phase II, both national and GEF funds	NPD Project Coordinator

The UNDP corporate annual work plan for the first year of execution can be found in Section III.

Budget according to source of funding and component

87. The components in the Project will be financed by GEF as well as by the national counterparts. The forthcoming table describes the budget according to source of funding and component.

Component	GEF	Co-funding	Total
Project Management	55.030	170.200	225.230
Component 1: Support the	66.000	81.000	147.000
Component 2: Strengthen the capacity of institutions, companies and communities to develop RE-projects.	249.500	44.000	293.500
Component 3: Promote investment in RE projects by developing innovative financial mechanisms.	30.000		30.000
Component 4: Demonstrate the validity of decentralized RE systems as a marketable option for electricity generation.	180.000	650.624	830.624
Component 5: Assess Costa Rica's rural electrification programme and confirm sites that may benefit from using RE.	340.000		340.000
Component 6: Evaluation of Phase I and release of funds for Phase II.	61.000		61.000
Total	981.530	945.824	1.927.354

Note: The category "Project Management" was created for accounting purpose, and it covers the expenditures that are difficult to allocate to one specific component.

Note: Total Co-funding is 39,045 US\$ higher than anticipated in the Project Brief. This is due to higher cost of equipment than foreseen, and ICE will cover that additional cost.

Section IV. Other Agreements

88. The UNDP Corporate Annual Work plans for the execution are presented in the forthcoming table.

Annual Work Plan Year 1

Proj. ID	Expected Output	Key Activities	Timeframe				Resp. Partner	Fund	Donor	Planned Budget		
			Q1	Q2	Q3	Q4				Account	Budget Description	Amount
00034921	Development Objective: Validate RE technologies as a viable option for rural electrification in isolated areas that will have no access to the connected system in the 10 coming years, and for the development of these communities as well. It is expected that the cost frontier between grid extension and RE based electrification will move in favor of the second as the market develops, experience and know-how is gained, and the implementation cost reduces. A cost reduction of 20 % can reasonably be expected.	Project Management and Monitoring	X	X	X	X	ICE-MINAE	62000	10003	71600	Travel	13.000
			X	X			ICE-MINAE	62000	10003	72200	Office Equipment	9.000
			X				ICE-MINAE	62000	10003	74100	Audits	2.000
							ICE-MINAE	62000	10003	72400	Communication	2.000
							ICE-MINAE	62000	10003	74500	Miscellaneous	2.900
		Component 1: Support the implementation of policies and regulations that establish a regulatory framework conducive to the use of RE in electrification projects.	X	X	X							
		Component 2: Strengthen the capacity of institutions, companies and communities to develop RE-projects.	X	X	X		ICE-MINAE	62000	10003	72100	Sub-contract 1	30.000
		Component 3: Promote investment in RE projects by developing innovative financial mechanisms.	X	X	X							
		Component 4: Demonstrate the validity of decentralized RE systems as a marketable option for electricity generation.	X	X	X		ICE-MINAE	62000	10003	72100	Sub-contract 4	26.000
		Component 5: Assess Costa Rica's rural electrification programme and confirm sites that may benefit from using RE.	X	X	X							
		Component 6: Evaluation of Phase I and release of funds for Phase II.				X						
		Training, Capacity Building, and Strengthening of DSE personnel	X	X	X		ICE-MINAE	62000	10003	71300	Local Consultant	14.000
							ICE-MINAE	62000	10003	71600	Travel	20.000
							ICE-MINAE	62000	10003	74500	Miscellaneous	10.000
		TOTAL										433.900

Annual Work Plan Year 2

Proj. ID	Expected Output	Key Activities	Timeframe				Resp. Partner	Fund	Donor	Planned Budget		
			Q1	Q2	Q3	Q4				Account	and Budget Description	Amount
00034921	Development Objective: Validate RE technologies as a viable option for rural electrification in isolated areas that will have no access to the connected system in the 10 coming years, and for the development of these communities as well. It is expected that the cost frontier between grid extension and RE based electrification will move in favor of the second as the market develops, experience and know-how is gained, and the implementation cost reduces. A cost reduction of 20 % can reasonably be expected.	Project Management and Monitoring	X	X	X		ICE-MINAE	10003	71600	Travel	12,900	
				X			ICE-MINAE	10003	74100	Audits	4,000	
		Component 1: Support the implementation of policies and regulations that establish a regulatory framework conducive to the use of RE in electrification projects.					ICE-MINAE	10003	72400	Communication	2,315	
							ICE-MINAE	10003	74500	Miscellaneous	2,915	
		Component 2: Strengthen the capacity of institutions, companies and communities to develop RE-projects.		X			ICE-MINAE	62000	72100	Sub-contract 1	31,000	
		Component 3: Promote investment in RE projects by developing innovative financial mechanisms.					ICE-MINAE	62000	74200	Communication - National Campaign	29,500	
		Component 4: Demonstrate the validity of decentralized RE systems as a marketable option for electricity generation.	X	X	X		ICE-MINAE	62000	72100	Sub-contract 5	70,000	
		Component 5: Assess Costa Rica's rural electrification programme and confirm sites that may benefit from using RE.	X	X	X		ICE-MINAE	62000	72100	Sub-contract 6	290,000	
		Component 6: Evaluation of Phase I and release of funds for Phase II.		X			ICE-MINAE	62000	71300	Local Consultant	21,000	
		Training, Capacity Building, and Strengthening of DSE personnel					ICE-MINAE	10003	72100	Sub-contract 7	40,000	
			X	X	X		ICE-MINAE	62000	71300	Local Consultant	20,000	
			X	X	X		ICE-MINAE	62000	71600	Travel	14,000	
							ICE-MINAE	62000	74500	Miscellaneous	10,000	
		TOTAL									981,530	

Total budget : 433,900+547,630= 981,530

89. More relevant information about the preparation and execution of the project can be found in the annexes. In Annex C is a description of the Training and Capacity Building Activities Programmed for the Project. Annex D gives a description of the Experiences in Costa Rica with Micro Hydroelectric Plants. Annex E describes the risks, sustainability and critical assumptions of the project. Annex F contains a description of Demonstrative Projects and the prior experience in Costa Rica. Lastly in Annex G is a description of the Programme Preparatory Phase (PDF-B).

90. In Annex II is the complete Project Brief, and the responses to the council comments from Switzerland are located in Annex III

**United Nations Development Programme
Global Environment Facility**

Signature page

Country: Costa Rica


Strategic Results Framework G3 – Sub-goal 1 – SAS 1 and SAS 2

MYFF: Service Line 3.3. Access to Sustainable Energy Services

Implementing partners: Instituto Costarricense de Electricidad (ICE)
Ministerio de Medio Ambiente y Energía (MINAE)

Programme period:	October 2004 –August 2006
Project Name:	National Off-Grid Electrification Programme based on Renewable Energy Sources
Project ID:	00034921
Project Duration:	24 months
Total Budget:	1.927.354 US\$
GEF (managed by UNDP)	981.530 US\$ (+ 165.624 US\$ for PDF-B)
ICE	694.624 US\$
MINAE (in-kind)	251.200 US\$ (+ 62.250 US\$ for PDF-B)
Management arrangement:	NGO-execution (NEX)

Agreed by
Government:



Carlos Manuel Rodríguez Echandi
Minister of Environment and Energy



Date: _____

Agreed by
Executing agency :



Pablo Cob Saborío
Executive President of ICE

Date: _____

Agreed by
UNDP:



José Manuel Hermida,
Resident Representative

Date: 6/12/04

ANNEXES

Annex I (A to G)

Annex A. Terms of References

Decision making bodies

Terms of Reference - Project Steering Committee

The Project Steering Committee (PSC) will be established in order to advise the project's implementation in direct consultation with the Executing Agency, the Implementation Agency and the National Project Directorate.

The responsibilities of the PSC include the following:

- Promote strategic partnerships,
- Give broad strategic orientation,
- One representative of the PSC will participate in tripartite reviews of the project
- Facilitate dissemination of projects results.

The Project Steering Committee will be regularly informed about the:

- Project implementation and achieved results and
- Project financial spending

The PSC shall regularly issue statements on the project progress issues. The PSC shall meet every three months to review the project matters. The Project Coordinator will take part in those meetings, acting as the Committee Secretary. In every meeting he will take the minutes.

All decisions involving GEF-funds will taken in consultation with UNDP, who has to approve spending of GEF-funds.

Terms of Reference - National Project Directorate (NPD)

NPD members shall be responsible for the supervision of the project in terms of programming, executing, controlling and evaluating the technical and administrative activities, included in the Project Document.

The duties of the National Project Directorate are as follows:

- Overall supervision of the operative and administrative management, evaluating the Project Coordinator and the project performance in the field to produce a successful implementation, according to the criteria and objectives of the United Nations Development Programme (UNDP) and the Global Environment Facility (GEF).
- The National Director of the Project will be the link of communication between the NPD and the Project Coordinator, and is responsible for all internal communication within the NPD.
- Responsible for high level contacts with relevant Costa Rican and UNDP authorities, regarding operational matters as project execution advances.

- Supervision and control over budget/financial execution, to guarantee the timely delivery of quality outcomes along the implementation cycle.
- Creation and strengthening of links with other projects related to the GEF Operational Programme No. 6 within the Central American region and abroad.
- Identify and, if possible, engage through negotiation other stakeholders and co-funders to broaden the programme baseline, according to GEF criteria.
- Provide technical advice and guide to the project staff and consultants along the implementation of the programme.
- With the support of UNDP, it will supervise the operations of the project's procurement committee; responsible for writing and formulating the contracting procedures for buying the equipments and materials that are needed.
- Submit semi-annual progress reports to the Steering Committee and the Tripartite Review Meetings, according to the format established by the UNDP country office in Costa Rica. It shall also coordinate the preparation of additional reports, as requested by UNDP-GEF officers.
- The NPD will be responsible for obtaining the signature of the designated person for the following documents: (Combined Delivery Report (CDR)(four times a year) and Budget Revisions (initial, substantive, mandatory and final)).
- Supervise the formulation of de the Terms of Reference and the equipment specificities in coordination with the Project Coordinator.
- The NPD will notify the UNDP CO when the Project is operationally closing its activities, and following in UNDP procedures, the NPD will make sure that the proper final documents get signed by the designed person (CDR and final mandatory revision).

NPD members should have the following qualifications:

- a) Leadership and management skills.
- b) Knowledge of technical and financial analysis for electrification projects.
- c) Knowledge and experience in contract negotiation.
- d) Ability to prepare viable plans and strategies.
- e) Ability to create relations with cooperation entities and development cooperation agencies.
- f) At least a 15-year experience in developing small scale renewable energy projects.
- g) Full command of Spanish, and good knowledge of English to talk, read, and write.

- h) A degree (at least B.Sc. or equivalent) in a specialization field relevant to renewable energy project development.

Project Personnel

TOR - Project Coordinator (in-kind contribution - US\$ 110.000)

Duties:

As a chief executive for the Project and in consultation with the Executing Agency, Project Steering Committee, National Project Directorate and UNDP, the Project Coordinator is responsible for day-to-day management, coordination and supervision of the implementation of the project activities. In specific, his/her responsibilities are:

- To prepare a detailed work plan for the project, adjust the budget and draft terms of reference for the subcontracts (in consultation with the Executing Agency, NPD and UNDP);
- To organize and supervise the workshops and training needed during the project;
- To identify the national experts and institutions to work for the project (in consultation with the executing agency, NPD, PSC and UNDP);
- He (she) will take part in the revision and adjustment of the specific Terms of Reference for the different consultancies, taking into account the different characteristics identified in every site. He (she) will also be responsible unto the Project Coordinator, of the implementation of all the demonstrative projects that will be executed during Phase I.
- To supervise, coordinate and facilitate the work of the national and international experts working for the project, including all subcontracts;
- To liaise with the communities, relevant ministries, energy sector stakeholders, national and international research institutes, NGOs, and other relevant institutions in order to involve their staff in project activities, and to gather and disseminate information relevant to the programme;
- To prepare periodic progress reports of the project and submit them for approval through periodic follow-up meetings with the NPD, the Steering Committee and UNDP;
- To control the expenditures and to ensure otherwise an adequate management of the resources provided for the programme, submitting quarterly financial reports to the NPD, the Steering Committee and UNDP;
- To identify and to the extent possible engage other participants and funds by means of negotiation to co finance the incremental costs, according to the GEF criteria.
- To maintain a detailed register of the Project progress, which will allow evaluating the march of the activities, as well as the production of the Interim Progress Reports and of the Final Report of the Programme.

- To implement a system of overall Monitoring and Evaluation of the programme, based on the field information that is obtained from the different activities, to proceed to recommend immediate actions that assure the successful continuation of the programme, pursuant to UNDP-GEF criteria and aims.
- Prepared all reports required according to UNDP and GEF procedures,
- Maintain a detailed register of all equipment purchased by GEF funds, and submit annually an updated inventory list to the UNDP CO.

Qualifications:

- Leadership – Manager attitude - Capacity and experience in the coordination of personnel.
- A degree (at least B.Sc. or equivalent) in energy, environmental management or other field relevant to the project, with graduate studies in business administration;
- Experience and a demonstrated ability in managing and implementing projects, and in liaising and co-operating with all project personnel including government officials, commercial companies, NGOs, private sector and international financing institutions;
- Full command of Spanish and proficiency in English (written and spoken).

TOR - Task Manager (*in-kind contribution MINAE, budget line 17.02 US\$ 81.000*)

As a senior coordinator appointed by the Energy Sector Directorate (**in-kind contribution US\$ 81.000**) to execute the activities related to removal of political, legal, institutional and information barriers on energy sector issues, this position will be subordinated to the Project Coordinator and will have technical and administrative support from the DSE structure and personnel. The person will work in coordination with the consultant(s) hired through subcontract # 1 on political, legal and institutional Barriers (see Annex II, paragraph 36 for a more detailed description) and with subcontract # 2 and 3 on informational barriers (see Annex II, paragraph 36 for more details on the barriers). He or she will bear the following responsibilities:

- Coordinate logistics of the activities related to policy negotiation, institutional lobbying and training, together with the Project Coordinator, following the activities and indicators stated on the Project Document.
- In coordination with the Project Coordinator, he/she will prepare the Terms of Reference for consultancy activities in the related areas, to be hired to undertake the different tasks in each of the selected project sites
- Write labor contracts for local experts, letters of understanding, agreements and other written documents, as needed, for a smooth implementation of the project
- Work as the main communication channel between the different project developers, communities and institutions participating in the programme, acting as a link between them, the Project Coordinator and the NPD.

- Receive from UNDP, together with ICE's delegate, the required training to warranty the adequate use and application of the established procedures for project execution, following UNDP financial and administrative rules.
- Support to the follow-up process of the administrative logistics and execution of the different field projects.
- Together with the Project Coordinator, attend the execution of financial and technical audits required by UNDP and GEF, and implement the resulting recommendations
- Prepare in coordination with the Project Coordinator progress reports on the tasks under his (her) responsibility, and submit them for approval through periodic follow-up meetings with de NPD, the Steering Committee and UNPD;

Qualifications:

- Leadership - manager attitude.
- Knowledge and verifiable experience in capacity building and on-the-job training programmes.
- Knowledge in contract negotiation.
- Ability to establish working relations with cooperation entities and development cooperation agencies.
- At least a five-year expertise on implementation of development projects.
- Full command of Spanish, and proficiency in English (written and spoken).
- A degree (at least B.Sc. or equivalent) in a field relevant to the implementation of rural electrification and renewable energy programmes

TOR - Field Projects Officer (in-kind contribution US\$ 60.200)

Duties:

- The Field Projects Officer will work in coordination with and under the instructions of the Project Coordinator, and will be located in Ice's headquarter offices.
- He (she) will prepare a detailed work plan and schedule for the field work in coordination with the Project Coordinator, for the aims of the project to be reached in every site, and to recommend immediate actions to guarantee its successful development, pursuant to the aims and criteria of the Global Environment Facility (GEF) and the United Nations Development Programme.
- He (she) will deliver to the Project Coordinator a monthly report describing the tasks completed as part of the follow-up to the implementation of the demonstrative projects, pursuant to the work plan previously approved.
- Based on information available at ICE and the DSE, and with additional for example NGO's , utilities, private companies in the field of renewable energy, the Officer will have

to keep an updated database of information about the stakeholders involved in the field projects at the local level, as well as of potential participants and of entities, individuals or institutions related to the project, in order to foster as means of specific actions, the appropriation of the project aims by different stakeholders nation-wide, so the process can continue and be sustained once this project has concluded.

- He (she) will have to undertake at least one field trip to each of the 18 sites every two months, to establish permanent relations with potential associates, consultants, local stakeholders and other interested parties, and to coordinate the establishment of the necessary conditions for the appropriation and timely development of the project.
- In the fields trips, the officer will have to gather information and coordinates for every community, especially on: energy end-users, suppliers of renewable energy and energy efficiency technology operating in the different regions, financial intermediaries who provide services to these areas and government agencies that visit to the communities (specially those related to the energy sector).
- He (she) will also be responsible for gathering, processing and submitting periodically to the Project Coordinator information on the activity of the project like: sales of photovoltaic systems on the local market, number of facilities built, kWh generated within and out of the programme for the selected sites, and similar information. Besides, he (she) will have to study the size of the existing renewable energy market nation-wide and the annual volume of sales of the main companies, and monitor closely all these numbers throughout programme's implementation.
- He (she) will take part in all the technical meetings of internal discussion, and in the necessary meetings with the counterparts identified in every community
- He (she) will wave to compile technical detailed information, coordinating with the community leaders this summary, for then to prepare a description of the energetic situation of every site (environmental, social, legal, economic) to establish accurately the project baseline.
- He (she) will supervise and provide advise to the staff assigned to each of the field projects, in the preparation and timely presentation of the quarterly reports that on every demonstrative project will be submitted to consideration of the Project Coordinator, including relevant information on the experiences and lessons learned in every site.
- Prepare, in close communication with the Tasks Manager, and in consultation with every community, the methodology and agenda for the Community Workshops, and elaborate the lists of participants. Besides he (she) will have to coordinate all the logistics in the field for the development of these workshops together with local counterparts in every site.
- If necessary, the Officer will have to take part in the different workshops as official representative of the Project Coordinator.
- Coordinate the process of obtaining "letters of commitment" for the establishment of the Administrative Community Board in every project site

Qualifications:

- Leadership, capacity and experience in the coordination of working groups.
- Knowledge and verifiable experience in programmes of electrification and community assistance.
- Experience of at least 3 years in the development of field projects.
- Full command of Spanish, and proficiency in English (written and spoken).
- With a Licentiate degree in engineering related field of study, suitable for the development of renewable energy off-grid electrification projects.

Subcontracts

TERMS OF REFERENCE / CONSULTANCY INPUTS:

***Legislation revision and introduction of changes
(Sub-contract no. 1)***

1 General

Relevant information on the project background, objectives, activities, expected outputs and budget is provided in the project document for which the information presented herein is an attachment. The project document is to be considered an integral part of the Terms of References for Consultancy Inputs.

In total 7 sub-contracts will be awarded to carry out the activities as included in the project document. This does not exclude the possibility by the NPD to combine the execution of tasks by its own staff together with external consultants.

In table A-1 the 7 sub-contracts and their activities are briefly presented. For each subcontract the Terms of Reference (TOR) has been prepared separately. It is expected that national and international consultancy activities will be combined as a package meeting the requirements of the individual TOR's.

Table A-1: Overview of the 7 sub-contracts and their activities.

Component 1	Sub-contract no. 1 (US\$ 61,000)	Legislation revision and introduction of changes
Component 2	Sub-contract no. 2 (US\$ 65,000) Sub-contract no. 3 (US\$ 100,000)	Standardization of information and development of regional information network and website. Launching of a nation-wide dissemination campaign and conduction of promotional workshops
Component 3	Sub-contract no. 4 (US\$ 26,000)	Evaluation of financial and bidding schemes
Component 4	Sub-contract no. 5 (US\$ 160,000)	Design, procurement, installation and training for the off-grid systems in 18 sites
Component 5	Sub-contract no. 6 (US\$ 340,000)	Re-assessment of the PDF-B project portfolio and feasibility studies for 313 sites
Component 6	Sub-contract no. 7 (US\$ 40,000)	Third Party Evaluation of Phase 1's results

2 Scope of consultancy services

The objective of the present contract is *to support the implementation of policies and regulations that establish a regulatory framework conducive to the use of renewable energy in*

rural electrification projects. Due to the relative lack of previous experiences with decentralized renewable energy systems, Costa Rican legislation provides few incentives for investment in renewable technologies. This subcontract shall provide elements for the reformulation of national energy policies in order to insert decentralized renewable energy systems into the country's long-term energy development strategies. This new regulatory framework will redefine the role of renewable energy systems in the country, promoting their use in future electrification projects after GEF support concludes. This consultancy will be carried out in close coordination with the Task Manager in DSE, who will be doing complementary work to this consultancy (in-kind contribution from MINAE/DSE of 81.000 US\$).

From the preparatory phase (PDF-B), the following political and institutional barriers were identified:

- Lack of a favourable regulatory environment to promote small renewable energy projects. These incentives would be needed to reduce investment risks, take into account the remote and disperse nature of the consumers and the related management costs associated.
- Lack of long-term fiscal incentive within the frame of Law 7447, which relates to renewable energy promotion in Costa Rica. This law is revised every year and latest revisions removed the former incentive to exempt renewable energy related equipment from import duty.
- Lack of specific budget in sector institutions to carry out renewable energy promotional programmes in areas not connected to the SNI.
- Electricity projects, regardless of their size, are subject to the same bidding process. This process is lengthy (at least 1 year) and cumbersome. It burdens small projects and prevents new comers from entering the bid.
- Lack of a legal and regulatory framework adapted to small-scale hydro projects related water concessions. Although ICE as such is a concessionaire de facto, other players wanting to construct hydro-based plants have to go through the process of concession granting.

Within this context, the scope of international and national consultancy services envisaged for the project includes, but is not limited to, the following items:

- Based on the analysis and results of the studies carried out in the preliminary phase of the project (PDF-B: See Annex VI of the project document), the consultants will undertake and in-depth review to determine the mechanisms by which, taking advantage of the existing legislation, some of the barriers to the development of rural projects of renewable energy can be overcome.
- In addition, the consultants have to state with details the projects of law, law amendments and additional regulations that are necessary to overcome remaining barriers, so that investments can flow and renewable energy projects can be developed in the country, by a variety of public, private, national and foreign stakeholders.
- In the same way, the consultants have to indicate the required lobbying channels and strategies for the proposed revisions to be made official by the Legislative, Executive and Judiciary Powers in Costa Rica.

Activities

- ***Evaluate current energy legislation.*** All legislation regarding energy will be analyzed (laws number 7200, 7447, 7508) to determine which regulations support or inhibit the development of renewable energy. These reviews will observe all the possibilities to make the best use of favourable legislation, while the issues of concern in less favourable legislation shall be addressed directly to identify and propose solutions.
- ***Advise the National Project Directorate to gather support from decisions makers at the Legislative Assembly and Executive Power to formulate the necessary legislation.*** Negotiation documents have to be prepared containing background information and proposed amendments to existing laws. This activity will be conducted through meetings and consultations, and the documentation will be used to facilitate these discussions.
- ***Provide elements for improving the hydroelectric concession process.*** The consultants have to suggest proposals of legal changes, decree-laws or other legal and political instruments to promote simplified administrative processes for water concessions, with the aim of improving conditions for the small-scale hydroelectric projects.
- ***Revise the procedures for administrative contracting*** that is currently being used to acquire goods and services within the public administration. The purpose is to determine the viability of incorporating changes that will allow smoothening those processes¹¹.
- ***Revise and enhance incentives and legal exemptions.*** Law number 7447, and associated laws and regulations that had provided incentives to the use of renewable energy systems, will be reviewed and enhanced to facilitate further investment.

3 Outputs

The following outputs have to result from the implementation of the indicated activities:

- A detailed strategy for the reduction or elimination of the regulatory and policy barriers that hinder the development of the market for RE systems has been formulated;
- A legal assessment and a proposal for the establishment of incentives for potential stakeholders are submitted and discussed.
- A legal assessment and a proposal for simplifying the administrative processes to give water concessions, including the legal study of amendments to the Law of Waters if applicable, is submitted and discussed with the Project Coordinator.
- At least eight different legal analyses on the most favourable application of the relevant laws to existing renewable energy rural electrification projects are prepared.
- The decree-laws and the changes to executive decree-laws on technical regulations are prepared, discussed and negotiated for their announcement.

¹¹ The recent approval of the law titled "Participation of the electrical rural cooperatives and municipal utility companies in the national development", which will allow electric cooperatives and municipal companies develop hydroelectric projects without legislative authorization for water concessions, is a very favourable precedent to this program's goals as for promoting the participation of third parties in the electrification process.

4 General requirements

International and national consultants could implement the project jointly. The international consultant(s) will have a limited time involvement and will focus mainly on the design and planning of the activities, quality control and human resource management.

MINAE, through the Energy Sector Directorate (DSE), will facilitate the following, so that the contractor can develop the requested activities:

The project document states that MINAE is the responsible party on policy matters within the NPD. Hence, for the execution of its obligations it has been provided that the DSE will be the unit giving technical support to the activities in that field. Thus, the DSE will have these obligations,

- a) Coordinate with the Ministry and other departments the facilitation of the necessary information for the consultants to comply with their obligations.
- b) Receive the reports of the consultants and to make observations in the case any changes are needed, to comply with the terms of reference, the consulting contract and current legislation.
- c) Evaluate the work done by the consultants in order to determine if the payment will be complete or partial. The amount has to be established according to the progress achieved and the work completed so far.
- d) Convene the necessary meetings, so that the work can be coordinated and the consultants can defend it.
- e) Any other obligation that has been specified on the contract, necessary to control the aim of the contracting.

To carry out the job as specified herein the consultants have to state clearly how they plan to organise and manage their work and their personnel's time involvement both in Costa Rica and in their home office (if applicable). The consultants have to submit within their proposal a preliminary time schedule that presents the work plan anticipated.

The working language will be Spanish. This requires that the consultants need to make appropriate provision for this aspect, since it greatly influences communication, working relationships and time required for the indicated activities. Reporting to be done by the international consultants is in Spanish unless otherwise agreed upon with the Project Coordinator.

Reporting requirements will be detailed in close collaboration with the Project Coordinator at the outset of the activities presented herein. All activities in this subcontract are complementary to the tasks carried out by the Task Manager in DSE, and they will be coordinated with the Project Coordinator.

5 Proposal submission and evaluation

5.1 Technical proposal

The technical proposal shall include, but need not be limited to the following:

- Comments and observation on the terms of reference and suggestion for improvements;
- Detailed proposed approach and work plan;
- Detailed description on the specific tasks to be assigned to each consultant and curricula vitarum of all consultants foreseen for the project; and
- References and descriptions of similar activities undertaken by the consultants.

In the evaluation of the technical proposals to be submitted by various consultants the following criteria shall be considered:

- (1) The consultancy team's relevant experience
- (2) Curricula vitarum of staff to be assigned
- (3) Experience with legal assessments related to the electric sector, preferably in the Latin American region
- (4) Methodology and proposed programme of work
- (5) Adherence to the terms of reference

5.2 Financial proposal

The financial proposal shall provide detailed breakdowns of i) national and international consultancy services, ii) travel expenses international travel (all national travel will be arranged for) and iii) daily subsistence allowance costs for international consultants.

Both the technical and financial proposals should be sealed in separate envelopes and the contents of each clearly marked. Both proposals shall be placed in a third sealed envelope suitably marked.

6 Consultant's experience

Curricula vitarum of the consultants to be assigned to the project should be included in the proposal. At least 5 years work experience in this field is required for the national consultants, whereas for the international consultants at least of 10 years relevant work experience is required.

The consultant shall comply the following requirements:

- 1- Master in Law, incorporated to the College of Lawyers.
- 2- With experience of at least one year in the theory and practice of the "Ley General de la Administración Pública" and the "Ley de Contratación Administrativa".
- 3- At least two years of experience in the preparation of projects of law, regulations and similar documents.
- 4- At least a one and a half year experience in the application of Costa Rica's energy sector legislation, especially in the areas of rural electrification / renewable energy.

5- With experience on one year and a half in legal and technical aspects related to laws # 7200, 7447 and 7508 and their regulations.

Failure to comply any of the requirements makes impossible to include a party as a candidate for the present contract.

Consultants who have good contacts with Legislative Assembly, the Executive Power or the Fourth Court in Costa Rica are encouraged to react.

7 Budget and time involvement

The total budget available for the activities outlined in this TOR is US\$61,000. For international consultants the budget available is max. US\$15,000.

Anticipated time involvement for national consultants is 12 months full-time and for international consultants 5-6 weeks full-time. The total duration of the activities under this TOR shall not exceed 11 months, commencing at the first day of consultancy activities.

**Standardization of information and development of regional information network and website.
(Sub-contract no. 2)**

1 General

Relevant information on the project background, objectives, activities, expected outputs and budget is provided in the project document for which the information presented herein is an attachment. The project document is to be considered an integral part of the Terms of References for Consultancy Inputs.

In total 7 sub-contracts will be awarded to carry out the activities as included in the project document. This does not exclude the possibility by the NPD to combine the execution of tasks by its own staff together with external consultants.

In table A-1 the 7 sub-contracts and their activities are briefly presented. For each subcontract the Terms of Reference (TOR) has been prepared separately. It is expected that national and international consultancy activities will be combined as a package meeting the requirements of the individual TOR's.

Table A-1: Overview of the 7 sub-contracts and their activities.

Component 1	Sub-contract no. 1 (US\$ 61,000)	Legislation revision and introduction of changes
Component 2	Sub-contract no. 2 (US\$ 65,000) Sub-contract no. 3 (US\$ 100,000)	Standardization of information and development of regional information network and website. Launching of a nation-wide dissemination campaign and conduction of promotional workshops
Component 3	Sub-contract no. 4 (US\$ 26,000)	Evaluation of financial and bidding schemes
Component 4	Sub-contract no. 5 (US\$ 160,000)	Design, procurement, installation and training for the off-grid systems in 18 sites
Component 5	Sub-contract no. 6 (US\$ 340,000)	Re-assessment of the PDF-B project portfolio and feasibility studies for 313 sites
Component 6	Sub-contract no. 7 (US\$ 40,000)	Third Party Evaluation of Phase 1's results

2 Scope of consultancy services

The objective of this contract is to **strengthen the National Energy Information System (SIEN in Spanish)**, by incorporating variables related to new and renewable sources of energy. From the analyses and results contained in the studies developed for the preparatory phase consultants will have to analyse, conceptualise, design, install and bring into operation, the information systems (software and hardware) required to reduce or remove the barriers of information and education affecting the development of renewable energy rural projects.

The scope of international and national consultancy services envisaged for the project includes, but is not limited to, the following items:

2.1 Renewable energy information system design

- Assess RE information needs;
- Document the current availability and accessibility of RE information in Costa Rica;
- Determine RE information gaps in Costa Rica;
- Prepare a plan for RE information collection, analysis, presentation and dissemination;
- Determine the possible modalities to disseminate RE information and prioritise them;
- Assess the most appropriate institutional set-up for collecting, analysing and disseminating RE information.

2.2 Standardization and classification of available and new data on small-scale renewable energy

- All available data will be compiled and incorporated into the SIEN, which will be made available publicly. Additionally, a classification system will be developed in order to process incoming data and ensure timely and reliable updates.

2.3 Development of a regional information network on renewable energy

- A system will be set up to promote information exchange at the Central American level. This system will allow stakeholders to cooperate and share experiences with other participants in renewable energy projects, building upon the common experiences to develop a set of “best-practice” procedures, including energy efficiency issues.

2.4 Creation of a web page to access available information

- A user-friendly, all-access web page will be developed in order to facilitate distribution and increase information availability regarding small-scale renewable energy projects in Costa Rica.

3 Outputs

The following outputs have to result from the implementation of the indicated activities:

- A RE capacity building needs assessment;
- An overview of available and accessible RE information;
- RE information requirements, including a plan for collection, analysis, presentation and dissemination;
- A National Energy Information System updated with the last technological advances, with the most recent information on renewable energy is presented the public and put in operation
- A regional network in renewable energy designed and in operation in all seven countries of Central America

- A website of high quality, user-friendly, fast, and of high and diverse thematic contents, and in two languages (Spanish and English) is presented to the public and put into operation

4 General requirements

International and national consultants can implement the project jointly. The international consultant(s) will have a limited involvement and should primarily focus on the design and planning of the activities, and secure the quality of the products.

The Energy Sector Directorate (DSE) in MINAE is the governmental institution responsible for the energy sector. Hence, DSE will be the unit giving technical support to the activities, and they will have the following obligations:

- a) Coordinate with the Ministry and other departments the facilitation of the necessary information for the consultants to comply with their obligations.
- b) Receive the reports of the consultants and to make observations in the case any changes are needed, to comply with the terms of reference, the consulting contract and current legislation.
- c) In coordination with the Project Coordinator evaluate the work done by the consultants in order to determine if the payment will be complete or partial. The amount has to be established according to the progress achieved and the work completed so far.
- d) Convene the necessary meetings, so that the work can be coordinated and the consultants can defend it.
- e) Any other obligation that has been specified on the contract, necessary to control the aim of the contracting.

To carry out the job as specified herein the consultants have to state clearly how they plan to organize and manage their work and their personnel's time involvement both in Costa Rica and in their home office (if applicable). The consultants have to submit within their proposal a preliminary time schedule that presents the work plan anticipated.

The working language will be Spanish. This requires that the consultants need to make appropriate provision for this aspect, since it greatly influences communication, working relationships and time required for the indicated activities. Reporting to be done by the international consultants is in Spanish unless otherwise agreed upon with the Project Coordinator.

Reporting requirements will be detailed in close collaboration with the Project Coordinator at the outset of the activities presented herein, and the consultants undertaking this subcontract will respond directly to the Project Coordinator.

5 Proposal submission and evaluation

5.1 Technical proposal

The technical proposal shall include, but need not be limited to the following:

- Comments and observation on the terms of reference and suggestion for improvements;
- Detailed proposed approach and work plan;
- Detailed description on the specific tasks to be assigned to each consultant and curricula vitarum of all consultants foreseen for the project; and
- References and descriptions of similar activities undertaken by the consultants.

In the evaluation of the technical proposals to be submitted by various consultants the following criteria shall be considered:

- (1) The consultancy team's relevant experience
- (2) Curricula vitarum of staff to be assigned
- (3) Experience with information management and dissemination projects, and in designing and operating IT software preferably in the Latin American region
- (4) Methodology and proposed programme of work
- (5) Adherence to the terms of reference

5.2 Financial proposal

The financial proposal shall provide detailed breakdowns of i) national and international consultancy services, ii) travel expenses international travel (all national travel will be arranged for) and iii) daily subsistence allowance costs for international consultants.

Both the technical and financial proposals should be sealed in separate envelopes and the contents of each clearly marked. Both proposals shall be placed in a third sealed envelope suitably marked.

6 Consultant's experience

Curricula vitarum of the consultants to be assigned to the project should be included in the proposal. A minimum of 5 years work experience in this field is required for the national consultants, whereas for the international consultants a minimum of 10 years relevant work experience is required. The consultant has to provide evidence to substantiate his experience in the working fields of:

- (1) Development, planning and bringing into operation of information systems, especially:
 - Bibliographical databases, geographical and statistical information systems;
 - Computer systems in the Worldwide Web (Internet);
 - Information management and analysis;
- (2) Integration of high-level technical information systems into the daily operations of governmental entities;
- (3) Proficiency in Spanish as the working language.

Consultants who have good contacts with computer equipment suppliers in Costa Rica or abroad are encouraged to react.

7 Budget and time involvement

The total budget available for the activities outlined in this TOR is US\$65,000. For international consultants the budget available is max. US\$20,000.

Anticipated time involvement for national consultants is 6 months full-time and for international consultants 3-4 weeks full-time. The total duration of the activities under this TOR shall not exceed 8 months, commencing at the first day of consultancy activities.

Launching of a nation-wide dissemination campaign and conduction of promotional workshops
(Sub-contract no. 3)

1 General

Relevant information on the project background, objectives, activities, expected outputs and budget is provided in the project document for which the information presented herein is an attachment. The project document is to be considered an integral part of the Terms of References for Consultancy Inputs.

In total 7 sub-contracts will be awarded to carry out the activities as included in the project document. This does not exclude the possibility by the NPD to combine the execution of tasks by its own staff together with external consultants.

In table A-1 the 7 sub-contracts and their activities are briefly presented. For each subcontract the Terms of Reference (TOR) has been prepared separately. It is expected that national and international consultancy activities will be combined as a package meeting the requirements of the individual TOR's.

Table A-1: Overview of the 7 sub-contracts and their activities.

Component 1	Sub-contract no. 1 (US\$ 61,000)	Legislation revision and introduction of changes
Component 2	Sub-contract no. 2 (US\$ 65,000)	Standardization of information, development of regional information network and website.
	Sub-contract no. 3 (US\$ 100,000)	Launching of a nation-wide dissemination campaign and conduction of promotional workshops
Component 3	Sub-contract no. 4 (US\$ 26,000)	Evaluation of financial and bidding schemes
Component 4	Sub-contract no. 5 (US\$ 160,000)	Design, procurement, installation and training for the off-grid systems in 18 sites
Component 5	Sub-contract no. 6 (US\$ 340,000)	Re-assessment of the PDF-B project portfolio and feasibility studies for 313 sites
Component 6	Sub-contract no. 7 (US\$ 40,000)	Third Party Evaluation of Phase 1's results

2 Scope of consultancy services

The objective of this contract is to develop a strategy of mass communication that produces as an output a national population well informed on the benefits of renewable energy decentralized systems.

The scope of international and national consultancy services envisaged for the project includes, but is not limited to, the following items:

2.1 Develop a nation-wide information campaign to promote RE

In order to fulfill project objectives, the Project will subcontract the implementation of the following activities, under the responsibility of a mass media specialist:

- Coordinate with the Project Coordinator the focus and schedule for the different outcomes. Report to the Project Coordinator on the progress and timing of the activities detailed below.
- Advise the Project Coordinator in key and strategic communication issues. The advertising strategy shall emphasize the comparative advantages of renewable energy sources for isolated rural areas, highlighting not only the environmental benefits but also those for rural development.
- Implement a rapid participative assessment regarding internal and external communications, and formulate a national strategy on mass communications. The campaign will incorporate results from the demonstrative projects as long as this information is available.
- By means of professional services in mass media communication, a wide information campaign will have to be conducted.
- Prepare the following promotional materials (this task comprehends coordination and supervision of all printed materials, that should be processed following the administrative procedures of the NPD and UNDP):
 - Fliers and informative brochures, presenting programme details, background, objectives, activities, and so forth.
 - Poster, showing the different renewable energy technologies, with information on the Project, CONACE, ICE, DSE, UNDP and GEF.
 - Promotional-informative folder, presenting general info on the programme, with focus on local organizations, and related projects and entities (DSE, GEF, others)
 - Ten (10) press releases at national level
 - Five radio ads and three TV spots

2.2 Design a renewable energy promotional workshops programme

- Carry out an “information needs assessment” to identify priority areas for capacity building in the RE field and determine how best to build capacity in these areas;
- Survey and review existing and relevant training capacity building programme, manuals and modules from Costa Rica and elsewhere and assess the feasibility of their application in Costa Rica;
- Design a programme of workshops for the prioritized areas, including an implementation plan: These workshops would include a) a Stakeholder analysis and identification: this

analysis will identify all possible individuals and institutions that could be involved. It will list their possible role, the benefits of their participation, and any possible challenges to their involvement. B) Stakeholder consultation: ensuring adequate consultation mechanisms, c) the objectives of each workshop and its scope, and d) Report all Results and findings of the workshops and c) Elaboration of the implementation plan on the basis of these consultations.

2.3 Conduct seven promotional workshops

- Prepare and implement (logistic coordination) seven promotional workshops nation-wide, including the presentation of the programme's activities, and the evaluation of the process and the mid-term outputs.
- The workshops will be 16 hours long each, addressed to the personnel of different governmental entities that visit isolated communities, to train them as promoters of the efficient use of sources of renewable energy in rural communities. The participation of ICE, CNFL, ESPH, JASEC, the rural electrification cooperatives societies: COOPEGUANACASTE, COOPELESCA, COOPEALFARORUIZ and COOPESANTOS; the EBAIS of the Ministry of Health, the Ministry of Public Education, the Costa Rican Fund of Social Assurance, the Conservation Areas of MINAE (National System of Conservation Areas), and the municipal mayors and district and community authorities is recommended.

3 Outputs

The following outputs have to result from the implementation of the indicated activities:

- A national campaign of information and dissemination implemented on the advantages of renewable energy options as clean technologies for rural electrification, that reach isolated areas.
- A training needs assessment executed on RE for government employees who visit or are employed at rural isolated areas;
- A national workshops programme prepared for the promotion of RE, including an implementation plan;
- Promotional nation-wide workshops organized;
- National stakeholders informed on the activities of the programme;
- A process of implementation of the project that incorporates the points of view of the communities and of local stakeholders.

4 General Requirements

International and national consultants can implement the project jointly. The international consultant(s) will have a limited time involvement and will focus mainly on the design and planning of the activities, quality control and human resource management.

Counterpart staff from the individual members from CONACE will be assigned to carry out activities in their geographic region and will participate in all aspects of the project execution. Jointly with the consultants, they will carry out data collection, data analysis and other types of technical and socio-economic studies. In addition NPD will provide logistical support (transport, travel accommodation, access to information, etc.).

To carry out the job as specified herein the consultants have to state clearly how they plan to organize and manage their work and their personnel's time involvement both in Costa Rica and in their home office (if applicable). The consultants have to submit within their proposal a preliminary time schedule that presents the work plan anticipated.

The working language will be Spanish. This requires that the consultants need to make appropriate provision for this aspect, since it greatly influences communication, working relationships and time required for the indicated activities. Reporting to be done by the international consultants is in Spanish unless otherwise agreed upon with the Project Coordinator.

Reporting requirements will be detailed in close collaboration with the Project Coordinator at the outset of the activities presented herein, and the consultants undertaking this subcontract will respond directly to the Project Coordinator.

5 Proposal submission and evaluation

5.1 Technical proposal

The technical proposal shall include, but need not be limited to the following:

- Comments and observation on the terms of reference and suggestion for improvements;
- Detailed proposed approach and work plan;
- Detailed description on the specific tasks to be assigned to each consultant and curricula vitarum of all consultants foreseen for the project; and
- References and descriptions of similar activities undertaken by the consultants.

In the evaluation of the technical proposals to be submitted by various consultants the following criteria shall be considered:

- (1) The consultancy team's relevant experience
- (2) Curricula vitarum of staff to be assigned
- (3) Experience with methodologies and mass communication media in rural development and environment protection projects, preferably in the Latin American region
- (4) Methodology and proposed programme of work
- (5) Adherence to the terms of reference

5.2 Financial proposal

The financial proposal shall provide detailed breakdowns of i) national and international consultancy services, ii) travel expenses international travel (all national travel will be arranged for) and iii) daily subsistence allowance costs for international consultants.

Both the technical and financial proposals should be sealed in separate envelopes and the contents of each clearly marked. Both proposals shall be placed in a third sealed envelope suitably marked.

6 Consultant's experience

Curricula vitae of the consultants to be assigned to the project should be included in the proposal. A minimum of 5 years work experience in this field is required for the national consultants, whereas for the international consultants a minimum of 10 years relevant work experience is required. The consultant has to provide evidence to substantiate his experience in the working fields of:

- (1) Development, planning and putting in practice of strategies of mass communication to affect the public opinion, specially the public of rural zones
- (2) Integration of the protection of the global environment into the national and community mentality;
- (3) Proficiency in Spanish as the working language.

Consultants who have good contacts with national and international press media (radio, television, written press) are encouraged to react.

7 Budget and time involvement

The total budget available for the activities outlined in this TOR is US\$100,000. For international consultants the budget available is max US\$ 25,000.

Anticipated time involvement for national consultants is 8 months full-time and for international consultants 8 weeks full-time. The total duration of the activities under this TOR shall not exceed 10 months, commencing at the first day of consultancy activities.

Evaluation of financial and bidding schemes
(Sub-contract no 4.)

1 General

Relevant information on the project background, objectives, activities, expected outputs and budget is provided in the project document for which the information presented herein is an attachment. The project document is to be considered an integral part of the Terms of References for Consultancy Inputs.

In total 7 sub-contracts will be awarded to carry out the activities as included in the project document. This does not exclude the possibility by the NPD to combine the execution of tasks by its own staff together with external consultants.

In table A-1 the 7 sub-contracts and their activities are briefly presented. For each subcontract the Terms of Reference (TOR) has been prepared separately. It is expected that national and international consultancy activities will be combined as a package meeting the requirements of the individual TOR's.

Table A-1: Overview of the 7 sub-contracts and their activities.

Component 1	Sub-contract no. 1 (US\$ 61,000)	Legislation revision and introduction of changes
Component 2	Sub-contract no. 2 (US\$ 65,000) Sub-contract no. 3 (US\$ 100,000)	Standardization of information and development of regional information network and website. Launching of a nation-wide dissemination campaign and conduction of promotional workshops
Component 3	Sub-contract no. 4 (US\$ 26,000)	Evaluation of financial and bidding schemes
Component 4	Sub-contract no. 5 (US\$ 160,000)	Design, procurement, installation and training for the off-grid systems in 18 sites
Component 5	Sub-contract no. 6 (US\$ 340,000)	Re-assessment of the PDF-B project portfolio and feasibility studies for 313 sites
Component 6	Sub-contract no. 7 (US\$ 40,000)	Third Party Evaluation of Phase 1's results

2 Scope of consultancy services

The objective of this contract is *to promote investments in renewable energy projects*. The introduction and use of renewable energy need a significant investment by the governmental institutions, the private sector, and the beneficiary communities. For a long-term success, this initiative must incorporate new financial- and bidding schemes that make the investments needed attractive for all the implied parties.

Background

The costs analysis done during the preparatory phase of the project (Annex II - Annex VI) concluded that, if the proposed systems were to be self-financed, a monthly fee would be needed at a minimum of US\$12.5 per household. Since the capacity of payment of the population has been estimated in less than US\$8.5 per month per household (in average), the monthly tariff structure will be one of the elements to be tested during the execution of the programme (See Annex II for a reference of the mechanisms already tested in Costa Rica). Financial schemes will have to explore a range of monthly fees in order to establish an acceptable and suitable tariff. With the incorporation of a substantial community participation in the operation and maintenance of the systems, a decrease of the costs of the project would be expected. As a result, the investments of capital would be partially covered by a subsidy coming from urban consumers addressed to rural consumers, according to the regulations of ARESEP. Operation and maintenance costs of the systems, that are expected to decrease substantially as the time goes, will be covered by tariffs paid by the users and the provision of in kind contributions.

Another aspect in this consultancy are the bidding schemes. Different schemes need to be evaluated and tested in order to assess their applicability for small scale RE in remote rural areas. Several combinations (procurement, installation, operation, maintenance, lease back, etc.) will be evaluated. Currently, private participation in these processes is limited and one of the objectives this subcontract is to find ways to enhance private participation in small scale RE-marked.

As it was stated before in the Project Brief, the distribution companies will be responsible for the installation of PV Systems and construction of Microhydroelectric Plants in their respective geographic area, and this will not prohibit the participation of the private initiative in the different stages of rural electrification project implementation: from the development of feasibility studies to the operation stage. This Full Size Project will undertake the evaluation of different project development mechanisms, like the following:

- ❖ Contracting “keys-in-hand” projects, including equipment, operation and maintenance
- ❖ Contracting installation only
- ❖ Schemes such as “Build, Operate and Transfer” (BOT), “Build, Lease and Transfer” (BLT), pursuant of the existent laws and regulations

In this context, the scope of international and national consultancy services envisaged for the project includes, but is not limited to, the following items:

2.1 Design of financial- and bidding schemes.

Financial schemes:

- Review the amount of expenditures in energy spent monthly by every family or productive unit in the communities of each one of all 16 pilot sites, no matter if it is a National Park or another institution. The following items will have to be considered: lamp batteries, candles, kerosene, diesel or gasoline for those using a generating plant, car batteries with periodic recharges and their average useful life, man hours spent in recharging car batteries, economic value of the inefficiency of traditional manual labours lacking electricity.

- Development of different payment and financing options for the rural communities. It can include repayment, regular quotas from the beneficiaries, participation of the beneficiaries in investment costs, or participation in O+M costs, in cash or in kind.
- The options will consider not only the limited payment capacity of the target beneficiaries and its current energy expenditures, but also –within the limits of the legal framework- the access that other stakeholders (third parties interested in rural electrification) can have to “subsidy type” resources that are usually only available for the public electrical companies.
- A clear difference will be made between residential and commercial sectors. The first one will continue with the benefits of subsidies as part of the principles of social equity established by the Government of Costa Rica, whereas innovative mechanisms will be looked for to some clients of the productive sector based on clear and transparent criteria.
- The financial schemes to be proposed will be based on the information compiled in the preparatory phase (Annex II - Annex VI) and from previous experiences, including investment payback by means of the invoicing for electrical services that already has been used in Costa Rica in programmes of energy conservation involving strategic alliances with banks.
- These mechanisms will have to involve the communal sector in the financing of the projects, taking into account the capacity of payment and the availability of local resources for the daily management of the operation and maintenance. Financial mechanisms that are accessible to third parties’ design will include effective means for the development of a sense of ownership inside the communities.

Bidding Schemes:

- The abovementioned combinations of bidding schemes will be evaluated and tested in order to assess their feasibility. These schemes will be seen as direct or indirect ways to get access to the electricity subsidy. In other words, it should be seen as a direct or indirect subsidy reallocation.

2.2 Follow-up to the implementation of different schemes in the execution of demonstrative projects.

- The most attractive mechanisms will be implemented and monitored throughout the demonstration activities of Phase I. The consultants together with the project staff will register the response of the community to such incentives and to the arrangements of participation and will evaluate the results to determine their relative success (criteria such as effectiveness, running time, cost of operation and maintenance, etc. will be taken into consideration when evaluated).

2.3 Design activities to facilitate access to (dedicated) financing

- Identify stakeholders involved in Financial mechanisms that are accessible to third parties and assess their role and the incentives they would require for long-term involvement;
- Design an incentive mechanism to ensure that key stakeholders will be involved in the long-term, thereby ensuring sustainability of the proposed initiative.
- The project will dedicate efforts in order to build capacity within financial institutions and to generate partnership amongst financial institutions and local project stakeholders, based on the previous experience Costa Rica and within the CONACE led programme on energy efficiency.
- Identify different bidding schemes that are coherent with national legislation.
- Evaluate and if possible test the abovementioned bidding schemes.

3 Outputs

The following outputs have to result from the implementation of the indicated activities:

- An analysis and proposal of design for at least three different schemes of rural financing is presented and validated for its application;
- Financial schemes in line with the requirements of each of the 16 demonstration projects have been designed, including the stakeholders involved (institutional set-up);
- An analysis and proposal of design for at least 3 bidding schemes are validated for its participation.
- A workshop where at least 20 financial officers receive training in RE-investment.
- A detailed proposal for third parties to participate into the subsidy schemes (from urban clients to rural clients) is analyzed and discussed widely with all sectors;
- Activities have been designed to underwrite or reduce real and/or perceived risks by potential investors in RE systems;
- Potential investment sources for RE systems have been identified and investment criteria have been assessed and to the extent possible been included in the financial engineering activities of the development of the 16 demonstration projects;
- Co-financing sources, have been identified and discussions with them have started on committing co-funding; this includes e.g. European Union. Their criteria will be respected.

- New financing mobilized for projects of rural electrification with renewable energy.

4 General requirements

International and national consultants can implement the project jointly. The international consultant(s) will have a very limited time involvement and will focus mainly on the design and planning of the activities, quality control and human resource management.

Consultants interested to undertake the above consultancy activities make their interest known by a letter with a recent CV attached. In the letter specific experience with activities similar to those indicated in this TOR have to be presented.

To carry out the job as specified herein the consultants have to state clearly how they plan to organise and manage the work both in Costa Rica and in the home office (if applicable). The consultants have to submit within the letter that indicates interest to undertake consultancy activities, a preliminary time schedule that presents the work plan anticipated.

The working language will be Spanish. This requires that the consultants need to make appropriate provision for this aspect, since it greatly influences communication, working relationships and time required for the indicated activities. Reporting to be done by the international consultants is in Spanish unless otherwise agreed upon with the Project Coordinator.

Reporting requirements will be detailed in close collaboration with the Project Coordinator at the outset of the activities presented herein, and the consultants undertaking this subcontract will respond directly to the Project Coordinator.

5 Proposal submission and evaluation

5.1 Technical proposal

The technical proposal shall include, but need not be limited to the following:

- Comments and observation on the terms of reference and suggestion for improvements;
- Detailed proposed approach and work plan;
- Detailed description on the specific tasks to be assigned to each consultant and curricula vitarum of all consultants foreseen for the project; and
- References and descriptions of similar activities undertaken by the consultants.

In the evaluation of the technical proposals to be submitted by various consultants the following criteria shall be considered:

- (1) The consultancy team's relevant experience
- (2) Curricula vitarum of staff to be assigned

- (3) Experience with financial mechanisms that are accessible to third parties for off-grid renewable energy projects, preferably in the Latin American region
- (4) Methodology and proposed programme of work
- (5) Adherence to the terms of reference

5.2 Financial proposal

The financial proposal shall provide detailed breakdowns of i) national and international consultancy services, ii) travel expenses international travel (all national travel will be arranged for) and iii) daily subsistence allowance costs for international consultants.

Both the technical and financial proposals should be sealed in separate envelopes and the contents of each clearly marked. Both proposals shall be placed in a third sealed envelope suitably marked.

6 Consultant's experience

Curricula vitae of the consultants to be assigned to the project should be included in the proposal. At least 5 years work experience in this field is required for the national consultants, whereas for the international consultants at least 10 years relevant work experience is required. The consultant has to provide evidence to substantiate his experience in the working fields of:

- (1) Development, planning and putting in practice of Financial mechanisms that are accessible to third parties for rural projects, especially
 - Studies on willingness to pay and capacity of payment in rural zones of Latin America;
 - Micro-credit, subsidies, and others;
 - Analysis and management of financial data;
 - Tariff studies for public services.
- (2) Proficiency in Spanish as the working language.

Consultants who have good contacts with financing intermediaries (development banks, micro-credit NGOs) with operations or an interest to operate in Costa Rica, are encouraged to react.

7 Budget and time involvement

The total budget available for the activities outlined in this TOR is US\$ 26,000. For international consultants the budget available is max US\$ 15,000.

Anticipated time involvement for national consultants is 4 months full-time and for international consultants 3-4 weeks full-time. The total duration of the activities under this TOR shall not exceed 6 months, commencing at the first day of consultancy activities.

***Design, procurement, installation and training
for the off-grid systems in 18 sites
(Sub-contract no. 5)***

1 General

Relevant information on the project background, objectives, activities, expected outputs and budget is provided in the project document for which the information presented herein is an attachment. The project document is to be considered an integral part of the Terms of References for Consultancy Inputs.

In total 7 sub-contracts will be awarded to carry out the activities as included in the project document. This does not exclude the possibility by the NPD to combine the execution of tasks by its own staff together with external consultants.

In table A-1 the 7 sub-contracts and their activities are briefly presented. For each subcontract the Terms of Reference (TOR) has been prepared separately. It is expected that national and international consultancy activities will be combined as a package meeting the requirements of the individual TOR's.

Table A-1: Overview of the 7 sub-contracts and their activities.

Component 1	Sub-contract no. 1 (US\$ 61,000)	Legislation revision and introduction of changes
Component 2	Sub-contract no. 2 (US\$ 65,000)	Standardization of information and development of regional information network and website.
	Sub-contract no. 3 (US\$ 100,000)	Launching of a nation-wide dissemination campaign and conduction of promotional workshops
Component 3	Sub-contract no. 4 (US\$ 26,000)	Evaluation of financial and bidding schemes
Component 4	Sub-contract no. 5 (US\$ 160,000)	Design, procurement, installation and training for the off-grid systems in 18 sites
Component 5	Sub-contract no. 6 (US\$ 340,000)	Re-assessment of the PDF-B project portfolio and feasibility studies for 313 sites
Component 6	Sub-contract no. 7 (US\$ 40,000)	Third Party Evaluation of Phase 1's results

2 Scope of consultancy services

The objective of this contract is ***the implementation of 16 pilot projects and 2 training facilities*** that demonstrate the benefits of renewable energy in isolated communities not connected to the national grid.

A specific electrification design for each of the 16 pilot project and 2 training facilities will have to be prepared. Consultations will have to be done to every community prior to the initiation of

the processes and later at regular intervals. The design will have to consider the specific conditions of every site and take advantage to the maximum possible of the renewable available resources to satisfy the electrical needs of the communities. The designs will have to use either solar photovoltaic or micro hydroelectric plants, depending on energy demand and the potential of every site. It the possibility of increasing the participation of micro hydroelectric projects will have to de evaluated, in order to better reflect proportions among both technologies for the full-scale programme. Besides specifying materials and services needed for each site, each design should include a work plan and a budget.

In coordination with the procurement group, headed by the NPD, the consultants will have to advise the acquisition of all the equipment by means of public biddings or competitive contracting, seeking to incorporate in the process a significant number of suppliers and of local and foreign specialists. The response of local equipment suppliers as well as of investors interested in entering to the market under the schemes of bidding will have to be evaluated. At least three different types of contracting will have to be applied.

The installation or construction will be a responsibility of the distribution company that serves to the geographical area of the demonstrative sites, who will be able to subcontract third parties for the installation and construction of the different projects, using the different schemes of contracting that will be evaluated and applied. Previous to the stage of construction or installation, all the electrical companies should have been trained in the potential of the renewable energy technologies, the identification of cost-efficient options, case studies of successful experiences in the country, system installation and maintenance, and energy efficiency of the equipment.

Community members will have to be trained in daily management, operation and maintenance of the installed equipments. This demonstrative phase will compare different levels of participation and of training inside the communities to determine the ideal level of local management and maintenance together with the technical support of the distribution companies. Based on results from this phase, the Director together with the consultants will support the community organizations to fulfill those tasks whose evaluation have determined these organizations can handle.

In this context, the scope of international and national consultancy services envisaged for the project includes, but is not limited to, the following items:

I. TECHNICAL EXECUTION - MICRO HYDROELECTRIC PROJECTS.

1. Review and take notes on the provisional profiles of the two sites chosen as pilot projects and the site for educational purposes.
2. Verify and measure, as appropriate, the following technical details:
 - a. Annual average of water flow
 - b. Estimation of the minimal probable water flow during the year. Sources of information: the National Meteorological Institute and ICE.
 - c. Net and gross water head.

- d. Topographic delineation of the pipeline of pressure.
 - e. Selection of site for water intake.
3. Design and choose the following:
- a. Capacity of the viable generating set with information of water flow and water head for the selected sites
 - b. Give technical specifications for the procurement of the equipments required
 - c. Design the pipeline of pressure for the project. The contractor will have to choose a route for the pipeline so that it is adequate from the economic point of view at the moment of its construction, and it presents lower losses for friction along the conduction of water.
 - d. Design the electrical distribution and transmission lines needed to bring the power produced by the project to the end users at the less possible cost.
 - e. Design the water intake or reservoir with its respective sand drainer and evaluate the possibility of taking advantage of natural available reservoirs on site. The design of the water intake must specify the type of concrete to be used as well as the structures of steel needed, indicating its caliber. Design must specify the capacity of pressure of the water intake in relation with the pressure that would be produced by the maximum water flow available throughout the year.
4. Productive uses of the produced energy:
Jointly with every community, natural reserve or beneficiary institution, the contractor, in coordination with the Project Coordinator, will have to consider those productive uses that can be served in the most efficient possible way with the power produced. In every case the contractor will have to present the corresponding calculations of efficiency and profitability. The contractor must calculate and determine if the potential of the hydroelectric project covers the needs for domestic energy and productive uses in the community.
5. The contractor will have to plan and possibly execute the construction and installation of the hydroelectric projects taking into account the following:
- a. The water intake will have to be constructed according to design specifications. NPD will keep the right to assign an inspector who verifies the fulfillment of those specifications. For any effect over the civil works it will prevail what the National Earthquake Code has established.
 - b. The contractor will have to install the generation set following the Supplier Installation manual that must be given with the equipments.
 - c. For all the awarded projects, the contractor will have to bring them into operation and develop “take-off tests”, as well as “stop and protection tests” (low and high frequency, overflow, short circuit, adjustment of frequency, voltage and power factor if needed in conformity with the type of load to be served).
 - d. The whole electrical installation of the hydro plant will be in conformity with the Electrical National Code.

REQUIREMENTS OF THE MINIGRID ASSOCIATED WITH THE MICRO HYDROELECTRIC PLANT

- e. The distribution grid will follow strictly Ice's Manual of Procedure for the Construction of Electrical Grids. The developers through the NPD will check with ICE the adjustment of those procedures that exceed the technical requirements of the projects based on their small magnitude.
- f. The mini distribution grid associated to the decentralized micro hydroelectric plants will have to possess necessary characteristics of design in order to be able to deliver to the national grid of distribution. This will be the case if the communities eventually get connected to the National Interconnected System:
 - It have to be a one-phase primary line
 - A line of 230kVA
 - A line of 2,5 km of maximum length up to the community
 - Be capable of distributing to each of the housings by means of a transformer of 10kVA up to a maximum dimension of coverage of 60 meters.
 - Advisable the utilization of posts of wood.

II. TECHNICAL EXECUTION PHOTOVOLTAIC PROJECTS

1. Review and take notes on the provisional profiles of all 14 sites chosen as pilot schemes and the site of educational character.
2. Determine and verify the following technical details as appropriate:
 - a. Measurement of average on site solar radiation (watts / m²) during every day of a whole week, taking measurements every hour between 8 a.m. and 1 p.m. If measurements are taken in the dry season, the contractor will have to estimate which will be the values of radiation corresponding to the rainy season and he will consult accordingly to the National Meteorological Institute, ICE and to the Solar Unit of the Department of Physics of the National University. It would be highly recommendable that the contractor verifies his information through the Internet with scientific institutes with access to satellite information.
 - b. The contractor will have to analyze on site the conditions of shade that might affect the solar intake for the project. In case of shades from vegetation or forest, the contractor will have to determine project's feasibility from the perspective of forest and environmental conservation in the site.
 - c. The contractor will have to determine if the site is suitable for a centralized energy system or for the installation of individual systems. This aspect will be strongly orientated to the optimization of energetic and financial resources.
3. If the project is going to consist of individual systems, the contractor will have to design the system that will be use, considering the following aspects:

- Type of technology and capacity in watts of the chosen panel.
- Number of panels for each system.
- Capacity of the load controller.
- Use of an inverter and its capacity in watts as well as its way of operation.
- Type and capacity of the deep cycle battery(s) that will be used as well as the minimal days of autonomy needed in each site.
- Protection against short circuits and land system.
- Design the anchorage of the panels according to the place where they will be located so that they can resist winds of 100 km/hour.

4. If a centralized project is chosen because of the community dispersion is so low, the contractor will have to design and determine the following:

- Diversity factor for the use of energy and power in the project.
- Type and capacity of the panel arrangement.
- Capacity of the controller (s) needed for the project.
- Capacity and type of the batteries bank
- System of electrical distribution and its protection against short circuits and land system.

5. Productive uses of the produced energy:

Jointly with every community, natural reserve or beneficiary institution, the contractor, in coordination with the Project Coordinator, will have to consider those productive uses that can be served in the most efficient possible way with the power produced. In every case the contractor will have to present the corresponding calculations of efficiency and profitability. The following uses are recommended for evaluation:

- Electrical solar fences.
- Public illumination systems.
- Water pumping for watering places for farm animals and irrigation.
- Water purification.
- Refrigeration in health centers.
- Communication

6. The panels must be placed with an inclination equal to the country's latitude, in descending form north to south and free of shade. The calibers of cables used must comply with the Electrical National Code.

III ADMINISTRATIVE AND LOGISTIC ASPECTS – MICRO HYDROELECTRIC AND PHOTOVOLTAIC PROJECTS.

1. The contractor will have to detect the communal organizations or associations in each of the 16 sites that might participate in the execution of the projects and that might generate local initiatives for the development of economic activities derived from the availability of the hydroelectric or photovoltaic energy.
2. The contractor will have to propose and implement a training course addressed to communal leaders and government employees related from the energy sector, on renewable energies and.
3. The contractor will have to implement a training programme on the operation and utilization of photovoltaic and hydroelectric systems, which will be addressed to the end-users.
4. The NPD through the procurement committee, and with support of UNDP, will have to write and formulate the contest or bidding process for the acquisition of all the equipments and materials required for the execution of all 18 projects, following all the requirements of the Law of Administrative Contracting and the principles due established in its regulations.

3 Outputs

The following outputs have to result from the implementation of the indicated activities:

- Replicable experiences spread nation-wide in the execution and facilitation of micro hydroelectric and solar photovoltaic energy projects by means of demonstrative projects that provide electric power for productive uses, offering clean electricity services to rural communities, small enterprises, households and farms without access to the electrical grid.
- Technical assistance and material support programmes implemented in every area, along the execution of renewable energy projects designed together with community organizations, and developed by national specialists who can reproduce them in other places with the aim to train technical personnel and assist with the development of small enterprises that provide materials and services for the micro hydroelectric plants and photovoltaic systems in rural areas.
- Financial mechanisms that are accesible to third parties brought into operation, taking into account the requirements and necessary procedures to promote investments in renewable energy projects in rural zones of Costa Rica.
- The strengthening of community organizations.
- Public officers and community beneficiaries are trained and aware of the benefits of using solar photovoltaic and micro hydroelectric energy, together with a stronger political will to integrate these alternatives into national development policies and plans

4 General requirements

The project has to be implemented jointly by international and national consultants. The international consultant(s) will have a limited time involvement and will focus mainly on the design and planning of the activities, quality control and human resource management.

Counterpart staff from the individual members from CONACE will be assigned to carry out activities in their geographic region and will participate in all aspects of the project execution. Jointly with the consultants, they will carry out data collection, data analysis and other types of technical and socio-economic studies. In addition NPD will provide logistical support (transport, travel accommodation, access to information, etc.).

Consultants interested to undertake the above consultancy activities make their interest known by a letter with a recent CV attached. In the letter specific experience with activities similar to those indicated in this TOR have to be presented.

To execute the job as specified herein the consultant has to state clearly how he/she plans to organize and manage the work both in Costa Rica and in the home office (if applicable). The consultant has to submit within the letter that indicates interest to undertake consultancy activities, a preliminary time schedule that presents the work plan anticipated.

The working language will be Spanish. This requires that the consultants need to make appropriate provision for this aspect, since it greatly influences communication, working relationships and time required for the indicated activities. Reporting to be done by the international consultants is in Spanish unless otherwise agreed upon with the Project Coordinator.

Reporting requirements will be detailed in close collaboration with the Project Coordinator at the outset of the activities presented herein, and the consultant company undertaking this subcontract will respond directly to the Project Coordinator.

5 Proposal submission and evaluation

5.1 Technical proposal

The technical proposal shall include, but need not be limited to the following:

- Comments and observation on the terms of reference and suggestion for improvements;
- Detailed proposed approach and work plan;
- Detailed description on the specific tasks to be assigned to each consultant and curriculum vitae of all consultants foreseen for the project; and
- References and descriptions of similar activities undertaken by the consultants.

In the evaluation of the technical proposals to be submitted by various consultants the following criteria shall be considered:

- (1) The consultancy team's relevant experience

- (2) Curricula vitae of staff to be assigned
- (3) Experience with off-grid renewable energy related projects, preferably in the Latin American region
- (4) Methodology and proposed programme of work
- (5) Adherence to the terms of reference

5.2 Financial proposal

The financial proposal shall provide detailed breakdowns of i) national and international consultancy services, ii) travel expenses international travel (all national travel will be arranged for) and iii) daily subsistence allowance costs for international consultants.

Both the technical and financial proposals should be sealed in separate envelopes and the contents of each clearly marked. Both proposals shall be placed in a third sealed envelope suitably marked.

6 Consultant's experience

Curricula vitae of the consultants to be assigned to the project should be included in the proposal. A minimum of 5 years work experience in this field is required for the national consultants, whereas for the international consultants a minimum of 10 years relevant work experience is required. The consultant has to provide evidence to substantiate his experience in the working fields of:

- (1) Renewable energy project development, planning and implementation, in particular
 - Renewable energy resource assessment (availability);
 - Market assessments from the demand and supply-side for renewable energy systems;
 - Data analysis and management;
 - Feasibility studies.
- (2) Installation / construction and set into operation of stand-alone renewable energy systems;
- (3) Integration of stand-alone renewable energy systems in local and/or mini-grids;
- (4) Proficiency in Spanish as the working language.

Consultants who have good contacts with (development) financing institutions and/or manufacturers of renewable energy equipment with an interest to operate in Costa Rica are encouraged to react.

7 Budget and time involvement

The total budget available for the activities outlined in this TOR is US\$ 160,000. For international consultants the budget available is max. US\$ 40,000.

Anticipated time involvement for national consultants is 10 months full-time and for international consultants 6 weeks full-time. The total duration of the activities under this TOR shall not exceed 12 months, commencing at the first day of consultancy activities.

***Re-assessment of the PDF-B project portfolio
and feasibility studies for 313 sites
(Sub-contract no. 6)***

1 General

Relevant information on the project background, objectives, activities, expected outputs and budget is provided in the project document for which the information presented herein is an attachment. The project document is to be considered an integral part of the Terms of References for Consultancy Inputs.

In total 7 sub-contracts will be awarded to carry out the activities as included in the project document. This does not exclude the possibility by the NPD to combine the execution of tasks by its own staff together with external consultants.

In table A-1 the 7 sub-contracts and their activities are briefly presented. For each subcontract the Terms of Reference (TOR) has been prepared separately. It is expected that national and international consultancy activities will be combined as a package meeting the requirements of the individual TOR's.

Table A-1: Overview of the 7 sub-contracts and their activities.

Component 1	Sub-contract no. 1 (US\$ 61,000)	Legislation revision and introduction of changes
Component 2	Sub-contract no. 2 (US\$ 65,000) Sub-contract no. 3 (US\$ 100,000)	Standardization of information and development of regional information network and website. Launching of a nation-wide dissemination campaign and conduction of promotional workshops
Component 3	Sub-contract no. 4 (US\$ 26,000)	Evaluation of financial and bidding schemes
Component 4	Sub-contract no. 5 (US\$ 160,000)	Design, procurement, installation and training for the off-grid systems in 18 sites
Component 5	Sub-contract no. 6 (US\$ 340,000)	Re-assessment of the PDF-B project portfolio and feasibility studies for 313 sites
Component 6	Sub-contract no. 7 (US\$ 40,000)	Third Party Evaluation of Phase I's results

2 Scope of consultancy services

The objective of this subcontract is to *assess Costa Rica's plans for rural electrification and confirm sites that may benefit from the use of the renewable energy*. The reassessment of the portfolio and the execution of the feasibility studies will be a responsibility of the distribution

company that serves to the geographical area of the considered sites, who will be able to subcontract with third parties the accomplishment of a part or the totality of such activities.

The scope of national and international consultancy services envisaged for the project includes, but is not limited to, the following items:

2.1 Re-assessment of RE rural project portfolio

- Work closely with the Project Coordinator to confirm the selection of the project sites, once a detailed assessment has been done. Confirmation criteria to be used include i) end-users ability and willingness to pay for electricity, ii) ability, initiative and interest of the community to organize itself, iii) proximity to road and/or river for access, iv) no extension of the grid and/or import from abroad planned for at least the next 10 years, v) interest of provincial and district officials, vi) the desire of the village to be included (measured by in-kind contributions, down-payment on renewable energy equipment), vii) availability of renewable energy resources throughout the year, viii) the replicability potential of the proposed demonstration project, and ix) availability of local support (technical, managerial) and x) the environmental impact of electrifying this community is less than in other sites. In addition the portfolio of projects needs to be balanced as it concerns the inclusion of both RE technologies: solar photovoltaic and micro hydroelectric plants.

2.2 Feasibility studies for 313 sites

Undertake 313 detailed feasibility studies for the selected sites, following the parameters established in the Attachment 1 to this Annex. Elements to be covered include: technical viability, institutional and managerial viability, financial viability (in terms of securing financial resources for implementation of the project) and financial sustainability (in terms of project viability after the proposed GEF intervention has come to an end). The Government of Costa Rica is committed to support off-grid renewable energy based rural electrification with clear subsidies.

The approach to be followed for these activities is in 2 steps. At first through a desk study of maps and existing secondary data at various ministries and academia. Secondly, through field visits including socio-economic surveys, energy resource data, assessing accessibility conditions and institutional set-ups at village and/or community and district levels.

3 Outputs

The following outputs have to result from the implementation of the indicated activities:

- A properly balanced portfolio (from a technology point of view) readied for pre-investment stage, of 313 detailed feasibility studies of projects to be implemented in the Full-Size Programme-Phase II.

4 General requirements

International and national consultants can implement the project jointly. The international consultant(s) will have a limited time involvement and will focus mainly on the design and planning of the activities, quality control and human resource management.

National and international consultants interested to undertake the above consultancy activities make their interest known by a letter with recent CV's attached. In the letter specific experience required for this TOR has to be presented.

Counterpart staff from the individual members from CONACE will be assigned to carry out activities in their geographic region and will participate in all aspects of the project execution. Jointly with the consultants, they will carry out data collection, data analysis and other types of technical and socio-economic studies. In addition, the NPD will provide logistical support (transport, travel accommodation, access to information, etc.).

To execute the job as specified herein the consultants have to state clearly how they plan to organize and manage the work both. The consultants have to submit within the letter that indicates interest to undertake consultancy activities, a preliminary time schedule that presents the work plan anticipated.

The working language will be Spanish. This requires that the consultants need to make appropriate provision for this aspect, since it greatly influences communication, working relationships and time required for the indicated activities. Reporting to be done by the international consultants is in Spanish unless otherwise agreed upon with the Project Coordinator.

Reporting requirements will be detailed in close collaboration with the Project Coordinator at the outset of the activities presented herein, and the consultants undertaking this subcontract will respond directly to the Project Coordinator.

5 Proposal submission and evaluation

5.1 Technical proposal

The technical proposal shall include, but need not be limited to the following:

- Comments and observation on the terms of reference and suggestion for improvements;
- Detailed proposed approach and work plan;
- Detailed description on the specific tasks to be assigned to each consultant and curricula vitarum of all consultants foreseen for the project; and
- References and descriptions of similar activities undertaken by the consultants.

In the evaluation of the technical proposals to be submitted by various consultants the following criteria shall be considered:

- (1) The consultancy team's relevant experience
- (2) Curricula vitae of staff to be assigned
- (3) Experience with off-grid renewable energy related projects, preferably in the Latin American region
- (4) Methodology and proposed programme of work
- (5) Adherence to the terms of reference

5.2 Financial proposal

The financial proposal shall provide detailed breakdowns of i) national and international consultancy services, ii) travel expenses international travel (all national travel will be arranged for) and iii) daily subsistence allowance costs for international consultants.

Both the technical and financial proposals should be sealed in separate envelopes and the contents of each clearly marked. Both proposals shall be placed in a third sealed envelope suitably marked.

6 Consultant's experience

Curricula vitae of the consultants to be assigned to the project should be included in the proposal. A minimum of 5 years work experience in this field is required for the national consultants, whereas for the international consultants a minimum of 10 years relevant work experience is required. The consultant has to provide evidence to substantiate his experience in the working fields of:

- (5) Renewable energy project development, planning and implementation, in particular
 - Renewable energy resource assessment;
 - Market assessments for demand and supply-side renewable energy systems;
 - Data analysis and management;
 - Feasibility studies.
- (6) Integration of stand-alone renewable energy systems in local and/or mini-grids;
- (7) Proficiency in Spanish as the working language.

Consultants who have good contacts with (development) financing institutions and/or manufacturers of renewable energy equipment with an interest to operate in Costa Rica are encouraged to react.

7 Budget and time involvement

The total budget available for the activities outlined in this TOR is US\$340,000. For national international consultants the budget available is max. US\$ 25,000.

Anticipated time involvement for national consultants is 9 months full-time and for international consultants 5-6 weeks full-time. The total duration of the activities under this TOR shall not exceed 13 months, commencing at the first day of consultancy activities.

ATTACHMENT 1 TO THE ANNEX A
ELEMENTS FOR DEMONSTRATIVE PROJECTS AND FEASIBILITY STUDIES

TECHNOLOGY: Solar Photovoltaics

ALTERNATIVE USES:

1. Electricity generation with solar home systems (PV cells).
2. Renewable energy models in rural communities for water pumping with PV systems for different agriculture activities and to generate electricity for lighting of lodges and other business.
3. PV solar systems to bring electricity to rural health centers, educational and communal facilities.
4. Solar electrification for forest conservation, as a trade-off through the provision of solar home systems for lighting and solar dryers for indigenous communities.
5. Emergency telecommunications, scientific monitoring instruments and cathode protection to reduce deterioration of ducts and reservoirs.

TECHNICAL REQUIREMENTS:

- Recognition of the community: visual, topographic, location of principal population nuclei, surveys of needs and socioeconomic surveys (living standard, main health problems, environmental conditions).
- Environmental impact assessment: quantify the effect of the project on the ecologic equilibrium in the surrounding area and identify harmful impacts.
- Assessments to determine incident solar radiation, daily cycles and schedules in the project site. If there are long intervals of insufficient light, it will require batteries with higher stock capacity to maintain the systems.
- Evaluate financial feasibility of the PV system compare to the grid extension, based on four elements: distance from the grid, number of households in each town, average distance between houses, and energy consumption demand per household.
- Specify the number of PV systems required for the project, taking into account the following considerations: For “direct current” (DC) systems, i.e. off-grid systems, it will require the panel arrangement, battery bank, controller and electric power system – direct current. For “alternating current” (AC), the required components are, panel arrangement, battery bank, electric power system (DC-AC), controller and inverter.
- Market research: determine demand, consumption, capacity of payment and willingness to pay.
- Economic assessment: determine project outcomes as compare to the bill of expenses in fuels of the community or family, and their capacity and willingness to pay for the service.

- Social impact assessment¹²: project's influence on the social conditions of the area, as for changes of its living patterns and generation of employment.
- Financial assessment: determine project's profitability, considering costs of investment of the generation and distribution systems, and the operation and maintenance costs.

TECHNOLOGY: Micro Hydroelectric

ALTERNATIVE USES:

1. Extend electric coverage to rural communities with micro hydroelectric plants energy, strengthening local distribution companies.
2. Validate replicable renewable energy models in rural communities by means of micro hydroelectric plants to benefit rural households, small businesses, and productive uses (agriculture) in rural Costa Rica.
3. Micro hydroelectric power for home lighting in rural households and towns.
4. Battery charging, power to mechanical processes (coffee depulping, corn processing) and electricity generation.

TECHNICAL REQUIREMENTS:

In order to determine the kind and scale of the technology solution needed, a high level multidisciplinary assessment for the micro hydroelectric plants has to be developed, including at least the following elements:

- Recognition of the community: visual, topographic, location of principal population nuclei, surveys of needs and socioeconomic surveys (living standard, main health problems, environmental conditions).
- Environmental impact assessment: quantify the effect of the project on the ecologic equilibrium in the surrounding area and identify harmful impacts.
- Geological assessment: determine soil constitution for the structural basis of the different project elements, and the adequacy of local materials for those structural elements
- Hydrological and meteorological assessment: estimate the maximum water level of the river to protect the works and adjust the design, calculating maximum power.
- Basin management plan: design management plans according to existent environmental laws.
- Topographical assessment: knowledge of detailed features of the field where the works will be based on.
- Design and Engineering: once the reports from the different experts have been compiled, the following data can be determined: cost per kW installed, installed

¹² It refers to the study and presentation of information as: number of poor families benefited by the project, opportunities of income generating activities associated with equipment (used by women and men), available financing for buying equipment (used by women and men), increase of the opportunities of employment for the women in other sectors than agriculture, women literacy and technical education, project effects on school enrolment of boys and girls, reduction in pollution of the internal air, improvement of health services, percentage or level of increase of pumped water.

capacity, consumption (kW/h), and the final design. The mini grid of distribution associated with the micro hydroelectric plant must have the necessary characteristics of design in order to, if eventually the national distribution grid reaches to the community, make it possible for the micro hydroelectric plant to deliver energy to the National Interconnected System, i.e.: a primary one-phase line of 230kVA, of 2,5 km of maximum length up to the community and capable of distributing to each of the housings by means of a transformer of 10kVA up to a maximum dimension of coverage of 60 meters (it is advisable the utilization of wooden posts).

- **Market research:** determine demand, consumption, capacity of payment and willingness to pay.
- **Socioeconomic assessment:** determine project impacts in relation to the monthly bill initially spent on fuels by the community or household (baseline).
- **Social impact assessment:** changes in social conditions, in terms of changes in their living patterns, and employment opportunities.
- **Financial analysis:** determine project profitability, taking into account investments costs of the generation set and the distribution grid, and also the operation and maintenance costs.

**Third Party Evaluation of Phase I's results
(Sub-contract no. 7)**

1 General

Relevant information on the project background, objectives, activities, expected outputs and budget is provided in the project document for which the information presented herein is an attachment. The project document is to be considered an integral part of the Terms of References for Consultancy Inputs.

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Component 5	Sub-contract no. 6 (US\$ 340,000)	Re-assessment of the PDF-B project portfolio and feasibility studies for 313 sites
Component 6	Sub-contract no. 7 (US\$ 40,000)	Third Party Evaluation of Phase 1's results

2 Scope of consultancy services

The overall objective of the present contract is to *dispose of an in-depth independent evaluation of the Phase I of the CONACE project* in order to take appropriate actions and make relevant decisions in the immediate future with regards to the required GEF Council approval for the Project's Phase II.

Background

UNDP-GEF supported a US\$ 1.927.354 project (phase I of a Full Size Project), executed by the Costa Rican Institute of Electricity ICE with a total amount of US\$981.530. The project aims at promoting the use of decentralized renewable energy systems in areas isolated from the National Interconnected System of Costa Rica, through the creation of a systematic approach within the Costa Rican energy sector to rural electrification with renewable energy.

The project started operation in month 1. It was reviewed according to GEF M+E procedures in month 7 and underwent a TPR review in month 11 and in month 14. The project phase I duration is scheduled to finish in month 15.

Expected outcomes of the project were as follows:

- ✓ Laws and norms that regulate the energy sector are modified to include provisions that allow the development of small scale Renewable Energy projects;
- ✓ Standardized procedure to analyze RE potential in electrification projects is in place
- ✓ Public and private funds are combined in rural electrification projects, being developed by all utilities and third parties (within the limits of national legislation),
- ✓ Construction of demonstration projects is successful and completed with the forecasted budget
- ✓ A Rural electrification plan that specifies the number of sites to be electrified with renewable energy is published by the end of Phase I.

The following components have been advanced so far:

- ✓ Establishment of a regulatory framework conducive to the use of renewable energy in electrification projects
- ✓ Strengthening of the capacity of institutions, companies and communities to develop RE projects
- ✓ Promotion of investment in RE projects by developing innovative Financial mechanisms that are accessible to third parties
- ✓ Demonstration of the validity of decentralized RE systems as a marketable option for electricity generation
- ✓ Assessment of scheme to provide third party access subsidies (including validating the various bidding schemes tested with a varied participation of contracted firms in RE-projects)
- ✓ Assessment of Costa Rica's rural electrification programme and confirmation of sites that may benefit from the use of renewable energy

Within that context, the scope of national and international consultancy services envisaged for the project includes, but is not limited to, the following items:

Pursuant to UNDP-GEF methodology for external evaluations implemented by third parties, the programme will be evaluated with the following scope: achievements will be contrasted with initial plans, indicators will be verified and human resources performance will be measured. The

financial administration of the UNDP-GEF resources will be evaluated regarding cost - efficiency and timeliness. Special attention will be put over the temporality with which the different products have been obtained, evaluating any justification presented for lags or significant breaches. The centralized administrative organization, the institutional arrangements, and the community organization established for the development and follow-up of the fields projects will be reviewed.

The specific objective of the present contract is to provide an objective evaluation of the project phase I's results and performance, based on the following:

Project design

- ✓ Review of project concept and design: Whether project meets GEF mandate and Government priorities, whether problems were clearly identified, immediate objectives properly defined and approaches to address them appropriate.
- ✓ Whether project beneficiaries were properly identified;
- ✓ Whether the objectives and outputs of the project were stated explicitly with verifiable terms and observable success indicators;
- ✓ Whether the relation between objectives, outputs and inputs are articulated in a logical way and whether the objectives were achievable;
- ✓ Whether the project started with a well-prepared work plan and whether the work plan was subsequently revised in a timely manner in the light of project implementation.

Project Implementation

With reference to the project document and in particular the log frame and work-plan, the evaluator will examine the quality and timeliness with regards to:

- ✓ Timely and good delivery of inputs by each stakeholders;
- ✓ The scheduling and actual implementation of activities;
- ✓ The fulfilling of success criteria as outlined in the project document;
- ✓ The responsiveness of project management to significant changes in the environment in which the project functions;
- ✓ The monitoring and backstopping of the project as expected by the local entities, the government and UNDP.

In terms of institutional arrangements, efficiency of operational management and institutional framework and in particular advantages and inconveniences of the modality of execution will also be examined.

Tasks to be performed

The consultant will be required to perform the following:

- ✓ Review of all existing documentation related to the project;

- ✓ Propose a methodology for evaluation, and implement this methodology upon formal approval by UNDP-GEF;
- ✓ Meeting with project executing agency as well as associated partners like the Energy Sector Directorate, CONACE members and other stakeholders active in the country, working in partnership with ICE;
- ✓ Meetings with beneficiaries including at least 2 project developers, 2 financial institutions, 2 governmental agencies and 2 high level policy makers involved in the project;
- ✓ Site visit to more than 8 projects;
- ✓ Determine relevance and contents of project follow-up;
- ✓ Elaborate a report including the following sections:
 - Executive summary
 - Project concept
 - Project implementation
 - Project results
 - Findings
 - Recommendations
 - Lessons learned useful for other projects

The project document, together with all project reports and dissemination materials will be at the disposal of the consultant.

Both above mentioned M+E related documents will be made available to the consultant.

3 Project outputs and achievements

The evaluator is expected:

- ✓ Identify the factors that have facilitated or impeded the progress of the project to attaining the stated outputs (networking, partnership with other projects or other institutions, political and institutional environment, etc.);
- ✓ Comment on the adequacy, effectiveness, timeliness and cost-effectiveness in the production of outputs;
- ✓ Evaluate the achievements of the CONACE project with respect to initial objectives and in particular relation to the project log frame and incremental costs matrix;
- ✓ Review undertaken activities bearing in mind project objectives in terms of organization, cost-effectiveness and sustainability;
- ✓ Evaluated project impact in terms of reduction of GHG;
- ✓ Assess whether project implementation would have been improved to make results more significant considering the size of the barriers to be removed.

Sustainability

- ✓ Whether the project is relevant to the development priorities of the country and its neighboring countries within the region and whether the project has obtained sufficient support from government in particular traduced by integration in national priorities;
- ✓ Given the objectives of the project, whether appropriate institutions were assisted and whether the project have a positive impact on concerned institutions;

4 Support to the Evaluation

UNDP-GEF Regional Coordinator will supervise the evaluation process and provide guidance as needed in the course of the evaluation. In particular, an initial briefing will be organized and the Regional UNDP-GEF office will ensure that consultant is provided with relevant documentation

The UNDP country office will be supporting the consultant, together with the project executing agency, specifically with regards to office space and travel and agenda arrangements.

5 Reporting

The evaluator will report to the Programme Steering Committee and the UNDP country office as well as to the UNDP-GEF regional coordinator who will be responsible for coordinating and supervising the evaluation process as detailed in the corresponding section.

The following will be produced:

- ✓ A short inception report including proposed methodology for evaluation and a work- plan including missions contemplated not later than 2 weeks after evaluation start;
- ✓ A draft report no later than 1.5 months after evaluation start circulated to UNDP-GEF regional coordinator, Costa Rica UNDP office, and New York based Director for Monitoring and Evaluation;
- ✓ A Final report not longer than 20 pages plus annexes including comments from the executing agency, regional coordination no later than 2 months after project start.

All documents will be prepared in English and Spanish under Word 2000 format and handed in 3 hard copies and an electronic copy. A debriefing will be organized at a location to be determined at a later stage, for main findings presentation:

6 Consultant's profile

The consultant would have to fulfill the following:

- ✓ A post-graduate degree in economics or engineering
- ✓ Have at least ten years of experience in RE or related fields
- ✓ Fluent spoken and written English and Spanish.

The following would be considered as a plus:

- ✓ Having already performed projects monitoring and evaluation
- ✓ Be familiar with GEF strategy, procedures, and eligibility criteria
- ✓ Knowledge of the Central American region, and of Costa Rica in particular.

7 Dates and duration

The mission is foreseen to take place between the 20-23 month of implementation

The consultant will complete her/his mission no later than two months after the evaluation start. Starting date is the date of official approval by UNDP.

8 Budget and time allocation

The consultant will be required to dedicate a total of 30 working days within the 2 months of project execution.

Maximum budget of the present project is US\$ 40.000 (Inclusive of mission costs)

9 Relevant contact persons

Catherine Vallee, UNDP-GEF Coordinator for Latin America, Mexico Country Office

Kasper Koefoed-Hansen, Programme Officer, UNDP Costa Rica

Annex B. Description of Equipment to be acquired

Office Equipment (financed by the project)

Equipment	Unit Cost in US\$	Total Costs in US\$
2 Computers	1 330	2 660
1 Portable computer	1 905	1 905
1 Printer	350	350
1 Fax	390	390
3 Phones	18	54
2 File cabinets	155	310
1 Photocopier	1 177	1 177
3 Work stations	400	1.200
3 Desks	177	531
3 Chairs	40	120
1 table with 4 chairs for meetings	263	263
TOTAL US\$	-----	8.960

Equipment (financed by national counterparts)

Generic Description of Equipment (Financed by ICE)

For the activities i- National Energy Information System, ii- Regional information system and iii- Website,

- Hardware: One server US\$ 25.000
- Software:
- Data warehouse US\$18.000
- Inter-phases US\$1.000
- **TOTAL US\$44.000**

For the activities of demonstration projects and training facilities:

- Photovoltaic projects
- 308 Panels (100 Wp) US\$201.432
- 308 Batteries US \$ 71.456
- 308 Controllers US\$43.736
- 308 Inverters US\$132.748
- Fluoresce lamps US\$21.252
- **TOTAL US\$470.624**

Annex C. Training and Capacity Building

An important part of the strategy to remove the barriers to small scale RE is the use of Training and Capacity building. In Costa Rica, the technical level of employees within utilities is traditionally high. However this country's electricity sector is operating in a highly centralized way, and heavy infrastructure projects are the day-to-day for these employees. Recent experience shows that acquired knowledge in a new technology for Costa Rica is possible and indeed has happened. The GEF supported wind project known as Tejona, has been successfully developed with direct participation of ICE's employees and is now being replicated. And the same is true for the solar powered rural electrification policy through which a total of 1000 solar home systems have been installed up to now by the employees of ICE and CoopeGuanacaste throughout the country.

However the main challenge is still two-fold: 1-Raise the trademark of small RE projects within the technical scene in Costa Rica utilities and 2- Broaden the technical knowledge to take into account socio-cultural factors in rural areas. So while the technical base is there, awareness of the interest and challenges both technical and socio-cultural, of renewable energy based off-grid electrification is still lacking. The aim of the present initiative is to address the above through workshops as well as hands-on training on the topic.

The project has planned the following 8 activities in order to reach all the important stakeholders and dealing with the challenges. It is important to state that each activity will be designed in order to consider the specific requirements of each technology. This is underline by the fact that an educational facility will be constructed and used for training for each of the two technologies.

Project Inception Workshop and Report

Within the first two months of project implementation an inception workshop will be held with the project team, institutional and other stakeholders relevant to project execution, and UNDP representatives. In this workshop the strategy of the project will be shared and discussed with the stakeholders, and the work plan for the project will be presented. Indicators will be revised in order to be able to determine progress made towards project objectives and outputs during project implementation.

Dissemination of official norms and standards (Activity 1.2).

Once approved, a national seminar and workshop will be conducted to present the technical norms and standards to the largest possible number of actors in the decentralized energy systems market. This workshop will include micro-hydroelectric and photovoltaic system distributors and installers.

Organization of 7 training workshops for employees of power utilities and private companies (Activity 2.1)

Each workshop will be 40 hours long and will focus on the introduction of renewable energy systems. The workshops will discuss the potential of renewable technologies, determination of cost-effective options, case studies of successful experiences and system installation and maintenance, as well as efficient energy equipment and use.

Strengthening of DSE personnel on renewable energy (Activity 2.1)

This entity shall be in charge of evaluating potential investments with renewable energy, providing information to private investors interested in the technology, and facilitating replication based upon project results. This entity shall be responsible for maintaining the systemized approach to rural electrification with renewable energy promoted by this project. Since positive results of this project may induce replication in the Central American region, information will be provided to neighboring countries interested in applying similar technology and DSE will act as facilitator of a network of similar entities existing at regional level.

Conduct 7 promotional workshops (Activity 2.3)

Workshops will be carried out (16 hours each) for employees of several government companies who visit the isolated communities, for the purpose of training them to work as promoters of the efficient use of renewable energy sources in rural communities. Participation by ICE, CNFL, ESPH, JASEC, *RURAL ELECTRIFICATION CO-OPERATIVES*: COOPEGUANACASTE, COOPELESCA, COOPEALFARORUIZ and COOPESANTOS, EBAIS, Ministry of Public Education, Costa Rican Social Security Board and MINAE Conservation Areas is foreseen. Private companies will be invited if found necessary.

Training workshops to financial sector officers (Activity 3.3)

This will be offered as part of the renewable energy promotion and financing strategic alliance deal. Training of involved financial actors will be conducted in order to achieve an effective long-term implementation of selected Financial mechanisms that are accesible to third parties.

Training of community members in daily management, operation, and maintenance (Activity 4.1)

Community members shall be trained in daily management, operation, and maintenance of the installed equipment. Administrative Council shall be set up in each locality to manage the operation of the systems and perform maintenance with local resources. Although ICE staff will be available for technical support, the technology effectiveness will be enhanced and the project costs reduced if a substantial portion of operations and maintenance is conducted at a local level. Therefore, the demonstration phase will compare different training and participation levels among the communities to determine the optimal level of local management and maintenance and required level of ICE support.

Dissemination of pilot project results (Activity 4.2)

On site workshops will be conducted in each of the 16 pilot communities. Local and regional interested actors and future phase II beneficiaries will be invited to participate in order to demonstrate the practical benefits of renewable energy technology. All relevant data regarding the 16 pilot projects shall be collected, organized, and made publicly available in order to allow the dissemination of results among interested parties. Training sites will allow Costa Rican citizens to observe and learn about renewable energy technologies, and serve as workshop sites to train utility employees in installation, operation, and maintenance of the systems.

The Project intends to build capacity among all the stakeholders relevant to the RE-sector in Costa Rica, ranging from end-users, local communities, private companies and NGOs, Financial sector, Utility companies and governmental institutions including DSE. Thereby addressing the

question in an integrated way, always respecting the specific requirements for each technology, in order to assure the long term sustainable development of the small-scale RE-marked in Costa Rica.

Annex D. Experiences with Micro Hydroelectric Plants

The experiences in Costa Rica with photovoltaic systems is described in detail in the Project Brief (Annex II), item 1.6, paragraph 24-26; and (Annex V in Annex II - : Calculation of tariff for PV users used today in Costa Rica). The following section describes the experiences with Micro Hydroelectric Plants in Costa Rica.

There are close to 100 micro hydroelectric plants in Costa Rica ranging from 1kW up to 100 kW located in different parts of the country and developed by different private companies: Canyon Industries through Energías Renovables de Costa Rica (Renewable Energies of Costa Rica), Turbinas y Generadores S.A. (Turbines and Generators), Interdinamica S.A., Sistemas de Energia Eficiente S.A. (Systems of Efficient Energy), Microturbinas S.A., besides the micro hydroelectric plant Genio built by ICE in the conservation area Isla del Coco (Cocos Island). Details regarding some currently operating micro hydroelectric plants in Costa Rica are presented in the forthcoming table.

Location	Province	Turbine	Power
San Gerardo Monteverde	Puntarenas	Pelton	22 kW
San Luis Monteverde	Puntarenas	Pelton	22 kW
Los Angeles de Nandayure	Guanacaste	Michell-Banki	80 kW
Monte Romo		Michell-Banki	16 kW
Alvaro Weisel in Rincón de la Vieja	Guanacaste	Michell-Banki	8 kW
Cerro de la Muerte	Perez Zeledon	Pelton	3 kW
Guatuso	Alajuela	Turgo	3 kW
Vista Verde Lodge - Monteverde	Puntarenas		10 kW
Genio (2 turbines)	Cocos Island	Pelton	2 x 40 kW

National private companies have in interviews with the DSE-personnel expressed the following positive and negative aspects regarding Micro Hydroelectric Plants. The comments regard the design, fabrication, installation, operation and maintenance of the Micro Hydroelectric Plants.

Positive factors / experiences in Costa Rica:

- Abundance of water
- Easy access to the necessary equipment (turbines, valves, etc)
- Easy access to highly qualified labor force,
- The equipment requires only little maintenance, and with a little bit of training, the people in the communities are normally able to do the required maintenance.
- The plants have a very long duration (up to 60 years) because of the reliability of the components (equipment) used in the power plants.
- Secure operation
- The plants do not require a constant monitoring and the operation is 100 percent automatic, adjusting automatically to the electricity demand.

- The cost of installed capacity (Watts) is low in comparison with other alternative systems.
- Access to energy 24 hours a day, and normally available in all seasons of the year (this is the case in many regions of the country).
- The turbines used are flexible and can be adapted and operated under different conditions (flow of water, etc.). This is useful in order to have a continuous energy supply both in dry and wet parts of the year.
- Significant potential marked for micro hydro power
- Lowers the CO₂-emissions

Negative factors / experiences in Costa Rica:

- The river needs to have certain characteristics in order to prevent inappropriate designs of the turbo generator systems.
- The users sometimes abuse the systems thereby provoking break-downs of the plant
- Break-downs in principal equipment requires highly qualified personnel. Luckily these break-downs are rare.
- The initial investment in a Micro Hydro Power Plant is very high in comparison with other alternatives such as diesel.
- If the river basin is deforested or mistreated, eventually it may affect the production of electricity.
- In certain areas the fluctuations in water flow in the rivers is very high between the seasons causing an unstable energy supply.
- In some cases, the costs of installing the water tubes in order to get a sufficient water drop, are higher than the construction of the actual micro hydroelectric plant.
- Sometimes the house with the engines is located in an area inaccessible to motorized vehicles making the construction more difficult.
- Misperception in some parts of the sector that small-scale RE is unreliable and unstable.

The abovementioned lessons learned give the impression that Micro Hydro Power is still under-utilized in Costa Rica, and the marked development will certainly be enhanced by this project.

Annex E. Risk, sustainability and critical assumptions

The following risks identified during the execution of the PDF B require careful monitoring during the programme execution process:

Limited payment capacity of users in the rural sector.

Users of decentralized systems, in average, have a lower income level than users of the SNI. For that reason a financing mechanism must be designed that includes leverage of the initial investment by ICE and hand labor contributed by the community itself. An adequate organization at the community level is also necessary. The risk associated to limited payment capacity of users located in dispersed areas is expected to be minimized through local enhanced participation at all stages of the project and through well understood shared costs and benefits.

As generally found, the reduced ability to pay of residential rural consumers poses a real challenge for stand-alone RE projects. The PDF-B found that the option for a self-sustainable project within the context of the Costa Rican electric sector, would imply that final users would have to pay an average US\$12.5¹³ per month, which is difficult, as their payment capacity does not exceed US\$8.5 per month, which is what they currently invest in candles and other fossil fuels. This will be taken into account in the design of financing mechanisms, based on the possibility offered in cross-subsidies which ARESEP recognizes and allows on social equity principles.

Commercial and public consumers will be required to pay according to national tariffs based on their consumption. However, in order to allow local development and to offer choices to consumers, various options will be offered.

Limited market development

The risk of lack of market development due to the very nature of ICE has been addressed through bidding processes opened to a wide range of providers and of various nature and size. Thus, ICE, the main contractor, would play the role of market developer in this case. Replicability is a real challenge to Costa Rica, considering the country's sustained effort to provide electricity to remote areas in the past. We are conscious that for this specific case, replicability is almost limited to increasing consumption and - to a lesser extent- to grid extension plans modification. The regional challenge consists in providing Costa Rica based firms with opportunity for business throughout the region. A regional synergy is sought in order Costa Rica is set as an example of successful renewable energy based rural electrification.

Lack of sustainability

Sustainability is achieved and guaranteed through inclusion of renewable energy based rural electrification within the national planning set of plans at an early stage of the project on one hand and through the declaration of continuation of activities related to these technologies by the Costa Rica government, executed by ICE on the other.

The Government of Costa Rica is committed to support off-grid renewable energy based rural electrification with clear subsidies, just in the same way as rural consumers are subsidized when

¹³ Considering 20 year useful life

grid extensions is the implemented solution. At the same time, a number of private and NGO players are active in renewable energy based rural electrification. Within the limits of national legislation it seems reasonable to open access (directly or indirectly) to the subsidy schemes to these local actors as well as benefiting from the GEF-project. Hence, while for major utility companies, the investment financing issue is set in terms of priorities and financing as such is not a major issue for those local actors. It is important to provide some schemes for initial investment financing so that a viable project can actually take place. Thus, the project will dedicate efforts in order to build capacity within financial institutions and to generate partnerships among financial institutions and local project stakeholders, based on the previous experience Costa Rica has within the CONACE led programme on energy efficiency.

Lack of the required level of credibility on RE projects within the major players:

Having appointed ICE as the implementing agency, the project will take advantage of this company's financial strength to gather support from the financial sector towards the project portfolio that would be developed under the different foreseen schemes inside and outside of this initiative. Moreover, the prior experiences that ICE (as a market leader) has undertaken with micro hydroelectric plants and solar home systems together with the accumulated expertise of the private suppliers and developers and the other distribution companies with these technologies, it will be relatively easy to gather the interest of third parties (as it already happened with private generation was allowed by Law 7200), provided that the dedicated financing is made available and the legal and regulation issues have already been dealt with appropriately (there is already a Government commitment on that matter). This risk has also been addressed through the proposed training and capacity building activities and the foreseen launching of a nation-wide dissemination campaign, that will include the dissemination of the pilot projects results amongst the major players.

Political and public order risks

Some risks of this kind would be,

- Perception of the public - reluctance to change: it is related to choosing another alternative different from traditional grid extensions
- Cultural insensibility: if the nature of the electricity public service provided does not agree with the users' expectations, they themselves would search to discredit the service.
- Creation of a monopoly: the small scale of the projects possibly will produce as a consequence that only one company will offer services in each area. This might be considered to be undesirable or more expensive to the user.

Since these risks cannot be shared, they will be assigned to the electricity service company. In the first two cases the key mitigation measure points to an exhaustive study of the community perceptions and to an appropriate information campaign with a community focus. In the third case, the mitigation measures will come principally from ARESEP, with supervision by the entities providing subsidies (MINAE, ICE, GEF).

Legal and regulation risks

This refers to the risk that changes in laws and regulations or delays in the necessary approvals may happen unexpectedly, increasing the cost or reducing the benefits for the end users and service companies.

The mitigation of this risk within the project is not easy for the singularity in the current power balance at the National Congress that seems to be so divided politically. Nevertheless, in spite of the autonomy the Legislative Power enjoys, the programme foresees that, by means of permanent lobbying during the whole Phase I (2 years), which will involve the Executive Power authorities (MINAE), and those of the electrical sector (ICE, CNFL, rural cooperatives, municipal companies), with advice from legislative specialists contracted with such a purpose (See Annex A, Subcontract 1), the negotiating power will be significantly productive towards obtaining the necessary reforms timely.

As a basis for the strategy to mitigate risks within the programme, during the PDF-B phase an assessment was developed to identify, analyse and quantify the different risks, in order to associate those risks with the stakeholders who can better manage every form of risk and apply the solutions and provisions to achieve the expected results. For rural electrification projects, operators in general are fully prepared to assume the financial, market and operation risks of the project. Certain political and regulation risks are of a kind that the investors assume them with reservations. The following **critical assumptions** have been identified for this programme during the preparation of the PDF-B:

Development Objective:

- Relative cost of RE and other solution is based on investment costs in network and diesel as well as fuel cost. Should these costs undergo a drastic fall, the interest in RE would drop and emissions would be higher.

Objective 1:

- High support and co-operation at the national level to electrification with RE.
- Political support for RE technology.
- National Rural Electrification Programme continues to be a national development priority.

Objective 2:

- Stakeholders demonstrate interest in learning about RE.
- Sufficient knowledge and interest by the press to publish articles on RE.

Objective 3:

- Costa Rica continues to experience economic stability
- Government institutions are cooperative.
- Ability to pay of rural users confirmed
- Interest of the financial sector on RE.

Objective 4:

- Communities interested and committed to projects.

Objective 5:

- Sustained Government cooperation and commitment.
- Electricity companies and the users demonstrate sustained interest in RE.

Objective 6:

- Phase activities remove sufficient barriers to allow initiation of Phase II.
- Committed country resources still available for Phase II.

Annex F. Demonstrative Projects: Prior experiences

All the members of CONACE were invited to propose sites where to implement demonstrative projects. Only three companies (ICE, ESPH and CoopeGuanacaste) presented potential sites, because the other companies have or are expected to have a 100 % of electricity coverage for year 2010. From a total of 37 sites, 29 were presented by ICE, 5 by ESPH and 3 by CoopeGuanacaste. For each site, a detailed the location and availability of energy resource were provided. Two prerequisites were a minimum distance to the grid of 4 Km, and the absence of a projection to electrify it in a minimum of ten years.

Based on the information provided by the companies, all the sites were evaluated in order to select those 23 to be recommended for performing a feasibility study. The criteria taken into account for this selection were the following, by priority order:

- Availability of information about the energy resource and designation of a community person for contact
- Use of diesel or gasoline thermal plants
- Demand to supply electricity for schools, health centers and productive activities
- Size of the community
- Sites related to ecotourism activities
- Ability to pay

Regarding the ability to pay, it was not a priority for the selection, and a minimum payment was not fixed as a requisite to participate. A high percentage of sites report very low ability to pay; around 2,000 colones. This amount of money would not cover the cost of the cheapest system. A commitment of the community leader about the monthly payment of the families was requested.

After a first selection, based on criteria number 1, resulted a total of 23 sites, 14 belonging to ICE area (of which 3 would be developed together with CNFL), 5 to ESPH and 3 to CoopeGuanacaste.

During the preparation-phase of the project, pre feasibility studies have been carried out and indicative budgets and schedules have been estimated. Nevertheless, this pre feasibility stage will have to be followed by detailed feasibility studies. It was determined which systems would be less costly compared to the grid extension. Consequently, the sites candidates to the installation of autonomous systems were selected, resulting in a total number of 16.

No.	Company	Site	Province	Energy resource
	ICE	Mondonguillo	Limon	Solar
	ICE/CNFL	Carmen de Bijagual	San Jose	Solar, hydro
	ICE	Belice de la Cruz	Guanacaste	Solar, hydro
	Coopeguanacaste	Alemania	Guanacaste	Solar, hydro, wind
	Coopeguanacaste	Jazminal	Guanacaste	Solar, hydro, wind
	Coopeguanacaste	Rio Tabaco	Guanacaste	Solar, hydro, wind

ICE	Estacion Biologica Cacao	Guanacaste	Solar, wind
ICE	Olan	Puntarenas	Solar, hydro
ICE	Faldas Volcan Turrialba	Cartago	Solar
ICE	Vereh y Altos de Pacuare	Cartago	Solar, Hydro
ICE/CNFL	Colonia Palmareña	Alajuela	Solar, Hydro, wind
ESPH	La Union	Heredia	Solar, hydro
ESPH	Los Angeles	Heredia	Solar, hydro
ESPH	Boca del Toro	Heredia	Solar, hydro
ESPH	Media Vuelta	Heredia	Solar, hydro
ESPH	Chimurria	Heredia	Solar, hydro

The initial proportion of 50% hydro and 50% solar was modified after sites visits for pre-feasibility studies. **As a result, only 3 of the 16 demonstration sites are finally suitable for micro hydro plants.** This will present serious consequences for the design of the national programme. If PDF study results are maintained, the demonstration component of the present project will not reflect the full-scale programme. In case studies confirm the proportion of hydropower use should be significantly lower, implications in terms of costs and quality of service provided to the consumers will have to be re-evaluated to the programme. It is possible that costs will increase under these conditions. Further studies will be carried out during phase one of the present project in order to assess this issue.

There are, on average, 20 residential houses in each one of these communities. Thirteen communities will be electrified with one photovoltaic panel per household. The remaining three communities will use a small-hydropower generator that will be connected through a mini-grid. These communities will also receive power for productive uses. The following chart describes the projected productive uses and energy requirements for each of the demonstration projects.

Previous experiences

The country has previously developed some off-grid renewable energy projects to provide services in isolated areas where the grid extension is not cost-efficient. MINAE, as the entity in charge of the energy national policies, has supported rural electrification initiatives based on new and renewable sources of energy, through the installation of photovoltaic lighting systems to provide energy to isolated communities with low population density. Similarly this type of solution has been used to provide energy to the forest protected zones where projects of generation, transmission and distribution cannot be developed due to legal regulations. In the recent years both ICE and CoopeGuanacaste R.L. have promoted a policy of rural solar electrification in geographically isolated areas and have installed 1000 systems for residential applications, productive uses, schools, health centers and national reserves.

Different financing schemes, like equipment rent, direct sale or a combination of both, have been used considering the socioeconomic studies that have been developed in every

isolated site. The total cost of every installed equipment¹⁴ has been around US\$1.989 (US\$1. 989. 000 whole) and costs of maintenance of US\$25 per year (US\$16500 in whole). The clients of ICE pay 1000 colones (US\$3 per month) whereas the clients of CoopeGuanacaste pay 3000 colons (US\$9). Lessons learned are included in Annex V of the Project Brief (Annex II).

It is estimated that in Costa Rica there exist approximately 20 micro hydroelectric plants from 1kw up to 100 kW located in different parts of the country and developed by different private companies: Canyon Industries through Energías Renovables de Costa Rica (Renewable Energies of Costa Rica), Turbinas y Generadores S.A. (Turbines and Generators), Interdinamica S.A., Sistemas de Energia Eficiente S.A. (Systems of Efficient Energy), Microturbinas S.A., besides the micro hydroelectric plant Genio built by ICE in the conservation area Isla del Coco (Cocos Island).

Moreover, ICE has already concluded two feasibility studies in Colonia Palmareña de San Ramon and Belize de la Cruz for the construction and system installation of micro hydroelectric plants. Similar studies have begun in the Chirripo National Park and in the community of Rio Blanco.

There are six local suppliers of photovoltaic systems. These suppliers (Shell Solar, Isofoton, Interdinamica S.A., Electro Burton, Solar BP and Consenergy S.A.) have supplied all the 1000 systems installed during the last five years as part of the described programme. For the micro hydroelectric plants, seven local suppliers have been identified (Interdinamica S.A., Canyon Industries, CICA S.A., ENERCOS, Consenergy, Motores y Turbinas S.A., Microturbinas); these companies. They have significant experience with mini and micro hydroelectric plants. The Compañía Internacional de Comercio y Asesoría- International Company of Trade and Advising, Sol Power, SediCom, Trav-o-Matic and Termisolar S.A.) have experience in solar water heaters.

¹⁴ This cost is based on previous acquisition of equipment (2000) done by the Costa Rican Electricity Institute, It includes the costs of installation and the equipment used by ICE too.

Annex G. Programme Preparatory Phase (PDF-B)

- On June 22-1999 the document of the “National off-grid electrification programme based on renewable energy sources” was signed by the Minister of Environment and Energy and the Resident Representative of the UNDP in Costa Rica. For this phase, within the GEF window called “project development facility” (PDF), the contribution from UNDP-GEF was agreed on US\$165,624 with co-financing from the Government of Costa Rica for US\$62,250. The objective was to identify, evaluate and prioritize existing barriers hampering the development of renewable energy based rural electrification, and to design the required actions to reduce or remove them. In addition, other needs would be identified and a process for the implementation of the national programme for developing renewable energy for rural supply would be initiated.
- On October 1999 the request for proposals was published, for the selection of consulting firms. November 1999 was the deadline for submissions. 30 firms were invited to participate, and a total of 61 consulting companies bought the terms of reference, but only the following submitted their proposals on time,

DANGIE, S.A.	INHACO S.A.
CONSORCIO IHI	DEPPAT S.A.
FUNDACION SOLAR-CECADE	TRANSENERGIE
CONSENERGY S.A.	ERA
SOL DOS MIL	

- On April 2000 UNDP signed contracts with two firms: Sol 2000 S.A. for the execution of the consultancy “*Market assessment and carrying out of feasibility studies for 23 sites*”, and with the consortium Saúl Ruiz Baltodano-TRANSENERGIE S.A.-Ramón Rosales-Fernando Ocampo, for the consultancies “*Renewable energy information system and capacity building programme*”, and “*Project management assistance and policy and financial engineering related activities*”
- On October 2000 the contract for consultancy activities 4 and 5 “*Development of indicators and methodology for monitoring and evaluation and the preparation of the project brief*” and “*Coordination and local GEF capacity building*” was signed with the non-governmental organization BUN-Central America.
- In that period, a workshop titled “*Is renewable energy convenient for Costa Rican off-grid areas?*” was held. The activity was attended by 69 participants: members of the National Commission for Energy Conservation (Executing Agency), UNDP and GEF Operational Focal Point (Fundecooperacion) officers, firms and institutions from the energy sector, NGOs, financial intermediaries, consultants, equipment suppliers, and representative from the isolated rural communities.
- On March 2001 the Final Report of the consultancy FNRE-1 in charge of SOL2000 was presented and approved. The report included the feasibility studies of the sites selected by

CONACE, the assessment of the potential market for off-grid renewable energy systems, and the programme to remove barriers for the dissemination and replication of renewable energy.

- On April 2001 the Final Report of the consultancy FNRE-2 *“Project management assistance and policy and financial engineering related activities”* was presented and approved. But on May 2001, after multiple efforts and negotiation with the firm to honour its obligations, CONACE requested UNDP to terminate the contract with *Saúl Ruiz-TRANSENERGIE* for the consultancy FNRE-3 *“Renewable energy information system and capacity building programme, including the organization and implementation of workshops”*

- On June 2001, the Board of Directors of the Costa Rican Institute of Electricity (ICE), agreed on the following (Article 2, Board Meeting No. 5306):

- *Support the goals of the “National Off-grid electrification programme based on renewable energy sources”, because the programme will foster social and economic development of isolated rural areas in our country.*
- *Give authorization to the Deputy Manager of ICE (Electricity branch), to provide all the institutional and financial support to this programme, in order to make available the required national counterpart to reach the objective of extending the electric coverage to 100% of the nation’s population, functioning as the programme management unit.*
- *Give authorization to the disbursement of the local counterpart for the project, initially estimated at 16 million dollars along the first 5 years of the project life.*
- *Appoint the Customer Service – Strategic Business Unit, which in turn will appoint a Project Coordinator responsible for implementing the project, with all the support from the structure of the institute.*
- *Give authorization to the Chairman of the Board to, if necessary, modify and adjust this agreement according to the requirements of the funding agencies, if both parties agree to, for the best of the interests of both parties and for a better implementation of the project, presenting the respective report to this Board. In addition, since the project includes issues related to policies and strategies for the energy sector, ICE and MINAE, through the Energy Sector Directorate, will coordinate the execution of those components related to the policy, capacity and information barriers identified, in such a way that the project success is assured.*
- *Give authorization to the administration, to continue the process of submission of the project financial proposal unto UNDP-GEF leaded by MINAE and the National Commission on Energy Conservation.*

- On July 2001 the Final Report of the consultancies *“Development of indicators and methodology for monitoring and evaluation and the preparation of the project brief”* and *“Coordination and local GEF capacity building”* was presented by BUN-CA and approved by CONACE.

- On August 2001, through an official letter, the Chairperson of the Board of CONACE and Director of the Programme Management Unit, submitted to UNDP-Costa Rica the first draft of the Project Brief for the National off-grid electrification programme based on renewable energy sources.
- Since that date, different modifications have been included in the document, producing revised versions in each of the following dates: September 2001, November 2001, December 2001, January 2002 (two new versions), February 2002, march 2002 (two new versions) and April 2002.
- On November 2001 Ms. Catherine Vallee from the Global Environment Facility (UNDP Mexico Office) undertook a field mission to work together with the NPD, its consultants and the UNDP programme officers, producing the final version of the Project Brief.
- In that period, the project received the endorsement of *Fundecooperación para el Desarrollo Sostenible*, the GEF operational focal point in Costa Rica.
- On December 2001, the final Tripartite Review Meeting was held with participation of the Deputy Resident Representative of UNDP, Mr. Alfredo Marty, Ms. Gloria Villa, President of CONACE, Gilbert Masis from BUN-CA, and the members of the Technical Committee: Misael Mora, Max Gasten and Nobelty Sánchez.
- On March 2002 it was conducted the Financial audit for the project, and on April 2002 the official report was received. From the conclusions, it is important to mention that “the organizational arrangement and the procedures employed by UNDP and the Programme Management Unit for the financial and operational management of the National off-grid electrification programme based on renewable energy sources, have been adequate. The project activities were executed as established in the official work plans included in the Project Document, and with one exception, the programmed activities were completed successfully. In addition, the financial reports are reliable and the procedures for internal control used by the executing agency are appropriate to offer reasonable security on the correct use of the funds granted, in accordance with UNPD norms and the Project Document.
- In the Board meeting on the 5th of July, 2002, CONACE is presented with the final version of the Project Brief, incorporating the requested changes from the different revisions, the most significant one being the division of the execution in two phases: Phase I – two years, Phase II – three years.

Regarding the execution mechanisms, the main changes were the following:

- *MINAE will be the political responsible party for the programme, according to the administrative procedures of UNDP for projects under “national execution”*

- *The Energy Sector Directorate (MINAE) will be responsible for the coordination of the activities required to remove the institutional, legal and information barriers*
- *ICE will be the executing agency for the project, responsible of executing the activities required to remove the technical and financial barriers, with support from the UNDP local office in Costa Rica.*
- *The Customer Service – Strategic Business Unit of ICE will be responsible for the implementation of the different project in each of the 329 communities.*
- *The National Project Directorate (NPD) will be comprised of the Director of the Customer Service –SBU (ICE), the Director of the National Project Directorate (ICE) and the Director of the Energy Sector Directorate (DSE-MINAE).*
- *CONACE will function as the Steering Committee*

On April 15, 2002, the project has already been revised by the STAP of the GEF Secretariat, and it was recommended for programme inclusion in the GEF work plan.

ANNEX F INCREMENTAL COSTS ANALYSIS

BACKGROUND

In Costa Rica, eight companies are responsible for providing power distribution services. In the year 2001, 95.5% of the households nation-wide have access to the public grid, and it is planned that through the rural electrification programmes of those eight companies, 99% will have access to the grid by the year 2010. The remaining 1% includes those isolated communities under the responsibility of ICE, the main state-owned company. Households yet to be provided with electricity services and with high potential for small-scale utilization of renewable energy sources are estimated at 7,273, located in 329 geographical areas. In addition to households, community centers will be electrified in each site. Furthermore, electricity will be provided to 66 natural reserves where the extension of the grid is prohibited by law. Under the "business as usual" scenario in the country, these sites will cope with their electricity needs primarily utilizing conventional technologies such as small diesel generators.

INCREMENTAL COSTS

1. Broad Development Goals

Costa Rica's National Development Plan has as the objective to extend electrification to 100% of the population by the year 2010. Extending the grid to scattered and low-demand rural centers is neither cost-effective nor economic and therefore not planned for, although the political will to electrify these remote areas exists.

In connection with this broad national objective, the development goal of the proposed GEF programme is to remove the barriers for the adoption of micro-hydro plants and solar home systems to provide electricity to 178 and 151 isolated communities, respectively, that have not been included in the current national rural electrification plans. For this, the PDF B process achieved the commitment of ICE –the electric sector's leading company– to modify its current and future rural electrification plans as to include the development of decentralized small scale renewable energy systems. Thereby, the investment costs of these alternative technology solutions for the rural areas of Costa Rica will be reduced.

2. Baseline

Without this Programme, rural electrification programmes through grid extension would service only 99% of Costa Rican families by the year 2010, according to on-going rural electrification programmes of the eight distribution companies throughout the country. The households still without electricity (7,273 units), are located in 329 small rural communities. These Costa Ricans will cover their electricity needs for recreation, education, health and communications and will power their machines and motors for productive end-uses, by using conventional small diesel generators¹⁵. The adoption of small lower initial cost diesel generators is the first option for off-grid rural communities since it is commercially available in nearby towns

At the same time, there is an unexploited renewable power potential in those 329 sites to generate electricity with micro-hydroelectric plants and solar home systems.

¹⁵ For cooking purposes, the use of firewood and LPG will not be replaced under the proposed project.

Given current and future electrification figures (95.5% by 2000, 98% by 2005) and the national goal to balance development between urban and rural areas, it is more realistic under current market trends to foresee that not-connected rural communities will increase energy consumption by seeing diesel generators installed to satisfy their growing demands for power, to keep the pace of the rest of the country.

Based on existing consumption pattern, and taking into account lighting on the sites where PV systems are foreseen and lighting and local productive use on sites where micro-hydro based electrification is foreseen, an estimated total of 60 thousand tons of CO₂ would be emitted over a ten year period.

If the level of energy intensity in rural areas of Costa Rica, related to the installation of diesel gen-sets, increases over time to meet basic residential and productive needs, consumption of diesel oil within 10 years would represent 382,405 barrels of diesel oil and approximately 210 thousand tons of CO₂ would be emitted into the atmosphere.

3. Global Environmental Objective

The global environmental objective of this programme is to reduce and avoid greenhouse gas emissions resulting from the present use of traditional energy and future use of diesel oil consumption in off-grid rural areas of Costa Rica. For this, those barriers that prevent utilising small-scale renewable energy to supply electricity to communities isolated from the National Interconnected System must be removed.

4. Alternative GEF Scenario

The alternative proposed under the GEF-Operational Programme #6 will remove these barriers that prevent the provision of electricity to 100% of the end users through the installation of small scale decentralized systems that take advantage of the locally available renewable potential, namely micro-hydro and solar energy potentials in isolated rural communities.

These technologies satisfy different needs of the residential sector, mainly home lighting, and in lesser degree, associated productive uses such as dairy activities, pumping and irrigation, public lighting, radio-communications, and small commercial ventures in isolated sites. Another outstanding features in the Costa Rican context are the utilization of refrigerators in health clinics and audiovisual systems at schools, besides building lighting. For research and guard facilities in wildlife and protected areas where is prohibited the laying of transmission and distribution lines, the project provides a sustainable alternative to power these facilities: solar home systems.

In the alternative scenario using small hydro plants, it is estimated that greenhouse gas emissions resulting from diesel oil combustion will drop around 184 thousand tons of CO₂ over a 10-year period. From the promotion of solar home systems, it is estimated that greenhouse gas emissions resulting from diesel oil combustion will drop around 26 thousand tons of CO₂ over the same period. The technical incremental cost of this technology substitution discounted at 12% over ten years has been calculated at US\$2,897,000.

5. Limits of the system

Regarding national coverage, the system limit is made up of the 329 isolated communities in off-grid geographic areas within the coverage area served mainly by ICE. The rural electrification plans of other distribution companies foresee supplying 100% of their clients through conventional grid extensions before the year 2010. This does not exclude revision of these plans as a positive result of the present project.

Concerning renewable energy technologies under OP#6, the project identified during the PDF B stage two technologies that are cost-efficient and mitigate greenhouse gas emissions, based on present and projected demand. PDF B results have shown that with an estimated initial investment of US\$13 millions, 178 micro-hydro plants can be installed, with an average capacity of 13 kW each, supplying power to 5,159 households grouped in 178 communities. In addition these micro-hydro plants will supply power to health facilities, educational centres, community halls and commercial-productive uses in each of those 178 communities. On the other hand, an initial investment of US\$8 millions will be required to install 2,114 stand-alone 120 Wp solar home systems. In addition, 2,870 photovoltaic systems will be installed in 151 communities provided with health facilities, educational centres, community halls, productive and commercial uses, and 66 solar home systems more in national wildlife reserves.

Thus, total programme cost amounts US\$ 22,050,452 over a period of 5 years. From this total, US\$ 1.8 million will be invested in removing existing barriers and developing 16 demonstrative projects throughout the country, and US\$ 20.1 million for the full investment in the remaining 313 isolated rural sites.

6. Local benefits

The main local benefits are obtained from reducing diesel oil imports, increasing the possibilities of off-grid communities to benefit from locally generated electricity so as to satisfy their current and future residential and productive power needs. Rural communities will also enjoy a better quality of life since they will count on better health, education and telecommunications services. ICE has officially allocated US\$17 million from its operating budget, -over a five-year period- to attain these benefits, in addition to US\$0.5 million from in-kind contributions from local stakeholders.

7. Additional benefits

Although the main goal of the present programme is to include renewable energy as a viable option within the rural electrification programme of Costa Rica, an additional benefit of will consist in the electrification of 66 natural reserves where any form of traditional electrification is prohibited by law. This will constitute the first path for the inclusion of these natural reserves within the eco-tourism dynamic present in the country and will generate local economic activity.

A second additional benefit of the project is to effectively commit the major power utility ICE, not only to renewable energy based rural electrification in Costa Rica but also to play a leading role at a regional level in this field.

8. Costs

The total cost of the project is estimated at \$ 22,050,452 while total cost for baseline scenario is estimated at \$ 16,920,457 Thus the full agreed incremental cost stands at \$5,129,995. Of this total \$ 4,242,366 is sought from GEF while \$887,629 of the increment will be financed locally. After ten years of the programme, secured reduction of CO₂ will reach an estimate of 210 thousand tons, corresponding to US\$ 20.10 per ton avoided CO₂. In addition, increased demand of rural communities will be satisfied by renewable energy when grid extension is uneconomic. Considering the current rate of increase of electricity consumption in the country of 5%, the amount of avoided CO₂ could be increased by as much as 70%.

ANNEX I (continued) - INCREMENTAL COST TABLE

Component		Baseline (B)	Alternative (A)	Increment (A-B)
PROGRAMME PHASE I				
C.1 Designing and Reformulating Policies, Rules and Regulations	Global environment protection is not sufficiently integrated into energy policies.	Interest and political support secured to foster RE within the framework of national energy policy	RE is promoted and integrated in the political agenda and national power plans.	
	The National Energy Plan does not include small-scale development of RE. Decision-makers level of awareness and support remains at its current level and RE for rural electrification is not supported. Costs (US \$) 0	Political awareness developed to explicitly favour decentralised RE projects	The framework created helps utilise policy instruments in other countries and regions	TOTAL \$ 96,000 GEF \$ 15,000 MINAE \$ 81,000
C.2 Strengthening the capacity of institutions, companies and communities	Ignorance of the long-term environmental, economic, social and financial advantages of RE	Small-scale RE technologies known at all level of the Costa Rican society. Existence of educational modules and	.Local stakeholders are committed to invest in RE projects Renewable energy forms an integral part of education at all level and the	

	<p>Non-existence of educational and promotional modules on RE</p> <p>Limited information available on RE and only basic information on experiences in other countries of the region</p> <p>Insufficient capacity and know how to tap local sources of energy</p>	<p>good knowledge about the installation, operation and maintenance of RE systems</p> <p>Energy information systems offer thorough and updated information on different aspects of small-scale RE off-grid projects, as well as information on local and foreign experiences</p> <p>Dissemination and information technology enables the general public and users interested in RE to access relevant information</p> <p>Lessons learned in Central America provide feedback to the National Programme and vice versa</p> <p>Participation of the private sector</p>	<p>whole society is aware of advantages of RET.</p> <p>Investors, companies and government are capable to draft, prepare and evaluate projects systematically, based on accessible reliable national and regional data .</p> <p>Professionals and general public convinced about RE use more local renewable sources</p>
<p>Costs (US \$)</p> <p>0</p>	<p>TOTAL \$ 224,000</p> <p>GEF \$ 176,000</p> <p>MINAE \$ 48,000</p>	<p>TOTAL \$ 224,000</p> <p>GEF \$ 176,000</p> <p>MINAE \$ 48,000</p>	

<p>C.3 Promote Investments in renewable by developing innovative financial mechanisms</p>	<p>The financial sector remains uninterested, unaware and risk adverse toward small scale renewable energy projects.</p> <p>Local project developers are limited when promoting energy solutions for local needs</p> <p>The Costa Rican market remains very much centralised and newcomers have difficulties entering the market</p> <p>Missed or wasted business opportunities</p>	<p>Credit analysts prepared to analyse RE projects. Banking system makes available funding for RE in a systematic manner</p> <p>Links between funding agents / project developers</p> <p>Adequate credit and risk mitigation conditions</p> <p>Participation of the private sector</p> <p>Bidding process simplified and more efficient for small scale projects</p>	<p>The learning curve from project implementation enhances new funds mobilised</p> <p>Local initiatives are successfully implemented.</p> <p>Private firms have access to this new market in an equitable manner.</p> <p>The decision-making process in the country regarding allocation of available private and public resources includes options of RE electrification</p>
<p>Costs (US \$)</p> <p style="text-align: center;">0</p>	<p>TOTAL \$ 57,000 GEF \$ 37,000 ICE \$ 20,000</p>	<p>TOTAL \$ 57,000 GEF \$ 37,000 ICE \$ 20,000</p>	

<p>C.4 Validating de-centralised systems as a market option, to supply electricity to isolated zones</p>	<p>Absence of sufficient small-scale RE projects in isolated areas of the country</p> <p>No oversight of systems design and operation standards</p> <p>The supply of RE at a small scale seems unreachable. The pace of rural electrification is slower for these communities far away from the grid while more expensive and polluting traditional options are implemented</p>	<p>Development of successful small-scale RE projects</p> <p>Standardised technical procedures for the efficient design and operation of projects</p> <p>Development of a participatory process whereby ownership by local stakeholders is attained</p> <p>Verified and validated feasibility of small-scale RE projects</p> <p>Effective solution to power needs in the rural areas</p>	<p>RE systems quality is achieved through the application of norms and standards</p> <p>The quality of service rendered by renewable energy is demonstrated at local and national level. Thus utilities as well as clients are in favour of RET:</p> <p>The existence of successful projects allows their replication throughout the country.</p> <p>New projects in the investment phase respond to power demand</p> <p>RE is seen as a business opportunity by private firms and investors.</p> <p>Improved quality of life</p>
	<p>Costs (US \$) \$641 801</p>	<p>TOTAL \$ 963,679</p> <p>GEF \$ 298,530</p> <p>ICE \$ 665,149</p>	<p>TOTAL \$ 321,878</p> <p>GEF \$ 298,530</p> <p>ICE \$ 23,348</p>

C.5 Assessment of sites for the full scale Rural Electrification Programme	Absence of a National Programme that solves the need for rural electrification in the most cost-effective and sustainable manner	A national co-ordinating entity organises actions carried out nation-wide by a wide range of stakeholders as part of the rural electrification programme with RE Existence of a nation wide, coordinated RE rural electrification programme	Rural electrification and RE-related actions and interventions by different stakeholders throughout the country are effective and productive. Conditions exist to implement a large scale RE rural electrification programme and data and information needed are ready. National co-ordination through the programme leads to lower costs for the country and greater productivity of the investment made in electricity
C.6 Evaluation of Phase 1	Costs (US \$) 0	TOTAL \$ 467,630 GEF \$ 375,000 MINAE \$ 92,630 TOTAL \$ 80,000 GEF \$ 80,000	TOTAL \$ 467,630 GEF \$ 375,000 MINAE \$ 92,630 TOTAL \$ 80,000 GEF \$ 80,000
PROGRAMME PHASE II			
C.7 System design and Installation	Power supply with sources that emit Greenhouse Gases In some rural areas electricity is still missing. There is limited participation of the private sector and NGOs	Validation of RE to meet energy needs Better utilisation of the RE potential in the country An effective power supply accessible to isolated communities	Reduced emissions of CO ₂ as a direct result More decentralised RE systems installed because of savings in wholesale purchase A larger population has access to electricity.

	Costs (US \$) \$16 278 656	TOTAL \$ 19,439,492 GEF \$ 2,660,836 ICE \$ 16,278,656 Local communities \$ 500,000	TOTAL \$ 3,160,836 GEF \$ 2,660,836 Local \$ 500,000 Communities
C.8 Full scale training in system maintenance and use	<p>Available information is not accessible to all stakeholders and the knowledge remains dispersed and partial.</p> <p>Insufficient institutional capacity to develop small-scale RE perpetuates the power-utilisation pattern in the country</p> <p>Poorest isolated communities remain late and poorly served, thus hampering economic social and human development.</p>	<p>Built capacity to implement a new series of RE off-grid projects</p> <p>More and better trained human resources to implement small-scale projects to meet the needs of the rural population.</p> <p>Job opportunities at the local level and development of local society.</p>	<p>Strengthened capacity of staff in power utilities, government agencies, private firms, NGOs and communities to draft RE project proposals</p> <p>Created/strengthened capacity to identify and develop more local projects</p> <p>New productive uses for energy appear and reduction of poverty and enhancement of quality of life</p> <p>More rural electrification solutions with RE, with lower investment costs</p>
	Costs (US \$) 0	TOTAL \$ 470,000 GEF \$ 400,000 ICE \$ 70,000	TOTAL \$ 470,000 GEF \$ 400,000 ICE \$ 70,000

<p>C.9 Coordination Monitoring and Regional dissemination</p>	<p>Implementation of few small-scale isolated RE off-grid projects without national co-ordination</p> <p>Absence of effective linkages between technology providers and users, consulting firms and funding entities</p> <p>329 sites in the country without electricity</p>	<p>Successful and more cost-effective development of RE off-grid projects because of economies of scale through investments co-ordinated by the institutions involved</p> <p>Links set up for project replication</p> <p>RE-based power generation for isolated communities and for off-grid productive uses</p>	<p>Reduced consumption of CO₂ – emitting fuels</p> <p>small scale renewable energy is increasingly seen as a business opportunity at national and regional level</p>
<p>TOTAL OF THE PROGRAMME Global Environmental Benefits</p>	<p>Costs (US \$)</p> <p style="text-align: center;">0</p> <p>CO₂ emissions increase as demand for power increases</p> <p>Barriers prevent penetration of clean energy sources in isolated zones</p>	<p>TOTAL \$ 250,000 GEF \$ 200,000 ICE \$ 50,000</p> <p>Reduction in CO₂ emissions due to new RE generation</p> <p>Gradual substitution of fossil-fuel energy sources with local RE sources</p> <p>The inclusion of renewable energy based rural electrification within national development plans is achieved</p>	<p>TOTAL \$ 250,000 GEF \$ 200,000 ICE \$ 50,000</p> <p>Estimated 210 thousand tons of CO₂ are avoided over a 10 year period, confirming the tendency to decrease CO₂ emissions in Costa Rica</p> <p>Conditions for a regional development of renewable energy are improved thereby increasing the chances of reduced CO₂ emissions at regional level.</p>

Local Benefit	<p>Electricity service arrives late and is of poor quality.</p> <p>Monthly expenditure in fossil-fuel to supply energy services not of the best quality</p>	<p>Larger and growing supply of rural electric energy</p> <p>Lower costs in long-term for local renewable resource power production for isolated areas</p>	<p>Rural population with better access to electricity</p> <p>Important long-term savings for public finances</p> <p>Existence of a local market of RET with potential development at regional level.</p>
	<p>Costs (US\$)</p> <p>\$ 16,920,457</p>	<p>\$22,050,452</p> <p>GEF \$ 4,242,366</p> <p>ICE \$ 17,086,456</p> <p>MINAE \$ 221,630</p> <p>Local communities \$500,000</p>	<p>\$ 5,129,995</p> <p>GEF \$ 4,242,366</p> <p>ICE \$ 665,999</p> <p>MINAE \$ 221,630</p>

ANNEX II - LOGICAL FRAMEWORK

NARRATIVE SUMMARY	INDICATOR	SOURCE	CRITICAL ASSUMPTIONS
<p><i>Development objective</i></p> <p>To reduce greenhouse gas emissions in Costa Rica by introducing renewable energy technologies as a viable option for electrification in isolated rural areas that are not connected to the national grid.</p>	<p>7,273 houses in 329 communities electrified with RE</p> <p>Estimated reduction in 210 thousand tons of CO₂ emissions in 10 years.</p>	<p>Final project report and official documents produced by government</p>	<p>Relative cost of RE and other solution is based on investment costs in network and diesel as well as fuel cost. Should these costs undergo a drastic fall, the interest in RE would drop and emissions would be higher.</p>
<p>Immediate objectives -- Phase 1</p>			
<p>Objective 1: To support the implementation of policies and regulations that establish a regulatory framework conducive to the use of renewable energy in electrification projects</p> <p>Output 1.1. Normative and legal framework that allows development of small-scale RE systems is approved and implemented.</p>	<p>Laws and norms that regulate the energy sector include provisions that allow the development of small scale Renewable Energy projects by the end of Phase 1.</p> <p>By the end of the Year 1: MINAE implements a simplified procedure (e.g. administrative executive mandate) for water concessions for private hydroelectric project developers. MINAE sends at least one proposed amendment to the Law of Waters to the Congress.</p>	<p>Government issued legal publication</p> <p>Government issued legal publication</p> <p>MINAE publication.</p>	<p>High support and co-operation at the national level to electrification with RE.</p> <p>Political support for RE technology.</p> <p>High support and co-operation at the national level to electrification with RE.</p>

Output 1.2. National norms and standards for renewable energy are developed, implemented, and disseminated.	Executive Decree on technical specifications for small hydro and PV systems produced and adopted by the end of Year 1	Government- issued technical specification documents Seminar and Workshop minutes	
Output 1.3. Fiscal incentives for the development of RE projects are in place.	Revisions of Law 7447-Rational energy use approved by Congress by the first quarter of Year 2	Government issued legal publication	Political support for RE technology.
Output 1.4. A National Rural Electrification Programme that incorporates RE systems into national energy planning is established.	MINAE approves incorporation of a RE program to the existing Rural Electrification Plan by the end Year 1	MINAE documentation MINAE and Rural Electrification Programme documents	National Rural Electrification Programme continues to be a national development priority.
Objective 2: To strengthen the capacity of institutions, companies and communities to develop RE projects	Standardized procedure to analyze RE potential in electrification projects in place by end of Year 1. Level of participation in awareness-raising workshops	Government documents Workshop memoranda.	Stakeholders demonstrate interest in learning about RE.

Output 2.1. Professionals and technicians are trained in RE technology	200 employees of utilities, NGOs and private firms trained by the end of Year 1 (7 workshops)	Workshop memoranda DSE personnel documentation SIEN information documents Web site counter of visitors	Interest in development of RE
Output 2.2. The National Energy Information System is strengthened, incorporating RE information.	RE website developed and published and SIEN info documents modified to include RE technology by the end of Year 1	Professional advertising agency report. Memorandums of on site workshops.	Sufficient knowledge and interest by the press to publish articles on RE
Output 2.3. The national population is informed and aware of the benefits of decentralized RE systems	At least three TV spots, five radio ads and ten press releases by the end of Year 2	Project financial accounts	Costa Rica continues to experience economic stability
Objective 3: To promote investment in RE projects by developing innovative financial mechanisms	Amount of private capital invested in Renewable Energy projects by the end of Phase 1	MINAE bidding procedures	Government institutions are cooperative
Output 3.1. National energy bidding processes are adapted to facilitate small scale RE projects	Bidding process for small scale RE projects reduced to 4 months by the end of Phase 1		

<p>Output 3.2. A set of possible financial mechanisms is developed and validated</p>	<p>At least 3 financial schemes developed, Year 1</p>	<p>Contracts with financial entities signed</p> <p>Demonstration project billing reports and third party evaluation report.</p> <p>Financial workshop reports.</p>	<p>Ability to pay of rural users confirmed</p>
<p>Output 3.3. Raised awareness and involvement of financial sector in Renewable Energy</p>	<p>At least 20 bank officials trained in RE, Year 1</p>	<p>Financial workshop reports.</p>	<p>Interest of the financial sector on RE</p>
<p>Objective 4: To demonstrate the validity of decentralized systems using RE as a marketable option for electricity generation</p>	<p>16 demonstration sites and 2 training facilities fully operational by the end of Phase 1.</p> <p>Total execution costs of completed demonstration projects are lower than alternative electrification options</p>	<p>Demonstration project final reports</p> <p>Project financial accounts</p>	<p>Communities interested and committed to projects</p>
<p>Output 4.1. 16 pilot projects in rural communities using RE systems and two demonstration and training facilities near the Metropolitan Area are developed</p>	<p>16 feasibility studies for pilot projects prepared during first 6 months</p> <ul style="list-style-type: none"> ○ At least 3 different bidding schemes tested after 8 months ○ 8 pilot projects in finished and operating after 14 months ○ 8 additional projects finished and operating after 20 months 	<p>16 feasibility study documents</p> <p>4 bids published by MINAE</p> <p>Demonstration project progress reports</p>	

<p>Output 4.2. Pilot project results are evaluated and disseminated</p>	<p>One evaluation seminar conducted in each demonstration project site by end of Phase 1.</p> <p>Publication of demonstration project reports.</p> <p>Level of attendance to on site information workshops</p>	<p>Seminar memorandums</p> <p>SIEN publications</p> <p>Workshop memorandums.</p>
<p>Objective 5: To assess Costa Rica's Rural Electrification Programme and identify the sites that may benefit from the use of RE</p>	<p>A Rural Electrification Plan that specifies the number of sites to be electrified with Renewable Energy is published by the end of Phase 1.</p>	<p>Sustained Government co-operation and commitment</p>
<p>Output 5.1. An updated portfolio of sites that demonstrates the overall potential use of decentralized RE systems in Costa Rica is developed</p>	<p>100% of site feasibility studies for 313 sites developed by the end of Year 2</p>	<p>Electricity companies and the users demonstrate sustained interest in RE.</p>
<p>Objective 6: To evaluate the accomplishments of Phase I and determine the feasibility of conducting a National Rural Electrification Program based on RE in light of these results</p>	<p>GEF and Government of Costa Rica respond to third party evaluation report by the end of Phase 1.</p>	<p>Phase I activities remove sufficient barriers to allow initiation of Phase II</p> <p>Committed country resources still available for Phase II</p>
<p>Output 6.1. A full evaluation of the Phase I results is conducted</p>	<p>A third party evaluation report is produced by the end of Year 2</p>	<p>Phase I Evaluation Report</p>
<p>Output 6.2. Funds for Phase II are secured</p>	<p>Costa Rican Government confirms availability of co-financing for the project, by the end of Year 2</p>	<p>GEF funds release document</p>

		Official government document	
Immediate objectives- Phase II			
Objective 7. To ensure satisfactory installation and financing of RE systems	All RE systems installed during project execution perform satisfactorily by the end of Phase II.	Site monitoring and evaluation reports.	
Output 7.1. Suppliers for installation and maintenance are selected	Bidding document for installation and maintenance published on month 28 Installation and maintenance contracts adjudged by month 31	MINAE Bidding document Contractual documents	Budget allocation is confirmed by government
Output 7.2. Satisfactory installation of RE systems in selected locations	At least 2500 RE systems installed by Year 4 At least 7 000 RE systems installed by month 60 and remaining installation ready to start. Satisfactory operation of systems	Contractor installation reports Contractor installation reports Site monitoring and evaluation reports.	Climatic factors favorable
Output 7.3. Financing mechanisms for RE technology are in use	At least 3 banks involved in RE financing. At least 200 financing contracts signed by end of Year 3.	Financial contracts Financial contracts	Economic stability situation in the country continues. Banking sector is interested in the market

<p>Objective 8 To ensure that adequate capacity levels are reached in order to provide satisfactory installation and maintenance of equipment</p>	<p>Experts and technicians trained during project execution are capable of successful installation and maintenance of RE equipment by the end of Phase II.</p>	<p>Performance record of installed RE facilities.</p>	<p>Public and private institutions are willing to provide personnel for installation and maintenance</p>
<p>Output 8.1 Involved stakeholders are fully trained in RE system</p>	<p>Attendance to 20 regional training workshops. 2 trained technicians per community, capable of basic system maintenance, by the end of month 40.</p>	<p>Workshop memoranda. Performance record of installed RE facilities.</p>	<p>Interest of communities and users</p>
<p>Output 8.2 Technicians in all electricity providing companies in Costa Rica as well as in private related companies are fully trained in RE technology.</p>	<p>Attendance to periodic staff training workshops during Phase II</p>	<p>Workshop memoranda</p>	
<p>Output 8.3 Expert designers and installation supervisors available for RE projects.</p>	<p>Number of certified experts by the end of Phase II</p>	<p>Registry of issued certifications</p>	
<p>Objective 9 Ensure that obtained results are effectively disseminated among interested parties on a regional level</p>	<p>Level of incorporation of Renewable Energy technology in energy supply projections in Central American countries.</p>	<p>Regional Renewable Energy Network documentation</p>	<p>Successful implementation of RE technology in Costa Rica</p>
<p>Output 9.1 Project monitored and evaluated in a continuous basis</p>	<p>Project advance reports issued every 3 months Monitoring and evaluation conducted according to UNDP procedures</p>	<p>Project report file M & E project files</p>	

Output 9.2 Project results are disseminated at a regional level	20 high level decision-makers and 20 senior staff of utilities and private firms well informed on RE technology by the end of Phase II.	Seminar memoranda	Interest of political decision makers and of the electricity sectors in developing a regional RE market
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Response to council comments

Project Name: Costa Rica- National Off-Grid Electrification Programme based on Renewable Energy Sources

Main Concerns		
<ul style="list-style-type: none"> Technology focus on PV systems 	<p>There is neither a mention of existing small hydropower plants nor the experiences and lessons learnt with these plants in view of the proposed project</p>	<p>Experiences with micro hydro power plants in Costa Rica have now been reported in the document. Lessons learned are presented and will be taken into account during project implementation.</p> <p>Please see Annex D and Annex F for more details.</p>
	<p>Different expressions are used but there's no definition given as to what size range they refer to.</p>	<p>Expressions have been harmonized throughout the whole document. In addition, Footnote # 3 in Part II. provides a clear definition of micro hydro plants: less than 100 kW. All related expressions are now printed in blue for easy reference.</p>
	<p>For the 3 demonstrative projects the capacity of the micro-hydroelectric plants is always 13 kW. To the reviewer it seems very unlikely that the potential and demand is identical at these 3 sites. It seems that project designers believe that micro-systems are off-the-shelf standard size systems</p>	<p>During project preparation, pre feasibility studies were carried out for each community. Based on these pre feasibility studies, and on consultation with local stakeholders, 16 sites were chosen as demonstration for the first phase of this project. While an average 13 kW was used to calculate CO₂ emission reduction since it is the average size in the examined portfolio, each site has of course a different demand and different renewable energy potentials. 3 sites (2 demonstrative and 1 educational) to be electrified with micro-hydroelectric plants.</p> <p>The size of above equipment will be determined based on potential demand in each site as well as a resource assess-</p>

ment.

The three sites to be electrified with micro hydroelectric plants will be chosen from the results of the first month of project implementation: there are projects identified whose capacity varies from 15 to 38 kW and will have a daily production between 123.2 kWh – 172.6 kWh. They will provide electric services to approximately 180 people. The re-evaluation of the list is based on the fact that the sites were identified during the PDF-B between 1998-2000. Most of the sites will probably be the same as identified earlier, but in some cases it might be beneficial to update the list and choose more appropriate sites.

The document has been amended to reflect this and to avoid confusion. Amendments are reported in blue for easy reference. Please see Annex II (Annex III – Demonstrative Projects- Project Brief) for a description of each of the demonstrative sites identified during the PDF-B (to be re-evaluated!).

- Current national legislation states that it is the responsibility of the distribution company to install the PV systems and build the micro hydroelectric plants. However, they can and will contract private companies to install, operate, maintain, etc. the systems in a specified period of time. Different schemes will be tested and evaluated during project implementation.

More specifically, as it is stated in the Project Brief, the distribution companies will be responsible to install the PV systems and build the micro hydroelectric plants in their

The impression is deepened by the fact that under output 4.1 it is written that the installation of the systems shall be the responsibility of the distribution company.

respective geographic area, and this will not prohibit the participation of the private initiative in the different stages of project implementation: from the development of feasibility studies to the operation stage. This Full Size Project will undertake the evaluation of different project development mechanisms, like the following:

- ❖ Contracting “keys-in-hand” projects, including equipment, operation and maintenance
- ❖ Contracting installation only
- ❖ Schemes such as “Build, Operate and Transfer” (BOT), “Build, Lease and Transfer” (BLT), pursuant of the existent laws and regulations

In sub-contract number 4, in the scope of the consultancy, again it is stated that the distribution company will be able to sub-contract third parties for installation and construction of the different projects, using the different schemes of contracting that will be evaluated and applied. One of the objectives of this project is precisely to open up for third party participation, and it will be followed to the extend possible.

- The project brief omitted to present the complete scheme for micro-hydroelectric power plants. These schemes will be developed at the outset of project implementation. In effect, it is planned to issue bids for these systems as indicated in the brief in output 4.1.. Different types of bidding processes will be tested:
- One option for Costa Rica is where the equipment supplier will be responsible for sub-contracting for civil work and installing as well as testing and commissioning the equipment. Supervision will be carried by the three largest utilities, also called distribution companies in the

		<p>brief. These utilities are the largest in Costa Rica and have an extensive experience in project supervision although "normal projects" are of larger size. The winner of the bid will carry the actual construction of micro-hydroelectric plants.</p> <ul style="list-style-type: none"> ○ These options will be further developed and assessed during the course of the project. Capacity building will be provided in each case, adapted to the nature of the local operator. <p>The Project Document has been completed accordingly and changes are indicated in blue for easy reference. Please see Part II. Strategy, for further details.</p>
<ul style="list-style-type: none"> ● Unclear use of GEF funds 	<p>Not clear whether funds for component 7 would be used for subsidizing RE systems</p>	<ul style="list-style-type: none"> ○ GEF support is requested for phase 1 only. In this first phase, the major utility ICE is providing co financing to cover for investment both in PV systems and in micro hydropower systems. A major issue relating to renewable energy in Costa Rica is the lack of clear vision of the related costs and in particular O&M costs for small RE systems. Hence, with implementation of phase 1, a better estimation of these costs will be carried out. In addition a market development is expected to generate a downward trend in investment costs. In line with GEF guidelines, this should ensure economic soundness of solutions implemented and hence, investment costs would not have to be covered by GEF. ○ GEF covers incremental costs of investments in RE systems. For phase 1 (this project), investment cost is covered by the executing agency as reported in the project budget and co financing letters (see budgets in Section III. and attached co-financing letter).

● Poor analysis of project risks

The limited technical capacity is named as a barrier to be removed. At the same time the limited technical capacity especially of employees of utilities is stated as a risk. The underlying reasons for the lack of technical capacities should be analyzed.

○ In Costa Rica, the technical level of employees within utilities is traditionally high. However this country's electricity sector is operating in a highly centralized way and heavy infrastructure projects are the day-to-day for these employees. Recent experience shows that acquired knowledge in a new technology for Costa Rica is possible and indeed has happened. The GEF supported wind project known as Tejona, has been successfully developed with direct participation of ICE's employees and is now being replicated. And the same is true for the solar powered rural electrification policy through which a total of 1000 solar home systems have been installed up to now by the employees of ICE and CoopeGuanacaste throughout the country.

○ However the main challenge is still two-fold: 1-Raise the trademark of small RE projects within the technical scene in Costa Rica utilities and 2- Broaden the technical knowledge to take into account socio-cultural factors in rural areas. So while the technical base is there, awareness of the interest and challenges both technical and socio-cultural, of renewable energy based off-grid electrification is still lacking. The aim of the present initiative is to address the above through workshops as well as hands-on training on the topic. Please see Part II. Strategy, under Project Strategy.

○ The document has been amended accordingly and changes are reported in blue for easy reference.

○ Please see Annex C. Training and Capacity Building, Annex E, Risk, sustainability and critical assumptions, and Annex F - Demonstrative Projects: Prior experiences, for further details. In annex F it is stated that "these com-

<ul style="list-style-type: none"> • Poor analysis of project sustainability 	<p>Only one small paragraph in the Project Brief explicitly dealing with sustainability beyond GEF support</p>	<p>panies have supplied all the 1000 PV systems for the last 5 years ... these companies have significant experience with mini and micro hydroelectric plants”.</p>
		<ul style="list-style-type: none"> ○ The project is interesting as far as sustainability goes. In many GEF projects, sustainability is a real issue due to lack of long-term commitment and lack of subsidy-type dedicated funds. In the case of Costa Rica this aspect was discussed at length during project preparation and the Government of Costa Rica is committed to support off-grid renewable energy based rural electrification with clear subsidies, just in the same way as rural consumers are subsidized when grid extension is the implemented solution. Probably for that particular reason, sustainability was given little attention because it is built in the project. At the same time, a number of private and NGO players are active in renewable energy based rural electrification and it was felt important to open access to the subsidy scheme to these local actors as well so that they could benefit from the GEF project. Hence, while for major utilities, the investment financing issue is set in terms of priorities and financing as such is not a major issue, for those local actors, it is important to provide so scheme for initial investment financing so that a viable project can actually take place. Hence the project will dedicate efforts in order to build capacity within financial institutions and to generate partnership amongst financial institutions and local project stakeholders, based on the previous experience Costa Rica has within the CONACE led programme on energy efficiency. ○ Please see Part II. and Annex E for further details. Also see subcontract 4 in Annex A, item 2.3: Evaluation of financial and bidding schemes. Design activities to facilitate

		<p>ate access to financing (specifically second bullet: "Design an incentive mechanism...". Project Strategy, page 10, paragraph five, from: "This linkage to national development policies... will play a key role for sustainability and replicability."</p> <ul style="list-style-type: none"> o Re-assessment of the PDF-B project portfolio and feasibility studies for 313 sites, Annex A, Sub-contract 6, item 2.2. Since the selection of projects and sites takes into account the financial sustainability of each proposed project, it can be highlighted that the project portfolio in this initiative will be carefully selected to assure its sustainability once the proposed UNDP-GEF assistance has come to an end.
<ul style="list-style-type: none"> • Incomplete feasibility studies for demonstration sites 	<p>For the 18 demonstration facilities a design would be issued, which shall include a budget and schedule forecast. This should have already been done.</p>	<p>During preparation, pre feasibility studies have been carried out and indicative budgets and schedules have been produced. Nevertheless, this pre feasibility stage will have to be followed by detailed feasibility studies in the first months of project implementation. It is important to note that the portfolio will be reassessed at the outset of project implementation, and changes might take place. The abovementioned has been modified in the document and changes are indicated in blue for easy reference.</p>
<ul style="list-style-type: none"> • Partly unsuitable performance indicators 	<p>Some indicators in the logical framework are not suitable.</p> <ul style="list-style-type: none"> o The indicator related to the development objective does not contain a timeframe. o The level of stakeholder attendance to workshop is not indicated. o The indicator "at least 50 visitors to the website per month" can be 	<ul style="list-style-type: none"> o CO₂ emission reduction as a direct result of the present project will be estimated for a 10-year period although the project is to last only 2 years. This is normal practice within GEF projects and justified by the fact that investments will deliver the energy service for a minimum period of 10 years (PV panels are expected to last at least 10 years since battery replacement is contemplated within the project, and micro-hydro plants can usually deliver energy up to 50 years). Please see footnote 5. o Usually GEF projects indicate an estimated CO₂ reduc-

	easily manipulated.	<p>tion taking into account project replication. In this particular initiative the figure provided corresponds to the electrification of 329 communities, without any replication and as a direct result of implementation of both phase 1 and phase 2. So estimation is prudent.</p> <ul style="list-style-type: none"> ○ The expected level of attendance in the workshops has been indicated. This is now reported. However we wish to indicate that this is not an impact indicator. In the course of the project, impact indicators will be elaborated and added. ○ The website indicator has been replaced. ○ All indicators and output targets have been revised in the Project Document, and can now be found in Section II – Project Results and Resources Framework.
Conclusions and Recommendations		
<ul style="list-style-type: none"> ● Project design should be improved to make it more likely to succeed 	<p>Technological background and sustainability issues have not been given sufficient attention.</p> <p>The proposed concept for the training and capacity building measures should be reconsidered based on the specific requirements for each technology.</p>	<ul style="list-style-type: none"> ○ Technological background and sustainability aspects of the project have been further developed in the document. For sustainability issues please see Annex E whereas information regarding technological background can be found in Annex D, and Annex V in Annex II (Project Brief). ○ The document has been substantially revised to clearly separate technologies and present adapted capacity building approaches. Changes are reported in blue for easy reference. ○ Annex C – Training and Capacity Building – gives an overview of the proposed training activities for the project. The Project intends to build capacity among all the stakeholders relevant to the RE-sector in Costa Rica, ranging from end-users, local communities, private companies and NGOs, Financial sector, Utility companies and governmental institutions. Thereby addressing the

<p>question in an integrated way, always respecting the specific requirements for each technology and sector, in order to assure the long-term sustainable development of the small-scale RE-marked in Costa Rica.</p> <ul style="list-style-type: none"> ○ Two educational sites – one for each technology - will be constructed at the outset of project implementation. These sites will play an important role in the training activities during the project. Each site will have people specialized in the relevant technology, and they will assist in the seminars and workshops to be held during project implementation. 		
<p>Further Commentaries.</p>		
<ul style="list-style-type: none"> ○ As indicated above, CO₂ emission reduction as a direct result of the present project will be estimated for a 10-year period although the project is to last only 2 years. This is normal practice within GEF projects and justified by the fact that investments will deliver the energy service for a minimum period of 10 years (PV panels are expected to last at least 10 years since battery replacement is contemplated within the project, and micro-hydroelectric plants can usually deliver energy up to 50 years). (Please see footnote 5). Additionally, CO₂ reductions will be calculated, not measured. Therefore, it is possible to estimate the 10-year effect already after two years. 	<p>The reduction in CO₂ emissions due to project implementation is estimated for a period of 10 years, but project's lifetime is 5 years</p>	<ul style="list-style-type: none"> ● Inconsistencies and unclarities
<ul style="list-style-type: none"> ○ Law number 7447, and associated laws and regulations that provides incentives to the use of renewable energy systems, will be reviewed and enhanced to facilitate further investment. Activity 1.3. is designed to do that. Paragraph 66 in the Project Brief (Annex II) describes the activity. 	<p>Is the incentive to exempt RE related equipment from import duty in place or has it been removed?</p>	

	<p>Different inconsistent figures are given on the average investment cost for a PV system, the respective monthly payment per household, and their willingness and ability to pay</p>	<ul style="list-style-type: none"> o The Project Document has been revised and corrected. Correct figures can be found in Annex II in paragraph 29-35 as well as paragraph 78.
	<p>It is not clear how many demonstration sites would be developed</p>	<ul style="list-style-type: none"> o 16 demonstrative sites (14 photovoltaic and 2 Micro hydroelectric power plants) and 2 educational sites (one of each). Project Document has been thoroughly revised and should now reflect this clearly (note: portfolio will be reassessed at the outset of project implementation and will reflect this).
<ul style="list-style-type: none"> • Poor formatting of Project Brief 	<p>The formatting of the document is poor.</p>	<ul style="list-style-type: none"> o The present project document is an internal UNDP format for implementation. Conscious of the issues raised by the Council member, this document has been reviewed for consistency following internal quality control procedures.