

# OFFICE MEMORANDUM

DATE: March 11, 2002

TO: Mr. Ken King, Assistant CEO, GEF Secretariat  
Att: GEF PROGRAM COORDINATION

FROM: Lars Vidaeus, GEF Executive Coordinator 

EXTENSION: 3-4188

SUBJECT: **Philippines: Rural Power Project**  
**Submission for Work Program Inclusion**

Please find enclosed the electronic attachment of the above mentioned program brief for work program inclusion. We would appreciate receiving any comments by March 20, 2002, so we can prepare for the project review meeting, if one is required.

The proposal is consistent with the *Criteria for Review of GEF Projects* as presented in the following sections of the program brief:

- **Country Drivenness:** The proposed project and Rural Power Program, of which the project forms the first phase, are based on the following policy directives of the Philippines' recently approved Electric Power Industry Reform Act: (a) acceleration of total electrification of the country; (b) enhancing the inflow of private capital; and (c) promoting the utilization of renewable energy resources in power supply. The proposed Rural Power Program is the government's major initiative to translate this strategy into action, and is thus an important part of the government's priority program for the energy sector (Section B). Under the leadership of the Department of Energy (DOE), a multi-agency Project Preparation Team has been formed to facilitate project preparation (Section C4 and Section E4). Further indication of country ownership is summarized in Section D4.
- **Endorsement:** The project and program are strongly supported by the DOE. Both the GEF project and the Rural Power Program of which it is a part were endorsed by GEF Operational Focal Point, Mario Rono in January 2001.
- **Program Designation & Conformity:** The project and program are fully consistent with the GEF Operational Strategy and with Operational Program #6: promotion of renewable energy by removing barriers and reducing implementation costs. The program aims to remove the market barriers to the application of RE technologies for rural electrification, particularly PV systems, small hydro and biomass power, which will be competitive in many mini-grid and off-grid applications (Section B1a). The barriers and strategies for their removal are discussed fully in Annex 2.
- **Project Design:** The rationale for and strategic choices made in the project's design are explained in sections B,C and D, and its design is summarized in Annex 1. The proposed APL phase 1 project's strategic interventions will support key reforms and capacity building

to promote private investment in rural electricity supply and thereby leverage the government's limited resources. It will also pilot-test various business models for mobilizing major private sector participation. Lessons learned from previous Bank program operations, from other renewable energy promotions effort world-wide, and from previous GEF and other donor support for renewable energy development in the Philippines are reflected in the design (elaborated in Section D3).

- **Sustainability:** The key factors promoting the sustainability in this project are its focus on: (a) developing a policy framework conducive to private sector led and commercially-oriented renewable energy development, while utilizing judiciously designed subsidies to take account of relatively lower rural incomes and affordability; and (b) comprehensive and sustained capacity building of all the key local players, particularly private investors and financiers. The sustainability issues, critical risks and how they will be addressed are summarized in section F and a section in Annex 2.
- **Replicability:** APL 1 is explicitly designed to create an enabling policy framework for private investment and to identify viable business models through pilots that will be scaled up and replicated in subsequent phases of the APL. Good practices and lessons learned from this project will also be disseminated to other countries.
- **Stakeholder Involvement:** Measures to identify and promote the involvement of key stakeholders, including target beneficiaries, are summarized in Sections C3 and E6.2, while consultations with NGOs and other civil society organizations are summarized in Section E6.3.
- **Monitoring & Evaluation:** Monitoring and evaluation of progress toward the achievement of GEF objectives will be part of the overall APL monitoring and evaluation effort. The mechanisms are summarized in Section C4 Institutional and Implementation Arrangements – Monitoring and Evaluation Component, while the indicators are identified in the Project Design Summary (Annex 1).
- **Financing Plan:** See Summary Page for Cost and Financing Data. Project components and their financing plan are identified in Sections B4 and C1.
- **Cost-effectiveness:** Cost effectiveness analyses will be included in pre-investment studies for the potential mini-grid and off-grid investments to ensure the selection of least-cost options (Section E1).
- **Core Commitments and Linkages:** The project is fully consistent with the Philippines CAS and GOP's development agenda, which places high priority on: (a) acceleration of infrastructure development; (b) enabling private sector participation to improve infrastructure facilities and services, especially in rural areas; and (c) acceleration of environmentally sustainable rural development (Section B1). GEF financing is essential to overcome the information, institutional capacity, high up-front system cost and financing barriers that are critical for the successful implementation of the program's renewable energy component.
- **Consultation, Coordination and Collaboration between IAs:** A major effort has been made to coordinate the program's design with other donors' initiatives to ensure complementary rather than overlapping Bank and GEF support to the Philippines. A

renewable energy integrator has been appointed at DOE (PHRD funded) specifically to coordinate all donor RE assistance. Regular consultation meetings have been held with other donors during the entire two-year preparation phase to coordinate donor assistance strategies and project assistance. The DOE has ensured and confirmed in writing that the Bank/GEF project is complementary to the UNDP/GEF project that aims to strengthen the capability of the Philippines renewable energy sector in general through various capability building activities (elaborated further in the last part of Section B4 - prepared by DOE - and Annex 2).

- **Response to Reviews:** Response to GEFSEC comments (in italic) at the time of pipeline entry:
  - *The government should identify how GEF assistance under a WB/GEF project fills gaps in addressing country priorities that are not covered by other existing or proposed renewable energy activities.*  
Response: The gap-filling role of the WB/GEF project is outlined in the Baseline and proposed GEF Alternative summaries in Annex 2.
  - *If project includes grid-connected component(s) under a Strategic Partnership, it should explain expected investments (both private and public) and actual policy changes to result from project activities. That is, policy studies by themselves would be an insufficient basis for a grid-connected component of the project.*  
Response: Main-grid connected investment is beyond the scope of this project, although it helps to lay the ground for such a future strategic partnership.
  - *The brief should describe the expected benefits and "value-added" that beneficiaries (households and community organizations) will receive, in terms of income-generation, employment, health, education, and productivity. The M&E plan should explicitly monitor and report on these benefits throughout the project.*  
Response: Qualitative benefits of the project are summarized in Section C3 and Annex 2. Quantitative benefits will be estimated by the preinvestment studies and M & E plan will also monitor these aspects (Section A4).
  - *Capital cost subsidies for on-grid or mini-grid components are not expected or may be provided in limited amounts commensurate with demonstration potential. Subsidies for SHS or similar household systems should be based on incremental costs and designed according to the following principles (or the brief should justify why the principles must be modified): (a) Subsidies cover no more than the incremental cost as defined by the difference between payments for similar energy services (i.e., kerosene, batteries, candles), and the cost of a solar home system or other alternative technology. (b) The project should demonstrate that there is a declining need for subsidies as costs decline through economies of scale in procurement, service, training, marketing, etc., or through other factors. (c) The project should apply GEF*

*subsidies on a declining scale over the life of the project, such that by the end of the project, there should be no more need for GEF subsidies to enable a sustained market, although on-going government subsidies (i.e., equivalent to those given to grid-connected consumers) may still be part of a "sustained" off-grid market. (d) Incremental costs should be cost shared with other partners whenever possible. This is similar to (c), in that the GEF share of incremental costs should decline to zero by the project end, but the remaining incremental costs may remain if a sustainable mechanism for covering them exists. (e) The project should try to leverage and maximize financing resources from others as a result of the existence of any GEF-provided subsidies.*

Response: The proposed subsidy scheme will indeed be based on the principles noted above (Annex 2) and detailed design of this scheme will be covered under the ongoing TA for rationalization of subsidies for rural electrification.

➤ UNFCCC comments:

*1. Under the head of Energy sector background and development, information has been provided for projected energy consumption in 2000. It may be of use to provide actual data for 2000. The project document will also be strengthened by the discussion of the potential for development of each of these NRE resources at the national level.*

Response: covered under Annex 2.

*2. We would appreciate receiving comments on the fact that the Philippines Energy Plan (1999-2008) projects an increase in renewable energy utilization but a decrease in total contribution in the energy mix as reliance on coal is envisaged to increase. It may be of use to include in the project document the total energy mix and how the project is expected to influence the mix in the future.*

Response: covered under Annex 2

*3. It would be worthwhile if the project document provides some insights into the policy framework in place for deployment of NRE. Along the same lines, a status picture of the Omnibus Electricity Bill and the NRE Bill could be provided, for clarity.*

Response: Covered under Annex 2

*4. In the context of being consistent with national priorities and programs, mention could also be made of the Energy Resources for the Alleviation of Poverty (ERAP) Program which envisages a target of 90 per cent electrification for each barangay by 2004, in contrast to the current value of 72 per cent electrification. The project document refers to the target of the*

*National Energy Plan, on page 3. Is there a link between the National Energy Plan and the ERAP target?. In light of the new government, it may be useful to comment on whether the ERAP Program will still be implemented; in light of this recent change, the project document may wish to reflect the energy priorities of the new government. Please clarify.*

Response: The name of the Rural Electrification Program has been changed from ERAP to the O-Ilaw Program, and is still part of the National Energy Plan. The current administration has reaffirmed its priority, and the target schedule for 100% barangay electrification has recently been extended to (still optimistic) 2006. For further information, please see the DOE website (<http://www.doe.gov.ph>)

*5. Additionally, while the project document deals with barriers with NRE deployment, what are the specific factors relating to rural RE deployment. Given that this project is primarily focusing on the rural sector, it may be useful to elaborate on the ADB TA project on rural electrification, which relates to capacity building of government institutions and assessing the potential sites for renewable energy projects in rural areas.*

Response: the ADB TA supported institutional strengthening of the rural electrification players, which facilitated preparation of this project by helping to establish the rural electrification program management office at the DOE.

*6. The overall project objectives appear to overlap with the UNDP-GEF and the UNDP-FINESSE projects.*

Response: The UNDP-FINESSE project is limited to capacity building of one bank, namely the Development Bank of the Philippines (DBP). On the other hand, the capacity building component of this project is proposed to cover a significant number of local financial intermediaries, including Land Bank of the Philippines, rural banks, micro-finance institutions, as well as non-bank participants, such as the participating suppliers of solar pv. The project's complementarity with the UNDP/GEF project is covered under Annex 2.

*7. It may be useful to revisit the activities listed within the project document, on page 9, in light of potential overlap between those identified and other projects. For instance in the case of activities 1-4, the DOE is currently doing these activities utilizing several funds (internal funds of DOE, ADB TA, UNDP-GEF PDF B, and rural electrification funds from energy regulation). There also appears to be an overlap between the activities identified in this project document and that of the UNDP-GEF PDF B project document.*

Response: covered under Annex 2

*8. The Energy Regulation 1-94 sets aside 1 centavo per kW in power generation to environmental protection and electrification of towns and villages hosting power generation facilities. These funds are now being used to conduct*

*feasibility studies and financing of renewable energy projects. Some insights may be provided as to how the WB-GEF PDF B complements these existing efforts.*

Response: This fund totaled about P130 million or \$2.6 million in 2001. The beneficiaries of these funds are mainly the communities hosting power generation facilities. While recent amendment of the regulation allows for broadening the geographical coverage of the beneficiaries, the amount available is very limited and is mainly targeted at small scale, commercially non-viable community based projects implemented by NGOs.

*9. The document mentions that there is a lack of funding for the conduct of pre-investment studies. It would be useful to inform if there has been any change in the status of these pre-investment studies due to the numerous ongoing projects.*

Response: The lack of funding for feasibility studies remains an issue. Currently, DBP is the only local financial institution trained in NRE lending and its credit facility for pre-investment studies is limited to \$25,000 per project.

*10. The project document does not currently include the estimated global benefits resulting due to the project. Have the incremental costs been studied. From the description of the baseline situation in terms of ongoing and proposed projects it appears as though renewable energy deployment is likely even in the absence of GEF support.*

Response: covered under Annex 2

- *UNDP comments call out one project activity and six PDF activities that overlap or duplicate activities in an existing UNDP/GEF full project. PDF activities conducted should first account for any results available from the UNDP/GEF project, and potentially modify PDF activities based on the availability of these results. The brief itself, or a separate memo, should explain how the PDF phase made effective use of outputs available from the UNDP project, and how effective sharing of results will occur under the full WB/GEF project.*

Response: Covered under Annex 2

Please let me know if you require any additional information to complete your review prior to inclusion in the work program. Many thanks.

**Distribution:**

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## PROJECT BRIEF

### 1. IDENTIFIERS:

PROJECT NUMBER:	P066397
PROJECT NAME:	<b>Philippines: Rural Power Program (Renewable Energy Component)</b>
DURATION:	APL of 12-14 years (of which Phase 1 will be about 4 years)
IMPLEMENTING AGENCY:	World Bank
EXECUTING AGENCY:	Department of Energy
REQUESTING COUNTRY OR COUNTRIES:	Philippines
ELIGIBILITY:	Philippines ratified FCCC on 8/2/94
GEF FOCAL AREA:	Climate Change
GEF PROGRAMMING FRAMEWORK:	OP 6

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**2. SUMMARY:** Rural electrification is a pro-poor flagship program of the Philippines' Department of Energy (DOE), the aim of which is to improve the quality of life in rural areas through the provision of adequate, affordable and reliable energy services in a sustainable manner. The government has set an ambitious target of 100% electrification at the *barangay* (village) level by the year 2006, implying electrification of about 8,300 barangays during the period 2001-2006. However, many of the non-electrified barangays are in areas that are not viable for grid extension, due to their remoteness and/or low density of demand. In addition, even in "electrified" barangays, many households remain unelectrified, sometimes because they are in isolated pockets which are too expensive to connect to the local grid. Hence only about half of the unelectrified barangays can feasibly be connected to the main grid, while the other half (the "offgrid" areas and the isolated unserved pockets in "electrified" barangays) will have to be served by decentralized systems (independent minigrids and individual systems). The challenge of implementing off-grid electrification is inextricably linked with the need to address deep-seated problems in the rural power subsector. These include serious financial and capacity constraints of the lead rural electrification body, the National Electrification Administration (NEA), and of many of the rural electric cooperatives (ECs). These constraints have led to the vicious circle of underinvestment in rehabilitation, low efficiency, poor quality of service, high cost and lack of attention to the needs of consumers in difficult or unviable areas.

This proposed APL would support the government not only in its rural and offgrid electrification investment program but also in the implementation of key reforms in the subsector. A building block approach, including learning by doing, is essential, so the APL will provide flexible tranches of funding based on initially agreed targets and progress toward goals. The APL would be rolled out in 4 phases over a period of 12-14 years, with an initial phase of 4 years. During the initial phase, new business approaches would be piloted to: (a) attract new players from the private sector to provide service to unelectrified barangays and underserved areas; and (b) transform ECs towards financial self-sufficiency over the longer term. Successful implementation of these pilot programs would be replicated and scaled up in subsequent phases of the APL.



The program will contribute towards the global environment objective of mitigating climate change caused by greenhouse gas (GHG) emissions by promoting widespread use of clean, renewable energy technologies in power generation. Because of its archipelago geography – the Philippines comprises some 7,000 islands spread over 300,000 square kilometers – decentralized power systems will be the least-cost solution for many non-electrified and under-served barangays. Environmentally-benign renewable energy technologies (RETs), particularly small hydro, photovoltaic (PV) systems and biomass power systems, will be competitive in many such applications, if and when (with GEF support) the market barriers to their adoption can be overcome. Hence in such situations, opportunities for the application of stand-alone RETs and/or diesel/hybrid RETs will be actively sought. And, while mini-grid RET systems currently suffer the vicious cycle of high cost and consequently few applications, their deployment on a large scale – as is feasible under a long-term rural electrification program in the Philippines – can significantly reduce those barriers and expand their market. Similarly, support to PV systems can and will build on successful initial experience in Philippines and other countries, and also benefit significantly from the economies of scale and from long-term market support that a large-scale 12-14 year program can provide.

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### **3. COSTS AND FINANCING (MILLION US\$)**

<b>PHASE 1</b>		
<b>GEF:</b>	- Program	10.000
	- PDF:	0.350
<b>SUBTOTAL GEF:</b>		<b>10.350</b>
<b>CO-FINANCING:</b>	-IBRD:	20.000
	-Other International:	n/a
	-Gov. of Philippines	3.300
	-Private	3.200
<b>SUBTOTAL CO-FINANCING:</b>		<b>26.500</b>
<b>TOTAL PHASE 1 COST (W/ PDF):</b>		<b>36.850</b>
<b>TOTAL PHASE 1 COST (W/O PDF):</b>		<b>36.500</b>
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<b>TOTAL PROGRAM</b>		
<b>GEF:</b>	- Program (estimated)	30.000
	- PDF:	0.350
<b>SUBTOTAL GEF:</b>		<b>30.350</b>
<b>CO-FINANCING:-IBRD</b>		180.000
	-Other International	n/a
	-Gov. of Philippines	28.000
	-Private	45.600
<b>SUBTOTAL CO-FINANCING:</b>		253.600
<b>TOTAL PROGRAM COST (W/ PDF):</b>		<b>283.950</b>

**TOTAL PROGRAM COST (w/o PDF): 283.600**

**4. ASSOCIATED FINANCING (MILLION US\$) n/a**

**5. OPERATIONAL FOCAL POINT ENDORSEMENT:**

**Name:** Mario Rono

**Organization:** Department of Environment and Natural Resources (DENR)

**Title:** GEF Focal Point

**Date:** January 2001

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## **A. Program Purpose and Development Objective**

### **1. Program purpose and program phasing:**

To achieve the overarching objective of poverty alleviation, the country's medium term plan is anchored on economic growth with social equity, including bridging the urban/rural divide. Towards this end, rural electrification is a flagship program of the Department of Energy (DOE) which aims to improve the quality of life in rural areas through the provision of adequate, affordable and reliable energy services in a sustainable manner. DOE's Accelerated Barangay Electrification Program aims to increase barangay electrification from 77% in 2000 to 100% in 2006. This would entail electrification of about 8,300 barangays during the period 2001-2006. However, many of the non-electrified barangays are in remote areas, or with low load density; grid extension in many instances is not viable. Based on NEA's preliminary estimate, only some 50% of the unelectrified barangays are expected to be connected to the main grid, while the balance (50%) would have to be served by decentralized electrification (off-grid or mini-grid). Given the quantum leap in financing requirements for the rehabilitation and expansion program<sup>1</sup>, coupled with fiscal and institutional constraints as well as low returns for expansion investment in general, the government recognizes that it is extremely ambitious and challenging to meet its stretched target for acceleration of barangay electrification.

The proposed APL would support the government in the implementation of reforms and priority investments in order to meet the needs of rural communities for adequate, affordable and reliable energy services in an efficient and sustainable manner. A building block approach, including learning by doing, is essential; the APL would provide flexible tranches of funding based on initially agreed targets and progress toward goals. During the initial phase of the APL, new business approaches would be piloted to (a) bring in new players from the private sector to provide service to unelectrified and underserved barangays; and (b) to transform ECs towards financial self-sufficiency over the longer term. Successful implementation of these pilot programs would be replicated and scaled up in subsequent phases of the APL.

In light of the sector's limited absorptive capacity, and the reality that incremental changes are required to address deep seated problems in the rural power program, targeted support for this program is proposed to be financed under an APL, rolled out in 4 phases over a period of 12-14 years. The above indicative time horizon is based on a more realistic but much slower electrification pace than the government's target noted above. In the event the government is successful in overcoming the serious constraints in fast tracking universal electrification<sup>2</sup>, the APL would be adjusted accordingly.

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1. Total distribution investment requirement for all ECs estimated to total about \$ 1.4 billion equivalent (at P40=\$1) over the period 2001-2006, or an annual average investment of \$233 million, as compared against an annual capital investment of about \$69 million for all ECs in 1998. The above investment requirements exclude subtransmission acquisition and investment by ECs (as provided by the EIRA).

2. Universal electrification has been a moving target for the country. At the time of the OED audit report of the first Bank-financed Rural Electrification Project in 1985, 100% electrification of households was targeted for 1990. As of end-2000, 33% of households in rural areas remained unelectrified

### **2. Program development objective: (see Annex 1)**

The objective of the proposed APL is to assist the country in making available affordable, reliable and adequate electricity that is used to meet the needs of rural communities in a sustainable manner. However, electrification must be viewed as an important component—but by no means the only one—of overall rural development efforts. With financing from the World Bank and other donors, the Government of Philippines (GOP) is presently carrying out projects to provide other infrastructure (notably roads and water supply), social facilities and other rural development support. The APL for the rural power project would complement a range of these ongoing and planned efforts for rural development in the country.

### **3. Global objective:** (see Annex 1)

The program would contribute towards the global objective of mitigating climate change caused by greenhouse gas (GHG) emissions through wider use of clean, renewable energy technologies in power generation. This would be complemented by grid system rehabilitation and loss reduction in distribution systems operated by electric cooperatives (ECs), which would increase the efficiency of grid-based supply and avoid high-polluting diesel-fueled power generation.

### **4. Key performance indicators:** (see Annex 1)

The monitoring indicators of the proposed program will fall into three categories. The first category will be “traditional” power system indicators for access and performance-related issues, such as number of connections, villages served, system losses, collection performance, debt service coverage and other technical and financial performance ratios. The second category will relate to GEF operational program and GHG mitigation impacts, including the scale of renewable energy technology mobilization, fossil fuel displaced, RET costs and expansion of the RET commercial sector. The third category will deal with more fundamental social and economic impacts of rural electrification. As part of ongoing program preparation, baseline indicators for measuring the poverty alleviation and quality of life improvement impacts of electricity (e.g. social benefits and income generating activities) will be developed, along with monitoring mechanisms that would include partnership with a local NGO. This will incorporate current Human Development Index indicators and measurement procedures.

## **B. Strategic Context**

**1. Sector-related Country Assistance Strategy (CAS) goal supported by the program:** (see Annex 1) **Document number:** 19355 **Date of latest CAS discussion:** May 1999

The government’s development agenda, supported by the Country Assistance Strategy (CAS), places high priority on the acceleration of infrastructure development and the enabling of private sector participation to improve infrastructure facilities and services, especially in rural areas, to alleviate poverty and improve standards of living. Relatedly, the CAS also supports acceleration of environmentally sustainable rural development. In this context, the CAS sets strategic directions by selecting a few activities, including rural electrification, for support through adaptable program loans (APLs). All these activities have a strong poverty-reduction focus and require long-term intervention and programmatic approaches for a sustained impact.

### **1a. Consistency with the GEF’s Operational Strategy and Programs:**

Consistent with the GEF’s Operational Strategy and its Operational Program #6, Philippines’ Agenda 21 identified the promotion of renewable energy as a priority component of the country’s global environment strategy. Its Climate Change Action Plan also endorses a gradual shift from the current fossil-dominated energy mix to one

involving greater use of renewables. The recently-completed UNDP/ADB/GEF Asia Least-Cost GHG Abatement Strategy (ALGAS) report and the preliminary outcomes of the UNDP/GEF Capacity Building Activity have both highlighted the crucial role of the energy sector in reducing Philippines' GHG emissions and have identified the promotion of renewable energy technologies as a priority component of the country's GHG abatement strategy.

Due to the archipelago geography of the Philippines, off-grid or mini-grid solutions are expected to be the least-cost solution for about half of the non-electrified and underserved barangays. It is expected that RETs, particularly photovoltaic (PV) systems, small hydros and biomass power will be competitive in many mini-grid and off-grid applications, if and when market barriers to their adoption are reduced. GEF support is therefore requested for the first phase of a long-term programmatic approach to begin removing these barriers. Consistent with GEF OP#6, Phase 1 aims to test business models and build local capacity that will remove market barriers to the wider adoption of RETs in offgrid electrification, thus eventually contributing to a significant reduction of GHG emissions from energy production. For many areas, PV systems will also be deployed to support pre-grid electrification, provide high-value modern electricity services, and serve as a prelude to grid-based electrification.

## **2. Main sector issues and Government strategy:**

### **Background**

Hitherto, power distribution in the rural areas has been largely under the purview of the 119 Electric Cooperatives (ECs) in the Philippines. The National Electrification Administration (NEA) is the apex organization for implementing the government's rural electrification policy and the principal lender to the ECs. The Strategic Power Utilities Group (SPUG), a functional group of the National Power Corporation (NPC), is by far the largest generator of power in isolated off-grid islands.

Over the past decade, significant progress has been made in the electricity supply sub-sector. By 2000, the electrification ratio reached 100% for the municipalities/cities and 77% for barangays in EC-franchised areas. Overall, EC finances improved significantly, with some 40% currently considered financially sound. In addition, overall EC power system losses declined from 21% to 16%. However, there is a great diversity of performance among individual ECs and much more needs to be done, both to improve existing operations and widen access to power supply in a sustainable manner. As of end-2000, 23% of barangays and 33% of households in rural areas still did not yet have access to electricity.

### **Main Issues**

The main issues facing the sector are the non-sustainability of past approaches, including the following:

- a. Reliance on EC grid extension and public sector financing to provide access to electricity, without due regard to economic efficiency, financial prudence, or institutional capacity;
- b. Institutional and commercial barriers to private investment in rural electrification;
- c. High service costs due to low loads and load densities in rural areas, which are exacerbated by investment and management inefficiencies. This problem is further compounded by affordability issues of poor households that comprise the majority of the unserved consumers and the fiscal constraints of the government to subsidize them for social equity reasons.

- d. Institutional weaknesses and precarious finances of the NEA and a large number of Ecs, which led to the vicious circle of under-investment in rehabilitation, low efficiency and less than desirable reliability of services.
- e. Politicization of the reform agenda, which has hampered implementation of known solutions consistent with sound commercial principles. Indeed, despite average tariffs that are among the highest in Asia and partial investment funding by government subsidy, the financial distress of many ECs has been exacerbated by political pressure to extend the grid in sparsely populated, remote areas.

## **Government Strategy**

### **(a) Medium Term Philippine Development Plan (MTPDP)**

The MTPDP embodies the antipoverty and overall development framework of the government during the period 2001-2004. In order to accelerate and sustain macroeconomic stability and equity growth, one of the strategic objectives of the MTPDP is to strengthen government and private sector partnership in infrastructure development. Towards this end, the government strategies are to:

- expand private sector involvement (i.e. financing, provision and operation) in infrastructure, by fulfilling and balancing the needs of: (i) the government, to obtain the required infrastructure through market competition with minimum fiscal burden and government contingent liabilities; (ii) the users, for efficient and affordable infrastructure services; and (iii) the private proponent, for reasonable returns and sharing of risks under fair and transparent terms;
- follow integrated planning to manage diverse issues in the development of the sector;
- focus on safety, technical and environmental standards;
- provide government financial assistance to services that are socially and economically desirable but financially unprofitable;
- intensify the shift in investments from highly developed megacenters to designated regional growth centers; and
- adjust user fees and charges to cover actual cost to sustain the provision and operation of infrastructure facilities and services.

### **(b) Energy Sector**

The Philippine Energy Plan (PEP) is aligned with the Philippine Agenda 21, the country's highest framework for development, and directly supports the Medium Term Philippine Development Plan (MTPDP). The PEP is an indicative plan providing for the strategies and programs geared towards the effective implementation of market-based reforms such as liberalization, deregulation and privatization. It likewise underscores the critical role to be undertaken by the private sector in the attainment of the energy plan's objectives. The government strategy seeks mainly to: (i) restructure the power sector and privatize NPC/PNOC-EDC; (ii) accelerate rural electrification; (iii) promote further use of clean and indigenous energy sources; and (iv) strengthen environmental management components of energy programs.

### **(c) Power Sub-sector**

The Electric Power Industry Reform Act (EIRA - Republic Act 9136) was approved in June 2001, after protracted delays. The declared policy of the State includes (a) acceleration of total electrification of the country; (b) ensuring the quality, reliability, security and affordability of the supply of electric power; (c) enhancing the inflow of private capital and broadening the ownership base of the industry; (d) assuring socially and environmentally compatible energy sources and infrastructure; and (e) promoting the utilization of indigenous and renewable energy resources in power generation in order to reduce dependence on imported energy. The EIRA would provide the overall framework for far reaching structural reform towards the development of an open and competitive power sector, with promulgation of the implementation rules and regulations (IRR) in February 2002.

#### **(d) Rural Power Sub-sector**

To meet the daunting challenge of achieving the targets set for the rural power sector, the government has been proactive in seeking support from the donors and private sector [most notably the independent power producers under the "adopt a barangay" and O-Ilaw (gift of light) program]. At the same time, the government requested Bank assistance to develop a new and comprehensive approach to rural electrification. The Bank has initiated, in close collaboration with DOE, a step-by-step approach to provide assistance to the rural power sector, starting with the recently completed Rural Power Sector Policy Note that provided recommendations for reform options. The thrust of its recommendations was discussed and agreed with the government.

It is recognized that there is no quick fix; that it will take time to effect new ways of doing business and a transitional period must be allowed for the transformation of ECs and gradual build-up of private investment in the sector. Thus, a dual track of public and private funding is envisioned for the sector. In this connection, it is essential that *a coherent sector policy and related donor assistance ensure that scarce public sector funding complement, and not compete with potential private sector funding*. This is an area that requires continued coordination with key donors.

Consistent with the recommendations of the policy note, a rural power sector strategy and an indicative action plan for policy and institutional reform have been developed by the DOE with the assistance of PHRD-financed consultants. The reform framework covers the following priority areas: (a) rationalization of franchise areas, including opening up unserved areas to new players and solutions from the private sector; (b) restructuring NEA; (c) restructuring marginal ECs; (d) rationalization of tariff and subsidy policy; and (e) privatization of SPUG. The above reform framework would provide the underpinning for the proposed Bank-financed operation. The proposed program would, by design, support the implementation of the aforementioned paradigm shift and test new approaches to address old problems through effective public/private partnerships.

***Rationalization of Franchise Areas.*** Barangay electrification is entering the last and most expensive stage in terms of investment and operating cost per connected consumer. Due to the archipelago geography of the country, preliminary estimates prepared by the ECs suggest that electrification through grid extension will be the least cost solution for about half of the approximately 8,300 unelectrified barangays. For the remaining barangays, decentralized service supply options must be found, with new and renewable energy having the potential for being the least-cost, off-grid options in many instances. In this connection, ECs may not have the experience and capacity for decentralized supply. Separately, implementation of the EIRA will gradually introduce competition and third party access to the ECs'



franchises. The reinforced focus on commercial viability introduced in the Act is expected to have a negative impact on the willingness of EC management to undertake missionary electrification. Indeed, during consultations with ECs, many managers indicated that they consider missionary electrification a financial burden which undermines the commercial competitiveness of ECs. Further, in some cases, extension of the grid from the neighboring EC is the least cost solution in electrifying unserved barangays, which makes it rational to redraw the borders between the two ECs concerned.

In light of the foregoing, the objective of reconfiguration of service territorial boundaries is to provide ECs the opportunity to become viable utilities and, at the same time, to mobilize new players and solutions to accelerate electrification of the remaining unserved communities. Towards this end, the EIRA mandates the opening up to other qualified third parties the provision of electric service to remote villages that the franchised utilities are unable to serve. It is in this context that *the first phase of the proposed Bank-financed Rural Power Program places a high priority on testing and demonstrating alternative business models for sustainable decentralized electrification which, if successful, could be replicated and scaled up during latter phases of the program.*

**Segmented Financing Strategy.** Consistent with the government policy of fiscal prudence, maximization of private investment is intended to be the kernel principle to change the mindset of the sector which has thus far relied on public sector funding. In light of the significant diversity of performance among the ECs, an agreement has been reached with the DOE on a segmented financing strategy of ECs, including: (a) graduation of creditworthy ECs from public/donor funding for financially viable investments while, at the same time, allowing for increased autonomy for the ECs concerned; and (b) donors funding to focus on (i) financially viable investments for the transformation of marginal ECs that are not able to tap private funding; and (ii) expansion investments of financially viable entities, including but not limited to ECs. Further analytical work will be carried out to better define the EC categorization.

**Table 1. Categorization of ECs**

EC Category	Characteristics	Size	Comments
Type A	Creditworthy, financially self-sufficient	About 50 ECs today (42% of total)	Increased autonomy, phasing out of public sector financing. Target: Increase to 85%
Type B	Critical mass (size and density), high margins, high potential efficiency gains (high losses/low collection)	About 15 ECs today (13% of total)	Phase out public sector financing using IMC model Target: Convert all to Type A
Type C	Marginal viability, unable to attract private financing at present	About 19 ECs today (16% of total)	Public sector lending or credit enhancement. Target: Convert all to Type A
Type D	Operating in low density and disadvantaged areas	About 35 ECs today (29% of total)	Smart subsidy from government Target: Reduce to 15%

**Table 2. Segmented Financing Strategy At A Glance**

<b>EC Category</b>	<b>Financially viable investment</b> (e.g. upgrading, sub-transmission)	<b>Expansion: grid &amp; off-grid for ECs &amp; new players</b> (minimum smart subsidy)
<b>A. Financially self-sufficient program sponsors (a) ECs; and (b) non-ECs in areas waived by ECs</b>	Private sector as first resort; public/donors debt financing as last resort	Public sector financing (debt & subsidy) to crowd in private sector investment
<b>B. Investment Management contract (IMC) candidates</b>	Private sector: IMC investor	IMC investor as the first resort; public sector financing if return to IMC investor not sufficient to crowd in other private investors for unserved areas waived by ECs
<b>C. Marginal ECs : With potential to turnaround but unable to attract private financing</b>	Public sector debt financing and/or credit enhancement, subject to commitment to change	Public sector financing (debt & subsidy) to crowd in private sector investors for unserved areas waived by ECs
<b>D. Disadvantaged ECs for missionary electrification</b>	Smart subsidy from government	Smart subsidy from government

**Commercial Funding Vehicle.** Taking into account the experience of the Cooperative Finance Corporation (CFC, US), a feasibility study sponsored by the IFC and the National Rural Electric Cooperative Association (NRECA, US) was recently completed for a new vehicle to tap long-term commercial funding by financially sound ECs for viable investments. Fifteen ECs recently established this funding mechanism, entitled Rural Electrification Financing Corporation (REFC); over thirty additional ECs are expected to become equity shareholders of the REFC in the near term. Further, the REFC has expressed an interest to tap initial funding from the IFC and the ADB (both public and private sector windows). In the interest of partnership, an agreement has been reached with the ADB that IFC would have the right of first refusal in processing the REFC request. In terms of enabling policy, *NEA's agreement on collateral sharing is critical for the ECs to tap new sources of long-term commercial funding.*

**IMC Pilots.** PHRD grant-financed TA for the first phase analytical work on the *development of an IMC framework and related feasibility study for up to 7 pilot ECs* is close to completion. Preliminary findings of the consultant confirm the potential for pilot ECs to attract private risk capital and improve the quality of service with business-oriented management techniques and performance-based incentives. In light of the potential benefits of decreasing greenhouse gas emission through significant reduction in power distribution system loss and avoidance of fossil fuel power generation, a recently approved PDF B grant is helping finance the second phase TA work related to competitive bidding for performance-based IMCs at pilot ECs. In addition, GEF contingent financing (in the form of partial risk guarantee) will be sought to mitigate investors' perception of risk under a proposed stand-alone GEF project.

**EC Transformation.** Building on the results of earlier studies on the rural power sector, PHRD-financed TA activity will develop a comprehensive institutional and financial restructuring program to break the vicious circle of under-investment to reduce system losses and improve operational efficiency and transform marginal ECs towards financial self-sufficiency over the longer term. e.g. increased members' equity contributions, patronage credit program, changes in corporate form, professional management through management contracts, joint EC endeavors to achieve synergies and reduce the risks of individual ECs. Additional financial recovery measures may include, for example, debt relief or restructuring of loans from NEA. Further, credit enhancement mechanisms (e.g. self insurance among ECs and/or third party guarantees) would need to be developed for non-creditworthy ECs to access credits. Implementation of the recommended EC transformation could be considered for support under the proposed Bank-financed program.

**NEA Restructuring.** Taking into account the comparative advantage and constraints of NEA, recommendations emerging from the consultant report on rural power sector strategy included the following:

- ***NEA to shed selected activities, mainly in direct lending and procurement***, which are its major shortcomings as evidenced by the earlier Bank-financed rural electrification project. Indeed, the financial objective of NEA as an interested lender for financially viable investments of ECs is conflicting with its social objective of increased rural electrification with mostly non-viable investments by ECs. Restructuring and right sizing of NEA could result in a major staff retrenchment.
- ***refocusing of its role on priority non-lending activities***, NEA has both the legal mandate and institutional capacity to assume a focused role in the following areas: (a) enabling policy implementation and providing technical support to (i) DOE in rural power sector planning and policy; (ii) ERC in regulation; and (iii) Congress in franchising; and (b) technical standardization and supervisory functions of ECs. NEA's specific role would include: (a) implementation of the rationalization of EC franchises and opening up unserved areas to qualified third parties; (b) capacity building for the transformation and credit enhancement of marginal ECs; and (c) channeling government subsidies for rural electrification.

### **3. Sector issues to be addressed and strategic choices:**

After a series of active Bank lending to NPC to eliminate the power crisis in the early 1990s, there has been no new Bank lending to the energy sector in the Philippines since 1997. The prevailing CAS calls for Bank assistance in the energy sector to be highly selective and focus primarily on the weakest link and the tough nut to crack, namely the rural power subsector, as part of the overall Bank response aimed at acceleration of infrastructure development in the provinces to bridge the urban/rural divide. In the interest of partnership, ADB is taking the lead in providing financial support for power sector restructuring and NPC privatization; the Bank will continue to coordinate closely with the ADB on the policy dialogue with the government.

The proposed program is a demand driven, strategic intervention that will focus on the following key issues in the rural power subsector:

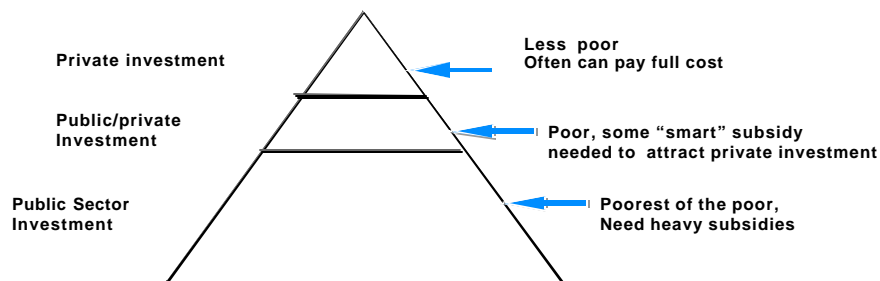
- a) the urgent need to find new ways to achieve rural electrification objectives. Scarce government resources must be leveraged by attracting a diversity of new players and solutions, particularly from the private sector, to share investment risks, and to transfer technology and management

know-how within a competitive and transparent rule-based framework. This applies to investments in both grid (line extensions) and offgrid (isolated systems) market. Electrifying generally low income populations remote from the grid for social equity reasons is a special challenge. New and innovative forms of public/private collaborations are critically needed because there is insufficient commercial incentive for the private sector to establish the business of electricity provision to these communities alone.

- b) the need to restructure NEA to improve its effectiveness as the primary administrator of the rural electrification program.
- c) Consistent with the segmented financing strategy discussed earlier, the need to assist transformation of marginal ECs that are not able to tap private funding.

### ***Issues in Improving Electricity Access to Poor and Remote Populations***

While offgrid communities are generally “poor”, the income levels are typically segmented as follows:



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Figure 1: Off Grid Market Segmentation and Public/Private Investment

The implication is that it is possible to attract the private sector to participate in the electrification of such communities, if appropriate incentives are provided. These incentives could be financial (subsidies) or non-financial (market conditioning support, etc). The size of the total market is crucial. Given enough customers in the “apex”, for example it may be possible for an external vendor to have a profitable business selling solar home systems (“cream skinning”). What is more common is for the public/private collaboration to cover both the apex and the next segment, with the government providing “smart” subsidies. The “base” portion is the most problematic, but could still be included in such collaborations if political will is backed up by sufficient budgets. An important policy in this regard is to match service level with actual need: as an example, households in the base and even upper portions of the income triangle often require only a few hours of lighting nightly and some radio use. An individual SHS instead of 24 hour AC service connection could satisfy that need at far lower cost.

To complement the proposed Bank program, an ESMAP-financed TA on a pilot village power fund and incubator services for community-based energy services is being carried out. It will test and demonstrate sustainable NGO/community project development business models in the poorest communities that could not attract external private service providers. The aim is to teach local communities the discipline of commercial credit to ease the transition in the long term towards commercial lending.

### ***Rationalization of Tariff and Subsidy Policy***

Given that subsidy is unavoidable if non-viable areas are to be electrified for equity reasons, it will be important to develop rational policies on tariffs and subsidy application. Consistent with Bank policy, subsidies, if unavoidable, should be transparent and well targeted to poor consumers, with one-time investment subsidies preferred over operating subsidies, except in the case of lifeline tariff rates which are direct, transparent and targeting the poorest of the poor. However, in translating the above “smart” subsidy principles into action, the challenge is to provide adequate business incentives to the service providers without distorting the market. The detailed design of a rational subsidy program is being developed with the assistance of consultants, building on the analytical work in this field already done by the Bank, including the emerging concept of output based aid (OBA).

### **Strategic Choices**

The ***first strategic choice*** of the program is to place high priority in institutional and policy reform to effect a paradigm shift in leveraging limited government resources by attracting a diversity of new players and solutions, particularly from the private sector, in the financing and delivery of rural energy services through new and innovative public/private partnerships. Considered most crucial is the development of a more effective, output-based, sustainable subsidy policy for rural electrification, which will be applied to all types and sources of subsidies by the government in a coherent and integrated manner.

The ***second strategic choice*** made is to deliberately set realistically low targets in APL1 for the investments in offgrid electrification, comprising independent minigrids and individual PV systems. Experience by the Bank so far in similar projects in other countries (Argentina, Sri Lanka, Indonesia, India) indicates that the uptake of new technologies and new business models in offgrid situations proceed very slowly in the first few years, but increases dramatically once start up problems are solved and institutional capacity is built. It will be very important to take time and care in setting up the needed policy, institutional and financing framework and ensure maximum participation of all stakeholders in the effort early on.

### **4. Program description and performance triggers for subsequent loans:**

The proposed APL, with an indicative total amount of about \$285 million, would assist the country in the implementation of priority reforms and investments necessary for achieving the targets for substantially improved state of the rural power subsector. In particular, the APL is designed to support the implementation of difficult, long-term solutions through new business approaches. Phasing of the APL generally follows the “horizontal expansion” model to progressively adapt and expand the earlier successful approaches to include new areas and cohorts in other parts of the country. Given the process-oriented nature of this operation which demands more built-in flexibility and allows for learning by doing, management of the process would be complex and less predictable than conventional projects. To avoid over extending the absorptive capacity of institutions concerned, the proposed APL has been designed

with manageable “bite size” modules, to be rolled out in four phases over a period of 12-14 years, starting with a four-year APL1. In the event the government is successful in overcoming the serious constraints in fast tracking the rural electrification program, the APL would be adjusted accordingly in terms of time horizon, the number of phases and proposed Bank loan amount.

## **I. Investment Component (US\$264.4 million)**

Decentralized (offgrid) electrification. The approximate target is about 1,000 offgrid barangays for the full APL, with about 100 barangays covered in APL1, plus unelectrified consumers in underserved electrified barangays. Each barangay consists of three types of customers for electrification: households, public service centers (rural school, health clinic, etc) and productive users (*sari-sari* stores and other small and micro enterprises, etc). For electrification purposes, these customers would be in two categories: concentrated and dispersed. Typically 10-30% of the barangay population are concentrated and the rest dispersed. The least-cost electrification solution for the concentrated users is normally a minigrid (or microgrid depending on the number of connections) powered by a centralized generation system, usually diesel, hydro or biomass power. For the dispersed users, the least-cost solution is normally individual PV systems or solar home systems (SHS).

### ***Minigrids***

The program strategy is to group the target barangays into “market packages” of sufficient critical mass for business operations. Depending on the characteristics of each package, one or more minigrids may be installed. For example, several barangays could be linked into one minigrid powered by a single hydro resource or the barangays could each have their own microgrids powered by small diesels. In any case, the idea is for a single entity to be contracted to provide long-term service to all customers in the entire package (e.g., as in a concession). Consistent with the provisions of the EIRA, qualified third parties would be allowed to provide energy services in the unserved franchise areas of the incumbent ECs. These parties could be private rural energy service companies (RESCO), qualified NGOs or local cooperatives organized for this specific purpose. An important objective of APL1 is to pilot these various types of service mechanisms and adopt the most successful ones for the subsequent phases. To the extent possible, the priority packages for program support are those that are commercially viable in themselves and require only non-financial incentives. It is recognized, however, that many of the offgrid communities have very low-income consumers, and that some form of “smart” subsidies may need to be provided by the government to enable the subprojects to be implemented. This subcomponent targets a total of 60,000 households and other users to be electrified with minigrids, with a total capacity of up to 30 MW, of which at least 5 MW is expected to be from stand-alone RETs or RET/diesel hybrids. The total cost is estimated to be about \$66 million, of which GEF support for the pilot schemes is estimated at about \$0.2 million for APL1.

### ***Solar Credit Line***

To date, the country has about 2.5 million unelectrified households. Even if all barangays are energized by 2006, over 1 million households still remain to have no access to electricity services. For dispersed users that are not feasible to connect to the grids, the program will make available for direct purchase various

capacities of PV systems through private vendors and NGOs. Recognizing the generally low incomes of dispersed users and the still high capital costs of PV systems, the program will provide, through GEF and government funds, subsidies to lower the cost to consumers, and financing to spread out the payments. The suppliers would offer small PV system options (e.g. 20-60 Wp) sufficient to provide basic services to households (e.g. lighting for several hours a night, as well as the use of radios, black and white TVs or small electric fans). Competing vendors would be enticed to do business through incentives that include assistance in market development and capacity building, product promotions and other risk-reducing activities funded by the proposed GEF grants in order to reduce the critical barriers of PV market development. GEF grants would be leveraged with government subsidies to render PV systems affordable for the rural poor. Further, to remove the barrier of credit access, the proposed Bank loan would support a solar line of credits to financial intermediaries (such as rural banks and micro-finance institutions) to enable them to provide consumer loans for the PV systems and financing of incremental working for dealers. In addition, GEF support is proposed for the provision of training in PV financing operations and partial credit risk guarantees for the suppliers and users of PV systems. The solar credit line targets a total of 200,000 households and other users to be provided PV systems over full program duration, with a modest target of 11,000 households for APL1. The total cost of this component for all the phases of APL is estimated to be about \$131 million, of which GEF support is estimated at about \$0.7 million for the pilot program under APL1.

### ***Partial Risk Guarantee Fund***

One of the key barriers for renewable energy development is the lack of medium and longer term commercial debt financing, which is in turn attributable to the stringent collateral requirements of the commercial banks. This has already been recognized in the UNDP-GEF project, which includes a Loan Guarantee Fund, but does not cover solar PV. Under this program, it is proposed to establish a partial risk guarantee fund to remove the credit access barrier for the suppliers and end-users of renewable energy, with the expected focus on solar pv under the APL1. During subsequent phases of the APL, successful pilot schemes for non-solar RETs emerging from the UNDP-GEF project would be replicated. Given the relatively innovative nature of this fund, its nature and scope will be developed during the course of further program preparation, as well as first few months of program implementation. GEF grants are proposed to finance this fund, totaling \$3.4 million over all phases of the APL, with \$ 1 million as the seed money during APL1. In case these resources are not utilized during APL1-APL3, the funds will be used during APL4 to provide investment support for further renewable energy development.

## **Reform-related Investments**

### ***(a) NEA Restructuring***

Following recommendations made by the recently completed rural power sector strategy study, this subcomponent will support the restructuring of NEA, implement a financial recovery plan, refocus its role on priority non-lending activities and streamline its staffing pattern consistent with the institutional realignment. Most of the funding will be used in severance pay packages that minimize the social impact of the needed staff retrenchment. The estimated cost is about \$5.5 million for this component which will be completed during APL1.

### ***(b) Transformation of Electric Cooperatives***

This subcomponent will finance investments needed to: a) turn around the operation of selected ECs that are not able to attract private investments but are committed to reforms, and b) support expansion programs of financially viable ECs. The investments will be in rehabilitation of old subtransmission and distribution systems, intensification of electrification, reduction of system losses, and improvement of efficiencies in collection, manpower productivity, maintenance and repairs, and procurement and materials management. Total cost estimate is about \$59 million for this subcomponent, with about \$8 million for APL1. A total of 30 ECs are targeted for the full program duration, starting with 3-5 ECs in APL1. The total new connections supported by this subcomponent would be about 40,000.

## **II. Technical Assistance Component (US\$19.2 million)**

This component would cover two main aspects: (a) the reduction of market barriers to the commercialization of RETs suitable for offgrid electrification, and (b) institutional and policy reform, mainly related to EC transformation. The total program cost estimate of item (a) is about \$14 million, of which \$13 million is proposed to be financed by GEF to cover a comprehensive range of activities to build capacity on RET matters in the various energy agencies (DOE, NEA, ERC), the financial intermediaries (DBP, LBP, rural banks, microfinance institutions, etc) and private participants (solar PV companies, ECs, NGOs, etc); reduce investment risks by more detailed characterization of market packages; develop and operationalize policies on subsidies, tariffs, regulation and integration of RETs into the missionary electrification program. (See [Annex 2](#)). Taking into account the lessons learned from similar projects in other countries, the technical assistance component to reduce market barriers to the commercialization of RETs would be front-loaded during the first phase of APL, with a GEF grant estimated at about \$8 million. As elaborated below, care has been taken to coordinate with other donors' initiatives to ensure complementary rather than overlapping GEF support in the Philippines.

### **Policy and Institutional Reform Triggers**

In order to ensure quality at entry, *upfront reform actions committed by the government* would establish a satisfactory policy and institutional framework for the rural power sector (see Section C below). The specific milestones indicating concrete progress in key policy and institutional reforms would be included in the timebound reform action plan to be agreed by appraisal. The specific *performance triggers* for the subsequent of APLs include *specific indicators for satisfactory implementation of the following key reform actions*: (i) progressive increases in the number of ECs opening up unserved areas to qualified third parties (specific targets for each phases to be agreed by program appraisal); (ii) rationalization of tariff and subsidy policy for both grid and off-grid electrification (based on sound economic principles); and (iii) NEA's agreement to a collateral sharing policy that would enable the entrants of private financiers (as indicated by actual financial closures on private sector transactions e.g. IFC/private sector funding of the REFC).

### **Phasing and Triggers of Investment Support**

Under the first phase APL, the core component would test and demonstrate alternative business models for decentralized electrification, based on effective public/private partnership that maximizes the participation of the private sector and extends the reach of available public resources for improving social welfare. In addition, subject to NEA and selected ECs' commitment to a satisfactory restructuring



program, additional components could include support for the implementation of the recommendations emerging from the planned TA noted above for (a) *NEA restructuring program* and related social impact mitigation measures (including early retirement package); and (b) high impact, viable investments for *rehabilitation and transformation of about three to five ECs* that are not able to attract private financing but are committed to reforms. Separately, an additional component could be included to support expansion investments (grid or off grid) for financially viable ECs. In the event some or all of the contingent components are not yet ready for APL1, they could be considered for support under APL2.

In addition to the aforementioned triggers linked to key reform actions, additional triggers for subsequent phases would be linked to performance indicators of the investment supported under the previous phase (e.g. at least 70% of the planned investment completed, majority of consumers surveyed are satisfied with the quality of service). However, similar to the condition of disbursement for a multi-component program, it is proposed that ***specific triggers for proceeding to the next phase of APL support for the grid subsector be made independent of those for the offgrid subsector***, since the triggers for one subsector are not critical for the successful implementation of the other subsector. Thus, for an individual phase of the APL, the program components could comprise one or both subsectors. An illustrative example to indicate phasing of the APL investment support is as follows:

	EC Grid Subsector		Decentralized Electrification Subsector
	Rehabilitation (No. of ECs)	Expansion (No. of connection)	No. of households
APL 1	3	4,050	17,000
APL 2	10	9,450	48,000
APL 3	15	13,500	79,000
APL 4	5	13,000	116,000
TOTAL	33	40,000	260,000

***Co-financing with GEF grant funds*** (in the form of both a direct financial contribution and contingent finance) would be sought to overcome the information, institutional capacity, high up-front system cost and financing barriers that are ***critical for the successful implementation of the new and renewable energy (NRE) component of the APL***. In addition to technical assistance and training related to the design and implementation of the renewable energy investments, proposed GEF support would include (a) limited capital cost subsidies for SHS based on incremental costs and on principles acceptable to GEF; and (b) partial risk guarantees for NRE suppliers and purchasers. The principles of significant leveraging of GEF resources with other financial resources, combined with the decline of GEF grants over time and promoting the transition to a commercial renewable energy market have been fully respected. Detailed discussions of the incremental costs and benefits between the baseline and the GEF alternative are in Annex 2.

Care has been taken to coordinate with other donors' initiatives to ensure complementary rather than overlapping GEF support in the Philippines. Towards this end, the PHRD grant is financing an integrator to facilitate coordination of all the donors' initiatives in NRE. In particular, the proposed program is complementary to the UNDP/GEF project that aims to strengthen the capability of the Philippine renewable energy sector in developing renewable energy, in general, through various capacity building activities. Specifically, the full UNDP/GEF project components include: a) strengthening the capacity of the GOP agencies to enact and implement sound new and renewable energy (NRE) policies; b) providing information for targeted audiences to build an NRE market; c) creating a "one-stop-shop" market service center for preparing and promoting NRE projects; d) increasing coordination among organizations

concerned with NRE; e) improving the quality of NRE technologies and systems through assistance with standard setting; and f) assisting the market penetration of NRE in remote, off-grid communities by providing incentives for innovative market delivery and financing mechanisms. Specifically, the UNDP/GEF project has identified three financing mechanisms for NRE projects that will be demonstrated as effective means of overcoming barriers namely, project preparation fund, loan guarantee fund and micro-finance fund. These mechanisms are intended for non-solar energy systems such as biomass, micro/mini-hydro and wind. The Dutch government under the “Environmental Improvement for Economic Sustainability” (EIES) project shall co-finance the funding of solar energy projects. The EIES project intends to install 15,000 solar home systems (SHS) in Regions I, II and CAR. In contrast, the proposed WB/GEF program aims to serve 200,000 households nationwide through SHS at the end of APL. Further, the proposed GEF support for technical assistance and training under the Rural Power Program focuses on bridging the skill gaps critical for the design and implementation of the policies and investments to be supported under the APL. Further elaboration of the comparisons of the proposed GEF support with the UNDP/GEF Project are summarized in Annex 2.

### **Interest in Larger-Scale, Grid-Connected Renewable Energy Generation**

Although not initially part of the proposed Rural Power Program, the Philippines DOE is interested in supporting larger-scale grid-connected renewable energy development, such as utility-scale wind farms. One concept that has been discussed is for eventual development of a Philippine component of the GEF-World Bank Strategic Partnership for Renewable Energy Development, in which the Rural Power Program might be expanded to support a grid-based Philippine RE Strategic Partnership.

## **C. Program Description Summary**

Each of the four phases of the APL consists of an investment component and a technical assistance component. The investment component would finance: (a) decentralized rural electrification subprojects, and (b) reform investments, including restructuring of the NEA and transformation of the rural electric cooperatives. The technical assistance component would finance : (a) activities designed to reduce market barriers to the use of RETs in offgrid electrification, and (b) activities designed to support the reform investment component.

### **1. Program components (see Annex 1):**

The table below shows the indicative costs of each subcomponent for APL1 and the estimated costs of each subsequent phase. The full 14-year long program is estimated to have a total cost of about \$284 million, of which about \$180 million is the IBRD loan and proposed GEF financing amounting to about \$30 million.

Components	Indicative Costs	% of total	IBRD Financin	% of IBRD total	GEF Financing	% of GEF total
<b>1. Investment component</b>						
1.1 small scale power generation/ minigrids	6.6	18.2%	4.8	24.0%	0.2	1.8%
1.2 Solar Credit Line	5.4	14.9%	1.6	7.9%	0.7	7.2%
1.3 Partial Risk Guarantee Fund	1.0	2.8%	0.0	0.0%	1.0	10.0%
1.4 NEA Restructuring	5.6	15.5%	5.0	25.2%	0.0	0.0%
1.5 EC Transformation	8.0	22.1%	7.2	35.9%	0.0	0.0%
<i>Total investment component</i>	26.6	73.4%	18.6	93.0%	1.9	19.0%
<b>2. Technical assistance component</b>						
2.1 Market barrier reduction for RETs	8.1	22.4%	0.0	0.0%	8.1	81.0%
2.2 Assistance to reform process	1.5	4.3%	1.4	7.0%	0.0	0.0%
<i>Total TA component</i>	9.6	26.6%	1.4	7.0%	8.1	81.0%
<b>Subtotal APL1</b>	36.2	12.8%	20.0		10.0	
<b>Subtotal APL2</b>	53.0	18.7%	30.2		8.0	
<b>Subtotal APL3</b>	81.5	28.7%	52.6		6.6	
<b>Subtotal APL4</b>	112.9	39.8%	77.2		5.4	
<b>Program Total</b>	283.6	100.0%	180.0		30.0	

## 2. Key policy and institutional reforms to be sought:

Consistent with the thrust of the EIRA, upfront actions and an indicative action plan for policy and institutional reform over the medium and longer term were discussed and agreed with the DOE (Attachment 1). The reform framework covers the following priority areas:

- a) rationalization of tariff and subsidy policy for both grid and off grid electrification
- b) rationalization of franchise areas and opening up unelectrified areas to qualified third parties;
- c) segmented financing strategy and transformation of marginal ECs towards financial self-sufficiency over the longer term;
- d) comprehensive institutional and financial restructuring of NEA; and
- e) privatization of SPUG, which is critically dependent on the rationalization of tariff and subsidy policy noted above.

The action plan is a living document that will be revised, as appropriate, to reflect changed circumstances and additional inputs from further analytical work.

### Upfront Reform Actions

Agreement has been reached with DOE on the following actions prior to program appraisal. These actions are fully consistent with the recommendations of earlier sector work (Rural Power Sector Policy Note) and, indeed, extend well beyond the upfront actions recommended by the review meeting of the Policy Note.

1. Establishment of a competitive power market structure

Implementation Rules and Regulations (IRR) of EIRA: competitive wholesale electricity spot market and gradual retail competition and open access

2. Establishment of technical specifications in the Distribution Code and standards for service, performance and financial capability of distribution utilities in the Implementation Rules and Regulations
3. Adoption of rate setting methodology based on principles that will promote efficiency
4. Measures to enhance competitiveness of Ecs  
EIRA-IRR: mandate of distribution utilities to: (a) acquire subtransmission assets to enhance reliability of service and have potentially more profitable industrial load; and (b) pursue structural and operational reforms such as joint actions between the distribution utilities to improve service and performance
5. Rationalization of EC franchises, including opening up to private sector participation
  - IRR-EIRA: provision of electric service in remote and unviable villages that the franchised utility is unable to service for any reason shall be opened to other qualified third parties
  - Adopt rules & regulations for off grid service providers
6. Adoption of graduation policy with public financing as the last resort: no financing for EC investments (e.g. rehabilitation) that could be financed by the private sector, and increased autonomy for the Ecs concerned
7. Adoption of framework for investment management contract
8. Clarification of policy on collaterals for NEA loans
9. Adoption of NEA institutional & financial restructuring program  
As a first step, EIRA-IRR: Authorized capital stock of NEA to be increased to 15 billion pesos
10. Rationalization of tariff & subsidy
  - EIRA-IRR: (a) Universal charge covering among others, direct, transparent subsidy for missionary electrification; and the equalization of the taxes and royalties applied to indigenous or renewable sources of energy vis-a-vis imported energy fuels; (b) Lifeline Rate: a socialized pricing mechanism for the marginalized end-users
  - Systematic adoption of deregulated, market-based pricing for non-exclusive service providers
  - Adoption of measures to rationalize subsidy allocation for both grid & off-grid electrification
  - Approval of SPUG's basic rate and power purchase adjustments: to allow for full recovery of O & M cost

### **3. Benefits and target population:**

The program's target beneficiaries are the rural poor that would gain access to electricity through it. Several studies, including an ESMAP study on the benefits of rural electrification in the Philippines, have established that electricity is a fundamental instrument in the quest for equitable rural growth. Studies have shown that access to electricity enables substantial improvement in living conditions of the poor and positively influences rural economic development. It provides opportunities to increase the effectiveness of social services, such as making possible adult literacy classes in the evenings under electric lights or making available medicines or vaccines that require refrigeration. Surveys carried out in the Philippines have shown that both the quality of life and household earnings improve with electrification. The number of households adopting electricity continues to grow for years after a village receives electricity, reinforcing the argument for evaluating these programs from a long-term perspective.

In summary, significant socio-economic development can occur with rural electrification, but opportunities for productive uses may be constrained by the lack of complementary programs that would enable fuller use of electric service. Further, rural electrification may not play a significant role in stemming migration

and it does not stimulate development in the absence of supporting programs or favorable socioeconomic conditions.

#### **4. Institutional and implementation arrangements:**

To facilitate efficiency and effectiveness in program preparation, a multi-agency Program Preparation Team (PPT) has been formed under the leadership of DOE, comprising the relevant government agencies (NEDA, NEA) and proposed borrowers of the Bank loan (DBP, Land Bank). *An integrator*, financed under the first stage PHRD grant, is assisting the DOE in the overall coordination of program preparation activities. Details of preparation activities and the related responsible agencies are shown in Annex 2.

***Proposed borrower for possible NEA restructuring*** (early retirement package): DOF

***Proposed borrowers for investment support:*** the direct borrowers would be DBP and LBP. It is understood that, in general, DOF prefers two, instead of one, government financial institutions (GFIs) to be the borrowers for the same program to promote competition and efficiency. The Bank is supportive of this position in light of the following: (a) a lot of donors funding already channeled through DBP; (b) diversion of borrowers will reduce the WB's exposure risk; and (c) in the case of rural projects, DBP plus Land Bank will offer broader coverage in the provinces. For rural and renewable energy lending, DBP is the only GFI which has the experience thus far (DBP has made loans to about 10 financially sound ECs). It was agreed with DOE that it would be desirable for the sector to diversify beyond DBP. Capacity building will be provided under the program.

DBP and LBP will, in turn, onlend the proceeds of the loan funds to public and private sub-borrowers for financing of subprojects. Potential sub-borrowers could include LGUs, ECs, private service companies and micro-finance for households. An operating manual will define the operating procedures and criteria of subproject selection that will be common to both GFIs. Both of them are already in the Preparation Team headed by DOE. The potential sub-borrowers will be given the choice of DBP or Land Bank. Targeted municipalities, barangays and ECs for Bank support will be identified through self-selection by the LGUs, the villages and the ECs concerned.

One of the lessons learned from the LGU Water Project is that the private service providers should be responsible for the design of the subprojects, in addition to construction and operation. In order to facilitate efficient and effective program management, agreement would be sought from the borrowers to establish ***Project Implementation Units*** (PIUs). Core staffing of the PIU will be in accordance with the program readiness filter requirement: namely project manager/director, procurement specialist and financial management specialist.

***Procurement Agent for ECs:*** Alternative local procurement agents for the ECs component will be assessed by an accredited procurement expert and satisfactory arrangements for a qualified procurement agent will be a pre-condition for any Bank-financed support for EC investments. A possible candidate is the planned service company to be established by the National Rural Electric Cooperative Association (NRECA, US) which is in the process of becoming the strategic technical partner of the REFC.

Insofar as the ***decentralized electrification component*** is concerned, TA will be provided to DOE/NEA in the ***competitive bidding for concessions to private service providers*** who will use established commercial practices for procurement of goods and services once they have been awarded the concessions competitively. DOE will lead an inter-agency committee in tender evaluation and NEA will serve as its secretariat and enter into concession contracts with the selected bidders.

**Monitoring and Evaluation:** (a) DBP and LBP have the primary responsibility in overseeing program implementation; and (b) the oversight agencies, DOE and NEA, have the primary responsibility for overseeing policy and institutional reforms. In addition, DOE, through its Program Management Office, will be responsible for monitoring the GHG mitigation and development impacts of the program (e.g. in terms of income-generation, employment, health, education and productivity). Monitoring and evaluation toward the GEF objectives would be coordinated to the maximum extent with the overall APL monitoring and evaluation. GEF-specific indicators, such as market prices and penetration, number of active entrepreneurs, and quantity of installed systems and power generated, will be incorporated into the monitoring and evaluation plan during program preparation. Dissemination of program results will be accomplished through regular reporting as well as contributions to international conferences and other such fora.

**Partnership with NGOs.** The mission discussed with the DOE/NEA their possible partnership with an NGO network to facilitate consumer outreach. During program implementation, NGO participation in monitoring and evaluation of program output and impact would help promote transparency, accountability and anti-corruption.

## **D. Program Rationale**

### **1. Program alternatives considered and reasons for rejection:**

**Program design alternative:** perpetuation of "business as usual" approach: continued heavy reliance on national government funding and donors financing channeled through NEA and continuation of monopoly by ECs within their individual franchised areas. While this approach represents the path of least resistance and thus far less time consuming and demanding (in terms of difficulty and resource inputs by the local counterparts and the Bank) it was rejected during program preparation as it has proved to be unsustainable under the earlier Bank-financed Rural Electrification Revitalization Project (with outcome rated by OED as unsatisfactory).

**Instrument alternatives:** Other lending instruments, be it a specific investment loan (SIL) or a learning and innovation loan (LIL) for a subsector (e.g. off grid electrification), would be less complex and lower cost to prepare. However, they were rejected as they would not be adequate to support incremental changes and solutions to deep seated problems in a holistic and sustained manner over the long term. By contrast, the proposed APL would support the implementation of difficult, long-term solutions through learning by doing, starting with limited risks on a small scale to test new approaches which, if successful, would be replicated in other parts of the country under subsequent phases of the APL.

### **2. Major related projects financed by the Bank and/or other development agencies (completed, ongoing and planned).**

Sector Issue	Project	Latest Supervision (PSR) Ratings (Bank-financed projects only)	
		Implementation Progress (IP)	Development Objective (DO)
<b>Bank-financed</b>			
Primary objective is to finance a time slice of sector investments, with limited contribution to the sector's institutional and policy framework	First Rural Electrification Project (completed in 1978 and completed in 1983)  OED rating: satisfactory outcome	S	S
(a) NEA's capability to function as an effective core agency for rural electrification	Rural Electrification Revitalization Project (approved in 1992 and completed in 1998)  OED rating: unsatisfactory outcome	U	S
(b) Electric cooperatives' weak performance			
(c) availability and reliability of electric supply in rural areas			

#### Other development agencies

Rural Electrification  
JBIC (loan to be closed in October 2001)  
Rural Electrification [financing for Rural Electric Finance Corporation (REFC)]  
ADB (planned for 2002, after processing by IFC)

IP/DO Ratings: HS (Highly Satisfactory), S (Satisfactory), U (Unsatisfactory), HU (Highly Unsatisfactory)

### 3. Lessons learned and reflected in proposed program design:

Care has been taken to incorporate lessons learned from earlier projects in the energy sector as well as the relevant country experience in other sectors, most notably the APL for the LGU Urban Water and Sanitation Project.

The OED audit report on the Rural Electrification Revitalization Project included the following comments: Critical reforms requiring legislative action should be passed before a Bank loan is approved by the Board. One of the key issues is the failure of congress to pass the necessary enabling legislation required to

recapitalize NEA. Yet the financial restructuring was crucial to putting NEA's finances on a sound footing. It was also a prerequisite for justifying the direct IBRD loan to NEA.

Consistent with the OED audit report recommendation, the proposed borrower are the financially sound DBP and LBP, which are governed by the prudential regulation of the Central Bank. In addition, NEA would not be the procurement agent, due to its poor performance under earlier projects. During final program preparation, alternative local procurement agents for the ECs will be assessed by an accredited procurement expert and satisfactory arrangements for a qualified procurement agent will be a pre-condition for any Bank-financed support for EC investments.

The program design also takes into account the recommendations of OED review of Bank experience in rural electrification (*Rural Electrification in Asia: A Review of Bank Experience, June 1994, and Rural Electrification: A Hard Look at Costs and Benefits; OED Précis, May 1995*). Its proposed economic and financial appraisal will be strengthened, consistent with the recommendations of the OED review mentioned above. Additional lessons are obtained from *Rural Energy and Development (World Bank Development in Practice, September, 1996)* which recommends five main principles to provide better access to electricity: provide for consumer choice, ensure cost reflective pricing, overcome the high first cost barrier, encourage local participation, and implement good sector policies.

The Bank is currently conducting a review of best practices in rural electrification. The emerging lessons from this review and incorporated in designing the proposed program include: the necessity of effective institutional structures to implement programs; the necessity for programs to keep political pressures from interfering with expansion plans; the development of a flexible set of criteria to direct the planning of service expansion; the continued importance of keeping distribution costs low, especially in areas with small electricity consumption; the overriding importance of cost recovery of distribution entities involved in rural electrification; encouraging all income groups in a region with electricity availability to obtain a connection; and the importance of involving local participation and cooperation to promote local ownership of the program.

Other lessons learned were obtained from "*The GEF Solar PV Portfolio: Emerging Experience and Lessons*", mainly based on review of WBG-financed projects in renewable energy. Key lessons include the following: (i) viable business models must be demonstrated to sustain market development for solar PV; (ii) delivery/business model development, evolution, and testing require time and flexibility; (iii) institutional arrangements for project implementation can greatly influence the value of the project in terms of demonstrating variable business models and thus achieving sustainability; (iv) projects must explicitly recognize and account for the high transaction costs associated with marketing, service, and credit collections in rural areas; (v) consumer credit can be effectively provided by microfinance organizations with close ties to the local communities if such organizations already have a strong history and cultural niche in a specific country; (vi) projects have not produced adequate experience on the viability of dealer-supplied credit a sales model; and (vii) rural electrification policies and planning have a major influence on project outcome and sustainability, and must be explicitly addressed in project design and implementation. Based upon this review, future projects in the GEF portfolio, including the proposed program, would focus on five key issues: (i) affordability; (ii) use of GEF resources for non-recurring costs; (iii) access to credit and incremental risk sharing; (iv) explicit linkages to rural electrification policies and planning; and (v) commercially feasible business models.

Two of the lessons learned cited by a recent ICR for an energy project in the Philippines are relevant for this program: (i) there are no short cuts to a successful complex operation; above-average inputs of Bank



resources and broad staff skill mix for project design, appraisal and supervision are required; and (ii) frequent changes of task manager and team members are not conducive to efficiency and effectiveness of the Bank's inputs.

Lessons learned from the LGU Urban Water and Sanitation Project that are relevant for this program include: (i) subproject selection criteria to include agreement reached between service organizations and end-users regarding user payment for services and prioritization of subregional clusters; however, measures are needed to mitigate potential risks related to a single contractor obtaining contracts in subregional clusters; and (ii) the need for mitigating the potential of political interference, streamlining the process of concluding private sector participation (PSP) transactions, improving the management of project implementation, and maintaining a pipeline for potential PSP deals.

#### **4. Indications of borrower and recipient commitment and ownership:**

The rural electrification program, supported by the proposed APL, is a pro-poor flagship program of the DOE. The proposed borrowers, DBP and LBP, have demonstrated their support of the APL through their participation in the Program Preparation Team led by DOE. Targeted municipalities, barangays and ECs for Bank support will be identified through self-selection by the LGUs, the villages and the ECs concerned.

GOP has demonstrated its commitment to structural reforms through the recent passage of the EIRA. Consistent with the EIRA, DOE has developed a rural power sector strategy and an indicative time-bound action plan with the assistance of PHRD consultants through a highly participatory approach.

#### **5. Value added of Bank and GEF support:**

The setting cited by "Philippines: Strategies towards 2010" has remained valid for Bank assistance in the country in general, and in the rural power sector in particular: The government has consistently stated that it relied on the Bank, not so much for lending volumes, but first and foremost to help "crack the tough nuts." This challenge will remain. The proposed use of an APL instrument would allow the Bank to tackle deep seated problems in a sustained manner, to build support by demonstrating results, and to overcome implementation problems through continued association with the same agencies.

The thrust of the energy sector assistance strategy, as articulated in the CAS, has remained valid. The proposed Bank interventions, which are highly selective, fit well with both the EAP regional strategy and the country's strategy over the 2010 horizon directed at sustainable social and economic development with equity. In terms of approaches, an increased emphasis on cross sector support would tap the potential synergies of the Global Country Team in the design and implementation of a Comprehensive Development Framework (CDF) and promotion of Community Driven Development (CDD) in the country.

Over the past few years, the Bank has been instrumental in nurturing country ownership in policy and institutional reforms, most notably in the implementation of a paradigm shift and a segmented EC financing strategy to maximize private sector participation in the rural power sector. New approaches to address old problems are being developed by the Bank's global team, in close partnership with the IFC, bringing to bear the global experiences of the WBG, GEF, ASTAE and ESMAP. This is particularly relevant for the decentralized electrification component. Although several market-based approaches for electrification of low-income offgrid areas have been successfully used in some countries, these emerging business models must be carefully tailored to specific country/site conditions.

To ensure quality at entry, the Bank has facilitated the design and implementation of various essential preinvestment studies financed by GEF, PHRD, USAID and other donors. The Bank has also initiated donors meetings on rural and renewable energy that have been convened quarterly since January 2000. Finally, as elaborated below, the Bank has been proactive in promoting stakeholder consultation and participation, including civil society, in the design and implementation of the reform agenda and the proposed APL.

## **E. Issues Requiring Special Attention**

### **1. Economic**

Economic evaluation methodology:

Cost effectiveness analyses will be carried out by the ongoing preinvestment studies for the grid/off-grid investment and power system loss reduction studies. They may be complemented by cost/benefit analysis if required. Market based approaches (with or without subsidies) will be based on competition and consumer choices.

### **2. Financial**

- Consistent with the recommendations of the OED on lessons learned from rural electrification projects, financial rates of return (FRR) on sub-projects would be calculated to help assess the level of smart subsidy required and the impact on the subproject sponsors. The projected risks/returns of subprojects for decentralized electrification would be prepared by the consultant for the preinvestment study and used as inputs for the definition of bidding parameters for potential service providers.
- As in the case of other Bank-financed projects, the selection criteria for sub-borrowers would include, among others, the willingness and ability of the participants to (a) pay for the debt service; and (b) contribute local counterpart funding. DBP and LBP, as part of the Project Preparation Team, will carry out financial appraisal of the proposed sub-borrowers.
- Special attention will be required for the financial restructuring of NEA and distressed ECs, including debt relief for non-performing projects.

### **3. Technical**

Technical assistance and training for both program preparation and implementation will bridge the gaps of specialized skills. In terms of investment support by the program, the choice of technology will be based on the least cost solution. TA for investment screening will be provided to NEA and ECs to enable them to make economic decisions in choosing between grid extension and off grid supply to serve new areas. All potential technology options will be those that are commercially proven.

### **4. Institutional**

#### **4.1 Executing agencies:**

DBP and LBP are experienced Bank borrowers. They will be supported in various policy aspects by DOE, NEA and other relevant agencies. DOE will be the implementation agency for the proposed GEF grant.

#### 4.2 Program management:

DBP and LBP are experienced WB borrowers. In order to facilitate efficient and effective program management, agreement would be sought for them to establish a Program Implementation Unit (PIU). Program management would be based on the following three main functions: (i) planning, monitoring and evaluation; (ii) procurement; and (iii) financial management. These three main functions will be assessed during program preparation and the PIU be staffed accordingly. In accordance with program readiness filter criteria, the core PIU staff would include Program Manager/Director, procurement specialist and financial management specialist.

#### 4.3 Procurement issues:

For the grid component, a suitable procurement agency will be selected. As noted under Section C 4 above, (a) a possible candidate is the service company planned to be established shortly by the NRECA; and (b) insofar as the decentralized electrification component is concerned, TA will be provided to DOE/NEA in the competitive bidding for concessions to private service providers.

Procurement assessment will be conducted by an accredited procurement expert. Based on the outcome of this assessment, a satisfactory procurement management system, including organization, staffing and training would be established during final preparation. Once the activities are well identified, the implementing agency will prepare a Procurement Plan to be reviewed and finalized with the Bank. The Plan should include the listing of the proposed contracts along with the timings/targets for various actions/steps. As part of the program readiness filter, the bidding documents for the first twelve months of implementation should be issued, and contract award process sufficiently advanced (if not finalized) so as to permit contract signature shortly after loan signature.

For procurement of goods and works, financed in part or in whole from IBRD funds, the Bank's Procurement Guidelines shall apply. For consultants' services financed in part or in whole from IBRD funds, the Consultants Guidelines shall apply.

#### 4.4 Financial management issues:

DBP and LBP are experienced Bank borrowers that have complied with the Bank's accounting and auditing requirements for earlier projects. Thus, it would not be necessary for the Financial Management Specialist to conduct a full financial management assessment for this program. The scope of financial management assessment that would extend beyond earlier Bank-financed projects would include DBP and LBP's assessment of the ECs and participating LGUs that have not yet received Bank loan support. As noted above, agreement would be sought from DBP and LBP to establish a PIU that will include satisfactory arrangements for financial management.

### 5. Environmental

#### 5.1 Summarize significant environmental issues and objectives and identify key stakeholders. If the issues are still to be determined, described current or planned efforts to do so.

The pre-investment studies would include feasibility studies, recommendations for least cost project design and environmental assessment. The decentralized electrification preinvestment study is ongoing and the final report is scheduled for completion around June 2002. An Initial Environmental Examination (IEE) shall be prepared for each sub-project. The IEE may be developed into a full-blown Environmental Impact Statement (EIS) should the IEE generate insufficient information to make a decision on the issuance of the environmental clearance arise. The IEE identifies the potential environmental impacts of each sub-project and contains an Environmental Management Plan (EMP) which has two parts, namely 1) the

Environmental Mitigation Plan and 2) the Environmental Monitoring Plan. It will be determined during program preparation if natural habitats safeguard will be required.

The program can be expected to contribute to environmental improvement, including:

- Use of renewable energy will displace generation which otherwise would have been fossil-fuel based. This would result in local and global environmental benefits.
- Widespread use solar home systems envisioned at the end of the APL should markedly reduce indoor use of kerosene and other lighting fuels, thus improving the indoor environment.

## 5.2 Environmental category and justification/rationale for category rating: **B - Partial Assessment**

No significant adverse environmental impact is expected. Nevertheless, all necessary environmental clearances shall be secured for each subproject.

## 5.3 For Category A and B projects, timeline and status of EA

EA start-up date:	August 2001
Date of first EA draft:	April 2002
Expected date of final draft:	June 2002

5.4 Determine whether an environmental management plan (EMP) will be required and its overall scope, relationship to the legal documents, and implementation responsibilities. For Category B projects for IDA funding, determine whether a separate EA report is required. What institutional arrangements are proposed for developing and handling the EMP?

As noted above, the consultant for the preinvestment study would develop the EMP as part of the IEE, in consultation with the key stakeholders and arrangements for public dissemination of the EMP in the participating local communities. Specialists of the private service providers and electric cooperatives will be responsible for the implementation of the EMP.

5.5 How will stakeholders be consulted at the stage of (a) environmental screening and (b) draft EA report on the environmental impacts and proposed EMP?

Stakeholder consultations (community meetings, joint EA scoping and public hearings with DENR, LGUs and communities), including but not limited to the EMP, will be carried out during final preparation, design and implementation

5.6 Are mechanisms being considered to monitor and measure the impact of the project on the environment? Will the indicators reflect the objectives and results of the EMP section of the EA?

The Environmental Management Plan which identifies indicators to be monitored and evaluated, provides a framework for a comprehensive monitoring and evaluation of the potential environmental impacts of the program for the entire program cycle.

## 6. Social

6.1 Summarize key social issues arising out of project objectives, and the project's planned social development outcomes. If the issues are still to be determined, describe current or planned efforts to do so.

The key social impacts will be from the two main objectives of the program: a) potential positive impact from improving access to power in the rural areas; and b) potential negative impacts from restructuring of the NEA and selected ECs.

**Rural Access.** DOE has recently completed a market assessment study of the rural electrification sector with the assistance of PHRD-financed consultant. The results serve to provide the socio-economic profiles, energy demand characteristics as well as expenditures on energy of unelectrified barangays. *A total of 6,000 households were randomly sampled* which are sufficient to represent the 1.7 million households in all the unelectrified barangays in the country. Of the total households surveyed, only 20% are non-poor, while 29% are poor and 51% are the poorest (with average annual household income of P109,391, P39,862 and P16,705, respectively). *Given that the majority of the households are far below the average income of rural households (P 74,000/year), special attention is required to address the issues of affordability and sustainability, most notably through rationalization of tariff and subsidy policy, including direct and transparent smart subsidy for the poor, and increased productive uses of electricity.* There will be an on-going pilot project to be implemented by an NGO and supported by ESMAP to explore and provide alternative energy for the poorest of the poor. Important lessons will be obtained from this pilot project. See Section B3 of the PCD for more information on the ESMAP project.

Barangays targeted for Bank support in expansion of rural electrification in the program will be self-selected. A pre-investment study is planned during program preparation where outreach will be conducted, information disseminated and barangays will be able to make their own decisions whether they wish to participate in the program or not.

**Restructuring.** TA will be provided for NEA restructuring and EC transformation. In this context, particular attention will be paid to the social impact of any retrenchment program and concrete recommendations will be developed through close consultations with the concerned staff (management, ranks and file) to develop appropriate mitigation measures, including staff training/re-tooling and an early retirement package. Subject to NEA commitment to a satisfactory restructuring program, the proposed APL1 could consider financing staff training/retooling and an early retirement program as part of the measures to mitigate adverse social impact.

**Safeguards.** It is not clear at this point whether or not indigenous people will be involved. If they are involved, it would be benefits and not adverse impacts which would emerge. The ongoing pre-investment study will help to determine which barangays have elected to participate in the program. From this study it will be known if indigenous people will be involved. If indigenous people are involved, then an IP strategy will be prepared in consultations with the stakeholders during final preparation. No resettlement or negative impact is anticipated as the core component of the APL1 would be decentralized electrification in remote and sparsely populated areas. However, it will be determined during final preparation if resettlement safeguard would be required.

6.2 Participatory Approach: How will key stakeholders participate in the project?

The policy note was discussed with the government in October 1999. Since then, written comments have been received from the DOE and NEDA which indicated their general agreement with the thrust of the

recommendations, while cautioning that it may take some time to effectively achieve a paradigm shift towards maximization of private sector participation. Separately, supported by the World Bank pilot fund to promote participatory activities in the Philippines, a series of broad-based consultations with key stakeholders (NGOs/civil society, government and related agencies, key donors) took place in January 2000. The design and implementation of the proposed program will continue to take into account the comments by stakeholders. To facilitate efficiency and effectiveness in preparation, a multi-agency Program Preparation Team (PPT) has been established under the leadership of DOE, and comprise the relevant government agencies (e.g. NEA) and proposed borrowers of the Bank loan (e.g. DBP, Land Bank). This has proved to be a good practice in the case of such Bank-financed projects as the LGU Water Project.

Consistent with the Bank's rural electrification policy, it is important to make sure that the targeted beneficiaries participate in the program design and are offered choices in the different levels of services that are commensurate with their ability to pay. The choices they make must also be based on full and accurate information. This would require consumer education. For purposes of identifying self-selected barangays for APL support, close consultations with the LGUs and local communities are an integral part of the ongoing preinvestment consultancy study.

### 6.3 How does the project involve consultations or collaboration with NGOs or other civil society organizations?

As noted above, consultations with the civil society were first initiated in January 2000. The immediate next step is for the dissemination of the Project Information Document (PID) to the civil society through the Infoshop and the public information center at the WB Manila office, and hard copies of the PID will be distributed to the stakeholders. Further, an agreement has been reached with the DOE/NEA that they would partner with an NGO network to facilitate communications with the civil society. See below for more details.

### 6.4 What institutional arrangements are planned to ensure the project achieves its social development outcomes?

DOE/NEA plan to partner with an NGO network to facilitate communications with the civil society. This could be considered for financing under the program preparation grants from GEF. The potential role of the NGO could facilitate the following:

***Rural Power Sector Reform.*** During the ongoing program preparation, a Communication Needs Assessment would underpin the development of a Communication Strategy aimed at building consensus among the stakeholders and enhancing the capacity of both government and private sector partners to use information and communication strategically for reforms. As indicated by the government's recent consultations with the civil society in connection with the Power Restructuring Bill, a potential role of the NGO network could include communications on the impact of rural power sector reform and consumer rights, consistent with the provision of EIRA for consumer education and protection.

***Program Design and Implementation.*** Care would need to be taken to ensure that the targeted beneficiaries for off-grid electrification are provided with full and accurate information and participate in the design, including making choices in the different levels of services that are commensurate with their ability to pay. In addition, during implementation, NGO participation in monitoring and evaluation of outputs and impacts would help promote transparency, accountability and anti-corruption.



6.5 What mechanisms are proposed to monitor and measure project performance in terms of social development outcomes? If unknown at this stage, please indicate TBD.

Social assessment will be conducted by a local NGO based on appropriate monitoring and evaluation indicators agreed with the Bank. For this purpose it is intended to establish baseline indicators for measuring the poverty alleviation and quality of life impacts of electricity. After identifying appropriate baseline indicators the enhancement in living conditions of rural households would be measured on the basis of socio-economic studies to be carried out under the program during the implementation phase.

## F. Sustainability and Risks

### 1. Sustainability:

The program design carefully avoids the major weaknesses of previously unsustainable approaches of "business as usual" that are top down, and rely heavily on government funding and monopoly by ECs within their respectively franchised areas. Instead, care has been taken to incorporate the following guiding principles included in the Bank's policy paper entitled "Rural Energy and Development": (i) provide for consumer choice – inform consumers of choices of affordable energy sources and enable the consumers to choose the most cost-effective solution; (ii) ensure cost-reflective pricing and avoid unnecessary subsidies – as a minimum, full cost recovery for O & M cost; (iii) overcome the high upfront cost barrier (e.g. through affordable credit mechanisms, lower-cost-equipment; and lower service standards to meet the needs of low-demand consumers); (iv) encourage local participation; and (v) implement good sector policies.

### 2. Critical Risks (reflecting the failure of critical assumptions found in the fourth column of Annex 1):

Risk	Risk Rating	Risk Mitigation Measure
<b>From Outputs to Objective</b> Inadequate political will to implement the necessary policy and institutional reforms satisfactorily	S	Ownership and commitment to reforms demonstrated by the government in the recent passage of the Electricity Law and DOE's agreement to upfront reform actions for the rural power sector; Performance triggers tied to satisfactory implementation of key reform actions; Broad based consultation with key stakeholders and participatory approach in the design of reform agenda as well as consumer education
Inadequate commitment of ECs to implement the necessary change management	H	EC commitment to reform as a pre-condition for this component; Gradual introduction of competitive retail market under EIRA would provide incentives for ECs to become competitive

Labor issues at NEA and ECs	S	TA for the design of an appropriate program to mitigate potential adverse social impact related to downsizing; Early and close consultations with the concerned staff and management and participatory approach in program design; Bank loan financing of NEA early retirement package
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Consumers' willingness and ability to pay for services	H	Self selection by local communities to participate in the program; Market assessment results incorporated in program design; Stakeholder participation in program design and implementation
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**Risk**

**Risk Rating**

**Risk Mitigation Measure**

**From Components to Outputs**

Inadequate participation by program sponsors (private sector, LGUs etc) for decentralized electrification	H	Early and close consultations with key stakeholders and investment promotion workshops/roadshows; Diversification of program sponsors; Flexibility in service delivery options; Upfront government commitment to rationalization of tariff and subsidy policy
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Program implementation delays	S	Quality at entry assurances, including program readiness filter; Assessment of procurement agent for ECs and follow up provision for capacity building
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Inadequate local counterpart funding	S	Adequate financial capacity of program sponsors as a selection criteria for support
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<b>Overall Risk Rating</b>	H	The APL instrument allows the country and the Bank to test out approaches and proto-type design before scaling up. The potential payoff from successful implementation are high. In the event of unsatisfactory
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implementation, performance triggers for subsequent phases of the loan would limit the downside risks and provide an exit strategy for the country and the Bank.

Risk Rating - H (High Risk), S (Substantial Risk), M (Modest Risk), N (Negligible or Low Risk)

In summary, although the risks are considered high, the potential payoff could be high and the risks have been mitigated through a unique combination of the following measures:

- Adoption of a long-term, programmatic, phased approach; the purpose of the proposed APL1 is not only electrification coverage but also learning by doing through testing and refining market-based approaches for offgrid electrification and EC transformation, thus significantly reducing the risks of future large-scale operations. As well, the requirement of the APL for triggers for subsequent phases provide an exit strategy for both the Bank and the borrowers to limit downside risk exposure.
- Government commitment to up-front reform actions critical for a satisfactory policy and institutional framework;
- heavy reliance on market-based delivery mechanisms and self selection by participating municipalities and local communities;
- stakeholder participation and country ownership of a comprehensive policy and institutional reform; and
- capacity-building and institutional support are specifically designed to complement each other to bridge specialized skill gaps, thereby promote the sustainability of the investments supported under the program.

**Attachment 1 : Summary Table Rural Power Sector Reform Action Plan**

ACTION PLAN	TIME FRAME												AGENCIES				MILESTONES (◆)	REMARKS	
	DONE	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	DOE	NPC	NEA			ERC
A. TARIFF & SUBSIDY RATIONALIZATION																			
A.1 Rationalization of tariffs for missionary electrification (SPUG)	◆																		
a. Fuel cost adjustment	◆													+	+		+	ERB Approval (September 2000)	Implementation staged from September 2000 to August 2001
b. Adjustment of basic rate		>>>>>◆												+	+		+	ERC Approval	Application refiled with ERC; proposed implementation of basic rate adjustment to be completed in 3 years from the date of approval; full recovery of O & M cost
c. Power purchase adjustment			◆											+	+		+	ERC approval	Application refiled with ERC
A.5. Universal charge covering direct, transparent subsidy for missionary electrification; and the equalization of taxes/royalties of renewables vis-à-vis imported energy fuels	◆													+				Promulgation of IRR of power bill (February 2002)	
A.2 Adoption of performance-based ratesetting (PBR) scheme for EC's, particularly applicable standards of performance				◆												+	+	ERC approval	ERB's consultant report completed for PBR rate setting
A.3 Systematic adoption of deregulated, market-based pricing for marginal/missionary areas and non-exclusive off-grid energy supply services			◆													+	+	ERB Approval on Tariffs for marginal/missionary areas and non-exclusive energy supply areas	Pilot implementation of market based pricing by Shell/CPC RESCO in Aklan
A.4 Adopt measures to rationalize subsidy allocation for both grid & off-grid electrification			◆											+		+	+	DOE/ERC approval	Consultant study to be completed by mid-2002
A. 5 Life line rates for marginalized end-users	◆													+			+	Promulgation of IRR of power bill (February 2002)	
B. RATIONALIZATION OF EC FRANCHISES, INCLUDING OPENING UP TO PRIVATE SECTOR PARTICIPATION																			
B.1 Set parameters and guidelines for re-delineation of franchise boundaries			◆													+		NEC Resolution on Re-delineation of Franchises	TA on grid/off grid investment screeing to be completed shortly
B.2 Adopt rules for off-grid service players			◆											+		+	+	DOE to promulgate Implementation Rules & regulations (IRR)	TA to be commissioned by mid-2002

ACTION PLAN	TIME FRAME													AGENCIES				MILESTONES (◆)	REMARKS
	DONE	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	DOE	NPC	NEA	ERC		
B.3 Implement pilot program to open up unserved franchised areas within a competitive framework			◆											+		+		Operating Contract(s) awarded to private sector	Preinvestment study to be completed by mid-2002
B.4 Scaled up opening up unserved areas to new players				>>>>>>>>>>>>>>>>>>>>◆										+		+		Gradual increase in pperating Contracts awarded to private sector	TA for preparation and implementation to be supported under APL
C. TRANSFORMATION/EFFICIENCY IMPROVEMENT FOR ECs C.1 Establishment of a competitive market structure  a. Competitive wholesale spot market  a. Gradual retail ocmpetition & open access			◆															Promulgation of IRR of Power Bill in February 2002; competitive wholesale spot market within 1 year & open access of EC distribution system 5 years thereafter	
C.2 Enhancement of service & performance a. Establishment of standards for service, performance & financial capability of distribution utilities			◆											+			+	Promulgation of IRR of Power Bill (February 2002); ERC to promulgate specific standards	
b. Provision for Ecs to acquire subtransmission assets & potentially more profitable industrial load			◆		◆									+				Promulgation of IRR of Power Bill in February 2002; implementation within 2 years thereafter	
C.3 Financial & Institutional Restructuring of ECs  a. Establish graduation policy with public sector financing as the last resort & enhanced autonomy for graduated ECs			◆											+		+		NEC Resolution on EC access to other Financing Sources	REFC established by 15 ECs as a vehicle to tap commercial financing
b. Clarification of policy on collaterals for NEA loans  c. Establish framework for investment management contracts (IMCs)	◆		◆													+	+	NEC Resolution on Collateral Policy  NEA Board approval of the framework of IMC	NEA and REFC reached agreement on sharing of collaterals  TA for IMC feasibility study substantially completed

[illegible]

## Annex 1: Program Design Summary

## PHILIPPINES: RURAL Power

<b>Hierarchy of Objectives</b> <b>Sector-related CAS Goal:</b>	<b>Key Performance Indicators</b> <b>Sector Indicators:</b>	<b>Data Collection Strategy</b> <b>Sector/ country reports:</b>	<b>Critical Assumptions</b> <b>(from Goal to Bank Mission)</b>
Development and use of electricity infrastructure, particularly in the provinces contributes to poverty alleviation and improvement in standards of living	<ul style="list-style-type: none"> <li>• All barangays and at least ___ percent of households have access to electricity services.</li> <li>• Per capita rural electricity use increases to ___ kWh per year</li> <li>• Rural commercial, institutional and industrial electricity use rises to more than ___ percent of total rural electricity use</li> </ul>	<ul style="list-style-type: none"> <li>• GOP social and economic reports</li> <li>• DOE/NEA electrification reports</li> </ul>	<ul style="list-style-type: none"> <li>• Broader national and international economic conditions are favorable</li> <li>• Government support continues for missionary electricity programs</li> </ul>
Global Environment Goal: Increase of CO2 emissions from power generation is reduced	<ul style="list-style-type: none"> <li>• CO2 emissions per GWh reduced to ____ tons</li> </ul>	<ul style="list-style-type: none"> <li>• GOP reports</li> </ul>	<ul style="list-style-type: none"> <li>• Effective implementation of greenhouse gas (GHG) mitigation program in broader power sector and other sectors</li> </ul>
<b>Program Purpose:</b> To meet the needs of rural communities for adequate, affordable and reliable energy services in an efficient and sustainable manner.	<b>End-of-Program Indicators:</b>	<b>Program reports:</b>	<b>(from Purpose to Goal)</b>
The Development Objective will be achieved in four phases of a 12-year APL, each of about 3-4 years duration. <b>APL1:</b> core component: Pilot decentralized electrification; contingent components: NEA and EC restructuring, expansion of service by ECs. <b>APL2-4:</b> Scale up decentralized electrification and grid expansion, investment in ECs willing to reform and associated TA	<ul style="list-style-type: none"> <li>• Socio-economic benefits accrued to households and barangays due to increased use of electricity</li> <li>• At least 90 % of ECs supported are financially self-sufficient.</li> </ul>	<ul style="list-style-type: none"> <li>• GOP social and economic reports</li> <li>• Surveys in electrified areas in the provinces</li> <li>• EC reports</li> <li>• NEA report</li> <li>• Quarterly monitoring &amp; progress reports</li> <li>• Supervision mission reports</li> <li>• Mid-term review report</li> </ul>	<ul style="list-style-type: none"> <li>• Economic and political stability in the country</li> <li>• Appropriate sequencing and adequate complementary investments and social development for rural transformation</li> <li>• There is demand for rural commodities and services and they receive fair remuneration</li> <li>• Purchased energy inputs remain affordable and adequate</li> </ul>

**GEF Operational Program:**

Mitigate global climate change caused by greenhouse gas (GHG) emissions through wider user of clean energy technologies

- \_\_\_ % of new generation capacity feeding the rural grids uses renewable energy
- \_\_\_ MWh per year of renewable energy-based power generation displaces, \_\_\_ tons/year of diesel and kerosene use

- Quarterly monitoring & progress reports.
- Supervision mission reports
- DOE/NEA electrification reports

- Experience from program is replicated in other parts of the country
- Effective enforcement of pollutant emission standards (e.g Clean Air Act on NOx) reduces use of polluting diesel generators.

**Project Development Objective:**

- APL1:
- to test and demonstrate viable business models that maximize leverage of public resources with private investment for decentralized electrification.
- Contingent components:
  1. to pilot turnaround of problem ECs through reforms and operational improvements
  2. to restore the financial health of NEA and improve its efficiency and responsiveness to the capacity building needs of the ECs
  3. to expand service of ECs in rural electrification.

**Outcome / Impact Indicators: Project reports:**

- % of consumers surveyed satisfied with service
- Number of new program sponsors, including private investors and LGUs, in off-grid electrification
- Dollar amount of investment from private investors and LGUs for off-grid electrification
- Financial health of NEA and participating ECs.

- Quarterly monitoring & progress reports
- Supervision mission reports
- Consumer survey results

**(from Objective to Purpose)**

- Sufficient participation by subproject sponsors, including private investors, ECs, LGUs, etc.
- Successor LGU administrations will remain committed to the implementation of the program

**Output from each Component:**

- Infrastructure is built to provide electricity access to barangays and to rural households who desire it.
- Renewable energy to displace fossil-fueled power generation

**Output Indicators:**

- \_\_\_ additional barangays electrified by end of APL.
- households gain access to electricity by end of APL
- \_\_\_ MW of renewable energy power generation installed.
- \_\_\_ HH households and barangays served by renewable energy

**Project reports:**

- Quarterly monitoring & progress reports
- Supervision mission reports
- Consumer survey results
- DOE/NEA reports
- Program Implementation Unit Quarterly reports
- User surveys

**(from Outputs to Objective)**

- Private sector invests in financially sound ECs
- There is willingness and ability of consumers to pay for electricity services
- Renewable energy life cycle cost remains competitive with that of fossil fuels
- Investment climate is favorable

	<ul style="list-style-type: none"> <li>sources.</li> <li>Cost per off-grid consumer declines to under ___ Peso and under /kWh for decentralized grids.</li> </ul>		<ul style="list-style-type: none"> <li>Renewable resource availability (e.g. hydro) does not decline</li> </ul>
<ul style="list-style-type: none"> <li>ECs operations are restructured to make them financially sustainable and efficient</li> </ul>	<ul style="list-style-type: none"> <li>At least ---% of ECs are financially self sufficient (satisfactory debt service coverage and self-financing ratios and capital structure) )_</li> <li>Overall electricity losses decline to &lt;12%.</li> <li>Collection efficiency increases to &gt;95% in % of ECs.</li> <li>Controllable expenditures/MWh drops by ___ %</li> </ul>	<ul style="list-style-type: none"> <li>EC and NEA reports</li> </ul>	<ul style="list-style-type: none"> <li>ECs do not lose their profitable customers under power sector deregulation</li> <li>Good quality trained staff are retained.</li> <li>Commitment of ECs to implement the necessary change management</li> <li>Political will to implement the necessary reforms</li> <li>Successful management of labor relations</li> <li>Successful implementation of IMCs</li> </ul>
<ul style="list-style-type: none"> <li>NEA operations are restructured to make it responsive to the needs of ECs in a restructured power sector and financially sustainable</li> </ul>	<ul style="list-style-type: none"> <li>NEA staffing level drops by ___%</li> <li>Debt service coverage improves to ___</li> </ul>	<ul style="list-style-type: none"> <li>NEA Reports</li> </ul>	<ul style="list-style-type: none"> <li>Political will to implement the necessary reforms</li> <li>Commitment of NEA to implement the necessary change management</li> <li>Successful management of labor relations</li> <li>The right mix of staff respond positively to early retirement offers.</li> <li>There is a conducive work environment at NEA</li> <li>Adequate alignment of government resources with NEA's role</li> </ul>
<ul style="list-style-type: none"> <li>Rural Power Program Implementation Units (PIUs) function effectively</li> </ul>	<ul style="list-style-type: none"> <li>PIUs functioning at DBP, LBP</li> <li>RE Steering Committee functioning</li> </ul>	<ul style="list-style-type: none"> <li>Quarterly status reports</li> </ul>	<ul style="list-style-type: none"> <li>EC and private suppliers are responsive to PIU requirements</li> </ul>
<b>Program Components / Sub-components:</b> APL1 <b>Investments</b> <b>(a) Core Component</b>	<b>Inputs: (budget for each component)</b>	<b>Program reports:</b>	<b>(from Components to Outputs)</b>
<ul style="list-style-type: none"> <li>Decentralized grids and off-grid options are implemented in about 100 barangays with 17,000 households</li> </ul>	\$13 million	<ul style="list-style-type: none"> <li>Program Progress Quarterly Reports</li> <li>Surveys</li> </ul>	<ul style="list-style-type: none"> <li>Enabling policy environment</li> <li>Consumers are willing and able to purchase electricity</li> </ul>
<ul style="list-style-type: none"> <li><b>Technical Assistance and Training</b></li> </ul>	\$10 million	<ul style="list-style-type: none"> <li>Program Progress</li> </ul>	<ul style="list-style-type: none"> <li>Sufficient participation by subproject sponsors</li> </ul>

**(b) Contingent Components**

- EC network rehabilitation and reconstruction investment and TA \$6 million
- Grid expansion: 4,050 consumers served by ECs connected to the main grid \$2 million
- NEA restructuring (early retirement package) \$5.5 million

- Quarterly Reports EC, NEA and DOE reports
- EC and NEA reports
- Program Progress Quarterly Reports
- NEA Report

- Adequate and timely local counterpart funding

Program Progress Quarterly Reports

- Financially sound ECs willing and able to service debt-financed investment for grid expansion
- Government agrees to implement NEA financial recovery plan
- ECs commitment to the necessary change management
- Successful management of labor relations and staff are responsive to change
- PIUs of DBP & Land Bank are fully operational with appropriate staff and adequate funding



## Annex 2: Incremental Costs and Benefits

### Context and Broad Development Goals

Rural electrification is a flagship program of the Philippines Department of Energy (DOE), and is an important component — but by no means the only one — of the Government of Philippines' overall rural development efforts to alleviate poverty. The proposed program complement a range of ongoing and planned efforts, including projects to provide other infrastructure (notably roads and water supply), social facilities and other rural development support.

Over the past decade, significant progress has been made in the rural power sector. The electrification ratio has reached 100% for the municipalities/cities and about 77% for *barangays* (villages) in Electric Cooperative (EC) franchised areas. **As of April 2000, about 7,500 barangays – about 22% of all barangays – and about one-third of rural households – approximately 2.5 million households – do not yet have access to electricity.** Many of the non-electrified barangays are in remote areas, or with low sales density, in many instances, grid extension would not be viable. It is likely that even when all of the barangays have been electrified, about one million households will not have access to electricity either because of low affordability or because it would be uneconomic to extend grid service to them: *at present, there are more unelectrified households in barangays that have been electrified than in barangays that have not yet been electrified.*

The proposed program – an APL of 12-14 years duration – would support the government in meeting the needs of rural communities for adequate, affordable and reliable energy services in an efficient and sustainable manner. **The first phase (APL1) of the proposed program is focused on testing and demonstrating business models for sustainable decentralized electrification,** of which the successful ones would be replicated and scaled up during latter phases of the rural electrification program. In particular, during the first phase of the APL, new business approaches would be piloted to:

- bring in new players from the private sector to provide service to unelectrified barangays and households; and
- transform Electric Cooperatives (ECs) towards financial self-sufficiency over the longer term.

### Global objective

Philippines' Agenda 21 identified the promotion of renewable energy as a priority component of the country's global environment strategy. Its Climate Change action Plan endorses a gradual shift from the current fossil-dominated energy mix to one that involves greater use of renewable. The recently-completed UNDP/ADB/GEF Asia Least-Cost GHG Abatement Strategy (ALGAS) report and the outcomes of the UNDP/GEF PDF B Capacity Building Activity have both highlighted the crucial role of the energy sector in reducing Philippines' GHG emissions and have identified the promotion of renewable energy technologies as a priority component of the country's GHG abatement strategy.

This program would contribute towards the global objective of mitigating climate change caused by greenhouse gas (GHG) emissions through wider use of clean, renewable energy technologies in power generation. Due to the archipelago geography, – the Philippines comprises some 7,000 islands spread over 300,000 square kilometers – off-grid or mini-grid solutions are expected to be the least-cost solution

for about half of the non-electrified barangays. It is expected that environmentally friendly renewable energy technologies (RETs), particularly photovoltaic (PV) systems, small hydros and biomass power will be competitive in many off-grid and mini-grid applications, if market barriers to their adoption are significantly reduced.

## Renewable Energy Background

### (a) Renewable Energy Contribution in the Energy Mix

The Philippines power sector is heavily dependent on fossil fuels, with petroleum products (oil and coal) accounting for 57% of total energy consumption in 2000. New and renewable energy (NRE), excluding large-scale hydro power and geothermal, provide only about 30% of the nation's total primary energy (see Table 1). Of greatest significance are fuelwood for household and commercial use and in plant use of bagasse and coconut wastes for sugar and oil milling, respectively. Other renewables such as solar, wind and micro-hydro provide a very insignificant contribution in the energy mix.

**Table 1: Energy Mix in the Philippines (1999-2000)**

	<b>1999</b>	<b>Share</b>	<b>2000</b>	<b>Share</b>
	<b>Volume</b>	<b>(%)</b>	<b>Volume</b>	<b>(%)</b>
	<b>(in MMBFOE)</b>		<b>(in MMBFOE)</b>	
<b>Indigenous Energy</b>	<b>106</b>	<b>43.3</b>	<b>112</b>	<b>45.0</b>
Oil	0	0.1	0	0.1
Gas	0	0	0	0
Coal	4	1.6	4	1.6
Hydro	14	5.6	12	5.1
Geothermal	18	7.5	20	8.0
NRE	70	28.6	75	30.1
<b>Imported Energy</b>	<b>139</b>	<b>56.7</b>	<b>138</b>	<b>55.0</b>
Oil	122	49.8	113	45.4
Coal	17	6.9	24	9.6
<b>Others</b>				
<b>Total</b>	<b>245</b>	<b>100</b>	<b>249</b>	<b>100</b>

Source: DOE (Draft Philippine Energy Plan 2002-2011)

### (b) Potential and Status of Renewable Energy<sup>1</sup>

During the period 2001-2010, it is expected that there will be a rapid growth in energy use of about 60%. Forecasts predict that imported fossil fuels will still play a big role in the country's energy supply, but

<sup>1</sup> Source: DOE and UNDP/GEF Project Brief: "Philippines: Capacity Building to Remove Barriers to Renewable Energy Development" (Dated October 24, 2001).

there will also be additional extraction of indigenous fossil fuels like natural gas. It is also projected that during the same period, the average annual growth rate of NRE consumption is about 5.5%. By 2010, the estimated NRE consumption in the country is about 90.91 MMBFOE. Biomass fuels, mainly fuel wood, bagasse, rice hull and coconut residues; will continue to account for the largest share of the demand for NRE. However, the annual growth rate in consumption will be in the use of wind, solar and micro/mini-hydro, in that order.

The forecast increase in NRE consumption until 2010 is based on the expectation of accelerated development of large-scale NRE systems generally suited for grid connection. This however, is in contradiction to the current thrust on off-grid NRE system applications. The commercial technologies expected to provide this increase include micro-, and mini-hydro, solar, wind turbine generators and their hybrids. The total installed capacity to be provided by NRE during the next 10 years is expected to reach about 410 MW. The NRE resource potential in the Philippines is very good but to date exploitation of these resources has been limited. Table 2 summarizes the potentials for NRE in the country, based on resource assessments in 1998 carried out under the Wind Energy Mapping Project conducted by NREL (National Renewable Energy Laboratory) and the USAID-funded Philippine Renewable Energy Project.

**Table 2: NRE Potentials in the Philippines**

<b>Renewable Energy Form</b>	<b>Potential</b>	<b>Utilization</b>	<b>Gap</b>
Wind	76 GW	100 kW and about 368 operating wind pumps	75.9 GW
Solar	Unlimited (162 W/m <sup>2</sup> average solar radiation)	500 kWp and about 400 solar thermal installations	Unlimited
Micro-hydro	28 MW	500 kW	27.5 MW
Mini-hydro	1,780 MW	82 MW	1,698 MW
Biomass	150 MW (new installations)	Minimal	150 MW

Considering the current thrust of supporting off-grid NRE systems (in line with the goal of total electrification of all barangays in the country by end 2004), it is forecast that the total NRE consumption will rise modestly to 95.91 MMBFOE by 2010. The additional consumption considers the utilization of NRE in off-grid power and non-power applications. In this regard, the average annual NRE consumption growth rate would be about 8%.

### **(c) National Renewable Energy Priorities**

Economic growth with social equity and poverty alleviation is the macroeconomic goal of the Philippine Energy Plan (PEP). The PEP promotes energy as a major input to the process of achieving this goal since it opens up opportunities where economic activities may germinate and gain a permanent foothold. A basic tenet of the PEP is that electricity should be available nationwide to open up opportunities for income generation and the resulting poverty reduction. Both on-grid and off-grid areas must be electrified. Particularly for off-grid areas, electrification projects must be packaged with economic programs in coordination with relevant government agencies and sectors.

The national NRE policies are to:

- a) Pursue large scale use of NRE systems;
- b) Enhance energy self sufficiency through continuous exploration, development and exploitation of indigenous energy resources;
- c) Encourage greater private sector investment and participation in NRE activities; and,
- d) Promote NRE for off-grid electrification

#### **(d) Removal of Policy Barriers to Private Investment in NRE Projects**

A bill was proposed in Congress in 1999 entitled “*An Act to Further Promote the Development, Utilization and Commercialization of New and Renewable Energy Sources and for Other Purposes*” (referred to as the NRE Bill). It seeks to provide the needed incentives for the development of NRE sources, including biomass, solar, wind, geothermal, micro-hydro, and ocean energy, among others. Specifically, the NRE Bill proposes new policy measures that would address the market failure for NRE projects aside from other proposed institutional and financial incentives to encourage private sector investment. However, it is uncertain when this bill will be finally enacted.

In recent years, one of the major accomplishments of the DOE, through the USAID-National Renewable Energy Laboratory (NREL), in collaboration with the private sector and stakeholders, is the amendment of Executive Order 462 and the Energy Regulation 1-95 (IRR for E.O. 215). These two policies have been recognized as the most significant barriers to attract private investment into the NRE development and dissemination. The amendments made under EO 462 now EO 232 entitled "Enabling Private Sector Participation in the Exploration, Development, Utilization and Commercialization of Ocean, Solar and wind Energy Resources for Power Generation and other Energy Uses" was approved in 2000. Likewise, ER 1-95 will strengthen the NRE industry, allow meaningful private sector participation and investment in NRE development and deployment, demonstrate the government's serious commitment to accelerate the development and commercialization of NRE technology, among others. In addition, the Electric Power Industry Reform Act (EIRA) which was approved in June 2001 included promotion of renewable energy as one of the strategic objectives in the energy sector and related provisions include the equalization of the taxes and royalties applied to indigenous or renewable sources of energy vis-a-vis imported energy fuels.

#### **Proposed Rural Power Program**

##### **First phase (APL1)**

The **specific objectives** of APL1 are to<sup>2</sup>:

- initiate implementation of agreed reforms in the rural electrification subsector, including the opening up of unserved franchise areas to other players, restructuring of NEA and marginal ECs, rationalization of tariffs and subsidy policies, and the privatization of SPUG.
- test mechanisms to attract the private sector to invest in and/or provide electricity services to unserved rural areas, through innovative public/private partnerships;
- reduce market barriers of policy, information, institutional capacity and financing that hinder wider adoption of RETs in offgrid electrification, thus eventually contributing to global reduction of greenhouse gas (GHG) emissions in energy production; and
- prepare a bankable pipeline of projects for subsequent phases of the APL.

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<sup>2</sup> The detailed objectives and implementation modalities of APL2-APL4 will developed during the course of the implementation of prior phases.

**Decentralized Electrification.** Basic electricity services would be provided to households, public centers (e.g. schools, health clinics) and productive users *via* either isolated grids or individual systems such as solar home systems (SHS). The main approaches are:

- **Market “packages” for unelectrified barangays.** Selected barangays would be grouped into geographical packages with sufficient critical mass of potential consumers to make them commercially attractive to private sector firms, including established international firms that are involved in rural electrification programs in other countries. Electricity service would be provided to customers connected to an independent minigrid (or microgrid) system, powered by a centrally located diesel genset, a renewable energy system (hydro or others) or a hybrid diesel/RET system. While the program would favor market packages that are fully viable from a commercial standpoint, it is likely that in many instances (very low-income areas, difficult terrain) it would be necessary to provide “smart<sup>3</sup>” subsidies to attract participation by private sector investors and/or service providers. In APL1, six market packages comprising about 6,000 households would be developed; overall, in all phases, it is proposed to cover about 60,000 households. It must be noted that not all of the unelectrified households in each barangay could be feasibly connected to the minigrid system. A large number are normally highly dispersed and are best served by individual systems.
- **Solar home systems for dispersed users.** For dispersed households and other users (including unelectrified households in barangays already classified as “electrified”), the least cost solution to providing lighting, communication and other very basic services is solar PV. The program would make this technology available through the vendor approach, where competing private companies or NGOs offer a range of products – including PV battery charging stations where individual consumers could get their batteries charged on a per-use basis – to customers, supported by a system that provides financing and grants to eligible consumers and business development services to selected vendors. It is expected that in APL1 about 11,000 households would be served in this manner, with about 200,000 households to be covered in all the phases.

### **Barriers to renewable energy development and barrier removal strategy**

#### ***Experience with and proposed renewable energy initiatives***

Although many large and small-scale renewable energy projects have been carried out in the Philippines over the last two decades by both the public and private sectors (see below), commercialization of these technologies has proved elusive, and some efforts to promote them have distorted their markets and consumer expectations. Past projects have typically been donor-driven, short-term, sub-optimal in scale, and have lacked the financial and technical resources needed to achieve sustained growth and long-term viability.

There have been a number of **official initiatives** to promote renewable energy, but they have had limited success only.

- The first **Government initiative** to implement a program for renewable energy development was

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<sup>3</sup> Explicit and transparent subsidies, with an appropriate exit strategy, that increase affordability/commercial viability while retaining cost-minimization incentives, with disbursements linked, to the extent feasible, to targeted outcomes/outputs, not inputs

made in 1977 with the promulgation of **Presidential Decree 1068**. The decree created the Nonconventional Energy Development Program for research, development, and demonstration of New and Renewable Energy (NRE) technologies, to be administered by the Ministry of Energy (now the DOE). Shortly thereafter extensive and heavily subsidized attempts to commercialize dendrothermal power, biomass gasifiers, and small hydro were launched by agencies other than the Ministry of Energy, but all were unsuccessful and had to be abandoned.

- Over the past 20 years, less than 4,000 PV systems have been installed. Most of the projects were export-driven by donors without adequate provision for after sale service. Further, the small scale of investment contributed to significantly higher unit costs than in other countries in Asia with more commercial PV markets.
- In 1993, the government created the **Renewable Energy Power Program (REPP)**, which was designed to finance private power projects using solar, wind, biomass, and small hydro resources with a capacity of 200 kWe to 25 MWe. REPP encountered various difficulties and delays and was never successfully launched.
- A few renewable energy projects have been financed by the **Development Bank of the Philippines (DBP)** through its Window III, which is a concessional lending facility for socially desirable projects that are too risky for traditional banking facilities. Though many types of NRE projects could meet the loan criteria, so far the applications have been few. A UNDP/FINESSE project is now providing technical assistance to the DBP to revitalize the Window III program for renewable energy by improving the capability of DBP staff to identify and appraise NRE projects and by helping develop a solid project pipeline.

Several ongoing **public and private sector NRE activities** tend to be one-off types initiated because donor grant financing was available for specific projects or because of individual initiative. These include:

- Extensive use of **biogas systems** at the livestock farms, on individual initiative. Since the 1970s Maya Farms has been biodigesting the wastes from some 60,000 hogs and cattle, and using the methane produced for process heat and electricity. On a smaller scale about 500 other biogas systems are being used nationwide in private hog and poultry farms. This use of NRE was clearly a practical and economic choice for the farm owners, who felt no need to wait for government assistance or incentives.
- Some commercial establishments use **solar water heaters**, though most are not yet competitive.
- The first pilot **for-profit rural energy service company** was launched by Shell Solar and Community Power Corporation in the Philippines in December 1999.

Existing and proposed **donor-funded NRE projects** include:

- A **UNDP/GEF Renewable Energy Capacity Building Project**, the objectives of which are: a) capacity building of government agencies to formulate renewable energy policies; b) Renewable Energy information dissemination and public awareness; c) institutional strengthening to improve Renewable Energy coordination between concerned organizations; d) development of market strategy for utilization of renewable energy; e) support for renewable energy delivery mechanisms; f) identification of innovative financing schemes; and g) development of standards, specification, testing, and certification for the renewable energy industry in the Philippines.

- A **UNDP/FINESSE** project that is developing the Development Bank of Philippines' (DBP's) technical capability in the evaluation of NRE projects and generating a modest pipeline of NRE projects for financing *and* a UNDP/GEF medium-sized Palawan Alternative Rural Energy and Livelihood Support Project demonstrates the viability of the RESCO (Rural Energy Service Company) delivery mechanism of off-grid renewable energy systems and the economic benefits of renewable energy services for rural communities.
- **NEA's "pre-grid electrification" project**, launched in 1991 with grant financing from the German GTZ. The project installs individual solar home systems (SHS) in remote households nationwide. Implemented by the rural ECs it has to date installed about 2,000 units. Further, GTZ is proposing a project to demonstrate grid-connected wind turbine technology and formulate quality standards for solar energy systems and components.
- **USAID/NREL's Philippines Renewable Energy Project**, (\$1.5 million over two years), which is providing policy advice on power sector restructuring (Omnibus Bill) and NRE development and training in NRE planning software use.
- **Australian AID** is providing to the Philippines Municipal Solar Infrastructure Project almost US\$30 million to finance the installation of about 1,000 packaged photovoltaic (PV) systems in 390 barangays in the Visayas and Mindanao to provide power to public service centers and other community applications. The project is being executed by the Department of Interior and Local Government (DILG).
- The governments of **Spain and the Netherlands** are proposing to fund solar photovoltaic systems for both home lighting and community-based services and activities in selected rural areas.

These activities, and particularly the two UNDP/GEF projects, will help to accelerate the application of renewable energy technologies, particularly household PV systems. Nevertheless, **additional efforts are required to overcome the barriers to the commercialization and large-scale implementation of renewable energy technologies.**

### *Major barriers*

The program will complement ongoing and planned initiatives that address the following five barriers to sustained and scaled-up renewable energy development:

1. **Lack of adequate policy and institutional framework.** Promoting NRE on a significant scale will require substantial private sector investment, which, in turn, requires a supportive policy and regulatory framework to define the risks and rewards of these investments. This program will address the following key regulatory/policy/planning issues:
  - Creation of a level playing field between rural grid extension and off-grid market development, including incorporation of off-grid and mini-grid schemes into rural electrification plans, determination of subsidy policy for off-grid and mini-grid schemes vs. on-grid hookups (e.g. should subsidies be given to fee-for-service companies so that household monthly payments are the same as for grid-connected consumers?)

- allowing market-based tariffs for wireless electricity services and permitting fee-for service operations to attract private sector investors and service providers
- permitting private rural energy service companies to enter un-served EC franchise areas
- promotion of public/private co-investments for social and economic development
- establishment of national standards for renewable energy equipment
- expansion of market, financial and technology information needed by the private sector
- determination of appropriate subsidy policies in offgrid electrification, that foster urban/rural equity, provides adequate incentives for private sector entry into difficult and low-income areas

**2. Inadequate financing mechanisms for private sector renewable energy investments.** The program will develop these through local financial institutions and micro finance institutions (MFIs) and, in cases when they are reluctant to lend, a credit enhancement mechanism will be explored, including possible GEF partial credit risk guarantee to remove credit access barriers for the suppliers and consumers of rural energy services.

**3. Lack of well-established delivery models.** In this program, multiple delivery models (or variations or combinations thereof), which are needed to address the wide range of market situations throughout the rural areas of this vast country.

- Options to be developed and introduced will include dealer sales of equipment (with consumer financing), leasing operations, and “fee for service” rural energy service companies (RESCOs).
- Pre-investment analyses and support, technical and business assistance, and capacity building components will be developed to create an enabling environment to promote private sector participation and the skills and information required for the private sector enter new markets. These capabilities are already relatively strong in the micro hydro area but need to be augmented for other Renewable Energy providers.
- In areas where the geographical or market territory is not conducive to attracting private sector interest, or where resources such as micro-hydro are particularly attractive, program preparation and implementation may be performed by communities and NGO organizations (which are relatively strong actors in the Philippines). When required, this will include upstream program preparation assistance similar to that provided for the private sector participants.

**4. Lack of coordination with government-funded social and economic development infrastructure** (for schools, health clinics, potable water, telecommunications, community lighting, etc.). Bundling of these development with private sector services and coordinated with other government agencies responsible for these non-energy sectors will serve as an incentive to attract private service providers by increasing local market scale and revenue-generating service requirements, while providing more direct linkages between local rural development and productive uses.

**5. Lack of coordination mechanisms for multilateral and bilateral assistance.** The program will develop this to focus existing and future resource flows, maximize financial leverage, and facilitate long term, sustainable, and private sector development of NRE projects and services.

## The Baseline

The baseline for this program consists of the activities (listed above) being undertaken by the Government of Philippines in conjunction with external assistance. The implication is that in the baseline there will be little, if



any, private sector-led, commercially-oriented development and field implementation of renewable energy technologies in the rural areas, i.e., the large-scale potential for use of renewable energy technologies for decentralized rural electrification will be exploited only on a limited basis. As a result, the unelectrified rural consumers will continue to use fossil fuels – diesel, kerosene, dry cell batteries, and batteries charged by conventional AC power – to meet their energy needs, with attendant greenhouse gas (GHG) emissions.

## The Alternative (The Program)

The focus of the APL is to promote decentralized rural electrification, using renewable energy technologies where appropriate. This will consist of :

- (i) off-grid power generation, using a variety of renewable resources, including technologies that are readily applicable in the Philippines in the near future, as well as those that may become applicable during the course of the APL. Efforts will be made to promote renewable energy power generation where renewable power is the only or main source, i.e., for small independent grids, as well as where it complements existing generation sources, i.e., sale of power into existing diesel-based grids; and
- (ii) standalone systems, such as solar home systems (SHS).

In order to achieve a large programmatic impact, going beyond the investments supported by the proposed program, the overall approach, consistent with GEF Operational Program 6, is to reduce the barriers constraining commercially-oriented renewable energy development. As a result, a significant proportion of unelectrified rural consumers will *switch from fossil fuels to renewable energy resources* to meet their energy needs, with *attendant reductions in greenhouse gas (GHG) emissions*.

## Incremental Cost Summary

With regard to the GEF-related components of the proposed program, the baseline and GEF alternatives are described below:

### Investment Component 1 – Off-grid renewable energy power generation

In the **Baseline case**, there are two possible activities: *one*, in some locations, the rural consumers would not receive any conventional AC power, and would continue to use kerosene/battery-based systems for lighting and battery-based systems, and *two*, in other locations, the rural consumers would receive conventional AC power from fully-diesel based grids.

In the **GEF Alternative**, the power supply would be from either fully renewable energy based generation or from hybrid systems in which diesel-based generation has a secondary role to play. As indicated above, the renewable technologies to be supported would depend upon the location as well evolving local and international developments in various renewable technologies. In every case, the renewable energy technology supported would be the least-cost renewable option, taking account of the differences in the degree of the maturity and reliability.

The economic costs of the GEF-supported independent mini-grids will depend upon technical site-specific factors, the scale of the system, the least-cost renewable energy technology, expected international trend of cost decline. In addition, the baseline economic costs will also depend upon a different set of site-specific factors. In other words, for independent grids, the incremental costs will vary according to site, technology and timing. For this reason, it is appropriate to develop a set of *per kW* “generic” incremental cost estimates that would be applicable, on average, to the specific site-projects as they are developed. Based on the available data for the market packages to be included in APL1, it is estimated that the average incremental cost, based on a net present value basis, of decentralized renewable energy power generation is about \$600 per kW at present, and that it would decline over time to about \$250 per kW during APL4.

**Table 3. Summary table for off-grid power generation**

	<b>APL1</b>	<b>APL2</b>	<b>APL3</b>	<b>APL4</b>	<b>Total</b>
Installed kW all types	3,000	4,500	9,000	13,500	30,000
No. households served, all types	6,000	9,000	18,000	27,000	60,000
<b>Installed kW RET/hybrids</b>	300	750	1,500	2,450	5,000
Ave. GEF grant, \$/kW	600	500	375	250	
Total GEF grant, \$ millions	0.18	0.38	0.56	0.61	1.73
Total Investment all types, \$ millions	6.6	9.9	19.8	29.7	60.0

### Investment Component 2 – Solar PV systems

In the **baseline case**, the rural consumers would use a combination of kerosene for lighting, dry battery cells for mobile lighting and radios, and some battery charging for appliances such as black-and white TV sets. In the **GEF alternative**, the consumers would switch to SHS.

As in the case of independent grids, the incremental costs of SHS are also expected to vary by location – regional differences as well differences between electrified and unelectrified barangays –scale of the system, and timing. At the same time, it is increasingly common practice in World Bank-GEF supported projects to provide GEF grants for SHS on a simplified administrative basis, e.g., a uniform grant for all the regions, frequently denominated a *per Wp* basis.

Based on the available data for the market packages to be included in APL1, it is estimated that the average incremental cost, based on a net present value basis, is about \$ 2/Wp; this is similar to estimates developed for neighboring Asian countries such as Indonesia. Further, it is expected that the incremental cost would decline over time to about \$ 0.5 per Wp during APL4 (see Table 3 below for an illustrative example).

<b>Table 4 PV Installation and Trend in Cost and GEF Support</b>				
			In Constant Year 2001 \$	
	Number	MWp	Average Cost (\$/Wp)	GEF Grant (\$/Wp)
APL1	11,000	0.4	12.7	2.0
APL2	39,000	1.5	10.9	1.8
APL3	61,000	2.8	9.6	1.2
APL4	89,000	5.0	8.6	0.5
	200,000	9.7	9.4	1.0

The proposed GEF grant would be leveraged with government subsidies and consumer financing to make the PV systems affordable to rural households. Government subsidy policy for the rural electrification, currently being developed with the assistance of consultants, will define how this overall subsidy is going to be channelled in terms of price support to the individual systems, that is the “20 Wp” (15-25 WP); “40 Wp” (33-45 WP); and “60 Wp”(50-65 WP). It is expected that the government’s subsidy policy will award price support to the systems according to their expected price elasticity of

demand, thereby achieving maximum impact in terms of market expansion. It is, therefore, expected that the subsidy to the smallest system, in terms of subsidy per Wp will be much higher than for the larger systems.

With support to capacity building and business development support provided by the program to participating companies and financial intermediaries, it is expected that about 0.4 MWp of SHS capacity would be installed during APL1, with an incremental cost of about \$0.7 million; this capacity would serve about 11,000 consumers. Overall, during all the phases, about 10 MWp of such capacity would be installed, with an aggregate incremental cost of about \$ 9.6 million, and about 200,000 total consumers.

**Table 5. Solar PV Estimated Investments (in US Million \$)**

	No. Consumers	MWp	Consumer Down Payments	Govt Subsidy	GEF Grant	Consumer Loans & Incremental Working Capital of Dealers	Total Cost
APL1	11,000	0.4	1.5	1.6	0.7	1.6	5.4
APL2	39,000	1.4	5.6	4.6	3.1	8.6	21.8
APL3	61,000	3.0	9.1	5.8	4.2	19.2	38.4
APL4	89,000	5.0	14.1	7.1	3.7	40.1	65.1
<b>Total</b>	<b>200,000</b>	<b>9.8</b>	<b>30.3</b>	<b>19.1</b>	<b>11.8</b>	<b>69.6</b>	<b>130.8</b>

### **Investment Component 3 – Partial Risk Guarantee Fund**

One of the key barriers for renewable energy development is the lack of adequate commercial debt finance. This has already been recognized in the proposed UNDP-GEF project, which includes a Loan Guarantee Fund, but does not cover solar PV; this forms the **baseline** for this program. In the **GEF alternative**, it is proposed to develop a partial risk guarantee fund that is expected to focus on solar pv under the APL1. During subsequent phases of the APL, successful pilot schemes for non-solar RETs emerging from the UNDP-GEF project would be replicated. Given the relatively innovative nature of this fund, its nature and scope will be developed during the course of further program preparation as well as first few months of program implementation. It is proposed to set aside \$ 3.4 million for this fund over the entire APL, with \$ 1.0 million each during APL1-3, and \$ 400,000 in APL4. In case, these resources are not utilized during APL1-APL3, the funds will be used during APL4 to provide investment support for further renewable energy development.

### **Technical Assistance Component**

There are five entities which must play key roles in order to stimulate large-scale, commercially-oriented renewable energy development in the Philippines: the Department of Energy, National Electrification Administration, Energy Regulatory Commission, financial institutions such as the Development and Land Banks of the Philippines as well commercial banks, and potential private sector providers. In the **baseline case**, these agencies, particularly the government agencies, will receive some capacity building support from a variety of sources. Along with the counterpart funds of these agencies, it is estimated that a total of about \$5 million (excluding support under UNDP/GEF capacity building project) will be spent for capacity building and other technical assistance activities over the full APL period.

It is recognized that UNDP/GEF project “*Capacity Building To Remove Barriers To Renewable Energy Development In The Philippines*” will to strengthen the capability of the Philippine renewable energy sector in developing renewable energy, in general, through various capacity building activities. The proposed program is complementary to the UNDP/GEF project that aims to strengthen the capability of the Philippine renewable energy sector in developing renewable energy, in general, through various capacity building activities. Specifically, the full UNDP/GEF project components include: a) strengthening the capacity of the GOP agencies to enact and implement sound new and renewable energy (NRE) policies; b) providing information for targeted audiences to build an NRE market; c) creating a "one-stop-shop" market service center for preparing and promoting NRE projects; d) increasing coordination among organizations concerned with NRE; e) improving the quality of NRE technologies and systems through assistance with standard setting; and f) assisting the market penetration of NRE in remote, off-grid communities by providing incentives for innovative market delivery and financing mechanisms. Specifically, the UNDP/GEF project has identified three financing mechanisms for NRE projects that will be demonstrated as effective means of overcoming barriers namely, program preparation fund, loan guarantee fund and micro-finance fund. These mechanisms are intended for non-solar energy systems such as biomass, micro/mini-hydro and wind. The Dutch government under the “Environmental Improvement for Economic Sustainability” (EIES) project shall co-finance the funding of solar energy projects. The EIES project intends to install 15,000 solar home systems (SHS) in Regions I, II and CAR. On the other hand, the proposed WB/GEF program targets to serve 200,000 households nationwide through SHS at the end of APL. Further, the proposed GEF support for technical assistance and training under the Rural Power Program focuses bridging the skill gaps critical for the design and implementation of the policies and investments to be supported under the APL.

**Table 6: Comparisons of the proposed GEF support with the UNDP/GEF Project**

WB/GEF Capacity Building Components	Complementation with UNDP/GEF Project
<p>Policy Development and Planning</p> <ul style="list-style-type: none"> <li>■ Policy studies in subsidy, regulation, tariff with respect to off-grid services</li> <li>■ Integration of renewable energy into the Missionary Electrification Development Plan</li> </ul>	<ul style="list-style-type: none"> <li>■ The UNDP project shall cover policy studies on electricity policy, electricity pricing, and power generation market. These three policy studies are intended for on-grid applications of renewable energy. WB/GEF focuses on off-grid services.</li> <li>■ Not covered by UNDP/GEF project.</li> </ul>
<p>Institutional Strengthening</p> <ul style="list-style-type: none"> <li>■ Improve ERC’s regulatory function for min-grid/off-grid services</li> </ul>	<ul style="list-style-type: none"> <li>■ Not covered by UNDP/GEF. WB/GEF shall focus on tariff setting, renewable energy service model for off main grid,</li> </ul>

WB/GEF Capacity Building Components	Complementation with UNDP/GEF Project
<ul style="list-style-type: none"> <li>■ Livelihood/productive uses promotions (partnership with local government units)</li> <li>■ Feasibility studies/market package preparation TA</li> </ul>	<p>monitoring and compliance with standards, due diligence for issuing operating licenses, conditions/guidelines/standards for granting operating licenses.</p> <ul style="list-style-type: none"> <li>■ Complements well with the UNDP/GEF's component on NRE Advocacy and Promotion.</li> <li>■ Not covered by UNDP/GEF.</li> </ul>
<p>Capacity Building</p> <ul style="list-style-type: none"> <li>■ NEA/EC</li> <li>■ GFI, MFI, CFI</li> <li>■ Solar PV Companies</li> </ul>	<ul style="list-style-type: none"> <li>■ WB/GEF covers contract management, supervision capacity enhancement, etc. which are essential for the opening up of unserved EC franchised areas to new players for the mini-grid/off grid component. Not covered by UNDP/GEF.</li> <li>■ UNDP/GEF covers the capacity building of GFIs, MFIs and CFIs in areas of project financing, rural electrification and project appraisal. The WB/GEF program focuses on technical appraisal of subprojects to be financed under the APL.</li> <li>■ Intended for solar energy companies. Capacity building activities shall focus in the areas of business/market development, technology support and financial planning . Not covered by UNDP/GEF</li> </ul>

Source: DOE

In the **GEF alternative**, such supporting activities crucial to the successful implementation of the various program components would be expanded substantially, with a total cost estimated to amount to about \$14 million over the full APL period. The incremental cost would be about \$13 million, of which about \$8 million is expected to be utilized in APL1 alone (see Table 7).

<b>Table 7. Technical Assistance: RET Market Barrier Reducing Activities</b>							
<b>Components</b>	<b>Total</b>	<b>Baseline</b>	<b>GEF</b>	<b>APL1</b>	<b>APL2</b>	<b>APL3</b>	<b>APL4</b>
<b>Department of Energy (DOE)</b>							
<b><i>Policy Development and Planning</i></b>							
o Policy Support (Policy Studies in subsidy, regulation, tariff with respect to off-grid services)	0.70	0.20	0.50	0.50	0.20	0.00	0.00
o Integration of Renewable Energy into the Missionary Electrification Development Plan	0.25	0.05	0.20	0.25	0.00	0.00	0.00
<b><i>Implementation Support</i></b>							
o Renewable Energy Program management support	1.40	0.10	1.30	0.55	0.30	0.25	0.30
o Project Subsidy Fund Allocation and Compliance	1.05	0.05	1.00	0.45	0.30	0.20	0.10
o Due diligence for market packages and solar PV businesses	0.45	0.05	0.40	0.25	0.10	0.10	0.00
o Monitoring and Evaluation	0.80	0.10	0.70	0.35	0.25	0.10	0.10
o Contingency Fund Set up and Administration	0.80		0.80	0.35	0.25	0.10	0.10
<b><i>Institutional Strengthening</i></b>							
o Improve ERC's regulatory function for off-grid services - capacity building for regulator (tariff setting, renewable energy service model for off-grid, monitoring/compliance with standards, due diligence for issuing operating licenses, conditions/ guidelines/standards for getting operating licenses)	0.60	0.10	0.50	0.60	0.00	0.00	0.00
o Livelihood /productive uses promotions (partnership with local govt units)	0.90	0.10	0.80	0.60	0.30	0.00	0.00
o New Market Package Preparation TA	2.50	0.10	2.40	1.20	1.30	0.00	0.00
<b><i>NEA and ECs</i></b>							
o Capacity Building and Technical Support for NEA/EC (Contract Management, Supervision capacity enhancement etc.)	1.10	0.10	1.00	1.10	0.00	0.00	0.00
o Monitoring and Evaluation	0.05	0.05		0.05	0.00	0.00	0.00
<b><i>DBP and LBP Support and PMO-managed TA</i></b>							
o Technical appraisal of RET subprojects	1.50	0.05	1.45	0.80	0.40	0.20	0.10
o Capacity Building for GFI, MFI, CFI	1.05	0.05	1.00	0.55	0.40	0.10	0.00
o Capacity Building for Solar PV Companies	1.00		1.00	0.50	0.40	0.10	0.00
<b>TOTAL TECHNICAL ASSISTANCE COST</b>	<b>14.15</b>	<b>1.10</b>	<b>13.05</b>	<b>8.10</b>	<b>4.20</b>	<b>1.15</b>	<b>0.70</b>

\*Baseline costs include funds from the Government, local private sources, existing bilateral funds and funds from the Bank loan.

Table 8: Incremental Cost Matrix

	Baseline	Alternative	Increment
<b>Domestic Benefits</b>	Rural and off-grid market grows, albeit slowly, and primarily with diesel  Limited development of private power and PV business models or acumen.	Stimulation of business entry into private power service for grid and isolated applications.  Energy costs decline and availability improves, with linkages to productive use applications	Barriers (information, first cost, etc.) to commercial development removed.  Successful demonstration of a wide range of alternative technologies and business approaches.  Technology improvement that benefits renewable energy producers and enhances competition with diesel sources.
<b>Global Environmental Benefits</b>	None, rural energy development relies primarily on diesel and unsustainable use of traditional fuels w/ low efficiencies	Significant offset of GHG emissions through range of renewable technology options,.	500,000 t of carbon avoided  Cost reduction for range of technologies in rural developing country setting and long-term programmatic APL strategy demonstrated.
<b>Cost by Component (million US\$)</b> <b>Phase 1</b> C1 – Off-Grid C2 – Solar PV C3 – Guarantee Fund. Monitoring & Evaluation TA /Capacity Building <b>Subtotal Phase 1</b>  <b>Phases 2-4<sup>1</sup></b> C1 – Off-Grid C2 – Solar PV C3 – Contingency Fund. Monitoring & Evaluation TA/Capacity Building <b>Subtotal Phases 2-4</b>	  6.40 4.70 0.00 0.10 0.10 <b>11.30</b>   59.70 112.3 0.00 0.25 0.25 <b>172.5</b>  TA/Capacity Building	  6.60 5.40 1.00 0.50 7.80 <b>21.30</b>   61.40 124.10 2.40 1.00 3.60 <b>192.50</b>	  0.20 0.70 1.00 0.40 7.70 <b>10.00</b>   1.70 11.80 2.40 0.75 3.35 <b>20.00</b>
<b>GEF Incremental Cost</b>	<b>183.80</b>	<b>213.80<sup>2</sup></b>	<b>30 (APL Total)</b>

Notes:



<sup>1</sup>These are indicative estimates. Incremental costs for Phases 2-4 will be calculated during preparation of these phases and will be subject to GEF Secretariat review and approval.

<sup>2</sup>Totals are for renewable energy investments only and do not include other program investments. Therefore, these totals are a subset of total program cost.

**Mainstream Financing** – World Bank funds, Government funds, and increasingly by the local private investment – cover the bulk of the significant investment costs of the program, which represents a high level of financial leverage for GEF funds. GEF support is on a declining basis over time.

**Possible Use of Non-Grant Modalities.** The program includes a Contingent Grant Fund for solar pv investments (other renewable energy investments will be covered under a UNDP project). The details of the functioning of this Fund will be determined during the course of further program preparation, and possibly in the first few months of implementation.

## **Benefits**

**Global Environmental Benefits.** Based on conservative capacity factors for off-grid renewable energy power generation, the estimated annual carbon displacement comes to about 1,000 tons per MW-year, or 30,000 tons of carbon per MW over a 30 year life. For the 5 MW in the APL, this comes to 154,000 tons carbon. Similarly, one watt of solar capacity installed should displace about 8.5 kg of carbon dioxide over a 15 year lifetime, resulting in estimated displacement of about 346 tons overall. This leads to a carbon displacement of about 500, 000 in the program.

**Domestic Benefits.** The domestic benefits will accrue to households and small and medium enterprises (SMEs) that are directly served, whether by independent grids or solar pv systems. Further, indirect domestic benefits will also flow to households who receive improved service from public institutions such as health clinics and schools that will be served under this program. The estimates of the SMEs served directly in this manner as well the indirect benefits accruing from public institutions will be developed during program preparation, particularly as the details of the market packages are developed.

International as well as local experience indicates that the financial viability of renewable energy projects increases considerably when SMEs and public institutions become consumers, they usually provide daytime load, which complements the evening household demand. Further, the SMEs ability to pay is usually higher than that of households; this is also the case for public institutions, provided the energy services provided are sufficiently reliable and support high-value activities.

In other words, the accrual of domestic benefits is a key element of the sustainability of programs whose focus is global environmental considerations. However, it is clear that promotional efforts are required for the SME benefits to realized, and close collaboration is required with public institutions for their benefits to be realized – both of these aspects are provided for in this program.

## **Sustainability**

One of the key factors promoting sustainability in this program is the focus on private-sector led commercially-oriented renewable energy development, while utilizing judiciously designed subsidies to take account of relatively lower rural incomes and affordability. The private sector's interest in cost reductions – to increase their profits – increases the sustainability of the long-term development program, while appropriate technical standards ensure the consumers get adequate and appropriate service. These cost reductions can result from market aggregation, which lowers the transaction costs for each installed PV systems, increases the procurement leverage of companies providing rural PV equipment and services and lowers the unit costs for maintenance, repair, and replacement. Such aggregation is one of the central objectives of the proposed program

The phasing strategy of the APL also enhances the sustainability of the program. The relatively slow start in terms of investment in APL1 provides an opportunity for field-testing and fine-tuning the business models for scale-up in APL2-APL4, when the investments would be larger. Further, the GEF grants for both investment and technical assistance have been designed with a declining trend, so that the reliance on external support declines over time.

### **Monitoring and Evaluation, and Dissemination**

Monitoring and evaluation toward the GEF objectives would be coordinated to the maximum extent with the overall APL monitoring and evaluation. GEF-specific indicators, such as market prices and penetration, number of active entrepreneurs, and quantity of installed systems and power generated, will be incorporated into the monitoring and evaluation plan during program preparation. Dissemination of program results will be accomplished through regular reporting as well as contributions to international conferences and other such fora.

The Department of Energy – specifically, the Program Management Office – will be responsible for monitoring the GHG mitigation and development impacts of the program. The DBP and LBP will be monitoring the loans that they will be giving to ensure that funds are used in accordance with agreement

### Annex 3: GEF STAP REVIEW and RESPONSE

From: Daniel M. Kammen

Re: Review of Philippine Rural Power Program (P066397)

*Summary:*

This program addresses critical market and government commitment issues in the area of clean, renewable energy for rural development. The program should be initiated, but subject to close review and monitoring. Each of the concerns about the program listed below relates to the level of political commitment and planning to make this program successful. The overall high (H) risk rating for the program (page 30) reflects this situation. It is recommended that this program be overseen by a government-NGO-community-external advisory group to monitor progress and enforce the loan guarantees whereby funds for subsequent stages will *not* be released until successful implementation of earlier stages is completed.

*Major Comments:*

Page 1: It is not specified how the APL tranches, expected to last 12 – 14 years, will interface with the stated government policy to electrify 100% of the barangays by 2006. These policies should be harmonized to minimize the political tension and public expectation that are likely to arise with such different targets for the two efforts. [Footnote2 on page 4 highlights the extent to which 100% electrification has been a political *moving target* in the Philippines for well over a decade. The problems associated with this sort of rolling goal have been significant – resulting in lack of political traction, lack of private-sector effort, and the public becoming increasingly disillusioned about government capacity and the technologies (e.g. RETs) to meet these lofty goals. The APL would appear to be the ideal mechanism to enter into discussions with the Philippine government to place a realistic timetable of these goals, and then to use the loan to find ways to achieve these targets. The text in this program document make it clear that 100% electrification by 2006 is unrealistic<sup>4</sup>. The key performance indicators (Annex 1), for example, could be used to tie program funding to ongoing political commitment to the target of X% electrification by a specified date.

The program implicitly focus largely on one technology, photovoltaics, is not a good match to the broad development policy goals articulated by the government and reflected in the policy plan (Section 1) of the program brief. This program features mainly PV installation, with only some recognition of the potential for wind and biomass energy in the RET/diesel or RE-RET hybrid systems to provide potentially far greater amounts of decentralized energy at far lower cost. This is illustrated throughout the proposal (e.g. Section 1a, page 5, page 54, PV Companies/NGO; the *lack* of discussion of wind in Annex 4, page 2, past actions of the **NRE**). Research and field pilot projects by both the Asian Institute of Technology and the National Renewable Energy Laboratory (NREL) have explored the wind energy resource base for many rural Philippine barangays. The minigrid components (page 13ff) do provide a natural unit for investment and support, and also provide the natural unit for analysis of *least cost* renewable energy options across all technologies. As an example, the results of the 100 barangay survey recently conducted (page 39) should be included to reflect the anticipated mix of RET technologies to be included in the program.

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<sup>4</sup> According to the project document (page 6), as of end-2000, 23% of barangays and 33% of households in rural areas do not have access to electricity. Has there been a four year period at any time in the past when that number of barangays has been electrified?

The solar credit line (page 14ff) is an example of an excellent mechanism that should be broadened to include other RET systems. Small wind turbines, for example, fit naturally into this financing scheme, and have proven successful in applications in Mongolia, Namibia, and much of South America.

Page 8ff: The recognition and reliance on franchise areas to implement electrification – a sensible route given the distributed nature and likely low initial market demand in many rural areas – raises a concern over the focus on PV. Rural franchises become the *de facto* utility in these areas (which are likely to be primarily EC Type C and D, page 8). A least cost energy strategy is therefore essential to ensure profitability of these utilities while providing least cost power to consumers. Clearly wind and biomass energy will in many cases be the least cost option, or a component in a least-cost hybrid system.

Page 12: The first and second strategic choices identified are sound, but need to be coupled more closely to the working plans for the APL.

Page 14ff: (2) Technical Assistance Component. Recent experience strongly indicates (e.g. Duke, *et al.*, 2002) that RET market expansion and support must involve capacity building and training for renewable energy entrepreneurs. A clear – and public – plan should be developed to provide this training, access to capital, advertising support, etc ... so that the RET industry can be facilitated across the Philippines. The Philippine Rice Research Institute and IRRI have extensive experience in agricultural extension. A similar energy extension network is recommended for support under this program. These programs are consistent with the ‘Urgent Reform Actions’ listed on page 18/19.

Page 20 & 26: the NGO partnership section is perfunctory. A more extensive and expanded plan for this dialog and collaboration is needed.

Page 27: Given the rural nature of this program, now can indigenous peoples not be directly consulted and involved?

#### Analysis of incremental cost (Annex IV):

Table 1, page 7: a breakdown of the components (expected wind, solar, biomass, etc ...) of the hybrid systems should be included.

Page 11: without a clear commitment to non-PV RETs this Incremental Cost Matrix is clearly not a least cost clean energy program.

#### *Minor Comments & Clarifications:*

The prose used in the document is in some places needlessly ornate (e.g. Page 11, “The implication is that it is not impossible...”).

Page 1 & 4: the term ‘*pro-poor* flagship program’ should be changed.

Page 10: The discussion of the proposed, versus *expected*, changes in NEC function over the next five years is not clear.

Page 12, rural areas where electricity demand is expected to be low are termed 'non-viable'. This is an unfortunate term which does not reflect the *evolution* of rural energy markets.

Page 14, Technical Assistance Component. Here again is a place where explicitly mentioning the technologies to be supported would send clear signals that a range of RETs will be supported.

Table on page 15: No indication is given if this is an illustrative calculation, or a development plan based on analysis.

Page 16: What is the evaluation/selection process for barangay selection? Ideally this will be a resource analysis, mini-grid planning/evaluation, and identification of a private-sector firm to undertake the installation, system maintenance and expansion over time.

Page 25: Section blank: Issues Requiring Special Attention 1. Economic; 3. Technical.

Page 25: The RET technology procurement process, and the overall program goals, would be greatly facilitated if the Government of the Philippines would commit to a specific plan for state purchase of solar, wind and other RET systems for government installations. The bulk purchasing power and the stability this would provide to the market would expand the RET market more than any other single measure.

Page 36: the program reports are probably not sufficiently extensive or public to be useful to an external advisory committee. A more extensive reporting and review program for this program is recommended.

Annex 3: the *Solar Credit Line for Rural Electricity Services* does not specify how new companies will be encouraged, facilitated, and overseen to both enter and function well in the rural markets.

#### *References:*

**Duke, R.D., Jacobson, A., and Kammen D.M. (2002), "Product Quality in the Kenyan Solar Home Systems Market," in press, *Energy Policy*.**

Available online at: <http://socrates.berkeley.edu/~rael/qualityshs.pdf>

**Kammen, D. M., Bailis, R., and Herzog, A.V. (2001) "Clean Energy for Development and Economic Growth: Biomass and Other Renewable Energy Options to Meet Energy and Development Needs in Poor Nations," UNDP report for the 7th Conference of the Parties to the UN Framework Convention on Climate Change (COP7-UNFCCC): Marakech, Morocco (October 29 - November 9), 111 pages, in press.**

Available online at: [http://socrates.berkeley.edu/~rael/RAEL\\_UNDP\\_Biomass\\_CDM.pdf](http://socrates.berkeley.edu/~rael/RAEL_UNDP_Biomass_CDM.pdf)

**RESPONSE TO  
COMMENTS ON DRAFT GEF PROGRAM BRIEF FOR PHILIPPINES RURAL POWER PROGRAM  
BY:  
DANIEL M. KAMMEN**

	Comment	Response
	<i>Summary:</i>	
1	This program addresses critical market and government commitment issues in the area of clean, renewable energy for rural development. The program should be initiated, but subject to close review and monitoring. Each of the concerns about the program listed below relates to the level of political commitment and planning to make this program successful. The overall high (H) risk rating for the program (page 30) reflects this situation.	We agree that the program should be closely reviewed and monitored, but would like to make it clear that the Government of Philippines and the Bank are both fully committed to supporting all renewable energy technologies (RETs) appropriate for off-grid utilization in the Philippines.
2	It is recommended that this program be overseen by a government-NGO-community-external advisory group to monitor progress and enforce the loan guarantees whereby funds for subsequent stages will <i>not</i> be released until successful implementation of earlier stages is completed.	<p>The establishment of an external monitoring group will be discussed with the Government. However, in terms of accountability, the DOE is responsible for overseeing the policy and the overall rural electrification program, and the borrowers of the Bank loan are responsible for the management of the loan funds.</p> <p>Under that Adaptable Program Loan (APL) procedures, trigger conditions are set for moving from one phase of the APL to the next. These trigger conditions will be defined during program preparation and agreed to with the borrower. Approval to implement a subsequent phase of an APL requires the substantial attainment of trigger conditions of the prior phase of the APL. The Bank supervision missions will monitor the attainment of trigger conditions and in consultation with the government will trigger the implementation of subsequent phases under new loan and grant agreements.</p>
	<i>Major Comments:</i>	
3	Page 1: It is not specified how the APL tranches, expected to last 12 – 14 years, will interface with the stated government policy to electrify 100% of the barangays by 2006. These policies should be harmonized to minimize the political tension and public expectation that are likely to arise with such different targets for the two efforts. [Footnote2 on page 4 highlights the extent to which 100% electrification has been a political <i>moving target</i> in the Philippines for well over a decade. The	<p>The program is part of the overall Rural Electrification Program in the country. It should be noted that even with 100% electrification at the barangay level, about one million households will remain unserved. The program will establish triggers that measure performance in providing electricity services to households rather than electrification at barangay levels.</p> <p>The long term horizon of the APL is expected to cover 100% electrification at the household level. The goal is to</p>

	Comment	Response
	<p>problems associated with this sort of rolling goal have been significant – resulting in lack of political traction, lack of private-sector effort, and the public becoming increasingly disillusioned about government capacity and the technologies (e.g. RETs) to meet these lofty goals. The APL would appear to be the ideal mechanism to enter into discussions with the Philippine government to place a realistic timetable of these goals, and then to use the loan to find ways to achieve these targets. The text in this program document make it clear that 100% electrification by 2006 is unrealistic. {footnote : According to the program document (page 6), as of end-2000, 23% of barangays and 33% of households in rural areas do not have access to electricity. Has there been a four year period at any time in the past when that number of barangays has been electrified?}</p> <p>The key performance indicators (Annex 1), for example, could be used to tie program funding to ongoing political commitment to the target of X% electrification by a specified date.</p>	<p>electrification at the household level. To accelerate rural electrification, the government has recognized the need to encourage qualified new players to enter the rural electricity delivery market and this is provided under the newly approved Electric Power Industry Reform Act (EIRA). The program would support reform and investment in the rural power sector, including implementation of the above provision in the EIRA.</p> <p>The advantage of the APL instrument is that it is performance-driven. The implementation time frame can be adjusted to match progress within the program and that in complementary/parallel undertakings.</p>
4	<p>The program implicitly focus largely on one technology, photovoltaics, is not a good match to the broad development policy goals articulated by the government and reflected in the policy plan (Section 1) of the program brief. This program features mainly PV installation, with only some recognition of the potential for wind and biomass energy in the RET/diesel or RE-RET hybrid systems to provide potentially far greater amounts of decentralized energy at far lower cost. This is illustrated throughout the proposal (e.g. Section 1a, page 5, page 54, PV Companies/NGO; the <i>lack</i> of discussion of wind in Annex 4, page 2, past actions of the <b>NRE</b>). Research and field pilot projects by both the Asian Institute of Technology and the National Renewable Energy Laboratory (NREL) have explored the wind energy resource base for many rural Philippine barangays.</p>	<p>The program is technology neutral and will support all RETs suitable for off-grid applications in the Philippines. This point has been strengthened and made clearer in the revised GEF Program Brief and will be further expanded upon in the Project Appraisal Document (PAD). Any implication that the program favors a technology was inadvertent and will be removed. Insofar as the Partial Risk Guarantee Fund is concerned, the APL1 is expected to focus on solar PV. During subsequent phases of the APL, successful pilot schemes emerging from the Loan Guarantee Fund for non-solar under the UNDP/GEF Project will be replicated.</p> <p>With respect to the issue raised that “the RET/diesel or RE-RET hybrid systems to provide potentially far greater amounts of decentralized energy at far lower cost,” please see (7) below.</p>
5	<p>The minigrid components (page 13ff) do provide a natural unit for investment and support, and also provide the natural unit for analysis of <i>least cost</i> renewable energy options across all technologies. As an example, the results of the 100 barangay survey recently conducted (page 39) should be included to reflect the anticipated mix of RET technologies to be included in the program.</p>	<p>There is substantial ongoing preinvestment work (funded by PHRD and GEF PDF B grants) that is investigating technical, economic and financial viability of RET and RET-diesel hybrids in mini-grid configurations. These include mini-hydro, biomass power, wind and other RETs.</p> <p>Once these studies are completed, the PAD will have a more comprehensive discussion of all viable options. As noted previously, the program design is technology</p>



	Comment	Response
		<p>neutral.</p> <p>In addition, significant GEF TA funds (~\$2.5 million) will be reserved and used during program implementation for examining such options and developing bankable investment projects. In addition, successful pilots and demonstrations emerging from the UNDP/GEF project and through other support will be eligible to seek funding through this program.</p>
6	The solar credit line (page 14ff) is an example of an excellent mechanism that should be broadened to include other RET systems. Small wind turbines, for example, fit naturally into this financing scheme, and have proven successful in applications in Mongolia, Namibia, and much of South America.	Discussions with industry and other interested parties in the Philippines indicate that initially the demand is likely to be for solar PV and mainly for direct sales. Nevertheless, the terms and conditions of the credit line allow other RETs and service delivery modes (direct sales, fee-for-service etc.) to be supported under the credit line. Consultations with the RET industry, and further market assessments will be conducted to determine the candidate technologies and service delivery vehicles that are likely to be demanded. Further, broadening/changing the scope of the credit line will be examined during the mid-term review of Phase 1 as well as in subsequent phases of the APL.
7	Page 8ff: The recognition and reliance on franchise areas to implement electrification – a sensible route given the distributed nature and likely low initial market demand in many rural areas – raises a concern over the focus on PV. Rural franchises become the <i>de facto</i> utility in these areas (which are likely to be primarily EC Type C and D, page 8). A least cost energy strategy is therefore essential to ensure profitability of these utilities while providing least cost power to consumers.	Detailed analyses of not only the least economic cost options, but also financial viability is being covered by the preinvestment study. The analyses to-date show that while renewables may be the economically least cost option, the higher initial cost of such investments makes RETs financially more risky and less attractive to investors than low upfront capital cost investment such as diesels. The studies are examining strategies/approaches to remove this financially constraining barrier. These include possible use of GEF and other government grant assistance to buy down the initial capital cost of the investment so that the projects become bankable.
8	Clearly wind and biomass energy will in many cases be the least cost option, or a component in a least-cost hybrid system.	<p>Agreed. Small hydro, wind, biomass as energy generation options are being considered for mini-grids in ongoing studies.</p> <p>These studies will consider not just “least cost” (peso/kWh), but also, more importantly, least <b>total</b> cost of service and financial viability of the business model – which are of greater practical significance to attract program sponsors and address to issue of affordability of consumers.</p> <p>Given the energy use patterns in rural areas, our investigations to-date show that a minimum critical mass of electricity demand is needed to make mini-grids financially viable. The scale of this critical mass is larger for renewables compared to diesels given the</p>

	Comment	Response
		relatively higher first cost of renewables compared to diesels. Where electricity demand is low, PV does provide basic electricity services at a lower <b>total</b> cost per household than minigrids. Renewables such as minihydro or biomass power investments are financially and economically more attractive when feeding the grid where 100% of its output can be absorbed, rather than in minigrid configurations where demand is limited.
9	Page 12: The first and second strategic choices identified are sound, but need to be coupled more closely to the working plans for the APL.	We agree
10	Page 14ff: (2) Technical Assistance Component. Recent experience strongly indicates (e.g. Duke, <i>et al.</i> , 2002) that RET market expansion and support must involve capacity building and training for renewable energy entrepreneurs. A clear – and public – plan should be developed to provide this training, access to capital, advertising support, etc ... so that the RET industry can be facilitated across the Philippines. The Philippine Rice Research Institute and IRRI have extensive experience in agricultural extension. A similar energy extension network is recommended for support under this program. These programs are consistent with the ‘Urgent Reform Actions’ listed on page 18/19.	<p>We agree. This capacity building must take place early. It must be timely, targeted and substantive. Hence significant resources are committed to capacity building during APL1. An important lesson learned is that the capacity building must be demand-driven. If it is supply driven by focusing on giving training courses, preparing and distributing brochures and marketing packages etc, this capacity will be soon dissipated. During preparation, a detailed capacity building and TA plan will be prepared. It will include among others, support to banks, renewable energy suppliers, rural energy service providers, and consumers. This work will complement the extensive capacity building and TA offered through the UNDP/GEF project.</p> <p>We refer to Annex 2 of the GEF Brief:</p> <p>“It is recognized that UNDP/GEF project “<i>Capacity Building To Remove Barriers To Renewable Energy Development In The Philippines</i>” will strengthen the capability of the Philippine renewable energy sector in developing renewable energy, in general, through various capacity building activities. The proposed World Bank/GEF program will complement this by focusing on the preparation of feasibility studies on specific target unenergized barangays with the intention of encouraging private sector investments in off-grid rural electrification through the use of renewable energy applications.</p> <p>...</p> <p>In the <b>GEF alternative</b>, such supporting activities crucial to the successful implementation of the various program components would be expanded substantially, with a total cost estimated to amount to about \$14 million over the full APL period. The incremental cost would be about \$13 million, <b><u>of which about \$8 million is expected to be utilized in APL1 alone</u></b> (see Table 4).” [emphasis added]</p> <p>We will review the applicability of IRRI experiences in</p>

	Comment	Response
		establishing an extension service network.
11	Page 20 & 26: the NGO partnership section is perfunctory. A more extensive and expanded plan for this dialog and collaboration is needed.	These sections will be expanded upon in the PAD.
12	Page 27: Given the rural nature of this program, how can indigenous peoples not be directly consulted and involved?	Indigenous people consultation and involvement will be in compliance with all World Bank and Government of Philippines requirements and guidelines.
	<u>Analysis of incremental cost (Annex IV):</u>	
13	Table 1, page 7: a breakdown of the components (expected wind, solar, biomass, etc ...) of the hybrid systems should be included.	This table will be updated to show more details on renewable energy systems installed in the Philippines in the PAD once the studies are completed.
14	Page 11: without a clear commitment to non-PV RETs this Incremental Cost Matrix is clearly not a least cost clean energy program.	The commitment will be made clearer in the revised GEF Program Brief and in the PAD. There is a clear Government and Bank commitment to all RET applicable off-grid. Details of non-PV specific investments and strategies will be provided in the final PAD.