

PROPOSAL FOR REVIEW

PROJECT TITLE	Palestinian Authority - Energy Efficiency Improvements and Greenhouse Gas Reductions.
GEF FOCAL AREA	Climate Change
GEF ELIGIBILITY	Under GEF-CEO letter of <u>2 August 1996</u> to GEF Executive Council members
TOTAL PROJECT COSTS	\$ 2.7 million
GEF FINANCING	\$ 2.25 million
GOVERNMENT COUNTERPART	Ministry of Planning and International Cooperation
GOVERNMENT COUNTERPART FINANCING OF GEF COMPONENT	\$ 0.25 million (in kind)
COFINANCING	\$ 0.20 million
ASSOCIATED PROJECT	UNDP/GEF project "Egypt - Energy Efficiency Improvements and Greenhouse Gas Reductions".
GEF OPERATIONAL FOCAL POINT	Dr. Nabeel Shaa'th, Minister of Planning and International Cooperation
GEF IMPLEMENTING AGENCY	UNDP
EXECUTING AGENCY	Palestinian Energy Authority in cooperation with UNDP-PAPP
LOCAL COUNTERPART AGENCIES	Palestinian Energy Center (PEC) Palestinian Electricity Agency (PEAg) Palestinian Environmental Authority (PEnA)
ESTIMATED APPROVAL DATE	July 1997
PROJECT DURATION	3.5 years
GEF PREPARATION COSTS	Staff costs

COUNTRY AND SECTOR BACKGROUND INFORMATION

Operational Programme

1. This proposal is formulated in line with the Operational Strategy approved by the GEF Executive Council in October 1995 and as such is elaborated in response to the Climate Change Operational Strategy, Operational Programme # 5 "Removing Barriers to Energy Efficiency and Energy Conservation". The proposal therefore represents an attempt to remove barriers to the effective adoption of energy efficiency and energy conservation in the demand side of the Palestinian Authority's (PA) energy system. The project will thus facilitate the *"implementation of win-win projects following the removal of barriers"*.

2. The project is being submitted in conjunction with the Egypt Energy Efficiency project which was submitted and approved by the Winter 1997 Intersessional GEF Council. The project is submitted under paragraph 9 (b) of the Instrument (see also CEO's note of 2 August 1996 to Council members).

3. It should be recalled that the Egypt project covered three components: (i) Loss reduction, load shifting and load management in the UPS (non-GEF funded); (ii) Energy Conservation and Engineering Services support to Energy Service Companies (ESCOs); and (iii) Cogenerated power. It should further be noted that the present Palestinian component will only address issues pertaining to Energy Conservation and Engineering Services Support to ESCOs.

4. The two initiatives (Egypt and Palestinian Authority) will be implemented concurrently. The Energy conservation components are designed along similar lines and the concurrent implementation of the two project components will bring about a great amount of synergy and cost effectiveness. While Egypt is further ahead in many of the fields mentioned, this will provide a great opportunity for the Palestinian counterparts to visit and train alongside their Egyptian colleagues. It is thus planned that a number of the training and capacity building activities will be implemented jointly; in addition, it is planned that Palestinian engineers and power specialists will visit their Egyptian colleagues in order to provide the maximum fora for exchange as the Palestinians set about to build and establish their power sector and its energy related policies.

Background Information

Economic Framework

5. The Palestinian economy is now in a formative stage. Its future will undoubtedly be influenced by the final stage of implementation of the Oslo Agreement between the PA and the Israeli Government which are expected to take place in mid-1999. The Palestinian economy has recently passed through a difficult stage due to the "closure" of the West Bank and Gaza from the main employment markets in Israel. However, with the recent Hebron Agreement there is an apparent easing of the situation and an improvement in the

economic outlook. Unless unexpected circumstances arise, such improvements are likely to continue.

6. The population of the West Bank is around 1.60 million in an area of 6,000 square kilometers, while that of Gaza is 1.00 million with an area of 800 square kilometers, rendering it one of the most congested population centers in the world. The GNP in 1994 was around \$3500 million with a per capita income of \$1,350, (about one tenth of the income per capita of Israel). However, incomes declined in 1995 and 1996 due to the security situation during this period. It is estimated that the GNP in 1996 was between \$3200-\$3500 million, with the last quarter of 1996 showing great improvement. It is hoped that, with the improved security situation, there will be significant growth in 1997 and later years.

7. Gross capital formation is at a high of 36% of GNP. Various international funding and donor agencies are actively investing in building and developing the infrastructure of the West Bank and Gaza. Furthermore, many wealthy expatriate Palestinians are investing and helping the PA to overcome its economic difficulties. The main problem is unemployment, particularly among the educated. However, it is expected that, with the easing of the political and security situation, job opportunities will be available for Palestinians in the West Bank and Gaza, as well as in Israel. This is going to improve significantly the economic situation of the PA.

Energy Sector

8. The West Bank and Gaza has no mineral or oil resources. The PA, therefore, imports some 10,000-12,000 barrels/day of refined products and around 1,400 GWH of electricity from Israel per year. The Palestinian Petroleum National Corporation (PNC) was established in August 1994 to import and distribute oil and its by-products. Due to problems resulting from frequent closures, the PA is seeking not only alternative suppliers but also alternatives sources of energy. One of the alternatives being sought out by the PA is energy efficiency and energy conservation.

9. The West Bank and Gaza are ideal for the application of energy efficiency and conservation measures. Lack of indigenous resources and high energy and electricity prices will enable the implementation of a viable efficiency and conservation programme with significant rewards in curtailing environmentally detrimental emissions. However, the PA still lacks the institutions and programmes necessary for implementing such a strategy. This project, therefore, seeks to build the capacity of the institutions and implement activities related to energy and electricity efficiency and conservation in the West Bank and Gaza.

Electricity Sector

10. The main power supplier to the West Bank and the Gaza strip is the Israel Electric Company (IEC), (owned by the Government of Israel). The municipal authorities operate the distribution systems. However, the Jerusalem District Electricity Company, a private Palestinian owned company, supplies East Jerusalem and almost half the West Bank.

Electricity production in the PA is very low, at 580 kWh per head in 1992 compared to 1,054 kWh in Jordan. In addition, the distribution network is in very poor condition and is overloaded. Supply interruptions are, therefore, frequent. The World Bank estimates that public sector investment needs in the power sector alone between 1994-98 is US \$350 million and between 1999-2003 is US \$600 million.

11. Electricity consumption in 1995 was around 1,400 giga-watt-hours (GWH). Although this is still low, it is nevertheless presently growing at a rate of over 10% per annum. There are presently more than 330,000 electricity consumers, over 90% of them are domestic who consume 68% of electricity. The commercial sector claims 19% of electricity utilization, while the remaining 13% is consumed by industry and other users. At present, the electricity network is poorly managed and organized. Losses in the distribution system exceed 25% of electric power channeled through it. With the exception of the Jerusalem District Electricity Co., there are no proper electricity utilities. The Palestinian Electricity Agency has been set up to organize the sector and is greatly assisted by the World Bank and other donors. It is hoped that three viable electricity distribution utilities will be set up which will ultimately be independently and privately run. It is the intention of the World Bank and the Arab Fund for Economic and Social Development to extend significant funds to develop the electricity supply industry, particularly the distribution of electricity in the West Bank and Gaza. Appraisal is now taking place and investments will commence this year or early 1998. The main impetus is investments in the electricity network in order to strengthen it, improve services and extend these services to the one million people who presently are not supplied with electricity. Significant loss reductions are, therefore, likely to be achieved. However, for these to fully materialize, there is a need for institutional strengthening and a heightened awareness of efficiency measures and strategies.

Investment and Reconstruction Policy

12. The Palestinian Authority has been strongly influenced by the seven-year Palestine Development Programme (PDP), prepared before the self-rule agreement. The plan, which estimated the required investment at some US \$11.6 billion (at 1991 prices), sets out assumptions, priorities and development strategies. Geared towards a market economy, with minimal government intervention, the PDP gives priority to correcting the distortions of the occupation, creating jobs, building houses, expanding and improving economic and social infrastructure and promoting export generating sectors. Prioritizing building and construction is evident in the plan that allocates nearly half the projected total for action in these sectors. Furthermore, it is estimated that the needed investments under the PDP in public utilities between 1994-2000 is US \$325 million while the estimated needed investment in the energy sector total US \$ 625 million (of which 170 million is planned to come from the private sector) in the same time frame.

13. The Public Investment Programme (PIP), drawn up by the PA with the support of the World Bank, presents proposed public investments and funding needed for the West Bank and Gaza during the next three years. The program envisages a total expenditure of US \$1.25 billion over three years in infrastructure (including large power generation and transmission schemes), human resources and encouragement of private sector economic

activity. The available or likely funding for the implementation of the PIP totals \$270 million out of a proposed US \$1.3 billion. This brings the residual funding needs, for the period 1995-1998, reach US \$1.02 billion. More specifically, in the power sector, only US \$22.5 million is available for planned interventions totaling \$200 million. This leaves nearly an additional \$178 million needed for that sector alone.

14. The electricity sector will be a main target for future investment, both privately and publicly. The World Bank estimates that the cost of rehabilitating the distribution system to be approximately \$115 million. The World Bank expects to contribute up to \$25 million of the needed amount. Other donors that are likely to support the PA are listed below.

- EIB: a possible contribution of up to \$50 million, mainly for rehabilitation of equipment;
- Finland: a possible contribution of about \$4-5 million, earmarked for a Load Dispatch Center in the West Bank;
- Norway: around \$24 million already pledged, earmarked for rehabilitation work in the West Bank; and
- The Arab Fund: possibility of appraising the electricity sector in April 1997 and contributing up to \$25 million towards it.

15. Generation is likely to be implemented by independent power producers (IPPs), who will mainly be located in Gaza, but also in the West Bank at a later time, with electricity wheeled to consumers across the Israeli network.

Economic Prospects and Donor Activities

16. When the Palestinian Authority began to exercise its functions in May 1994, the economic situation reflected disequilibria and fragmentation in all markets, coupled with a virtual paralysis of the public sector. The empowerment of the Palestinian people and the establishment of a Palestinian self-government promised a new beginning for the economy. At present, the PA faces two challenges that have implications for the success of long-term development efforts that require immediate action, such as (a) building new institutions for Palestinian government administration and rejuvenating the existing ones; and (b) addressing the issue of unemployment. Unemployment is expected to exceed 25% of the work force unless funds for investment are available. The role of external aid in providing the needed investments is substantial. In the past, such aid was channeled through direct small donations to charitable organisations and non-governmental organisations (NGOs), also through the UNDP Programme for Assistance to the Palestinian People (UNDP-PAPP) and UNRWA.

17. According to UNDP data, ongoing and planned project aid in 1992 amounted to over US \$202 million spanning several years. The UN Relief and Works Agency's (UNRWA) share of this amount was about US \$120 million. The past priorities of the

donors are reflected by the following distribution: health 41.9% of the total, education 17.6%, industry 10.9% and agriculture 8.6%. In the future, most of the investment will go into building the infrastructure of the transport, telecommunications, housing, energy and electricity systems. Furthermore, funds will be channeled by the donors to the official institutions and government departments which are being set up by the PA. Energy and electricity systems will claim a large proportion of these investments. Donors have pledged hundreds of millions of dollars; however, most of these investments have not yet materialized because of the security situation. The UN agencies, particularly UNDP and UNRWA, will continue to play a prominent role in the Palestinian economy. The present UNDP annual programme of \$50 million is likely to increase and so will, the annual disbursements of UNRWA, for the time being. It is hoped that in the future, when the Palestinian economy starts to mature, the burden of projects and relief activities will slowly be shouldered by the Palestinian institutions. The PA is now receiving more funds to enable it to function and provide crucially needed services to the population of the West Bank and Gaza. A large proportion of these funds are for purposes of electricity projects. In 1996, there were donor pledges of around \$870 million, \$576 million of which was actually committed.

Existing Environmental Policy

18. The Palestinian Authority faces formidable environmental challenges, such as over-congestion, lack of sanitation and waste disposal systems, water shortages, absence of emissions abatement strategies and all possible environmental degradation problems. High population growth in the over-congested area of Gaza, which lacks natural resources, particularly water, is a tremendous challenge. The annual population growth of over 3% in one of the world's most congested regions is likely to aggravate an already dangerous environmental situation. Water shortages as well as water quality are major causes of environmental strains in both the West Bank and Gaza. With increasing population, urbanization as well as economic activities, there are possibilities for air quality degradation due to emissions from transport vehicles and cars as well as from energy facilities in the future. A project like this one, that aims at protecting air quality through abatement of global and local emissions through conservation and efficiency measures, is overdue.

19. Realizing its environmental challenges, the PA has established a new agency to deal with these environmental challenges: the Palestinian Environmental Authority (P.En.A.), with temporary headquarters in Hebron. A President has already been appointed to the new Authority and staff are being recruited. A new law is being enacted to define the role of the P.En.A. in dealing with environmental activities in the West Bank and Gaza. It is expected that the new Authority will be able to assist in addressing the formidable environmental difficulties that already exist in the West Bank and Gaza. In order to enable it to undertake this role, the P.En.A needs assistance and capacity building. It is planned that various UN, bilateral and multilateral assistance programmes (UNDP, METAP, UNEP, etc.) will help the P.En.A. to play its much needed role.

PROJECT OBJECTIVES

Overall Objectives

20. The overall objective of this project is to assist the Palestinian Authority, in reducing the long-term growth of GHG emissions from electric power generation and from consumption of non-renewable fuel resources. In responding to the new operating conditions following the peace accord (signed in 1993), public and private industry must invest in process modifications and new machinery to remain competitive, with the likelihood that their investments will have favorable rates of return based on savings from reduced operating costs. This is especially the case due to the unsubsidized high energy prices and electricity tariffs in the West Bank and Gaza. With the proper capacity building and institutional setup, this will assist in increased investments in energy conservation and efficiency. The funding for this project will leverage new investments in ways that are most beneficial to the global environment.

21. The above overall objective will be accomplished by addressing energy conservation, needs of institutional improvement and development, and by effectively disseminating and implementing the results of pilot and demonstration projects implemented as part of this project. In the long run, this project will therefore secure long term programmatic benefits through promoting the self-sustaining capabilities of newly established energy sector authorities and other key players in the Palestinian energy and power sectors.

Immediate Objectives

22. The approach through which overall objectives and the accompanying long-term programmatic benefits will be achieved is to:

facilitate adoption and implementation of energy conservation measures in all sectors of Palestinian society. There will, however, be an initial emphasis on the commercial and industrial sectors of the PA;

assist in reducing the losses and improve the efficiency of the electrical power system;

stimulate and guide the private sector in the development of a capability for energy system planning, feasibility analysis, conceptual design, and project implementation;

assist in the international and regional transfer of experience and technology that could be instrumental in GHG emission reduction;

- promote public and private sector investments in energy projects that are beneficial for the global environment;

- stimulating and guiding the industrial sector in the field of energy auditing, optimal operation and better house-keeping; and
- facilitating the adoption and implementation of energy conservation measures in the industrial, commercial, and public sectors through promoting establishment of a number of ESCOs, human resource development and awareness campaigning.

Improvement Targets

23. Measurable target objectives to be achieved by year 2005, include:

reductions in CO₂ emissions by 0.149 million tons annually; and

annual savings of 110 GWH of electricity.

24. It should be emphasized that the above represent goals and targets which could potentially be realized, if the accompanying down-stream investments are mobilized through this project. Should subsequent investments be mobilized, large profits can be realized. However, in order to attain these efficiencies, a transaction hurdle will have to be overcome. This project is catalytic in enabling the PA and its energy institutions to overcome these transaction hurdle and costs.

PROJECT DESCRIPTION AND OUTPUTS

Project and Related Programme Context

Regional Significance of Project

25. The proposed project will join the UNDP/GEF initiative for energy efficiency in Egypt under the umbrella of the UNDP/GEF Project *Egypt - Energy Efficiency Improvements and Greenhouse Gas Reductions*. Together, the two initiatives will comprise a regional project that will address energy efficiency and energy conservation issues in the sub-region.

26. Egypt is the main beneficiary from the combined regional project. However, the Palestinian Authority will benefit from this project since it will receive assistance through joining in the execution of the project's activities that deal with removing barriers to energy efficiency and conservation. This project is an important opportunity to address one of the Palestinian Authority's top priority areas for action: demand side energy conservation and efficiency.

27. The existing and expanding wave of reconstruction that was set into motion throughout the Palestinian territories after the signing of the peace accord with Israel in 1993, and has made it crucial for the sustainable development in the PA to implement and

plan activities that promote energy conservation and energy efficiency in the region. As a result of the peace accord, the PA is investing heavily in infrastructure and institutional establishment, making this an ideal time for intervention so as to influence the development of policies at an early stage. From a regional perspective, the timing is also ideal for such a project. It would help integrate regional priorities and regionally relevant issues on energy and power into upcoming planning cycles of the two participating countries and help establish the basis for sub-regional cooperation that would sow the seeds for PA involvement in all regional energy and power plans.

28. There is already a high level of education (comparable to the standard of education in Egypt and Jordan) in Gaza and the West Bank. This will therefore facilitate the implementation of such a regional project, and strengthen the accompanying transfer of practical experience from Egypt to the PA and the inevitable exchange of information that would follow. The regional aspect of this project provides a great opportunity for the Palestinian Authority to start regional cooperation in energy and power sector issues with Egypt through twinning arrangements, cross country study tours and institutional cooperation. Furthermore, it will also enhance the local and regional capacity to mitigate climate change through the promotion of energy conservation and energy efficiency. At last, private sector funding will be sought as follow up investments for projects aimed at improving energy efficiency and promoting energy conservation. The project will take an active role in encouraging regional investments and seeking financing opportunities that would ultimately be beneficial for the global environment.

29. The contribution of this regional initiative, and other donor programs, will be to successfully demonstrate approaches and technologies. The GEF program will ensure timely and widespread adaptation of their results within the Ministry of Energy and Electricity in Egypt and the Palestinian Energy Authority with the territories under the PA, and will expedite implementation in public and private sector industries. The project will leave behind a trained, self-supporting staff and industrial support mechanisms to continue dissemination of energy saving improvements and implementation of specific energy savings projects.

Palestinian Context

30. The project will address energy efficiency and conservation and engineering services support to Energy Services Companies (ESCOs) in the Palestinian Authority. The project will do so by initiating and strengthening institutions that will address alternative methods for meeting demand through promoting energy conservation and demand side management.

31. The Palestinian component, that is part of this regional initiative together with Egypt, will address the removal of barriers to enhance energy efficiency in the context of the PA. The project will primarily focus on the Palestinian demand side sectors (including fuel and electricity consumption in the industrial, commercial and public sectors). By creating an appropriate institutional setting and the adequate capacity in the sub-region to engage in energy conservation activities, alternatives to meeting the ever increasing demand for power by expansion of generating facilities, will arise.

32. In spite of the fact that energy prices are not subsidized, inefficiencies still proliferate in all energy systems. This is due to the absence of institutions and lack of knowledge of efficiency and conservation measures. Most of the energy-consuming machinery and equipment in the West Bank and Gaza are most inefficient. The Palestinian Territories have become the dumping ground for cheap and inefficient equipment, most of which is second hand and exported to the PA after being disposed of by its original users. The absence of institutions and lack of information and standards have considerably contributed to this. At present, losses in the electricity distribution network exceed 25% of the energy. This is one of the highest electricity losses in any electricity system in the world. It is foreseen that there will be large investments in energy and electricity systems in the West Bank and Gaza. However, the benefits of these investments will not fully materialize unless there is capacity building and information about energy efficiency and conservation incentives available to investors and institutions. The PA is already aware of this unfortunate situation and is willing to intervene to ensure its reversal.

Location and Extent

33. The headquarters of the project will be located in the West Bank. The city of Ramallah, where the Palestinian Electricity Authority is located is an appropriate location. However a sizable part of the project activities, including one of the energy consumers center, will be stationed in Gaza.

34. The West Bank has most of the industries as well as an extensive, but highly inefficient electricity distribution system which will benefit from this project. In addition, the West Bank being the most heavily populated area, is likely to have the most future extensions of Palestinian industries and commercial activities. It is therefore appropriate to locate the Energy Conservation Center in the West Bank, with a sub-office in Gaza. It is recommended that two "energy consumers service centers" will be set up which will serve as pilot centers for future private sector "energy service companies (ESCOs)". One of these centers can be located in Gaza and the other in the West Bank, most likely in the city of Nablus.

35. Links will also be established with other energy efficiency and energy conservation initiatives in the region. Needless to say, strong links with the associated GEF energy efficiency project approved for Egypt will be both essential and useful. Likewise, exchange of information and networking can be undertaken with the GEF project *Syria - Supply Side Efficiency and Energy Conservation and Planning*, soon to be initiated in the Syrian Arab Republic. Lastly, links will also be established with energy conservation agencies in other Arab countries such as Tunisian AME, who have done preliminary work on codes and standards in many energy intensive sectors and with ALME in Lebanon who have a number of problems and concerns within their energy sector which are common with the Palestinian energy authorities.

Project Description

36. **Goal:** Conduct an energy conservation programme, and establish an Energy Conservation Center within the PEA. The Center will be the focal point for all measures to

establish codes and standards and activities for energy efficiency and conservation in the West Bank and Gaza. The Center will also gather and disseminate information about energy and electricity utilization and its rationalization. The interaction with industrial, commercial and other private sector energy consumers will be through two pilot energy consumer service centers, which will primarily be established by the Conservation Center. Ultimately these will be converted into private management and ownership. Therefore the Center will include a focal point which can act as a repository for experience on ESCO establishment, and further conduct training, outreach and information to private sector entrepreneurs interested in establishing ESCOs. Such ESCOs will provide engineering services to help the emerging utilities, industries and commercial establishments improve energy efficiency, and will help specify, install, and operate new equipment and systems, during the critical period of heavy new investments in infrastructure, institutional establishment and emerging private enterprises. Finally, the Center will include specialists on Transmission and Distribution loss reduction. These specialists will work closely with the PEAg to identify, evaluate and prepare high priority projects within this sector of the PA's power system.

37. Barriers: This activity is not being undertaken at present due to a lack of capacity of trained personnel to carry out the energy audits and the lack of an appropriate institutional setting such as an energy conservation agency. This transaction barrier will be removed via public awareness campaigns, training of personnel, and detailed training of staff in energy conservation and audit techniques. Another transaction barrier is the lack of services to consumers in the region. The PA has no energy service companies which have emerged to work as brokers to stimulate energy efficiency. There are a number of barriers to ESCO establishment, not the least of which is the absence of institutions and lack of information and awareness. There is also a shortage of personnel familiar with the technical aspects of energy conservation and also familiar with business management skills and principles. As energy consumption increases and the existing unsubsidized pricing system is maintained there will be important opportunities for ESCOs to begin undertaking business and investments in energy efficiency. This project is also designed to establish consumer service centers as an initiation for ESCO-creation and support facility within the Energy Conservation Center. In the near future, these consumer service centers will be converted in ESCOs. Training will be provided to professionals familiar with the technical aspects of energy efficiency in order to provide them with the necessary business skills. The project will provide assistance to the Energy Authority and the Electricity Agency, thereby removing many of the existing barriers.

38. Tasks:

- (a) conduct energy audits;
- (b) recommend conservation and energy saving measures to commerce and industry;
- (c) conduct follow-up audits for documentation, and identification of further improvements;
- (d) promote energy conservation in a public relations campaigns to all sectors;

- (e) offer conservation seminars and training;
 - (f) work on codes and standards for energy efficiency in buildings and appliances. This will include the provision of basic training on inspection and enforcement;
 - (g) facilitate financing mechanisms for energy efficiency investments;
 - (h) develop limited rebates or other incentives for increased energy efficiency;
 - (i) identify, evaluate and prepare high priority projects for loss reduction in the Transmission and Distribution system;
 - (j) conduct energy planning and feasibility analyses;
 - (k) provide conceptual designs and financial analyses;
 - (l) prepare procurement specifications and support for project management;
 - (m) provide training in system operation and maintenance;
 - (n) promote and support the establishment of ESCOs, through the initiation of two pilot consumer services centers, one to be located in the West Bank and the other in Gaza;
 - (o) provide basic tools such as software and model contracts;
 - (p) seek out and provide initial projects and project opportunities for ESCOs to implement;
 - (q) create data bases on energy and electricity consumption of different consumer groups, load patterns, and saturation and ownership of electric appliances;
 - (r) involvement of Palestinian university departments in outreach work to promote conservation and energy awareness in commercial, private and public sectors. This will include seminars for managers and professionals university students; and
 - (s) undertake policy research and provide policy advice plus model legislation to energy policy makers in general and PEA policy makers in specific to create incentives for energy conservation.
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Outputs

Overall Project Achievements

39. The overall achievement of the project will be an increased capability to make the Palestinian Authority more capable in the management of energy systems and more efficient in its consumption of energy resources, both electricity and fuels. This capability will be embodied in the self-supporting institutions of the Palestinian energy sector, which will be adequately equipped and trained to insure maximum resource utilization. These institutions will also provide an effective energy conservation programme, and the needed engineering support services to public and private industries. The proposed energy consumers services centers, and later the ESCOs, will interact with industries and the private sector. Services to the public will also be supplemented by standards and codes of practice that will protect the public from the present influx of inefficient facilities and appliances.

Specific Project Achievements

40. Energy auditing, conservation, and engineering services will be provided to the industries and commercial establishments to assist them in energy resource planning. This will result in fuel savings, as well as electricity savings. Typical fuel energy savings from programs of improved insulation, waste heat recovery, elimination of leakage, and burner efficiency improvement, can result in a 10 to 20% reduction in total fuel utilization in those industries that mount an effective conservation program. Savings that can be achieved in the reduction of electric power by power factor correction, substitution of low-wattage bulbs and low loss ballasts, and other conservation programs initiated within this component can result in a 5 % reduction in the amount of fuel for power generation. When the project is completed in the year 2001 it is expected that there will be an overall annual reduction of a least 23 thousand toe, and savings of 35 GWH annually of electricity losses from the commercial and industrial sectors alone. By the year 2005, when expected follow up investments have taken place in all sectors (including the residential sector), annual savings will be in the magnitude of 47 thousand toe and 110 GWH annually.

41. With such achievements, it is expected that the project's activities will reduce the energy consumption in the West Bank and Gaza, by at least 7% annually. The total range of potential savings which are approximately 20-25% can only be achieved through the above mentioned planned investments.

42. It is expected that, because of the small size of the Palestinian territories, most industries will participate and benefit from the conservation and efficiency programmes. Therefore with an electricity savings of 35 GWH annually in 2001, and other fuel savings by the industry of 15 thousand toe, total energy savings will amount to 23 thousand toe at project completion. With the foreseen follow-on investments and the economic growth, these are likely to grow to at least 47 thousand toe by 2005.

<i>Potential reduction in GHG (CO₂): 0.149 MT/year in 2005.</i>
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RATIONALE FOR GEF FINANCING:

43. The project is developed in line with the GEF Operational Programme # 5: "Removing Barriers to Energy Conservation and Energy Efficiency".
44. The Palestinian Authority is eligible under paragraph 9 (b) of the Instrument (see also CEO's note of 2 August 1996 to Council members).
45. The project funds are primarily devoted to institutional strengthening and capacity building within the Palestinian Energy Authority, specifically addressing the needs for restructuring, greater efficiency, self-sustainability, and appropriate technologies within the PEA. The project is crucial as a facilitating and catalytic step for effective reorganization and efficient operation of the energy demand sector. It will also facilitate the identification of inefficiencies and conservation prospects. Lastly, through the energy consumers service centers and ESCOs, the project will provide direct interaction and assistance to large industrial consumers and to the public.
46. The project contributes to meeting climate change mitigation objectives of the GEF. The project facilitates reductions in projected GHG emissions (CO₂) of 0.149 MT/year by the year 2005. This is equivalent to an approximate 6 % to 7 % decrease in energy intensity from the current value of 0.50 TOE per US\$1000 of GDP, a significant step in the right direction.

SUSTAINABILITY AND PARTICIPATION

47. The emphasis on energy loss reduction, conservation, and strengthening institutional roles and investments in maintaining energy efficiency, establishes an energy efficiency awareness throughout the system. The project will actively promote the marketing of its services and capabilities to both the public and private sectors. It will also build the necessary institutional capacity to insure continued sustainability of effort.
48. Many developing nations are wrestling with the problems of providing adequate and reliable electric power to sustain industrial development, satisfying domestic and industrial requirements for fuel, growing domestic awareness of environmental quality issues, and becoming responsible neighbors in the global environment. Demonstration of a methodology for managing developments in the energy sector, while at the same time achieving global benefits vis-à-vis GHG emission reductions, will provide a valuable model for adaptation elsewhere in the region and the developing world.

Government Commitment and Stakeholder Involvement

49. The PA, as well as its Energy Authority and its various agencies are fully committed to this project. They fully realize the present inefficiencies and dire need for conservation. They are also aware that the pricing mechanism alone is not capable of achieving rationalization of energy utilization, unless accompanied by capacity building in the energy and electricity sector, availability of information and interaction with the public and energy consumers. The PA is becoming fully aware of the mounting environmental challenges it is going to face. Over-utilization of energy will only increase pollution, particularly air pollution in the West Bank and Gaza where air pollution is a very serious problem and will increase the level of globally detrimental emissions from the PA. Therefore, the PA and its energy and environmental authorities, are willing to contribute \$0.25 million (mostly in kind) towards the implementation and success of this project. However, considering the importance of this project to the PA, it is likely that its actual contribution may prove to be much larger.

50. The stake-holders in the commercial and industrial sectors as well as the Palestinian Energy Authority and its different agencies are also fully committed to this project. The commercial and industrial sectors are displeased with the heavy energy bills and their expansion prospects are handicapped by the inability to meet future energy costs. Furthermore, the commercial and industrial sectors realize that the project's efficiency and conservation measures will greatly assist in reducing their energy burden.

Incentive and Regulatory System

51. There are many incentives to ensure the PA and private and public sector's involvement and commitment to the implementation of the project. Firstly, as there are no indigenous energy sources in the West Bank and Gaza, all their requirements have to be imported at high prices. Secondly, there is an awareness that inefficiencies exist and that the pricing system alone is not capable of dealing with them. Lastly, the PA is in need of capacity and institution building which this project will provide. The regulatory system is now being built up. Such a project will direct the regulatory system into the right course.

LESSONS LEARNT AND TECHNICAL REVIEWS

52. This project has been designed after extensive consultations with Palestinian authorities through a mission that was fielded to the PA in late January 1997. Comprehensive discussions on this project were also held with the World Bank and the UNDP-PAPP.

Lessons learnt

53. Through the development and design of the GEF projects in Egypt and Syria, some important lessons have been learnt that have helped focus and target the efforts of this project. Firstly, it was found that sound financial incentives for energy conservation and energy efficiency (as is the case in the PA) are a necessary, but an insufficient condition needed to achieve noteworthy energy efficiency improvements. It has become clear that without adequate institutional settings and in country capacity to address these issues, energy efficiency and conservation measures will not take hold in the country in question. Secondly, it was found that undertaking a series of energy audits alone will fail to remove barriers to energy conservation and energy efficiency. Without the accompanying strengthening of local institutions and capacity, and without adequate transfer of technology and know-how, audits alone will not have the desired long-term impact.

54. Moreover, experience with similar initiatives in eastern Europe have shown that regional networking is essential for exchange of information and experience. This project, therefore, places emphasis on regional networking as means to transfer of information, experience and know-how. As stated in paragraph 35, links will be established to other energy efficiency and energy conservation initiatives in the region where important lessons can be learnt. The association with the GEF project in Egypt will work to create strong channels of exchange of information and experience. Important lessons can also be learnt from the energy planning and conservation initiative soon to be initiated as part of the GEF project *Syria - Supply Side Efficiency and Energy Conservation and Planning*. Furthermore, an active and ongoing dialogue with established energy conservation agencies in the region, such as Tunisian AME and Lebanese ALME, will secure information exchange and transfer of know-how.

Technical Review

55. This project has been submitted for an independent technical review to a STAP roster member who recommended a number of changes described below. The project was strengthened accordingly. The technical review is attached in Annex 5.

56. One of the recommendations of the reviewer was to include a number of activities that address the Transmission and Distribution (T&D) sector in the PA. As the T&D sector accounts for a large portion of electricity systems losses in the PA, and since such activities would have the desired long term positive impact on curtailing GHG emissions, the project brief was adapted accordingly. In paragraph 36 on page 11, emphasis on T&D can be seen through the plans to include T&D loss reduction specialists in the Energy Conservation Center. Moreover, a strengthened list of activities (paragraph 38) reiterates this emphasis on the T&D sector. Activities that include identification, preparation and evaluation of high priority projects for loss reduction in the T&D sector were added.

57. The reviewer also emphasized the need for training during the establishment of codes and standards. Activity (f) in paragraph 38 was specifically strengthened accordingly. Moreover, the reviewer recommended the provision of basic tools for ESCO operation and ensuring the availability of a start-up project for the ESCOs to implement. Activities (g), (h), (o) and (p) ensure that these essential elements for ESCO establishment and operation will be provided.

58. The reviewer also expressed some concern that the project did not address the residential sector. He therefore recommended that after an initial emphasis on the commercial and industrial sectors, the project should expand its activities to the residential sector by the last year of project implementation. As a result, the first of the immediate objectives (paragraph 22) was altered to emphasize the reviewer's recommendation. In the activities presented in paragraph 38, emphasis on the residential sector will be undertaken through activities (d), (e), (f) and (h).

59. The reviewer also emphasized the importance of links to other energy initiatives in the region. Paragraph 35 has been added to secure these links and the accompanying exchange of information and experience.

60. In response to the review's comment on the expected electricity savings by the year 2001 and the resulting amount of CO₂ emissions curtailed, the CO₂ calculations were redone taking into account the view of the reviewer.

61. Lastly, the reviewer found that the initial budget set aside for training activities, work on codes and standards, promotion activities and staffing was inadequate. The budget was augmented by adding US \$ 100,000 to training, US \$ 100,000 to codes and standards, US \$ 50,000 to marketing and promotion activities and US \$ 100,000 to staff costs. In total, US \$ 350,000 was added.

PROJECT FINANCING AND BUDGET

62. The proposed project is budgeted at US \$2.7 million. As the activities included in this component largely target technical assistance, training and institutional strengthening, the proposed GEF contribution is \$ 2.25 million. In spite of their meager resources, both the PA and the UNDP-PAPP are willing to contribute to the project to the extent of \$0.25 million and \$0.2 million, respectively.

63. The project will be implemented over the period 1998-2001.

INCREMENTAL COSTS

64. A detailed incremental cost analysis, in accordance with GEF Secretariat guidelines is attached in Annex 1.

ISSUES ACTIONS AND RISKS

Potential Risks and Possible Corrective Measures

65. **Potential Problem:** the challenges associated with getting professionals to shift focus to new goals rewarding energy savings instead of increasing gross energy supply. This change in approach may be difficult and could potentially slow down project implementation.

Actions: Possible corrective measures include intensive capacity building and sensitization of the professional staff involved in the project as well as the drafting of policy guidelines for professional operational staff.

66. **Potential Problem:** Establishing smooth cooperation between PEA and the distribution companies may also be complex and could also slow down implementation.

Actions: Possible corrective measures include addressing this in a preventive fashion through the Board of Directors.

67. **Potential Problem :** Unpredictable political and security problems may delay project implementation.

Actions : Recent political trends have been very encouraging and they are likely to continue this way. Implementation of this and similar projects, will only assist in directing the economy in a way that improve political and security prospects.

INSTITUTIONAL FRAMEWORK AND PROJECT IMPLEMENTATION

68. The Palestinian Energy Authority (PEA) will be responsible for project oversight and review, while the proposed Energy Conservation Center will be responsible for project implementation. The Palestinian Electricity Agency (PEAg) will be involved in ensuring the rationalization of electricity consumption, particularly in the industrial and commercial sectors. The Palestinian Energy Research Center (PEC) will be subcontracted to implement the project's activities that deal with demand side management (DSM) as well as the establishment of standards and codes. The proposed two "Energy Consumers Service Centers" and future ESCOs will ensure collaboration with the energy consumers and the public, as well as the initiation of public awareness campaigns.

69. A Board of Directors will be formed to provide overall guidance and program review, and to facilitate coordination among the involved entities. Membership of the Board of Directors will include representation from the following : PEA, PEC, Palestinian Electricity Agency, Palestinian Environmental Agency, Ministry of Planning, Private Sector Members (from the Chambers of Commerce and Industry) and the UNDP-Jerusalem Office.

70. The main purpose of the Board of Directors is overall guidance, review and coordination. It will not interfere with the day-to-day implementation of the project which will be entrusted to the Executing Agency, the PEA (through the proposed Conservation Center), and its different agencies. Due to the difficult and special circumstances of the West Bank and Gaza, it is intended that the UNDP-PAPP Office in Jerusalem will assist the PEA in executing the project. The UNDP-PAPP in Jerusalem which is well staffed and experienced is in the best position to undertake this task in the difficult circumstances prevailing in the Territories.

71. This project is part of a regional project that is associated with the UNDP/GEF project *"Egypt-Energy Efficiency Improvements and Greenhouse Gas Reductions"*. Therefore, it is essential that both projects undertake joint activities. The two projects have the same objective of energy efficiency and conservation and share the same implementation tasks of demand side management and public awareness and services to the public through ESCOs. Therefore, joint activities will not only be beneficial but will also reduce costs and speed up implementation, since each project can learn from the experience of the other. Joint activities will involve: periodic meeting of the top management of the two projects, exchange of visits, joint training sessions and close networking. Such networking is essential in both public awareness campaigns as well as in the procedures to establish the ESCOs. A meeting has to be initiated at the commencement of project implementation to work out modalities for networking and joint activities. UNDP-Cairo and UNDP-PAPP in Jerusalem will assist in the joint activities. Also, the monitoring and evaluation procedures referred to below will assist in the coordination of the two projects as one regional project.

MONITORING AND EVALUATION

72. The project will have formal review and oversight provided by the Board of Directors and its Technical Sub-Committees (if any). Results that will form component tasks for follow-up activities, will be incorporated in periodic Monitoring and Evaluation reports.

73. The project will be closely monitored in accordance with UNDP's established monitoring procedures. As such, therefore, ongoing performance monitoring will be provided by the UNDP Office with the backstopping from UNDP technical staff from HQs. In addition, annual project reviews (tripartite reviews) will also be held with the participation of all project participants. During the TPRs, the project performance will be measured against established workplans, expenditures will be reviewed and overall technical performance will be assessed. In addition, a final evaluation will be carried out at the end of the project.

74. Joint monitoring and evaluation will be carried out for both the Egypt and the Palestinian Authority projects. Such monitoring exercise will assist the Egypt Electricity Authority (EEA) and the Palestinian Energy Authority (PEA), the two respective implementing agencies, to coordinate and initiate joint activities as well as to learn from the experience of one another.

LIST OF ANNEXES

- ANNEX 1: CALCULATION OF INCREMENTAL COST**
- ANNEX 2: INDICATIVE BUDGET - INCLUDING INCREMENTAL COST SUMMARY**
- ANNEX 3: ESTIMATION OF ENERGY AND ELECTRICITY SAVINGS BY THE PROJECT**
- ANNEX 4: LETTER FROM CEO/GEF AUTHORIZING PROGRAMMING IN THE PALESTINIAN AUTHORITY WITHIN A REGIONAL CONTEXT AND LETTER OF ENDORSEMENT BY OPERATIONAL FOCAL POINT**
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ANNEX 1

CALCULATION OF INCREMENTAL COST

Broad Development Goals

1. After the signing of the Peace Accord with Israel in 1993, a major wave of reconstruction has been set into motion throughout the Palestinian territories. A part of its broad development goals, the PA is investing heavily into infrastructure and institutional establishment. Moreover, meeting power and energy demands through efficient and rational consumption and utilization of alternative energy source is also part of these goals. However, at this time, many of the actions which can be taken to improve the situation have not been undertaken due of the existence of a number of barriers of a technological, human-resource, or legal nature. It is nevertheless crucial for the sustainable development in the PA and the region to capitalize on the existing atmosphere of restructuring to implement and plan activities that promote energy conservation and energy efficiency. It is therefore an ideal time for intervention in order to influence the development of policies at an early stage. Through the relatively high level of energy pricing currently established in the West Bank and Gaza, many of the financial incentives for energy conservation have been put in place. However, experience has shown that this is a necessary, but insufficient condition needed to achieve energy efficiency improvements of the type discussed in this proposal. This is due to the absence of institutions and lack of efficiency standards, information and knowledge about energy efficiency and conservation in all sectors of Palestinian society.

Global Environmental Objective

2. The global environmental objective being pursued through this project is the reduction of GHG emissions through increased efficiency of power and fuel utilization in the Palestinian territories. As such, this project has been designed to correspond to GEF Operational Programme # 5: Removing Barriers to Energy Efficiency and Energy Conservation. As described in the project brief, the main thrust of the activities in this project will focus on removing different barriers to the achievement of greater energy conservation (electricity and fuel) in the demand sides of the public and private sectors.

Baseline

3. With the political developments presently taking shape in the region, economic prospects are expected to considerably improve during the next few years. With the assistance from donors, the PA is presently building its infrastructure (including energy projects) and improving the conditions of living for over 2.5 million people in the West Bank and Gaza. As a result, the presently suppressed demand for energy and electricity consumption is expected to soar. Fuel consumption is expected to increase at a rate of 6%

and electricity at over 10% annually. Such an increase, unless rationalized, will impose a heavy burden on the population and on the economy in general.

4. With electricity production per capita bound to rise drastically over the coming years (to meet the growing demand prompted by the current wave of reconstruction), it is vital to initiate activities that would guide and steer this growth in a direction that would secure energy conservation as a means to meeting the demand. In this way, the project will also influence this growth in a manner that would take into account global environmental issues.

5. Without intervention on the part of this project, uncontrollable growth in demand is likely to result, leading to a scenario where capacity expansion is the only accepted method of meeting demand. Furthermore, basic energy services would not exist, inefficiencies would dominate both public and private enterprises and the per capita consumption of fuel and power would be unacceptably high. The present high losses of the electricity system will continue and the utilization of the West Bank and Gaza as dumping grounds for inefficient machinery and apparatus will proliferate.

GEF Alternative

6. The activities of this project will focus upon creating a national institution which will play the important role of focusing on energy efficiency and energy conservation. Moreover, since, at present, no energy efficiency standards or codes exist, this project will, therefore, result in their formulation. The project will undertake extensive training programmes and raise public awareness to energy efficiency opportunities linked to this, and other ongoing projects and the major wave of investments and restructuring that has been initiated. With a high-level national institution focusing on energy efficiency, many of the public information, training, and regulatory obstacles to improved energy efficiency will be met. Furthermore, the project will seek to address the shortage of skilled personnel and private-sector entities dealing with investments in energy efficiency. It will also establish an energy efficiency center which will serve (through pilot energy consumer centers) as an incubator for energy service companies (ESCOs). With this national center established, the emerging private sector of the PA will be in a better position to establish ESCOs taking advantage of the many profitable energy efficiency investments which exist.

Domestic and Global Benefits

7. The projected potential savings in heavy fuel oil are estimated to be 0.023 MTOE/year in 2001, increasing to over 0.047 MTOE/year in 2005. The global benefits are measured as the reduction in emissions of greenhouse gases. The project could potentially achieve a reduction in CO₂ of about 0.149 MT/year in 2005. However, it is important to emphasize that additional investment beyond the technical assistance outlined in this project will be necessary to capture the goals set for the year 2005. All of the components of this project are meant to lay the foundation for this potential significant investment

8. In order to respect the principal of incremental cost, that project is ensuring that all GEF funds are targeted barrier removal activities and that these funds only focus on technical assistance elements and training. Any funds to be used in follow-on investments will have to be obtained independently from non-GEF sources.

9. This project is not intended to finance investments in energy efficiency equipment, but to remove barriers that will, among others, enable follow-up investments to take place. Cost recovery on barrier removal is, however, impossible and therefore GEF involvement is needed. Once the barriers are removed, potential and anticipated follow on investments in "win-win" projects could trigger the curtailing of as much as 0.14 MTCO₂/year. Domestic benefits associated with the project will be the creation of a strong national institution that will act as an incubator for energy services companies and other investments in energy efficiency.

Total Project Costs

10. The costs of this project are estimated to be \$2.7 million, of which \$2.25 million is being requested from GEF. As part of the baseline, \$0.20 million will be obtained as co-financing by the UNDP, while the remaining \$0.25 million represents the contribution (in kind) of the Palestinian Authority.

INCREMENTAL COST MATRIX

Scenario	Total costs US \$	Domestic Benefits	Global Benefits
Baseline: Drastic and uncontrolled rise in energy utilization and electricity production per capita; Unguided surge in consumption, capacity expansion will become the only method to meet demand and large inefficiencies will come to dominate all sectors of Palestinian society.	0.45 million	<ul style="list-style-type: none"> ➤ Unjustified high level of capacity expansion. ➤ Large inefficiencies in all sectors of the Palestinian energy demand side 	A drastic and accelerating increase in the level of emissions of GHG from the PA.
GEF Alternative: <ul style="list-style-type: none"> ➤ Creation of national institution which will focus on energy conservation and energy efficiency. ➤ Establishment of energy engineering centers for ESCO support and incubation 	2.7 million	<ul style="list-style-type: none"> ➤ Help to efficiently meet demand ➤ Help limit capacity expansion ➤ Creation of a strong national institution that will promote energy services through ESCOs and other energy savings activities 	<ul style="list-style-type: none"> ➤ The reduction of 0.075 MTCO₂/year by 2001. ➤ The potential reduction of CO₂ emissions by 0.149 MT/year by the year 2005 ➤ Help limit capacity expansion
Incremental Cost: GEF Alternative - Baseline	2.25 million	<ul style="list-style-type: none"> ➤ Creation of a strong national institution that will promote energy services through ESCOs and other energy savings activities 	<ul style="list-style-type: none"> ➤ The reduction of 0.075 MTCO₂/year by 2001. ➤ The potential reduction of CO₂ emissions by 0.149 MT/year by the year 2005 ➤ Help limit capacity expansion

ANNEX 2

INDICATIVE BUDGET - INCLUDING INCREMENTAL COST SUMMARY

	Staff Costs \$	Sub- contracts \$	Equipment cost \$	Training costs \$	Misc. costs \$	TOTAL COSTS \$	Transaction Barrier	Likely inremen tal costs	How will replication be assured
1 Establishment of an Energy Efficiency Center (and two energy consumer service centers)	600 000 (GEF) 50 000 (UNDP)	400 000 (GEF)	150 000 (GEF)	100 000 (GEF)	75 000 (GEF)	1 325 000 (GEF) 50 000 (UNDP)	No existing institutional responsibilit y for energy conservation	Positive in the short term then negative	Training of staff and establish- ment of two consumer centers that will be replicated by ESCOs :
2 Demand Side Management Activities in the electricity sub-sector	300 000 (GEF) 150 000 (PA)	200 000 (GEF) 50 000 (UNDP)	100 000 (GEF) 50 000 (UNDP)	50 000 (GEF)	75 000 (GEF) 50 000 (PA)	725 000 (GEF) 100 000 (UNDP) 200 000 (PA)	Lack of information and knowledge	Negative	Standards and methods will be established that will be replicated
3 Various Capacity Building Activities in the energy sector	100 000 (GEF) 50 000 (UNDP)		50 000 (GEF)	50 000 (GEF)	50 000 (PA)	200 000 (GEF) 50 000 (UNDP) 50 000 (PA)	Shortage of skilled personnel and institutions	Positive in the short term then negative	Disciplines and trained staff will be available
GEF Contribution	1 000 000	600 000	300 000	200 000	100 000	2,250,000			
UNDP	100 000	50 000	50 000	--	--	200 000			
Other Contribution PA	150 000	--	--	--	100 000	250 000			
Total	1 250 000	650 000	350 000	200 000	200 000	2 700 000			

ANNEX 3**ESTIMATION OF ENERGY AND ELECTRICITY SAVINGS BY THE PROJECT****INTRODUCTION**

The West Bank and Gaza has become a dumping ground for inefficient machinery and household appliances (refrigerators, heaters, cookers, etc.) which are discarded because of their high energy consumption and imported to the West Bank and Gaza without consideration into their energy consumption and cost of operation.

The present energy consumption in the West Bank and Gaza which is presently around 600,000 tons of oil equivalent (t.o.e.) plus 1,400 GHW of electricity. These figures are expected to soar to over 750,000 tce and over 2,100 GWHs of electricity by the year 2001. All fuel will be imported; however, a growing proportion of electricity will be indigenously produced by new power stations in Gaza and possibly the West Bank.

Presently, losses in the distribution system exceed 25%, which compares very poorly to the 8% that is the expected norm in well designed distribution systems in the rest of the developing countries. It is not possible to exactly estimate the extent of inefficiencies in other sectors of the economy, particularly the industrial and commercial sectors. It is, however, safe to assume, through field observations, visits and measuring the energy intensity, that inefficiencies proliferate to a very high degree. Most machinery and equipment is old and vintage of the past energy intensive era. A large proportion of the currently consumed 600,000 t.o.e. of energy is used in the industrial sector, which only contributes by 8% of the GDP.

ESTIMATION OF THE BENEFITS

Direct benefits resulting from the implementation of this project (starting at the year 2001) are calculated on the basis of a reduction in the growth of fuel consumption from 6 to 4 % annually of the value of consumption at that year.

Most of the benefits of electricity loss reductions will be brought about by investments; however, a significant amount will also come through direct efficiency measures and benefits emanating from execution of this project. Such benefits will amount to 5% of the annual electricity consumption in the industrial and commercial sectors (which is 32% of the total consumption).

It is assumed that, initially (up to 2001), this project will have no direct impact on electricity consumption reduction in the residential sector and loss reduction in

Transmission and Distribution. This will, however, change with the investment phase that will be initiated during the project and that will be increased after its successful implementation. It is, therefore, assumed that in the period 2001 to 2005, investments made in the above sectors will have an impact on electricity consumption and therefore a substantial impact on reductions in CO₂ emission.

Consumption in industrial and commercial sectors by 2001:

$$2100 \text{ GHW} \times 0.32 = 670 \text{ GHW}$$

Therefore in year 2001, reductions in electricity consumption will amount to 5% of the expected 670 GWH consumption at that date, nearly 35 GWH annually.

Reduction in growth of fuel consumption will result in:

$$(0.06 \times 750,000) - (0.04 \times 750,000) = 15,000 \text{ toe/year}$$

With regard to fuels, there will be an estimated 15 000 toe savings.

Assuming that each kWh of electricity will need 0.25 kg of oil equivalent then the combined benefits of the project can be summarized as follows:

Annual fuel savings from reduction in electricity consumption:

$$0.25 \text{ kg/kWH} \times 35 \times 10^6 \text{ kWH} = 8,750 \text{ toe}$$

$$\text{Annual direct savings in fuel consumption} \quad 15,000 \text{ toe}$$

$$\text{Total fuel savings} \quad 23,750 \text{ toe}$$

In terms of Carbon curtailed:

$$0.86 \text{ t C/toe} \times 23,750 = 20,425 \text{ tons of carbon annually.}$$

In terms of CO₂:

$$3.66 \text{ t CO}_2/\text{t C} \times 20,425 = 74,755 \text{ tons of CO}_2 \text{ annually.}$$

By the year 2005 the following scenario is used:

Due to the expected high growth in the economy and energy use, such savings, by the year 2005, will increase by 30% at least. Therefore:

resulting total in fuel savings from the commercial and industrial sectors:

$$23,750 + (23,750 \text{ toe} \times 0.30) = 30,875 \text{ toe/year} \quad (1)$$

Taking into consideration the impact of electricity savings in the residential sector and savings from loss reduction in the transmission and distribution system (resulting from follow up investments that would have materialized by this time) on GHG emission:

First the following assumptions have to be made:

Assuming that the share of the residential sectors electricity consumption drops from the current 68% to 55% as a result of the growth in economy and investments in industry that are likely to occur;

Assuming a 5% reduction in consumption in the residential sector;

Consumption in the residential sector:

Consumption in industrial and commercial sectors:

$$2400 \text{ GHW} \times 0.55 = 1320 \text{ GHW}$$

Reduction in consumption is therefore:

$$1320 \times 0.05 = 66 \text{ GHW}$$

electricity fuel savings:

$$0.25 \text{ kg/KWh} \times 66 \times 10^6 \text{ KWh} = 16,500 \text{ toe/year} \quad (2)$$

Adding (1) and (2) the total fuel savings would amount to:

$$47,375 \text{ toe/year}$$

In terms of Carbon curtailed:

$$0.86 \times 47,375 = 40,742 \text{ tons of Carbon annually.}$$

ANNEX 3

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In terms of CO₂:

$$3.66 \times 40,742 \approx 149,000 \text{ tons CO}_2/\text{year} = 0.149 \text{ million tons/year.}$$

ANNEX 4

**LETTER FROM CEO/GEF AUTHORIZING PROGRAMMING IN THE PALESTINIAN
AUTHORITY WITHIN A REGIONAL CONTEXT AND LETTER OF ENDORSEMENT BY
OPERATIONAL FOCAL POINT**

**GLOBAL
ENVIRONMENT
FACILITY**

MUHAMMAD T. EL-ASHRY
CHIEF EXECUTIVE OFFICER
AND CHAIRMAN

August 2, 1996

Dear Council Member:

The *Instrument for the Establishment of the GEF* was accepted by representatives of States participating in the GEF Participants Meeting convened in Geneva from 14 to 16 March, 1994. In accepting the Instrument, the representatives participating in the meeting also agreed upon a set of understandings concerning the Instrument. These understandings are recorded in the Chairman's Summary of the meeting.

Paragraph 6 of the Chairman's Summary notes:

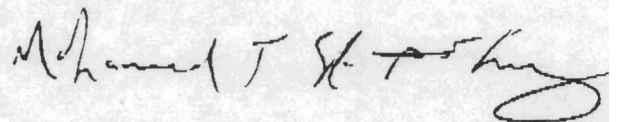
"With regard to "other activities" referred to in paragraph 9(b) of the Instrument, it is understood that territories other than "countries" may be eligible for GEF financing to the extent that they are to be recipients of such financing through a GEF regional or global project".

In the course of their operational work, the Implementing Agencies have received requests to prepare regional projects that would include activities in the West Bank and Gaza which led to inquiries as to the eligibility of the West Bank and Gaza for GEF financing. In response to the inquiries, we consulted with interested stakeholders in the region. Throughout our consultations, there was overwhelming support for GEF assistance to the West Bank and Gaza. On the basis of our consultations, I have concluded that the West Bank and Gaza is eligible for GEF financing consistent with paragraph 6 of the Chairman's Summary of March 16, 1994, and in accordance with the following understanding:

To enable Palestinian eligibility in the GEF only, the West Bank and Gaza Strip would be deemed associated with a state that is a GEF participant and has ratified the UN Framework Convention on Climate Change and/or the Convention on Biological Diversity.

I thought it useful to inform you of this decision so you may take it into account in your review of future work programs.

Sincerely,



cc: Alternates, Implementing Agencies, STAP, Convention Secretariats



**Palestinian National Authority
Ministry of Planning and International Cooperation
Minister's Office**

Gaza Fax: 07824090 Tel: 07867354

West Bank Office Al-Ram, P.O. Box 1386 Tel: (02) 5747045 • Fax: (02) 5747045

**To: Mr. Timophy S. Rothermy
Special Representative to the Administrator
UNDP - PAPP
Jerusalem
Fax: 02-6280089**

26.2.1997

**From: Dr. Nabeel Sha'ath
Minister of Planning & Int. Cooperation**

Dear Mr. Rothermy,

The Palestinian Authority, in recognition of the Letter of Dr. Mahmoud El-Ashery of 2 August 1996 to GEF Council members, is hereby requesting your assistance in submitting the project component entitled: "Energy Efficiency Improvements and Greenhouse Gas Reductions" to the May GEF Council for its consideration and approval. It should be recalled that the said project is affiliated with Egypt Project with the same title mentioned above, which was approved by the GEF Council during 1997 Winter intercessional Approval.


**Dr. Nabeel Sha'ath
Minister**



ANNEX 5
TECHNICAL REVIEW

Palestinian Authority - Energy Efficiency Improvements and Greenhouse Gas Reductions

by

Dr. Howard Geller
February 21, 1997

1 My overall impression is that this is a relatively good project. Establishing an energy conservation center that supports ESCOs, works on energy efficiency codes and standards, supports utility energy efficiency programs, and promotes energy conservation in general could have substantial economic and environmental benefits in the Palestinian Authority (PA). It is well within the guidelines and operational strategy of the GEF, and should receive funding by the GEF in my view.

2 I believe this project is highly relevant to both the Climate Change Convention and national priorities. Increasing energy efficiency is one of the most effective ways of limiting greenhouse gas emissions. It is especially important in rapidly developing regions where energy demand is rising very fast, such as in the PA. The high population density of the PA (especially Gaza) makes it even more important to reduce emissions of all types of pollutants, and improving energy efficiency is one of the best ways of doing this.

3 The background and justification for the project are well elaborated in the project proposal.

4 The project appears to be reasonable from a technical perspective given the details provided. However, there is not a lot of detail about the specific activities of the energy conservation center and how the goals will be achieved. These details should be defined in the next phase of project development (assuming the project is approved at this stage). I provide further comments on the proposed activities below.

5 The qualitative objectives regarding reduction of GHG emissions, institution building, stimulating private sector investment in energy efficiency, etc. are valid and well-focused. I have some concerns, however, about the quantitative energy savings goals and whether they can be achieved given the activities presented and project budget.

6 First, it appears that the direct fuels reduction goal (12,000 toe per year by 2001 according to Annex 3) is reasonable considering total current fuels use of 600,000 toe. It should be noted that there is a discrepancy between the fuels savings goal in the text (15,000 toe on p. 13) and the value given in the Annex.

7 But the electricity savings goal of 100 GWh per year by 2001 seems rather ambitious given the activities and budget. In terms of end-use savings, it should be remembered that commercial and industrial sectors account for only 30% of total electricity use. A 5% savings in these sectors by 2001 might result in about 35 GWh of electricity savings, given projected growth rates. I think this is a reasonable if not ambitious goal given the barriers and difficulties of reaching a high percentage of consumers. The remaining savings appears to come from reducing T&D losses, although this is not very clearly stated in the project proposal. Also, very little is said about how the energy conservation center will operate in this area. I think it is an important area to work in given the very high T&D losses, but the activities as now elaborated do not appear to adequately address this need. I comment further on this below.

8 I have a number of suggestions for expanding and/or modifying the activities as the project is further developed. First, I suggest developing a specific component of the project on T&D loss reduction (i.e., make this a primary area of activity for the Energy Conservation Center and related efforts). In particular, the center could include specialists on T&D loss reduction who would evaluate and identify high priority projects. These projects might include installation of meters among unmetered consumers (i.e., reducing theft), upgrading overloaded lines or transformers, or improving power factor. Separate funding would be needed to implement these projects of course. The center could accompany implementation and evaluate results, as well as prepare T&D loss reduction projects, working closely with the PEAg.

9 Second, I was pleased to see that work on codes and standards is included as one of the tasks. Given the rapid growth of infrastructure in the PA and the fact that it has been a "dumping ground" for inefficient appliances and machinery, developing and effectively implementing reasonable commercial building codes, equipment efficiency standards, and possibly even maximum energy intensity limits for key industrial processes could be very important for improving energy efficiency and cutting energy waste over the long run. This could be the most important function of the project and center in my view. In addition to establishing good codes and standards, it is important to train builders, inspect buildings under construction, test products, and enforce the codes and standards. These functions will require some funding and staffing. Also, it may be possible to use ESCOs to carry out some of these functions.

10 Third, I believe there are a number of activities that the Center and other organizations could do to increase the chance of bringing in or setting up ESCOs in the PA, and to increase the number of efficiency projects that actually get implemented. Experience around the world has shown that conducting audits alone is usually inadequate for overcoming the barriers inhibiting energy efficiency improvements. In addition to providing training for ESCOs (or potential ESCOs) and sponsoring audits that would be performed by ESCOs, it could be helpful to: 1) provide tools such as software and model contracts; 2) establish workable financing mechanisms with attractive interest rates and reasonable guarantee requirements; and 3) provide some initial projects for ESCOs to implement, e.g., retrofitting public buildings.

11 Fourth, the decision not to work on the residential sector should be reconsidered in my view, given the fact that the sector represents 68% of electricity use and probably a disproportionate share of the T&D losses. Perhaps it would be reasonable to start working on the commercial and industrial sectors, but then expand to include the residential sector by say the third year of the project. Activities for the residential sector could include information dissemination, promotion efforts, developing utility DSM programs that would disseminate measures such as compact fluorescent lamps and high efficiency appliances, and development and implementation of codes and standards relevant to this sector. ESCOs could be used for some of these activities.

12 The question of stakeholder and community participation is a relevant issue in my opinion. The inclusion of private sector representatives on the Board of Directors should help in this regard.

13 The project proposal does a good job of estimating avoided CO2 emissions given the assumed levels of energy savings. However, as explained above, I believe that either the activities should be expanded in order to meet the energy savings goals, or the goals should be reduced somewhat.

14 The project fits within the context and goals of the GEF, its operational strategies, and program priorities. It also is consistent with the UN Framework Convention on Climate Change.

15 I believe this project has value in terms of demonstrating a strategy and approach that, if successful, could be replicated in other developing countries. There is enormous potential for end-use efficiency improvements and T&D loss reductions in other developing countries as well as a need to establish ESCOs for implementing energy efficiency projects. While the PA has a number of unique characteristics, succeeding there could be of value to other Arab nations and perhaps to African nations. Energy efficiency codes and standards in particular have not been widely implemented yet in developing countries as far as I know.

16 Regarding capacity building, the project clearly would build capacity by creating the Energy Conservation Center and supporting energy efficiency programs in other institutions. Also, if successful, the project will help to establish private sector ESCOs in the PA.

17 The proposed level of funding as provided in Annex 2 may not be adequate in my view. First, I think the training item (\$100,000 total for 3.5 years) is not enough given the tasks identified in the proposal. Second, I think additional funding would be needed to work on codes and standards in order to do a good job in this area. Third, the budget does not include specific funds for marketing and promotion. Fourth, funding would be needed for staff in the area of T&D loss reduction, if this is one of the objectives of the project. Overall, I think a total budget of \$4-5 million over 3.5 years would be more reasonable.