

# Cover Note

**Project Name:** Polish Energy Efficient Motors Programme (PEMP)

**Date:** 30 January 2002

	Work Program Inclusion	Reference/Note
<b>1. Country Ownership</b>		
<ul style="list-style-type: none"> <li>Country Eligibility</li> </ul>		<ul style="list-style-type: none"> <li>Cover Sheet (Ratified UNFCCC on 28 July 1994).</li> </ul>
<ul style="list-style-type: none"> <li>Country Drivenness</li> </ul>	Clear description of project's fit within: <ul style="list-style-type: none"> <li>National reports/communications to Conventions</li> <li>National or sector development plans</li> </ul>	<ul style="list-style-type: none"> <li>Policy framework and national plans in this sector described in Section 1.2.</li> </ul>
<ul style="list-style-type: none"> <li>Endorsement</li> </ul>	<ul style="list-style-type: none"> <li>Endorsement by national operational focal point.</li> </ul>	<ul style="list-style-type: none"> <li>OFP endorsement letter for this project sent with the brief (Annex E).</li> </ul>
<b>2. Program &amp; Policy Conformity</b>		
<ul style="list-style-type: none"> <li>Program Designation &amp; Conformity</li> </ul>	<ul style="list-style-type: none"> <li>Describe how project objectives are consistent with Operational Program objectives or operational criteria.</li> </ul>	<ul style="list-style-type: none"> <li>Annex A</li> </ul>
<ul style="list-style-type: none"> <li>Project Design</li> </ul>	Describe: <ul style="list-style-type: none"> <li>sector issues, root causes, threats, barriers, etc., affecting global environment.</li> <li>Project logical framework, including a consistent strategy, goals, objectives, outputs, inputs/activities, measurable performance indicators, risks and assumptions.</li> <li>Detailed description of goals, objectives, outputs, and related assumptions, risks and performance indicators.</li> <li>Brief description of proposed project activities, including an explanation how the activities would result in project outputs</li> <li>Global environmental benefits of the project.</li> <li>Incremental Cost Estimation based on the project logical framework.</li> <li>Describe project outputs (and related activities and costs) that result in <i>global</i> environmental benefits</li> <li>Describe project outputs (and related activities and costs) that result in joint <i>global and national</i> environmental benefits.</li> <li>Describe project outputs (and related activities and costs) that result in <i>national</i> environmental benefits.</li> </ul>	<ul style="list-style-type: none"> <li>Section 1.4 on barriers to energy efficiency in electric motor systems; barriers, threats, and root causes addressed throughout Section 3.</li> <li>Annex B.</li> <li>Objectives in Section 2.2; Outputs throughout Section 3; Risks in Section 4.1; Indicators and critical assumptions in Annex B.</li> <li>Activities and outputs in Section 3.</li> <li>Global benefits described in Annex A and Annex B.</li> <li>Incremental Cost Estimation is provided in Annex A.</li> <li>Annex A and Annex B describe outputs resulting in global environmental benefits.</li> <li>Outputs described throughout Section 3. Annex A and B describe global environmental benefits.</li> <li>Outputs described throughout Section 3. Annex A describe national environmental benefits.</li> </ul>

	Work Program Inclusion	Reference/Note
	<ul style="list-style-type: none"> <li>Describe the process used to jointly estimate incremental cost with in-country project partner.</li> <li>Present the incremental cost estimate. If presented as a range, then a brief explanation of challenges and constraints and how these would be addressed by the time of CEO endorsement.</li> </ul>	<ul style="list-style-type: none"> <li>Incremental Cost addressed in Section 6 and in Annex A (including breakdown of financing by partner).</li> <li>Incremental Cost addressed in Section 6 and in Annex A (including breakdown of financing by partner and a detailed budget estimate).</li> </ul>
<ul style="list-style-type: none"> <li>Sustainability (including financial sustainability)</li> </ul>	<ul style="list-style-type: none"> <li>Describe proposed approach to address factors influencing sustainability, within and/or outside the project to deal with these factors.</li> </ul>	<ul style="list-style-type: none"> <li>Sustainability is addressed in Section 4.2.</li> </ul>
<ul style="list-style-type: none"> <li>Replicability</li> </ul>	<ul style="list-style-type: none"> <li>Describe the proposed approach to replication (for e.g., dissemination of lessons, training workshops, information exchange, national and regional forum, etc) (could be within project description).</li> </ul>	<ul style="list-style-type: none"> <li>Replication addressed in Section 4.3; and as part of project design under Objective/Activity 2. Dissemination of lessons learned is under Activity 1.2, 1.4, 3.3; and workshops under Activity 1.4.</li> </ul>
<ul style="list-style-type: none"> <li>Stakeholder Involvement</li> </ul>	<ul style="list-style-type: none"> <li>Describe how stakeholders have been involved in project development.</li> <li>Describe the approach for stakeholder involvement in further project development and implementation.</li> </ul>	<ul style="list-style-type: none"> <li>Process of stakeholder participation and implementation arrangements described under Section 5.</li> <li>Stakeholder participation 5.3.</li> </ul>
<ul style="list-style-type: none"> <li>Monitoring &amp; Evaluation</li> </ul>	<ul style="list-style-type: none"> <li>Describe how the project design has incorporated lessons from similar projects in the past.</li> <li>Describe approach for project M&amp;E system, based on the project logical framework, including the following elements: <ul style="list-style-type: none"> <li>Specification of indicators for objectives and outputs, including intermediate benchmarks, and means of measurement.</li> <li>Outline organizational arrangement for implementing M&amp;E.</li> <li>Indicative total cost of M&amp;E.</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>Monitoring and evaluation is described in the final bullet in Section 6 and in Section 7.</li> <li>Objectively verifiable indicators and means of verification are addressed in Annex B.</li> <li>M&amp;E implementation in Section 7.</li> <li>Reflected in total project cost (Section 6).</li> </ul>
<b>3. Financing</b>		
<ul style="list-style-type: none"> <li>Financing Plan</li> </ul>	<ul style="list-style-type: none"> <li>Estimate total project cost.</li> <li>Estimate contribution by financing partners.</li> <li>Propose type of financing instrument.</li> </ul>	<ul style="list-style-type: none"> <li>Total project cost on cover page, and in Section 6. Breakdown detailing the contributions of financing partners is in Section 6.2.</li> </ul>
<ul style="list-style-type: none"> <li>Implementing Agency Fees</li> </ul>	<ul style="list-style-type: none"> <li>Propose IA fee.</li> </ul>	<ul style="list-style-type: none"> <li>The standard fee will be requested.</li> </ul>
<ul style="list-style-type: none"> <li>Cost-effectiveness</li> </ul>	<ul style="list-style-type: none"> <li>Estimate cost effectiveness, if feasible.</li> <li>Describe alternate project approaches considered and discarded.</li> </ul>	<ul style="list-style-type: none"> <li>Annex A.</li> </ul>

	Work Program Inclusion	Reference/Note
<b>4. Institutional Coordination &amp; Support</b>		
IA Coordination and Support <ul style="list-style-type: none"> <li>Core commitments &amp; Linkages</li> </ul>	Describe how the proposed project is located within the IA's: <ul style="list-style-type: none"> <li>Country/regional/global/sector programs.</li> <li>GEF activities with potential influence on the proposed project (design and implementation).</li> </ul>	The GEF implementing agency, UNDP, has identified the environment as a priority areas for global activity. UNDP Poland is involved in continuing assistance to the Polish government to comply with international environmental conventions, particularly the UNFCCC. UNDP has also provided support to GEF focal areas through NGOs/community-level initiatives through its management of the GEF Small Grants Program (SGP) in Poland, which has been operating since 1994. The GEF/SGP Country Strategy has placed a strong emphasis on operational programs that address barriers to efficiency.
<ul style="list-style-type: none"> <li>Consultation, Coordination and Collaboration between IAs, and IAs and EAs, if appropriate.</li> </ul>	<ul style="list-style-type: none"> <li>Describe how the proposed project relates to activities of other IAs (and 4 RDBs) in the country/region.</li> <li>Describe planned/agreed coordination, collaboration between IAs in project implementation.</li> </ul>	See Activity 5.1.4, Activity 1.3, and Section 5.1.2.
<b>5. Response to Reviews</b>		
Council	Respond to Council Comments at pipeline entry.	
Convention Secretariat	Respond to comments from Convention Secretariats.	
GEF Secretariat	Respond to comments from GEFSEC on draft project brief.	Informal comments have been addressed in Section 1.3 and Section 2.1 with enhanced discussion of motor systems and impacts of EU accession, respectively. In addition, the Project Brief has been revised based clarifications requested in the GEF Sec Project Review.
Other IAs and 4 RDBs	Respond to comments from other IAs, 4RDBs on draft project brief.	Comments from UNEP are addressed at the relevant places in the document; particularly in Section 6.2.1. and Section 1.3.
STAP	Respond to comments by STAP at work program inclusion	NA
Review by expert from STAP Roster	Respond to review by expert from STAP roster.	Annex C (STAP Roster Technical Review and Response).

## PROJECT BRIEF

### 1. IDENTIFIERS:

<b>PROJECT NUMBER:</b>	(PIMS 1545)
<b>PROJECT NAME:</b>	<b>Poland: Polish Energy Efficient Motors Programme (PEMP)</b>
<b>DURATION:</b>	5 years
<b>GEF IMPLEMENTING AGENCY:</b>	United Nations Development Programme (UNDP)
<b>EXECUTING AGENCY:</b>	Office of the Committee for European Integration (UKIE)
<b>LOCAL IMPLEMENTING AGENCY:</b>	Polish National Energy Conservation Agency S.A. (KAPE S.A.)
<b>REQUESTING COUNTRY:</b>	Poland
<b>ELIGIBILITY:</b>	Poland ratified the FCCC on 28 July 1994
<b>GEF FOCAL AREA</b>	Climate Change
<b>GEF PROGRAMME FRAMEWORK:</b>	OP 5 - Removal of barriers to energy efficiency and energy conservation

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**2. SUMMARY:** The economic potential for energy efficiency improvement of electric motor systems in Poland is large and could substantially reduce domestic greenhouse gas emissions. While industrial energy efficiency is a priority in Polish energy and climate change policy, the market share of energy efficient motors is currently very low due to a range of barriers. The Polish Energy Efficient Motors Programme (PEMP) project aims to overcome these existing barriers to increase the market penetration of energy efficient motors and related efficiency improvements in electric motor systems.

PEMP will address key technologies and sectors identified by the Polish Energy Policy, with a special emphasis on the manufacturing industry, the energy sector (heating), the utility industry (water supply and sewage treatment) and the mining sector. PEMP will address information barriers, financial barriers, lack of capacity for project development, and institutional barriers. Under this programme, four components will be developed and implemented: (i) capacity building by providing information and services related to energy efficient electric motors; (ii) implementation of four demonstration projects for efficient motor systems in different key sectors; (iii) market transformation, using a financial incentive mechanism coupled with awareness raising; and (iv) development of industrial energy efficiency policy, particularly in the field of efficient motor systems.

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### 3. COSTS AND FINANCING:

<b>GEF: Project</b>	4,304,300
<b>PDF</b>	195,700
<b>Subtotal GEF</b>	<b>4,500,000</b>
<b>CO-FINANCING:</b>	
Local investments	
Manufacturers of electric motors:	300,000
Domestic environmental funds:	1,215,359
Other funds (domestic and international):	500,000

In-kind contributions	
Government of Poland / Polish National	
Energy Conservation Agency S.A.:	300,000
Polish Foundation for Energy Efficiency/	
Polish Copper Promotion Centre S.A.:	100,000
<b>Subtotal Co-financing</b>	<b>2,415,359</b>
<b>Parallel financing:</b>	
Local investments	
Energy efficient electric motor customers:	15,296,113
<b>Subtotal Parallel Financing</b>	<b>15,296,113</b>
<b>TOTAL PROJECT COST:</b>	<b>22,211,472</b>

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**4. ASSOCIATED FINANCING: (MILLION US \$)** NONE

**5. OPERATIONAL FOCAL POINT ENDORSEMENT: (SEE ANNEX E)**

**Name:** Wojciech Ponikiewski  
**Title:** Director of the Department for UN Economic and Social Affairs  
**Organization:** Ministry of Foreign Affairs of the Republic of Poland  
**Date:** 15 February 2001

**6. IA CONTACTS:**

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## LIST OF ABBREVIATIONS

APR	Annual Performance Report
ATT	Agency for Technique and Technology
BPI	Best Practice Initiatives
CEMEP	The European Committee of Manufacturers of Electrical Machines and Power Electronics
EBRD	European Bank for Reconstruction and Development
ECCP	European Climate Change Program
ECOFUND	The Ecofund Foundation – the GEF operational focal point for Poland is located at the Foundation
EEM	Efficient Electric Motor (or high efficiency electric motor)
EMS	Electric Motor Systems
ERU-PT	Emission Reduction Unit Procurement Tender – a program sponsored by the Government of the Netherlands
ESCO	Energy Service Company
EU	European Union
EuroDEEM	European database of energy efficient motors
FEWE	Polish Foundation for Energy Efficiency
GDP	Gross Domestic Product
GDP/PEC	Primary Energy Productivity
GEF	Global Environment Facility
GHG	Greenhouse Gases
GUC	Central Duty Office
IEC	International Electrotechnical Commission
IEEE	The Institute of Electrical and Electronics Engineers
IPCC	Intergovernmental Panel on Climate Change
JI	Joint Implementation
JICA	Japan International Co-operation Agency
KAPE or KAPE S.A.	Polish National Energy Conservation Agency S.A.
KBN	Polish Committee for Research and Science
KIE	[Polish] Committee for European Integration
LTA	Long Term Agreements
M&D	Motors And Drives
MF	Ministry of Finance
MG	Ministry of Economy
MS	Ministry of Environment
MSZ	Ministry of Foreign Affairs
Mton and kton CO <sub>2</sub>	10 <sup>6</sup> and 10 <sup>3</sup> tons of CO <sub>2</sub> , respectively
MUNEE	The Municipal Network for Energy Efficiency
NFOSiGW	[Polish] National Fund for Environmental Protection and Water Management
OECD	Organisation for Economic Co-operation and Development
OPET	Organisation for the Promotion of Energy Technologies
PBP	[Simple] Payback Period
PCPC S.A. or PCPC	Polish Copper Promotion Centre S.A.
PDF	Project Preparation and Development Facility
PELP	Polish Energy Efficient Lighting Project
PEMP	Polish Energy Efficient Motors Programme
PEMP Centre	The main project mechanism for information dissemination – a clearinghouse.

PKN	Polish Committee for Standards
PMU	Project Management Unit
PN	Polish Standard
PSC	Project Steering Committee
PSO	The Netherlands Programme for Co-operation with Central and Eastern European Countries
R&D	Research and Development
SCORE	Supporting the Cooperative Organization of Rational Energy Use
SENER	A Dutch agency for government project implementation
SME	Small and Medium Enterprises
TWh, GWh, MWh	$10^{12}$ , $10^9$ , $10^6$ Watt-hours
UKIE	[Polish] Office of the Committee for European Integration
UNDP	United Nations Development Programme
UNEP	United Nations Environment Programme
UNFCCC	UN Framework Convention on Climate Change
UNIDO	United Nations Industrial Development Organisations
URE	[Polish] Energy Regulatory Authority
VSD	Variable Speed Drives



# 1. BACKGROUND AND CONTEXT

## 1.1. Background

With 38.7 million inhabitants and area of 312,000 square kilometers, Poland is considered a strategic country in Central Europe. Polish economic growth and social stability have served as a model for neighboring countries. During the last ten years, Poland has carried out fundamental and highly effective economic and social reforms, including the transformation from a central economy to an open market economy. After the social and economic shocks of the early 1990s, Poland has shown stable economic growth in GDP that has ranged from 3 to 7 per cent per year. From 1990 to 1998, GDP in Poland increased by 32.2 per cent (based on 1990 fixed prices).

Productivity, including productivity in energy use, increased significantly in the 1990s. As a result, primary energy productivity (GDP/PEC) increased from 2.4 PLN/kg<sub>oe</sub> in 1989 to 3.7 PLN/kg<sub>oe</sub> in 1998 (calculated in PLN with constant 1995 prices). While GDP has increased over the past five years, electric energy production in Poland has remained constant. Nonetheless, Poland still has high energy intensity in comparison to OECD countries. For example energy intensity in 1998 was 0.79 MWh/1000 USD in Poland -- approximately four times higher than countries such as Germany, Switzerland, Denmark, and the Netherlands.

Power production in Poland relies on hard coal and brown coal. Ninety-five (95) per cent of electric energy is generated in coal-fired power plants, as well as in coal-fired heat and power stations. As a result, the share of carbon dioxide emission from electricity generation represents 38 percent of the country's overall carbon dioxide emissions. In 1998, Poland's annual CO<sub>2</sub> emissions totaled 338 million tons of CO<sub>2</sub>. Of this, 38 per cent of the emissions came from electricity production, of which 50% were attributable to electric motor systems (i.e., 64 million tons of CO<sub>2</sub> per year).

Electric motor systems (which include motors, drives, pumps, fans, and control equipment) use 40 to 50 per cent of all electricity consumed in Poland. The share differs by end-use sector: from 40-90 per cent in production sector to 20-40 per cent in households and public services. Manufacturing activities (35 per cent), electric energy, gas, heat and water supply (17 per cent) and households (17 per cent) constitute the biggest share of Poland's electricity consumption, which totals 122.8 TWh annually.

The most significant application for electric motor systems (60 per cent of electric energy consumption) is for raising pressure and pumping liquids and gases through pumps, fans, compressors, etc. in three industrial sectors: the manufacturing sector; the energy sector (gas, heat, and water supply); and the mining industry. The technical potential<sup>1</sup> for electricity savings of electric motor systems in these applications in these sectors is 3.9 TWh/year. The remaining 40 per cent of electricity consumption by electric motor systems is used by freight and passenger transport and for materials processing. Total technical potential for savings is estimated at 6.3 TWh/year (which is 5.1 per cent of overall electric energy consumption in Poland)<sup>2</sup>.

The economic potential for electricity savings of electric motor systems is 5.6 TWh/year for a payback period of less than 10 years, or 3.1 TWh/year for a payback period of less than 6 years. The payback period within the economic potential is a conservative measure that only considers electric energy cost

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<sup>1</sup> The potential available when applying the best technologies available on the world market in conditions where operating times totalled more than 2,000 hours/year with a constant load for high energy efficiency motors and with a minimum 30% variation in load for variable speed drives.

<sup>2</sup> Source: FEWE, 2000.

savings. It does not consider additional costs and benefits, such as the reduction of water consumption, air, and gas losses as well as automation and process management. Electricity savings of 6.3 TWh/year, or the total technical potential, would result in a reduction of greenhouse gases (GHGs) in Poland of 6.8 million tons of CO<sub>2</sub> per year. This figure corresponds to 1.6 percent of Poland's total GHG emissions in 1997.

The conclusions from this analysis are the following:

- The technical potential for energy efficiency improvement of electric motor systems in Poland is large in both absolute and relative terms;
- Energy efficiency increases could substantially reduce domestic GHG emissions in Poland, thereby supporting Poland's activities as a party to the UN Framework Convention on Climate Change (UNFCCC);
- There is great economic potential for energy efficiency improvements with low payback periods that meet the usual investment criteria. However, the manufacturer Elektrim Motor, which holds 70% of the Polish motor market has reported that no energy efficient motors have been sold recently in Poland. Therefore, it is clear that these investments face substantial barriers;
- A large economic potential exists with higher pay-pack period, which could be exploited by financial incentives lowering the pay-back period; and,
- The manufacturing industry, the energy and water sector, and the mining industry are key sectors, because they show the largest economic potential for efficiency improvements.

## **1.2. Policy Framework in Poland**

The main topics of the *Government Long-term Strategy for Sustainable Development* (June, 2000) are the rational use of natural resources; promotion of advanced, efficient, and clean technologies; and access to education and information.

The Second National Environmental Policy of Poland (approved by the Government of the Republic of Poland in June 2000) defines the following policy priorities related to air quality and climate change protection as:

- medium term priorities (up to 2010)
  - to reduce air emission pollutants particles by 75%, SO<sub>2</sub> by 56%, NO<sub>x</sub> by 31% from 1990 level emissions;
  - to fulfill Kyoto Protocol requirements pertaining to GHG emissions reduction by using state-of-the-art energy efficient technologies and renewable energy sources;
- long term priorities (up to 2025)
  - deep restructuring of production and consumption model by increasing energy and resource efficiency and broadening the use of renewable energy sources.

The *Guidelines for State Energy Policy to the year 2020* (approved by the Government of the Republic of Poland in February 2000) is the key energy policy document in Poland. It defines the following objectives:

- Integration of energy and environmental management; and,
- Reduction of energy intensity. Polish State Energy policy includes specific targets for energy intensity for primary energy use as well as for electricity consumption.

The Energy Policy includes references to energy efficiency policy in the chapter "Strategy for Improvement of Energy Efficiency." It also defines key technologies in industry such as combined heat and power production, and variable speed electric motors and energy efficient equipment. Chapter 6 'State Action Plans' mentions the development of market mechanisms under point 6.6 'Energy Efficiency

Policy.’ The text states that rationalization policy will require specific measures, such as direct regulations (standards), market stimulation (economic and fiscal), and supporting instruments (information, education, R&D).

The Ministry of Economy, which is responsible for implementation of the national energy policy, is tasked with preparing integrated government programs to introduce several energy efficient products on the Polish market, including energy efficient motor systems. The programmes are designed to give preference to market mechanisms.

Poland is a signatory to the UNFCCC, and it has committed to an 8 per cent GHG emission reduction target under the Kyoto Protocol. The Second National Communication of Poland to the UNFCCC (1998) mentions improving energy efficiency in industry and municipalities as one of the key measures to reduce domestic GHG emissions.

Poland is also in the process of negotiating to accede to the European Union (EU), which would happen in late 2004 at the earliest. There are several activities in the EU related to energy efficiency in electric motor systems that are in progress, including the compilation of a European database of energy efficient motors (EuroDEEM), and voluntary agreement of the European motor manufacturer association CEMEP to move the motor market from class 3 to class 2 and 1 in the next several years.<sup>3</sup> The proposed PEMP project will result in better preparation for EU accession and will give Poland an opportunity to participate in some of the European initiatives in future. For example, the proposed PEMP Centre might serve as a professional representative for Poland that would allow it to join CEMEP. More information on the impact of accession is provided in Section 2.1, “Rationale.”

### **1.3. Boundaries of Electric Motor Systems**

Analysis has shown the significant potential for GHG emission reduction in Poland through the increase of energy efficiency in electric motor systems. Also a large economic potential was identified which is not exploited at the moment because cost-effective investments face a range of existing barriers, and profitability of the investments is too low from an investor’s perspective. Energy efficiency, particularly in electric motor systems in industry, is a priority in Polish energy and climate change policy. However, there is still a need for implementation programmes in this field.

The proposal at hand for a Polish Energy Efficient Motors Programme (PEMP) aims to fill this gap. PEMP will contribute to Polish energy policy objectives and supports the development of the required implementation programmes. PEMP addresses key technologies and sectors as identified in Polish Policy.

Electric motors are always a component in drive systems. Drive systems consist of a number of different components. No less than seven different options have been identified that could increase the efficiency of these systems:

1. Improving the electrical supply (low voltage drop, steady power supply and efficient power capacity from the grid system);
2. Implementing high-performing start and stop devices;
3. Adding a variable speed drive (VSD), which can improve efficiency in a range of M&D applications that often operate at partial load (e.g. fans, pumps, conveyors);
4. Increasing motor efficiency by optimising motors for the specific required load, voltage, speed and application;

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<sup>3</sup> Motor classes are determined by a combination of rotation speed and power depending on the size of the motor and are described in reference tables used by the European Commission. Class 1 is the most efficient. These tables are available upon request.

5. Reducing the transmission losses (belt drive, gear drive, shaft drive etc.);
6. Choosing machinery with proper drives for the highest efficiency possible ; and,
7. Reducing losses in pipelines and ducts (thus allowing for the selection of a smaller motor).

All of the above measures can increase the efficiency of the systems. In addition, system optimization enhances electricity savings significantly. PEMP will focus on optimizing the electric motor system, particularly options 2, 3, and 4 in the above list, which are commonly found across a wide range of applications. Also, the products used in these options are often delivered by the same contractor and can be designed and fitted together by the same supplier. This characteristic provides advantages in price, warranty and delivery time. PEMP will pay special attention to variable speed drives, because the variation of required power output is large in many applications in Poland, resulting in potential savings that are also large.

When working with motors, PEMP will promote Class 1 motors only. The reason for choosing these high performance motors is that the many motors are used in pump applications connected to heating systems. These motors have an extended annual operational sequence (often over 4,000 hours), which results in considerable savings because of the improved motor efficiency. Many of these pump applications require high-powered motors, which also increase their efficiency in accordance with increases in the motor size. Furthermore, this class is widely used in promotion programmes and recommended by the European Commission to be used as a minimum standard for national efficiency programs.

Class 1 motors are 1.5 - 3 per cent (large motors) to 5 - 7 per cent (small motors) more efficient than the average motor on the Polish market today. When the replacement of a standard motor by an energy efficient motor is augmented by optimizing the surrounding electric motor system, these savings grow substantially and can reach 40 per cent.

#### 1.4. Barriers to Energy Efficiency in Electric Motor Systems

A range of barriers have prevented Poland from realizing the economic potential for energy efficiency in electric motor systems. In the PDF-B phase of the proposed project, the project team conducted a survey was conducted of manufacturers and end-users, which resulted in a ranking of barriers. The complete results can be found in Annex G. The survey showed that a large majority of users/investors (approximately 75%) were prepared to invest in energy efficient motor systems if the simple payback period for the investment were less than 2 to 3 years (see Table 1).

**Table 1 - Willingness to invest in energy efficient motor systems**

<i>Simple Payback Period (PBP)</i>	<i>Share of the respondents</i>
less than 1 year	95 %
less than 3 years	63 %
less than 6 years	6 %
less than 10 years	3 %

Based on the above information, the project team identified two categories of barriers:

1. *Barriers to profitable investments.* The economic potential of investments with a PBP of less than 2 to 3 years, which is the criterion applied by most investors, is not currently exploited. Nonetheless, there are a number of projects that have been identified with low pay back periods. For example, in district heating and water utility projects involving the replacement of standard motors with energy efficient motors, pay back periods of between 2.2 and 2.8 years were possible with expected savings of between 520 and 566 MWh/year. However, the current market share of high efficient electric motors that would capture these savings is practically zero.

2. *Barriers to investments with lower profitability.* An even greater potential exists for investments with a PBP of up to 6 years. However, these projects are not implemented because profitability is perceived as too low by potential investors.

PEMP will address both barriers to profitable investments and barriers to investments with a lower profitability. The PDF-B phase of the project assessed these barriers by focusing on sectors with the highest expectancy of full-scale implementation (i.e., in water, heat, electric energy, gas supply sectors, and in industry, mainly the chemical industry). The barriers were found to be the same across these specific sectors.

#### ***1.4.1. Barriers to Profitable Investments***

Poland is open to the introduction of energy efficiency technologies either from domestic production, import or technology transfer. Unfortunately, energy end users and investors are accustomed to installing the lowest-efficiency and cheapest equipment; replacing worn out or damaged equipment with inefficient models; and repairing obsolete equipment rather than replacing it with more efficient or state-of-the-art technologies for employment reasons. Nonetheless, domestic producers and importers are prepared to buy energy efficient motors if market opportunities are introduced. However, most energy users/investors:

- do not know about the potential of electricity cost reduction;
- do not believe that investment in new efficient technologies are cost-effective;
- do not know about existing technical, financial opportunities to implement these efficiency measures;
- do not have the capacity to develop a technical and financial investment project.

The PEMP programme will focus on overcoming the information barriers, financial barriers, lack of capacity for project development, and institutional barriers. Details on each key barrier are given below.

##### *Information and awareness barriers:*

- Lack of awareness of the local industries and municipalities regarding available technologies, and the associated economic and environmental benefits of reducing electricity consumption of electric motor systems. Companies tend to rewind old motors despite that it is not profitable over the longer term.
- Lack of information at the company level concerning the potential technical and economic energy saving potential by replacing old motors with new, correctly-sized energy efficient models with variable speed drive control as applicable.
- Lack of information on quality and motor efficiency (lack of standardisation and labelling schemes).
- The reduction of electricity consumption is often a secondary concern for the enterprises and it is not considered a priority measure in their investment plans. There is overemphasis on first cost versus operating costs.

##### *Financial barriers:*

- Lack of available financial investment mechanisms and financial resources.
- Investors regard investment in energy efficient motors systems as high risk.
- Transaction costs for smaller to medium size investments are relatively high.

##### *Institutional barriers:*

- There is a lack of targeted national policies and programmes for industrial energy efficiency.
- There is a lack of sustainable expertise in this field that is accessible for all stakeholders.
- There is no strong promoter or advocate for energy efficiency in motor systems. No professional organisation for motor manufacturers exists in Poland.
- Development is slow in the field of new businesses with specialised, high-quality services like energy services companies.

*Lack of capacity for project development:*

- Companies often do not have the resources to identify and address this component of their expenses.
- Often the companies, investors and sponsors lack the capacity to develop technically and financially sound projects in the area of efficient electric motor systems because of shortcomings in knowledge and experience.

#### **1.4.2. Investments with Lower Profitability**

In addition to the economic potential that is already profitable from the investor's perspective, a large additional potential exists for payback period between 2-3 and 6 years, a range where profitability is considered too low by most investors. This low profitability is caused by the incremental investment costs of energy efficient motors in relation to the electricity costs savings and high transaction costs of energy saving measures. PEMP will also address this potential by decreasing the incremental and transaction costs. However, equally important is that investment decisions are usually made without considering the additional benefits and increasing electricity prices:

- Efficiency improvement in electric motor systems often lead to substantial benefits, in addition to the savings on electricity use, for example the reduction of maintenance costs, lower noise abatement costs etc. If these benefits would be considered the profitability would increase; and,
- Electricity prices are likely to increase in the future<sup>4</sup>. Based on a forecast of electricity prices in Poland, electricity prices will likely increase by up to 20% over the next 3 years. This increase is mainly due to long-term contracts between power suppliers and distributors (which cover up to 80% of electricity production), which include the cost of required investments for addressing environmental concerns. If a dynamic investment assessment were made instead of considering current prices exclusively, profitability would also increase.

Both barriers could be addressed by providing information and raising awareness on the benefits and on how to include them in an investment assessment.

## **2. PROJECT RATIONALE AND OBJECTIVES**

### **2.1. Rationale**

The rationale for the project is based on the following:

- Efficiency improvement of conventional electric motor systems leads to a large reduction of electricity consumption in industry and consequently to long-term GHG emission reduction in the Polish power sector. The economic potential for a payback period less than 6 years is 3.1 TWh/year. The corresponding emission reduction is 3.3 Mton CO<sub>2</sub>-eq./year;
- Part of this potential is cost-effective from the investor's point of view (up to 2 to 3 year PBP), but is not exploited because different market barriers prevent this. The remaining part of this potential is not cost-effective yet (PBP between 2-3 and 6 years) from the investor's point of view;
- An active intervention is necessary because it is not expected that the key barriers will be resolved in a business-as-usual (baseline) scenario;
- Active intervention in the field of energy efficient motor systems in industry will support the implementation of Polish energy efficiency policy. Due to the lack of experience, resources and capacity in Poland it is not expected that Poland will be able to implement such an intervention without support; and,
- The main barriers for market penetration of energy efficient motors in Poland have been identified. The proposed GEF intervention specifically addresses these barriers.

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<sup>4</sup> [www.electricity.org.uk/uk\\_inds/pricesla](http://www.electricity.org.uk/uk_inds/pricesla)

The proposal contributes to key objectives of the Polish Government (see Section 1). The project will be implemented by the Polish Energy Conservation Agency (KAPE), which is a public body established and fully supervised by the Polish Government, including the Polish Ministry of Economy.

The proposed GEF project should be seen separately from the environmental obligations that need to be met as a result of Poland's candidacy to join the European Union. The EU has decided not to introduce mandatory standards for electric motors, and there is no indication that this situation would change before the end of the project. In addition, while the EU has mentioned the possibility of a motor challenge in the 2<sup>nd</sup> phase of the European Climate Change Program, the actual timeframe for the implementation of this program (even for current member states) is several years away. Finally, Poland's negotiations to accede to the EU do not include any detailed obligation to achieve specific efficiencies in electric motor systems. Therefore, it is safe to conclude that even in a baseline scenario involving EU accession at the soonest possible date, Poland would not be able to undertake the proposed incremental activities in efficient electric motors and electric motor systems. Any changes in this situation will be noted in the Project Implementation Review submitted annually to the GEF Secretariat, and the GEF funding will be monitored to ensure that it is used exclusively to meet obligations under the UNFCCC.

## **2.2. Objectives and Targets of the Project**

The main objective of the project is the following:

*To reduce domestic GHG emissions in Poland by overcoming existing barriers for increased market penetration of energy efficient motors and related efficiency improvements in the electric motor system (including variable speed drives), particularly, but not exclusively, in the manufacturing industry, the energy sector (heating), the utility sector (water supply and sewage treatment) and mining.*

The project has established the following specific targets:

- Increase energy efficient motor sales in Poland to app. 15% of the total motor market as a direct result of PEMP during the duration of the programme (five years);
- Increase the efficiency of electric motor systems by increasing the penetration of variable speed drives in combination with energy efficient motors;
- Achieve a medium-term increase of energy efficient motors sales of 30% of the total motor market in the year 2010;
- Save electricity by promoting the optimization of electric motor systems, including the implementation of energy efficient motors and variable speed drives to a level of 55.7 GWh/year in 2006 and 231.6 GWh/year in 2010; and,
- Reduce domestic GHG emissions by 885 kton CO<sub>2</sub> by 2006 (cumulative over the project lifetime), and 3.7 Mton CO<sub>2</sub> by 2010, including the medium-term impact (cumulative over the lifetime of the investments).

## **2.3. Implementation Strategy and Selection of Instruments**

A wide range of instruments can be used to promote energy efficient motors. The instruments used in PEMP have been selected according to the following principles:

1. The instruments should match the key barriers identified in Section 2, which are diverse. PEMP will therefore apply a package of instruments rather than focus on one specific instrument.
2. The instruments should comply with the principles of Polish energy and energy efficiency policy. The choice of instruments in the proposal should also comply with the identification of priority instruments for energy efficiency improvement in Polish Energy Policy, including (i) economic market stimulation, and (ii) information dissemination and awareness raising.

3. The instruments should reflect responses from the survey of possible manufacturers and end-users. Both groups recommend that PEMP should include the following instruments/measures (in order of priority):
  - a. improved access to a wider range of information (e.g., catalogues, guidebooks, computer programs, a professional information network);
  - b. creation of co-financing opportunities to reduce the payback period of investments in electric motor systems to less than 2-3 years;
  - c. development of energy services companies (i.e. ESCOs);
  - d. training and information dissemination on (i) energy efficient motor systems, (ii) energy audits, (iii) assessment of investments, and (iv) financing.

Considering these principles and the barriers identified, PEMP will utilize the instruments outlined below.

***Capacity building for project developers, intermediaries, investors, potential ESCOs, and end-users***

- Providing technical assistance for project development (technical and financial).
- Organizing training on technologies, project development, and financing options.

***Institutional instruments***

- Supporting the development of energy efficiency policy in industry.
- Strengthening the capacity of a sustainable institutional mechanism and focal point for the delivery of information and services on energy efficient motor systems.
- Establishing a sustainable Centre of expertise and advocacy for efficient motor systems.

***Financial instruments***

- Providing investment grants for demonstration projects.
- Providing financial incentives for manufacturers of energy efficient motors.
- Developing new financing instruments (e.g., through ESCOs).

***Informational and awareness instruments***

- Disseminating information on energy efficient motor systems.
- Raising awareness of the technologies available and the resultant benefits through demonstration projects.
- Developing labeling schemes.
- Increasing awareness through marketing activities targeted at consumers.
- Compiling and analyzing market data.

### **3. PROJECT ACTIVITIES AND EXPECTED RESULTS**

The proposed project has four main activities to be supported under the GEF. The first major activity focuses on building capacity and raising awareness by providing information and services related to energy efficient electric motor systems. This activity will be coordinated and delivered through the PEMP Centre at FEWE, which will be strengthened as a sustainable mechanism for the provision of information and services for the energy efficient electric motors market. The focus will be on generating and disseminating market information on energy efficient motors, providing technical and business advisory services for pilot projects and business project development, establishing and operating an advisory system for the energy efficient motors market, and supporting the development and implementation of industrial energy efficiency policy. The second major activity involves demonstration projects to establish and showcase the technical and economic benefits of energy efficient motor systems, and increase awareness. The third major activity has the objective of stimulating market transformation and



competition through a financial incentive mechanism, supported by coordinated and targeted awareness raising activities. The fourth, a policy component, comprises both institutional and information instruments, and has been identified as a separate component because it addresses a different target group than the other components and requires a different approach on a national government level.

Table 2 summarizes the major project activities and related tasks, their objectives, and the barriers they address. In the following sections, each of the components is described in more detail.

**Table 2 – Project objectives and corresponding activities, outcomes, and barriers addressed**

<b>Objectives</b>	<b>Description of Activities</b>	<b>Outcomes</b>	<b>Barriers Addressed</b>
1. Build Capacity and Raise Awareness by Providing Information and Services Related to Energy Efficient Electric Motor Systems	<ul style="list-style-type: none"> <li>• prepare a business plan for the PEMP Centre</li> <li>• generate and disseminate market information on energy efficient motors</li> <li>• provide technical and business advisory services for pilot projects and business project development</li> <li>• establish and operate an advisory system for the energy efficient motors market</li> <li>• support the development and implementation of industrial energy efficiency policy</li> </ul>	<ul style="list-style-type: none"> <li>• establishment of a sustainable mechanism for the provision of information and services for the energy efficient electric motors market;</li> <li>• availability of information on the energy efficient motors market in Poland, thereby establishing a market baseline and providing a resource on market activities;</li> <li>• easily-accessible information on the benefits of energy efficient motors;</li> <li>• availability of technical and business advisory services for pilot projects and business project development;</li> <li>• trained project developers, industry, and financial institutions on energy audits, feasibility studies, funding applications, etc.</li> </ul>	<ul style="list-style-type: none"> <li>• lack of awareness and information</li> <li>• lack of financing mechanism and sources</li> <li>• lack of project development capacity</li> <li>• lack of focused energy efficiency policy</li> <li>• lack of strong interest groups/advocacy of energy efficient motor systems</li> <li>• no consideration of additional benefits of energy efficient motor systems in business and financial decision-making</li> </ul>
2. Demonstrate Efficient Motors under Polish Market Conditions	<ul style="list-style-type: none"> <li>• implement demonstration projects for energy efficient motor systems in 4 key sectors</li> <li>• disseminate information gained through the demonstration projects</li> </ul>	<ul style="list-style-type: none"> <li>• awareness of efficient options increased</li> <li>• cost-effectiveness and technical benefits of investments proven</li> </ul>	<ul style="list-style-type: none"> <li>• lack of awareness and information</li> <li>• high incremental investment costs for energy efficient motor systems</li> <li>• no consideration of additional benefits</li> </ul>
3. Stimulate Market Development and Competition Using a Financial Incentive Mechanism	<ul style="list-style-type: none"> <li>• establish financial incentive programme for efficient motor manufacturers</li> <li>• develop and launch an advertising campaign to create demand</li> <li>• provide a competitive pre-allocation to successful applicants</li> <li>• increase awareness through labeling of energy efficient motors</li> <li>• conduct outreach to customers to enhance awareness and acceptance of energy efficient motors</li> <li>• performance allocation</li> </ul>	<ul style="list-style-type: none"> <li>• cost-effectiveness of investments in efficient motors and motor systems increased</li> <li>• increase in sales and open the market for efficient systems</li> <li>• increase in awareness</li> </ul>	<ul style="list-style-type: none"> <li>• lack of financing mechanism and sources</li> <li>• high incremental investment costs for energy efficient motors</li> <li>• lack of awareness</li> </ul>
4. Develop and Support Energy Efficiency Policy in Industry for Energy Efficient Drives	<ul style="list-style-type: none"> <li>• increase knowledge of industrial energy efficiency policy among decision-makers</li> <li>• develop a national policy for industrial energy efficiency</li> <li>• develop schemes for the labeling, Long Term Agreements (LTA) and Best Practice Initiatives (BPI)</li> <li>• link and co-ordinate with other energy efficiency programmes</li> </ul>	<ul style="list-style-type: none"> <li>• improvements in the Polish policy framework</li> <li>• dedicated involvement of policy makers</li> </ul>	<ul style="list-style-type: none"> <li>• lack of a policy framework</li> <li>• lack of policy instruments</li> <li>• low priority of energy efficiency</li> </ul>

## **OBJECTIVE 1. BUILD CAPACITY BY PROVIDING INFORMATION AND SERVICES RELATED TO ENERGY EFFICIENT ELECTRIC MOTOR SYSTEMS**

*[GEF: US\$ 1,609,300; Other Funds: US\$ 600,000, including \$100,000 in-kind; Government of Poland/KAPE S.A.: US\$ 150,000 in-kind]*

The main objectives of the capacity building and awareness activity are to:

- establish a sustainable institutional mechanism for the provision of information and services for the energy efficient electric motors market;
- gather and provide information on the energy efficient motors market in Poland, thereby establishing a market baseline and providing a resource on market activities and a source of information for benchmarking;
- document and compile information on the benefits of energy efficient motors;
- provide technical and business advisory services for pilot projects and business project development; and,
- train project developers, industry, and financial institutions on energy audits, feasibility studies, funding applications, etc.

This project component will build capacity and raise awareness concerning energy efficient electric motor systems in Poland by providing information and services delivered through a “virtual” Information Centre and Clearing House. The centre will be given the name “PEMP Centre” and will bring together seekers and providers of services and information on energy efficient motors. It will operate within the FEWE Katowice Centre thereby making use of the existing technical knowledge of energy efficiency and leveraging FEWE’s understanding of international and domestic institutional environments.

The PEMP Centre activities will be the responsibility of FEWE (see section 5.1.3 “Other Key Participants”). FEWE will contribute through in-kind input including software (“EFEmotor”), lessons learned from three small demonstration implementations, thirty (30) walk-through audits, courses for industry, established networks with software users and motor producers, and a primary database developed under the PDF B phase of the project (financed by UNDP/GEF). Up-front, in-kind input of FEWE to the PEMP Centre is valued at \$100,000. The PEMP Centre’s relationship with key organizations is presented in detail in Section 6.

Running capacity building and awareness activities through the PEMP Centre structure will maximize coordination and reduce duplication of services. The PEMP Centre will be responsible for facilitating a variety of services: generation and dissemination of market information; technical and business advisory services; training; and policy advocacy. While GEF funding is required to initiate the PEMP Centre’s activities, which are described in this section, the Centre is expected to become a revenue-generating organization that will therefore be financially independent by the end of the project. Other sponsors have already expressed a commitment to funding part of the PEMP Centre’s fourth and fifth year of operation.

The individual tasks of this major project activity are described below.

### ***Activity 1.1 – Prepare a business plan for the PEMP Centre***

The main delivery mechanism for the capacity building activities will be the PEMP Centre. This activity will involve creating a business plan for the PEMP Centre, with a focus on preparing for the Centre’s sustainability and ongoing contribution to the energy efficient motors market after the termination of the GEF project. This business plan will be developed at the outset of the project under the leadership of the PEMP Centre Director and the Project Manager. The Project Steering Committee (PSC) will review and approve the business plan, which will be updated throughout the course of the project to response to

project results and the motors market in general. An outline of the business plan's contents will be established prior to finalization of the Project Document.

The Centre will potentially receive fees by providing various services to electric energy users and their associations such as House of Industrial Energy Power, House of Water Supply and Sewerage System, House of Heat Engineering etc.; manufacturers and importers of motors and other components of the electric motor system; consulting and engineering companies; energy service companies; funds and financial institutions; and, ministries, offices and government agencies. Cost recovery mechanisms, which will financially sustain the Centre after the project lifetime, will be designed under the business plan.

***Activity 1.2 - Generate and disseminate market information on energy efficient motors***

Market analysis and market research related to the energy efficient motors market in Poland will be prepared for potential purchasers. In addition, information on energy efficient motors and drives will be compiled and disseminated to these potential end-users. This information will consolidate the baseline understanding of energy efficient motors market and will serve as a base for providing services to this market.

This market research and outreach will draw upon the results of monitoring the demonstration projects discussed further under Objective 2. The PEMP Centre will assist in compiling and disseminating the results and lessons learned from these demos as successful models of energy efficient motor projects in Poland.

***Activity 1.3 - Provide technical and business advisory services for pilot projects and business project development***

This task will provide technical assistance and financial expertise to assist with the development of small and medium scale projects involving energy efficient motors. Technical feasibility, financial analysis, selection of technologies, and assessment and reduction of risk are all activities that will be supported. Business project development will be assisted by providing support to the development of bankable projects or/and preparation of applications for projects.

Follow-up projects to the demonstration activities described under Objective 2 below will be identified using criteria developed at the outset of the project by the PEMP Centre and the Project Manager, in consultation with the PSC and UNDP-GEF. In addition, project development assistance will be provided as appropriate, and the PEMP Centre will assist with the development of the revolving fund for industrial energy efficiency<sup>5</sup>. The criteria for use of the revolving fund will be finalized by the Project Steering Committee at the end of the GEF project, however, the basic principles of operation will be agreed before the project begin (prior to the submission of the Project Document). Tentative design parameters for the revolving fund are provided in Annex D. The potential for ESCOs as a viable business in the energy efficient motors and drive sector will be studied, and suitable assistance will be provided to develop a business plan for new and/or existing ESCOs in this sector. The PEMP Centre will consult extensively with existing ESCO-related initiatives, such as the European Bank for Reconstruction and Development's program for Poland. In addition, the PEMP Centre will use UNDP and its donor coordination work to monitor and liaise with proposed UNEP and UNIDO initiatives in this area to avoid duplication or optimize its contribution in this unique area of expertise.

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<sup>5</sup> See Objective 2 for more information on the fund, which is to be used to replicate activities consistent with the demonstration activities conducted under the project.

### ***Activity 1.4 – Establish and operate an advisory system for the energy efficient motors market***

Through the PEMP Centre, an advisory system for project developers and financial institutions will be developed and operationalized. Both groups will be trained on the benefits of energy efficient motors. Workshops and seminars will be offered for industries and banking institutions, with an emphasis on investments in energy efficient motors. An investment advisory support system will be developed to provide information on financing energy audits and feasibility studies. The system will also provide applications for bank loans and other sources of funding. In addition, this advisory system will disseminate lessons learned from the demonstration projects.

### ***Activity 1.5 - Support development and implementation of industrial energy efficiency policy***

The PEMP Centre will mobilize support to policy makers in developing new mechanisms for the promotion of energy efficient motor systems (e.g., new regulations, voluntary contracts). Technological and market data will be prepared and provided to policy makers. Activities related to energy efficient motors will be coordinated with other programmes for industrial energy efficiency. In addition, a labeling and standardization scheme for energy efficient motors will be developed and promoted in conjunction with manufacturers. This scheme will draw upon the results of other efficient appliance labeling initiatives in Western and Central Eastern Europe, and it is described further in Activity 3.1 below.

## **OBJECTIVE 2. DEMONSTRATE EFFICIENT MOTORS UNDER POLISH MARKET CONDITIONS**

*[GEF: US\$ 400,000; Buyers: US\$ 7,481,263; NFOSiGW: US\$1,215,359]*

The main barriers that will be addressed by the proposed demonstration projects relate to end-users' lack of information and awareness concerning energy efficient electric motor systems. Information related to the technical and economic potential of energy efficient motor systems will be gathered and provided to potential end-users. The lack of access to investment capital by the end-user will be dealt with in one of the demonstration projects. Furthermore, the implementation and the results emerging from the demonstration projects will assist in determining more precisely the electric motor system elements or components that are targeted under this project, which will be used for working out the activities planned for the PEMP Centre in more detail.

The main objective of the demonstration projects is to address the barriers as outlined above, with the following specific objectives:

- Demonstrating the technical and economic feasibility of energy efficient motor systems;
- Providing a solid basis for replication of the demonstration projects; and,
- The information gained through the demonstration projects will be coordinated and disseminated through the capacity building and information dissemination activities (Activity 1).

Demonstration projects have been selected under the PDF B project, which first chose four sub-sectors in which the projects would be most useful and then selected the actual demonstration projects. The criteria used for selecting the sub-sectors as well as the projects themselves are presented in Table 3.

Given that each of the demonstration projects has a payback period within the lifetime of the project, each demonstration will be required to return the GEF portion of the funding (total \$400,000) after successful completion of the demonstration activities. Tentative criteria for the success of demonstration projects are as follows: investment in similar projects in the same sector (replication); repayment of GEF contribution to the demonstration projects (sustainability); energy savings as specified in the agreements with the companies; reduced operating costs as specified in the agreements with the companies; and indirect

reduction of CO<sub>2</sub> through energy savings (GHG emission mitigation). The tentative criteria, developed prior to the finalization of the Project Document, will be measurable and unambiguous, with clear milestones (timelines). Criteria will focus on performance related to the investor, and will not be related to replication.

A revolving fund will then be established with these returned funds, and it will be used for replication activities consistent with the demonstration activities conducted under the project. The criteria for use of the revolving fund will be finalized by the Project Steering Committee at the end of the GEF project. The specific operating mechanisms of the fund, including any necessary legal agreements and administrative criteria, will be developed by the project team with the greatest participation by the Director of the PEMP Centre. Poland already has a working example of a revolving fund in the form of the NFOSiGW, and it is anticipated that the workings of the PEMP fund will be similar (although on a much smaller scale and without the NFOSiGW's partial revenue from pollution fines). A representative of the NFOSiGW will serve on the Project Steering Committee and will be consulted during the design of the fund. The specific terms and conditions of the fund will be left flexible in order to ensure that the fund will best meet the needs and operating environment in Poland at the end of the project.

**Table 3 - Selection of demonstration projects**

<i>Selection Criteria</i>	<i>Demo 1: Heating</i>	<i>Demo 2: Water utility and sewage treatment</i>	<i>Demo 3: Chemical industry</i>	<i>Demo 4: Coal mine</i>
<b>Selection of the sub-sector:</b>				
• Economic prospects for the sector	High	High	High	High / medium
• Working hours of energy efficient systems	High	High	Medium	High
• Size of the energy efficient systems and related cost ratio of investment to savings	High	High	Medium	Medium
• Replication potential	High	High	Medium	Medium / high
• Correlation with other government priorities	Medium	Medium	Medium / high	Medium / high
• Savings potential	High / medium	High / medium	High	Medium
• Priority of energy efficient system modernization in the development strategy of the sector	Medium / low	Medium / low	Medium / low	Medium / low
<b>Selection of demonstration project:</b>				
• Technical feasibility	High	High	High	High
• Economic feasibility	Medium	Medium	High	High
• Willingness to implement	High	High	High	High
• Capability to implement	Low / medium	Low / medium	Low / medium	Low / medium
• Accessibility for monitoring/evaluation and demonstration to others	High / medium	High	Medium	High
• range of electric motor system elements addressed (energy efficient motor, vsd, control equipment, proper sizing, energy management system)	Medium	Medium	High	High
• Ability to address the barriers analyzed	High	High	High	High
• Availability of co-funding	Medium	Medium	Medium	Medium

The sub-sectors with the highest scores were those where enterprises would undertake their projects not only to reduce electric energy costs but also to implement new technologies, which are indispensable for quality improvement and a higher level of production and service competitiveness. The sectors and sub-sectors considered to have the highest probability of success were determined to be as follows:

- water supply and sewage treatment;
- generation and distribution of steam and hot water;
- generation and distribution of electric energy;
- mining sector; and,
- manufacturing sub-sectors, including chemicals and chemical goods production, food and beverages production, and, cellulose and paper production.

From these sectors the heating, mining, chemical and sewage treatment sub-sectors have been selected as they have met the most important selection criteria as outlined in Table 3. The demonstration projects developed in these sub-sectors are briefly presented below. These selections have been endorsed by the Project Steering Committee as well as by a larger group of Polish stakeholders during a national workshop organized as part of the implementation of the PDF B activities.

For all demonstration projects, a monitoring system will be developed and implemented, as well as a methodology for the owners operating the demonstration project to ensure that information and experiences gained from it will be useful for replication and further development of similar types of projects in the various sub-sectors. A strategy for up-scaling the demonstration projects will be designed and implemented as part of the activities of the PEMP Centre. Data sheets of the demonstration projects with more details on the technical, financial and institutional arrangements are included in Annex E.

*Note: Unambiguous and measurable targets for investor performance (loan repayment) will be established before the project document is finalized and will be included in the document. The project document will also include basic principles for the revolving fund,” including selection and performance criteria.*

### **Activity 2.1 - Demonstration #1: Heating**

*A combined energy efficient motor and management system for heat production and distribution in the boiler house of the ‘Cieplownia Rydułtowy’ heating plant.*

The main **barriers** that will be addressed in this demonstration project relate to identifying the energy and financial savings associated with the various components of energy efficient motor systems, and the information and awareness barriers existing among the owners and operators of heating systems on the technical and economic potential of investments in combined energy efficient motor and management systems.

The **objective** is to demonstrate the energy/financial savings that will accrue from a) hardware investments (energy efficient motor system) and b) combined hardware and ‘software’ investment (automated energy production and management system) as well as to show how future replication projects should be designed to make optimal use of investments in various energy saving options in this sub-sector.

The main **activities** will be to install energy efficient motor system hardware (efficient motors, including control equipment) as well as an automated energy management system, the rationale being that inefficient use of efficient equipment results in partial energy savings only. To monitor the contribution in energy savings of both elements, they will be monitored separately. Results will be used for rationalizing

system boundaries as it involves energy efficient investment decisions. In addition, the owner will invest in the heat distribution network.

Total **financing** (investment) is approximately US\$ 350,000, with a GEF contribution of 30%. The simple payback period of the combined measures is less than 3 years. Replicability is estimated at between 200 and 300 projects.

### **Activity 2.2 - Demonstration #2: Water Utility and Sewage Treatment**

*Minimisation of energy used by electric drives in the Centrum primary sewage treatment plant and the Jaworowa water pump house.*

The main **barriers** that will be addressed in this demonstration project relate to identifying the energy and financial savings associated with the various components of energy efficient motor systems, and the information and awareness barriers existing among the owners and operators of water utilities and sewage treatment plants on the technical and economic potential of investments in combined energy efficient motor and management systems.

The **objective** is to demonstrate the energy/financial savings that will accrue from a) hardware investments (energy efficient motor system) and b) combined hardware and ‘software’ investment (energy management system) as well as to demonstrate how future replication projects should be developed to make optimal use of investments in various energy saving options in this sub-sector.

The main **activities** will be to install energy efficient motor system hardware (efficient motors, including control equipment) as well as an energy management system, the rationale being that inefficient use of efficient equipment results in partial energy savings only. In order to monitor the contribution in energy savings of both elements, they will be monitored separately and in addition the energy management system will be operated one month on and the other month off for a period of 2 years. Results will be used for identifying energy and financial savings associated with energy efficient motor systems that will in turn be used to inform energy efficient investment decisions.

Total **financing** (investment) is approximately US\$ 110,000, with a GEF contribution of 46%. The simple payback period of the combined measures is approximately 4.4 years. Replicability for hardware investments only is close to 1500 and between 100-200 for investments in the combined hardware and software items.

### **Activity 2.3 - Demonstration # 3: Chemical Industry**

*Exchange of motors with more energy efficient motors to achieve energy savings at the ‘Pulawy’ chemical plant.*

A main **barrier** that will be addressed is the common practice of rewinding motors, for which most chemical industries have designated units. The existence of such a unit hampers the introduction of new and more efficient motors. Furthermore, the over-dimensioning of motors is common practice in most Polish industrial sectors. Other barriers that will be addressed are the information and awareness barriers existing among the decision-makers of chemical plants with respect to the energy cost savings possibilities as a result of new, more efficient motors in comparison with the rewinding of motors.

The **objective** is to demonstrate the energy/financial savings that will accrue from introducing new, more efficient motors and proper dimensioning of (especially) large, high voltage motors. Furthermore, the providing of alternative employment for the rewinding unit will be one of the objectives to be addressed.



The main **activities** will be to replace low voltage motors that are due for rewinding with energy efficient motors and to replace over-dimensioned high voltage motors. The currently existing rewinding unit will be fully involved in these operations in order to create awareness of the technical and economic possibilities that these measures can bring. This will be the basis for the development of a training programme, where the rewinding unit staff will be trained to be involved in the replication of such measures throughout the chemical sub-sector; i.e. the provision of consultancy services being contracted through the PEMP Centre. The unit has shown interest in this service and is interested in understanding the ESCO concept.

Total **financing** (investment) is approximately US\$ 375,000, with a GEF contribution of 40%. Simple payback period of the combined measures is 2 years. Replicability is between 10 and 20 projects in chemical plants and more up to 100 in large manufacturing plants.

#### **Activity 2.4 - Demonstration #4: Coal Mine**

*Reducing the energy consumption of the ventilation system through the introduction of 'soft start' principles and the installation of more efficient motors and variable speed drives in the 'Jaworzno' coal mine.*

A main **barrier** that will be addressed in this demonstration project relates to the access to investment capital (mainly loans at commercial banks) for cost-effective energy efficiency measures in the hard coal mining sector. Furthermore, the information and awareness barriers that exist among the owners and decision makers of hard coal mines as it involves investment decisions for electric energy efficiency improvements.

The **objectives** are twofold. Firstly, to demonstrate the energy/financial savings that will accrue from implementing energy efficient hardware investments. Secondly, to demonstrate the financing approach, resulting in increasing access to commercial loan capital.

The main **activities** will be installing energy efficient motor system hardware; i.e. the soft-start system, more energy efficient motors and cascades/principle of variable speed operation systems. This will be done on a pilot basis for an 800 kW ventilator system, financed through 40% equity from the mine owners and 60% by GEF on a 0% loan basis. The loan will be converted into a grant if the monetary value of (expected) energy savings will be used for making similar investments in the second 1 MW ventilator system currently in operation at the mine. If no investments are made in the 1 MW ventilator system, the loan will have to be repaid under Polish commercial lending conditions. Results of such financing arrangement will be used for developing and implementing future financing arrangements to be initiated and coordinated by the PEMP Centre.

The total **financing** (investment) is approximately US\$ 170,000 with a GEF contribution of 60%. The simple payback period is less than 3 years. Replicability is between 45 and 55 projects in the hard coal mining sub-sector.

### **OBJECTIVE 3. STIMULATE MARKET TRANSFORMATION USING A FINANCIAL INCENTIVE MECHANISM AND AWARENESS RAISING**

*[GEF: US\$ 1,734,000; Buyers: US\$7,814,850; Motor Producers: US\$ 300,000]*

While many energy conservation programs tend to focus on influencing consumer choice in buying energy-using technology, for example by offering a rebate to encourage purchase of energy efficient equipment, market transformation activities instead influence the manufacturers to produce only energy-efficient equipment. This approach is both a cheaper and more direct way to change consumer behavior.

Market transformation promotes manufacturing and purchase of energy-efficient products, and focuses on products not readily available in the competitive marketplace. The goal is to remove barriers so that the competitive market can provide these products and to induce lasting structural and behavioral changes resulting in increased adoption of energy-efficient technologies. While simple rebates are sometimes used to increase sales, but only temporarily, market transformation instead draws on competitive forces released by restructuring for lasting results. Because market transformation uses consumer awareness and education in part to remove market barriers, the overall cost is generally much lower than if a subsidy were used.

A key aspect of market transformation is overcoming the market barriers that inhibit the manufacture and purchase of energy-efficient products. Some examples of market barriers are:

- Limited availability of energy-efficient products;
- Lack of consumer awareness of the products and their benefits;
- Resistance to new products purchase and integration in industrial application in general; and,
- Over-emphasis on first cost vs. operating costs.

The market transformation of the energy efficient electric motors market is a three-pronged approach:

- i. An important aspect of market transformation strategies is establishing a common efficiency specification that is used as a voluntary guideline for manufacturers and efficiency programs in the country. Communicated through a labeling scheme, for example, this sends a consistent message to manufacturers about the importance of efficiency in their products and the level of efficiency that provided to the buyers.
- ii. At the same time, financial incentives, offered to manufacturers in an attempt to overcome market inertia in the manufacturing of the products, help to “kick-start” sales of energy-efficient products. The financial incentive will encourage motors manufactures to rebuild their facilities for production of energy efficient motors and offer new products.
- iii. Consumer awareness and education programs are established simultaneously. The increased demand for efficient motors will lead in turn to greater production volume and lower prices. By the time the financial incentive is no longer offered the consumer is aware of, and is demanding, a product that is produced cost-competitively with traditional equipment.

Based on the market transformation model, the objectives of this activity are to stimulate the market by encouraging both increased production and quality of energy efficient motors; encourage competition in the production of energy efficient motors; increase sales of energy efficient motors; and, build awareness of these motors in the Polish motors market. The activities are described below in detail.

### **Activity 3.1. –Labelling of Energy Efficient Motors**

PEMP will develop a logo for use in the sale and marketing of energy efficient motors under the program. Manufacturers will produce non-removable labels with program logo and appropriate information for the customer, including customer price as agreed under the program.

Minimum specifications for eligible motors will include the following:

1. *Safety*: the eligible efficient motors must meet all applicable Polish safety regulations for electronic/electric products.
2. *Motor Efficiency*: The electrical motor efficiency shows different values, depending on the measurement standard. The most important methods of calculation are IEC-34 and IEEE-112. The efficiency calculations of the standards differ mainly in their ways of taking stray load losses of squirrel-cage induction motors into account. At this stage of the PEMP project, development manufacturers will be encouraged to provide efficiency test results from an independent testing

laboratory based on IEC standards.<sup>6</sup> Labeling for general-purpose motors may also recognize Class 1 and 2 motors.

3. *Rated Average Life:* Minimum rated average life of the motors shall be no less than 12 years. Manufacturers must offer a minimum one-year warranty covering product replacement.

### **Activity 3.2. –Financial Incentive Programme for Energy Efficient Motor Manufacturers**

#### *Activity 3.2.1. - Establishing Financial Incentive Programme for Energy Efficient Motor Manufacturers*

A financial incentive mechanism will be fully designed and established, where financing is made available to efficient motor manufacturers that are able to meet minimum technical requirements established under PEMP. Participating manufacturers will compete with each other for the right to receive financing and the right to receive a larger share of financing will be given to those manufacturers who are able to provide the greatest savings, in terms of projected avoided electricity use, at the lowest overall cost.

Manufacturers are given freedom to decide which type of motor to produce under the technical requirements established under PEMP. The intention is to use the manufacturers' knowledge of the marketplace to maximize efficient motor sales, and thereby maximize energy savings per dollar of available financing. This activity is designed to allow overall environmental goals to be achieved by motor manufacturers who competitively pursue their independent business objectives. This structured competition allows many manufacturers to win, but manufacturers with the best products and the best marketing campaigns will be able to expand their sales the most. Manufacturers have both the incentive and the freedom to use the financing in the most efficient way to maximize the sales of efficient motors, benefit the Polish customer, and reduce damage to the global environment.

The targets of the programme are expressed in number of motor units that will be sold under the programme. The programme will run for four years, but will be evaluated and adapted yearly, if necessary. Because the relevant savings as well as the relevant incremental costs of energy efficient motors are higher for smaller motors, three motor classes are defined. The targets are set assuming that in a period of ten years the average market share of energy efficient motors could reach the level of 30 %. Assuming a gradual growth, this implies that in the first four years, during which the programme and the other PEMP components will open the markets and a market share of 15 % could be reached. The Table below shows the yearly targets in absolute terms as well as in share of total motor sales in Poland.

**Table 4 – Target Sales for Energy Efficient Motors in Poland<sup>7</sup>**

Motor Class	Rated Power (kW)	Number of Units Sold Under Programme (unit)			
		Year 1	Year 2	Year 3	Year 4
Group 1:	0.55 – 7.5	2,600	5,304	10,820	20,694
Group 2:	11 – 37	180	367	749	1,433
Group 3:	45 – 250	30	61	125	239
<b>Total:</b>		2,810	5,732	11,694	22,365
<b>Total over four years:</b>					42,601
<b>Share of total motor sales:</b>		2.0 %	4.0 %	8.0 %	15.0 %

<sup>6</sup> The efficiency level for different types of motors with additional comments are specified in chapter IV-Technical Criteria, A. Minimum Motor Efficiency, from 'Description of Efficient Motors Program'.

<sup>7</sup> The targets were validated by information supplied by manufactures and importers.

### *Activity 3.2.2. – Develop and Launch an Advertising Campaign to Create Demand for the Financial Incentive Programme*

A countrywide advertising campaign will be organized to create interest and demand for the financial incentive programme for efficient motor manufacturers. The scheduling and details of this campaign will be determined in cooperation with participating manufacturers.

Four companies have already expressed interest in participating, including ELEKTRIM MOTOR S.A., which serves about 70 % of the Polish motor market. The other companies are two other manufacturers TAMEL S.A., DAMEL S.A. and one exclusive importer, ABB Centrum Automatyki Sp z.o.o.. Together, the level of interest amounts to over 70,000 units of energy efficient motors, which the companies expect to be able to sell over the coming years under the programme.

### *Activity 3.2.3. – Competitive Pre-allocation for the Financial Incentive Programme*

Manufacturer will be requested to submit proposals for financing. To receive funding, manufacturers must submit both a proposal and, after the successful sales period, “Proof of Performance” documentation. Proof of Performance documentation will include the invoice and all other documents, which accompany the sale of Promotional motors by the manufacturer or its channel partners to customers.

To ensure that PEMP encourages high quality efficient motors, manufacturers must meet minimum technical criteria detailed in the attached draft “Poland Efficient Motors Project - Minimum Specifications for Efficient Motors”. An Allocation Committee, to be established, will evaluate each manufacturer’s proposal on the objective technical and marketing criteria. These criteria are intended to establish a ‘level playing field’ for manufacturers to compete with each other on. The Allocation Committee will make initial allocations of the entitlements to financing based on this evaluation. Manufacturers who submit the most attractive proposals will receive relatively larger shares of the entitlements to the financing. These entitlements give manufacturers the right to apply for funding *after* they have met the terms of the Manufacturer Agreements that they sign with Implementing Agency. The manufacturers will only receive funding after manufacturing and sales if all the terms of the Manufacturer Agreement have been fulfilled.

Manufacturers will be asked to describe marketing and distribution plans, including factors such as access to sales channels and distribution, past track records of sales, and advertising and in-store promotion strategies. This section is intentionally unstructured, recognizing diverse market circumstances, and allowing the committee to recognize innovative ideas and marketing approaches. The marketing plan might include descriptions of how the manufacturer will promote PEMP, which retail and distributor outlets it intends to work with, how the manufacturer will be able to achieve the sales targets in its proposal, and how the manufacturer intends to minimize the number of its products which are finally transported outside Poland. Manufacturers will also be evaluated on their ability to contribute to further reductions in the wholesale prices of their motors. This additional reduction is referred to as the ‘Manufacturer’s Allowance’

Manufacturers are encouraged to maximize electricity savings. Promotional motors that are more energy efficient than competitors will displace more kilowatts and receive a higher evaluation. On the other hand, a manufacturer who is able to sell more efficient motors for the same of as a competitor, and thereby save more electricity, will also be evaluated highly.

#### *Activity 3.2.4. – Performance-based Allocation for the Financial Incentive Programme*

As part of the Programme, manufacturers will have a limited amount of time to complete sales. If a manufacturer is unable to sell as many motors during a designated sales period, as agreed upon during the Competitive Pre-allocation phase, the entitlement to the funding will be reallocated to a more successful competitor. In this way, PEMP preserves and strengthens competitive forces in the marketplace and will use them to achieve program goals.

Part of this activity, therefore, relies on monitoring of motor sales. PEMP will only provide funding to manufacturers that submit “proof of performance” documentation showing that the agreed upon number of specified motors has been sold at the agreed prices to appropriate customers. Such 'proof of performance' documentation may consist of normal commercial documentation of the sales to either wholesalers and/or retailers/dealers (copies of all purchase orders, packing slips, invoices, etc.). Proof of performance documentation submitted must disclose all relevant information (e.g. model, the quantity delivered, the ship-to location, the retailer's/wholesaler's acquisition price).

#### **Activity 3.3. – End-User Outreach to Enhance Awareness and Acceptance of Energy Efficient Motors**

In order to assist in the development of consumer information, manufacturers shall print and distribute either consumer response cards or consumer response forms. Customer response cards will be used for program monitoring and evaluation. A marketing campaign, coordinated closely through the PEMP Centre's awareness activities and the dissemination of lessons-learned through the demonstration projects, will focus on increasing consumer awareness of the energy efficient motors and their benefits. Emphasis will be placed on consumer resistance to new products purchase and problems with integration in industrial application, and over-emphasis on first cost versus operating costs. Further, motor return will be considered for the second year of the project pending a positive signal from the market after one year of implementation.

### **OBJECTIVE 4. DEVELOP ENERGY EFFICIENCY POLICY IN INDUSTRY FOR ENERGY EFFICIENT DRIVES**

*[Government of Poland/KAPE S.A.: US\$ 150,000 in-kind]*

The increase of energy efficiency in the Polish industry will contribute to the competitiveness of the Polish industry and to environmental objectives, particularly climate change abatement. However, presently, no comprehensive energy efficiency programmes are in place. Good principles have been stated, but not translated into operational instruments. There is a need for the implementation of measures to strengthen, expand and develop new energy efficiency policies and measures.

This component will ensure that the instruments developed and implemented in PEMP are integrated in official policy, thereby providing sustainability. The objective of this programme component is to support and develop energy efficiency policy for industry with the focus on energy efficiency improvements in the electric motor system. This will be done by supporting the development of the Government programme for promotion of energy efficient motor systems as mandated by the Energy Policy and by supporting the development of energy efficiency policy and implementation in industry.

KAPE will use PEMP's results and activities in order to support the Ministry of Economy in the development of industrial energy efficiency policy. The main tasks to be carried out are outlined below.

#### **Activity 4.1. Increase the Knowledge of Industrial Energy Efficiency Policy**

- Provide policy makers with information on instruments for promotion of energy efficiency in industry, including the experience in OECD countries, with focus on electric motor systems.
- Organize seminars on Long Term Agreements and Financing Instruments, Labeling Scheme, Minimum Efficiency Standards, Co-operative Technology Procurement, Best Practice Initiatives, Recycling Tax and their impact on electric motor systems. These seminars will be geared to policy-makers, motor manufacturers, and the research and development community in Poland.
- Present the results of PEMP to policy makers at the national level.

#### **Activity 4.2. Development of Policy for Industrial Energy Efficiency**

- Support the drafting of a National Action Plan for Industrial Energy Efficiency with focus on energy efficient motors systems.
- Support the development of policy instruments for energy efficiency in industry, and optimizing the impact on energy efficiency in electric motor systems.
- Develop proposals for the Action Plan and Implementation Plans with focus on electric motor systems.

#### **Activity 4.3. Develop Schemes for the Implementation of Labelling, Long Term Agreements (LTA) and Best Practice Initiatives (BPI) for Electric Motors**

- Develop schemes for labeling (outside of the demonstration projects under Activity 2), LTA and BPI to be used in Poland.
- Advise the Government on the implementation of labeling, LTA and BPI schemes.

#### **Activity 4.4. Link and Coordinate with Other Energy Efficiency Programmes Located in Poland**

KAPE will be responsible for linking PEMP with present and future energy efficiency international or bilateral programmes located in Poland including:

- Pre-accession Development of Methods and Instruments for Effective Implementation of the National Industrial Energy Efficiency Policy (The Dutch Government PSO-Pre-Accession Programme, which is managed by the SENTER Agency);
- Poland - Japan Energy Conservation Technology Center (The Japanese Government JICA Programme, which is managed by the Energy Conservation Centre, Japan); and,
- Baltic Chain - Clearing House (The Danish Government Baltic Sea Region Programme, which is managed by the Danish Energy Agency).
- The Municipal Network for Energy Efficiency (MUNEE, which is managed by the Alliance to Save Energy).

The co-ordination of all programmes will contribute to the acceleration of energy efficiency policy implementation in Poland, namely within energy efficient electric motor systems. All above mentioned energy efficiency programmes are coordinated by KAPE on behalf of the Polish Government.

## 4. RISKS AND SUSTAINABILITY

### 4.1. Risks

In this section, the main risks are discussed for the four components of PEMP, as well as the measures taken to abate these risks.

#### *Generic Risks*

- There is a risk that energy efficiency measures and auxiliary energy technologies in industry might remain a low priority in industry. The risk will be mitigated by all PEMP's components supported with existing domestic environmental funds (e.g. NFOSiGW and ECOFUND). See Section 5.3 for details.
- Unchecked, lower quality electric motors and technologies might be imported to Poland. This will be prevented by the strict technical standards that will be applied in the market transformation activity and the development of labeling and standardization schemes in official energy efficiency policy.
- As a result of the increased investment in energy efficient motors systems, old motors with low efficiency will be replaced. They might be resold on the second-hand market either in Poland or be exported. This will reduce the overall global emission reduction of PEMP. This risk will be abated by (i) prices for scrap metal, (ii) information provision, (iii) small and temporary demand expectations, and (iv) interest of motor manufacturers in recycling including possible motor return.

#### *PEMP Centre*

The PEMP Centre will play the following important roles: (i) center of expertise, (ii) training facility, (iii) means of building institutional and human capacity, and (iv) basis for advocacy. It has a corresponding wide range of tasks. The combination of these tasks in one organization will increase efficiency as well as provide synergy. However, the creation of the PEMP Centre also entails the following risks:

- The organisation and management might not be sufficiently prepared for the task. This risk is minimised by: (1) the strong institutional link with the PEMP PMU at the start of the programme; and, (2) the contracting of an experienced international technical adviser. The international technical adviser will strengthen the capacity at the PMU/PEMP Centre.

Furthermore, the sustainability of the PEMP Centre beyond the actual PEMP programme is an important prerequisite for further increasing the market share of energy efficient motors. The PEMP Centre might cease to function following the end of the GEF support for PEMP. The following measures are being taken to prevent this:

- The dependence of the PEMP Centre on GEF will be decreased over the lifetime of the PEMP programme (see budget). As a result the PEMP Centre will be forced to attract alternative sources of funding. Discussions have already been initiated with potential donors and clients.
- PEMP will work to ensure that energy efficient motor systems remain a priority in Polish energy efficiency policy in industry. As a result, the PEMP Centre will form part of the institutional framework for implementation, and the PEMP programme will be integrated into government energy efficiency programmes.
- PEMP will act as a representative for importers and manufacturers of energy efficient motors. One of the results of PDF B phase is the involvement of Polish manufacturers in PEMP.

#### *Demonstration projects*

For the demonstration projects, the following risks have been identified:

- The recipient might not be able to come up with the required co-financing. This risk has been reduced by the long preparation of the demonstration projects. Furthermore, all projects show substantial benefits for the recipient and will be fitting to the requirements of the potential co-financiers.

- The estimated savings might not be achieved. An extensive ex-ante analysis has been made. Furthermore, a baseline study will be made and validated and a monitoring scheme put in place. (see Section 7). The results of the monitoring will be used to improve the design and implementation of the demonstration project to increase the emission reduction.
- Even if the demonstration projects are implemented successfully, the results of the projects might not be contribute enough to demonstrating to potential and might not trigger enough spin-off projects. Therefore, to address this risk, a detailed promotion plan will be elaborated for the demonstration projects. The identification of the spin-off projects is a specific task of the PEMP Centre.

### *Market Transformation*

The main risks of the market transformation activity relate to not achieving the number of sales as planned. The following measures are taken to secure that the targets are achieved:

- The PEMP Centre will play a large role in the promotion of the market transformation activities. The PEMP Centre will have both the resources and the network for promotion;
- The involvement of manufacturers will ensure the availability of motors on the market. The initial offers of the domestic manufacturer ELEKTRIM MOTOR shows that the targets for the rebate are indeed feasible (up to 15% of the total motor market in year 5 of PEMP and cumulative sales during PEMP 42,600 units). Their offer even exceeded the targets (47 000 units);
- The coordinated marketing activities (both labeling and consumer awareness) will help influence demand; and,
- The activities will be regularly monitored and adjusted to new market conditions to be able to optimize the design and implementation.

### *Development of energy efficiency policy*

The development of energy efficiency policy in industry is the responsibility of the Polish Government. The main risk is that the Polish Government is not active enough in developing and implementing policy, particularly in labeling and standardization schemes, financing instruments, creating awareness and setting up the institutional framework. PEMP will therefore support the Polish Government in the following ways:

- KAPE, the implementing agency, was established by and is an important adviser to the Ministry of Economy, which covers both industry and energy (there is currently no separate ministry of industry or energy). The Ministry of Economy will be invited to serve on the Project Steering Committee.
- PEMP will establish a strong lobby and centre of expertise for energy efficient motors and drives: the “PEMP Centre”, which can support the Government. PEMP will actively propose economically viable and legally justified mechanisms for energy efficiency policy to the Polish Government.
- PEMP will demonstrate and promote the advantages of energy efficiency and raise the level of awareness in industry.

## **4.2. Sustainability**

The long-term sustainability of the PEMP project objectives is ensured in the following ways:

- (i) The continued capacity of the motors market to produce and promote energy efficient electric motors is assured through the ongoing operation and effectiveness of the PEMP Centre. This Centre was designed with the goal of financial independence at the end of the GEF project. The development of a business plan, which is reviewed by the PSC and updated throughout the course of the GEF project, is one of the methods used to ensure that financial sustainability is planned. The emphasis will be on identifying revenue streams generated from the many services provided by the PEMP Centre, thereby allowing it to become a revenue center.
- (ii) The GEF funds from the successful demonstration projects will be returned to a fund. A revolving fund will be established with these funds and be used for replication activities consistent with the



demonstration activities conducted under the project. The criteria for use of the revolving fund will be finalized by the Project Steering Committee at the end of the GEF project, and will be subject to approval by UNDP-GEF. The mechanisms, including draft agreements and criteria for establishing and operating the revolving fund, and the institution nominated to manage this fund, will be addressed prior to finalization of the project document.

- (iii) The inherent design of the market transformation activity will lead to lasting changes in the energy efficient motors market, through increased production and lowered costs, and through the awareness of the associated energy savings. The common efficiency specification, communicated through the labeling scheme, also remains as an indicator of the importance and level of efficiency in motors.
- (iv) Project management is also designed to be sustainable and build capacity. While the project will utilize an international expert as a technical adviser to its activities, it is anticipated that both the Director of the PEMP Centre and the Project Manager will be national staff, providing continuity and expert knowledge of local conditions and stakeholders. The Project Manager will be hired by the local implementing agency (i.e. KAPE), according to standard UNDP procedures under NEX operation. If the implementing agency is for any reason unable to conduct an international search and hire process, UNDP Poland will provide support in that area in its role as the GEF Implementing Agency.

### **4.3. Replicability**

A key means of ensuring the sustainability of the project is to replicate its results widely throughout Poland and in other countries in the region. This principle of replication has been a strong influence on project design. For example, the project preparatory phase was designed to assess the potential for the replication of investments in efficient motor systems in entire market sectors, not simply through a few demonstration projects. The project team gathered numerous contacts in industry, and these contacts will be interested in applying the project findings in their own enterprises.

In the proposed project, all activities contain an element of replication. For example, the PEMP Centre will focus on disseminating information on efficient motor systems in order to encourage all potential end-users – not merely those participating directly in the competition or demonstration projects – to incorporate the project ideas into their industrial operations. Training will facilitate this interest.

The structure of the demonstration project component also supports replication. The fact that GEF money will be used as a loan and not a grant should send a strong message to other enterprises that EMS projects are commercially viable. UNDP-GEF experience in the region has shown that this type of loan-funded demonstration can be very effective in attracting investors, and the project proves the effectiveness of a technology under market conditions.

In addition, the implementing arrangements of the project also support the potential for replication to other countries in the region. By using KAPE to implement the project, the project team will be able to disseminate information on the project for replication to other state energy efficiency bodies, including the European Union. Housing the PEMP Centre at FEWE will also allow the project to leverage FEWE's strong international network of energy efficiency organizations and industry.

Finally, UNDP-GEF will seek lessons learned from the project, as it is the first efficient motors project in the region. UNDP-GEF staff will use the UNDP country office network (covering 28 countries in the region) to circulate these lessons learned and other information on the project to other donors and interested parties throughout the region.

## **5. STAKEHOLDER PARTICIPATION AND IMPLEMENTATION ARRANGEMENTS**

### **5.1. Implementation Arrangements**

#### **5.1.1. Executing Agency**

The Office of the Committee for European Integration (UKIE) will serve as the Executing Agency for the proposed project. UKIE is a UNDP counterpart in Poland, and it serves as the executing agency for several UNDP projects. It is the part of the Central Public Administration responsible for coordinating the policies and activities of Poland's line ministries on the EU accession process on behalf of the Committee for European Integration. UKIE performs the functions of the executive secretariat for KIE. The Office is headed by the Secretary of State.

#### **5.1.2. Local Implementing Agency**

The Polish National Energy Conservation Agency (KAPE) is the local implementing agency for the proposed project. This implies that full responsibility lies with the executing agency for the implementation of this project.

The Polish National Energy Conservation Agency (KAPE) is a public company established by the Government of the Republic of Poland in October 1994. The agency is fully supervised by the government through shareholders and government representatives on the Supervisory Board of KAPE. KAPE is a Plc., and the shareholders are:

- Ministry of Treasury of State – 51%;
- National Fund for environmental Protection and water Management (gov.) – 16.3%;
- Agency for Industrial Development (gov.) – 16.3%; and,
- Bank of the National Economy (gov.) – 16.3%.

The Ministry of Economy, the Ministry of Environment; the Ministry of Interior and Administration and the State Office for Housing and Municipal development are represented in the Supervisory Board of the Agency.

The responsibilities of KAPE are listed below:

- promote energy conservation issues with parliament, government and its institutions;
- support and implement national energy and environmental policies;
- participate actively in EU Poland's pre-accession process;
- co-operate with international organizations and co-ordinate bilateral energy efficiency programmes;
- search for international and bilateral financial support for energy efficiency common activities in Poland;
- support regional and local authorities in energy planning process, and in setting and implementing energy efficiency schemes;
- observe and monitor development and improvement related to rational energy production and reduction of energy consumption;
- develop institutional structures supporting energy efficiency processes;
- support various NGO-type initiatives toward sustainable development through energy efficiency activities;
- create training schemes and networks for energy experts and professionals; and,
- develop energy efficiency awareness campaigns.

KAPE has gained experience as an executing agency steering and monitoring domestic and international strategic projects. For example with the SCORE (Supporting the Cooperative Organization of Rational Energy use) programme, Polish-Danish municipal energy planning programme, recently approved PSO programme on developing policy on energy efficiency in Poland and a Poland-Japan Energy Conservation Technology Center.

KAPE has also done significant work for the Polish government. For example, KAPE is an important advisor of the Ministry of Economy, which is in charge of formulating Polish energy policy. KAPE has also created and established an energy training and consultancy scheme for buildings in Poland where about 3000 Polish engineers and architects were trained under the scheme during last 5 years. KAPE is the SAVE II EU Program coordinator in Poland nominated by the Ministry of Economy and a full OPET network member. National and international institutions recognize the agency as the primary Polish governmental implementing body in the field of energy conservation.

KAPE will house the Project Management Unit for the proposed PEMP project. KAPE will also contribute assets to PEMP, which will strengthen capacity of the project and allow the technical and policy activities of the PEMP Centre to begin quickly after the project is approved.

### ***5.1.3. Other Key Participants***

The Polish Foundation for Energy Efficiency (FEWE), which is a private, not-for-profit organization established in 1990, will also play a key role in project guidance and implementation. For example, the activities surrounding the PEMP Centre will be handled primarily by FEWE. The original program proponent and implementing agency for the PDFB, FEWE specializes in the following areas:

- Studies of aspects of the global economy that influence the situation in Poland;
- Studies and analyses to support energy efficiency and environmental protection nationally, regionally and on a local scale;
- Support for entrepreneurship, including joint ventures with foreign companies as well as transfer of energy efficient materials, technologies and know-how;
- Training, consulting and the implementation of demonstration and pilot projects; and,
- Public education.

FEWE has been involved in approximately 200 different international and domestic projects in energy and environment, and it has demonstrated capabilities in policy advice, project development and management, energy planning, demonstration projects, programme evaluation, technical assistance, financial engineering, tendering, energy audits, and training.

For example, FEWE developed the Strategy of GHG Emission Reduction and Adaptation of Polish Economy to a Changed Climate (a program sponsored by the U.S. Department of Energy). Within the project, FEWE defined a methodology for a strategy to reduce GHG emissions in industry as a whole, in the power industry in particular, and in the municipal sector. FEWE also identified and analyzed options for reducing emissions in Poland.

In addition, FEWE has experience with electric motors in international and Polish markets, and it has developed contacts with relevant research institutes in this area, as well as with electric motor manufacturers and end users. FEWE and the Polish Copper Promotion Center (PCPM S.A.) developed the computer software EFEmotor that enables end users to make rational decisions for energy efficient motors and implemented small-scale prototype efficient motor demonstration projects. Furthermore, FEWE has prior experience with GEF projects: they have been actively involved as one of the main sub-contractors of the IFC/GEF Polish Energy Efficient Lighting Project (PELP). The PEMP Centre will be housed at FEWE's facilities in Katowice, which is located in the center of a heavily-industrialized region that is convenient to many potential program beneficiaries.

#### ***5.1.4. Programme Management Unit***

The project will establish a programme management unit (PMU) within the implementing agency in Warsaw. The PMU will coordinate all project-related activities, and it will ensure that the expected project outputs are completed on time and comply with the UNDP/GEF criteria and requirements. A Project Manager, who will oversee daily management and coordination, will head the PMU. The Project Manager will also be responsible for regular reporting on the progress of the project to the executing agency, the Project Steering Committee, and UNDP.

UNDP will engage the services of a highly experienced project manager. An international technical advisor and local administrative support staff will assist the project manager. The project manager will also establish close co-operation with international financing institutions active in Poland so as to ensure complementary activities working towards the same goal. For example, EBRD has been instrumental in the design and implementation of the first ESCOs operational in Poland. Furthermore, bilateral donors such as the Japanese and the Dutch Governments are active in the field of industrial energy efficiency measures and energy efficiency policy development, respectively.

#### ***5.1.5. Project Steering Committee***

The project will also establish a Project Steering Committee (PSC) to advise the executing agency on the direction of project development and implementation. Furthermore, the PSC will act as a platform for sharing information on the project's progress. The membership of the PSC will be determined by the executing agency in close collaboration with the PMU and UNDP.

The Project Steering Committee will be chaired by the National Project Director, who will be appointed by and represent UKIE, the executing agency. UNDP will hold a seat on the PSC to monitor the progress of the programme and to provide the required guidance to the process where it concerns the administrative UNDP/GEF requirements. FEWE will also serve on the PSC. A representative list of PSC members and a description of their duties will be prepared during the project document stage.

The performance of the PSC for PDF B phase will be evaluated and improvements will be implemented. However, it is also anticipated that representatives of the following organizations will hold seats on the committee in addition to those mentioned above: KAPE, the political and/or operational GEF Focal Point, co-financiers, representative(s) of the relevant financial institutions, representative(s) of the relevant end-use sectors, representatives of the energy efficient motor system manufacturers (possibly all to avoid unfair competition) and UNDP-Warsaw. The PSC may be complemented with external experts as deemed appropriate by the executing agency, PMU and/or UNDP. No attendance fees will be paid to representatives of government institutions who sit on the PSC. External experts will be contracted and paid for their services as necessary. Details will be worked out by the executing agency and UNDP during the project document stage.

#### ***5.1.6. Reporting and Administrative Requirements***

UKIE, the executing agency, will be responsible for the continuous monitoring of the project's advancement and will be advised by the PSC in this task. To this end, the project manager will prepare regular reports on the progress of the project and its constituting activities. In addition, the Political and Operational GEF Focal Points, the Ministry of Foreign Affairs and the ECOFUND will follow the project closely and support its implementation.

After a detailed work plan has been prepared at the outset of the project implementation, the PSC and UNDP representatives will undertake a review of it. The purpose of the review is to identify possible gaps, overlaps and other risks to successful implementation of the project, as well as to identify potential partners and sources of experience, expertise and information from which the project could benefit.

The project will be subject to a Tripartite Review after six months of project implementation and following each subsequent year of project implementation. The project manager, in consultation with the UNDP Poland programme officer responsible for GEF, shall prepare and submit an Annual Performance Report (APR) for this Tripartite Review meeting. Additional reviews may be requested, if necessary, during the project.

The project will be administered in accordance with UNDP established administrative procedures. At the outset of the implementation of the full-scale activities the financial and administrative procedures will be detailed. Technical backstopping from UNDP technical staff from the UNDP/GEF regional unit in Bratislava as well as the core unit in New York will be provided as appropriate.

## 5.2. PEMP Centre

The responsibility of the PEMP Centre is to play the key role in opening the energy efficient electric motor system market by serving as: a centre of expertise; a training facility; a source for building institutional and human capacity; and a strong advocate.

The PEMP Centre will build its capacity and skills based on international and domestic experience, networks, and links. The PEMP Centre will be located at the FEWE Katowice Centre to leverage its existing knowledge of the international and domestic institutional framework. PEMP Centre activities will be the responsibility of FEWE. FEWE will contribute to the PEMP project through "in kind" input coming from 4 years of projects results including: software (EFEmotor), lessons learned from three small demonstration implementations, 30 walk through audits and courses in industry, links with software users and motor producers, primary data base from phase PDF B of the PEMP project. Up front in kind input of FEWE is evaluated at \$100 000. The PEMP Centre and its relationship with other organizations is presented schematically in the figure below.

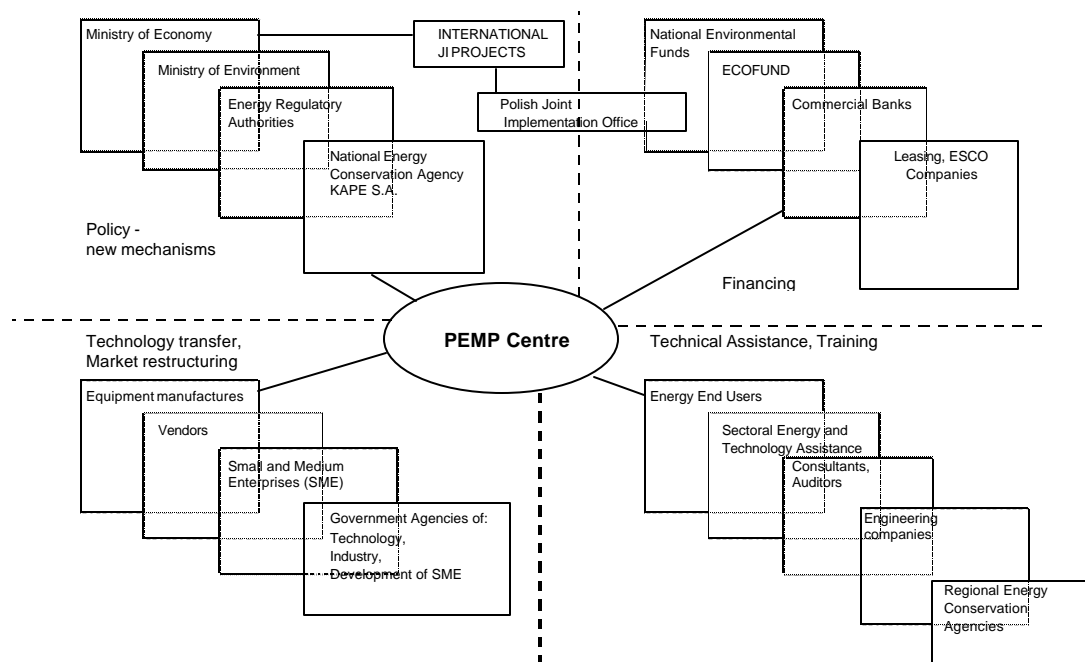


Figure 1 - PEMP Centre and its relationship with stakeholders

### 5.3. Stakeholder Participation

The following institutions and organizations (in no particular order) are of importance for the implementation of the full-scale programme, and moreover for the increased use of energy efficient motors in Poland. During the PDF B implementation they have been consulted as appropriate and their inputs have been incorporated in the design of this full-scale project brief:

- MG - Ministry of Economy - responsible for economy, energy, industrial policy creation and legal acts preparation for the Polish energy economy;
- URE - Energy Regulatory Authority - a Governmental Authority responsible for energy economy regulation and energy market mechanisms development. When energy enterprises are obligated to create tariffs on the basis of economically reasonable costs with respect for DSM opportunities, the Authority is responsible for stimulating and controlling that process;
- MF - Ministry of Finance - responsible for financial mechanisms preparation and supervision of their implementation;
- MS - Ministry of Treasury - responsible for privatization issues (motor and motor related industry enterprises are still not privatized);
- MSZ - Ministry of Foreign Affairs - responsible for international relations among others with GEF;
- MS - Ministry of Environment - responsible for environmental policy preparation and development of related institutions. Among others responsible for GHG issues on behalf of the Republic of Poland;
- GUC - Central Duty Office - responsible for duty system control - important in the case of import of sub-product or technologies;
- ATT - Agency for Technique and Technology - responsible for promotion and development of modern technology and techniques for the Polish economy;
- PKN - Polish Committee for Standards - responsible for preparation of standards policy and specific requirements;
- KBN - Polish Committee for Research and Science - Governmental institution responsible for allocation of public resources for research and science as well as for the implementation of the results (to some extent);
- NFOSiGW - National Fund for Environment Protection and Water Treatment - financial institution responsible for investment of the public resources for projects with positive effects on environmental conditions;
- ECOFUND - GEF operational focal point. The task of the Ecofund Foundation consists in the provision of co-funding for environmental protection-related projects not only of crucial importance on a regional or national scale, but also of major influence on the process of achieving environmental objectives recognized as priorities by the international community on a global as well as European level.
- Multilateral Financial Institutions (IFC, EBRD, EIB) - potential investors for the full-scale project;
- PCPP - Polish Copper Promotion Center - responsible for promotion of copper use increase what is an expected effect of use of more efficient electric motors.

Selected stakeholder representatives will take seat in the PSC and through that mechanism will be able to influence the direction and implementation pace of the full-scale programme.

**Beneficiaries** of the full-scale project will be first and for all the main end-user groups such as the heating sector, chemical plants, water utilities, sewage utilities and hard coal mining. Furthermore, indirectly other sub-sectors will benefit from the proposed initiative by increasing the use of energy efficient motor systems in their production processes (metallurgical, chemical, mining and cement), utilities (water, waste and heat) and to a lesser extent the residential and commercial sectors. In addition the manufacturers of electric motors will benefit from the support that will in the longer-term lead to the development of the market for energy efficient motor systems. Other beneficiaries of the project include policy-makers and members of the research and development community.

## **6. INCREMENTAL COSTS AND PROJECT FINANCING**

### **6.1. Incremental Costs**

The baseline for the programme included several factors. Presently the market share of energy efficient motors in Poland is practically zero (confirmed by Elektrim Motor and ABB). There are no indications that the market for EEM will open in the near future in a business-as-usual scenario, as explained by the barriers identified in Section 2. Therefore, it is assumed that in the baseline the market share of energy efficient motors remains virtually zero over the duration of the project (2001 to 2006).

Energy efficiency improvements in electric motor systems will lead to a decrease in electricity consumption and to a reduction of GHG emissions in electricity production. The CO<sub>2</sub> emission factor used for electricity production is based on the current fuel mix and efficiencies of central electricity production in Poland (1.06 kg CO<sub>2</sub>/kWh). Electricity savings of about 3.1 TWh/year (economic potential with PBP up to 6 years, see Section 1) will result in a reduction of greenhouse gases in Poland of about 3.3 million tons of CO<sub>2</sub> each year. This corresponds to 1.6 percent of Poland's overall CO<sub>2</sub> emissions in 1997.

The following components of PEMP lead to a direct increase in sales and corresponding emission reduction: market transformation activities; demonstration projects; and, follow up projects. The average savings realized by the market transformation programme have been estimated for three categories of motors, and include 1) efficiency improvement of the motor; 2) application of variable speed drives; and 3) system optimization, among which the proper sizing of the motor. The savings of the demonstration projects are estimated in an ex-ante analysis. For the direct impact of PEMP by the year 2006, all investments in energy efficiency improvement of motor systems that occurred during the implementation of PEMP in the period 2002-2006, including related investments in VSD, are included. The calculations indicate that in 2006, energy efficient motors will have gained 15 per cent of the motor market.

The medium-term indirect impact of PEMP will, of course, be much larger. PEMP aims to overcome the main market barriers for energy efficient motors and as a result start exploiting the economic potential (see above). The medium-term indirect impact of PEMP is estimated under the assumption that by removing the main barriers, the market for energy efficient electric motors in Poland could gradually reach the level of 30 per cent of total motor sales in a period of 10 years (2010). In other words, indirect impact includes the new related investments triggered by this project over 2001-2010.

The specific GHG reduction costs can be calculated on the basis of the total GEF funding. The emission reduction is calculated for the electricity savings over the whole lifetime of the investment (15 years), and a summary of the results is provided in Table 5. Additional details regarding incremental cost are provided in Annex A.

**Table 5 - GHG emission reduction and specific reduction costs of the PEMP programme**

	<i>Direct impact of PEMP (2001-2006)</i>	<i>Direct and mid-term indirect impact (2001-2010)</i>
Yearly electricity savings (GWh/year)	55.7 (in year 2006)	231.6 (in year 2010)
CO <sub>2</sub> emission reduction (over lifetime of 15 years) (kton CO <sub>2</sub> )	885	3,682
Specific CO <sub>2</sub> emission reduction costs (US\$/t CO <sub>2</sub> ) <sup>8</sup>	5.1	1.2
SO <sub>2</sub> emission reduction (over lifetime of 15 years) (ton SO <sub>2</sub> )	7,507	31,215
NO <sub>2</sub> emission reduction (over lifetime of 15 years) (ton NO <sub>2</sub> )	2,090	8,690
Particulate emission reduction (over lifetime of 15 years) (ton)	790	3,285

<sup>8</sup> Based on GEF funding of US\$ 4,500,000.



## 6.2. Project Budget

Activity Group		GEF	Buyers	Motor Producers	Other Funds	Ecofund, NFOSiG W	Govt. of Poland / KAPE S.A.	Total
Build Capacity and Raise Awareness		1,609,300	0	0	600,000 (of that, \$100,000 in-kind)	0	150,000 (in-kind)	2,359,300
Demonstrate Efficient Motors	<i>District Heating</i>	100,000	243,560	0	0	0	0	343,560
	<i>Water / Sewage</i>	50,000	59,000	0	0	0	0	109,000
	<i>Chemical Industry</i>	150,000	225,000	0	0	0	0	375,000
	<i>Coal Mine</i>	100,000	66,666	0	0	0	0	166,666
	<i>Follow-Up</i>	0	6,887,037	0	0	1,215,359	0	8,102,396
Stimulate Market Development	<i>Labeling</i>	55,000	0	0	0	0	0	55,000
	<i>Financial Incentive</i>	1,619,000	7,814,850	300,000	0	0	0	9,733,850
	<i>Awareness</i>	60,000	0	0	0	0	0	60,000
Policy		0	0	0	0	0	150,000 (in-kind)	150,000
Project Management Unit (PMU)		561,000	0	0	0	0	0	561,000
Full Project Total		4,304,300	15,296,113	300,000	600,000 (100,000 in-kind)	1,215,359	300,000 (in-kind)	22,015,772
PDF B		195,700						
<b>Grand Total</b>		<b>4, 500,000</b>	15,296,113	300,000	600,000	1,215,359	300,000	<b>22,211,472</b>

### 6.2.1. Budget Notes

- The project assumed a conversion rate of \$US 1 = 4.50 Polish zloty (PLN).
- For the PEMP Centre, FEWE and the Polish Copper Promotion Center will contribute \$100 000 will make an in-kind contribution, and the project team will raise other public and private funds for financing a share of the PEMP Centre activities in its fourth and fifth year of operation.
- The contribution of KAPE to the PEMP Centre and to the development of energy efficiency policy will be made on behalf of the Polish Government.
- The incentive mechanism for the manufacturer is intended to influence the manufacturers to produce energy efficient equipment. Financing will be made available to efficient motor manufacturers that are able to meet minimum technical requirement established under PEMP. Participating manufacturers will compete with each other for the right to receive financing and the right to receive a larger share of financing will be given to those manufacturers who are able to provide the greatest savings, in terms of projected avoided electricity use, at the lowest overall cost.

For the GEF contribution to the Financial Incentive component of the Stimulation of Market Development, the numbers of motor units that will be sold under the programme were established (see Table 4 of the Project Brief). For each of the three motor classes defined, the cost on a per unit basis was estimated based on the required manufactures' costs to rebuild their facilities for production of energy efficient motors and offer new products for sale. This additional cost, multiplied by the target EE motor sales, was aggregated for the three motor classes over the four-year period that the Incentive Programme would be operational. The total incentive amount is \$1,594,447 for the incentive and \$24,553 for additional activities required to set-up and operate the Programme (total \$1,619,000).

- The contribution of buyers under "Follow-Up Activities" for Activity Section 2 of the budget are an informed estimate of the minimum amount of investors' own financing for projects, which will follow the demonstration projects. This figure takes into consideration the number of viable projects identified by the project team during the PDFB phase and the necessary buyer contribution to financing given current experience with domestic environmental funds. The number of potential replication projects was based on the number of preliminary application forms received and discussions with the possible beneficiaries. The potential projects were distributed as follows:
  - Heating: 15 additional projects
  - Water utility: 11 additional projects
  - Chemical industry: 2 additional projects
  - Coal mines: 6 additional projects

The worksheet with the calculations used for the follow-on financing is provided on the following page (see Summary of Follow-on Financing below). The contribution of the buyers is reflected as parallel financing in this project (as noted on the cover page).

- The contribution of domestic environmental funds (NFOSiGW and ECOFUND) under "Follow-Up Activities" for Activity Section 2 of the budget refer to financing which is available for energy efficient motor system projects basing on actual criteria in the project as listed under the project approach. This figure is conservative given the much larger amount of funding that is available through these mechanisms and represents only a small percentage of funds' annual program budgets.
- The "other funds" contribution to building capacity is based on co-financing from national environmental funds, and is based on 15% of the value of the proposed project. This is fully within the accordance of the rules of the funds, which can support up to 20% for commercial enterprises. This figure was selected as a very conservative estimate of the national fund contribution to the project (letters of intent are provided in the Optional Annexes section). These funds are fully expecting to support the demonstration component and follow-on investments through funding for individual applications to the funds.
- The estimated contribution of purchasers under the financial incentive program assumes that the project reaches its target.

- The estimate of the producers' contributions to the market transformation activities is based on an initial manufacturer proposal.
- The buyers' contribution to the market transformation initiative was calculated as the total amount that buyers would spend on EE motors, up to the target number of motors as outlined in Table 4 of the Project Brief. The total cost of EE motor sales (minus the incentive to the manufacturer) were aggregated for the three motor sizes over the project period at \$7.814M, which has been reflected as parallel financing in this project (as noted on the cover page).
- The allocation for monitoring and evaluation for the project overall is calculated at \$70,000. In addition, \$10,000 will be allocated from the capacity building funds to monitor and evaluate those activities.

## Summary of Follow-on Financing

### A. District heating:

demo project cost:	\$343,560	
co-financing:	\$243,560	
projects in sector:		15 (possible 200-300)
avg. project cost x	\$343,560	
total project cost x	\$5,153,400	
Assume:	15% financing from environmental fund:	\$773,010
	85% self-financing (incl. commercial loans):	\$4,380,390
Total for co-financing:		\$5,153,400

### B. Water utility

demo project cost:	\$109,000	
co-financing:	\$59,000	
projects in sector:		11 (possible 100-200)
avg. project cost x	\$109,000	
total project cost x	\$1,199,000	
Assume:	15% financing from environmental fund:	\$179,850
	85% self-financing (incl. commercial loans):	\$1,019,150
Total for co-financing:	\$1,199,000	

### C. Chemical industry

demo project cost:	\$375,000	
co-financing:	\$225,000	
projects in sector:		2 (possible 10-20)
avg. project cost x	\$375,000	
total project cost x	\$750,000	
Assume:	15% financing from environmental fund:	\$112,500
	85% self-financing (incl. commercial loans):	\$637,500
Total for co-financing:	\$750,000	

### D. Coal mine

demo project cost:	\$166,666	
co-financing:	\$66,666	
projects in sector:		6 (possible 45-55)
avg. project cost x	\$166,666	
total project cost x	\$999,996	
Assume:	15% financing from environmental fund:	\$149,999
	85% self-financing (incl. commercial loans):	\$849,997
Total for co-financing:	\$999,996	

### A - D

demo project cost:	\$994,226	
co-financing:	\$594,226	
projects in sector		34
total project cost x	\$8,102,396	
Assume:	15% financing from environmental fund:	\$1,215,359
	85% self-financing (incl. commercial loans):	\$6,887,037
Total for co-financing:	\$8,102,396	

## **7. MONITORING, EVALUATION, AND DISSEMINATION**

### **7.1. Programme Monitoring, Evaluation and Dissemination**

Section 3 defined the objectives and activities under PEMP. However, the success of PEMP will depend upon the regular monitoring and evaluation of these objectives and activities. UNDP will commission an independent team for monitoring and evaluating the mid-term and final achievements of PEMP. In addition to the UNDP monitoring, it is important that extensive monitoring and evaluation are an integral part of the individual program components. The different components of PEMP will be monitored as follows:

- The project team will monitor the practical implementation of the demonstration projects. A baseline for each project will be established. After implementation the electricity consumption will be measured and, in comparison with the baseline, the electricity savings can be calculated. Also the financial aspects of the project will be considered. The follow-up projects will be monitored in the same way, but with lesser detail;
- For the market transformation programme, specific targets will be adopted in terms of number of sales. The number of sales and the corresponding investments will be continuously monitored. A selection of investments will be monitored in detail to check if the project is really implemented and if it leads to the expected electricity savings. Furthermore, the transaction/organization/management costs of the market transformation programme will be monitored in order to optimize the implementation; and,
- In the business plan for the PEMP Centre, indicators will be defined to monitor the success of its activities.

Each year a report will be published in which all PEMP activities and the monitoring results will be made available. The report will also include a financial audit that will be carried out by independent accountants. The project team and Project Steering Committee will use this interim report to evaluate the project's progress and plan for coming years. If necessary, the programme design can be adjusted.

The PEMP Programme manager will be responsible for monitoring, and planning and reporting to the Implementing Agency of PEMP as well as to the financiers of PEMP. An independent research institute will carry out the yearly monitoring and evaluation subcontracted by the Implementing Agency.

### **7.2. Monitoring GHG emission reductions**

The GHG emission reduction achieved by the GEF intervention will be assessed in a reliable and verifiable way. For each component of PEMP, a different methodology will be used, which will comply to the extent possible with existing guidelines for Joint Implementation projects (Poland has its own Secretariat for Joint Implementation and a methodology for evaluating project benefits).

Several detailed guidelines for baseline studies, validation, monitoring and verification have been established e.g. by the Dutch Government for the ERU-PT JI tender and for the World Bank Prototype Carbon Fund or proposed by OECD methodology for electricity-efficiency projects: motors and lighting<sup>9</sup>. Ultimately, the Project Manager will be responsible for development and oversight of a GHG monitoring and measurement plan for the project. Methodologies or techniques developed for the projects that are unusually innovative or cost-effective will be shared with other similar GEF projects through UNDP/GEF and the GEF Secretariat.

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<sup>9</sup> An Initial View on Methodologies for Emission Baselines: Energy Efficiency Case Study, 2000.

### 7.2.1. Monitoring the demonstration projects

GHG emission reductions from the demonstration projects will be estimated and monitored using guidelines for Joint Implementation projects. This will ensure that PEMP will profit from the extensive experience that has been gained in developing guidelines for JI projects.

The following steps will be carried out within the PEMP programme:

1. **Baseline study.** For each demonstration project, a baseline study will be carried out, which describes: 1) the current situation; and 2) the level of GHG emissions in the case the GEF project would not be implemented.
2. **Validation.** The baseline study will be validated by an independent evaluator using existing guidelines.
3. **Monitoring study.** After implementation, a monitoring study will be carried out, assessing the level of emission after implementation, including measurements.
4. **Verification.** The emission reported in the monitoring study will be validated by an independent body.

### 7.2.2. Monitoring the Market Transformation Programme

The following approach, which will be developed in more detail at the start of the project, will be used:

- **Baseline study.** The baseline study should address the development of the energy efficient motor market in Poland in the period to 2006 (duration of PEMP) and to the commitment period 2008-2012 without GEF intervention.
- **Validation.** The baseline study will be validated by an independent body. Guidelines for validation need to be developed.
- **Monitoring.** The monitoring will use a two-fold approach: 1) on the basis of financial incentives offered and the data on the investments, the total electricity savings can be calculated using generic data on average saving, 2) for a selection of projects the electricity savings will be measured to validate the generic assumptions.
- **Verification.** The monitoring study will be verified by an independent body.

The proposed project implementation work plan is provided below.

**Proposed Project Implementation Work Plan  
(5-year project)**

ACTIVITIES	PROJECT QUARTERS									
	1	2	3	4	5	6	7	8	9	10
<b>Set up of PMU, PSC, PEMP Centre</b>										
<b>Capacity Building &amp; Awareness</b>										
- Provide information										
- Technical assistance										
- Training, capacity building										
- Financing mechanisms										
- Design and monitor market transformation activities										
- Monitor demonstration projects										
- Design, replication demo projects										
- Assist policy development gvt.										
<b>Market Transformation Programme</b>										
<b>Demonstration Projects</b>										
<b>EE Policy Development in Industry</b>										

(continued)

ACTIVITIES	PROJECT QUARTERS									
	11	12	13	14	15	16	17	18	19	20
<b>Set up of PMU, PSC, PEMP Centre</b>										
<b>Capacity Building &amp; Awareness</b>										
- Provide information										
- Technical assistance										
- Training, capacity building										
- Financing mechanisms										
- Design and monitor market transformation activities										
- Monitor demonstration projects										
- Design, replication demo projects										
- Assist policy development gvt.										
<b>Market Transformation Programme</b>										
<b>Demonstration Projects</b>										
<b>EE Policy Development in Industry</b>										

Note: Timing of the activities refers to the period in which these activities are to take place. The intensity of the activities; i.e. full-time/percentage part-time varies per activity and is not included here.

## **ANNEX A -INCREMENTAL COST ANNEX**

### **Broad Development Goals**

The broad development goal of the PEMP program is to support to the Poland's commitments to reduce GHGs through the adequate and efficient use of electricity for the growth in its industrial sector. At present, electricity production in Poland is highly polluting. This programme will not only help bring the peak electrical demand in line with generation capacity but also it will assist utility and industries sector to reduce production costs through increased energy efficiency, thereby increasing profits.

### **Baseline**

An assessment of the current situation points to several barriers which prevent the significant energy conservation potential of utility and industries sector in Poland from being achieved.

The first is a lack of awareness and information about the potential benefits of increased energy efficiency. Although limited energy efficiency activities have been undertaken in Poland; it has been a relatively small amount and it has not been conducted systematically. In fact the issue of energy efficiency is given quite a low priority. Personnel have received insufficient training linking the physical parameters and possibilities of energy conservation with the preparation and financing of profitable investments. At present, financing of energy efficiency projects is restricted to a few enterprises, most of which are either larger subsidiaries of international companies or have been involved in subsidized donor-funded activities. Local financial institutions are unaware of the significant potential market related to investing in energy efficiency; and are unfamiliar with financial mechanisms, which can open this market. This information barrier will be addressed by the PEMP Centre that is to be established as part of the programme.

A second barrier resulting in this limited attention to energy efficiency and more specific to energy efficient drives, is the lack of institutional development (i.e., institutions and organizations that bridge the gap from technical assessments and energy audits to a financially sound proposal that can be financed, without burdening the sectors financial position). There is a clear lack of such energy service organizations or companies which can assist the sectors in developing and implementing technically sound proposals, while designing the financial schedule such, that it minimizes the investment burden, uses all the possible support mechanisms and reduces the risk to the sector.

A third barrier that hinders the development of more energy efficient industry is the limited number of actual demonstrations of enhanced energy efficiency through investment. While many firms have taken "no" or "low" cost housekeeping measures, very few have undertaken the investments in new plant capacity to improve energy efficiency and therefore, profitability. The recommendations of past audits have only been followed in a limited number of cases; and there is a need to develop more success stories to engender confidence within the Utility and industries sector to invest in such projects on their own financial merit. Finally, Poland possesses few, if any, institutions to develop sustainable energy efficiency activities. This is exemplified by a lack of dedicated policy and guidelines, a lack of knowledge of international best practice, and a lack of capacity to implement energy efficiency measures. In the absence of this GEF supported programme, the pattern of minimal to modest energy efficiency improvement is likely to continue.

The utilities and industries sector in Poland utilize a supply-side approach to energy use. They focus on utilizing the cheapest fuel rather than minimizing energy costs per unit of output. There is a general lack of knowledge of life cycle economic and financial analyses methods and their application to energy use within industry. The programme seeks to widen this perspective and reshape the decision-making framework as applied in the sectors in Poland.



A fourth barrier identified is a lack of knowledge about the financial benefits for investment in energy-efficient electric motor systems. Both utilities and industries often fail to perceive the profitability of these investments. The market survey conducted under the preparatory phase of the project, for example, indicated that nearly 40% of motor consumers would not currently be willing to invest in a project that would pay for itself in less than 3 years. While the potential projects targeted under PEMP are profitable, they are unlikely to be pursued in the absence of the proposed project.

The financial sector is also not knowledgeable on the financial benefits and returns of energy efficiency. This barrier will be principally addressed by the implementation of an international supported financial mechanism.

### **Global Environmental Objective**

The global environmental objective of this programme is the reduction of GHG emissions from the utilities and industries sector. This objective will be achieved by removing the four barriers that have been identified to the improvement of the efficiency of energy-use in this sector (see below). This is consistent with the goals and guidelines of GEF Operational Program 5 Removing Barriers to Energy Conservation and Energy Efficiency.

### **Alternative**

#### ***Component 1: Building Capacity by Providing Information and Services Related to Energy Efficient Electric Motor Systems***

This component will address the capacity building of the following relevant actors:

- Selected utility and industries sector staff and personnel who will be involved in energy efficiency activities;
- Manufacturers, supplier, installers of EE motors and drive trains;
- National policy makers and municipalities task managers in the utility and industries sector;
- Intermediary organizations and institutions;
- Universities and Vocational school relevant staff.

The PEMP Centre will be set up as the institutional delivery mechanism for providing information and technical assistance to these target groups using for each target group starting with a solid information and training needs assessment. For the awareness raising, means such as workshops, conferences, seminars, newsletters, and trade fairs are included as elements.

Training will be delivered by local, regional and international specialists. Throughout the programme, the training materials will be turned over to Poland institutions to enhance their capacity to provide future training thereby ensuring sustainability. The training of the target groups will be delivered through energy auditing workshops and specialized courses for energy managers. This training will be designed to raise awareness of potential energy conservation measures and to instill capacity to implement energy efficiency measures. An industrial energy efficiency network will be established in the later years of the programme to encourage and facilitate dialogue among energy managers.

Financial engineering courses will be offered to train the utilities and industries sector personnel and other project developers in the conduct of life-cycle energy and economic analysis, including environmental considerations. In addition, the relevant information needed by potential investors will be assembled in a Guide for Investors -- which will cover legal, financial and programme development concerns.

The final purpose of this component is to strengthen the PMU hosted at within PEMP to undertake and effectively execute the five-year programme. Ultimately, this capability will be established at FEWE to

enable it to become a focal point for energy efficiency activities in Poland. This will be accomplished through formal training in Poland and abroad, as well as through on-the-job training. Having developed the fundamental capability to assess energy and global environmental issues, the PMU will be well placed to perform GHG emission inventories, contribute to national energy and environment policies, and establish guidelines for the implementation of globally beneficial energy efficiency measures.

***Component 2: Demonstration of Efficient Motors on the Polish Market***

The transaction costs associated with developing demonstration projects will be covered by the previous project components. In addition, the GEF support will provide a portion of the costs of 4 demonstration projects to cover the incremental costs and ensure financing of a selected number of demonstration projects. The demonstration projects, as outlined in the body of the text, are selected on the basis of past performance, potential energy savings, willingness and ability of the enterprise to obtain the additional necessary funds from other sources, potential replicability, and potential GHG savings. These projects will be executed along the lines of small-scale projects; and funds will be released to cover the incremental costs of the demonstrations, which are largely anticipated to be learning-related costs. The demonstration project, will be expected to share information about performance freely. The results of demonstration projects will create critical mass of credibility and willingness to replicate in follow up projects.

***Component 3: Market Transformation Using Financial Incentive Mechanism and Awareness Raising***

The market transformation activity is aimed to tackle the barriers to the development of the energy efficient motors market. This activity will provide incentive for manufactures to increase the production of energy efficient motors while simultaneously enhancing consumer awareness of the benefits of these motors.

Differential cost of energy efficient motor is divided between manufactures and programme subsidy and it will be lowered at the increasing scale of energy efficient motors sets. It allows continuing the viable business of energy efficient motor production when the market transformation programme will stop.

***Component 4: Institutional strengthening and policy development***

Incremental cost of this component focuses on supporting of Polish energy efficiency policy development within energy efficient motor systems.

Institutional strengthening and policy mechanisms developing will be designed for promotion energy efficiency in motor systems in industry. GEF requested involvement is included in the PEMP Centre budget.

**Incremental Cost Matrix**

The incremental costs of the PEMP Programme (2002 - 2006) and benefits for each programme component are summarized in the incremental cost matrix (Table A-1). For Component 1, awareness of energy efficiency as a “win-win” proposition would remain at a low level without the programme.

After programme completion, there should be a well established PEMP Centre that can be run sustainably, and perform effectively its tasks in capacity building, and awareness raising in energy efficient motors and drive trains. The present effort of KAPE, PCPM and FEWE totals only US\$ 250,000, while the total costs for the PEMP Centre are budgeted at US\$ 2,586,187.

Follow-up projects can after programme compilation (beyond 2006) could bring future investments of US\$ 28,000,000 assuming that market penetration rates targeted by the project are reached and that all of

the viable projects identified in the PDFB phase of the project are implemented. The financial incentive under the market transformation program would be working to open up the market by increasing the financial attractiveness of EE motors and drive train projects to the targeted utility and industrial sectors. The project would also transform the market by reducing transaction costs through increased capacity and awareness among intermediaries and the financial sector. This new investment could reach US\$ 50,000,000 during the period 2006 - 2010.

### **Additional Benefits**

The programme may have additional domestic benefits in terms of the new energy efficiency business opportunities that are opened up and a reduction in local air pollution associated with small and medium enterprise energy efficiency. Other additionalities will come from water saving in water supply and heating companies. New advance technologies and higher level of management will enforce market position of energy end users/industrial enterprises and equipment producers. Positive results of the PEMP Programme can be a good example of implementing of integrated energy and environment management as component of government sustainable development strategy. Neither of these additional benefits has been included in the incremental cost calculations.



**Table B-1 Incremental Cost Matrix**

<b>Component</b>	<b>Baseline</b>		<b>Alternative</b>		<b>Increment</b>	
<b>1. Capacity Building &amp; Awareness Raising</b>  <b>PEMP Centre</b>	<b>Global</b>	Utility and industry sectors emit GHGs – unaware of “win-win” nature of energy efficiency.	<b>Global</b>	Utility and industry sectors see environmental potential of energy efficiency and have the knowledge to capture this potential.	<b>Global</b>	Utility and industry sectors view energy efficiency as “win-win” proposition.
	<b>Domestic</b>	<ul style="list-style-type: none"> <li>Little or no awareness of energy efficiency.</li> <li>Utility and industry sectors cannot prepare &amp; obtain financing for energy efficiency projects</li> <li>Few, if any, energy efficiency investments made</li> </ul>	<b>Domestic</b>	<ul style="list-style-type: none"> <li>Utility and industry sectors see economic potential of energy efficiency.</li> </ul>	<b>Domestic</b>	Awareness of the economic potential for energy efficiency.
	<b>Cost</b>	US\$ 150,000 (KAPE) US\$100,000 in-kind (FEWE + PCPM)	<b>Cost</b>	US\$ 2,609,300	<b>Cost</b>	US\$ 2,359,300 including requested US\$ 1,609,300 from GEF
<b>2. Demonstrating Efficient Motors on the Polish Market</b>	<b>Global</b>	Few, if any, financed energy efficiency projects implemented with resultant GHG reductions	<b>Global</b>	Energy efficiency demos partly financed from GEF—financing & cost recovery critical.	<b>Global</b>	<ul style="list-style-type: none"> <li>Financing of “win-win” projects demonstrated widely.</li> <li>Utility and industry sectors prepare “win-win” energy efficiency projects.</li> </ul>
	<b>Domestic</b>	Few, if any, energy efficiency loans undertaken	<b>Domestic</b>	Utility and industry sectors and financial institutions learn to prepare & process energy efficiency loans.	<b>Domestic</b>	<ul style="list-style-type: none"> <li>Energy Efficiency loans and grants made available.</li> <li>Profitable energy efficiency investments made.</li> </ul>
	<b>Cost</b>	<b>Demo Projects</b> – US \$270,000 <b>Follow up Projects</b> – US\$ 3,930,000	<b>Cost</b>	<b>Demo Projects</b> – US \$994,226 <b>Follow up Projects</b> – US\$ 8,102,396	<b>Cost</b>	US\$ 9,096,622, including requested US\$ 400,000 from GEF
<b>3. Market Transformation Program</b>	<b>Global</b>	Moderate market penetration of Energy Efficient Motors	<b>Global</b>	Successful Polish PEMP project and rebate schemes replicate in other transition economies and developing countries	<b>Global</b>	Acceleration of economic potential utilization for relatively moderate incremental cost.
	<b>Domestic</b>	Many barriers and non-significant market penetration of Energy Efficient Motors. High risk of producers to prepare and offer new efficient motors	<b>Domestic</b>	End users learn about advantages of energy efficient motors, increased demand for energy efficient motors.	<b>Domestic</b>	Overcoming of up front capital barriers for more energy efficient products.
	<b>Cost</b>	US\$ 930,000 (Energy Efficient Motors Buyers)	<b>Cost</b>	US\$ 10,663,850	<b>Cost</b>	US\$ 9,733,850, including requested US\$ 1,734,000 from GEF

<b>4. Policy Development and Institutional Strengthening</b>	<b>Global</b>	Poland retains weak institutional structure for energy efficiency in motor systems	<b>Global</b>	Institutions strengthened for “win-win” projects.	<b>Global</b>	Policy instruments, exist and energy efficiency projects operate.
	<b>Domestic</b>	Weak institutional framework & programme mgt capabilities and policy instruments	<b>Domestic</b>	<ul style="list-style-type: none"> <li>• Programme implemented.</li> <li>• Implementation capacity for the policy framework developed</li> </ul>	<b>Domestic</b>	Institutions possess ability for “win-win” programmes.
	<b>Cost</b>	<i>US\$ 150,000</i> (Polish Government / KAPE)	<b>Cost</b>	<i>US\$ 711,000</i>	<b>Cost</b>	<i>US\$ 561,000</i>
<b>TOTAL PROGRAMME</b>						
<b>Global Environmental Benefits</b>	-	Utility and industry sectors emit increasing amounts of greenhouse gases.	-	Barriers to increased energy efficiency removed.	-	Barriers to energy efficiency removed
	-	Barriers prevent investment in increased energy efficiency.	-	Significant CO <sub>2</sub> emission reductions will be achieved	-	CO <sub>2</sub> savings from utility and industry sectors will accrue.
	-	Baseline Emissions Reduction from utility and industry sectors <i>53,000 tonnes CO<sub>2</sub></i>	-	Alternative Emissions Reduction from utility and industry sectors <i>885,000 tonnes CO<sub>2</sub></i>	-	Programmed Emission Reductions of up to <i>832 000 tonnes CO<sub>2</sub></i> (direct impact of PEMP).
<b>Domestic Benefits</b>	•	Limited energy efficiency investments and weak energy efficiency industry.	-	Energy efficiency investments common — energy efficiency industry grows.	-	Energy efficiency improves.
	-	Electricity outages common	-	Industry begins to shave peak demand.	-	Peak demand reduced.
	-	Little or no attention paid to local air pollution from utility and industry sectors	-	Local pollution from utility and industry sectors reduced, including a reduction of 7,507 tonnes of SO <sub>2</sub> , 2,090 tonnes of NO <sub>2</sub> , and 790 tonnes of particulates over the project lifetime.	-	Local pollution reduced.
<b>Cost</b>	-	<i>US\$ 3,931,200</i> from utility and industry sectors		<i>US\$ 22,015, 772</i> total, including baseline funding and <i>US\$100,000</i> in-kind from FEWE/PCPM plus GEF and other leveraged contributions as a result of the project.		<b><i>US\$ 17, 784, 572 including requested US\$ 4,304,300 from GEF</i></b> (not including PDF funds)
	-	<i>US\$ 300,000</i> in-kind from Polish Gov./ KAPE				

## ANNEX B – LOGFRAME MATRIX

Project Strategy	Objectively Verifiable Indicators	Means of Verification	Assumptions
<b>Global Environmental Objective</b>			
Reduction of GHG emissions for utilities and industries sector	<p>*Electricity consumption reduced by 55.7 GWh/year annually by the final year of the project</p> <p>*Reduction of CO2 emissions by 885,000 tonnes over the project's lifetime</p>	<p>Official Statistics</p> <p>National GHG inventories according to revised IPCC methodology</p> <p>Report base on the methodology described in Section 7</p>	
<b>Immediate Objective</b>			
Reduction of electricity consumption in Poland by overcoming existing barriers for increased market penetration of energy efficient motors and related efficiency improvements in the electric motor system (including variable speed drives), particularly, but not exclusively, in the manufacturing industry, the energy sector (district heating), the utility industry (water supply and sewage treatment) and mining.	<p>*Sales of energy efficient electric motors increased significantly</p> <p>*Sales of variable-speed drives (VSDs) increased significantly over the project lifetime</p> <p>*Number of energy efficiency projects implemented with support of PEMP Center</p> <p>*Changes in electricity consumption for production unit in selected sectors (i.e. KWh/m3, KWh/GJ)</p>	<p>Manufacturer's reports</p> <p>Independent market research</p> <p>Project Status Reports</p> <p>Official Statistics</p>	

Project Strategy	Objectively Verifiable Indicators	Means of Verification	Assumptions
<b>Outputs</b>			
<b>Component 1</b>  Capacity-Building and Awareness Raising	<ul style="list-style-type: none"> <li>* PEMP Centre established</li> <li>* PEMP Centre operations continue after completion of GEF support</li> <li>* Majority of target consumers have received information about efficient motors by the conclusion of the project</li> <li>* Web site established and accessed by consumers .</li> <li>* Label designs and scheme developed</li> <li>*Target number of projects developed directly and indirectly due to the PEMP Centre established before project launch</li> <li>* Proposal for promotion of efficient motors and VSDs through ESCOs completed and at least one existing or new ESCO involved in motor-related projects by the end of the project.</li> </ul>	<ul style="list-style-type: none"> <li>Project Status Reports</li> <li>Reports on the PEMP Center's revenue-generating activities</li> <li>Ex-post Evaluation Report</li> <li>Web-page user statistics</li> <li>Field survey of selected implemented projects</li> <li>Estimation of financial sources spent by investors on energy efficient drives</li> </ul>	<ul style="list-style-type: none"> <li>Successful development of a market for energy efficient motor systems</li> <li>The PEMP Centre is able to partially commercialize informational and technical assistance that it provides by the end of the project.</li> </ul>



Project Strategy	Objectively Verifiable Indicators	Means of Verification	Assumptions
<b>Component 2</b>  Demonstration projects and follow-up projects	*All four demonstration projects implemented.  *All four projects continue with additional financing from non-GEF sources.  *At least <i>n</i> similar projects in each sector are undertaken (number to be determined before project launch) as a result of the demonstration projects.  *Additional funding for projects obtained from domestic environmental funds.	Project Status Reports  List of projects implemented with the support of Ecofund, NFOSiGW ...	The project receives the support of target sector chambers of industry (or other professional associations) in disseminating information  The demonstration projects can be partially implemented without the proposed (promoted) energy efficient drives if there are time delays or other difficulties.
<b>Component 3</b>  Market transformation	* At least <i>n</i> projects funded and <i>n</i> energy efficient motors sold under the proposed financial mechanism (exact figure to be finalized in the project document).  * Implementation of the financial mechanism on the basis of the stated criteria  * Significant number of motor manufacturers involved in the program  * Development and entry into force of a label for energy efficient motors  * Awareness of buyers and financiers increased through seminars, conferences, informational materials, and other means of outreach and training.  *Key customers in industry and utilities become aware of the benefits of energy-efficient motors by the end of the project.	Project Status Reports Independent market research  Manufacturer's reports on energy efficient motor sale.	A competitive electric motor market is in operation.

Project Strategy	Objectively Verifiable Indicators	Means of Verification	Assumptions
<p><b>Component 4</b></p> <p>Development of Energy Efficiency Policy</p>	<ul style="list-style-type: none"> <li>* Policy-makers receive information on instruments for promoting energy efficiency and on the results of the project</li> <li>* Policy-makers from key ministries and agencies are trained in project-related areas</li> <li>* A National Action Plan for Industrial Energy Efficiency is drafted and submitted to the Government of Poland</li> <li>* The government receives advice from the project on labeling, long-term agreements, and best practices in motors</li> <li>* Best practices regarding motors are incorporated into Polish national energy efficiency policy</li> </ul>	<p>Project Status Reports</p> <p>Introduced policy mechanisms</p>	<p>Poland will continue, as an EU candidate country, to place a high priority reducing its energy intensity through policies and programs.</p>

## ANNEX C – STAP ROSTER TECHNICAL REVIEW

Eric D. Larson, Princeton University  
September 2001

This project is well designed. It is targeting industrial electric motor systems, a sector in which there are substantial opportunities for energy efficiency improvements and in which the chances for successful implementation of energy-efficiency motor systems is favored by generally rational financial decision making. The institutional arrangements proposed for implementing the project appear to be well developed and sound. Detailed comments and questions follow.

### Page 1

- The technical savings potential is indicated to be 6.3 TWh/yr, which appears to be about 10% savings relative to estimated current electricity consumption by electric motor systems in Poland. This seems like a rather modest technical potential, although the definition of “technical” is not given. The brief goes on to indicate 5.6 TWh/yr savings (almost the whole technical potential) are available with 10 year payback or less. It would be helpful to give a clearer definition of “technical savings potential”.

### Page 3

- My understanding is that the impact of poor power quality has been considered on the functioning of eems and vsds in Poland. In light of the mention in Sec. 1.3 that electricity supply characteristics need to be improved (bullet #1 in para 3), it would be worthwhile to indicate that the potential impact of power quality on operation of eems and vsds has been considered, and factored into the expected savings.
- How is bullet #5 different from #6?

### Page 4

- Are the high-end of payback periods mentioned in Table 1 (6 to 10 years) consistent with financial parameters that are used in Poland for assessing new electricity supply investments? Aren't longer economic lifetimes considered for the latter? If efficiency improvements and new electricity supply are to be considered on a “level playing field” would it not be reasonable to use similar financial parameters? With longer PBP, the economic savings potential will obviously be larger.

### Page 15

- In Activity 2.3, the objective of finding alternative employment for the motor winders, especially by forming an ESCO, is an outstanding idea.

### Page 22

- Top-most bullet: To address concern about second-hand market, why not build in the requirement that old motors must be turned into the manufacturer (for scrapping) in order for the manufacturer to collect the financial incentive? I understand that this idea was discussed during the preparation of the project. It may be worth mentioning here as one option being considered for addressing this risk.

Page 25

- The project steering committee is described in Section 5.1.5. A smaller number of individuals/organizations with decision making responsibility, advised by a larger group, would seem to be a more effective decision making structure than the proposed very-large steering committee. Perhaps the proposed steering committee could be redefined as an advisory committee to a smaller executive committee.

Page 29

- At first reading, the avoided carbon emissions of 1.06 kgCO<sub>2</sub>/kWh saved seems to be on the high side. (Emissions from modern coal-fired thermal power plants are lower than this.) It may be worth footnoting the basis for this estimate. In particular, I understand that the estimate of avoided carbon emissions takes account of electricity production savings from reduced T&D losses (9-10%) associated with reduced end-use of electricity and that the assumed fuel mix for the carbon estimate is 56% steam coal, 42% brown hard coal, and the remaining natural gas, oil and coke oven gas.

Page 39

- In Table A-1, it would be helpful to clarify how the costs for the baseline demo projects and follow-up projects were estimated. In particular, my understanding is that the demo project costs have been calculated as the amount that investors planned to spend on replacing their motors over the life of the project. The follow-up project baseline has been calculated as the baseline investments expected in the follow-on project over the period of 2003-5, with follow-on projects expected in the district heating sector (15 projects), water utility (11), chemical industry (2) and coal industry (6).

## ANNEX C1 – RESPONSE TO STAP REVIEW

The STAP reviewer has indicated that this project is well designed, targets a sector with substantial opportunities for energy efficiency improvements, has significant chances for success due to rational financial decision-making, and proposes sound institutional arrangements. Further, the reviewer noted that the objective of finding alternative employment for the motor winders, especially by forming an ESCO is an outstanding idea. In addition, the reviewer has pointed out areas requiring clarification, and answers to each question are provided below. (STAP comments are included in italics).

*Page 1. The technical savings potential is indicated to be 6.3 TWh/yr, which appears to be about 10% savings relative to estimated current electricity consumption by electric motor systems in Poland. This seems like a rather modest technical potential, although the definition of “technical” is not given. The brief goes on to indicate 5.6 TWh/yr savings (almost the whole technical potential) are available with 10 year payback or less. It would be helpful to give a clearer definition of “technical savings potential”.*

The technical saving potential was defined as follows: the potential available when applying the best technologies available on the world market in conditions where operating times totalled more than 2,000 hours/year with a constant load for high energy efficiency motors and with a minimum 30% variation in load for variable speed drives. This has been clarified as a footnote on page 1.

These qualifying assumptions explain the relatively small difference between the technical potential and economic potential as stated in the project proposal. The technical potential calculated for all applications in electric motor systems is much higher and is comparable with the estimation made for European Union member states.

*Page 3. My understanding is that the impact of poor power quality has been considered on the functioning of eems and vsds in Poland. In light of the mention in Sec. 1.3 that electricity supply characteristics need to be improved (bullet #1 in para 3), it would be worthwhile to indicate that the potential impact of power quality on operation of eems and vsds has been considered, and factored into the expected savings. How is bullet #5 different from #6?*

The impact of poor power quality was taken into account when the project team considered various implementation risks. Fortunately, poor power quality poses only a very minor risk, as the problem is being addressed as a priority under negotiations as part of the European Union accession process. Poland has agreed under these negotiations to meet European technical and legal standards in this area by the end of the year 2002.

The key issue related to variable speed drives and other electronic devices under current conditions is not so much loss of efficiency or operational shortcomings in the equipment but rather the negative impact of electronic devices on the power grid. However, this problem is addressed by the technical standards established for the equipment.

Bullet #6 should read “Choosing machinery with proper drives for the highest efficiency possible.” This has been corrected on page 3.

*Page 4. Are the high-end of payback periods mentioned in Table 1 (6 to 10 years) consistent with financial parameters that are used in Poland for assessing new electricity supply investments? Aren't longer economic lifetimes considered for the latter? If efficiency improvements and new electricity supply are to be considered on a "level playing field" would it not be reasonable to use similar financial parameters? With longer PBP, the economic savings potential will obviously be larger.*

Longer payback periods for electricity supply investment are usual. PBPs for new electricity supply investments are expected to be 10-15 years and calculated lifetimes for investments are 15-20 years. Such PBPs are accepted because of the long-term contracts established for the electricity supply to the grid.

From an integrated resources planning approach it is possible to examine both investment supply side and demand side on a "level playing field" and, under such an analysis, a wider range of energy efficiency measures can become economic. However, under real conditions the distinction between demand and supply side must be made. When the focus is on the demand side, the consumer requires much lower payback periods as indicated in Table 1, which presents the real willingness of electricity users to invest in energy efficient motor system. Only 3% of investors (according to the survey) are ready to invest under such a condition.

*Page 22. Top-most bullet: To address concern about second-hand market, why not build in the requirement that old motors must be turned into the manufacturer (for scrapping) in order for the manufacturer to collect the financial incentive? I understand that this idea was discussed during the preparation of the project. It may be worth mentioning here as one option being considered for addressing this risk.*

The idea of requirement that old motors must be turned into the manufacturer for scrapping was indeed discussed and carefully investigated. The project preparation team found that any potential perceived "restrictions" for the consumers (such as a requirement about turning in old equipment) were a deterrent to potential participants. For this reason, the team modified its idea to require motor return: motor return will now be considered for the second year of the project pending a positive signal from the market after one year of implementation. The requirement to consider this mechanism for introduction in Year 2 of the project will be included in the UNDP project document (Activity 3.3) and has been noted in project brief.

*Page 25. The project steering committee is described in Section 5.1.5. A smaller number of individuals/organizations with decision making responsibility, advised by a larger group, would seem to be a more effective decision making structure than the proposed very-large steering committee. Perhaps the proposed steering committee could be redefined as an advisory committee to a smaller executive committee.*

The STAP reviewer is correct that the Project Steering Committee is a broad group that is designed for occasional, overall guidance of the project (1-2 meetings annually). Therefore, UNDP often establishes a Project Board consisting of the following participants: a UNDP representative, the National Project Director, the project manager, and a representative of any other key partners. This board will meet as needed (usually on a bi-monthly basis) and provide

more specific guidance to the project manager. UNDP will clarify this arrangement in the project document and explain the relative roles of both bodies.

*Page 29. At first reading, the avoided carbon emissions of 1.06 kgCO<sub>2</sub>/kWh saved seems to be on the high side. (Emissions from modern coal-fired thermal power plants are lower than this.) It may be worth footnoting the basis for this estimate. In particular, I understand that the estimate of avoided carbon emissions takes account of electricity production savings from reduced T&D losses (9-10%) associated with reduced end-use of electricity and that the assumed fuel mix for the carbon estimate is 56% steam coal, 42% brown hard coal, and the remaining natural gas, oil and coke oven gas.*

All calculations have been based on official data for Poland. In other publications devoted to reduction of CO<sub>2</sub> emission, we can find comparable data of up to 1.10 kg CO<sub>2</sub>/kWh for Poland. The data is similar to that for the Czech Republic, and slightly lower but above 1 kg CO<sub>2</sub>/kWh for Bulgaria, Slovakia and Ukraine (A. T. de Almeida, P. Fonseca, F. Ferreira, "Carbon Savings Potential of Energy-Efficient Motor Technologies in Central and Eastern Europe", IEA - International Workshop on Technologies to Reduce Greenhouse Gas Emissions: Engineering-Economic Analysis of Conserved Energy and Carbon, 5-7 May 1999, Washington DC, USA).

*Page 39. In Table A-1, it would be helpful to clarify how the costs for the baseline demo projects and follow-up projects were estimated. In particular, my understanding is that the demo project costs have been calculated as the amount that investors planned to spend on replacing their motors over the life of the project. The follow-up project baseline has been calculated as the baseline investments expected in the follow-on project over the period of 2003-5, with follow-on projects expected in the district heating sector (15 projects), water utility (11), chemical industry (2) and coal industry (6).*

The baseline costs were indeed calculated by estimating what investors planned to spend over the project lifetime on motors (both during the “pilot” and “follow-on” phases). These estimates were developed using information provided directly by the investors during discussions with the project development team. These discussions were held with investors responding to the initial questionnaire.

It is important to note that – contrary to the reviewer’s assumption – motor replacement was not named as a business as usual scenario by any investor during discussions. Instead, investors mentioned standard maintenance and rewinding for existing motors. The business as usual measures varied from investor to investor. In addition, while some (but not all) of the investors expected to install controls, all of those planning to do so said that they would select the controls with the cheapest up-front cost, not necessarily those with the greatest lifetime savings.

## ANNEX D – TENTATIVE DESIGN PARAMETERS FOR THE REVOLVING FUND

Prior experience with other UNDP-GEF projects in the region suggests that designing a fund during the course of a project makes sense when the fund capital is relatively small (under \$2 million), the fund forms one component among several in a project, and the fund will not start at the inception of the project. This preparatory period can provide several advantages: 1) The team can study possible operators and prepare tender documentation that will allow the fund to be operated in the most cost-effective way; 2) The team can explore the possibility of cost-sharing with the host government (e.g. the government accepts the capital as an earmarked equity contribution to an existing fund, eliminating many of the operating costs); and 3) The team can integrate its experiences in the demonstration projects to improve disbursement schedules and payment strategies; and 4) The team can adapt to changes in the institutional environment over the course of the project (e.g. government restructuring, appearance of additional commercial banks with interest in operations, etc.).

However, the project team has already begun to consider the design of the fund and the options concerning its operation. The following is a preliminary overview of this work:

*Operations:* The operator of the fund could be one of several organizations, including the following two options:

1. Domestic environmental fund. UNDP-GEF is pursuing this option in Slovenia, for example, under its biomass energy project.
2. A state agency such as KAPE, the proposed implementing agency. State agencies operate similar types of funds in other countries in the region; e.g. Belarus.

Allowing for the design of the fund during the course of the project would allow the project team to negotiate the most favorable operating costs.

*Financial Operations:* The financial operator of the fund could also be one of several stakeholders:

1. A commercial bank
2. A domestic environmental fund
3. Another government agency
4. An enterprise promotion fund

Identification and locking into a partnership with an organization will not be done before a tender for financial operation of the fund has been prepared. By allowing for a competitive tender to operate the fund, the team can lower its administrative costs substantially.

*Capital:* Capital in the fund would amount to the money repaid from the demonstration projects dispersed over a period of time to be agreed upon. The length of the loans offered will depend partly upon the experiences gained during the first year of operation of the project, when the team can monitor payback rates and actual energy and financial savings.

*Duration:* The duration of the fund is anticipated to last through the end of the project or until the capital has been expended or the market met. The project team will hold meetings with the Government of Poland during the final two quarters of the project to determine the subsequent use of the funds. The project document for this project will specify UNDP's intent that the funds



be used for similar purposes following the conclusion of the UNDP-GEF project. This document will serve as official legal notice of this intent.

*Type of Support:* The type of support could consist of one or more of the following options:

1. Interest-free credit (of which a part transforms into contingent grant under certain conditions)
2. A credit at competitive rates compared to the commercial loan.

The project team will study the portfolio of the Ekofundusz (Polish Ekofund) to determine lessons learned in financial appraisal and project financing.

*Work Plan for Fund Operation:*

1. Call for tenders (conditions, data sheets), dissemination
2. Reception of applications
3. Completion of documents
4. Acceptance of applications
5. Formal evaluation of applications/applicants
6. Technical evaluation
7. Financial-economical evaluation / credit analysis
8. Proposal to the Appraisal Committee
9. Decision on support (at periodic meetings; schedule to be determined)
10. Notification of degree of support
11. Transfer of interest-free credit
12. Monitoring
13. Repayment

## ANNEX E – LETTER OF ENDORSEMENT



**Ministry of Foreign Affairs  
of the Republic of Poland**  
Department for United Nations  
Economic and Social Affairs  
Aleja Szucha 23, 00-580 Warszawa, Poland  
Tel.: (4822) 5239407, fax (4822) 5239197  
DESONZ/4448-5/99

Warsaw, 15 February 2001

Dear Mr. Asenjo,

In my capacity as GEF Political Focal Point I would like to endorse project proposal entitled "Polish Energy Efficient Motor Program" (PEMP).

The objective of the project is to increase use of energy efficient motors and variable speed drivers, particularly in the manufacturing industry, energy sector, utility industry and mining. The project aims at overcoming the existing barriers in order to increase market penetration of energy efficient motors in Poland. In this way project will induce the reduction of domestic greenhouse gas emissions. The project will contribute to meeting Poland's commitments under the UN Framework Convention on Climate Change and the Kyoto Protocol.

The project proposal has been developed by the Polish Energy Efficiency Foundation and Polish National Energy Conservation Agency, which cooperated with the manufacturers of energy efficient motors and ensured their financial involvement in the project as well as the participation of the Polish environmental funds. However, the available resources are not sufficient to close the financial package and therefore the external assistance is necessary.

The project is consistent with the national environmental policy. Therefore, the project enjoys full support from the Polish authorities.

Yours sincerely,

Wojciech Ponikiewski  
GEF Political Focal Point

Mr. Rafael Asenjo  
Executive Coordinator  
UNDP GEF  
fax 212 906 66 9

Mr. Marc Destanne de Bernis  
Resident Representative  
UNDP, Warsaw

## **OPTIONAL ANNEXES**

Annex F.	Letters of interest
Annex G.	Data sheets demonstration projects
Annex H.	Results of the survey on barriers

**UNDP-GEF Response to Review by the GEF Secretariat for  
Poland Efficient Motors Project (PEMP)**

January 30, 2002

GEF Secretariat Comments	Responses
<b>Program and Policy Conformity (pg 4-5): Project Design</b>	
<p>“The Brief describes the financial barrier in terms of "lack of financial attractiveness" and "too little economic incentives" for EE investments. Please clarify this; if the investments were not inherently financially viable, the project could not be justified.”</p>	<p><b>The paragraph in the Annex on Incremental Cost, referred to on page 4 of the GEF review, has been clarified to be consistent with the description of barriers Sections 1.4 and 2.1 of the project brief, and now reads as follows:</b></p> <p>“A fourth barrier identified is a lack of knowledge about the financial benefits for investment in energy-efficient electric motor systems. Both utilities and industries often fail to perceive the profitability of these investments. The market survey conducted under the preparatory phase of the project, for example, indicated that nearly 40% of motor consumers would not currently be willing to invest in a project that would pay for itself in less than 3 years. While the potential projects targeted under PEMP are profitable, they are unlikely to be pursued in the absence of the proposed project.”</p>
<p>“The project envisages incentive payments to manufacturers for increased production of energy efficient motors/systems. However, the exact nature of these payments remains unclear: what is the basis of their calculation, how is the GEF contribution of \$ 1.619m calculated?”</p>	<p>The incentive mechanism for the manufacturer is intended to influence the manufacturers to produce energy efficient equipment. Financing will be made available to efficient motor manufacturers that are able to meet minimum technical requirement established under PEMP. Participating manufacturers will compete with each other for the right to receive financing and the right to receive a larger share of financing will be given to those manufacturers who are able to provide the greatest savings, in terms of projected avoided electricity use, at the lowest overall cost.</p> <p>In order to determine the GEF contribution to the Incentive Programme, the number of motor units that will be sold under the programme were established (see Table 4 of the Project Brief). For each of the three motor classes defined, the cost on a per unit basis was estimated based on the required manufactures’ costs to rebuild their facilities for production of energy efficient motors and offer new products for sale. This additional cost, multiplied by the target EE motor sales, was aggregated for the three motor classes over the four-year period that the Incentive Programme would be operational. The total incentive amount is \$1,594,447 for the incentive and \$24,553 for additional activities required to set-up and operate the Programme.</p>

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	<p><b>The above explanation is provided in section 6.2.1 “Budget Notes” in the revised brief.</b></p>
<p>“The four demonstration projects are receiving a GEF contribution of 30%-60%. The contribution is expected to be paid back if the demonstration was successful, and capitalise a revolving fund. The criteria for "success" are not given in the brief.”</p> <p>24 Jan 2002 Email:  “Repayment of demonstration grants: I would expect that the local EA defines measurable and unambiguous performance indicators for the demonstration investments to be achieved within a certain time. They should measure only performance which can be influenced by the investor, not replication in other sectors.”</p>	<p><b>As now outlined in the section „Objective 2. Demonstrate Efficient Motors under Polish Market Conditions”,</b> the tentative criteria for the success of demonstration projects will be as follows:</p> <ul style="list-style-type: none"> <li>• Investment in similar projects in the same sector (replication)</li> <li>• Repayment of GEF contribution to the demonstration projects (sustainability)</li> <li>• Energy savings as specified in the agreements with the companies</li> <li>• Reduced operating costs as specified in the agreements with the companies</li> <li>• Indirect reduction of CO2 through energy savings (GHG emission mitigation)</li> </ul> <p>The tentative criteria, developed prior to the finalization of the Project Document, will be measurable and unambiguous, with clear milestones (timelines). They will focus on performance related to the investor, and will not be related to replication.</p>
<p>“Further, the revolving fund design is proposed to be undertaken at project end. However, to justify the concept, the design needs to be agreed before project start.”</p> <p>24 Jan 2002 Email:  “I agree that the fund may not be completely designed before starting the project in order to benefit from project experience. Still, GEF funds can only be extended when basic principles are agreed before project start, inter alia, purpose of the fund, type of investment to be</p>	<p><b>The criteria for use of the revolving fund will be finalized by the Project Steering Committee at the end of the GEF project, however, the basic principles of operation will be agreed before the project begin (prior to the submission of the Project Document). Tentative design parameters for the revolving fund are provided in Annex D of the revised Project Brief.</b></p> <p>Prior experience with other UNDP-GEF projects in the region suggests that designing a fund during the course of a project makes sense when the fund capital is relatively small (under \$2 million), the fund forms one component among several in a project, and the fund will not start at the inception of the project. This preparatory period can provide several advantages: 1) The team can study possible operators and prepare tender documentation that will allow the fund to be operated in the most cost-effective way; 2) The team can explore the possibility of cost-sharing with the host government (e.g. the government accepts the capital as an earmarked equity contribution to an existing fund, eliminating many of the operating</p>

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<p>supported, performance targets (these could actually be derived from the performance targets mentioned above). I am sorry that we do not have accepted GEF guidelines on this at the moment. My suggestion is that we agree to treat the issue of "basic principles for revolving fund " as a condition for CEO endorsement."</p>	<p>costs); and 3) The team can integrate its experiences in the demonstration projects to improve disbursement schedules and payment strategies; and 4) The team can adapt to changes in the institutional environment over the course of the project (e.g. government restructuring, appearance of additional commercial banks with interest in operations, etc.).</p> <p>However, the project team has already begun to consider the design of the fund and the options concerning its operation. The following is a preliminary overview of this work:</p> <p><i>Operations:</i> The operator of the fund could be one of several organizations, including the following two options:</p> <ol style="list-style-type: none"> <li>1. Domestic environmental fund. UNDP-GEF is pursuing this option in Slovenia, for example, under its biomass energy project.</li> <li>2. A state agency such as KAPE, the proposed implementing agency. State agencies operate similar types of funds in other countries in the region; e.g. Belarus.</li> </ol> <p>Allowing for the design of the fund during the course of the project would allow the project team to negotiate the most favorable operating costs.</p> <p><i>Financial Operations:</i> The financial operator of the fund could also be one of several stakeholders:</p> <ol style="list-style-type: none"> <li>1. A commercial bank</li> <li>2. A domestic environmental fund</li> <li>3. Another government agency</li> <li>4. An enterprise promotion fund</li> </ol> <p>Identification and locking into a partnership with an organization will not be done before a tender for financial operation of the fund has been prepared. By allowing for a competitive tender to operate the fund, the team can lower its administrative costs substantially.</p> <p><i>Capital:</i> Capital in the fund would amount to the money repaid from the demonstration projects dispersed over a period of time to be agreed upon. The length of the loans offered will depend partly upon the experiences gained during the first year of operation of the project, when the team can monitor payback rates and actual energy and financial savings.</p> <p><i>Duration:</i> The duration of the fund is anticipated to last through the end of the project or until the capital has been expended or the market met. The project team will hold meetings with the Government of Poland during the final two quarters of the project to</p>

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	<p>determine the subsequent use of the funds. The project document for this project will specify UNDP's intent that the funds be used for similar purposes following the conclusion of the UNDP-GEF project. This document will serve as official legal notice of this intent.</p> <p><i>Type of Support:</i> The type of support could consist of one or more of the following options:</p> <ol style="list-style-type: none"> <li>1. Interest-free credit (of which a part transforms into contingent grant under certain conditions)</li> <li>2. A credit at competitive rates compared to the commercial loan. The project team will study the portfolio of the Ekofundusz (Polish Ekofund) to determine lessons learned in financial appraisal and project financing.</li> </ol> <p><i>Work Plan for Fund Operation:</i></p> <ol style="list-style-type: none"> <li>1. Call for tenders (conditions, data sheets), dissemination</li> <li>2. Reception of applications</li> <li>3. Completion of documents</li> <li>4. Acceptance of applications</li> <li>5. Formal evaluation of applications/applicants</li> <li>6. Technical evaluation</li> <li>7. Financial-economical evaluation / credit analysis</li> <li>8. Proposal to the Appraisal Committee</li> <li>9. Decision on support (at periodic meetings; schedule to be determined)</li> <li>10. Notification of degree of support</li> <li>11. Transfer of interest-free credit</li> <li>12. Monitoring</li> <li>13. Repayment</li> </ol>
<p>"The project suggests labelling and standardisation to support market transformation. This appears very helpful. Are the budgets for advertisement on the labels and standards appropriate (\$ 0.1m)?"</p>	<p>The budget for the labeling is \$55,000 and \$60,000 for awareness activities, which were calculated as being adequate to support the envisaged activities.</p>
<b>Replicability (page 6):</b>	
<p>"It might be useful to identify replication activities which are "hidden" at the moment under other activities like training, information</p>	<p>Replication activities, which may appear hidden, <b>are summarized in a brief, distinct section – Section 4.3 --</b> of the project document as per the reviewer's recommendation. Currently, all activities under the project contain an element of replication. For example, the PEMP Centre will focus on disseminating information on</p>

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campaigns etc.”	efficiency motor systems in order to encourage all potential end-users – not merely those participating directly in the competition or demonstration projects – to incorporate the project ideas into their industrial operations.
<b>Financing (pg 7-8): Financing Plan</b>	
“UNDP proposes to hire a project manager to be financed from the project budget. If the PM is to be financed from the project funds, the PM should be hired by the local EA.”	<b>As now noted under Section 4.2 “Sustainability”</b> , the Project Manager will, as noted in the review, be hired by the local implementing agency (i.e. KAPE), according to standard UNDP procedures under NEX operation. If the implementing agency is for any reason unable to conduct an international search and hire process, UNDP Poland will provide support in that area in its role as the GEF Implementing Agency.
Co-financing: “1) "Other Funds" of 0.6m are unspecified”	<b>As now noted under section 6.2.1</b> , co-financing from the environmental funds was assumed at 15% of the value of the proposed project. This is fully within the accordance of the rules of the funds, which can support up to 20% for commercial enterprises. In fact, the Polish Ecofund and the National Fund for Environment were the source of the \$0.6 million mentioned as domestic co-financing. This figure was selected as a very conservative estimate of their potential contribution to the project (their letters of intent are provided in Optional Annexes). They were not cited by name as they have not agreed to contribute a specific amount to the project but are fully expecting to support the demonstration component and follow-on investments through funding for individual applications to the funds.
2) “It is not clear what "buyers' followup on demonstrations" encompasses and how it is calculated”	<p>The number of potential replication projects was based on the number of preliminary application forms received and discussions with the possible beneficiaries. The potential projects were distributed as follows:</p> <p>Heating: 15 additional projects  Water utility: 11 additional projects  Chemical industry: 2 additional projects  Coal mines: 6 additional projects</p> <p><b>The above explanation, and the worksheet with the calculations used for the follow-on financing, is provided in section 6.2.1 “Budget Notes” in the revised brief. The contribution of the buyers is reflected as parallel financing in this project (cover page).</b></p>
3) “The buyers' contribution to	<b>As now included in section 6.2.1</b> , the buyers’ contribution to the



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<p>the market transformation initiative is not clear. What is it including, how is it calculated? Based on the available information, the buyers' contributions may not qualify as co-financing.”</p>	<p>market transformation initiative was calculated as the total amount that buyers would spend on EE motors, up to the target number of motors as outlined in Table 4 of the Project Brief. The total cost of EE motor sales (minus the incentive to the manufacturer) were aggregated for the three motor sizes over the project period at \$7.814M.</p> <p>The justification for including buyers’ contributions to this project is that the funds to be spent on the demonstration of efficient motor systems would <i>not</i> have been spent in this area in the absence of the project. <b>These funds are reflected as parallel financing on the cover page.</b></p>
<b>Implementing Agency Fees</b>	
<p>“Not available”</p>	<p>A request for standard fee was noted on the project cover sheet submitted with the project on 7 January, and this request still stands.</p>
<b>General Comments</b>	
<p>“It would be helpful to have a list of acronyms and definitions”</p>	<p>The list of acronyms was inadvertently omitted from the project brief and <b>has been restored at the beginning of the Project Brief (page iv).</b></p>