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EXECUTIVE COMMITTEE OF
THE MULTILATERAL FUND FOR THE
IMPLEMENTATION OF THE MONTREAL PROTOCOL
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Item 10(b) of the provisional agenda[1]

SUMMARY PAPER ON THE CASE STUDIES IN REVOLVING FUNDS ON ENERGY EFFICIENCY (DECISION 95/87(i))

Introduction

1. At its 95th meeting, the Executive Committee decided to establish a funding window of US $40 million for two energy-efficiency end-user projects using a revolving fund modality and *inter alia* requested the Secretariat to work with implementing agencies experienced in revolving funds on energy efficiency to gather examples and lessons learned. Furthermore, the Secretariat was to illustrate the expected benefits of Multilateral Fund contributions to both existing and new funds and present a summary paper at the 96th meeting (decision 95/87(i)).

2. In response to the decision, the Secretariat consulted financial and subject matter experts experienced in revolving funds or equivalent mechanisms on energy efficiency. Based on these consultations, this document was prepared to present five case studies on revolving funds. The case studies present information from relevant reports shared by the experts and available in the public domain.

[1] UNEP/OzL.Pro/ExCom/96/1

Country: Armenia

Agency: World Bank (with GEF funding)		Implementation period: Three years and three months
Funding: US $10.66 million (with US $1.82 million from GEF)	Target audience: Public sector buildings	Status: Completed

Background and objective

3. The Energy Sector Strategy and the Sustainable Development Program of the Government of Armenia recognized the challenges relating to the energy supply gap, threatened energy security and unaffordable energy tariffs, and implemented a project with support from the Global Environment Facility (GEF) to reduce energy consumption in public sector buildings.

Brief description of the project

4. Funds available for energy efficiency in public facilities amounted to US $8.7 million.[2] These funds were used mainly to finance building infrastructure, and to make improvements such as replacing equipment like boilers and heating systems, mercury vapor lamps, etc., that would result in lower energy consumption. The project funding support was available to social and other public facilities, e.g., schools, kindergartens, hospitals, administrative buildings, and street lighting. The public facilities were selected based on simple and specific performance criteria. The clients benefited from improved comfort, lighting and general conditions within their facilities, financial (budgetary) savings and a positive impact resulting from lower energy use and reduced CO_2 emissions.

5. The funding followed the energy service agreement (ESA) modality. Under the ESA, a full package of services was offered to identify, finance, procure, implement and monitor energy-efficiency projects for clients. The project was designed to develop, test and disseminate replicable and sustainable models of energy-efficiency service provision using ESAs. The clients were asked to pay what they were paying for energy at that time, i.e., baseline energy costs; from this, the fund recovered the new (lower) energy payments, investment costs and associated fees until the end of the contract period. This allowed the clients to maintain a constant cash flow while retaining their energy cost savings for the duration of the ESA. Net present value (NPV)-based procurement had the benefit of encouraging bidders to be innovative in their technical solutions while maximizing the energy-efficiency benefits per dollar invested, as it in factored both investment cost and energy savings. The repaid funds were earmarked to finance future energy-efficiency investments. The average energy savings generated by the project was 50.9 per cent and the payback period ranged from 2.6 to 8.8 years.

6. The project included a technical assistance component that helped remove existing barriers to realizing energy-efficiency potential. The component primarily financed the capacity building of different actors (e.g., banks, construction firms, energy service companies (ESCOs)); project pipeline development support, policy development support for energy efficiency, which was an integral part of project performance and the national energy efficiency policy; and project management, including monitoring, reporting and financial audits. During the final supervision mission for the project, the updated operations manual for the next three to five years was developed to support the sustainability of the business model.

Project performance and impact

7. While the project identified an initial subproject pipeline during appraisal, implementation was delayed by administrative factors. Once the initial subprojects were disseminated, combined with increasing awareness about energy efficiency and increased energy tariffs, demand for energy-efficiency investments

[2] US $1.76 million was in addition to this for technical assistance relating to the project.

grew and the project was ultimately able to surpass its objective indicator targets for project development and even surpassed its original investment target.

8. The key indicators linked to the project development objective versus the global environmental objective were energy savings (in kWh) and CO_2 emission reductions (in CO_2-equivalent (CO_2-eq) tonnes) in the retrofitted social facilities and other public facilities through energy-efficiency investments. The project resulted in energy savings of 540.24 million kWh which translated into emission reductions of 145,739 CO_2-eq tonnes. In addition, the project resulted in an improved energy-efficiency policy and regulatory framework; the development of an energy-efficiency market and industry; improved energy-efficiency capacity in the industry and satisfied end users; and the evolution of the financing entity in the area of commercial financing of energy-efficiency-related programmes.

Country: Uzbekistan

Agency: World Bank		Implementation period: June 2022–December 2028
Funding: US $143 million	Target: Public sector buildings	Status: Ongoing

Background and objective

9. Uzbekistan's long-term development goal is to become an industrialized upper-middle-income country by 2030. The approach of the Government of Uzbekistan to achieve this goal is to continue the transition toward a more market-oriented economy. It is in this context that the Government is implementing significant reforms in the energy sector.

10. The buildings sector is responsible for the largest share of total final energy consumption, most of which is for space heating. This constitutes about 50 per cent of the country's total energy consumption. About 85 per cent of the 53 million m^2 of public buildings are in the health care and education sectors. Studies done by UNDP and the World Bank found that implementing standard energy-efficiency measures, including building-envelope measures, heating and cooling systems, water heating, pumps/fans, and lighting, could potentially generate cost-effective normative energy savings in schools and hospitals ranging from 35 to 45 per cent.

11. The proposed project was designed with the main objectives of developing, adopting, and enforcing regulations to promote and facilitate clean-energy applications in the buildings sector, by developing and implementing clean-energy financing approaches that do not only rely on government financing but also mobilize private sector financing including revolving financing mechanisms. The proposed project was also designed to strengthen government institutions and enhance coordination among them, to monitor overall program implementation and track progress toward policy goals, to provide capacity building, and to develop stakeholder experience in clean-energy investments in the buildings sector.

Brief description of the project

12. Revolving financing schemes have proven effective in promoting energy-efficiency initiatives. Investments under the project are proposed to focus on public buildings given the high social and energy-efficiency impact of those buildings. The proposed project will be implemented using energy service agreements (ESAs); under the ESA, the Project Management Company, hired by the Ministry of Energy/Fund,[3] will provide a full set of services for clean-energy improvements at the beneficiary facility, and the beneficiary will pay for such services over the payback period of the investments primarily using energy-cost savings. The World Bank will lend funds to the Government through the Ministry of Finance, which will channel the funds on to the Fund under a subsidiary agreement. The Fund will implement the project through the Project Management Company under a project management contract. The repayments from the project will be reinvested in new energy-efficiency projects. The payback period will vary depending upon project specifics and is estimated to range from eight to 13 years. The effectiveness of these programmes is expected to encourage private-sector participation in energy-efficiency and clean-energy investments. Further, this project is expected to build on the results of other projects implemented by other agencies.

13. The project also includes technical assistance and capacity building to enhance the enabling environment for clean-energy investments in the buildings sector, to support market development, and to provide project implementation support.

[3] The fund is established under the Ministry of Energy; this fund will be used for receiving funds and transferring them for project investment purposes. The fund will also receive repayment from the beneficiary.

14. The line ministries (e.g., Ministry of Health, Ministry of Public Education) will be responsible for nominating facilities to participate under the project. They will also participate in the evaluation of bidding documents (through the procurement committee) and provide strategic and operational guidance through the project steering committee. Social facilities under the line ministries will be responsible for repayments to the Fund according to the ESA.

Performance indicators

15. The main project performance indicators are: projected lifetime energy savings from energy-efficiency investments in public buildings (megajoules); renewable energy generation capacity constructed under the project (megawatts); and clean energy secondary legislation (for energy audits, building energy performance, and energy service contracts) adopted under the project.

Country: Thailand

Agency: Government of Thailand		Implementation period: 2003–2011
Funding: US $235 million (in 5 phases)	Target: Multiple clients	Status: Completed

Background and objective

16. The Thai Energy Efficiency Revolving Fund (EERF) began operations in 2003 as part of the framework of the Energy Conservation Program and was established to address key barriers within the Thai financial sector to stimulate lending for energy-efficiency measures. To kick-start the EERF, the Fund's initial capital was provided by the Government of Thailand. Originally, the EERF was launched for a pilot period of three years, from 2003–2005, as a partnership between Government and originally six participating banks. The initial pilot phase has been replicated in additional phases via lines of credit allocated for ten-year periods.

17. The guiding principle of the EERF was to stimulate and leverage commercial lending by providing initial capital. Government involvement was kept to a minimum and procedures were simplified to further engage the banking community. For this project, an Energy Efficiency Market Assessment study was conducted in cooperation with commercial banks and served as the basis for the planning and design of the EERF. The study suggested an initial fund of THB 1 to 2 billion (about US $30 to 60 million). The design of the EERF was also influenced by the Industrial Finance Corporation of Thailand (IFCT), which specializes in providing banking services to industrial customers. The IFCT suggested that the Department of Alternative Energy Development and Efficiency (DEDE) develop a simplified loan programme to operate under the Energy Conservation Program Act for promoting energy-efficiency in the industrial sector.

Brief description of the project

18. The general flow of the EERF consisted of the DEDE allocating a budget to the participating banks which they used for on-lending to clients to implement energy-efficiency and renewable-energy projects. Once mature, the interest earned on these investments flowed back to the participating bank, and was used to pay back the DEDE for its original budget allocation. The EERF provided credit lines in the range of US $2.5 million to US $10 million to each participating bank to finance energy-efficiency projects. Specific loan eligibility criteria and items that would be considered ineligible through the revolving fund were identified and used for on-lending by the banks. For the financial assessment, the participating banks analyzed applicants and based their loan decisions on their regular lending criteria, wherein they applied asset-based lending assessments. Thus, loan applications were assessed by the participating bank based on capacity to repay as well as offered collateral. The banks were responsible for the monitoring of loans issued as they were the party on-lending to the client. Routine monitoring usually took place every two to three months with the borrower. During the period of implementation, a total of 294 loans were financed through this facility. The loan tenor specified seven years for repayment of the loan while the participating banks had a shorter repayment tenor.

Performance indicators and impact

19. The energy-efficiency gains achieved through the project as of February 2012 amounted to 1,170.66 million kWh/year, which translated to 0.98 million CO_2-eq tonnes. In addition to achieving energy-efficiency gains, key features/achievements of the EERF project were to stimulate the investment appetite of commercial banks in Thailand so that they would engage in financing energy-efficiency projects, and to create networks of private financiers and ESCOs. The factors that contributed to the success of the EERF were: making the procedures for accessing funds as simple as possible; making the conditions and

interest rates attractive for potential applications; promoting the EERF among the Thai banks that started getting more interested as a result of the project and its visible gains; and communication between key stakeholders including private financers, technical experts and ESCOs.

Country: Lebanon

Agency: Central Bank of Lebanon		Implementation period: 2010–2019
Funding: US $126 million (funded by EIB and AFD)	Target: Multiple	Status: Not available

Background

20. National Energy Efficiency and Renewable Energy Action (NEEREA) was created to increase the share of renewable energy in electricity production, to reduce greenhouse gas (GHG) emissions, to promote energy-efficiency investments and to support sustainable financing mechanisms for Lebanon's private sector. The proposed project is a national financing mechanism initiated by the Central Bank of Lebanon (BDL) in 2010 to support renewable energy and energy-efficiency projects. It provides long-term, low-interest loans to individuals, small and medium-sized enterprises (SMEs), and corporations as well as subsidies to encourage sustainable green investments.[4] This mechanism was supported through financing from the European Investment Bank (EIB) with a grant of €12 million (US $13.65 million), and from the Agence Française de Développement (AFD) with its contribution of €90 million (US $102.4 million) in credit lines to sustain NEEREA.

Funding process and capacity building

21. The operationalization of this financial mechanism was done through the Central Bank of Lebanon (BDL), which provided long-term loans for a tenor of 15 years to commercial banks at 1 per cent interest. The BDL also provided the commercial banks with the option of releasing part of the legal reserve to add additional sustainable funds for financing energy-efficiency and low-GHG-emissions technology (e.g., renewable energy sources for energy generation). This was under the continuous monitoring and audit of commercial banks by the BDL.

22. The commercial banks can deploy the loan from BDL in the form of soft loans to end users benefitting from long-term repayments of up to 10 years at a preferential interest rate; this makes it attractive for the borrowers to invest in energy-efficiency and low-GHG-emissions technology. The loans given to the commercial banks by the BDL were repaid over a period of 14 years.

23. The Ministry of Energy and Water sets energy policies and supports their implementation; the Ministry of Finance has the responsibility of overseeing financial regulations. Further, the Lebanese Centre for Energy Conservation (LCEC) conducted technical assessments and feasibility studies of energy-efficiency and renewable-energy investments. UNDP offered technical support, capacity building, and awareness campaigns to BDL and the financial sector.

Performance indicators

24. As of June 2020, more than 1,000 projects had been approved by the NEEREA financing mechanism for total funding in the amount of more than US $600 million. Estimated energy savings from these projects collectively amounted to US $73 million, reducing energy consumption by approximately 260 million kWh and lowering CO_2 emissions by 281,245 tonnes.[5]

25. The main success factors relating to this project are: strong partnerships between the Government, private sector, UNDP, LCEC, commercial banks and international donors; co-financing by beneficiaries of up to 30 per cent (varying among banks) of the investment costs, which enhanced their commitment and

[4] https://tony-kaldany.squarespace.com/s/lebanon_neerea_web.pdf
[5] https://lcec.org.lb/our-work/partners/NEEREA?utm_source

enlarged the aggregated value of the total investments; well-structured financial incentives from the BDL that resulted in encouraging the participation of commercial banks and end users; technical validation by LCEC to ensure project feasibility; continuous support from development institutions (e.g., EU, UNDP, EIB, AFD) including support for the technical and operational capacity building of banking personnel; and the BDL's monitoring of commercial banks' performance in this program.

26. The project faced challenges mainly relating to macroeconomic and political instability in Lebanon and the ongoing financial difficulties within Lebanon's banking sector, which have persisted since 2019. To address these challenges, there is a need to have appropriate risk-mitigation instruments structured into such project financing.

Country: Ukraine (Credit Guarantee)

Agency: UNIDO with GEF funding		Implementation period: October 2013–December 2025
Funding: US $5.55 million (GEF funding)	Target: Industrial enterprises	Status: Ongoing

Background

27. The main objective of this project was to improve energy management in Ukrainian industry by promoting the widespread implementation of energy management systems (EnMS) that comply with international energy management system standard ISO 5000. The GEF funding support for this project was US $5.55 million with co-financing of US $34 million. This project was implemented by UNIDO with the State Agency on Energy Efficiency and Energy Savings, and the Ministry of Economy Development and Trade as the executing partner.

28. The project included three components, namely: policy and institutional support for the introduction of a national energy management system (EnMS) standard corresponding to ISO 50001; building national capacity for the planning, implementation and certification of EnMS and energy system optimization (ESO); and technology diffusion and deployment to promote the implementation of energy management systems in selected industrial sectors. The technology diffusion component used a revolving fund to support technical assistance for the development of EnMS, energy efficiency and ESO projects to promote and support increased investments by industrial companies.

Funding process and capacity building

29. A detailed analysis of financing options led to the recommendation that a "portfolio-based deposit Loan Guarantee Fund (LGF*[6])" be established to develop the revolving-fund support. This LGF can provide the collateral that companies are unable to present to meet the "risk coverage" required by the banks; and reduce the cost of financing through a guarantee, especially in the form of a deposit, which makes it possible to reduce the cost of capital/financing and consequently lower interest rates for the issued loans. The service contract regulating the guarantee fund specifies information on borrowing terms and conditions, including the guarantee-related conditions. Through this revolving mechanism, once the loan given to the beneficiary is repaid, the equivalent guarantee value is released for a new borrower.

30. The target companies include industrial enterprises that have gone through the project's training and capacity-building support on EnMS/ESO, other industrial enterprises that meet the defined criteria and SMEs and large companies. The loans under this project have been used for the implementation of EnMS (in line with ISO 50001:2018), including third-party certification, energy-system optimization projects (fans, pumps, compressed-air, steam, etc.) and other IEE measures (if EnMS is already in place).

31. The interest rates on these loans with the guarantee, which is valid for about 18 months, results in an interest rate reduction from 25 per cent to 16.5 to 18 per cent.

Performance indicators

32. It is estimated that the project represents 3,305 GWh in direct savings over 10 years; this translates to 580,000 CO_2-eq tonnes of savings over a 10-year timeframe.

[6] LGF is a type of mechanism that covers most of the risks of providing loans in the identified sector. This mechanism is most applicable in countries with vulnerable financial systems and when the perception of the financial risks in the identified sector is in the development stage.