



Report Number: ICRR0024373

## 1. Project Data

**Project ID**  
P118737

**Project Name**  
ENERGY EFF - INDUST ENTERPRISES

**Country**  
Uzbekistan

**Practice Area(Lead)**  
Energy & Extractives

**L/C/TF Number(s)**  
IBRD-88260,IDA-47450,IDA-52410,IDA\_  
52410,IDA\_-47450

**Closing Date (Original)**  
31-Jan-2016

**Total Project Cost (USD)**  
303,991,300.49

**Bank Approval Date**  
17-Jun-2010

**Closing Date (Actual)**  
31-Jan-2018

|                     | <b>IBRD/IDA (USD)</b> | <b>Grants (USD)</b> |
|---------------------|-----------------------|---------------------|
| Original Commitment | 25,000,000.00         | 0.00                |
| Revised Commitment  | 124,197,527.45        | 0.00                |
| Actual              | 108,693,236.04        | 0.00                |

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**Group**  
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**Project ID**  
P133633

**Project Name**  
Additonal Financing Energy Efficiency ( P133633 )

**L/C/TF Number(s)**

**Closing Date (Original)**

**Total Project Cost (USD)**  
0

**Bank Approval Date**

**Closing Date (Actual)**



26-Apr-2013

|                     | IBRD/IDA (USD) | Grants (USD) |
|---------------------|----------------|--------------|
| Original Commitment | 0.00           | 0.00         |
| Revised Commitment  | 0.00           | 0.00         |
| Actual              | 0.00           | 0.00         |

**Project ID**  
P165054

**Project Name**  
UZEEF3 ( P165054 )

**L/C/TF Number(s)**

**Closing Date (Original)**

**Total Project Cost (USD)**  
0

**Bank Approval Date**  
30-Jan-2018

**Closing Date (Actual)**

|                     | IBRD/IDA (USD) | Grants (USD) |
|---------------------|----------------|--------------|
| Original Commitment | 0.00           | 0.00         |
| Revised Commitment  | 0.00           | 0.00         |
| Actual              | 0.00           | 0.00         |

## 2. Project Objectives and Components

### a. Objectives

The Original Project Development Objective (PDO) was “to improve energy efficiency in Industrial Enterprises by designing and establishing a financing mechanism for energy saving investments.” (Project Agreement, page 5). The PDO was stated identically in the Project Appraisal Document (PAD) (PAD, page x).

The PDO was not revised.

For the purposes of this ICR review, the objective will not be broken into parts but will be assessed as one PDO.



**b. Were the project objectives/key associated outcome targets revised during implementation?**

Yes

**Did the Board approve the revised objectives/key associated outcome targets?**

Yes

**Date of Board Approval**

30-Oct-2018

**c. Will a split evaluation be undertaken?**

No

**d. Components**

**1. Original components**

**Component A Development of Energy Efficiency (EE) Capacity (appraisal cost: US\$1.0 million; actual cost: US\$0.82 million)** aimed to: (i) assist the Ministry of Energy (MoE) in developing an EE strategy for Industrial Enterprises (IEs) that would enable an effective scale-up of EE implementation in the IEs; (ii) improve capacity in preparing and implementing EE projects in IEs; (iii) develop EE communication strategy for industry; and (iv) finance Project management.

**Component B Credit Line to Participating Banks (PBs) (appraisal cost: US\$24.0 million; actual cost: US\$303.18 million)** was to provide a credit line, via the Ministry of Finance (MoF), to three pre-vetted PBs – state-owned banks Asaka and Uzpromstroy, and a private bank Hamkor - for on-lending to IEs for EE investments, with US\$8 million allocated to each PB. PBs' loan approval processes would be reviewed and verified by the World Bank (WB). Sub-borrowers were large state-owned enterprises (SOEs) in such sectors as metals, mining, chemicals, oil and gas, electricity, and construction materials. Key conditions included: (i) a limit of US\$3.0 million per sub-borrower, and US\$10 million for a group of affiliated IEs; (ii) PBs co-financing of 20 percent of sub-loans, and IEs contributing 20 percent of total investment cost; and (iii) PBs could not have ownership in sub-borrower IEs, while IEs could not hold more than 1 percent of PB shares.

**Revised Components:**

During the two additional financings (AFs), conditions for Component B financing were revised, and the list of PBs and types of IEs expanded. The Original Project, AF1, and AF2 effectively formed three phases of Project implementation.

**AF1 (April 3, 2013):**

- Project activities and related results framework (RF) indicator targets were scaled up.
- Credit lines for PBs increased from US\$8.0 million to US\$10.0 million.
- The limits were increased: (i) IE loan limit from US\$3.0 million to US\$10 million, and for a group of affiliated companies from US\$10 million to US\$30 million; (ii) PBs' ownership in sub-borrower IEs from zero to 10 percent; and (iii) IEs' ownership of PB shares from one percent to 10 percent.

**AF2 (January 30, 2018):**



- Project activities and related RF indicator targets were further scaled up.
- Three additional PBs joined: a state-owned bank National Bank for Foreign Economic Activity of the Republic of Uzbekistan (NBU), and private banks Invest Finance (InFin) Bank and Asia Alliance Bank (AAB).
- The selection of IEs expanded from large SOEs to include large private companies and small and medium enterprises (SMEs), mostly private, in metals, food, non-metallic mineral products, rubber and plastic products, and textiles.
- PBs' co-financing increased from 20 percent to 25 percent of the sub-loan.

**e. Comments on Project Cost, Financing, Borrower Contribution, and Dates**

**Project Cost:** The appraisal estimate was US\$25.0 million. AF1, approved in April 2013, provided US\$100.0 million, and AF2, approved in January 2018, provided US\$200.0 million. Thus, the total funding amounted to US\$325.0 million, with actual disbursement at closure recorded as US\$303.4 million. The discrepancy is due to: (i) the cancellation of US\$11.8 million, not used by the PBs and refunded to the WB; and (ii) exchange rate fluctuations between the Special Drawing Rights (SDR), the currency in which the Project was denominated, and the US dollar.

**Project Financing:** The Project was financed through an International Development Association (IDA) credit at appraisal (appraisal estimate: US\$25.0 million, disbursement at closure US\$24.20 million), an IDA credit at AF1 (appraisal estimate: US\$100.0 million, disbursement at closure US\$87.27 million), and an IBRD loan at AF2 (appraisal estimate: US\$200.0 million, disbursement at closure US\$192.49 million at closure).

**Borrower/Recipient contribution:** There was no Borrower's contribution.

**Co-financing.** There was a commercial co-financing requirement to PBs and IEs. At appraisal, PBs were expected to contribute 20 percent of the sub-loans, while sub-borrower IEs were to contribute 20 percent of the total investment costs. The PB's contribution requirement increased to 25 percent at AF2. This co-financing was estimated at US\$13.0 million at appraisal and at US\$201.0 million at AF2 (ICR, page 29). At closure, total commercial co-financing amounted to US\$393.4 million (ICR, page 13).

**Project Dates:** The Original Project was approved on June 17, 2010, and became effective on December 15, 2011. The mid-term review (MTR) was on November 24, 2015. The original closing date was January 31, 2016, which was the date of actual closing of the Original Project, with the ICRR for this Project issued on May 2, 2018. Two additional financings (AF) effectively constituted phases 2 and 3 of implementation and had separate closing dates. AF1's original closing date of January 31, 2018, was extended once, by 60 months (five years), to January 31, 2023 (actual closing), to align with the AF2 closing. AF2's original closing date of January 31, 2023 was extended twice by a total of 16 months, with the actual closing taking place on May 31, 2024.

**Restructurings:**

**Restructuring 1** (AF1, April 3, 2013) involved a US\$100.0 million AF, an increased credit limit per PB, and eased conditions for Component B financing (see section "Revised Components" above).



**Restructuring 2** (January 18, 2018) extended AF1's closing from January 31, 2018, to January 31, 2023, to align with AF2's planned closing (see Restructuring 3).

**Restructuring 3** (AF2, January 30, 2018) involved a US\$200.0 million AF, expanded the list of PBs and types of IEs (to include SMEs), and increased PBs' co-financing requirement (see section "Revised Components" above). In addition, new intermediate results indicators (IRIs) were added to the RF, to monitor co-financing by PBs, the Energy Management System adoption, and the sub-lending to SMEs.

**Restructuring 4** (October 4, 2022) added a new PB, reallocated proceeds from the PBs no longer participating in the Project to remaining PBs, changed the PBs' co-financing requirement from 25 percent per sub-loan to 25 percent of the PB's portfolio in the Project, and extended AF2's closing from January 31, 2023, to January 31, 2024, to allow time to disburse reallocated funding.

**Restructuring 5** (February 1, 2024) extended AF2's closing from January 31, 2024, to May 31, 2024.

**Split evaluation.** A split evaluation is not necessary, as there was no decrease in the Project's scope. AF1 and AF2 expanded the Project's scope and raised the RF targets. Therefore, Project efficacy will be assessed based on the RF targets as of Restructuring 3 (AF2, January 2018).

### 3. Relevance of Objectives

#### Rationale

**Country and Sector Context.** At Project appraisal in 2010, Uzbekistan had one of the most energy- and carbon-intensive economies globally, with energy use per unit of GDP (at purchasing power parity (PPP)) 1.6 times the Eurasian average, twice that of Kazakhstan, and nearly four times higher than Germany's; and carbon intensity (CO<sub>2</sub> emissions to GDP) twice the Eurasian average and over three times the Organization for Economic Co-operation and Development (OECD) average (ICR, page 1, Original source: International Energy Agency (IEA); Eurasia comprising the five Central Asian countries, the three countries in the Caucasus, and Russia). This was largely due to outdated infrastructure and inefficient industrial processes and equipment. The economy was dominated by highly subsidized state-owned enterprises (SOEs), responsible for a significant portion of energy over-consumption. Reducing energy demand, particularly by replacing outdated equipment in industry, was key to increasing productivity and competitiveness. In response, the government prioritized energy conservation in industrial enterprises (IEs), as reflected in the 2009 President's Resolution "Program Measures to Support Enterprises" (ICR, page 1). To support the government's EE objectives, the Project aimed to develop a sustainable financing mechanism for industrial energy efficiency (EE) by providing concessional credit lines to banks for on-lending to large industrial SOEs for equipment modernization.

**Relevance to Government Strategies during implementation and at closure.** At closure, the Project was aligned with the *Development Strategy of New Uzbekistan 2020–2026*, which aimed for a 20 percent increase in EE of the economy by 2026; and the *Green Economy Transition Strategy for 2019–2030*, targeting a 20 percent improvement in industrial EE. It was also aligned with the country's 2021 Nationally Determined Contributions (NDC), which committed to a 35 percent reduction in GHG emissions per GDP from 2010 levels, up from the 10 percent reduction target set in 2017.



**Relevance to the WBG’s Assistance Strategies during implementation and at closure.** During implementation, the Project was aligned with the Uzbekistan Country Partnership Framework (CPF) FY16-FY20, specifically its Public Service Delivery pillar, Objective 4, focused on promoting energy security and reducing energy intensity. At closure, the Project was also aligned with the CPF FY22–26, specifically High-Level Objective “Improve Livelihoods and Resilience through Greener Growth”, Goal 1 “Decarbonization and the greener development of industry and the economy”. The 2022 Second Systematic Country Diagnostic for Uzbekistan emphasized addressing energy inefficiency, and the 2023 Uzbekistan Country Climate and Development Report highlighted EE as key to carbon neutrality by 2060.

**Previous sector experience and related projects.** The Project was the World Bank’s first energy sector operation in Uzbekistan, drawing on experiences of similar World Bank-supported credit lines in Türkiye, China, and Croatia, including launching pilot projects to create a scalable, sustainable business model. The Project’s experience informed the design of the Scaling Up Energy Efficiency in Europe and Central Asia Program, which uses the Multiphase Programmatic Approach, building on the Project’s successful implementation across three phases.

The Project was well-aligned with the WBG’s CPF at closure, and the government’s objectives of improved EE in the economy, particularly in industry. It was informed by similar operations in other client countries, and the objectives were pitched at the right level considering country’s commitment and capacity.

## Rating

High

## 4. Achievement of Objectives (Efficacy)

### OBJECTIVE 1

#### Objective

To improve energy efficiency in industrial enterprises by designing and establishing a financing mechanism for energy saving investments.

#### Rationale

The Project’s theory of change (ToC) was not included in the PAD but was prepared for the ICR (ICR, pages 2). It outlined “Activities”, “Outputs”, “PDO outcomes”, and “Long-term outcomes”, presenting clear logical links across the results chain. According to the ToC, the Project supported the following activities: (i) providing EE credit lines to PBs for on-lending to IEs; (ii) project implementation support; (iii) technical assistance to PBs and IEs and (iv) developing strategic EE documents and contributing to draft laws and regulations. The outputs of these activities would be: (i) disbursed funds to PBs, IEs, and SMEs, as well as co-financing by IEs; (ii) an operational Project Coordinating Unit (PCU); and (iii) an EE communication strategy, an EE strategy for IEs, increased EE awareness, and improved legal framework for EE. These outputs would ultimately result in the PDO outcome of establishing a financing mechanism for energy-saving investments in



EE. The critical assumptions were strong government support for the EE agenda and growing interest in energy savings among IEs.

The ICR's ToC effectively illustrated the logic of Project implementation, clearly showing the chain of causality: how, through what processes, the implementation of Project activities would lead to achieving the PDO outcome, with well-defined critical assumptions.

### **Outputs/Intermediate Outcomes:**

1. "Number of beneficiary IEs" (baseline: zero; target: 70 IEs). The achievement at closure was 101 IEs; the target was exceeded.
2. "EE Strategy for IEs, Yes/No". The strategy was completed; the target was reached.
3. "Establishment and Operation of the PCU, Yes/No". The PCU was established; the target was reached.
4. "EE Communication Strategy, Yes/No". The strategy was completed; the target was reached.
5. "Co-financing amount by participating banks, US\$ mn" (baseline: zero; target: US\$96.0 million). The achievement at closure was US\$148.7 million; the target was exceeded.
6. "Amount of sub-loans to SMEs, US\$ mn" (baseline: zero; target: US\$30.0 million). The achievement at closure was US\$66.3 million; the target was exceeded.
7. "SMEs' satisfaction with their engagement in the development of subprojects, %" (baseline: zero; target: 80 percent). The achievement at closure was 59 percent; the target was 73.8 percent achieved (substantially achieved). This indicator was based on a satisfaction survey from December 2023, where SMEs' managers were asked about their satisfaction. The results were: 59 percent were "highly satisfied", 11 percent were "overall satisfied", and 30 percent were less satisfied, mainly due to an increase in the banks' interest rates (Restructuring paper 3, page 27; ICR, page 19).
8. "Number of IEs which adopted Energy Management System" (baseline: zero; target: 50 IEs). The achievement at closure was 40 IEs; the target was 80.0 percent achieved (substantially achieved). The installation of the Energy Management System was an integral part of sub-projects, enabling IEs to manage energy consumption using tools that monitored, analyzed, and controlled energy consumption in the IE.

### **PDO Outcomes:**

1. "Leveraged EE investments, US\$ mn" (baseline: zero; target: US\$201.0 million). The achievement at closure was US\$384.6 million; the target was exceeded. This indicator measured leveraged EE investments by PBs through co-financing of sub-loans and by IEs through own direct EE co-financing (ICR, page 75).

The ICR noted the target was nearly doubled due to (i) incentives from the energy tariff reforms, and (ii) increased awareness of EE by PBs and IEs during Project implementation. (ICR, page 22)



2. "Energy savings, MWh" (baseline: zero; target: US\$613,000 MWh). The achievement at closure was 3,442,000 MWh; the target was significantly exceeded. This indicator measured reduced electricity and natural gas consumption (ICR, page 75).

The ICR noted that the target was exceeded more than five times due to (i) underestimated energy savings potential (including the technologies available at appraisal), particularly in heavy industry targeted by the Original Project and AF1; and (ii) conservative Project risk estimates at appraisal. (ICR, pages 9, 22-23)

3. "CO2 emission reduction, tons CO2" (baseline: zero; target: 1,269,000 tons CO2). The achievement at closure was 2,949,692 tons CO2; the target was significantly exceeded.

The ICR noted the target was exceeded more than twice, mainly due to (i) unexpected level of CO2 reduction from addressing natural gas leakage in the gas transmission system; and (ii) conservative CO2 reduction estimates. (ICR, page 23)

**Achievement of Project's PDO and sustainability of Outcomes.** The Project was expected to improve EE in IEs by designing and piloting an EE financing mechanism and incentivizing a scale-up to ensure sustainability. Efficacy was assessed mainly using the PDO indicators, which are directly linked to the PDO and adequate. The financing mechanism pilot achieved significant energy and emissions savings in the sub-projects, exceeding the expectations. The scale-up (outcome sustainability) was already happening prior to Project closure: both PBs and IEs were independently financing EE (as measured by leveraged EE investments). Additionally, the Project was supported by policy development and capacity building activities, which were successfully implemented. At the same time, the Energy Management Systems were not as widely adopted by IEs as expected, and the SMEs' satisfaction with subproject development was slightly below expectations, though progress was substantial. However, these two outputs/intermediate outcomes have lower importance for PDO achievement than other discussed results.

The ICR pointed out that the sustainability of Project outcomes was demonstrated by PBs and IEs embracing EE, driven by capacity building (Component A) and experience with the EE financing mechanism (Component B). PBs continued financing EE subprojects using own resources and repayments from Project-financed EE investments, with some even incorporating energy savings assessments in non-EE lending, thus mainstreaming EE. IEs gained skills in identifying EE opportunities, estimating potential, preparing bidding documents, and evaluating bids, leading to higher-than-expected demand for EE under Component B. A 2023 client satisfaction survey showed that 89 percent of IEs supported EE technologies. The Project-supported legal and regulatory framework for EE was recognized as valuable, encouraging the Government to further develop its EE policy. (ICR, page 8)

**Rating.** The Project exceeded all three PDO targets (leveraged EE investments, energy savings from EE, and CO2 emission reduction). It also reached or exceeded most output/intermediate outcome targets (on policy development, and the number of beneficiary IEs and sub-loans to SMEs), except for two, which were nevertheless substantially met at 80 percent and 74 percent. These measured the adoption of the Energy Management system by IEs and the SMEs' satisfaction with subproject development. Accordingly, the rating is Substantial.

## Rating





Substantial

## OVERALL EFFICACY

### Rationale

The Project improved EE in participating IEs by developing and piloting an EE financing mechanism and incentivizing a scale-up to ensure sustainability. The financing mechanism pilot achieved significant energy savings and CO2 emissions reduction in the sub-projects, exceeding the expectations. The scale-up was also achieved: both PBs and IEs were independently financing EE by Project closure. Additionally, the Project was supported by policy development and capacity building activities, which were successfully implemented. At the same time, the Energy Management Systems were not as widely adopted by IEs as expected, and the SMEs' satisfaction with subproject development was slightly below expectations as well. Accordingly, the overall efficacy is rated as Substantial.

### Overall Efficacy Rating

Substantial

## 5. Efficiency

### a. Economic Analysis:

Economic analysis focused on Component B sub-projects and was conducted five times: ex-ante at appraisal, AF1, and AF2; and ex-post at interim review (of January 2018) and closure. Since specific sub-projects were unknown upfront (due to the nature of the Project), the ex-ante analyses used representative sub-projects, while ex-post analyses assessed the implemented ones. Key benefits included reduced power/gas consumption, improved equipment efficiency, and savings in maintenance and repair costs. The non-energy savings were not included, making the estimates conservative. The costs covered energy saving equipment, installation, and, in some cases, connection to power grid or gas/heat sources. All analyses except the one at closure used a 12-percent discount rate, while a 6.6 percent rate was applied at closure. The time horizon was 15 or 20 years. The results were as follows:

- **Ex-ante.** At appraisal, the EIRRs were 36.8 and 44.8 percent (PAD, pages 77-83). The A1 results yielded EIRRs from 15.6 to 21.7 percent (AF1 Restructuring Paper, page 8). At AF2, the EIRRs ranged from 17.1 to 18.1 percent (RP, pages 15-16). The NPVs were positive.
- **Ex-post.** The interim ICR's results showed EIRRs ranging from 15.5 to 35.0 percent. (Interim ICR, pages 17-18, 42-50) At closure, the overall EIRR for the Project was 13.9 percent. (ICR, page 34-36)

The appraisal EIRRs were significantly higher than those at all other time points, while the results at A1, A2, interim ICR, and closure were similar. This difference is mainly due to the increased Project costs following the switch to a free-floating currency exchange regime on September 5, 2017, and the subsequent two-fold drop in the value of the Uzbekistani Som against the US dollar, which made imports more expensive. When recalculating the closure results for the comparable subprojects using the appraisal exchange rate, the EIRRs at



closure were higher than at appraisal. Additionally, comparisons across the five time points are complicated by the shift in sub-projects' selection, from large SOEs in the original Project to later including large private companies and private SMEs, where returns tend to be lower.

Overall, the EIRRs at all five points (appraisal, AF1, AF2, interim ICR, and closure) exceeded the opportunity cost (discount rate) (both the 12 percent used at appraisal and AFs and the 6.6 percent used at closure). While the EIRR is lower at closure than at approval, recalculating the closure result using the appraisal exchange rate reverses this outcome.

#### **b. Administrative Efficiency:**

The project closed within budget, demonstrating that the costs were under control, while all planned activities were implemented. The ICR noted that the Bank team closely supervised the Project, engaging regularly with the PCU and PBs and maintaining a dialogue with the government. Emerging risks, challenges, and opportunities were addressed in AF-1 and AF-2 design. The three-phase implementation of this innovative Project required hands-on supervision, high level technical expertise, pro-active monitoring of the activities, and continuous close communication with the client. The team was able to accomplish this with minor deviation from the deadlines.

Client satisfaction was generally high, as evidenced by beneficiary surveys and the absence of complaints through the grievance system. Despite frequent Project management changes, with seven Task Team Leaders during implementation, transitions were smooth.

However, there were some administrative inefficiencies, including delays. The Original Project became effective only 18 months after approval due to disagreements between the Bank and the government on selecting IEs - with the Bank advocating for the inclusion of private SMEs and the government preferring to limit selection to large SOEs. In the Original Project, minor delays (not affecting Project closing date) also resulted from prolonged government registration and clearance. Additionally, until the switch to a floating exchange regime in September 2017, frequent delays in obtaining MoF approvals for currency conversion caused sub-loan repayment delays by IEs. However, this was a short-lived issue, resolved following the September 2017 exchange rate policy. The ICR noted that PBs' capacity could have been further strengthened to better guide sub-borrowers. Also, procurement delays affected sub-project implementation. The 16-month extension of the Project timeline was mainly due to the need to reallocate financing across new PBs. (ICR, pages 4, 14, 15, 18, and 19)

Overall, the EIRRs exceeded the opportunity cost of capital, NPVs were positive, the Project closed within the budget while including all planned activities, and was supervised closely, with technical competence and continuous coordination with the government. The 16-month implementation delay should be viewed in the light of two large AFs, which constituted phases 2 and 3 of implementation, widening the Project's scope and deepening its impact. Accordingly, the Project's efficiency is rated as Substantial.

#### **Efficiency Rating**

Substantial



a. If available, enter the Economic Rate of Return (ERR) and/or Financial Rate of Return (FRR) at appraisal and the re-estimated value at evaluation:

|              | Rate Available? | Point value (%) | *Coverage/Scope (%)                              |
|--------------|-----------------|-----------------|--|
| Appraisal    | ✓               | 36.80           | 96.00<br><input type="checkbox"/> Not Applicable |
| ICR Estimate | ✓               | 13.90           | 99.00<br><input type="checkbox"/> Not Applicable |

\* Refers to percent of total project cost for which ERR/FRR was calculated.

## 6. Outcome

The relevance of objectives is rated as High, the efficacy is Substantial, and the efficiency is Substantial. Thus, the Overall Outcome is rated as Satisfactory.

a. **Outcome Rating**  
Satisfactory

## 7. Risk to Development Outcome

**Ownership.** The Project relied on strong government commitment to reducing industrial energy intensity. However, to scale up Project achievements to a broader range of industrial and non-industrial beneficiaries, support from other stakeholders – such as private enterprises, the public sector, and households – is essential. Key risks include financial disincentives, low awareness of EE nature and benefits, and unfamiliarity with innovative energy-saving equipment.

- **Financial disincentives.** Ongoing energy price subsidies discourage investment in EE, and tariff reforms have been slow. However, the government is addressing this, with plans to reduce energy subsidies significantly by 2027, including an electricity tariff increase in April 2025.
- **Low EE awareness** has been a barrier to scaling up EE, but the Project has successfully addressed this through capacity building and demonstrating benefits via sub-project implementation. There is confidence that these efforts will be continued after Project closure.
- **Behavior change.** Unfamiliarity with innovative energy-saving equipment poses a higher barrier to scaling up EE outside the industrial sector, including in residential sector. Targeted training and awareness programs would be needed to help users understand and adopt new practices.

**Capacity of PBs and sub-borrowers in financing and implementing EE projects.** This risk, noted at Project appraisal, remains at closure. Scaling up to other sectors and involving new banks and sub-borrowers requires capacity building. Banks need to develop mechanisms for selecting and appraising EE sub-projects, while sub-borrowers must be equipped to estimate their EE potential, prepare bidding documents, and adequately monitor energy and CO2 savings, among other skills. However, the Project successfully demonstrated EE potential to the PBs, and they began financing EE sub-projects using their



own resources before Project closure. This shows that the model introduced by the Project is viable beyond the Project's scope.

## 8. Assessment of Bank Performance

### a. Quality-at-Entry

The Project's design was robust, addressing identified risks effectively. It was informed by consultations with the government, other stakeholders, analytical work, and lessons from similar Bank operations in other countries. Risk identification was thorough, and mitigation measures were integrated in the design. The implementation arrangements were rigorous, with Project Implementation Units (PIUs) in each PB, and a Project Coordinating Unit (PCU) overseeing overall implementation and capacity building of PBs, IEs, and other stakeholders. (ICR, pages 8, 16, and 18)

However, there were shortcomings, specifically: (i) the IE selection approach was not finalized prior to Project approval, causing an 18-month gap between approval and effectiveness due to lengthy negotiations with the government on inclusion of SMEs as sub-borrowers and ; (ii) subproject monitoring lacked pre- and post-investment energy audits, complicating the measurement of the PDO indicator for energy savings; and (iii) the RF initially lacked targets for two key indicators - energy savings and CO2 emission reduction - until they were added at AF1. (ICR, pages 16-18)

### Quality-at-Entry Rating

Moderately Satisfactory

### b. Quality of supervision

Supervision proceeded smoothly, supported by the Bank team's close oversight and strong government commitment. The adoption of the EE strategy and relevant EE policies facilitated implementation, and clear implementation arrangements, including the division of roles and responsibilities, helped to maintain progress. The approach was flexible, adapting the Project to evolving needs and government requests. Supervision missions were conducted regularly - initially annually, then bi-annually after AF1 approval, to strengthen operational advice and technical support. Implementation Status and Results Reports (ISRs) were candid and prepared on time. Overall, 22 ISRs were filed based on missions conducted over the 13-year life of the Project. Financial management, procurement, and contract administration were generally of good quality (ICR, page 13-15).

The shortcoming included some implementation delays and insufficient focus on M&E issues. While the overall closure was delayed by 16 months, this was mainly due to an AF2 extension for reallocating financing across PBs to enhance effectiveness. Additionally, while there were procurement, registration, and currency exchange delays, the team mitigated these issues efficiently, and they did not result in closing date extensions. At the same time, addressing M&E issues earlier would have further improved



implementation, including through: (i) strengthening monitoring of energy savings and CO2 emissions reduction; (ii) better technical analysis to set realistic PDO indicator targets during AF1 and AF2; and (iii) PB capacity building to guide sub-borrowers on M&E, especially on methodologies for calculating EE savings and CO2 reductions. (ICR, pages 14, 18-19)

Overall, the supervision was effective, with proactive measures to address challenges and strong coordination with the government.

### **Quality of Supervision Rating**

Satisfactory

### **Overall Bank Performance Rating**

Moderately Satisfactory

## **9. M&E Design, Implementation, & Utilization**

### **a. M&E Design**

The RF design had clear strengths, including sound PDO indicators directly linked to the PDO and ToC. These indicators measured expected outcomes via leveraged investments, energy savings, and CO2 reduction, thus demonstrating that the Project-supported financing mechanism improved EE of IEs, as intended. All PDO indicators were specific, measurable, time-bound, attributable to the Project, and quantitative.

However, there were some deficiencies concerning the PAD's intermediate results indicators (IRIs), as follows:

- While the IRIs for technical assistance (TA) under Component A were well-defined and monitored, the IRIs for tracking progress with establishing the financing mechanism (Component B) were neither reported in any ISRs, AFs, or the interim ICRR, nor formally dropped during restructurings. These indicators, which were specific, measurable, and linked to the PDO outcomes, included: "Outstanding loan portfolio of PBs", by PB; "Portfolio quality" (non-performing loans); and "Financial sustainability" (of PBs). The ICR noted issues with providing monitoring guidelines to the PCU, PBs, and IEs, and with M&E capacity building in PBs to guide sub-borrowers. These IRI, while technically sound, were inadequate given the implementation capacity, and this issue was not sufficiently mitigated through capacity building.
- The targets for three of the four quantitative RF indicators in the PAD were not set at design.

In addition, as noticed above, subproject monitoring lacked pre- and post-investment energy audits, complicating the measurement of the PDO indicator for energy savings. However, the RF included indicators that were sufficient to monitor the achievement of Project's outcomes, therefore the above noted deficiencies did not affect the assessment of efficacy.



## b. M&E Implementation

The ICR reported that M&E implementation was adequate. PBs provided relevant data to the PCU, which prepared semiannual progress reports and handled financial management (FM) reporting. Subproject data were reviewed by the World Bank team during regular project supervision missions and used for random site visits to verify compliance. IEs monitored energy savings either by comparing metered energy consumption pre- and post-investment or by calculating consumption based on the new equipment's capacity and operating hours. PBs closely tracked subproject implementation and financial performance, with no repayment issues or defaults. The collected and verified data were transferred to the PCU for aggregation. Data verification procedures were thorough and involved the World Bank technical team. (ICR, page 16)

The deficiencies in the RF design were corrected as follows: (i) at AF 1, the three missing targets for major RF indicators in the PAD were defined; and (ii) at AF2, the PAD's IRIs for Component B were replaced.

However, the new IRIs, introduced at AF2, did not provide an adequate replacement of the original ones, as they only measured specific inputs or outputs without tracking progress of activities and outputs towards achieving the PDO outcomes. This is a minor deficiency because the outcomes were adequately tracked by the PDO indicators.

Separately, there were also minor inconsistencies in reporting, which have been identified and corrected (ICR, page 17).

## c. M&E Utilization

The ICR reported that M&E utilization was fully adequate. The M&E findings and data were effectively utilized throughout Project implementation to inform discussions on the Project's progress and critical decisions, including closing date extensions, indicator revisions, restructurings, and AFs. Key M&E data were instrumental in evaluating the Bank's value-added. (ICR, page 17)

Overall, the M&E quality is rated as Modest.

### M&E Quality Rating

Modest

## 10. Other Issues

### a. Safeguards

**Environmental and Social Safeguards.** At appraisal, the Project was classified as Environmental Category "Financial Intermediary Assessment" (FI) and triggered Environmental Assessment (OP/BP 4.01) due to the potential works in sub-projects. PBs were required to ensure that sub-projects did not involve involuntary resettlement or land acquisition and that the Environmental Assessment Framework and EMPs were included in Project Reports. The ICR reported that sub-projects complied with national environmental regulations, including preparing Environmental Impact Assessments (EIAs), obtaining necessary approvals



and permits, and meeting environmental emissions and waste disposal requirements during equipment installation and operation (ICR, page 17). The overall safeguard rating was consistently Satisfactory in the last four years of implementation. The grievance mechanism was established, but there were no complaints. The ICR noted that dissemination of the grievance mechanism from the PBs to the IEs could have been improved (ICR, page 18).

**b. Fiduciary Compliance**

**Financial management (FM).** The ICR reported that the FM arrangements were regularly reviewed by the World Bank FM team during implementation and were found Satisfactory in both the PCU and all PBs. Bi-annual financial reports were submitted on time, reviewed, and deemed acceptable. Audited financial statements were submitted on time, with unmodified opinions indicating that the financial statements were presented fairly, in all material respects, in accordance with the applicable financial reporting framework. The FM rating was consistently Satisfactory in the last four years of implementation. (ICR, page 18)

**Procurement.** The ICR noted that while procurement was generally adequate, delays occurred due to the requirement for International Competitive Bidding for subprojects over US\$2.0 million, which involved time-consuming preparation of bidding documents and obtaining endorsements from the Inter-Ministerial Tender Committee. However, starting in 2016, the new Procurement Framework stipulated that the World Bank Procurement Regulations applied only to procurement by the PCU/Borrower under Component A and not to the sub-projects under Component B, which considerably facilitated implementation. Procurement performance was consistently Satisfactory in the last four years of implementation.

**c. Unintended impacts (Positive or Negative)**

NA

**d. Other**

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**11. Ratings**

| Ratings          | ICR                     | IEG                     | Reason for Disagreements/Comment |
|------------------|-------------------------|-------------------------|----------------------------------|
| Outcome          | Satisfactory            | Satisfactory            |                                  |
| Bank Performance | Moderately Satisfactory | Moderately Satisfactory |                                  |
| Quality of M&E   | Modest                  | Modest                  |                                  |



Quality of ICR

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Substantial

## 12. Lessons

The following lessons were derived from the ICR (ICR, pages 20-21):

**1. Policy support and government commitment are critical for projects introducing innovative, transformational EE initiatives.** In the reviewed Project, conducive Presidential and Government Decrees and resolutions, such as Government Decrees PP-2343, provided incentives and guidance for IEs to implement EE measures, creating demand and removing technical barriers for EE investment. This experience demonstrated that innovative EE investments, when combined with policy dialogue, technical assistance, and the development of legal and regulatory framework, can lead to transformative impact.

**2. Adequate monitoring of EE investment projects that use credit lines to banks and sub-lending to enterprises requires well-defined M&E procedures and related significant capacity building for banks and sub-borrowers.** In the reviewed Project, PBs had incentives to monitor financial performance of the sub-projects but not energy savings, which was the Project's main outcome indicator. Missed opportunities included: (i) unclear M&E responsibilities for all parties; (ii) lack of clear guidelines for PBs and IEs on measuring energy savings (including via pre- and post-investment energy audits); (iii) insufficient monitoring by the PCU of sub-project implementation, sub-project reporting quality, and energy audits; and (iv) inadequate capacity building on energy savings verification for the PCU and PBs. Apart from energy savings' M&E issues, tracking IE's co-financing and some other outcomes was also insufficiently guided. Better M&E procedures to measure and verify inputs and outcomes of EE investments would have enhanced Project efficiency and outcomes.

**3. Customized capacity building for banks and sub-borrowers is critical for EE investment projects that use credit lines to banks and sub-lending to enterprises.** In the reviewed Project, opportunities to maximize EE potential through capacity building was missed, such as (i) enhancing PBs' capacity in marketing, pipeline development, safeguards reviewing, screening, and reporting; (ii) implementing targeted capacity building for IEs; and (iii) conducting energy audits for selected companies to provide best practice examples to other market players. The Project would have benefited from allocating a portion of the loan for essential TA activities identified during Project preparation.

## 13. Assessment Recommended?

No

## 14. Comments on Quality of ICR

The ICR is based on robust evidence and provides abundant technical details and data to illustrate all aspects of Project implementation. It conveys the Project's value-added, implementation context, and performance





factors. It discusses various aspects of Project implementation, including relevance of objectives, efficacy, economic analysis, M&E quality, and safeguard and fiduciary compliance. Main conclusions are reliable, and lessons learned are supported by evidence and analysis, reflecting specific Project experiences.

The ICR would have benefitted from a more clear and succinct presentation, with better structured and summarized information, significantly reduced details and data, eliminated repetitions, and highlighted main points and conclusions, which often are hidden in the middle of paragraphs. Some sections are hard to understand for these reasons, especially the economic analysis section. Also, there is no administrative efficiency subsection, and no risks are pointed out in the “Risk to Development Outcome” section, while they are clear from sections on efficacy, key factors, M&E, Bank performance, and lessons learned.

Despite these minor limitations, the ICR provides sufficient information and analysis to draw meaningful conclusions about the Project. On balance, its overall quality is rated as Substantial.

**a. Quality of ICR Rating**  
Substantial