Document of the Inter-American Development Bank

**Paraguay**

**Promoting Private Sector Investments in Energy Efficiency in the Industrial Sector in Paraguay**

**(PR-L1146)**

**Monitoring and Evaluation Plan**

**Contents**

I. Introduction 3

A. General Framework 3

B. Scheme for Implementation and Monitoring 5

II. Monitoring 6

A. Indicators 6

B. Data collection and Instruments 8

C. Reporting of monitoring results 9

D. Coordination, workplan and budget for monitoring 9

III. Ex-Post Evaluation 10

A. Main Question(s) 10

B. Existing Knowledge 11

C. Evaluation methodology 14

D. Reporting of evaluation results 16

E. Complementary evaluation 16

F. Coordination, workplan and budget for evaluation 17

1. Introduction
	* + 1. A. General Framework
	1. The following document presents the proposed monitoring and evaluation plan for the program Promoting Private Sector Investments in Energy Efficiency in the Industrial Sector in Paraguay (the “program”). The general objective of the program is to promote energy efficiency (EE) investments by SMEs in Paraguay, improving their productivity in the long-term. The specific objectives are:
2. to increase access to medium and long-term finance for EE investment projects by SMEs
3. to reduce greenhouse gas (GHG) emissions, supporting the achievement of the country’s climate change goals
	1. As described in the Proposal for Operation Development (POD), one particular type of investment that is relevant to SMEs is associated to the implementation of EE measures, which can have a significant impact in the firm’s energy consumption, contributing toward reducing company expenses and increasing productivity and competitiveness[[1]](#footnote-2). However, EE investments in Paraguay are hindered by credit constraints, which in the case of SMEs are heightened by extra collateral requirements, lack of credit history and documentation, and high transaction costs that translate into high interest rates. EE technologies involve high up-front costs and long payback periods[[2]](#footnote-3), and there is usually very little information on the performance of new equipment and availability of reliable service for its installation, operation and maintenance. As a result, firms lack the capacity to develop bankable business plans and Local Financial Intermediation Institutions (IFIs) use traditional asset-based lending (future cash flows generated by the project are not included in the risk analysis), limiting financial flows to these investments[[3]](#footnote-4).
	2. In this context, unlocking Paraguay’s full EE potential requires a well‑designed financial strategy that coordinates all relevant actors (including government institutions, technology and service providers, IFIs and SMEs) to incentivize private investment. The problem that the program intends to address is the lack of adequate financing for SMEs operating in energy-consuming industrial sub‑sectors in Paraguay, where a significant potential for implementing EE measures has been identified[[4]](#footnote-5).
	3. By increasing access by SMEs to medium and long‑term financing, the program will enable the development of increased investment in EE in the short to medium term[[5]](#footnote-6). In the longer term, with the effective implementation of a diversified portfolio of subprojects, the program aims to encourage a transformation in SME industrial practices, by demonstrating EE economic and financial viability for the private sector, while further reducing consumption of non-sustainable biomass and avoiding GHG emissions and forest degradation. Also, the financial intermediation design of the program aims to generate a demonstration effect with IFIs that can contribute to transforming the local climate finance market in the long-term
	4. The program consists of a global credit loan operation of US$40 million under a single component to be executed by *Agencia Financiera de Desarrollo* (AFD), development bank of Paraguay. AFD will use Green Climate Fund (GCF)[[6]](#footnote-7) reimbursable resources, channeled by the IDB, along with its own resources to provide long-term finance via its network of accredited IFIs, which will on-lend funds to EE projects by SMEs[[7]](#footnote-8) through second tier sub-loans. Additional US$3 million non‑reimbursable resources from the GCF will be used for technical cooperation (TC) activities (PR-T1249) to: (i) reduce SMEs and IFI perceived risks associated to EE investments; (ii) support SMEs and technology providers in developing bankable sub-projects; and (iii) promote energy policy enabling environment for EE investments.
	5. Sub-loans will be provided to end borrowers through AFD accredited IFIs[[8]](#footnote-9), seeking to encourage their participation in financing these investments in the future. Subprojects to be financed will be deemed eligible based on conditions established in the operating regulations (OR), to be agreed between IDB and AFD, consistent with AFD’s operational policies and with IDB policies and procedures, including legal, financial, environmental, social and technical requirements for each individual subproject, following local norms and legislation. Although the program does not preestablish specific amounts to be allocated for each type of sub project (by subsector or technology), it is expected that the majority of the resources (around 85%) will be used in efficiency measures in equipment without changing the energy source (mainly firewood) while the remaining funds (15%) will go to modernization by technologies involving substitution of biomass energy source with electricity. From a demand perspective, appetite for investing in EE is determined not only by the cost of energy, but also by potential productivity gains that SMEs expect to obtain from these technological changes.
	6. Owing to the highly concessional terms of GCF resources, the program shall provide a financial instrument that is adequate to the characteristics of the projects. By using GCF resources, AFD will increase its ability to provide a longer tenor consistent with eligible projects’ costs, risks and cash flow profile, as well as the expected returns to make these ventures successful[[9]](#footnote-10).
	7. The program will use US$20 million reimbursable resources from the GCF, co‑financed with a local counterpart of US$20 million from AFD. AFD will use GCF resources to diversify and lengthen its funding sources, blending them with its own resources to better respond to the financing needs of eligible firms. The total amount of program resources will be channeled to end borrowers (SMEs investing in EE projects)[[10]](#footnote-11) by AFD through its network of accredited first-tier IFIs.
	8. The purpose of this document is to present the Monitoring and Evaluation Plan (M&EP) of the Promoting Private Sector Investments in Energy Efficiency in the Industrial Sector in Paraguay program (PR-L1146).
		* 1. B. Scheme for Implementation and Monitoring
	9. The borrower and Executing Agency (EA) of the program will be AFD. AFD is a second-tier bank that promotes economic development and job creation. It is Paraguay’s only channel for public financing (from or guaranteed by the government) to first-tier IFIs, cooperatives and other financial entities created by law[[11]](#footnote-12). AFD will implement the program under its current organizational structure and will be responsible for supervising the adequate use of program financial resources and for ensuring the timely provision of human and technical resources, as well as the necessary administrative and control mechanisms, to provide and maintain a transparent and effective administration of the program.
	10. All specific norms related to execution of the program will be established in the OR of the program[[12]](#footnote-13). This includes specific procedures, conditions and requirements for individual projects to access resources from the program, including: (i) eligibility criteria for accessing the sub-loans; (ii) disbursement mechanisms; (iii) eligibility criteria for the participating IFIs; and (iv) monitoring and evaluation requirements. An agreement between AFD and each eligible project will provide the precise terms and conditions (i.e. maturity, rates and costs for the end borrower) of the financing, which will depend on the characteristics of the project, its internal rate of return and its risk profile.
	11. **Sub-project portfolio supervision.** As executor of the program, it is AFD’s responsibility to ensure that each end borrower is eligible for funding from the program in accordance with the program’s eligibility criteria, as defined in the OR. Monitoring of portfolios of sub-projects undertaken by IFIs will be held by the IDB in connection to disbursements for eligible expenditures presented by AFD. In coordination with AFD, the IDB may schedule supervision visits to IFIs or sub‑borrowers to verify compliance with contractual conditions of the program with regards to the use of funds.
	12. **Record keeping.** All operations presented to the IDB to be recognized under each disbursement from the program, including all required information for monitoring at the sub-project level, must be properly identified in AFD’s reporting systems. Records of the sub-loans shall be registered in AFD’s accounting systems and consistent with their corresponding loan agreements. These records should be accessible to the IDB and should allow for identifying financial conditions of each transaction (e.g. currency, maturity, interest rates), the value of the contract, loan proceeds, program funds balances and default rates, if necessary.
	13. **Financial statements and expenses of the program** will be audited annually by an independent auditing firm acceptable to the IDB. Annual audited reports will be presented to the Bank within 120 days after the end of AFD’s fiscal year, and the final audit will be presented to the bank 120 days after the date of last disbursement.
	14. A specific account shall be set up or designated by AFD for the transfer of funds following requests for disbursements. This will facilitate the control of financial transactions and the preparation of reports of financial progress.
	15. The program will be executed under a sole component, using US$20 million from GCF’s reimbursable resources and co-financed with an additional US$20 million from AFD, for a total program funding of US$40 million. Table 1.1 indicates costs by output for the proposed program.
	16. Also, Non‑audited Financial Reports for the IDB to report to GCF, based on existing financial information concerning the service of the loan agreement, including confirmation from AFD to the GCF, that: (i) appropriate concessionality is applied to the IFIs and SMEs, (ii) a ratio of 1 : 1 of loan financing from GCF and AFD for the portfolio of Sub-Loans is maintained, and (iii) the use of resources available in the Revolving Account is in compliance with the OR. The first un‑audited Financial Reports will be prepared within six (6) months after the end of the year in which the first repayment of principal was made. Second and subsequent Annual Unaudited Financial Reports from the IDB to GCF, will be prepared annually, not later than June 30 of each calendar year. The end of Project un‑audited Financial Reporting Period will be twenty (20) years as of the effectiveness of the loan agreement \*

**Table 1.1.- Costs of the program by expected output**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Output/Costs | Y1 | Y2 | Y3 | Y4 | Y5 | Total |
| 1. EE credit line used (US$ million) | 1.7 | 3.4 | 9.7 | 12.6 | 12.6 | **40** |
| Costs Output 1 (US$ million) | 1.7 | 3.4 | 9.7 | 12.6 | 12.6 | **40** |
| Total Program Financing | 1.7 | 3.4 | 9.7 | 12.6 | 12.6 | **40** |

1. Monitoring
	* + 1. A. Indicators
		1. The proposed monitoring plan intends to follow up the gradual implementation of the program in order to quantify actual achievements in relation to the proposed targets for each year, evaluate outcomes and, if necessary, identify and recommend corrective actions. The indicators to be monitored will be those included in the Results Matrix, which also serves as the base for the Progress Monitoring Report (PMR). Table 2.1 summarizes these indicators and includes information on the source and frequency of collection and reporting process.

**Table 2.1: Monitoring Indicators**

|  |  |  |  |
| --- | --- | --- | --- |
| Indicator | Unit | Frequency of measurement | Description / Source of verification |
| Energy efficiency (EE) credit line used | Millions of US$ | Annually and Final Program Report | Indicator measures the annual usage of the credit line as established by the program. Annual projections consider that the line is fully operational and ready to use in Y1.**Source:** Annual report on program execution by AFD. |
| Small and medium enterprises (SME) that finance EE projects with funds from the program | Number | Annually and Final Program Report | Measures number of eligible EE projects implemented by SMEs and on operation (includes all subsectors and technologies)Source: Annual report on program execution by AFD. |
| Financing from third parties mobilized by the program | Millions of US$ | Annually and Final Program Report | Includes all sources of financing other than the program (debt or equity). Target estimate based on the average total investment required per project and a 90/10 debt to equity ratio. Real values will be monitored and validated with information provided by AFD in periodical reports, which will include detail on sources of financing per individual project.Source: Annual report on program execution by AFD. |
| Average maturity of sub loans  | Years | Annually and Final Program Report | Measures the length of the amortization period for the portfolio of sub projects financed in order to compare with alternative financing sources available (market average and/or AFD financing without program resources).Source: Annual report on program execution by AFD |
| Average annual energy savings from sub projects financed by the program | toe | Annually and Final Program Report | Final target was estimated based on an average consumption of beneficiary firms and efficiency ratios of EE systems installed. As sources may include electricity and firewood, energy measures (consumption and savings) are standardized by using tons of oil equivalent (toe) as unit.*Energy cost savings = energy consumed by beneficiary firms \* [1 – (efficiency of system installed – efficiency of original system)]*Source: Annual report on program execution by AFD. |
| Average annual greenhouse gas (GHG) emissions reductions from sub projects financed by the program | TM CO2e | Annually and Final Program Report | Indicator is based on the CO2e emissions avoided by EE energy savings produced in sub projects financed. Final target was estimated based on envisaged EE savings. Conversion factors from: (i) default emission factor for stationary combustion of wood/wood waste in manufacturing industries and construction from the [2006 IPCC Guidelines for National Greenhouse Gas Inventories](http://www.ipcc-nggip.iges.or.jp/public/2006gl/pdf/2_Volume2/V2_2_Ch2_Stationary_Combustion.pdf) (112,000 kg of CO2 per TJ); and (ii) Latin America’s average conversion factor for electricity (0.188 kg CO2 per kWh) from the [List of international emission conversion factors for electricity](https://ig-tools.com/files/CF_for_IG_Tools.pdf).*GHG emissions = energy consumption x CO2 emission factor***Source:** Annual report on program execution by AFD and conversion factor from internationally accepted GHG inventory guidelines. |

* + 1. The complementary TC program (PR-T1249), to be approved separately (see ¶1.5) envisions a series of activities that will support the effective implementation of the loans produced by this program. Among its activities, it includes support to the development of methodologies for computing energy savings at the sub project level (validation, protocols, formats and monitoring procedures). While these tools are aimed for project developers (ESTP, SMEs) and validators verifying project performance, it is considered that the data resulting from these tools will serve as input for the “Average annual energy cost savings from sub projects financed by the program” indicator. As such, AFD shall have access to this data, to track and compile information related to energy savings at the project level, and calculate the value of the aggregated indicator, periodically. The budget allocated for this activity under the TC is included in the monitoring budget of this program (Table 2.2).
		2. Program preparation activities include the development of an Environmental and Social Management System (ESMS), to be fully integrated in the program’s OR. Risks at the sub‑project level are expected to be low. Nevertheless, the ESMS will provide a framework for the proper assessment, management and monitoring of individual sub-projects and overall portfolio, in accordance with the IDB environmental safeguards policies. The ESMS shall also integrate all applicable local systems and norms (see [Environmental and Social Management System](https://idbg.sharepoint.com/teams/EZ-PR-LON/PR-L1146/_layouts/15/DocIdRedir.aspx?ID=EZSHARE-1067953801-11)).
		3. In relation with this, the loan agreement will include environmental and social considerations as follows: (i) AFD and the IDB will agree on an ESMS to be included in the OR; (ii) AFD will coordinate any inter-institutional arrangements to facilitate the adequate implementation of the ESMS; and (iii) AFD will ensure that all sub projects financed by the program are implemented in full compliance with the requirements of the ESMS. AFD shall include relevant environment and social aspects in the annual implementation reports of the program, in addition to the accounting and results framework requirements.
			1. B. Data collection and Instruments
		4. AFD will collect the required data for monitoring and present annual reports to the IDB. In cases where indicators involve calculations, estimations or projections, the IDB will produce these based on the information provided by AFD in the annual reports. Secondary sources of information (especially international and government agencies publications related to the sector) are also acceptable and will serve to complement required information, as per description of monitoring indicators (see Table 2.1).
		5. AFD own information systems are considered sufficient and appropriate for monitoring the proposed indicators. However, it should be noted that the aforementioned complementary TC (PR-T1249) to be approved in addition to this program, considers among its activities the support for the establishment of an electronic registry system for monitoring and evaluation of projects and program’s results in a more efficient manner. The electronic registry system will enable AFD to collect/index information from sub projects financed and track the amount of investment, the energy savings produced and the resulting GHG emission reductions. Budget allocated for this activity under the TC is included in the monitoring budget of this program (Table 2.2).
		6. IDB monitoring activities will be supported by a multi sector team composed by specialists from IFD/CMF, INE/ENE and CCS/CSD, as well as local assistance from the country office in Paraguay. They will be jointly in charge of following up the execution, monitoring and evaluation of the program. AFD and the IDB will commit to carry out monitoring meetings based on a regular schedule to be agreed upon once the program starts implementation (see Table 2.2).
			1. C. Reporting of monitoring results
		7. The Planning and Finance Department of AFD, will act as project coordination unit. As such, it will be the main channel of communication with the IDB in all matters related to the program, including: (i) coordination and supervision of operational and administrative activities, (ii) monitoring compliance with contractual and reporting commitments; and (iii) coordination of monitoring and supervision visits, including IDB follow up missions related to the program.
		8. **Semi-annual and annual reports** shall be prepared by the AFD and presented to the IDB. Semi-annual reports must provide operational data from the program, at least on disbursements (amounts, dates, co-financing including local counterpart and other sources, when applicable), the corresponding eligible expenses financed, and the remaining amount of funds. Operational data shall be complemented by an assessment on the performance of the program, in particular, with regard to the compliance on the eligibility and concessionality requirements, as established in the OR.
		9. Annual reports must include a more in-depth examination on the performance of the program relating to the results framework (evolution of indicators included in Table 2.1 and any additional tracking requirements at the project and/or program level). This reports shall also include information on the fulfilment of fiduciary obligations (financial information regarding the use of the resources and the state of the program’s account), environmental and social aspects associated to the projects financed (see ¶2.3 and 2.4), as well as gender-related information, as per prior agreement with the IDB.[[13]](#footnote-14) The products envisioned and eligible expenses for this program do not entail considerations on intellectual property.
		10. AFD will deliver annual reports within 60 calendar days after the end of each year of program implementation. Based on valid and accepted conclusions from these reports, the AFD and the IDB could consider making adjustments to the program. The IDB will be entitled to request additional information, if necessary[[14]](#footnote-15).
		11. **Additional monitoring products.** A final report will be presented to the IDB by the AFD up to six months after the last disbursement or the end of the execution period. This report shall contain a summary of the program implementation and all relevant information to assess if objectives of the program and targets for each indicator have been met. Furthermore, lessons learn will be included that should be applied in similar operations. After the 5-year execution of the program, two additional reports are required by the GCF on the use of funds (in year 6 and year 20), which shall include financial information on the loan and AFD’s declaration on: (i) continued use of resources; (ii) fulfilment of OR; and (iii) compliance with concessionality and co-financing requirements by the GCF. These reports are not required to be audited.
			1. D. Coordination, workplan and budget for monitoring
		12. Program resources are to be fully committed and disbursed within five years (60 months) from the effective date of the loan agreement. As explained above, AFD will be responsible for the execution, supervision, technical and administrative coordination of the program and for performing the necessary reporting duties to the IDB. The organizational structure of AFD and IDB’s proven successful experience working with AFD ensure that proper compliance with all tasks and commitments related to this plan can be achieved.
		13. Costs of monitoring activities described in this plan are mainly derived from IDB and AFD staff hours involved in these activities. Resources to cover these costs will come from both institution’s standard operational and administrative budgets associated to IDB and AFD staff participating in the program. In addition, complementary TC resources will further support AFD in establishing an electronic registry system for monitoring and evaluation of projects and program’s results (see ¶2.6) as well as support beneficiary firms in computing energy savings at the sub project level (see ¶2.2). It is estimated that the IDB will dedicate 0,5 FTE (full time employee) per year for program monitoring and AFD will dedicate the equivalent to 1 FTE.

**Table 2.2: Monitoring workplan and budget[[15]](#footnote-16)**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Activity | Y1 | Y2 | Y3 | Y4 | Y5 | Y6 | Responsible[a] | Budget (US$) |
| Coordination meetings and supervision visits[[16]](#footnote-17) | 1 | 2 | 2 | 2 | 2 |  | AFD/IDB | 12,000 |
| Tools for computing energy savings at the sub project level | X | x | x | x |  |  | IDB/Consultants | 347,900 |
| Electronic registry system at AFD for monitoring and evaluation | X | x |  |  |  |  | IDB/Consultants | 89,000 |
| Preparation of annual reports on program execution to IDB | 1 | 1 | 1 | 1 | 1 |  | AFD | 15,000 |
| Preparation of annual reports on program execution to GCF | 1 | 1 | 1 | 1 | 1 |  | IDB | 10,000 |
| Audits |  | 1 | 1 | 1 | 1 |  | AFD/IDB | 30,000 |
| Final reports (for IDB and GCF) |  |  |  |  |  | 1 | AFD | 10,000 |
| Total |  |  |  |  |  |  |  | **513,900** |

[a] All AFD responsibilities in terms of budget are considered to be payable in-kind.

1. Ex-Post Evaluation

* + - 1. A. Main Question(s)
		1. This section includes a proposed plan to evaluate the program after its completion. In particular, and in line with the proposed program objectives, the plan will seek to carry out an analysis that will serve to answer the following questions:
1. *Related to the specific objective (i) to increase access to medium and long-term finance for EE investment projects by SMEs: Have SMEs received medium and long-term finance to support their EE investment projects? Have the supported EE projects been properly implemented? How much additional funding (public and private) was the program able to leverage in the development of projects financed by the program?*
2. *Related to the specific objective (ii) to reduce greenhouse gas (GHG) emissions, supporting the achievement of the country’s climate change goals: Have the projects financed by the program contributed to reduce GHG emissions? What are the energy savings [current and projected] from EE projects financed by the program?*
	* 1. Due to the financial nature of the program, which necessarily involves a non‑random selection of projects (applicants are evaluated by IFIs based of specific criteria and conditions), the use of experimental methodologies is not considered possible (or doing so would involve a level of sophistication and costs that are not considered appropriate for this program), and an ex-post cost benefit analysis has been established as the more effective and convenient approach to be employed. The ex-post analysis of the program will seek to measure the economic results of its implementation with regards to both the size of the induced investment and the benefits of the technologies incorporated to the system. To this end, the ex-post economic analysis will follow the methodology used for the ex‑ante economic analysis linked to the program proposal (see [Economic Analysis](https://idbg.sharepoint.com/teams/EZ-PR-LON/PR-L1146/_layouts/15/DocIdRedir.aspx?ID=EZSHARE-1067953801-4)).
		2. Due to the expected lifetime of sub projects to be financed (10 years), real data available by the end of the execution period (5 years from the effective date of the loan agreement) will not be sufficient to run an ex-post cost-benefit analysis without partially relying on certain projections. The evaluation exercise included in this plan will be made at the time of program completion, time at which data collected will be used to adjust projections on the expected results. After that, arrangements will need to be made for a discussion on an optimal timeframe if further real data collection during the expected lifetime of the projects financed is to be carried out.

* + - 1. B. Existing Knowledge
		1. Paraguay’s National Energy Policy (signed by Executive Decree 6092 on October 2016) defines the country’s energy mix in the short, medium and long-term (25 years) and acknowledges the importance of energy as key to realizing economic growth, industrial development and social progress. The policy also establishes the basics of public policy-making geared towards addressing the country’s energy needs. The policy outlines EE as one of its prioritized objectives and states an Action Plan composed of ten elements to encourage the growth of this sector, including a plan to promote EE in industry and support technology, equipment and process improvement through its [National Energy Efficiency Plan](http://www.ssme.gov.py/vmme/pdf/eficiencia/PNEE-CNEE%20-%20FINAL.pdf) (NEEP)[[17]](#footnote-18) and its *Comité Nacional de Eficiencia Energética*. The policy also states an Action Plan to ensure mobilization of capital for energy-related investments, including EE.
		2. One of the pillars of the NEEP is the implementation of programs on the efficient and rational energy use, supporting the prioritization and development of specific measures in all sectors. Specifically, it seeks to introduce EE measures in the use of steam and heat, focused on promoting cogeneration (technology innovation), improvements in equipment and processes (substitution and modernization) to incorporate new technologies with higher efficiency levels, technical assistance and capacity building in EE project implementation and the implementation of energy audits and energy management systems.
		3. At the same time, the [Nationally Determined Contribution](http://www4.unfccc.int/Submissions/INDC/Published%20Documents/Paraguay/1/Documento%20INDC%20Paraguay%2001-10-15.pdf) (NDC)[[18]](#footnote-19) submitted by Paraguay in 2015, established a unilateral goal of 10% of national GHG emissions reduction by 2030 and an additional 10% conditional of access to climate finance by 2030. The NDC also refers to the diverse objectives proposed in the [*Plan Nacional de Desarrollo* 2014-2030](http://www.stp.gov.py/pnd/wp-content/uploads/2014/12/pnd2030.pdf)(PND) [[19]](#footnote-20), including, inter alia, the effective control of deforestation, increasing consumption of renewable energy, increasing efficiency in the agricultural system, and reducing forest degradation.
		4. To achieve the goals set under the NDC, Paraguay developed the first phase (Mitigation Strategy) of a [National Climate Change Plan](http://www.seam.gov.py/sites/default/files/users/comunicacion/Estrategia%20de%20Mitigaci%C3%B3n%20-%20Fase%201.pdf) (2014), which among its strategic lines of action includes the following: (i) promote EE measures and provide financial incentives and access to finance; (ii) strengthen institutional capacity to coordinate actions towards EE and sustainable use of energy; (iii) promote and adopt sector policies towards clean energy through measures oriented to private sector investment in EE equipment; (iv) mobilize financial resources to improve energy systems, including in the industry sector; and (v) promote reforestation with energy purposes to diminish pressure on native forests.
		5. According to the [*Prospectiva Energética* 2013-2040](http://die.itaipu.gov.py/die/files/files2016/file/Presentacion%20Final%20FB%2021-11-16%20Final.pdf), in a scenario in which the core of the PND and NEEP policies are effectively implemented, Paraguay’s energy savings potential (accumulated over the period 2013-2040) resulting from the implementation of EE measures, is equivalent to four times the energy consumption in the country in 2013 (4,761 ktep). This represents a savings potential of some 221,481.72 GWh over the 27-year period.
		6. More specifically, the estimated potential for viable EE investment in the short to medium term is supported by an analysis of opportunities in specific high-potential subsectors, carried out as input for the program. According to this study, significant potential for EE (US$ 66.5 million potential demand for feasible investment) was identified in the industrial sector of Paraguay, linked to the replacement of equipment that is outdated, obsolete and inefficient (most of which over 10 years old) and, in some cases, the substitution of energy sources, incorporating electricity as a replacement for non-renewable biomass[[20]](#footnote-21).
		7. IDB’s previous experience with development banks in the region –including NAFIN in Mexico, BROU in Uruguay, BANCOLDEX in Colombia and BANDESAL in El Salvador– in the development of financing solutions for clean energy projects has proven viable and effective with a number of programs[[21]](#footnote-22), all of which had objectives related to the support of private sector investment in sustainable energy technologies in small, medium and large projects.
		8. The ex-ante cost-benefit analysis[[22]](#footnote-23) for the proposed program found that the net cash flows discounted at a rate of 12% produce a Net Present Value (NPV) for the program of US$54.9 million.

**Table 3.1: Key Outcome Indicators**

|  |  |  |  |
| --- | --- | --- | --- |
| Indicator | Unit | Frequency of measurement | Description / Source of verification |
| Small and medium enterprises (SME) that finance EE projects with funds from the program | Number | Annually and Final Program Report | Measures number of eligible EE projects implemented by SMEs, aggregated for all technologies**Source:** Annual report on program execution by AFD. |
| Financing from third parties mobilized by the program | Millions of US$ | Annually and Final Program Report | Includes all sources of financing other than the program (debt or equity). Target estimate based on the average total investment required per project and a 90/10 debt to equity ratio. Real values will be monitored and validated with information provided by AFD in periodical reports, which will include detail on sources of financing per individual projectSource: Annual report on program execution by AFD. |
| Average maturity of sub loans  | Years | Annually and Final Program Report | Measures the length of the amortization period for the portfolio of sub projects financed in order to compare with alternative financing sources available (market average and/or AFD financing without program resources).Source: Annual report on program execution by AFD |
| Average annual energy savings from sub projects financed by the program | toe | Annually and Final Program Report | Final target was estimated based on an average consumption of beneficiary firms, and efficiency ratios of EE systems installed. As sources may include electricity and firewood, energy measures (consumption and savings) are standardized by using tons of oil equivalent (toe) as unit.*Energy savings = energy consumed by beneficiary firms \* [1 – (efficiency of system installed – efficiency of original system)]*Source: Annual report on program execution by AFD. |
| Average annual greenhouse gas (GHG) emissions reductions from sub projects financed by the program | TM CO2e | Annually and Final Program Report | Indicator is based on the CO2e emissions avoided by EE energy savings produced in sub projects financed. Final target was estimated based on envisaged EE savings. Conversion factors from: (i) default emission factor for stationary combustion of wood/wood waste in manufacturing industries and construction from the [2006 IPCC Guidelines for National Greenhouse Gas Inventories](http://www.ipcc-nggip.iges.or.jp/public/2006gl/pdf/2_Volume2/V2_2_Ch2_Stationary_Combustion.pdf) (112,000 kg of CO2 per TJ); and (ii) Latin America’s average conversion factor for electricity (0.188 kg CO2 per kWh) from the [List of international emission conversion factors for electricity](https://ig-tools.com/files/CF_for_IG_Tools.pdf).*GHG emissions = energy consumption x CO2 emission factor***Source:** Annual report on program execution by AFD and conversion factor from internationally accepted GHG inventory guidelines. |
| Energy intensity in the industrial sector | toe/million PGY | Final Program Report | Measures the quantity of energy required to generate PGY 1 million of output in the industrial sector.Source**:** Official figures from the *Base de Indicadores de Eficiencia Energética* (BIIE)and the *Balance Energetico Nacional* |

* + - 1. C. Evaluation methodology
		1. The evaluation proposed will follow an ex-post cost-benefit analysis, based on the data collected in relation to the set of indicators detailed above. Following the recommendations of the Toolkit for the application of the Development Effectiveness Matrix (DEM), the ex post cost benefit analysis uses the same framework defined in the ex-ante economic analysis and replaces ​​assumed values ​with actual values at the time of analysis.
		2. **Justification for the selected methodology.** This method is appropriate because the relatively small universe of sub projects and the inherently non-random mechanisms that lead to the approval of the best sub projects for financing (applicants are evaluated by IFIs based of specific criteria and conditions) do not allow for a construction of a control group for an experimental or quasi‑experimental exercise for the evaluation.
		3. The ex post cost benefit analysis can be considered a reassessment of the cost benefit analysis made as part of the program proposal, once effective magnitudes related to the sub projects financed are known. In this sense, the key elements of a cost benefit analysis ex post are similar to those of a cost benefit analysis ex ante.
		4. The analysis is based on the comparison of two scenarios[[23]](#footnote-24):
		5. In the scenario A (“with” program), GCF funding and co-financing from AFD for the program provides financing to investments by SMEs in a number of EE sub projects. This will result in the implementation of specific EE measures in a subset of industrial sub sectors. Investment costs occur during the investment phase, while operation and maintenance (O&M) costs occur throughout the life of the sub projects. Additional costs corresponding to the complementary TC activities, although not part of this proposal, are included, as they are considered essential for the investments to be deployed effectively. In this scenario, energy consumption and emissions are reduced.
		6. In the alternative scenario B (“without” program), it is assumed that none of the EE sub projects in scenario A is implemented –without financing from the program, SMEs do not have the capacity to finance 100% of these investments by themselves and other sources of financing are not currently available at terms adequate to match their projects’ profiles. In this scenario, there are no investment costs and O&M costs over the period of analysis correspond to those incurred by the use of old equipment currently in operation. No energy savings from EE projects are produced, maintenance costs remain high and there are no CO2 emission reductions.
		7. The cash flows in both scenarios are built from the following main elements: (i) investments costs of new equipment (incorporating all sources of financing, including third-party leveraged equity); (ii) operation and maintenance costs (O&M), based on the average production/use of equipment (old and new); and (iii) average energy consumption of equipment (old and new). Based on the expected lifetime of sub projects to be financed, and the projected schedule of disbursements throughout the execution, the horizon for the analysis is 15 years.
		8. The main principles pertaining the accounting of benefits for each scenario include the following:
		9. Economic benefits for the program derive from: (i) the difference of expected firm’s energy costs between the scenario with program (with new or retrofitted equipment installed and operating) and the scenario without program (no change in current equipment); (ii) the difference of O&M costs of equipment between the scenario with program (with new or retrofitted equipment installed and operating) and the scenario without program (no changes to equipment); and (iii) a monetized value of CO2 emissions avoided, as a representation of the externalities associated with the reduction of GHG emissions.
		10. Benefits are mainly represented by the foregone costs that are implied by saving an amount of energy (mainly biomass-sourced) as a result of the EE measures implemented in the sub projects financed by the program. The value of these foregone costs in the scenario without program shall be zero, as no savings in energy are expected in the absence of an EE technology in place
		11. A net present value (NPV) is calculated by projecting the net economic flows over the estimated useful life of each type of projects and discounting them at a rate of 12%[[24]](#footnote-25). The NPV for the program, as well as its Internal Rate of Return (IRR), is presented to determine its economic viability.
		12. **Treatment and control groups**. The selected methodology does not require the assignment of treatment and control groups. However, the ex-post cost-benefit analysis will rely on the counterfactual without-project scenario –as defined in the ex-ante cost-benefit analysis– with updated data.
		13. **Counterfactual.** As aforementioned, this program will employ an ex-post cost benefit analysis at closure and it is expected that analysis of attribution will be conducted in theoretical manner. Since the ex-post analysis constitutes a reassessment of the cost benefit analysis made as part of the program proposal (ex-ante), the counterfactual scenario remains the same, i.e. “without” program, it is assumed that other sources of financing are not available at terms adequate to match the targeted projects’ profiles and that SMEs do not have the capacity to finance 100% of these investments by themselves– thus, no EE projects of this sort are implemented (see ¶3.15).[[25]](#footnote-26)
		14. **Data collection**. AFD will collect the necessary data to monitor indicators described in this plan and will submit annual reports to the IDB. Information systems in AFD –those already in place and additional developments resulting from the TC support from IDB– and government and international institutions related to the energy sector, are considered sufficient to monitor the proposed indicators.
		15. AFD has access to external sources of information, in addition to rigorous internal requirements for evaluating projects that apply for funding from the program. It is expected that this will facilitate the collection of information for the proposed analysis of the impact of the program. The Planning and Finance Department at AFD will act as focal point and coordinator in the preparation of reports and liaison with the IDB.
		16. Supervision visits to monitor the projects that receive financing from the program may be carried out individually or jointly by AFD and IDB staff members. When IDB does not participate, AFD shall be responsible of providing access to the IDB to all information resulting from those visits.
		17. Since the ex-post cost benefit analysis aims to replicate the ex-ante cost benefit analysis, adjusting the assumptions or replacing estimated values with values ​​effectively verified will require to gather information that is consistent with that used in the ex-ante analysis (see [Economic Analysis](https://idbg.sharepoint.com/teams/EZ-PR-LON/PR-L1146/_layouts/15/DocIdRedir.aspx?ID=EZSHARE-1067953801-4)). Table 3.2 illustrates sub project information to be obtained once they are recognized under the program, will include: number of sub projects financed by technology, subsector and firm size, operating capacity, efficiency factors, time of start of operations, investment costs, O&M costs, emission factor, etc.

**Table 3.2.- Inputs for the cost benefit analysis**

|  |  |  |  |
| --- | --- | --- | --- |
| Indicator/Input | Ex-ante | Ex-Post | Comments |
| PROJECT INFORMATION |
| Investment in USD | Projected annually based on tentative pipeline | Real from actual annual disbursements justified and reported by AFD | Information on investment is to be provided per individual project and shall include disaggregated data, i.e. share of financing from program and equity (leveraged finance). |
| Number of projects | Projected from tentative pipeline | Real from actual portfolio justified and reported by AFD each year | Information must include a description of the technology and activity of each individual project. |
| Baseline energy consumption per project | Estimated based on each category of project considered in the assumed portfolio | Real as reported by each beneficiary project, once recognized for financing | Baseline consumption refers to the amount of energy consumed before installation of efficient equipment. |
| Savings ratio of equipment per project | Standard average for corresponding technologies, following the technology used in each category of project in the assumed portfolio | Standard ratio featured by actual equipment to be installed in each beneficiary project, once recognized for financing |  |
| O&M costs old equipment per project | Estimated as a value relative to O&M of new equipment | Real as reported by each beneficiary project, once recognized for financing (may be approximate) |  |
| O&M costs new equipment per project | Estimated as a value relative to CAPEX | Real as reported by each beneficiary project, once recognized for financing (may be approximate) |  |
| OTHER VARIABLES |
| Conversion factors | International standard | International standard | Information normally found online. Sources can be verified when carrying out the ex-post analysis; if different values are used for any of these factors, it must be specified. |
| Emission factors | International standard and regional average | International standard and regional average. If available, country values must be used | Energy sector government agencies in other countries in the region regularly produce country emission factors and include them in periodical reports, such as the *Balance Energetico Nacional*. Currently, Paraguay does not have such a practice but it may be developed by the time when the ex-post analysis is due. |
| CO2 price | International standard | International standard updated | Due to the volatility of this price, available data should be revised and updated for the ex-post analysis. |
| Electricity price | Projected based on current and historical price scenario | Updated with real values for each year of execution | Projections will need to be adjusted for the years following the time in which the ex-post analysis is carried out, based on updated values for the period Y0-Y5 and any relevant information that affect the trend assumptions initially made. |
| Firewood price | Projected based on current and historical price scenario | Updated with real values for each year of execution | Projections will need to be adjusted for the years following the time in which the ex-post analysis is carried out, based on updated values for the period Y0 to Y5 and any relevant information that can affect the trend assumptions initially made. Unlike electricity, firewood prices are not necessarily public so the sources and assumptions used for the revisions and projections of this input, shall be clearly specified. |
| TC funding | Projected based on indicative disbursement plan | Real as per disbursements reported by the TC execution |  |

* + - 1. D. Reporting of evaluation results
		1. The Planning and Finance Department at AFD, acting as project coordination unit, will oversee the preparation and presentation of all required reports, as well as communication with the IDB in all administrative, operational and evaluation matters. From a technical and operational perspective, AFD is able to fulfill its responsibilities competently and has sufficient administrative and operational capacity, and qualified personnel to provide all inputs necessary to fulfill their commitments under the proposed program. In addition, the institution understands the benefits of optimizing the use of lessons learned to improve their programs.
		2. AFD will report to IDB on agreed indicators, and all relevant considerations pertaining to program performance, through annual reports. Based on the conclusions of these reports, AFD and IDB could discuss and eventually introduce adjustments to the program. AFD will deliver the reports within 60 calendar days after the end of each year of program implementation. Periodical monitoring meetings are also scheduled (see Table 2.2 above).
		3. This report shall contain a clear and practical assessment on the level of achievement of objectives of the program and potential gaps in relation to targets set for each indicator. Any special development with regards to the execution of the program shall be presented in the form of lessons learned and recommendations on these issues are highly desirable.
		4. The IDB, in a joint effort from its IFD/CMF, INE/ENE and CCS/CSD divisions, with support from the Office of Strategic Planning and Development Effectiveness (SPD), will collaborate with AFD in the development of the proposed evaluation plan, in any aspects requiring technical and expert assistance. If necessary, the IDB may provide additional technical and financial support to carry out the activities of specialized analysis on the economic assessment.
			1. E. Complementary evaluation
		5. In addition to the annual reports and the scheduled contacts for monitoring of program operations, AFD and IDB will conduct an Interim Evaluation Report within six (6) months after Year 2 of effective date of the loan agreement. The evaluation will assess progress the ongoing accomplishment of program objectives and outcomes in order to identify any immediate corrective action required.
		6. Interim Progress Reports will also be prepared at ten (10) years as of the effectiveness of the loan agreement, and Twenty (20) years as of the effectiveness of the loan agreement.
		7. A Project Completion Report (PCR) will be prepared within six (6) months after the last disbursement of GCF Proceeds by the Accredited Entity to the Funded Activity. The PCR is an IDB operational tool that will evaluate the fulfillment of targets and review the results of the operation. While this report will be produced by the IDB, the AFD shall compile, maintain and be ready to provide all information necessary to properly conduct the PCR.
		8. The final annual report will be prepared within nine (9) months after the submission of the PCR.
			1. F. Coordination, workplan and budget for evaluation
		9. For the implementation of this plan, it is expected that IDB will use its own staff, with the assistance of and in coordination with the AFD. This working scheme is considered adequate and sufficient to ensure the quality and success of the evaluation work. For activities that require additional or specific expertise, consultancy services may be hired by AFD or the IDB (see Table 3.3).
		10. It will be the responsibility of the IDB, through its IFD/CMF division, to follow-up and supervise the execution of the ex post cost-benefit analysis, in accordance with the plan proposed. The IFD/CMF division has a group of specialists focused on climate finance that will participate in the revision of the final report, with expert support from the INE/ENE and CCS/CSD divisions.
		11. It is expected that the information required for the calculations of the cost benefit ex post will be available from available national sources and program reports produced by AFD, as indicated in Table 3.1. Some of the information required is generated by existing information systems of AFD, and in this sense, is does not entail additional costs. Other information is periodically generated by government agencies (e.g. Vice Ministry of Mines and Energy, ANDE), in the normal course of its operations. Since the information is expected to be publicly available, it is assumed that any complementary consultancy services that may be needed will focus on gathering information specific to sub projects financed. All costs of the activities listed in this plan will be financed by the IDB, using the supervision budget included in the transactional funds of the IFD/CMF division. Its completion is expected by the end of the execution period of the program (see Table 3.3). Any further evaluation involving other specific or more sophisticated purposes, longer timeframes of data collection or seeking to determine additional externalities resulting from the execution of the program, may be carried out if considered relevant, but will not be incorporated as part of this M&EP.

**Table 3.3: Evaluation workplan and budget**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Activity | Y1 | Y2 | Y3 | Y4 | Y5 | Y6 | Responsible[a] | Budget (US$) |
| Collection of data for outcome indicators[[26]](#footnote-27) |  |  |  |  | 1 |  | AFD/IDB | 12,000 |
| Data Projections and Analysis |  |  |  |  | 1 |  | IDB/Consultants | 20,000 |
| Preparation of final evaluation: Cost-Benefit Analysis Ex-post |  |  |  |  |  | 1 | IDB/Consultants | 10,000 |
| Cost-Benefit Analysis Ex-post distribution and discussion |  |  |  |  |  | 1 | IDB/AFD | 3,000 |
| Total |  |  |  |  |  |  |  | **45,000** |

[a] All AFD responsibilities in terms of budget are considered to be payable in-kind.

1. [Industrial EE and competitiveness](https://www.unido.org/fileadmin/user_media/Services/Research_and_Statistics/WP052011_Ebook.pdf), Working Paper 05/2011, United Nations Industrial Development Organization (UNIDO), 2011. [↑](#footnote-ref-2)
2. The average payback period is 3.6 years, which is incompatible with the conditions offered by the banking system, generating mismatches in loan amortization periods. [↑](#footnote-ref-3)
3. [Carlino, H. 2017](https://idbg.sharepoint.com/teams/EZ-PR-LON/PR-L1146/_layouts/15/DocIdRedir.aspx?ID=EZSHARE-1067953801-2). *Guía para la estructuración de instrumentos financieros para la promoción de la eficiencia energética - Estudio de caso de la Agencia Financiera de Desarrollo de Paraguay*. [↑](#footnote-ref-4)
4. A market study ([Carlino, H., 2017](https://idbg.sharepoint.com/teams/EZ-PR-LON/PR-L1146/_layouts/15/DocIdRedir.aspx?ID=EZSHARE-1067953801-2)) has shown potential demand for credit for EE improvements in SMEs, in sub-sectors such as brick fabrication, sugar mills and agroindustry. In selecting the target sectors for the study, several factors were taken into account, including participation in GDP, relevant value chains for Paraguay, impact on generating positive foreign trade and job creation. See also [*Producción y Consumo de Biomasa Solida en Paraguay*](http://www.ssme.gov.py/vmme/pdf/biomasa/base/37.%20Produccion%20y%20Consumo%20Biomasa%20%281%29.pdf), Vice Ministry of Mines and Energy (VMME) and GIZ, 2013. [↑](#footnote-ref-5)
5. Non-financial barriers such as lack of awareness of business opportunities, insufficient technical capacity, and entrenched behavioral patterns will be addressed through complementary technical cooperation (TC) activities (see PR-T1249). [↑](#footnote-ref-6)
6. The GCF is a UNFCCC’s financial mechanism that provides funding to promote mitigation and adaptation to climate change. The IDB is accredited by the GCF to manage these resources. The framework for this relationship is established in the AMA approved by the IDB Board (GN‑2895, Resolution DE-31/17). In addition, the FAA to be agreed between the IDB and GCF will establish terms and conditions specific to this program, and shall be signed prior to the signing of the loan contract. [↑](#footnote-ref-7)
7. Eligible EE projects are expected to be related to efficiency improvements in industrial processes, including equipment replacement, energy substitution and co-generation. [↑](#footnote-ref-8)
8. AFD accredits IFIs for lending annually by assessing their financial and institutional risk. AFD’s accredited IFIs are supervised by the Central Bank and include 14 banks and 8 finance companies (see [AFD- *IFIS Habilitadas*](https://www.afd.gov.py/ifis)). Participant IFIs will request rediscounting of expenses to AFD, based on a portfolio of sub-projects undertaken that meet the conditions of the OR. The IDB shall recognize all eligible expenditures in order to proceed with disbursements to AFD. [↑](#footnote-ref-9)
9. The program will be operated by AFD existing financing lines, which offer terms that are considerably longer than the average for the system. Over its nearly eleven years of operation, AFD has succeeded in becoming the main source of long-term financing in the Paraguayan financial system. [↑](#footnote-ref-10)
10. The program will use firm size definition as per the definition of economic unit under the framework of the *Censo Economico Nacional*. In this sense, SMEs under the program are firms with less than 50 employees and income equal to or less than PYG 2,000 million. In some particular subsectors with high potential, such as the sugar industry subsector, eligible firms may be larger in size. Whereas the analyses related to the potential demand and results of the program are based on an indicative set of SMEs and technologies, the program remains open to other EE technologies and industrial SMEs subsectors. The origination of innovative financial and non-financial instruments will allow for the introduction of various EE technologies (boilers, furnaces, electric motors, and ancillary equipment). [↑](#footnote-ref-11)
11. According to its mandate, all funding provided to AFD shall be used for: (i) rural development; (ii) credits for microenterprises and SMEs; (iii) business creation and development, with emphasis on SMEs; (iv) exports of goods and services and imports of capital goods, especially for SMEs; (v) development of tourism; (vi) basic infrastructure; and (vii) development of housing and urban programs and other actions aimed at reducing housing deficit. [↑](#footnote-ref-12)
12. The OR is an agreement by which the executing agency formally adapts their internal processes to requirements by the IDB, in the context of the execution of a specific program. The OR will be prepared and owned by AFD, with supervision from the IDB, and must be finalized and approved by AFD’s appropriate instances prior to the first disbursement of funds. [↑](#footnote-ref-13)
13. The collection of any gender-related information is part on ongoing agreement between IDB and AFD. These efforts are solely with the purpose of gathering information to better understand gender-related conditions. [↑](#footnote-ref-14)
14. All reporting required by the GCF on the use of their funds will be the sole responsibility of the IDB. However, it is expected that AFD will be available to support with the provision of any information required for GCF reporting, in addition to that included in AFD’s annual reports. [↑](#footnote-ref-15)
15. Funding for the proposed budget includes a portion of resources from the TC program PR-T1249. [↑](#footnote-ref-16)
16. Includes travel and per diem costs of required travel. Coordination meetings may be carried out remotely, via video or call conference. It is expected that at least one coordination meeting/supervision visit per year will only include staff from the local office in Paraguay and will not involve international travel. [↑](#footnote-ref-17)
17. Vice Ministry of Mines and Energy, 2014. [↑](#footnote-ref-18)
18. The NDCs are public outlines of climate actions countries intend to take under the new international agreement adopted in December 2015 at the Conference of the Parties (COP21) in Paris. United Nations Framework Convention on Climate Change (UNFCCC), 2016. [↑](#footnote-ref-19)
19. As part of the PND, the Government of Paraguay supports economic diversification strategies and a strong public investment effort to alleviate binding infrastructure constraints. [↑](#footnote-ref-20)
20. [Carlino, H., 2015](https://idbg.sharepoint.com/teams/EZ-PR-LON/PR-L1146/_layouts/15/DocIdRedir.aspx?ID=EZSHARE-1067953801-2). [↑](#footnote-ref-21)
21. In Mexico, see loans under the CCLIP ME-X1010 with *Nacional Financiera,* and loan [3563/OC-ME](http://www.iadb.org/en/projects/project-description-title%2C1303.html?id=ME-L1172) with *Banco Nacional de Comercio Exterior* (BANCOMEXT). In Uruguay see operation [3396/OC-UR](http://www.iadb.org/en/projects/project-description-title%2C1303.html?id=UR-L1099). In Colombia, see [GRT/TC-15613-CO](http://www.iadb.org/en/projects/project-description-title%2C1303.html?id=CO-G1007) with *Banco de Comercio Exterior de Colombia S.A.* (BANCOLDEX). See also, De Olloqui, F., *Bancos públicos de desarrollo: ¿Hacia un nuevo paradigma?* IDB, 2013; Deason, J., Varadarajan, U., and Levi, P., Getting the most from your green: An approach to using public money effectively through green banks and other low-carbon financing. Climate Policy Initiative, 2015 [↑](#footnote-ref-22)
22. See [Economic Analysis](https://idbg.sharepoint.com/teams/EZ-PR-LON/PR-L1146/_layouts/15/DocIdRedir.aspx?ID=EZSHARE-1067953801-4). [↑](#footnote-ref-23)
23. See [Economic Analysis](https://idbg.sharepoint.com/teams/EZ-PR-LON/PR-L1146/_layouts/15/DocIdRedir.aspx?ID=EZSHARE-1067953801-4). [↑](#footnote-ref-24)
24. Following IDB guidelines for economic analysis of programs financed by the IDB, it is recommended to use a discount rate of 12% for all IDB operations. [↑](#footnote-ref-25)
25. If data is available and conditions allow, the team might commission a comparative exercise on energy use for existing beneficiaries and incoming beneficiaries in the fourth year.  The latter are expected to have similar characteristics as those already benefited so that their consumption and spending patterns before the investment would be valid as a counterfactual scenario for the beneficiaries who already have new equipment in operation. This would be demonstrated via propensity score matching, if existing administrative data allow (such as sales, sector, size, and energy use), in an attempt to control for differences between both groups and make them more comparable.  A baseline would be necessary, and this could be estimated reflexively with input from existing beneficiaries. The possibility to carry out this exercise will be evaluated following discussions with AFD once a reasonable number of projects are underway and experience on data collection has been gained. [↑](#footnote-ref-26)
26. Includes travel and per diem costs of required travel. [↑](#footnote-ref-27)