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Report No: ICR00004198

IMPLEMENTATION COMPLETION AND RESULTS REPORT

(TF092377)

ON A

GLOBAL ENVIRONMENTAL FACILITY GRANT

IN THE AMOUNT OF US$15.155 MILLION

TO THE

ARGENTINE REPUBLIC

FOR AN

ENERGY EFFICIENCY PROJECT (P090119)

MAY 29, 2018

Energy and Extractives Global Practice
Latin America and Caribbean Region

CURRENCY EQUIVALENTS

(Exchange Rate Effective January 29, 2018)

Currency Unit =	Argentine Peso (ARS)
ARS19.57 =	US$1
US$1 =	ARS19.57

FISCAL YEAR
July 1– June 30

ABBREVIATIONS AND ACRONYMS

AEEF	Argentina Energy Efficiency Fund
CAS	Country Assistance Strategy
CFL	Compact Fluorescent Light
CIM	Centrum für Internationale Migration und Entwicklung
ESCOs	Energy Service Companies
ESMF	Environmental and Safeguards Management Framework
FONAPYME	Fondo Nacional de Desarrollo para la Micro, Pequeña y Mediana Empresa
GDP	Gross Domestic Product
GEF	Global Environmental Fund
GEO	Global Environmental Objective
GHG	Green House Gas Emissions
GoA	Government of Argentina
IRAM	Argentina's Institute for Norms and Measures (IRAM, in Spanish).
M&E	Monitoring and Evaluation
MOU	Memorandum of Understanding
MJ	Megajoule
NGO	Non-governmental Organization
NOx	Nitrogen Oxide Emissions
PAEE	Energy Savings and Efficiency Program
PDO	Project Development Objective
PIEEP	Project for Increasing Productive and Energy Efficiency in Small and Medium Enterprises
PIU	Project Implementation Unit
PROCAE	Quality Program for Energy Appliances
PRONUREE	National Program for the Rational and Efficient Use of Energy
PURE	Program for the Rational Use of Energy
RFP	Request for Proposal
SEPYME	Secretariat of Small and Medium Enterprises and Regional Development
SMEs	Small and Medium Enterprises

SOX	Sulphur Oxide Emissions
SSEES	Subsecretariat of Energy Efficiency and Savings
TTL	Task Team Leader

Regional Vice President:	Jorge Familiar Calderon
Country Director:	Jesko Hentschel
Senior Global Practice Director:	Riccardo Puliti
Practice Manager:	Antonio Barbalho
Task Team Leader(s):	Lucia Spinelli
ICR Main Contributor:	Farah Mohammadzadeh

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DATA SHEET

BASIC INFORMATION

Product Information

Project ID	Project Name
P090119	Energy Efficiency Project
Country	**Financing Instrument**
Argentina	Specific Investment Loan
Original EA Category	**Revised EA Category**
Not Required (C)	Not Required (C)

Organizations

Borrower	Implementing Agency
Argentine Republic	Subsecretaria de Ahorro y Eficiencia Energetica

Project Development Objective (PDO)

Original PDO

To reduce greenhouse emissions by removing the regulatory, financing and informational barriers that prevent activities andinvestments in energy efficiency and energy conservation.

FINANCING

	Original Amount (US$)	Revised Amount (US$)	Actual Disbursed (US$)
World Bank Financing			
TF-92377	15,155,000	14,436,363	14,436,363
Total	**15,155,000**	**14,436,363**	**14,436,363**
Non-World Bank Financing			
Borrower	51,000,000	0	0
GERMANY: German Technical Assistance Corporation (GTZ)	740,000	0	0
Borrowing Country's Fin. Intermediary/ies	0	0	0
Local Sources of Borrowing Country	20,000,000	0	0
Sub-borrower(s)	3,700,000	0	0
Foreign Multilateral Institutions (unidentified)	0	0	0
Total	**75,440,000**	**0**	**0**
Total Project Cost	**90,595,000**	**14,436,363**	**14,436,363**

KEY DATES

Approval	Effectiveness	MTR Review	Original Closing	Actual Closing
26-Jun-2008	20-Nov-2009	12-Jun-2012	30-Jun-2015	31-May-2017

RESTRUCTURING AND/OR ADDITIONAL FINANCING

Date(s)	Amount Disbursed (US$M)	Key Revisions
20-Sep-2013	1.32	Change in Results Framework Change in Components and Cost Reallocation between Disbursement Categories Change of EA category Change in Legal Covenants Change in Institutional Arrangements
12-Aug-2016	7.48	Change in Loan Closing Date(s) Reallocation between Disbursement Categories
24-May-2017	10.55	Reallocation between Disbursement Categories

KEY RATINGS

Outcome	Bank Performance	M&E Quality
Satisfactory	Satisfactory	Substantial

RATINGS OF PROJECT PERFORMANCE IN ISRs

No.	Date ISR Archived	DO Rating	IP Rating	Actual Disbursements (US$M)
01	26-Sep-2008	Satisfactory	Satisfactory	0
02	05-May-2009	Satisfactory	Satisfactory	0
03	11-Jun-2009	Satisfactory	Satisfactory	0
04	26-Aug-2009	Moderately Unsatisfactory	Satisfactory	0
05	22-Dec-2009	Satisfactory	Satisfactory	.50
06	14-Jun-2010	Satisfactory	Satisfactory	.50
07	22-Feb-2011	Satisfactory	Satisfactory	.50
08	24-Aug-2011	Satisfactory	Satisfactory	.60
09	23-Apr-2012	Moderately Unsatisfactory	Unsatisfactory	.60
10	09-Oct-2012	Moderately Unsatisfactory	Unsatisfactory	.84

11	10-Jul-2013	Moderately Satisfactory	Unsatisfactory	1.32
12	12-Mar-2014	Moderately Satisfactory	Unsatisfactory	1.43
13	18-Dec-2014	Moderately Satisfactory	Moderately Satisfactory	3.96
14	15-Jul-2015	Satisfactory	Moderately Satisfactory	7.21
15	28-Dec-2015	Satisfactory	Moderately Satisfactory	7.36
16	27-Jun-2016	Satisfactory	Moderately Satisfactory	7.48
17	11-Jan-2017	Satisfactory	Moderately Satisfactory	7.66

SECTORS AND THEMES

Sectors

Major Sector/Sector	(%)
Public Administration	**18**
Central Government (Central Agencies)	18
Energy and Extractives	**82**
Other Energy and Extractives	82

Themes

Major Theme/ Theme (Level 2)/ Theme (Level 3)	(%)
Private Sector Development	**0**
Enterprise Development	13
MSME Development	13
Finance	**0**
Financial Infrastructure and Access	13
MSME Finance	13
Environment and Natural Resource Management	**0**
Climate change	50
Mitigation	50
Environmental policies and institutions	25

ADM STAFF		
Role	**At Approval**	**At ICR**
Vice President:	Pamela Cox	Jorge Familiar Calderon
Country Director:	Pedro Alba	Jesko S. Hentschel
Senior Global Practice Director:	Laura Tuck	Riccardo Puliti
Practice Manager/Manager:	Philippe Charles Benoit	Antonio Alexandre Rodrigues Barbalho
Project Team Leader:	Xiaoping Wang	Lucia Spinelli
ICR Co Author:		Farah Mohammadzadeh

I. PROJECT CONTEXT AND DEVELOPMENT OBJECTIVES

A. CONTEXT AT APPRAISAL

Context

1. By the year 2008, Argentina was already an upper-middle-Income country and one of South America's largest economies with a population of 40.38 million, a gross domestic product (GDP) per capita of US$8,953, and an energy intensity level of around 4.3 MJ per $GDP (at US$2011purchasing power parity (PPP)), higher than Brazil and above the Latin American average. Leading up to 2008, Argentina experienced high levels of economic growth between 2003 and 2006, followed by an increased demand for energy, which was projected to continue growing by more than 5 percent per year.

2. Energy sector reforms started in the 1990s with a focus on making the generation, transmission, and distribution more efficient. This situation resulted in a continuous increase in primary energy intensity since 1998 and consequently higher energy imports for the country, higher energy costs, and lower competitiveness for productive sectors, greater energy consumption for consumers with increasingly higher costs as retail prices had raised, and greater local and global pollution associated with the consumption of fossil fuels. However, the 2002 economic crisis derailed the Government's attempt to adequately address efficiency improvements on the demand side.[1]

3. After the economic crisis, the Government of Argentina (GoA) launched a series of energy efficiency programs in 2003, starting with the first Energy Savings and Efficiency Program (*Programa de Ahorro y de Eficiencia Energética* - PAEE) in 2003, followed in 2004 by the Program for the Rational Use of Energy (*Programa de Uso Racional de la Energía Eléctrica* - PURE) and the energy labeling program, Quality Program for Energy Appliances (*Programa de Calidad de Artefactos Energéticos* - PROCAE). In December 2007, the Government launched the National Program for the Rational and Efficient Use of Energy (PRONUREE, Decree 140/2007), which declared the rational and efficient use of energy to be of national interest and was also part of the energy sector strategy to counter the supply/demand imbalance. Under the responsibility of the former Secretariat of Energy, this decree signaled an attempt by the GoA to address energy efficiency more systematically and strategically and aimed to be a vehicle for improving energy efficiency in the energy-consuming sectors, acknowledging that energy efficiency needs to be promoted with a long-term commitment and vision.

4. Given Argentina's relatively high-income level, its need to continue developing sustainably, and the fact that energy efficiency has demonstrated to have strong economic and social benefits, it was clear that the country needed to implement a wide variety of energy efficiency strategies to achieve sustainable development. However, the country faced several barriers to increase investments in energy efficiency such as

[1] Smaller programs to address demand-side energy efficiency include the IFC Efficient Lighting Initiative from 1999 to 2003 as well as the Project for Increasing Productive and Energy Efficiency in Small and Medium Enterprises (PIEEP) funded by the German Agency for International Cooperation (*Deutsche Gesellschaft für Internationale Zusammenarbeit*, GIZ) from 1999 to 2005.

- Lack of regulatory incentives to promote energy efficiency;
- Lack of adequate price signals to energy consumers, especially residential consumers who paid highly subsidized tariffs. This was mostly due to the financial crisis, which led to controlled and subsidized prices for all consumers, which did not reflect the cost increases of energy supply;
- Lack of information among residential consumers on the efficiency of energy equipment;
- Inadequate information and high transaction costs for companies to implement energy efficiency investments;
- Lack of experience and perceived high risk among banks regarding financing of energy efficiency projects; and
- Infancy stage of the energy service companies (ESCOs) industry, which are expected to pursue cost-effective energy efficiency investments.

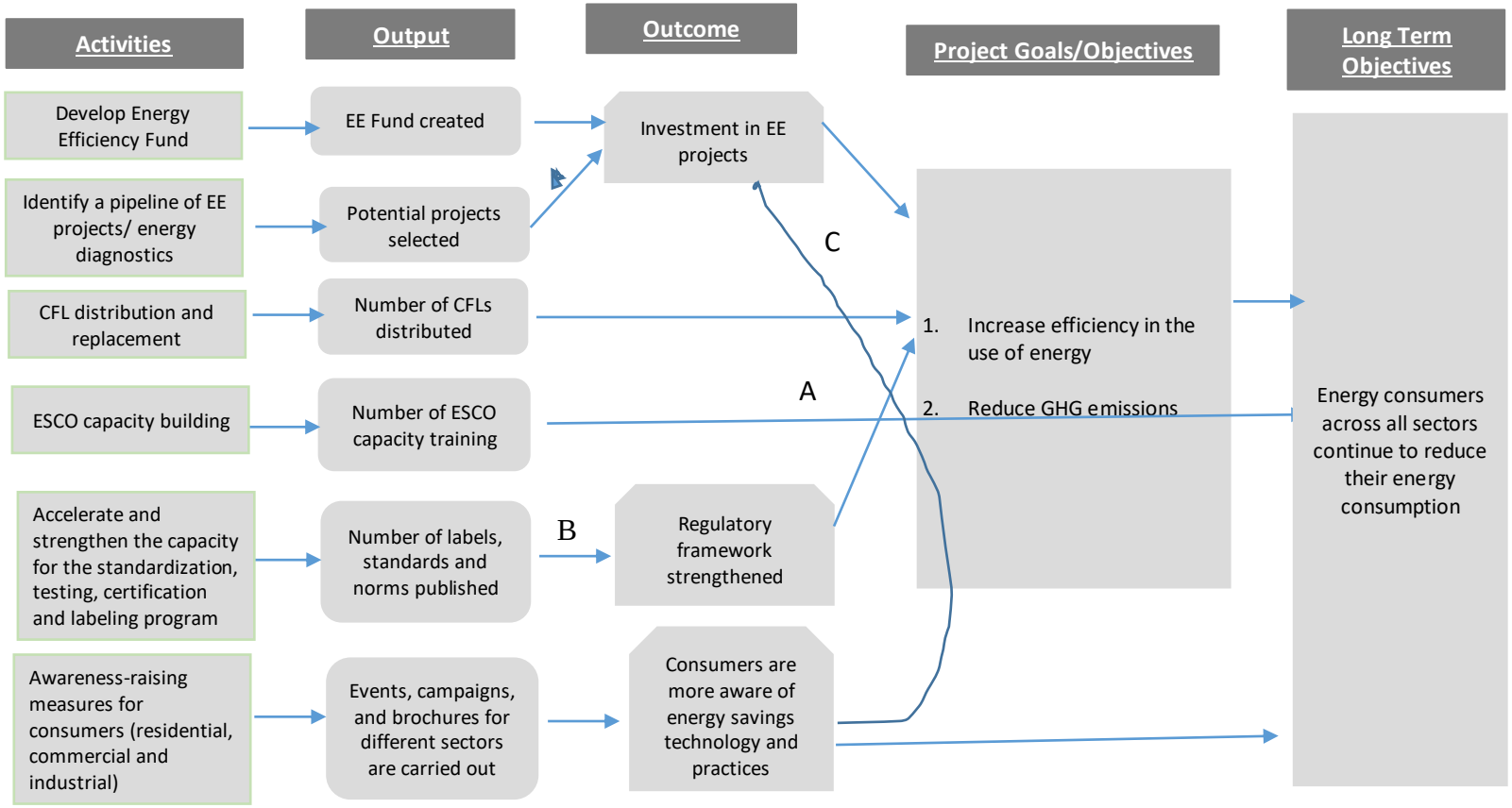
5. Acknowledging the country's challenges, the 2006–2008 Country Assistance Strategy (CAS) Report No. 34015-AR for Argentina included the objectives of sustained economic growth, environmental sustainability and climate change mitigation. Therefore, the GoA and the World Bank conceived the Argentina Energy Efficiency Project, in line with the CAS and the GoA's emphasis on supporting complementary energy efficiency initiatives on the demand side.

6. During project preparation and most of the project implementation, the Project Implementation Unit (PIU) consisted of three dedicated staff working on energy efficiency projects. During this time, the GoA did not have a separate Ministry of Energy and Mining. After 2015, and with the creation of the Argentina Ministry of Energy, the rank of the implementation unit was elevated to a Sub-secretariat, resulting in higher resources, more staff, and stronger political support and mandate.

Theory of Change (Results Chain)

7. The objectives of the project were to increase the efficiency in the use of energy and reduce greenhouse gas (GHG). The underlying logic to achieve these objectives was by supporting the GoA in fostering energy efficiency on the demand side—household, commercial, and industrial users. This was to be achieved by removing the regulatory, financing, and informational barriers that prevent activities and investments in energy efficiency and energy conservation. Figure 1 illustrates the theory of change of the project.

Figure 1. Causal Chain



Note: A - Critical assumption: ESCOs will carry out energy audits to help SMEs identify energy savings measures which the SMEs will follow.
B - Critical assumption: Labeled equipment will be sold and less efficient equipment will be replaced.
C – Critical assumption: Awareness- raising events geared at commercial and industrial consumers (for example, SMEs) will increase the number of SMEs that apply to the EE Fund and therefore increase investments in EE projects.

Project Development Objectives (PDOs)

8. The project identified two main objectives:

(a) To increase the efficiency in the use of energy by developing a sustainable and growing market for energy efficiency services and equipment in Argentina,[2] as development objective

(b) To reduce GHG emissions by removing the regulatory, financing, and informational barriers that hinder activities and investments in energy efficiency and energy conservation, as the Global Environmental Objective (GEO)

Key Expected Outcomes and Outcome Indicators

9. The two key expected outcomes and outcome indicators were as follows:

Objective 1: Increase the efficiency in the use of energy
PDO indicator: Accumulated amount of GWh saved

Objective 2: Reduce greenhouse gas emissions
PDO indicator: accumulated project-related avoided emissions (million tons of CO2)

Components

10. The project was conceived with three main components to be financed with US$15.155 million by the Global Environment Fund (GEF), US$43.360 million by the GoA, US$0.740 million by the Joint Argentina-Germany Senior Expert Program (*Centrum für Internationale Migration und Entwicklung,* CIM), US$40.00 million by distribution companies, and US$0.180 million by small and medium enterprises (SMEs)—totaling US$99.435 million.

Table 1. Project Components of the Argentina Energy Efficiency Project at the Time of Appraisal

Category	Description	Grant Allocated at Approval (US$, millions)	Grant after Reallocations - Final (US$, millions)
Component 1: Development of the Argentina Energy Efficiency Fund (AEEF)	(a) Feasibility studies to develop a pipeline of energy efficiency projects, to be financed through a grant facility (b) Develop the Argentina Energy Efficiency Fund (AEEF)	1.80	14.00

[2] The PDO in the Project Appraisal Document is the same as stated in the Legal Agreement.

Component 2: Development of a Utility EE Program	(a) Phase out incandescent bulbs with compact fluorescent lights (CFLs) (b) Support the dissemination campaigns to educate the beneficiaries of the advantages of replacing incandescent bulbs with CFLs (c) Provide technical assistance to explore new delivery mechanisms of energy efficiency services	9.20	0.00
Component 3: Capacity Building and Project Management	(a) Policy and regulation. Studies to identify and evaluate barriers to the development of the energy efficiency market. (b) Labeling. Accelerate and strengthen the capacity for the standardization, testing, certification, and labeling program. (c) ESCO capacity building (d) Communication, dissemination, and training. (e) Monitoring and evaluation (f) Project management	4.15	1.15

B. SIGNIFICANT CHANGES DURING IMPLEMENTATION (IF APPLICABLE)

Revised PDOs and Outcome Targets

11. Neither the PDO/GEO nor the outcome targets were changed.

Revised PDO Indicators

12. None of the PDO indicators were revised.

Revised Components

13. The original aim of Component 1(b) was to create an independent AEEF for SMEs, which was a highly bureaucratic and time-consuming endeavor due to fiduciary funds regulation. The expectation was that once the fund was created, it would begin operations as part of a potential follow-up project. However, on September 20, 2013, the project was restructured, changing Component 1(b) to create the AEEF by embedding it under an already existing trust fund in Argentina targeting SMEs—the *Fondo Nacional de Desarrollo para la Micro, Pequeña y Mediana Empresa* (FONAPyMe) Trust Fund under the Ministry of Industry—and open a line of credit to invest in energy efficiency projects during the project duration. This means, rather than just creating the AEEF and opening a line of credit for SMEs under a potential follow-up project, the restructuring allowed to create the AEEF and make the line of credit available as part of this project. This line of credit was financed with funds from Component 2 (further details in paragraph 15 on reallocation of funds).

Other Changes

14. As part of the first restructuring on September 20, 2013, the following other changes were made:

- **Changes in institutional arrangements.** Implementation arrangements did not change (the Secretariat of Energy remained the key responsible agency). However, since the project embedded the AEEF under the FONAPyME Trust Fund, a subsidiary agreement between the Secretariat of Small and Medium Enterprises and Regional Development of the Ministry of Industry (where the FONAPyME is hosted), its trustee *Banco Nación*, and the Secretariat of Energy needed to be signed.

- **New condition of effectiveness in the amended Grant Agreement.** Signing the subsidiary agreement between the SEYPME, *Banco Nación*, and the Secretariat of Energy.

- **Reallocation of funds.** Reallocation of a total of US$9.2 million from Component 2 to Component 1(a) - US$1.5 million to carry out feasibility studies, and Component 1(b) - US$7.7 million to finance the AEEF credit line.

- **Safeguards.** With the addition of the credit line under Component 1(b), the project changed from Category 'C' to 'B'. This change implied the development of environmental and social frameworks.

15. As part of the second restructuring on August 16, 2016 the following other changes were made:

- **Reallocation of funds.** Reallocation of a total of US$2.0 million from Component 1 to Component 3(f).

16. As part of the third restructuring on May 2017 the following other changes were made:

- **Reallocation of funds.** US$2.95 million in funds were reallocated from Component 3(d) to Component 1(b) and US$0.05 million from Component 1(a) to Component 1 (b).

Rationale for Changes and Their Implication on the Original Theory of Change

17. The project was conceived to support the GoA in addressing the topic of energy efficiency, introducing it in the public agenda, and reducing the electricity demand across all sectors: household, commercial, and industrial. Ultimately, the changes made during the restructurings positively affected the project's contribution toward the objectives of increasing the efficient use of energy and reducing GHG emissions. This is because the creation of the AEEF under the FONAPyME fund allowed the project to already open a line of credit as part of this project. The reallocation of funds under two of the restructurings provided the necessary funding to operationalize the AEEF and open a credit line to SMEs for energy efficiency measures, which ultimately increased the SME's energy efficiency and further reduced GHG emissions.

18. There were no adverse impacts to completing Component 2. During project preparation, the World Bank team worked with the GoA to prepare a bidding process to support the implementation of the PRONUREE —replacement of CFLs in households—and committed US$9.2 million to finance the acquisition and distribution of CFLs. However, by the time the project became effective, the GoA had

already bid, with their own resources, all the needed CFLs (Component 2), therefore making available US$9.2 million to finance other relevant activities.[3]

19. As a result, the available US$9.2 million was reallocated on September 20, 2015, to Component 1(a) to finance energy audits, whose costs proved to be higher than expected. Furthermore, the remaining US$7.7 million from Component 2 was reallocated to the amended Component 1(b), allowing the capitalization of the AEEF. The revision of Component 1(b) allowed the project to avoid the lengthy process of creating a new self-standing trust fund—as envisioned in the project design. Instead, the GoA and the team identified the possibility of embedding the AEEF under a preexisting trust fund within the Ministry of Industry—the FONAPyME Trust Fund. The FONAPyME was already an existing trust fund providing credit lines to industrial and commercial SMEs for upgrading technology and infrastructure, among other things. By embedding the AEEF within the FONAPyME Trust Fund, the project could open the energy efficiency line of credit to SMEs, and thus start investing in projects, and demonstrating AEEF's commercial viability.

20. Considering that the AEEF became operational during the project and that the GoA had financed the distribution of all 26 million CFLs with its own resources by the time the project became effective, it was both necessary and rational to reallocate US$9.2 million.

II. OUTCOME

A. RELEVANCE OF PDOs

Assessment of Relevance of PDOs and Rating

21. Overall relevance of the PDO with regard to the Argentina Country Partnership Strategy (CPS) for FY15–FY18 is substantial. The CPS for FY15–FY18 is built upon nine World Bank Group results areas set within three broad pillars: (a) employment creation in firms and farms, (b) availability of assets for people and households, and (c) reduction of environmental risks and safeguarding natural resources.

22. The Argentina CPS identified 'Pillar I: Unlocking long-term productivity growth and job creation' as the main area of engagement for the World Bank Group. The CPS identified "facilitating access to longer-term credit and the expansion of online platforms and electronic processing tools to increase the productivity and the job-creation potential of Argentine SMEs" as a way to achieve Pillar I. Under this project, SMEs were the main beneficiaries, first through the activities that uncovered savings potential through the energy diagnostics, and second by providing SMEs access to a new credit line for energy efficiency improvements, ultimately supporting SMEs to increase their productivity. The GoA is determined to continue providing this credit line and improve the application process for SMEs through electronic tools and online platforms. Furthermore, the need to continue conducting energy diagnostics, so that SMEs can access the credit line has also created an environment that promoted job creation, requiring firms to specialize in this new type of diagnostics.

23. The project also supported Pillar III of the CPS 'Reducing Environmental Risks and Safeguarding Natural Resources.' Notably, the general population will benefit from positive environmental impacts.

[3] See Section III.B for details on implementation delays.

Overall, higher end-use efficiency creates a positive link between environmental, economic, and social outcomes. Among the environmental benefits of reducing energy consumption through energy efficiency projects are the reduction in local air pollutants (particulates, SO_X, NO_x, and hydrocarbon emissions) and the reduction of GHG emissions, specifically CO_2, which the project directly addressed in its PDO.

B. ACHIEVEMENT OF PDOs (EFFICACY)

Assessment of Achievement of Each Objective/Outcome

24. The overall efficacy of the project is high as the two objectives—increase the efficiency in the use of energy and reduce GHG emissions—were achieved and the PDO-level indicator targets were in fact surpassed (see details in tables below).

25. To achieve these objectives, the project focused on developing a sustainable growing market for energy efficiency services and equipment, as well as removing regulatory, financial, and informational barriers that prevent activities and investments in energy efficiency and energy conservation. Component 1 specifically focused on the commercial and industrial sector by providing a new energy efficiency credit line for SMEs to upgrade their equipment. Component 2 focused on the household sector, supporting the replacement of incandescent light bulbs with CFLs. Component 3 transversally focused on all sectors, supporting the creation of new energy efficiency norms, the development of ESCOs and awareness-raising activities.

26. Out of the four PDO-level indicators identified, the two main indicators to assess the achievement of the two objectives are (a) accumulated amount of GWh saved and (b) accumulated amount project-related avoided emissions (million tons of CO_2 as explained in the section Key Expected Outcomes and Outcome Indicators.

Table 2. PDO Indicators and Achievements

PDO Indicators			Baseline	Original Target	Revised Target	Project Values at Project Completion	Achievement
1.	Original	Accumulated amount of GWh saved	0	17,257	—	63,841	**Achieved (370%)**
1.	Original	Accumulated amount project-related avoided emissions (million tons of CO_2)	0	10.7	—	34	**Achieved (318%)**

27. The three main activities that led to the achievement of the objectives and linked outcomes—of largest to smallest contribution were the following:

(a) Component 2: Development of a Utility EE Program

(b) Component 3(b): Labeling - accelerate and strengthen the capacity for the standardization, testing, certification, and labeling program

(c) Component 1(b): Development of AEEF

28. Since increasing the efficiency in the use of energy reduces associated GHG emissions, these three activities contributed to achieving both objectives simultaneously. The explanations of the contributions of each activity are provided in the following paragraphs.

29. **Component 2: Development of a Utility EE Program.** This activity alone accounted for 75 percent of energy savings by replacing 29 million incandescent lightbulbs in residential homes with CFLs. This component was a major contributor to surpassing the expected target values for both outcome indicators—energy savings (measured in GWh saved) and reducing associated GHG emissions (measured in avoided CO_2 emissions). Even before the approval of the project, the World Bank team supported the GoA in the design and preparation of the necessary technical and procurement documentation to procure and distribute the CFLs. Ultimately, the target values were exceeded by project closing.

30. However, it is worth mentioning that, given the delay in the effectiveness of the project, the GoA decided to finance with its own resources the distribution of all 26 million CFLs. Thus, given that the GoA cofinanced the implementation of Component 2, the project was restructured to reallocate US$9.2 million previously assigned to Component 2 into Component 1. Given that the Component had been designed and prepared as part of the project, the GoA and the World Bank team agreed to retain this component in the project and continue measuring its results among the project indicators.

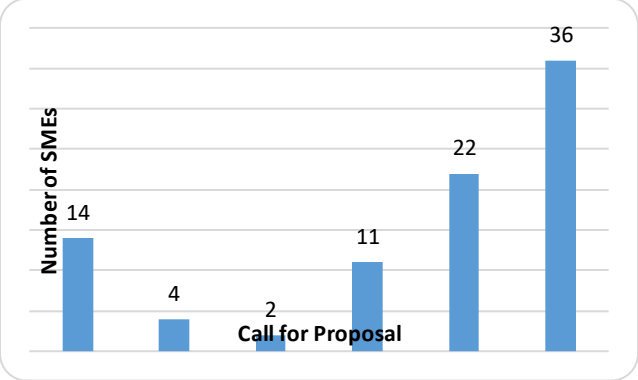
31. **Component 3(b): Labeling. Accelerate and strengthen the capacity for the standardization, testing, certification, and labeling program.** This activity accounted for close to 25 percent of energy savings. The aim of the activity was to strengthen the capacity of the different stakeholders involved in the standardization, labelling, and issuance of mandatory energy efficiency norms, minimum energy efficiency standards, and energy equipment labels. The project financed four contracts between Argentina's Institute for Norms and Measures (IRAM) and the former Secretariat of Energy/current Sub-secretariat of Energy Efficiency and Savings (SSEES) to issue the 19 energy equipment labels, which in turn allowed IRAM to dedicate considerable resources, and specialized staff into generating energy efficiency norms. By assigning dedicated staff to focus on energy efficiency norms, IRAM was able to issue the labels and standards in a shorter time frame than normal. This was achieved by strengthening the capacity of IRAM by hiring experts that provide advice on (a) the study of energy efficiency norms and regulations; (b) the development and systematization of a permanent database, which is periodically updated; (c) improvement of the institutional framework and of the interrelations among the participating agents; (d) strengthening of the taxation and control activities; and (e) strengthening of the laboratory structure for testing. A list of all norms and standards created under the project can be found in annex 7.

32. **Component 1(b): Development of the Argentina Energy Efficiency Fund (AEEF).** While this activity only contributed 0.1 percent to energy savings, the operationalization of the AEEF did "increase the efficiency in the use of energy by developing a sustainable and growing market for energy efficiency services and equipment in Argentina."[4] While the uptake of the credit line was slow, both tariff incentives and appropriate marketing helped the AEEF credit line attract the interest of SMEs. By project closing, there were a total of 6 calls for SMEs to submit proposals for the energy efficiency credit line, with 89 submitted proposals by SMEs, and 17 projects were financed, disbursing US$0.74 million and saving 25.17

[4] Specific wording from the Legal Agreement.

GWh of energy. Out of the 17 projects financed, 5 SMEs participated in the feasibility study/energy diagnostics financed by the projects. The target values were lower than expected. The reason for the number of submitted proposals decreasing between AEEF I and AEEF III can be attributed to the period leading up presidential elections whereby much of the dedicated staff was otherwise occupied (see figure 2). The rise in the number of proposals in 2016 is related to the establishment of the SSEES, thus allowing the PIU to focus on outreach efforts to promote the AEEF, as well as the increase the electricity tariff for commercial consumers which came into effect early in 2016. The number of proposals doubled between the call AEEF IV and AEEF V due to the SMEs paying higher electricity prices because of the increased tariff, as well as improved marketing efforts by the SSEES. Under Component 3(d), the project financed several outreach and marketing activities aimed to promote the AEEF and collect contact information of SMEs who would be interested in accessing an energy efficiency credit line.

Figure 2. Number of SMEs that Submitted Proposals



(Source: directly from SSEES)

33. Although the final achieved values related to the indicators of this component are below the expected target values, the SSEES has seen a growing demand for this credit line and therefore will continue managing this credit line after project closing. and will increase the lending capital. Its implementation during the project served as a valuable testing period to fine-tune the application and disbursement processes.

34. Ultimately, the associated accumulated amount of project-related avoided emissions was 34 million tons of CO_2, 3.2 times higher than target values.

35. Other activities that qualitatively contributed to the increase in the efficient use of energy in the long term.

- Component 1 (a) financed feasibility studies/energy audits of 219 SMEs with the aim to grow the pipeline of potential AEEF projects. This exercise led to the creation of a roster of qualified auditors, incentivized SMEs to apply for the credit line, and strengthened the national capacity of analyzing energy savings measures in SMEs.

- Component 3(c) aimed to strengthen the capacity of ESCOs to provide energy efficiency services.

- Component 3 (d) financed information, training, and dissemination programs aimed at residential, commercial, and industrial users to raise awareness about energy efficiency measures. A few examples include the following:
    - Top 10 Argentinian websites to increase information geared primarily at the end-users, such as citizens buying equipment, but also toward manufacturers and other audiences interested in finding out about the labeling norms that are published.
    - Organization and the delivery of theoretical practical training courses on energy efficiency and rational use of energy for 3,000 sellers of household appliances. The number of sellers who participated was 3,019.
    - Energy diagnostics of 10 public buildings to identify potential energy savings measures.
- A more detailed list of activities that contributed to increasing the efficient use of energy can be found in annex 7.

Justification of Overall Efficacy Rating

36. The overall efficacy rating is High based on achievement of the outcomes of increasing the efficient use of energy and energy conservation as well as reducing CO_2 emissions. The project exceeded its target values of GWh saved and CO_2 emissions reduced. One of the objectives of the project was to tackle energy efficiency on the demand side and increase the efficiency in the use of energy, to secure energy supply in the long and medium term by saving energy and delaying construction of new generation plants, particularly fossil fuel generation. The second objective was to reduce GHG emissions, which is linked to inefficient energy usage.

C. EFFICIENCY

Assessment of Efficiency and Rating

37. Efficiency with regard to cost-effectiveness (spending on the right activities) is rated Substantial. The project's design and implementation paid special attention to an efficient use of resources. Energy efficiency was identified as one of the least-cost options to secure energy supply in Argentina in the short and medium term, through the delay in construction of new generation plants and associated investments in transmission and distribution, particularly for meeting peak demand. This was confirmed through the financial analysis performed for the replacement of incandescent bulbs with CFLs under Component 2. CFLs use 75 percent less electricity than the equivalent incandescent lamps given the same amount of lumen outputs, each saving 164 kWh per year. As a result, the replacement of incandescent bulbs with CFLs has an average internal rate of return (IRR) of 12 percent to 35 percent and a repayment period of 24 to 36 months, depending on the tariff levels for customers in different consumption categories. The repayment period is much shorter than the life of CFLs. Ultimately, the passing of the law that prohibited the commercialization of incandescent lamps has a significant long-term impact on the residential consumer's electricity consumption pattern.

38. The reduction of energy use during the day by the usage of more efficient lamps represents important savings for the customers but a loss of income by the utilities. However, the loss of income by

the utilities is partially compensated by the reduced purchase of energy in the wholesale market and the postponement of investments in generation, transmission, and distribution.

39. The incremental cost of the GEF alternative was estimated at US$91.628 million, and the global environmental cost for which GEF resources were requested was US$15.155 million. The substantial domestic incremental costs would be covered through increased investments by electricity customers through the utility program. Global incremental costs occur for those measures needed to stimulate investments in industry, commerce, public, and residential sectors and to support the national incandescent bulb phase-out program, as well as those measures for improvements in the regulatory framework, capacity building, and information (including risk perceptions and pilot programs).

40. Accumulated GHG emissions reductions directly resulting from the project were expected to reach 10.7 million tons of CO_2 with associated savings of 17,257 GWh of electricity. The GEF investment exceeded these indicators, resulting in the reduction of 34 million tons of CO_2 and saving 63,841 GWh.

41. The implementation efficiency is rated Modest. The project reached its objectives of increasing the efficient use of energy (GW saved) and reducing GHG emissions (reduction in CO_2 emission). The efficiency of carrying out the activities that directly contributed to the objectives allowed the project to exceed target values. However, all implemented activities suffered from continuous delays and a slow implementation pace. Some aspects of design and implementation that contributed to or reduced efficiency included initial delays in signing of the Presidential Decree needed for effectiveness, ulterior delays due to the existence of multiple small activities that involve several stakeholders and the process to change sector authorities. Also, the activities under Component 1 required more time and resources than anticipated, resulting in lower target values for the intermediate outcome indicators. Ultimately, this turned into cost overruns for Component 1 (a) and the project had to be restructured to adjust for the higher cost energy audits, for example.

42. The overall efficiency rating is Substantial based on what would be expected in the operation's sector. This project was one of the first energy efficiency projects in Argentina and had an ambitious scope by addressing all three consumer sectors. The efficiency of the cost-effectiveness, however, was Substantial and the focus on certain main activities still led the project to exceed the expected target values. Therefore, even though the overall implementation efficiency rating was categorized as Modest, when considering both the cost-effectiveness and the implementation strength to achieve of the objectives, the overall efficiency rating is Substantial.

D. JUSTIFICATION OF OVERALL OUTCOME RATING

43. The overall outcome rating is Satisfactory based on the Substantial rating for relevance, High for efficacy, and Substantial for efficiency.

E. OTHER OUTCOMES AND IMPACTS (IF ANY)

Gender

44. Not applicable.

Institutional Strengthening

45. The project contributed substantially to the institutional strengthening, primarily within the SSEES (former Secretariat of Energy), which was established in 2015; IRAM, the National Standards Bureau; and participating ESCOs that provided successful energy auditing services.

46. Because of the project, the recently established SSEES was strengthened. During project preparation and most of the project implementation, the former Secretariat of Energy consisted of three dedicated staff working on energy efficiency projects. At the time of project preparation, the GoA did not have a separate Ministry of Energy and Mining nor a SSEES. Through the project activities, the recently established SSEES was strengthened as demonstrated by the following achievements:

- Enhanced capacity to sustainably continue the AEEF credit line beyond the project lifetime: following the success of the seven calls for proposals completed during project implementation, the *Banco Nación* confirmed continued interest to act as retail agent to SMEs through the AEEF. Furthermore, the SSEES is discussing adding another credit line specifically meant for larger consumers to access higher energy efficiency loan amounts.

- Development of an institutional roster of qualified companies for the PIU to expedite the selection and award of contracts to execute energy diagnostics/audits in SMEs from various sector

- Annual 'National Energy Efficiency Day' (*Jornada Nacional de Eficiencia Energetica*) organized by the SSEES in December 2016: following the success of the 1st National Energy Efficiency Day, partially funded by the project, the SSEES brought together more than 350 participants over the course of three days, including national and municipal government agencies, energy efficiency companies, industrial and commercial companies, various chambers, ESCOs, nongovernmental organizations (NGOs), the press, embassies, and multilateral and bilateral organizations. This has become an important annual event organized by the SSEES to bring together different stakeholders, with the 2nd annual event in November 2017 attracting over 500 participants.[5]

- Office equipment: the recent creation of the SSEES allowed an increase of personnel working on energy efficiency programs and projects. Given the limited budget allocated to the SSEES, office equipment and software has been vital for the PIU and other SSEES personnel to continue developing the energy efficiency mandate.

47. Before the project, IRAM had only issued four energy equipment labels. Through the close collaboration with the PIU to develop energy equipment labels, norms, and minimum standards, the institutional capacity of IRAM was strengthened as demonstrated through the issuance of 15 energy equipment labels during project implementation.

[5] *Source:* News - "Aranguren cerró la 2da Jornada Nacional de Eficiencia Energética", 24 de Noviembre de 2017, Argentina Ministry of Energy and Mines Website [*Link*].

48. Participating ESCOs were strengthened by successfully providing energy auditing services and subsequently becoming part of a special roster which the SSEES will continuously use for future energy auditing services.

Mobilizing Private Sector Financing

49. By creating and operationalizing the AEEF, the project mobilized private sector funds. A local bank, *Banco Nación*, functioned as the financial intermediary and financed up to 70 percent of the costs of implementing eligible investment subprojects. Beneficiaries contributed the remaining 30 percent. Following the increasing demand in the credit line, *Banco Nación* agreed to continue as a financial intermediary after project closing to continue financing the credit line.

Poverty Reduction and Shared Prosperity

50. This project aimed to reduce national GHG emissions by tackling demand-side energy use, therefore indirectly, and in the long term, improving the livelihoods of the entire population, including the most vulnerable. In particular, impoverished communities experience reductions in safe drinking water as well as food security because of climate change. Furthermore, the project included the implementation of communication and outreach activities to educate the general public (including vulnerable communities) about energy efficiency and the efficient use of energy, in schools and in low-income neighborhoods throughout the country, with the expectation that learning from those activities will translate into behavior changes at the household level.

51. In addition, the project supported the improvement of energy efficiency (and thus the productivity) in SMEs through the activities financed under Component 1 and Component 3, both geared toward SMEs. This is expected to facilitate an environment in which SMEs can flourish, allowing them to play an important role in more equal economic development and achieving shared prosperity.

52. The project financed 219 energy efficiency diagnostics in SMEs, offered a new credit line to SMEs to improve their energy efficiency and therefore reduce their operational costs. By project closing, a total of 89 SMEs had applied to the credit line, 13 projects were financed (saving a total of 66,447 MWh of energy), and the credit line has shown strong potential as a fundamental tool for SMEs that seek to reduce their energy consumption and is essential to accompany energy efficiency policies aimed at this sector.

53. Additional complementary activities were implemented, as the dissemination of the results obtained during energy diagnostics, the dissemination of energy efficiency promotional material for residential, commercial, and industrial sector. These activities allowed to raise awareness among a larger number of SMEs about the possibility of doing energy diagnostics in the future as well as about the energy efficiency credit line.

54. Lastly, activities funded under Component 3 also sought out to identify national firms that could develop further expertise in undertaking energy diagnostics, which has become a growing market. Other activities also trained energy managers in energy efficiency for SMEs and provided the possibility of a further certification to better manage and oversee energy use.

Other Unintended Outcomes and Impacts

55. As a lesson learned from the application process, SMEs have gone through to access the AEEF line, the SSEES decided to develop prefeasibility tools to shorten the time needed to determine whether an SME qualifies for a AEEF credit line. These tools have not yet been completed but are being prepared.

56. University professors are developing energy efficiency curriculums around policy and engineering.

57. Creation of a prequalified roster of firms to expedite the selection and award of contracts to execute energy diagnostics/audits in SMEs from various sector

58. New energy efficiency certification courses are being offered by private sector companies to ESCOs as well as facility managers of SMES.

III. KEY FACTORS THAT AFFECTED IMPLEMENTATION AND OUTCOME

A. KEY FACTORS DURING PREPARATION

59. The project was designed with two project objectives (a) to increase the efficiency in the use of energy and (b) reduce greenhouse gas emissions. Both the project objectives and targets of the project were realistic and at the right level of ambitiousness. To achieve these objectives, the project focused on introducing energy efficiency in the public agenda and developing a sustainable growing market for energy efficiency services and equipment, as well as removing regulatory, financial, and informational barriers that prevent activities and investments in energy efficiency and energy conservation. Component 1 specifically focused on the commercial and industrial sector by providing a new energy efficiency credit line for SMEs to upgrade their equipment. Component 2 focused on the household sector, supporting the replacement of incandescent light bulbs with CFLs. Component 3 transversally focused on all sectors, supporting the creation of new energy norms and financing awareness-raising activities.

60. The rationale for the design of the project was to make a concerted effort to tackle energy efficiency on the demand side in Argentina, addressing the consumption of all sectors, including household, commercial, and industrial. The reforms in the 1990s focused on production, transmission, and distribution of electricity and natural gas but did not address efficiency improvements on the demand side. This situation has resulted in higher energy use for the Argentine economy, and consequently higher energy imports for the country, higher energy costs and lower competitiveness for productive sectors, greater energy consumption for consumers with increasingly higher costs as retail prices are raised, and greater local and global pollution associated with the consumption of fossil fuels. The 1999–2005 PIEEP project demonstrated a large potential for energy efficiency and productivity improvements in SMEs, but the inadequate development of an ESCO industry, and a financial sector averse to investment lending, left many potential energy efficiency projects idle. Given rising energy imports, concerns about the security of energy supply, and growing environmental awareness, the GoA showed strong commitment to implement a more ambitious energy efficiency program at the time of preparation.

61. The World Bank team and the recipient designed the project based on extensive prior information collected, including from the following preparation activities to (a) study the regulation, tariff signals, and economic incentives for the efficient use of energy; (b) design an Energy Efficiency Investment Fund and

evaluate financial institutions; (c) design a utility program; (d) design a national standardization and labeling program and of an ESCO development program; and (e) undertake a baseline study of the energy market, incremental cost of the project, and estimated emissions reduction.

62. The project was designed to engage with the appropriate selection of stakeholders and identified the following target the following beneficiaries: (a) SMEs, mostly in the industrial and the service sector, municipalities, and housing cooperatives/ associations; (b) ESCOs and energy efficiency consulting firms; (c) electric utilities and their customers; (d) academic entities and laboratories; and (e) local environmental and energy efficiency advocacy groups and NGOs.

63. The design of Component 1 and Component 2 was simple, with clear operational logic and appropriate timing and sequencing of tasks given the country context. Since the earlier PIEEP already demonstrated a large potential for energy efficiency and productivity improvements in SMEs, Component 1 was designed to (a) develop a pipeline of energy efficiency projects to be financed through a grant facility and (b) develop the AEEF. Component 2 was designed to provide additional support to national utilities in carrying out PRONUREE where the GoA established the goal to phase out the incandescent bulbs in the residential sector by 2011.

64. However, the design of Component 3 and its six subcomponents were loosely structured and the outcome of most of these activities could not be directly linked to the project objectives, except for Component 3(b) which focused on strengthening the capacity to issue equipment labeling. Even though the operational logic for the other activities under Component 3 can be inferred, the design, timing, and sequencing of some of the tasks lacked clear alignment with the project objectives and outcomes. The inadequate preparation for Component 3 is also reflected in the design of the Results Framework. While the PDO indicators are clearly aligned with the two project objectives, some of the original intermediate outcome indicators did not adequately monitor progress toward the two objectives—improving the efficiency use of energy and reducing CO_2 emissions.

65. Energy efficiency projects that seek to provide capacity training and to inform, educate, and create awareness around energy efficiency on a national level ultimately require the development of activities that need to be broken down into several small contracts. The management of many small contracts can lead to a big administrative burden, which affects both the management of the activities as well as the disbursements, as was the case with this project.

66. Overall, the critical risk matrix and the mitigation measures identified were adequate. However, the project failed to explicitly consider political and governance risk due to legislative and/or presidential elections.

B. KEY FACTORS DURING IMPLEMENTATION

Factors Subject to the Government and/or Implementing Entities Control

67. **Government factors.** The project had a slow start due to the internal process within the GoA, which required first a Presidential Decree before signing the GEF Grant Agreement. While the project was approved by the Board on June 26, 2008, the Presidential Decree was not approved until September 14,

2009, and subsequently the Grant Agreement was signed on October 1, 2009. The project was declared effective on November 20, 2009—17 months after Board approval.

68. During the project preparation phase, the bidding documents for the acquisition of the CFLs were prepared and by the time the project became effective, the GoA had already successfully distributed and installed all 26 million CFLs (Component 2). Therefore, once effective, the funds from Component 2 were reallocated to finance the capitalization of the new AEEF credit line for SMEs, as well as allocate adequate funds to continue the energy diagnostics, which turned out to be more expensive, based on the experience from financing the first 25 during the pilot phase.

69. During the project implementation period, there were changes in government authorities affecting the project management capacity of the PIU (part of the former Secretariat of Energy/current SSEES). When a new Secretary of Energy was appointed in July 2014, the project faced important administrative delays in signing contracts. The institutional capacity for implementation was again affected following the presidential elections in November 2015 due to several changes in important government authorities, such as the creation of a separate Ministry of Energy and Mines and another change in the appointment of the Secretary of Energy. When the Ministry of Energy Mines was created, so was the SSEES, replacing the Directorate Secretariat of Energy, which was dependent on the Ministry of Federal Planning. This also meant that the PIU was moved to the SSEES, initially leading to administrative delays due to employee turnover, loss of knowledge and institutional memory, and change of location of the PIU.

70. However, the creation of the Ministry of Energy and the SSEES demonstrated renewed interest in the topic of energy efficiency and strong commitment to the implementation of this project. With the change from Directorate to Sub-secretariat, the implementing agency increased in institutional relevance with a larger budget and the possibility of hiring additional technical resources.

71. These changes in the Government also contributed to why the AEEF was slow in attracting SME proposals during the first four calls for proposals. Several factors, though, contributed to the rise in demand for the credit line. The tariff increase for industrial consumers that came into effect in early 2016 provided a greater incentive for SMEs to lower energy costs and thus look for energy efficiency improvements. The increase in the proposal submission could also be linked to the improved marketing and outreach campaigns designed by the PIU. Both factors, tariff increase, and improved marketing led to an increase in proposal submissions by SMEs.

72. **Implementation Unit factors.** Throughout the project implementation, the PIU faced challenges regarding efficient and timely preparation of individual activities. This also affected the procurement process of works, goods, non-consulting services, and consultants. Although the PIU received capacity training in 2011, hired an additional procurement staff and developed an Operational Manual acceptable to World Bank standards, the PIU continued to face procurement challenges. Changes and updates to the Procurement Plans were done based on the flow and needs of the project rather than with adequate planning, slowing down the procurement process and implementation pace. Ultimately, the project did not fully disburse (4 percent) due to inadequate preparation of activities, which ultimately slowed down procurement process (timing and sequencing of activities) which in the end did not allow to finish all activities under 3(f).

73. **Other factors.** Other factors subject to implementing entities control that positively influenced the operations achievement included their overall strong coordination and engagement with relevant stakeholders, such as IRAM and the FONAPyME. Through these collaborations, the PIU could advance large portions of the activities under Components 1 and 3.

74. A time line that summarizes the main milestones throughout the life of the project can be found in annex 6.

Factors Subject to World Bank Control

75. The World Bank team conducted regular supervision missions to meet with the implementing agency to discuss progress under the project. There were three task team leaders (TTLs), and the current TTL was part of the project team during preparation as well as throughout the implementation and is based in Argentina. The World Bank was proactive in integrating new opportunities and adapting to changing conditions to improve the implementation and outcomes, as can be seen through the three formal restructurings carried out by the World Bank to modify a component, reallocate funds, update indicators, and extend closing deadlines.

76. The implementing agency would have benefitted from increased World Bank support regarding procurement challenges faced as well as a thorough review of the implementing agency's data collection and reporting methods for M&E. There were no factors outside the control of the Government and/or implementing entities that influenced the operation outcomes.

IV. BANK PERFORMANCE, COMPLIANCE ISSUES, AND RISK TO DEVELOPMENT OUTCOME

A. QUALITY OF MONITORING AND EVALUATION (M&E)

M&E Design

77. **Quality of M&E Design is rated as Modest.** The operation's theory of change is clear and the quality of the PDO indicators were more than sufficient to measure the achievement of the two objectives—(a) increase the efficient use of energy and (b) reduce GHG emissions. However, the project could have benefitted from better indicators that would have allowed to quantify some of the impacts, such as 'electricity bill reduction for residential households using CFLs' or 'electricity bill reduction for SMEs using more efficient technology'. The M&E framework designed at appraisal had some shortcomings with regard to the intermediate outcome indicators, which were not adequately defined to measure the progress of some of the activities. These initial weaknesses in the M&E design were addressed in the first two restructurings that took place, whereby new and replacement indicators were created, which were more measurable. However, the original M&E design was overall adequate to assess the achievement of the objectives and outcomes.

M&E Implementation

78. **Quality of M&E implementation is rated as Modest.** The World Bank's Implementation Status and Results Reports (ISRs) provided regular updates on the Results Framework indicators, including explanations for discrepancies in calculations reported in consecutive ISRs.[6] However, there were further discrepancies in the ISRs with regard to baseline values and actual values not linked to new calculation methods. This was most likely due to inconsistent progress report data provided by the implementing agency due to staff turnover or due to negligence by World Bank team members during data entry in the portal. While progress reports were submitted regularly by the implementing agency, different output numbers can be found between the various reports submitted by the implementing agency. Nevertheless, even when assessing the M&E data with lower or higher output numbers, the data discrepancy would have a negligible effect on project objectives and outcomes and would still be considered generally sufficient to assess the achievement of the objectives and outcomes.

M&E Utilization

79. **Quality of M&E utilization is rated as Substantial.** Data were collected from the progress reports to regularly update the indicators and to inform decision making on certain activities. During the midterm review that took place in June 2012, the World Bank team noted that the low disbursement and explored options to reallocate funds from Component 2, which ultimately was fully financed by the GoA, to Component 1. The restructuring that took place on September 20, 2013, allowed to operationalize the AEEF under Component 1(b) and finance the credit line. Furthermore, based on the experience with the first 25 feasibility studies/energy diagnostics financed under Component 1(a), the cost for each audit was significantly higher than originally estimated and a reallocation of funds from Component 2 allowed to carry out further feasibility studies.

80. As part of the September 2013, the World Bank team took the decision to replace three of the original intermediate indicators linked to Component 3 to make the indicators more measurable with regard to achieving the expected outcome (see paragraph 11).

Justification of Overall Rating of Quality of M&E

81. **The overall rating of quality of M&E is Substantial.** The M&E design was flexible and the World Bank team could restructure the project to adequately adjust intermediate outcome indictors and target values during implementation. M&E reports were prepared on time to keep track of project status at any given time. While there were moderate shortcomings in the M&E design and implementation, overall, the M&E system was generally sufficient to assess the achievement of the objectives and outcomes.

B. ENVIRONMENTAL, SOCIAL, AND FIDUCIARY COMPLIANCE

82. **Environmental and social compliance.** Throughout project implementation the safeguards ratings were Satisfactory. The original safeguards category for the project was classified as 'C'. However, with the addition of a credit line under Component 1(b) to finance energy efficiency sub-projects in SMEs, the safeguards category was changed from 'C' to 'B' during the restructuring of September 20, 2013. The

[6] Linked to Nationally Determined Contribution calculations.

project complied with all triggered safeguards policies (OP 4.01). The Secretariat of Energy developed an Environmental and Social Management Framework (ESMF) in accordance with the environmental policies of the World Bank. The ESMF was used and implemented by Secretariat of Energy through the specialists within the PIU and each SME who received the credit line (subprojects) also submitted their own Environmental Management Plan. All subprojects financed to date by the credit line were considered low risk.

83. **Financial management (FM).** Project FM performance rating was consistently Satisfactory throughout the implementation period. The project showed adequate FM arrangements that complied with World Bank requirements. The project implementation initially developed at a very slow pace. Interim financial reports were received by the World Bank, reviewed, and found acceptable. Extension of the Grant closing date as well as reallocations of proceeds among disbursement categories were required by the client and approved by the World Bank for project implementation completion. The project financial statements audits have been carried out by Argentina Supreme Audit Institution (*Auditoria General de la Nación*, AGN) since project inception. Audit reports were received by the World Bank with some delay and reviewed and found acceptable, and no accountability issues have arisen throughout the project life. The project closed on May 31, 2017. Advances to the Designated Account have been fully documented to the World Bank. An amount of US$718,637.50 was cancelled corresponding to non-executed funds. The last audit report, covering the period from January 1, 2017, to the closing date, including the grace period, is expected to be submitted to the World Bank no later than June 30, 2018.

84. **Procurement.** Procurement performance was moderately satisfactory over the course of the project. Similar weaknesses were found during procurement post review missions conducted annually. Overall performance on procurement activities was good, with some minor issues, such as monitoring and delays in updating of the Procurement Plan to reflect progress. Although the World Bank approved an extension of the Grant closing date for project implementation completion, some contracts (consultant services) were cancelled. The World Bank's final rating for procurement was Moderately Satisfactory.

C. BANK PERFORMANCE

Quality at Entry

85. The World Bank's performance with respect to quality at entry is Satisfactory. The project was of strategic relevance and in alignment with the GoA's National Program for the Rational and Efficient Use of Energy (PRONUREE, Decree 140/2007), which declared the rational and efficient use of energy to be of national interest. The project was designed thoughtfully, considering all energy consuming sectors—household, commercial, and industrial—and with well-defined implementation arrangements. During project preparation and appraisal, the World Bank considered the adequacy of project design and all major relevant aspects, such as technical, financial, economic, institutional, and procurement. Risk factors and lessons learned from earlier projects were also considered and incorporated into the design. After Board approval, the team closely monitored and engaged with the recipient about the Presidential Decree, which needed to be signed before the recipient could sign the Grant Agreement. The quality at entry was, however, weakened by not providing timely procurement training to the PIU until 2011, which ultimately caused some delays in procurement, as well as inadequately prepared procurement plans.

Quality of Supervision

86. **The World Bank's performance with respect to the quality of supervision is satisfactory.** On average, two full-fledged supervision missions were conducted per year. The project leveraged locally based World Bank staff to maintain engagement with stakeholders and fostered communication. In 2013, the TTL role was transferred to the current TTL, who is locally based in Buenos Aires. Additional guidance was also provided during implementation, when needed, through the organization of workshops and the deployment of World Bank specialists (for example, procurement, FM, and safeguards). The World Bank was proactive in recognizing the needs to improve the components and Results Framework, which led to the two project restructurings in 2013 and 2016. Particularly, the restructuring in 2013 required continuous follow-up with the client and internal World Bank departments to reallocate 50 percent of the project funds to create and capitalize on the AEEF by embedding the fund under the existing FONAPyME Trust Fund geared at SMEs: new Memorandum of Understanding between government agencies had to be negotiated, drafted, and signed; new effectiveness conditions were created and met; the change in safeguards category from 'C' to 'B' was a long process; and ultimately the changes to the Grant Agreement required ongoing dialogue with the client. Over the course of the project, the team could maintain a candid dialogue with the project team and client to address various issues.

Justification of Overall Rating of Bank Performance

87. For the reasons outlined in the previous paragraphs, the overall rating for World Bank performance is Satisfactory.

D. RISK TO DEVELOPMENT OUTCOME

88. At project completion, the risk to development outcome is considered low. The main activities directly measured to assess achievement of development objectives are (a) the creation of the AEEF, (b) develop a pipeline of bankable projects, (c) distribution of CFLs, (d) strengthening of the IRAM labeling program, and (e) training for ESCOs. Activities (a)–(d) will be continued after projection completion. The SSEES and *Banco Nación* committed to continue the credit line and are improving the prequalification process for SMEs to reduce the time, length, and financial burden on SMEs trying to gain access to the energy efficiency credit line. The SSEES also has a considerable list of interested SMEs and the pipeline of bankable projects is expected to continue growing. With regard to distribution of CFLs, the GoA published the 'Public Lighting Plan' (Resolution 84-E/2017) in April 2017, which aims to improve energy efficiency in public lighting across Argentina and replace them with more efficient LED technology. With the experience acquired during project implementation, the SSEES also confirmed that they will continue working with IRAM to issue more standards, labels, and norms. The training that ESCOs received will serve them to provide energy efficiency services to their clients.

89. However, with regard to communication and awareness campaigns to inform energy users about energy efficiency, the SSEES currently does not have sufficient budget to continue printing the necessary brochures, manuals, and other learning material. Nonetheless, the SSEES is preparing several online tools and platforms to continue information dissemination.[7]

[7] *Source:* Informe de Cierre, August 31, 2017, Sub-secretariat of Energy Efficiency and Savings.

V. LESSONS AND RECOMMENDATIONS

90. **Early marketing and pipeline development are critical for demand-driven programs such as the AEEF.** The AEEF would have benefitted from more focused outreach campaigns across Argentina to increase the number of proposals submitted per call for proposals. In a survey carried out by the PIU among SMEs that participated in the energy diagnostics, most SMEs stated that they did not apply to the AEEF because they did not know about the credit line. While the PIU and FONAPyME did carry out promotional campaigns to increase the demand for financing, the lack of continuity in SME's outreach activities as well as lack of specific experience in communicating the benefits of the energy efficiency financing played its role in lower than expected demand during the first few years of the implementation.

91. **Streamlining the application process to access the credit line is important to increase the number of proposals submitted.** Initially, each SME had to prepare a technical prefeasibility study for their proposal to determine whether they are eligible for the credit line. However, under the current procedures, there is no standardized way for SMEs to perform a quick analysis of their energy savings potential, and they have to either pay for energy audits, which are expensive, or do an in-house analysis of their potential energy savings, even though energy efficiency is a new topic that most energy managers are not trained on. Therefore, the SSEES is working with FONAPyME to build an online platform for SMEs to quickly calculate their potential energy savings, based on their industry, and determine whether they would be eligible for the credit line.

92. **Creating a roster of prequalified firms that can carry out energy diagnostics by sector is essential to expedite assessments in SMEs.** Rather than doing requests for proposals each time, energy diagnostics need to be carried out. The demonstrated benefits during this project of creating a roster with prequalified firms are the expedited selection and awarding of contracts to execute energy diagnostics/audits in SMEs from various sector.

93. **The project design was too complex, including too many activities with a small grant.** This project was designed in 2008, when energy efficiency was a relatively new topic in Argentina, and the GoA was interested in using as much money as possible across all consumer sectors to jump start discussions and include energy efficiency in the public agenda.. However, this meant breaking down the small grant into several activities, causing procurement delays, and reducing the impact the project could have had if it had focused on one or maximum two sectors as opposed to all demand sectors. Component 3 had to be restructured to reallocate money since not all activities envisioned during project design were able to be completed. Because activities related to funding studies and outreach campaigns tend to be fragmented and small, the PIU procurement teams need to be appropriately supported to deal with the preparation and management of the various contracts. Further, activities should be designed in a way to bundle contracts and reduce transaction costs.

94. **Beneficiaries need to have a strong incentive to seek an energy-efficient credit line.** In the case of Argentina, the number of proposals submitted increased significantly once the electricity tariff increased in early 2016, which is one of the reasons for the program's success and continuation beyond project completion. In fact, with no such incentive, an energy efficient credit line would have gained as much traction within that time. The credit line also had a small budget, and ultimately was geared toward smaller SMEs, whereby larger SMEs consumed more energy and would have seen bigger energy savings

would they have access to a larger credit line. Creating different credit lines to cater to the different consumption of small, medium, and large companies is important to capitalize on the different incentives these companies have for this type of credit line.

ANNEX 1. RESULTS FRAMEWORK AND KEY OUTPUTS

The ICR team adopted a summary table instead of the system-generated Results Framework. The following modified Results Framework table was designed to convey changes in the Results Framework during the project.

Table 1.1. Summary of PDOs and Indicators

Objective 1		**Increase the efficiency in the use of energy**						
Objective 2		**Reduce greenhouse gas emissions**						
PDO Indicators			**Baseline**	**Original Target**	**Revised Target**	**Project Values at Project Completion**	**Achievement**	
1.	*Original*	Accumulated amount of GWh saved	0	17,257		63,841	**Achieved (370%)**	
2.	*Original*	Amount of MW deferred	0	1,429		2,075	**Achieved (145%)**	
3.	*Original*	Accumulated amount of natural gas and other fuels saved (thousands of TOE)	0	373		10,106	**Achieved (271%)**	
4.	*Original*	Accumulated amount project-related avoided emissions (million tons of CO_2)	0	10.7		34	**Achieved (318%)**	
Intermediate Indicators			**Baseline**	**Original Target**	**Revised Target**	**Project Values**	**Achievement**	**Comments**
5.	*Original*	Number of feasibility studies and energy audits carried out	0	360	325	219	**Achieved (88%)**	Target values revised during 2013 restructuring due to the increased cost of audits based on the initial experience carrying out the first 25 energy audits
6.	*Original (dropped in*	Number of proposals for bankable EE projects developed	0	324				

	2013 restructuring)							
7.	*Added (2013 restructuring)*	Number of projects financed by AEEF	0	0	48	13	**Not Achieved (27%)**	Indicator added during 2013 restructuring to replace original 'number of proposals for bankable projects developed' since the AEEF fund became operational during this project
8.	*Added (2013 restructuring)*	AEFF Disbursements (US$, millions)	0		4.0	1.12	**Not Achieved (28%)**	Indicator added during 2013 restructuring to replace original 'number of proposals for bankable projects developed' since the AEEF fund became operational during this project. This indicator more directly measured projects successfully accessing energy efficiency financing.
9.	*Added (2013 restructuring)*	Energy savings by AEEF projects (MWh)	0		300,000	66,447	**Not Achieved (22%)**	Indicator added during 2013 restructuring to replace original 'number of proposals for bankable projects developed' since AEEF fund became operational during this project. This indicator more directly measured the impact of the AEEF in terms of energy savings and its contributions to the objectives.
10.	*Original*	Number of CFLs distributed and installed by electricity utilities (million CFLs)	5.0	25.0	26.0	29.8	**Achieved (115%)**	—
11.	*Original*	Number of energy equipment labels issued	1.0	18		19	**Achieved (105%)**	—
12.	*Original (dropped in*	Number of project-supported ESCOs promoting EE projects	0					

	2013 restructuring)							
13.	*Added (2013 restructuring)*	Number of training events for ESCOs	0		9	11	**Achieved (122%)**	Indicator added during 2013 restructuring to replace original 'Number of project-supported ESCOs promoting EE projects.' This indicator better measured support provided to ESCOs.
14.	*Original (dropped in 2013 restructuring)*	Issuance of regulations, norms, and standards	0	8				
15.	*Added (2013 restructuring)*	Number of mandatory norms	2	0	7	12	**Achieved (171%)**	Indicator added during the 2013 restructuring to replace 'Issuance of regulations, norms, and standards.' This indicator was more specific and therefore could be measured more consistently.
16.	*Added (2013 restructuring)*	Number of EE minimum standards	1		5	8	**Achieved (160%)**	Indicator added during the 2013 restructuring to replace 'Issuance of regulations, norms, and standards.' This indicator was more specific and therefore could be measured more consistently.
17.	*Original (dropped in 2013 restructuring)*	EE knowledge and behavior change by residential and industrial users	Low	Increasing over time				
18.	*Added (2013 restructuring)*	Number of contacts in AEEF dissemination events for SMEs	0		2,603	3,911	**Achieved (150%)**	Indicator added during the 2013 restructuring to replace 'EE knowledge and behavior change by residential and industrial users.' This indicator was more specific and therefore could be measured more consistently.

19.	*Added (2013 restructuring)*	Number of contacts accumulated in dissemination and awareness activities for general population	0		797,150	881,273	**Achieved (111%)**	Indicator added during the 2013 restructuring to replace 'EE knowledge and behavior change by residential and industrial users.' This indicator was more specific and therefore could be measured more consistently.

Table 1.2 Summary of Activities by Components Linked to the Achievement of the Objectives

Component	Activities Linked to the Achievement of the Objectives *(following restructurings)*	Key Outputs Linked to the Achievement of the Objectives
Component 1	Identify a pipeline of energy efficiency projects/conduct energy diagnostics	• Potential projects for energy efficiency investment identified
	Create the AEEF under the existing trust fund FONAPyMe under the Ministry of Industry and open a credit line to invest in energy efficiency projects	• Number of AEEF projects financed • Number of AEEF Disbursements • Energy efficiency savings by AEEF projects
Component 2	CFL distribution and replacement	• Number of CFLs distributed
Component 3	Accelerate and strengthen the capacity of the standardization, texting, certification, and labeling program	• Number of labels, standards, and norms published
	Awareness-raising measures for residential, commercial, and industrial consumers	• Number of contacts in AEEF dissemination events for SMEs identified for potential future AEEF investment

ANNEX 2. BANK LENDING AND IMPLEMENTATION SUPPORT/SUPERVISION

A. TASK TEAM MEMBERS

Name	Role
Preparation	
Xiapoing Wang	Task Team Leader
Todd Johnson Senior Energy Specialist	Task Team Leader(s)
Lucia Spinelli	Team Member
Almudena Mateos	Task Team Leader(s)
Lucia Alejandro Solanot	Financial Management Analyst
Ana María Grofmacht	Procurement Analyst
Andres Mac Gaul	Senior Procurement Specialist
Reynaldo Pastor	Senior Counsel
Fowzia Hassan	Team Member
Fernanda Pacheco	Team Member
Ana Kuschnir	Team Member
Andres Mac Gaul	Senior Procurement Specialist
Reynaldo Pastor	Senior Counsel
Supervision/ICR	
Lucia Spinelli	Task Team Leader(s)
Martin Ariel Sabbatella	Procurement Specialist(s)
Luz Maria Meyer	Financial Management Specialist
Luis M. Vaca-Soto	Team Member
Claudia Nin	Team Member
Tuuli Johanna Bernardini	Environmental Safeguards Specialist
Carolina Marcela Crerar	Team Member
Maria Pia Cravero	Counsel
Nora Elizabeth Sanchez Guzman	Team Member

Roberto Luis Estevez Magnasco	Team Member
Alvaro Larrea	Senior Procurement Specialist
Alfredo Idiarte	Team Member
Luis Enrique Garcia Crispin	Team Member
Daniel Chalupowicz	Financial Management Specialist
Geraldine Alicia Garcia	Team Member
Megan Meyer	Team Member
Andrea Mara Rispo	Environmental Specialist
Elizabeth Sanchez	Team Member
Farah Mohammadzadeg	ICR Co-Author

- **STAFF TIME AND COST**

Stage of Project Cycle	Staff Time and Cost	
	No. of staff weeks	US$ (including travel and consultant costs)
Preparation		
FY05	2.425	36,800.00
FY06	10.231	100,146.26
FY07	8.057	57,602.04
FY08	27.799	124,702.26
FY09	0	- 917.85
Total	**48.51**	**318,332.71**
Supervision/ICR		
FY09	14.559	67,196.88
FY10	11.303	52,041.56
FY11	21.172	121,460.54
FY12	20.473	61,950.62
FY13	12.515	40,398.04

FY14	7.875	36,286.92
FY15	0	0.00
Total	**87.90**	**379,334.56**

ANNEX 3. PROJECT COST BY COMPONENT

Components	Amount at Approval (US$, millions)	Actual at Project Closing (US$, millions)	Percentage of Approval (US$, millions)
Development of the Argentina Energy Efficiency Fund (AEEF)	1.80	11.00	72.56
Development of a Utility EE Program	9.20	0.00	0.00
Capacity Building and Project Management	4.16	4.16	27.44
Total	**15.16**	**15.16**	**100.00**

ANNEX 4. EFFICIENCY ANALYSIS

1. **Project benefits.** From a broad perspective, this energy efficiency project could have generated a wide spectrum of benefits, such as the following:

- Direct benefits, such as the reduction of CO_2 emissions, as well as NOx and SOx emissions, with (a) reduction of damaging climate change and (b) health benefits to the population at large. Of these, only CO_2 emission reductions have been estimated.
- Efficiency benefits by providing better information to consumers on the characteristics of equipment they are purchasing, thereby improving the allocation of resources. The benefit from addressing this market failure consists of greater consumer surplus for a given price.
- Energy sector benefits derived from savings associated with a lower demand for energy from the distribution of energy efficient devices, such as CFLs.
- Benefits to the economy at large derived from a lower energy intensity (measured in thousands of tons of oil equivalent per U.S. dollar of GDP).

2. Quantifying these benefits is not straightforward. For an economic analysis, only the benefits associated with CO_2 estimated reductions have been evaluated, together with those associated to savings from the introduction of CFLs and energy-efficient equipment to be installed as a consequence of the AEEF credit line.

3. **Direct benefits.**

(a) **Avoided GHGs (CO_2).** These have been estimated at around 34 million tons. The unit cost associated with these emissions can be estimated at the price of carbon certificates which are traded on the carbon market. The price is very variable, and can be estimated in the long run to be between €10 and €15 per ton, thereby yielding benefits on the order of €170 and €510 million (around US$209 to 627.3 million). From a cost-effectiveness point of view, it can be said that the GEF grant of US$15.155 million has accomplished its purpose within the project's implementation period.

(b) **Energy savings associated with CFLs.** Limiting the benefits of the project to the CFLs distributed by the GoA, each CFL used 75 percent less electricity than the equivalent incandescent lamps given the same lumen outputs of 9 hours of use per day, each saving 164 kWh per year (see table 4.1).

Table 4.1. Energy Savings with CFLs

Type of lamp	Lifetime	Lamp Efficiency	Average Watt
	Hours	Lm/W	W
Incandescent	940	8-12	68
CFL	4,500	40-70	17

(c) The project expected to replace 2 incandescent lamps of 60 W and 75 W—primarily for low consumption residential users which consume less than 300 kWh bimonthly and represent 46 percent of the total residential customer—with 2 CFLs of 15 W and 19 W. As a result, the replacement of incandescent bulbs with CFLs has an average IRR of 12 percent to 35 percent and a repayment period of 7–47 months, depending on the tariff levels for customers in different consumption categories. The incremental cost of the GEF alternative was estimated to be US$91.628 million compared to the GEF resources allocated to this project of US$15.155.

(d) Energy savings associated with energy-efficient equipment installed as a consequence of AEEF credit line for SMEs. The financial analysis was based on a sample project of improving the energy efficiency of a compressed air system through the transformation of four fixed-capacity devices to a system of variable capacity. Electricity prices used are those in force at the time 2013 during which time there were subsidies of 60–65 percent for the industrial sector. Therefore, the results are considered conservative. With a US$1,000,000 investment on equipment co-financed with equity (30 percent, required return of 25 percent) and the AEEF loan for the remaining 70 percent, the investment would result in annual energy savings of 655 MWh (or over 9,800 MWh over the 15-year lifetime of the equipment) and a reduction of power capacity needed of 61.2 kW. Ultimately, this would result in an NPV of 18.5 percent, an IRR of 9 percent, and a simple repayment period of 1.5 years.

4. **Additional economic benefits.** The most important benefit of the AEEF program is its demonstration effect, since there are limited or no financing available for energy efficiency investments in SMEs. This is the result of

- Limited demand from SMEs and
- Lack of knowledge in financial institutions about the economic/financial profile of these investments, resulting in high perceived risks associated with them and unfavorable financing terms, conditional to the strength of the balance sheet of the SMEs.

5. On the first issue, other activities in the project (awareness campaigns/trainings to SMEs and energy audits) helped create interest and demand for financing for this type of investments. For the second, the financing to be offered by AEEF—and the results to be obtained and disseminated from the investments made—will provide the demonstration effect needed to bridge the knowledge gap and reduce the risk perception associated with energy efficiency projects in SMEs. This will help build interest among financial institutions for this type of investments. Enhancement of demand and supply of financing for these projects is expected to help create a market for energy efficiency projects while also offering favorable conditions for further development of ESCOs as market catalysts.

6. Another economic benefit of this project is the enhancement of competitiveness of SMEs as they can reduce energy—and therefore production costs.

7. More general economic benefits of an enhanced energy efficiency program include the following:

- Local and global environmental benefits
- Balance of payment benefits, when the need for importation of expensive fossil fuels, electricity or capital is reduced
- Deferred capacity investment

8. Ultimately, the benefits of the AEEF credit line have become more apparent as the energy subsidies are being removed for industrial consumers, as observed in 2016. The economic and financial benefits of energy efficiency investments in SMEs will increase as the GoA continues to raise tariffs (as a direct result of removing the aforementioned subsidies).

ANNEX 5. BORROWER, CO-FINANCIER AND OTHER PARTNER/STAKEHOLDER COMMENTS

1. The team would like to thank the SSEES for their cooperation and support in preparing this report. The borrower prepared a closing report, which was discussed during the ICR mission in October 2017 and was also used to inform most of the ICR. The team shared the ICR with the donor for further feedback and integrated the comments received on April 6, 2018.

The following feedback was received from the borrower:

En referencia al documento enviado, tenemos las siguientes observaciones:
Párrafo 26 – La cantidad de proyectos financiados por el FAEE al día de hoy son 30, por un monto total desembolsado es 2,2 millones de USD.
Párrafo 33 – La cantidad de estudios financiados por la Componente 1 (a) es de 219, y no 192.
Párrafo 40 – Se indica que el costo incremental del GEF se estimó en USD 91.628 millones, mientras que en el párrafo 8 se indica otro valor.
Párrafo 47 – La cantidad de normas de EE publicadas durante la ejecución del proyecto fue 15.
Párrafo 80 – Donde dice "segunda reestructuración" debe decir "primera", ya que hace referencia a la relocalización del 50% de los fondos del proyecto para la capitalización del FAEE.

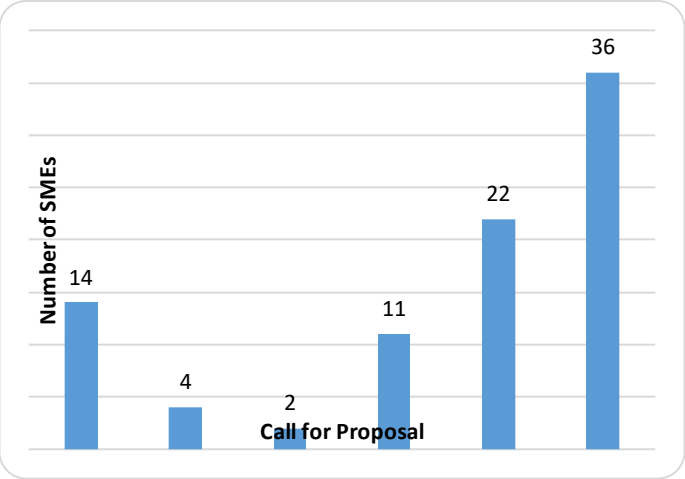
ANNEX 6. SUPPORTING DOCUMENTS (IF ANY)

- Argentina - Country Partnership Strategy for the period of FY15–FY18, August 7, 2014, World Bank
- Argentina - Performance and Learning Review of the Country Partnership Strategy for the period FY15–FY18, January 13, 2017, World Bank
- Aide Memoires, Implementation Status Reports (ISRs), and Project Files for Argentina - Energy Efficiency Project (P090119), World Bank
- Bank Guidance for Implementation Completion and Results Report (ICR) for Investment Project Financing (IPF) Operations, issued July 5, 2017, World Bank
- *Informe de Cierre,* August 31, 2017, Sub-secretariat of Energy Efficiency and Savings
- News - "Aranguren cerró la 2da Jornada Nacional de Eficiencia Energética", 24 de Noviembre de 2017, Argentina Ministry of Energy and Mines Website [Link]
- Restructuring Paper, September 23, 2013, (Report No. RES80435), World Bank
- Restructuring Paper, August 3, 2016, (Report No. RES23963), World Bank
- Restructuring Paper, May 24, 2017, (Report No. RES27007), World Bank

ANNEX 7. SUPPORTING INFORMATION

Progress of AEEF During Project Implementation – source from the SSES directly

Figure 7.1. Status of Projects Under FAEE



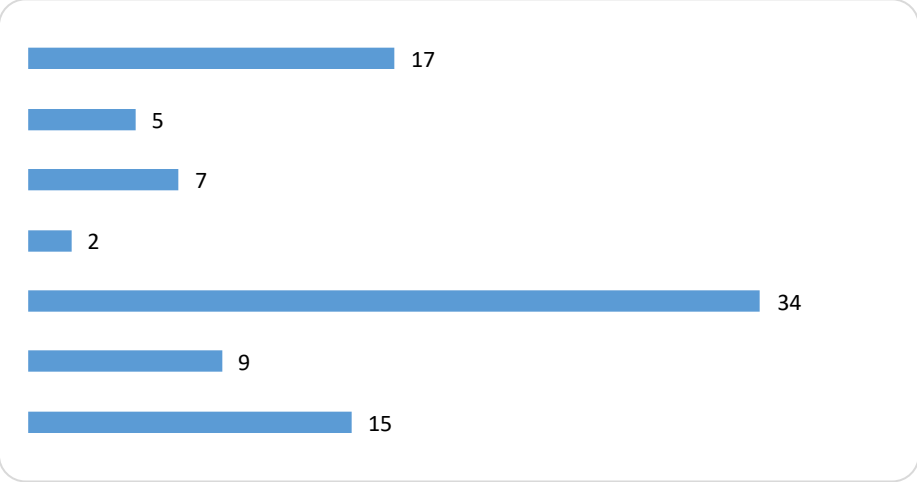


Figure 7.3. Number of Projects Financed by AEEF

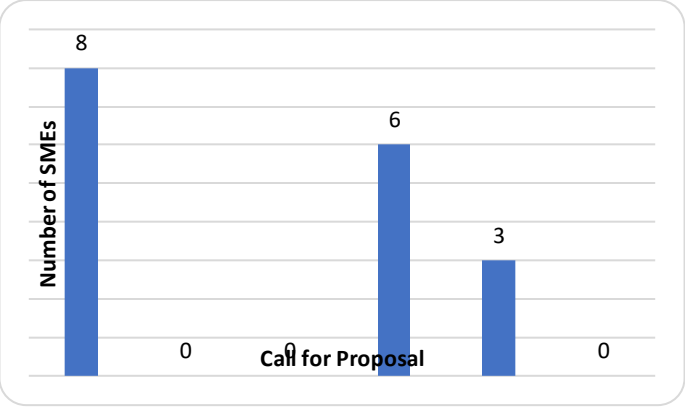


Figure 7.4. AEEF Disbursements

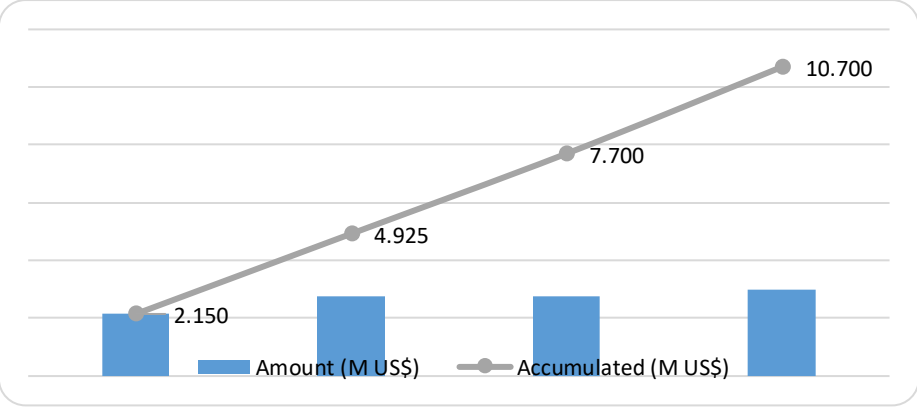


Table 7.1. AEEF Project Status after Project Closing (as of January 5, 2018)

Llamado	Empresas Presentadas		Empresas en Evaluación		Empresas Aprobadas		Estado Actual de Aprobación							
							Aprobación Técnica		Aprobación Técnica y Financiera		Instrumentación de Garantía		Desembolsado	
	Cantidad	Monto Solicitado (US$)	Cantidad	Monto (US$)	Cantidad	Monto (US$)	Cantidad	Monto (US$)	Cantidad	Monto (US$)	Cantidad	Monto (US$)	Cantidad	Monto (US$)
FAEE I	14	1,328,817	—	—	8	744,469	—	—	—	—	—	—	8	744,469
FAEE II	4	194,001	—	—	—	—	—	—	—	—	—	—	—	—
FAEE III	2	212,890	—	—	—	—	—	—	—	—	—	—	—	—
FAEE IV	11	1,055,833	—	—	7	583,421	—	—	—	—	1	72,171	6	511,250
FAEE V	22	1,800,385	—	—	14	1,091,566	—	—	2	110,789	4	405,751	8	575,026
FAEE VI	20*	1,640,917	—	—	8	884,169	—	—	3	317,958	4	507,428	1	58,783
FAEE VII	35	3,191,289	2	362,197	30	2,409,285	14	1,374,656	16	1,034,629	—	—	—	—
Total	**108**	**9,424,132**	**2**	**362,197**	**67**	**5,712,910**	14	1,374,656	21	1,463,375	9	985,351	23	1,889,528**

Note: *** Los proyectos que se presentaron en el FAEE VI y luego realizaron el pase al FAEE VII se contabilizan dentro de FAEE VII.**
****Los valores están expresados en dólares de EEUU según la cotización al momento de la presentación del proyecto.**

Table 7.2 Status update of projects in proces of approval

ESTADO ACTUAL DE PROYECTOS EN PROCESO DE APROBACIÓN	CANTIDAD DE PROYECTOS	MONTO COMPROMETIDO (US$)
DESEMBOLSADOS	**23**	**1,889,528**
INSTRUMENTACIÓN DE GARANTÍA	**9**	**985,351**
APROBADO POR SSAYEE Y FONAPYME	**21**	**1,463,375**
APROBADO SÓLO POR SSAYEE	**14**	**1,374,656**
TOTAL DE PROYECTOS	**67**	**5,712,910**

Table 7.3. List of all Energy Efficiency Labels and Standards Developed – Source: shared by SSEES directly

Etiquetado y Estándares de EE								
EQUIPOS ELÉCTRICOS	**Norma**	**Año**	**Estudio**	**Obligatorio**	**Disp DNCI/año**	**Año Vigencia**	**ESTÁNDARES mínimos vigentes**	**Año**
Aparatos de refrigeración de uso doméstico	IRAM 2404-3	1998 2015	Previo al GEF Convenio IRAM II (2015)	SI	35/2005	2007	Resolución SE N° 682/2013 Entro en vigor 06/11/2013 (Clase mínima de Eficiencia Energética B - Refrigeradores) 01/04/2014 (Clase mínima de Eficiencia Energética B - Congeladores)	2013
Acondicionadores de aire	IRAM: 62406	2007 Revisión en estudio	Previo al GEF Convenio IRAM III (2015)	SI	859/2008	2009	Resolución SE N°814/2013 Resolución SE N°228/2014 Entra en vigor 01/08/2014 – Modo Frío. Clase mínima de Eficiencia Energética B 01/08/2014 – Modo Calor. Clase mínima de Eficiencia Energética C 01/04/2015 – Modo Frío. Clase mínima de Eficiencia Energética A	2013
Lámparas incandescentes	IRAM: 62404-1	2005 2014	Previo al GEF Convenio IRAM II (2015)	SI	86/2006	2008	Ley 26473 - Prohibición incandescente	2010
Lámparas Fluorescentes de Iluminación general	IRAM: 62404-2	2006 2015	Previo al GEF Convenio IRAM II (2015)	SI		2008	-	
Lavarropas eléctricos de uso doméstico	IRAM: 2141-3	2008 2017	Previo al GEF Convenio IRAM III (2015)	SI	761/2010	2012	Resolución SE N° 684/2013 Entro en vigor 07/10/2013 (Clase mínima de Eficiencia Energética B	2013
Motores eléctricos de inducción trifásicos	IRAM: 62405	2010	Previo al GEF	SI	230/2015	A partir del reconocimento de laboratorios	-	-
Balastos para lámparas fluorescentes	IRAM: 62407	2011	Previo al GEF	SI	246/2013	2014	-	-
Electrobombas de uso domiciliario	IRAM: 62408	2012	Convenio IRAM I (2010)	NO	-	-	-	-
Medición del consumo de potencia en modo en espera (standby)	IRAM: 62301	2012	Convenio IRAM I (2010)	Solo para TV	-	-	-	-
Calentadores de agua eléctricos, de acumulación, para uso doméstico	IRAM: 62410	2012	Convenio IRAM I (2010)	SI	172/2016	A partir del reconocimento de laboratorios	-	-
Receptores de televisión en modo encendido	IRAM: 62411	2012	Convenio IRAM I (2010)	SI	219/2015	A partir del reconocimento de laboratorios	-	-
Hornos a microondas, para uso doméstico	IRAM 62412 IRAM 62301	2014	Convenio IRAM II (2015)	SI	170/2016	A partir del reconocimento de laboratorios	-	-
Motores de inducción monofásicos	IRAM 62409	2014	Convenio IRAM II (2015)	SI	230/2015	A partir del reconocimento de laboratorios	-	-
Envolvente térmica de Edificios	IRAM 11900	2010	-	NO	-	-	-	-
Lámparas LED para iluminación general	IRAM: 62404-3	2017	-	NO	-	-	-	-
Lavavajillas	IRAM: 2294-3	2016	Convenio IRAM IV (2016)	NO	-	-	-	-
Etiquetado de eficiencia energética para hornos eléctricos	IRAM: 62414	2017	Convenio IRAM IV (2016)	NO	-	-	-	-
Etiquetado de eficiencia energética para ventiladores de techo	IRAM: 62481	2017	Convenio IRAM IV (2016)	NO	-	-	-	-
Etiquetado de eficiencia energética para ventiladores de mesa, pared, pie y circuladores de aire.	IRAM: 62480	2017	Convenio IRAM IV (2016)	NO	-	-	-	-

Detailed List of Other Activities that Indirectly Contribute to the Increase in the Efficient Use of Energy

1. Component 3(c) aimed to strengthen the capacity of ESCOs to provide energy efficiency services. Therefore, the project financed several capacity-building and awareness-raising activities aimed at ESCOs such as

- Energy efficiency and capacity-building events for the ESCOs that were are part of the prequalification roster to carry out energy audits;
- European energy manager trainings; and
- Certified measurement and verification professional course.

2. Component 3 (d) financed information, training, and dissemination programs such as the following:

- Develop and implement several communication/dissemination in schools and in public places campaigns to educate on rational and efficient use of energy for children of ages 6 to 12 and their families. This aimed to develop new behaviors and attitudes from a young age related to the care of the environment and savings of energy.
- Develop manuals and executive guides on good energy efficiency practices for 10 industrial sectors (ceramic, plastic, paper, textile, metalworking, food industry, laboratories/pharmaceutical, wood and tannery, and others), taking as reference the information generated from energy diagnostics carried as well as relevant international experience. This work sought to generate a sectorial material that allows actions to disseminate the benefits that can be obtained from energy efficiency projects in the industrial sector. To date, a single manual (for the pharmaceutical industry) has been completed
- Promote the establishment of energy management systems in medium and large companies in various sectors, preferably in the industrial sector, through a training pilot project and implementation of ISO 50001 in 9 companies in the country. Ultimately only 1 company completed the work.
- Organize and deliver theoretical-practical training courses on energy efficiency and rational use of energy for 3,000 sellers of household appliances. The number of sellers who participated was 3,019.
- Carry out energy diagnostics in 10 public buildings to identify potential energy savings measures.
- Design and plan a communications strategy and a publicity campaign of national scope with short and long-term actions, aimed at (a) renewing and unifying the image about the national efforts to promote energy efficiency and of the nation's new SSEES and (b) raising general awareness on the responsible and efficient use of energy, disseminating the labeling

policies, and encouraging the preference of users toward energy-efficient technologies.

- Top TEN Argentinian websites to increase information geared primarily at the end users, such as citizens buying equipment, but also toward manufacturers and other audiences interested in finding out about the labeling norms that are published.

Figure 7.2. Main Project Milestones