



1. Project Data

Project ID P133288	Project Name AR Renewable Energy	
Country Argentina	Practice Area(Lead) Energy & Extractives	
L/C/TF Number(s) IBRD-84840	Closing Date (Original) 31-Oct-2020	Total Project Cost (USD) 81,325,335.06
Bank Approval Date 07-Apr-2015	Closing Date (Actual) 31-Dec-2023	
	IBRD/IDA (USD)	Grants (USD)
Original Commitment	200,000,000.00	0.00
Revised Commitment	91,511,634.31	0.00
Actual	91,511,634.31	0.00

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2. Project Objectives and Components

a. Objectives

According to the International Bank for Reconstruction and Development Loan Agreement (p.5) dated October 9, 2015, the project objective is “to provide and enhance access to modern energy services in the Borrower’s selected rural areas,” where the Borrower is defined as the Argentine Republic. In the Project Appraisal Document (p.5), the last part of the project objective reads as “...in selected rural areas of Argentina.”



The PAD (footnote 5 on p.2) defines modern energy services as “reliable and affordable energy, including electricity and additional energy-related services (such as potable water, cooking or heating).”

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

Yes

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

No

c. Will a split evaluation be undertaken?

Yes

d. Components

The Renewable Energy for Rural Areas Project (PERMER II - Proyecto de Energías Renovables en Mercados Rurales II) consisted of four components:

A. Renewable Electricity Service Provision. (*Appraisal cost: US\$215.61 million; revised cost at the first restructuring: US\$161.04 million; actual cost: US\$141.35 million*)

This component consisted of the following activities: (a) the acquisition and installation of stand-alone solar and wind systems, pico-photovoltaic (PV) for isolated households and public facilities; (b) the construction and upgrade of mini grids; (c) the acquisition and installation of water pumping systems in isolated households, public facilities, and communities; (d) the acquisition and installation of equipment to micro-enterprises for productive use of electricity; and (e) the provision of small works and goods as in-kind compensation for resettlement.

B. Solar Thermal Service Provision. (*Appraisal cost: US\$9.67 million; revised cost at the first restructuring: US\$5.01 million; dropped at the second restructuring*)

This component was to finance the provision of solar thermal energy services through the acquisition and installation of solar water heaters, solar spatial heating systems, cookers, and ovens in public facilities and buildings. This component was later cancelled (see Revised Component later in this section).

C. Project Deployment Support. (*Appraisal cost: US\$6.71 million; revised cost at the first restructuring: US\$0.77 million actual cost: US\$1.74 million*)

The following activities were to be financed under this component: (a) market studies to determine potential energy demand and technologies at both urban and rural areas; (b) monitoring and evaluation activities to measure electricity consumption; (c) communication strategies and outreach including studies to support Argentina’s renewable energy goals, dissemination of lessons learned, and capacity building for the weakest stakeholders; and (d) support for the development of feasibility studies for new technologies, such as solar heating systems.

D. Project Management. (*Appraisal cost: US\$8.10 million; revised cost at the first restructuring: US\$1.84 million; actual cost: US\$2.29 million*)



This component was to provide support to project management through the strengthening of the operational capacity of the project coordination unit and the participating provinces in Argentina and their respective project implementation units; carrying out of audits, training, and financing incremental costs related to travel and rental of vehicles for supervision.

Revised Components

The project scope narrowed in accordance with the partial cancellations of the IBRD loan amount in the first and third project restructurings (see project restructurings in Section e. Comments on Project Cost, Financing, Borrower Contribution, and Dates below).

The second component was dropped from the project scope at the second restructuring in June 2022 because the government decided to give priority to electrification through renewable energy service provision under the first component within the limited time left until the revised project closing date of June 30, 2023 (the project closing date was extended by an additional 6 months in the third restructuring to close on December 31, 2023).

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

Project Cost: The project cost was originally estimated at US\$240.09 million. The project closed on December 31, 2023, with an actual cost of US\$145.38 million, but this corresponds to the IBRD financing amount and US\$4.8 million the provincial government of Salta contributed to Component 1 (ICR, Annex 3). The ICR does not report the actual project cost.

Financing: At appraisal, the IBRD loan amount was estimated at US\$200 million. At the first restructuring, US\$31.3 million was canceled. This was followed by the cancellation of US\$23.3 million at the third restructuring (see the entries for project restructurings below). These two cancellations decreased the estimated IBRD loan amount from US\$200 million to US\$145.4 million. According to the information in Annex 3 of the ICR, the project had disbursed US\$140.58 million by project closing. However, the ICR's data sheet reports the disbursed amount at US\$91.51 million.

Borrower's contribution: At appraisal, the contribution of the Government of Argentina was estimated at US\$10.85 million. The provinces were estimated to contribute US\$25.74 million. The private sector's contribution was estimated at US\$23.50 million. The ICR (Annex 3) reports that the provincial government of Salta contributed US\$4.8 million to Component 1. The ICR does not report the actual contributions of the Government of Argentina and private sector.

Project Restructurings: The project was restructured three times.

- **First Project Restructuring and Additional Financing (October 29, 2020 – Level 2):** In this restructuring, the project closing date was extended by 20 months from October 31, 2020 to June 30, 2022 to allow time for the completion of project activities that were delayed because of the slow start of the project due to frequent changes in the energy authorities and ministerial reorganizations, and the onset of COVID-19 pandemic in 2020. A partial loan amount of US\$31.3 million was canceled upon the request of the Government of Argentina to use this amount for the containment of the COVID-19 pandemic, support social protection program, and support economic recovery. Because of the narrowing of the project scope but increased focus on electrification, the targets of



the objective level indicators were revised as the following: (a) the number of direct project beneficiaries from 756,000 to 454,000; (b) people provided with access to electricity by household connections from 175,000 to 193,991; (c) community electricity connections constructed under the project from 1,800 to 2,615; and (d) people that obtain daily and constant electricity service through mini-grids from 37,000 to 3,600.

- **Second Project Restructuring (June 23, 2022 – Level 2):** The project closing date was extended by 12 months from June 30, 2022 to June 30, 2023 to allow time for the completion of the ground installation and certification of electrification activities that were delayed because of the changes in the officials authorized to sign contracts and processing of payments and the impact of the Covid-19 restrictions on movement of people. In this project restructuring, the second component was dropped from the project scope (see Revised Component in section d. Components above). The funds for the second component were reallocated to the first component to increase its scope in electrifying households. The targets of the objective level indicators were revised again as follows: (a) the number of direct project beneficiaries from 454,000 to 509,468; (b) people provided with access to electricity by household connections from 193,991 to 348,091; (c) community electricity connections constructed under the project from 2,615 to 1,660; and (d) people that obtain daily and constant electricity service through mini-grids from 3,600 to 3,872.
- **Third Project Restructuring (June 11, 2023 – Level 2):** Because of import restrictions that delayed project implementation and the possibility that the government might have insufficient funds to finance the ongoing project activities after project closing, a 6-month closing date extension was approved. A partial loan amount of US\$23.38 million was canceled upon the request of the Government of Argentina because it was assessed that the time until project closing was insufficient to disburse that amount for project activities. As a result, the project scope further narrowed, and the targets of all projective objective level indicators were significantly revised down: (a) the number of direct project beneficiaries from 509,468 to 229,000; (b) people provided with access to electricity by household connections from 348,091 to 139,600; (c) community electricity connections constructed under the project from 1,660 to 780; and (d) people that obtain daily and constant electricity service through mini-grids from 3,872 to 340.

Dates: The project was approved on April 7, 2015 and became effective more than one year later on May 4, 2016 because of changes in the administration and sector authorities that delayed the fulfillment of effectiveness conditions. A Mid-Term Review took place in May 2019. The original project closing date was October 31, 2020, but it was extended by 38 months (please see the project restructurings above for the reasons of project closing date extensions). The project closed on December 31, 2023.

The reason for undertaking a split assessment of the project's outcome:

The revisions to the targets at each three project restructurings require a split assessment of the project's performance, but a split assessment will be undertaken only for two periods—before and after the third restructuring. Although each of the three project restructurings requires a split assessment of the project's efficacy in achieving the project objective, the targets revised at the first and second restructurings are assessed together with the original targets, because the project's achievements at project closing were significantly lower than the targets resulting in the same efficacy rating for each revision. Therefore, a split assessment is undertaken only for the periods before and after the third restructuring.



3. Relevance of Objectives

Rationale

At appraisal, the project objective was aligned with the World Bank's strategy as defined in the Country Partnership Framework for the Argentine Republic for the period FY2015-2018. The project sought to address the development problem of inadequate access of the remote rural communities including indigenous people to modern energy services. The project would have also been expected to support Argentina to get closer to the achievement of universal access to electricity while reducing the number of people in extreme poverty and increase coordination between the Federal Government and provinces in this effort. The project was to achieve these objectives by financing the acquisition and installation of renewable energy sources for electricity, cooking, water boiling, and water pumping while providing technical assistance for productive uses of electricity and coordination and collaboration between the Federal Government and provinces in the preparation and implementation of subprojects. The project objective corresponded to Pillar 2, Increasing access and quality of social infrastructure and services for the poor and supported the achievement of Objective 4: Increasing access to electricity, safe drinking water, housing, and sanitation services for the bottom 40 percent in low-income provinces and areas. However, the project objectives were only partially aligned with the World Bank's latest strategy as defined in the Country Partnership Framework for the Argentine Republic for the period FY2019-2022. The project objective partially falls under the Focus Area 3: Supporting Argentina to implement its Nationally Determined Contributions (NDC) and partially supported the achievement of the Objective 8: Transitioning to a cleaner Energy Matrix through the installation of renewable energy sources in remote areas that would have been expected to replace the use of wood and charcoal for cooking and water heating. Although the project objective was partially aligned with the World Bank strategy at the time of project closing, this was mostly because of the shift in the strategy from achieving universal access to electricity in Argentina and expansion of other modern energy services (because of Argentina's achievement of universal access in 2022) to the higher objective of transitioning to a cleaner energy matrix through the use of its abundant renewable energy sources. Overall, the project objective's alignment with the World Bank strategy was substantial.

The project objective was highly relevant to the country context. Although the project objective was output-oriented, its achievement would have been critical to improve the socio-economic welfare of the remote rural communities where extreme poverty was high. The project objective was appropriately pitched for the development status and capacity in the country as described in the World Bank strategies. While the project benefited from the experience gained and lessons learned during the implementation of the PERMER I between 1999 and 2012, the project objective of the current project was less challenging than its predecessor, which was "to remove market barriers to application, implementation and dissemination of renewable energy sources, and reduce greenhouse gas emissions by replacing small-diesel electricity generation and the use of candles, kerosene and gas cylinders and in lighting and other domestic uses with renewable energy systems."

Overall, the relevance of the objectives is rated Substantial.

Rating

Substantial



4. Achievement of Objectives (Efficacy)

OBJECTIVE 1

Objective

To provide and enhance access to modern energy services in the Borrower's selected rural areas.

Rationale

Theory of Change before the Third Project Restructuring

The project inputs were to be used for the installation of stand-alone solar and wind systems, solar water pumps, and equipment for micro-enterprises for productive uses, construction or upgrading of mini-grids powered by hydro or other renewable energy sources, and installation of water heaters spatial heating systems, cookers and ovens powered by renewable energy. These project outputs applied in the right mix were expected to lead to the project outcome of an increased number of people, micro-enterprises, and public facilities with first time or enhanced access to reliable and affordable modern energy services in rural areas of Argentina. The long-term impact of the project would have been improved socio-economic welfare and reduced absolute poverty. The project was also to finance communication and outreach activities to the communities and capacity development activities at the provincial government level to facilitate the smooth implementation of the project and sustainability of the project outcomes.

Overall, the causal links from project inputs and outputs to the expected intermediate outcome of increased or enhanced access to modern energy services were direct and valid, and the achievement of the project objective could be attributed to the project's intervention.

The following outputs were expected to contribute to the achievement of this theory of change:

Outputs

- **Community electricity connections constructed under the project (schools):** The project financed the installation of 263 standalone solar systems at schools. The original target was 1,200 schools. It was revised up to 1,820 schools at the first restructuring and revised down to 745 schools at the second restructuring. This was well short of the target.
- **Community electricity connections constructed under the project (other public facilities):** The project financed the installation of 75 standalone solar home systems at other public facilities other than schools. The original target was 600 public facilities. It was revised down to 376 public facilities at the first restructuring and revised up to 838 public facilities at the second restructuring. This was well short of the target.
- **Generation capacity of hydropower constructed or rehabilitated under the project:** The project was to finance the construction of mini hydroelectric generation plants with a total installed capacity of 14 MW. The target was revised down to 0.21 MW and up to 0.30 MW at the first and second restructurings, respectively. The project did not achieve any increase in hydropower generation capacity.



- **Generation capacity of renewable energy (other than hydropower) constructed:** The project financed the installation of solar power systems with a total installed generation capacity of 5 MW. The project did not finance the installation of wind power systems. The original target was 10 MW consisting of 8 MW solar power and 2 MW of wind power. The total target was revised to 9.66 MW (9.48 MW solar and 0.18 MW wind) and 10.34 MW (10.13 MW solar and 0.21 MW wind) at the first and second restructurings, respectively.
- **Clean energy studies and strategies supported under the project:** The project financed the preparation of four studies related to the use and scaling up of clean energy against the original target of 10. This target was not revised at the first and second restructurings.
- **Capacity building, outreach, and training activities implemented under the project:** The project financed 108 such activities against the target of 70.
- The project was to install solar powered pumps for potable water supply to isolated individual households and public facilities. No target was set for this activity. The achievement was zero.
- The project was also to install solar systems for thermal energy for heating, cooking, and water heating. No target was set for the installation of these systems. These activities to be implemented under the second component were cancelled at the second restructuring.

Outcomes

- **Collective micro-enterprises that obtained an electricity service under the project:** The project was to provide electricity service through the installation of mini grids to 20 collective micro-enterprises. This target was significantly increased to 665 collective micro-enterprises and revised down to 577 collective micro-enterprises at the first and second restructurings. The achievement was zero.
- **Individual micro-enterprises that obtained an electricity service under the project:** The project was to provide electricity service to 4,200 individual micro-enterprises. This target was revised up to 8,275 individual micro-enterprises and revised down to 7,736 individual micro-enterprises at the first and second restructurings. The achievement was 6,870 individual micro-enterprises.
- **People that obtained access to an electricity service for water pumping only:** The project was to provide electricity service for water pumping only to 185,000 people. This target was revised down to approximately 124,000 people and 20,000 people at the first and second restructurings. The achievement was zero.
- **People that obtained access to thermal energy provision (modern spatial heating, cooking, and water heating) in public institutions:** The project was to provide thermal energy to 205,000 people for modern cooking appliances (31,000 people), modern spatial heating systems (10,000 people) and modern water heating systems (164,000 people). After the cancellation of the second component, the targets for modern cooking appliances and modern spatial heating systems were deleted. The target for modern water heating systems was revised down to 28,350 people. The achievement was zero.
- **People provided with electricity by household connections through off grid and mini grid (only renewable sources):** As a result of the installation of standalone solar systems, 136,748 people gained access to electricity. The original target was 173,000 people, which was revised up to approximately 194,000 people and 348,000 people at the first and second restructurings.
- **People provided with electricity by household connections through off grid and mini grid (any source except only renewable):** As a result of the establishment of mini-grids powered by non-renewable sources, 2,000 people were to gain access to electricity. This target was significantly



revised down to 360 people and 38 people at the first and second restructurings. The achievement was zero.

- **People that obtain a daily and constant electricity service with prior access to the service (through mini grids) as a result of the project:** The project was to provide enhanced electricity services to 28,000 people through mini-grids, which was later revised down to 3,240 people and 3,291 people at the first and second restructurings. The achievement of 288 people was significantly lower than the targets.
- **People that obtain a daily and constant electricity service and with prior access to the service (through mini grids) and without prior access to the service as a result of the project:** The project was to provide electricity access through mini-grids to 9,000 people, which was later revised down to 360 people and up to 581 people at the first and second restructurings, respectively. The achievement of 51 people was significantly lower than the targets.
- **Direct project beneficiaries that obtained enhanced access (daily hours and quality of service) to modern energy services (electricity, water pumping, productive uses, solar thermal applications):** The project was to enhance 241,000 people's access to modern energy services through project activities. This target was revised down to approximately 119,000 people and 70,000 people at the first and second restructurings. The achievement was 10,608 people.
- **Direct project beneficiaries that obtained access to modern energy services (electricity, water pumping, productive uses, solar thermal applications):** The target was to provide electricity access to 524,000 people. This target was revised down to approximately 335,000 people at the first restructuring and up to 440,000 people at the second restructuring. The achievement of approximately 180,000 people was significantly lower than the targets. This number included approximately 22,000 people who benefited from the installation of electric fences for livestock, which the ICR (p.33) counts as an application for productive uses.
- **Micro-enterprises supported under the project that increase their production:** The project targeted that 65 percent of the micro-enterprises supported under the project would have increased their production because of the availability of modern energy services. The target was not revised at the first restructuring but up to 77 percent at the second restructuring. The ICR (p.32) 90 percent of the micro-enterprises that were supported by the project increased their production.
- **People that are satisfied with the benefits arising from obtaining access or an enhanced access to electricity through household connections:** The expectation at appraisal was that 80 percent of the people would have been satisfied with benefits of electricity through household connections. The target was not revised. The achievement was 88 percent.
- **People that are satisfied with the benefits arising from obtaining access or an enhanced access to electricity through community connections:** The expectation at appraisal was that 80 percent of the people would have been satisfied with benefits of electricity through community connections. The target was not revised. The achievement was 93 percent.

The project significantly underachieved the targets in increasing or enhancing access to modern energy services in selected rural areas of Argentina. Because of the changing preferences of the government, some project activities were dropped or not implemented in favor of increasing electricity access in rural areas. The project did not achieve any results in providing or enhancing energy-related such as potable water, cooking, or heating. The project objective was not revised when the second component, which was to finance activities to provide such energy-related services, was dropped. Therefore, the project's achievement was limited to increasing access to electricity by household and community connections, which was significantly lower than the original and revised targets at the first and second restructurings, except the achievements related to increasing micro-enterprises access to electricity. In addition, the evidence is insufficient to assess the



reliability and affordability of modern energy services (in this case only electricity supply service because the project did not achieve any results in energy-related services). Furthermore, there is no evidence to assess the sustainability of the solar systems installed under the project in terms of their maintenance and replacement of batteries. The survey conducted at project closing shows that electricity had a positive impact on the production of micro-enterprises and people are satisfied with the benefits arising from electricity through household or community connections, but these results prove the positive impact of electricity on businesses and individuals that is very well documented in the literature. Such positive impacts are limited to a small group of people because of the underachievement of the project's results.

Overall, because of significant underachievement and insufficient evidence, the project's efficacy in achieving the project objective in the period before the third project restructuring is rated Negligible.

Rating

Negligible

OBJECTIVE 1 REVISION 1

Revised Objective

To provide and enhance access to modern energy services in the Borrower's selected rural areas (The project objective did not change but the key indicators were revised).

Revised Rationale

Theory of Change after the Third Project Restructuring

Following the cancellation of the second component, the project design did not include any energy-related service activity, such as provision of thermal heat or electricity for potable water, cooking or heating. This created a gap in the theory change in achieving the project objective to provide and enhance access to modern energy services, which consists of access to electricity and other energy-related services. Therefore, the causal links from project inputs and outputs to the expected intermediate outcome of increased or enhanced access to electricity were still direct and valid, and the achievement of this part of the project objective could be attributed to the project's intervention but the project's design did not support the achievement of increased or enhanced access to energy-related services.

Outputs

The targets of two indicators were revised down significantly at the third restructuring in June 2023, approximately six months before project restructuring. The target for the number of schools connected to electricity under the project was revised down from 745 to 430, but the achievement was 263. Similarly, the target for the number of other public facilities connected to electricity under the project was revised down from 838 to 240, but the achievement was only 75. The target of other indicators were revised down to match the actual achievement at the time of project restructuring such as the target for solar power generation capacity constructed from 10.13 MW to 5 MW, and the target for the number of clean energy studies supported by the project from ten studies to four studies.

Outcomes



At the third restructuring, targets of most of the indicators were revised to match the results already achieved before the restructuring, but the achievements were mostly below the targets. For example, the target for the number of people provided with electricity by household connections was revised down from approximately 348,000 to 139,600, and the achievement was approximately 137,000. Similarly, the target for the number of people who obtained a daily and constant electricity service with prior access through mini grids was revised down from approximately 3,900 to 340; the achievement was 399. The target for the number of direct project beneficiaries was significantly revised down from approximately 510,000 people to 229,000 people. The achievement was 194,302 people.

Furthermore, as explained in the revised theory of change in this section above, the project design did not include any activity to provide and enhance energy-related services (other than access to electricity) such as water pumping, cooking, and heating. Therefore, the project’s intervention partially supported the achievement of the project objective, and the achievements were lower than the targets. In addition, as was the case in the assessment of the achievement of the project objective before the third restructuring, the evidence is insufficient to assess the achievement of the provision of modern energy services in a reliable and affordable way.

Overall, the project efficacy in achieving the project objective after the third restructuring is rated Modest.

Revised Rating

Modest

OVERALL EFFICACY

Rationale

The project significantly underachieved its targets for increasing access to modern energy services before the third restructuring. The evidence was also insufficient to assess the reliability and affordability of the electricity services. Overall, the project’s efficacy in achieving the project objective is rated Negligible.

Overall Efficacy Rating

Negligible

Primary Reason

Low achievement

OVERALL EFFICACY REVISION 1

Overall Efficacy Revision 1 Rationale

After the cancellation of the second component, the project design had a gap in supporting the achievement of the project objective to provide and enhance energy-related services such as water pumping, heating, and cooking that are included in modern energy services. The project’s achievements were limited to the first time or enhanced provision of electricity access to households, public entities, and micro-enterprises, but these achievements were lower than the targets revised at the third restructuring. Therefore, the project’s efficacy in achieving the project objective after the third restructuring is rated Modest.



Overall Efficacy Revision 1 Rating
Modest

Primary Reason
Low achievement

5. Efficiency

Economic Analysis

At appraisal, a cost-benefit analysis was conducted to assess the economic viability of the activities to be implemented under the first and second components for the provision of electricity services and solar thermal energy in rural areas. The economic benefits included in the analysis were typical for such rural electrification projects consisting of cost savings to users arising from shifting from traditional energy sources, such as kerosene, candles, and batteries, to electricity and users' willingness-to-pay for the electricity and thermal energy services based on surveys carried out under the predecessor PERMER I. The costs were taken as the investment cost, and operation and maintenance (O&M) costs. Annex 7 of the PAD provides a detailed explanation of economic analysis. The assumptions used in the methodology were relevant for the analysis. The calculations resulted in an economic rate of return (ERR) of 22.8 percent and a net present value (NPV) of US\$76.9 million at a discount rate of 10 percent.

At project closing, a post-project economic analysis was conducted using the same methodology as at appraisal. The calculations resulted in an ERR of 21.3 percent and an NPV of US\$18.2 million at a discount rate of 10 percent. The ICR (p.14) states that the lower ERR and NPV values were because of higher capital cost per unit of equipment and the considerable reduction in the investment component's size. The calculations at both appraisal and project closing show the economic viability of the project's intervention; however, it should be noted that the project was partially successful in achieving the outcomes expected in electrification (modest compared to the targets revised at the third restructuring and negligible compared to the original and earlier reviews targets) and unsuccessful in achieving the outcomes expected from the use of thermal energy. Thus, the project fell short of achieving the full scale of economic benefits expected from its intervention.

Operational and Administrative Efficiency

There were significant shortcomings in the operational and administrative efficiency of the project. The frequent changes in the officials and administrative structures of the organizations resulted in delays in project effectiveness and procurement. The project was not ready for implementation. It was approved in April 2015, but approximately three years were needed for "preparation, completing institutional arrangements, design of technical specifications and procurement processes" (ICR, p.16). As discussed in section 10.b Fiduciary Compliance, procurement issues through to project closing resulted in significant implementation delays contributing to the project closing date extension of 38 months. Despite this time extension, 34 contracts could not be completed by project closing and were transferred to Clean Energy for Vulnerable Households and Communities Project (P178553). The import restrictions imposed by the Central Bank of Argentina also adversely affected project implementation because these restrictions complicated the importation of solar panel and batteries to be installed under the project.

Overall, the project's efficiency in achieving the project objective is rated Modest.



Efficiency Rating

Modest

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

	Rate Available?	Point value (%)	*Coverage/Scope (%)
Appraisal	✓	22.80	71.40 <input type="checkbox"/> Not Applicable
ICR Estimate	✓	21.30	76.10 <input type="checkbox"/> Not Applicable

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

6. Outcome

A split assessment of the project's outcome is undertaken because of the changes in the targets of key indicators and reduction in the project's scope. The calculation of the split rating is given in the table below. The relevance of the project objectives is rated Substantial. The project's efficiency in achieving the project objective is rated Modest because of low achievement of the economic benefits expected from the project's intervention and significant shortcomings in the project's administrative and operational efficiency. The efficacy of the project in achieving the project objective before the third restructuring is rated Negligible. It is rated Modest after the third restructuring, because of limited achievement of the outcomes related to electrification and no achievement related to access to energy-related services such water pumping, heating, and cooking. Overall, the split assessment of the project's performance resulted in an Unsatisfactory rating.

Table 1

	Before the Third Restructuring	After the Third Restructuring
Relevance of Objectives	Substantial	
Efficacy	Negligible	Modest
Efficiency	Modest	
Outcome Rating	Unsatisfactory	Moderately Unsatisfactory
Outcome Rating Value (a)	2	3
Amount Disbursed (US\$ million)	91.01	49.57
Disbursement (%) (b)	64.74%	35.26%
Weight Value (a)x(b)	1.2948	1.0578
Total weights	2.3518 (rounds down to 2)	
Overall Outcome Rating	Unsatisfactory	

a. **Outcome Rating**
Unsatisfactory



7. Risk to Development Outcome

Technical: The stand-alone solar systems installed under the project are third-generation solar technology systems. These solar systems are known to have shorter lifetimes, and their operation and maintenance and the replacement of batteries are not fully incorporated into the post-project institutional arrangements to be implemented by local provinces (ICR, p.24). Therefore, inadequate maintenance of these systems and potential issues in the replacement of parts and batteries could adversely affect the sustainability of the limited outcomes achieved under the project.

Geographical: The project was implemented in remote areas of the country with difficult geographical conditions. Such conditions pose a substantial risk for the availability of services for the maintenance of the solar home systems. The follow-on Clean Energy for Vulnerable Households and Communities Project (P178553) is expected to further support the sustainability of maintenance and replacement services for the stand-alone solar home systems.

Political: Frequent changes in the policy priorities and administrations pose a high risk for the sustainability of project outcomes. Because of changes in the government's policy orientation, government's support to rural energy operations decreased. This was already evident during project implementation through the project scope narrowing and the shifting focus from energy-related services, such as water pumping, heating, and cooking, to electricity access. The uncertainties around the government's commitment to rural energy services can adversely affect the sustainability of the project outcomes.

8. Assessment of Bank Performance

a. Quality-at-Entry

Increasing access to modern energy services in the remote areas of Argentina was of high strategic importance for the government at the time of appraisal. The project was the main instrument for the government to achieve universal access. While the project benefited from the experience and lessons learned during the implementation of PERMER I, the project preparedness at entry was inadequate. The subprojects were not identified; hence, most of the safeguard documents were prepared at the framework level. The project preparations had to be completed during the first three years of project implementation that resulted in significant delays. Fiduciary aspects of the project were designed based on PERMER I, but the insufficient procurement capacity was not adequately identified. The technical aspects had shortcomings; the introduction of Generation 3 solar panels resulted in a substantial risk to the sustainability of development outcomes. The M&E framework included a total of 33 indicators including sub-indicators, but the M&E design was insufficient to appropriately test the links in the results chain of the project's theory of chain. The risk levels were inadequately identified (ICR, pp.15-16); hence, mitigation measures were ineffective. The economic analysis was detailed, and the assumptions used in the analysis were adequate; however, since the subprojects were not identified at appraisal, the economic analysis was based on estimations.



Overall, for a project, the appraisal of which benefited from the experience and lessons learned during the predecessor PERMER I, the quality at entry had significant shortcomings; therefore, the quality at entry is rated Moderately Unsatisfactory.

Quality-at-Entry Rating

Moderately Unsatisfactory

b. Quality of supervision

From the appraisal stage to project closing, the same Task Team Leader stationed in Buenos Aires led the project team—a rare occurrence in World Bank projects. The project team held regular supervision missions at least twice in a calendar year. The project team’s focus on the achievement of the development impact of the project was insufficient; the project restructurings were mostly about adjusting the indicator targets rather than increasing the effectiveness of the project’s implementation in achieving the project outcomes. Although the second component, which supported the implementation of thermal solutions was deleted, the project objective was not revised to reflect this major change in the project’s theory of change. This created a significant gap in the assessment of the project’s outcome. The shortcomings in the M&E design were not addressed to adequately capture the project results and test the links in the causal chain. As noted in the Quality at Entry section above, because of the shortcomings in the project’s preparedness, the first three years of project implementation until 2018 were “spent mostly in preparation, completing institutional arrangements, design of technical specifications and procurement processes” (ICR, p.16). This significantly contributed to the 38-month extension of the project closing date. The Mid-Term Review was conducted according to the plan, and an action plan was agreed on with the government to address the issues in project implementation. These had some partial success in improving project implementation but shortcomings in procurement resulted in 34 contracts’ being transferred to the Clean Energy for Vulnerable Households and Communities Project (P178553) because they could not be completed before the extended project closing date. The supervision of safeguard policies had some minor shortcomings; 19 compensation payments to project-affected people were still pending at project closing under the Involuntary Resettlement safeguard policy.

Overall, the quality of supervision is rated Moderately Unsatisfactory.

Quality of Supervision Rating

Moderately Unsatisfactory

Overall Bank Performance Rating

Moderately Unsatisfactory

9. M&E Design, Implementation, & Utilization



a. M&E Design

The project's theory of change was straightforward establishing direct and valid causal chains between the project activities and outputs and expected outcomes, but it was not adequately reflected in the results framework. Although the results framework included 33 indicators, they were insufficient to document how the key activities and outputs led to outcomes. Most of the indicators were designed to count the connections to electricity or energy-related services, falling short of monitoring how those connections were achieved.

b. M&E Implementation

The project coordination unit collected data and reported the project progress in bi-annual reports in coordination with the project implementation units at the provincial government levels. The indicators included in the results framework were adequately measured, and the World Bank project team regularly reported them in the Implementation Status and Results Reports (ICR, p.19). The weaknesses in the M&E design in adequately capturing the project outputs and outcomes were not addressed during project implementation. The three project restructurings resulted in cancellation of nine intermediate results indicator. The frequent changes in the end targets of the indicators complicated the assessment of the project's results. The data is assessed to be reliable and of good quality, but the methodology to be used in measuring the indicators could not be defined for a prolonged time (ICR, p.19); the ICR does not report the impact of this shortcoming on the measurement of the indicators.

c. M&E Utilization

The M&E data and findings were used to restructure the project three times and revise the end targets of the indicators in accordance with the narrowing scope of the project rather than shifting the implementation direction of the project to achieve the project objectives. Despite the cancellation of the second component based on the M&E findings, the project objective was not revised to reflect this change, which resulted in a gap in the project's theory of change related to increasing access to energy-related services. The M&E data were used to provide evidence for the achievement of the repeatedly revised indicator targets, rather than evidence for the achievement of the project outcomes and the establishment of attribution between the project's intervention and the achievement of the objectives. The M&E findings are not expected to lead to a subsequent intervention because the last mile electricity connections is not a topic high on the agenda of the government.

Overall, the M&E quality is rated Modest, because of shortcomings in the M&E design to adequately capture the project outputs and outcomes and the M&E implementation in providing inadequate data to sufficiently assess the achievement of the project objectives and test the links in the results chain as defined in the project's theory of change.

M&E Quality Rating

Modest



10. Other Issues

a. Safeguards

The project was classified as Category B under Environmental Assessment (OP/BP 4.01) and triggered Natural Habitats (OP/BP 4.04), Indigenous Peoples (OP/BP 4.10), Physical Cultural Resources (OP/BP 4.11), Involuntary Resettlement (OP/BP 4.12), and Projects on International Waterways (OP/BP 7.50).

Environmental Assessment (OP/BP 4.01): The project was classified as Category B because of the limited and reversible potential environmental impacts of the project activities such as the construction of low-voltage distribution lines and related infrastructure and the mini-hydro systems. Since the exact location of the project activities were not identified, an Environmental and Social Management Framework (ESMF) was prepared based on an update of the ESMF of PERMER I. Consultations with local communities, local governments, and non-governmental organizations were adequately held. The ESMF was disclosed in country on August 12, 2014. It was redisclosed in country and on World Bank's InfoShop on October 29, 2014. After the identification of subprojects, Environmental Impact Assessments and Environmental Management Plans for each subproject were prepared and disclosed prior to implementation. The project complied with the requirements of this safeguard policy.

Natural Habitats (OP/BP 4.04): The project triggered this safeguard policy because of the potential impact of the project activities on natural habitats such as the construction of mini-hydro systems and the distribution lines. The implementation of this safeguard policy had a moderate shortcoming that resulted in the extraction of a cactus under legal protection in the Luracatao project site because of the absence of measures to protect the natural habitat.

Indigenous Peoples (OP/BP 4.10): The project triggered this safeguard policy because the targeted project areas included the indigenous communities. Since the exact locations of the project activities within the indigenous community areas, an Indigenous Peoples Planning Framework (IPPF) was prepared based on the experience of PERMER I and desk review. Following the completion of consultations with the indigenous communities through the Indigenous Participative Council of the National Indigenous People Institute, the IPPF was disclosed in country and the World Bank's InfoShop on November 14, 2014. All project documents and communications related to the implementation of mini grids in the indigenous communities' territories were translated into three indigenous languages and distributed. Some indigenous people were adversely affected by the project activities that required compensations. These are handled under the Involuntary Resettlement safeguard policy with some shortcomings.

Physical Cultural Resources (OP/BP 4.11): The project triggered this safeguard policy because of the possibility of chance finds during the implementation of projects since the exact locations of the subprojects were not known at appraisal. During project implementation, the project activities resulted in a major damage to a hermitage in Luracatao project site. The hermitage was still under repair when project closed in December 2023.

Involuntary Resettlement (OP/BP 4.12): The project triggered this safeguard policy because the construction of mini grid, hydropower and small dam subprojects to be financed under the project were expected to require land easements and acquisitions and resettlement of people. At the preparation stage, a Resettlement Policy Framework (RPF) was prepared based on the experience gained during the implementation of PERMER 1. The RPF was disclosed in country and the World Bank's InfoShop on November 14, 2014. The ICR (p.21) states that the capacity of some local teams to implement the RPF procedures related to mini grids was inadequate. One Resettlement Action Plan (RAP) was prepared to



process compensations for one involuntary resettlement and 42 economic displacements. The processing of the compensations was slow. At project closing, 19 of these settlements were still pending. Their processing is monitored under the Clean Energy for Vulnerable Households and Communities Project (P178553).

Projects on International Waterways (OP/BP 7.50): The project triggered this safeguard policy because some of the mini grid projects were expected to include small hydro run-of-river electricity generation facility that could have used water from international waterways or their tributaries such as the La Plata River system, which originate in Brazil and flows through Bolivia, Paraguay, Argentina and Uruguay, and the Negro, Colorado, Chico, and Deseado Rivers, which Argentina shares with Chile. The World Bank notified all five riparian states in September 2014 about the project in accordance with the requirements of this safeguard policy. The Oriental Republic of Uruguay, the Republic of Paraguay, and the Republic of Chile did not send any responses. The World Bank responded to the additional information requests of from the Plurinational State of Bolivia and the Federative Republic of Brazil. The project adequately complied with the requirements of this safeguard policy before the start of project implementation.

b. Fiduciary Compliance

Financial Management

A fiduciary unit within the Ministry of Finance was responsible for the financial management of the project with adequate capacity. The interim financial reports were submitted according to the schedule. External audits were conducted as planned and the auditors' opinions were unqualified. The 2019 audit was delayed because of the onset of COVID 19 pandemic but was submitted before the deadline extended by the World Bank. The financial management arrangements were in line with World Bank standards (ICR, p.22). However, following the merging of the Ministry of Energy with the Ministry of Finance in 2018, financial management processes were adversely affected, and project-related payments could not be appropriately documented for approximately five months (ICR, p.17). This irregularity was later corrected by completing the documentation of the payments. The ICR does not report any issues of corruption or misuse of funds associated with the project. The ICR does not report whether all project funds were accounted for or not at the time of project evaluation.

Procurement

The project followed the procurement policies and guidelines of the World Bank. Under the fourth component, the project supported procurement activities. The project coordination unit coordinated procurement activities with more than twenty beneficiary provinces, but this complicated the procurement process because provinces had different levels of procurement capacity. The ICR (p.22) reports the procurement related issues that led to delays in project implementation as follows: (a) insufficient procurement planning; (b) delays in evaluation, selection, and awards processes; (c) inadequate identification and prevention of bottlenecks in procurement; (d) frequent changes in authorities resulting in delays in approvals; and (e) inaccurate cost estimates, temporary shortages of specialized staff, and excessive number of members in evaluation committees. The slow evaluation of the bids for the solar water pumping facilities resulted in no contract being awarded and cancellation of the solar water pump subcomponent worth US\$6.4. million. Procurement issues significantly delayed project implementation. Although all contracts, except those for cancelled activities, had been awarded during project



implementation, 34 contracts were still ongoing at project closing. These contracts were transferred to the Clean Energy for Vulnerable Households and Communities Project (P178553). The ICR (p.23) states that the project’s “procurement experience warrants a systematic review that could be particularly useful in identifying areas to improve and draw lessons for future operations.”

c. Unintended impacts (Positive or Negative)

None.

d. Other

None.

11. Ratings

Ratings	ICR	IEG	Reason for Disagreements/Comment
Outcome	Moderately Unsatisfactory	Unsatisfactory	The project significantly underachieved its targets before the third restructuring resulting in a Negligible efficacy rating. After the third restructuring, the project’s efficacy in achieving the project objective was modest because the project design did not support the achievement of the energy-related services. The relevance of objectives is rated Substantial. The project’s efficiency in achieving the project objective is rated Modest because of lower achievement of economic benefits and significant shortcomings in the administrative and operational efficiency of the project. The split assessment of the project’s outcome resulted in an Unsatisfactory rating.
Bank Performance	Satisfactory	Moderately Unsatisfactory	The quality at entry and quality of supervision were rated Moderately Unsatisfactory because of shortcomings in



			project's preparedness and results framework, insufficient risk identification, focus on development impact, and supervision of safeguard policies.
Quality of M&E	Substantial	Modest	The M&E design and implementation had significant shortcomings in capturing the project outputs and outcomes and testing the links in the results chain.
Quality of ICR	---	Modest	

12. Lessons

This review has drawn three lessons based on the information in the ICR.

Inadequate preparation at the appraisal stage when a project is to be implemented by numerous provincial governments can result in significant implementation delays. The project was to be implemented in 20 provinces. This required the signing of 20 agreements between the Federal Government and provincial governments. The project was not ready for implementation when it was approved because institutional arrangements, design of technical specifications, and procurement process were not completed (ICR, p.16). The completion of these aspects of the project took approximately three years. The project was approved in 2015, but full implementation could only start in 2018. Given that the project had a predecessor that was implemented between 1999 and 2012 (i.e., PERMER I), the project under this review would have been expected to have had a higher level of preparedness at the start of its implementation.

If the changes in the project scope are not adequately reflected in the project objective formulation through revisions, this can result in gaps in the project's theory of change and underachievement of the project objectives. The project was restructured three times because of the narrowing of the project scope and cancellation of the project funds. These changes resulted in the cancellation of the project activities under the second component such as acquisition and installation of solar water heaters, solar heating systems, cookers and ovens. The implementation of these activities were expected to provide energy-related services to rural households, which is a part of modern energy services together with access to electricity. The cancellation of these activities made it impossible to achieve the energy-related services objective of the project. Since the formulation of the project objective was not revised in accordance with the narrowing of the project's scope, this created a gap in the project's theory of change. Therefore, the assessment of the project's efficacy in achieving the project objective is assessed to be modest resulting in an unsatisfactory outcome rating.

Insufficient procurement capacity and complex procurement arrangements can adversely affect the operational and administrative efficiency of a project. The project implementation suffered from procurement issues through to project closing. The complex procurement arrangements involving 20 provinces, each of which had different capacity level, resulted in



significant implementation delays, one of the main reasons for project closing date extensions. Only for the first component, 90 contracts were signed. There were delays in evaluation, selection, and award processes. Frequent changes in the authorities or in the organization of the sector also caused delays in approving the procurement steps. Despite the project's support to procurement, 34 contracts were still pending at project closing, which were later transferred to the Clean Energy for Vulnerable Households and Communities Project (P178553). The ICR (p.23) states that "PERMER's procurement experience warrants a systematic review that could be particularly useful in identifying areas to improve and draw lessons for future operations."

13. Assessment Recommended?

No

14. Comments on Quality of ICR

The ICR is concise and provides a comprehensive overview of the project. The narrative mostly follows the Bank guidance. The Table 4, Factors that Affected Project Implementation and Annex 4, Project Timeline provide important information in a concise way to understand the project implementation timeline and related issues. However, the narrative is mostly descriptive rather than evaluative. It also lacks internal consistency. The ICR assesses the achievement of the project objective as moderately unsatisfactory, but the narratives in the other sections of the ICR assesses the preparation and implementation of the project as successful, such as the sections on Bank performance, quality of M&E, and lessons and recommendations. The discussion of efficacy is restricted to the achievement of the frequently revised end targets of the indicators. The discussion is inadequate in explaining how project activities resulted in project outputs that were expected to lead to the achievement of the project outcomes. The results orientation of the report is weak. The interrogation of evidence, explanation of salient points, and linking of evidence to findings is insufficient. The entries in section V. Lessons and Recommendations of the ICR respond to the specific experiences of the project, but they are in the form of findings rather than lessons or recommendations.

Overall, the quality of the ICR is rated Modest.

a. Quality of ICR Rating

Modest

