

## PROJECT INFORMATION DOCUMENT (PID) CONCEPT STAGE

Report No.: PIDC1087

<b>Project Name</b>	Argentina Renewable Energy for Rural Areas Project (P133288)
<b>Region</b>	LATIN AMERICA AND CARIBBEAN
<b>Country</b>	Argentina
<b>Sector(s)</b>	Hydropower (5%), Other Renewable Energy (75%), Transmission and Distribution of Electricity (15%), General energy sector (5%)
<b>Theme(s)</b>	Social Inclusion (50%), Rural services and infrastructure (50%)
<b>Lending Instrument</b>	Investment Project Financing
<b>Project ID</b>	P133288
<b>Borrower(s)</b>	ARGENTINE REPUBLIC
<b>Implementing Agency</b>	Secretariat of Energy
<b>Environmental Category</b>	B-Partial Assessment
<b>Date PID Prepared/ Updated</b>	18-Oct-2013
<b>Date PID Approved/ Disclosed</b>	05-Mar-2015
<b>Estimated Date of Appraisal Completion</b>	13-Nov-2014
<b>Estimated Date of Board Approval</b>	07-Apr-2015
<b>Concept Review Decision</b>	Track II - The review did authorize the preparation to continue

### I. Introduction and Context

#### Country Context

President Fernandez's administration has worked on the promotion of economic development with a strong focus on social inclusion. Inclusion and shared prosperity have become a priority of the current administration, but still a considerable number of Argentinian families in urban and rural areas lack adequate access to basic infrastructure and social services, in particular in rural areas. This calls for the development of infrastructure, emphasizing expansion of the poor's access to basic services, including energy, water supply and sanitation and transport, the creation of safety nets and fostering employment. In particular, providing access to modern energy services in rural areas could have a direct and strong impact on improving the lives and incomes of the poorest and reducing the migration flows towards urban areas.

However, after the 2001 crisis, Argentina achieved strong economic growth rates averaging 7.2 percent annually during 2003-2012. The macroeconomic performance and outlook have deteriorated

after 2011. While growth rates declined significantly during the 2008-2009 global crisis, economic activity rebounded soundly in 2010 with a 9.2 percent expansion. But starting from 2011 the Argentine economy entered into a cycle of low growth. In 2012, GDP expanded by 1.9 percent and growth estimates for 2013 point to 3.1 percent. Both external factors and domestic economic policies –including external trade and foreign exchange restrictions– contributed to this deterioration. Inflation shows downward resistance despite growth deceleration, and efforts to control inflation have had an adverse impact on competitiveness. As measured by INDEC, the official annual inflation holds at 10.5 percent in June 2013 (Inflation figures are based on Argentina’s official price index (CPI-GBA). The IMF has called on Argentina to adopt remedial measures to address the quality of the official inflation data. Bank staff is also using alternative measures of inflation based on data produced by provincial statistical offices and private analysts, which have shown considerably higher inflation figures than the official data since 2007 (average inflation was about 24% in June 2013 according to market analysts estimates and some provincial price indices).

## **Sectoral and Institutional Context**

### **Argentina’s Power Sector**

Argentina’s electricity system, also called SADI (Sistema Argentino de Interconexión), had in December 2011 an installed capacity of 29,500 MW, 59% of which was thermal, 37.5% hydro and the remaining 4% nuclear. The Province of Buenos Aires, southern Santa Fe and Entre Ríos concentrate 42% of the supply, followed by Comahue with 21%. The Northeast contributes with 10%, while the Central and Northwestern territories contribute approximately with 8% each; 6% from Cuyo and the remaining 3% from Patagonia. During 2011, generation was predominantly thermal (62%), (mostly from combined-cycle power plants, which represented 38% of total generation), followed by hydropower with 33%.

The system is interconnected through a transmission network of approximately 14,000 kilometers of extra-high voltage lines (500 kV) and 17,000 kilometers of distribution lines with voltages between 330 kV and 33 kV. Demand increased 5.1% from 2010 (110,775 GWh) to 2011 (116,381 GWh). In 2010 distribution losses totaled 14.7%. In that same year, the residential sector represented 34% of the demand, while the industrial sector represented 35%, commercial sector 26% and lighting 4%. The system had 14 million customers, 12 million at the residential level, 1.4 million from the commercial sector. The rest is divided between industry, government agencies and other users.

Residential, commercial and small and medium industries consumption is satisfied by more than 70 distributors and cooperatives. Most of the large industries, along with the big commercial and service users acquire their energy directly from generators and/or marketers. Demand is concentrated in the regions of Greater Buenos Aires (GBA), the Coastline (LIT), Buenos Aires (BAS) and Central Argentina (NEC), which represent three quarters of the country's total demand.

In terms of the regulatory framework, Law 24.065 created the Argentine Electricity Market (MEM), which established the sector’s vertical breakdown, defining the following key participants: i) generators, ii) transmission companies, iii) distribution companies, iv) large users, and v) marketers. The first three are currently the main players in MEM.

By the end of 2011, the MEM counted with 58 generation companies, composed of 35 thermal-based, 20 for hydro, 2 bi-national hydro companies and 1 national nuclear generation company. The

public sector represented 25% of installed capacity and 30% of generation. Four private companies (SADESA, ENDESA, AES and Pampa Energía) represented 53% of installed capacity and 50% of generation.

Transener controls all 500 kv high-voltage. The MEM also has six regional transmission companies (Transcomahue, Transnoa, Transnea, Transpa, Transba y Distrocuyo) as well as other independent entities. The main shareholders of Transener (and Transba – Province of Buenos Aires) are Pampa Energía, Electroingeniería and Enarsa. The Argentinian grid is also interconnected with Brazil, Uruguay and Paraguay.

In 2010, the three distribution companies (Edenor, Edesur and Edelap) that operate in the greater Buenos Aires area and are thus under federal jurisdiction represented 45% of the country's electricity consumption.

#### Access

Universal access to modern energy services is still one of the Government of Argentina (GoA) main sectorial priorities. As in most middle income countries, Argentina's level of electrification is high. However, three typical barriers to the supply of conventional on-grid electricity at reasonable costs are still present: Argentina's large size, its topography, and the low population density in rural areas.

Even though the country's electrification rate has increased from 95 percent in 2001 to 98 percent ten years later, 145,000 households in Argentina still don't have access to modern energy services (this is, access to reliable and affordable energy, including both electricity and fuels), while many others only count with partial, inadequate and inefficient access. This means that at least 725,000 low-income people from extremely isolated areas have less health, education and production opportunities.

Under the leadership of the Secretaría de Energía (Secretariat of Energy, SE as per its acronym in Spanish), under the Ministerio de Planificación Federal, Inversión Pública y Servicios (Ministry of Federal Planning, Public Investments and Services), the GoA has implemented several projects and programs to increase access to energy services in rural areas. PERMER I has the longest and most successful experience. This project focused on providing rural areas with reliable electric supply in a sustainable manner – using renewable energy technologies when convenient and developing thermal applications and water pumping (in a lesser degree) in public buildings. The Project was approved on March 1999 and became effective on December 1999. However, the crisis of 2001 had a major impact on the project. Implementation delays plus the approval of Additional Financing in 2008 meant the Project remained active until December 2012. Overall, the project addressed the needs of more than thirty thousand customers in fifteen provinces with the following outcomes: 25,071 residential solar home systems (SHS); 1,894 SHS in schools; 361 SHS in public services; 2,407 in mini networks (solar, wind power, but mostly diesel units); 350 solar thermal systems (mostly in schools) and 188 solar pumps.

Given the use of renewable off-grid technologies and the implementation of a solid operation and maintenance (O&M) scheme, the PERMER I project proved to be a valuable way to increase electricity access in rural areas. Nevertheless, further investment is needed to provide access to modern energy service to the remaining isolated populations.

The Federal Government has to work together with Provinces if it is to achieve meaningful progress towards universal access to modern energy services. Even though the federal government manages generation and backbone transport of electricity as well as distribution in the city of Buenos Aires, Provinces set the contracts for concessions (area or zone, rates, quality of service, sanctions, among others) and control distribution through provincial regulators. This legal framework calls for the active participation of subnational entities if any initiative focused on providing access to modern energy services and increasing renewable energy generation is to succeed.

Finally, even though SE's tasks are limited to the energy sector, the provision of modern energy services has a direct impact on other sectors. As electricity is a vital input for almost all other basic services (be it health, water or education), providing access contributes to the quality of these services and enabling poor people to share prosperity. In line with this, the PERMER II would build upon the networks and knowledge gained through PERMER I, but would also incorporate new institutions (such as water utilities and the health sector) which were not part of the previous operation.

### **Relationship to CAS**

The operation would be aligned with Country Partnership Strategy 2014-2016 currently under preparation. The Project would clearly support the Government in expanding inclusion in an efficient and sustainable manner as energy is a vital input for almost all other basic services. PERMER II would thus help improve basic services – through the provision of energy – and necessarily strengthen environmental and natural resource management as this would be done through renewable – clean – energy sources. In addition, PERMER II would build on lessons learned from a successful experience of the long standing partnership between Argentina and the Bank with PERMER I. Finally, the proposed Project would contribute to the three strategic objectives identified by the draft CPS: i) enhanced equity and inclusive growth; ii) improved quality, coverage, efficiency and sustainability of social services; and iii) improved sustainable natural resource management, environment and climate resilience.

In the energy sector, the Bank has been supporting the GoA's objectives through the following activities:

#### **Stages of Energy Engagement in Argentina**

##### **Early Support (1998–2008)**

###### **Financial Services:**

###### **Argentina Renewable Energy Markets, PERMER I (P006043) - 1999**

Objective. The objectives of the Project were to: (a) provide the rural areas of the Participating Provinces with reliable electric supply in a sustainable manner through the use of renewable energy; (b) advance the reform of the Borrower's energy sector in particular critical areas; (c) support the Borrower's strategy to expand the participation of the private sector in the provision of electricity in the rural areas of the Participating Provinces, as well as strengthen the capacity of Participating Provinces to regulate such participation; and (d) support the creation of sustainable business operations for rural energy in Argentina.

###### **Knowledge Services:**

Argentina, Infrastructure for growth and poverty alleviation. (P090381). This TA helped identify the key investments needed in different infrastructure sectors, including Energy.

Strengthening (2009–)

Financial Services:

Energy Efficiency project (P090119) – 2008

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

PERMER I Additional Financing – 2008

Its main purpose was to expand the scale and geographical scope of the Project.

Argentina Renewable Energy Project for Rural Areas, PERMER II (P133288) – 2013

Knowledge Services:

The bank contributed to the organization of PERMER closing workshop, evaluation and consultations – November 2012

Convening Services:

Sucre workshop on rural energy access models, with the participation of representatives from PERMER I & II, FONER I & II (Proyecto de Mejoramiento de Electrificación Rural mediante Fondos Concursables, Perú) and IDTR I & II (Infraestructura Descentralizada para la Transformación Rural, Bolivia) – 2013

## II. Proposed Development Objective(s)

### Proposed Development Objective(s) (From PCN)

The development objective for the proposed project is to increase and improve access to sustainable modern energy services in rural areas of Argentina, supporting the Government of Argentina's (GoA) goal of achieving universal Access.

### Key Results (From PCN)

Progress towards achieving the PDO could be assessed through the following performance indicators:

- Number of direct project beneficiaries that obtain access to modern energy services (electricity, hot water).
- Number of direct project beneficiaries that obtain improved access (in terms of hours of service per day and quality of service) to modern energy services.

Intermediate outcome indicators could include

- People provided with access to electricity under the project by household connections-

#### Other Renewable Energy – Off-grid (Number)

- Community electricity connections under the project – Other Renewable Energy – Off-grid (Number)
- Number of beneficiaries that obtain or improve their access to improved potable water sources, through individual or collective systems.
- Emissions reductions (Thousand tons of carbon dioxide equivalent per year).
- Number of beneficiaries benefiting from productive uses activities supported under the Project.
- Generation Capacity of Renewable Energy constructed under the project by technology (MW).
- People and institutions provided with access to improved energy sources for water heating, cooking and heating.
- Number of beneficiaries and public services institutions that obtain access to modern energy services.
- Number of activities supported to enhance and boost the development of renewable energy sources in the country.

### III. Preliminary Description

#### Concept Description

The proposed Project (USD \$ 200 million IBRD plus co-financing for USD \$ 38.75 million from the GoA) provides key support to Argentina's plans to achieve universal access to modern energy services. The Project would build upon the activities conducted under PERMER I, the lessons learned, best practices and experiences obtained from its implementation, as well as from activities in other countries. However, this new operation would also represent an evolution from PERMER I, as its scope, targets and boundaries would be dramatically expanded. As in PERMER I, the proposed operation would continue financing the acquisition of goods to expand the provision of electricity to households and institutions (mainly for lighting, communication, and water pumping); as well as for thermal applications (water heating, cooking and heating). In addition, the proposed Project would also finance goods, their installation (as needed) and works to improve access in rural areas with currently underserved populations, with access to inefficient and/or unreliable electricity services (as little as a few hours a day depending on access to fuels). The proposed Project would considerably increase the number of households to be served with modern energy services, substantially expand the development of thermal and water pumping applications (combined, these represented less than 2% of funding in PERMER I) and provide electrification of health centers. The resources of the proposed Project (PERMER II) would be available for all provinces.

The proposed operation would also incorporate the development of commercially productive activities dependent on electricity provision. This new activity will required a close coordination between SE and provincial productive authorities and a careful monitoring of subprojects to assess the impact of electricity provision on the income generation capacity of targeted rural population. Finally, capacity building activities to strengthen the design of subprojects and to support the implementation of all components as well as for enhancing the country's ability to increase renewable energy use will be financed In order to improve PERMER's monitoring capacity and to better assess the use and the impact of the solar home systems, a remote monitoring mechanism that allows measurement of electricity provision and consumption, will be connected in a sample of systems. This innovation will allow PERMER to have a better understanding of panel and battery performance and of users' behavior.

The proposed lending instrument would be Investment Project Financing for US \$200 million. The operation could represent at least one third of the external financing Argentina needs if it is to meet its universal access to modern energy services commitment.

The Project would continue relying on the implementation arrangements developed under PERMER I. This would mean that the Secretariat of Energy would continue functioning as the overall coordinator of the Project, and will be responsible, in most cases, for the bidding processes. The Provinces would be responsible for identifying the demand, designing the subprojects, supervising the implementation in their own territories and assuring that an acceptable operation and maintenance mechanism is in place. Under these “joint but differentiated responsibilities” arrangements, the federal government – through the SE – would coordinate the participation of sub-national entities through institutional agreements. In the case of the Provinces, activities would be developed by local energy authorities and provincial regulators. Finally, the private sector would participate as concessionaires of subprojects and as possible co-financier of hydro mini-grids.

The proposed operation also incorporates relevant lessons learned from the implementation of PERMER I. The original design of PERMER I envisioned that procurement of goods would be done in a decentralized manner, through each participating Province; and that electricity would be provided only by private concessionaires, without taking into account other actors, such as public electric utilities and cooperatives. The economic crisis that hit Argentina shortly after the Project was approved, led to changes to PERMER I’s design and implementation, including: i) incorporating public electric utilities and cooperatives as service providers and operators; ii) increasing public-sector support; iii) adding new actors such as other national institutions and provincial agencies; and iv) allowing more time for the Project to be implemented. In addition, and in order to expedite and make more efficient the acquisition of goods and services, PERMER I was also restructured to allow for centralized procurement activities.

The proposed new operation will build upon these updated arrangements, and will incorporate the lessons learned in the implementation completion report for PERMER I. These lessons include:

- A large-scale renewable energy system project is a medium to long-term effort that requires a design flexible enough to adapt to the changing conditions that may arise. The project’s experience also casts doubts on the effectiveness of short-term instruments in addressing long-term rural development challenges, which calls for longer implementation schedules.
- Large-scale decentralized renewable energy operations face unique challenges associated with the market dispersion, the large number of players involved, limited knowledge of the terrain, and complex communications that require a delivery model tailored to these needs. Specific lessons made evident by the project are: a) the importance of dissemination; b) the need to promote the use of local resources; and c) that the sustainability of the operation is more a logistical challenge rather than a technical task.

The project is proposed to be implemented over a six year period and comprise four components, supporting the acquisition and installation of goods and services to: (A) increase and improve the provision of electricity services; (B) augment the provision of solar thermal energy; (C) support the design, implementation and execution of subprojects; and (D) Project management. The Project would be implemented by SE, through the existing PERMER implementing unit.

Further information on the four components can be found below:

A – Electricity service provision. This component will finance the acquisition and installation of stand-alone solar (PV) or wind systems and the construction and/or upgrade of mini grids with renewable technologies (for groups of consumers that may include public institutions and population clusters, among others). This component would benefit nearly 560,000 people. IBRD funding would amount to USD \$189,950,000, while the GoA would provide around USD \$36,000,000. Planned activities would support the provision of electricity services for residential and public users for multiple purposes:

- Electricity for lighting, entertainment and communication services (among others) for: isolated individual households; dispersed public services institutions; and rural and isolated clusters through mini-grids.
- Electricity for potable water pumping in: individual households; dispersed public services institutions; and rural and isolated clusters.
- Electricity for productive uses for individual purposes or collective subprojects.

B – Solar thermal energy provision. This component will finance the acquisition and installation of mostly solar water heaters as well as other solar thermal applications for which markets are still in an early stage (this includes solar heating systems, cookers and solar ovens). The specific technologies and items to be acquired and/or installed would be further refined during preparation, based on existing markets and the needs of targeted beneficiaries. The component will help provide solar thermal energy in public institutions only, based on some relevant experiences from PERMER I. It is expected that this component could benefit almost 290,000 people. IBRD funding would reach USD \$4,930,000, while GoA's co-financing would be near USD \$1,250,000.

C – Activities to support the design, implementation and execution of subprojects and for the development of renewable energy technologies. With funding of about USD \$3,300,000 (IBRD), this component would finance activities such as: market studies to determine potential energy demand and technologies, monitoring and evaluation tasks, communication strategies and outreach activities, studies to support Argentina's renewable energy goals, dissemination of lessons learned, best practices and relevant experiences, among others.

D – Project management. This component would finance the incremental costs of the Project, strengthening existing structures, operation and maintenance of monitoring and evaluation (M&E) systems – which would take into account the methodologies being developed by the Bank and the International Energy Agency under the Sustainable Energy for All Global Tracking Framework –, training and travel costs for PIU members, equipment, etc. IBRD funding would reach USD \$1,820,000 (IBRD), while GoA's co-financing would be near USD \$1,100,000.

#### IV. Safeguard Policies that might apply

Safeguard Policies Triggered by the Project	Yes	No	TBD
Environmental Assessment OP/BP 4.01	x		
Natural Habitats OP/BP 4.04	x		
Forests OP/BP 4.36			x
Pest Management OP 4.09		x	



Physical Cultural Resources OP/BP 4.11	x		
Indigenous Peoples OP/BP 4.10	x		
Involuntary Resettlement OP/BP 4.12	x		
Safety of Dams OP/BP 4.37		x	
Projects on International Waterways OP/BP 7.50			x
Projects in Disputed Areas OP/BP 7.60		x	

## V. Financing (in USD Million)

Total Project Cost:	240.09	Total Bank Financing:	200.00
Financing Gap:	0.00		
<b>Financing Source</b>			<b>Amount</b>
Borrower			10.85
International Bank for Reconstruction and Development			200.00
Local Govts. (Prov., District, City) of Borrowing Country			5.74
Local Sources of Borrowing Country			23.50
Total			240.09

## VI. Contact point

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