

# RENEWABLE ENERGY SECTOR IN ARGENTINA

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Subsecretaría de  
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Promoción Comercial  
Ministerio de Relaciones Exteriores y Culto  
República Argentina

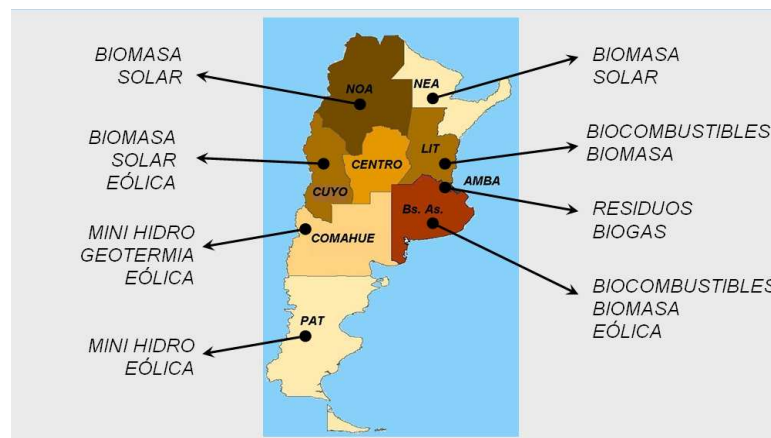


INVIERTA EN  
ARGENTINA

## RENEWABLE ENERGY SECTOR IN ARGENTINA

Endowed with favorable natural and technical conditions, Argentina has the potential to become one of the world's leaders in renewable energy production. As shown in Map 1 below, a wide range of renewable energies are suitable for development throughout Argentina's vast extensions of land, including wind, solar, mini-hydro, geothermal, biofuels, biogas and biomass power.

**Map 1: Argentina's potential in renewable energies  
(by region)**

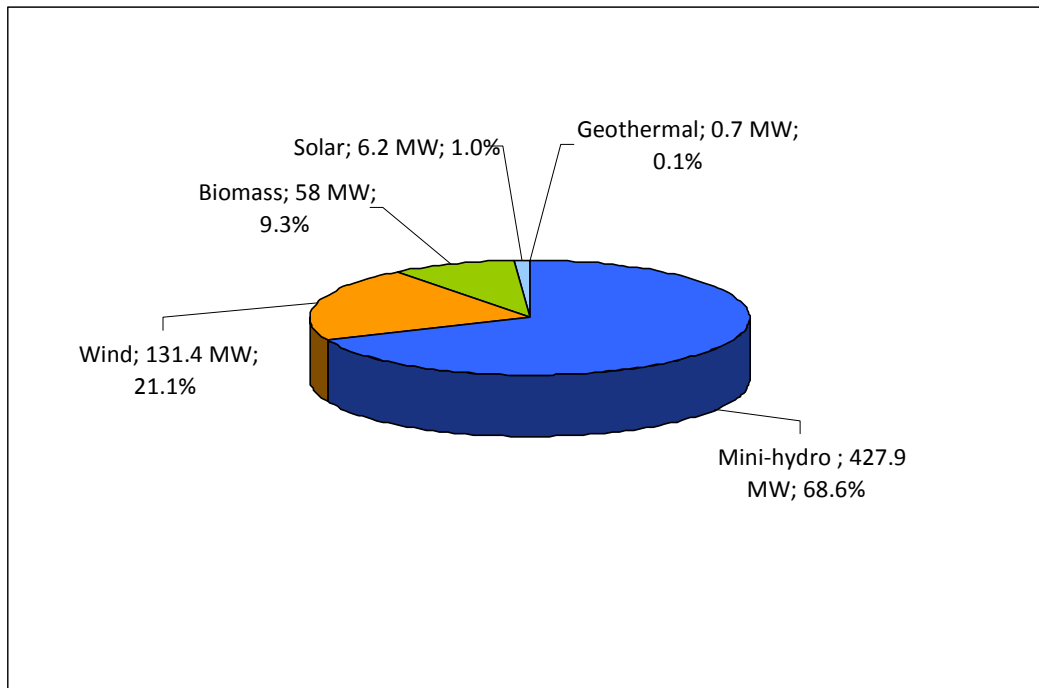


Source: Energy Undersecretariat

### **1. Renewable energy matrix in Argentina**

Argentina has an installed renewable energy capacity of 625 MW. As shown in Graph 1 below, most of the energy generates from mini-hydro facilities, as the country has a long-lasting tradition in water resources. However, due to the country's excellent natural conditions, projects in other alternative energies, especially wind power, are increasing in number. With 131.4 MW of installed capacity, wind energy accounts for 21% of the sector's total. Biomass power ranks third, accounting for 10% of the sector's installed megawatts (58M), followed by solar and geothermal power, where future projects are growing in number.

**Graph 1: Renewable energy matrix in Argentina**  
**(in MW)**



Source: Prepared by the Undersecretariat for Investment Development and Trade Promotion based on the *Clean Energy Report* (2011) of the Argentine Wind Energy Association and market data.

## **1.1. Renewable energy by type**

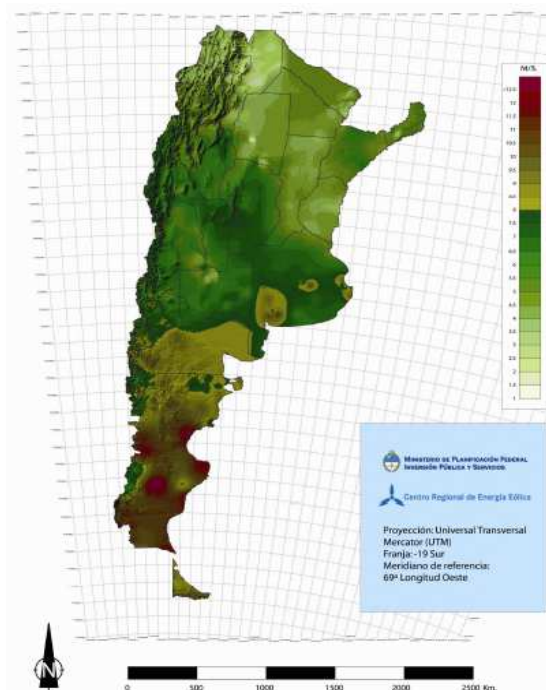
### **1.1.a) Wind power**

Argentina has one of the three most important wind corridors in the world, located in Patagonia, as well as the most important onshore potential global wide<sup>1</sup>. The Ministry of Federal Planning, Public Investment and Services, jointly with the provinces, prepared a wind map of the country in order to measure the average wind's speeds. This survey revealed that vast extensions of land have average wind speeds of 8m/sec and boast important capacity factors for wind energy generation (see Map 2).

Currently, there is a total of 18 wind farms distributed in 7 provinces (Chubut, La Rioja, Buenos Aires, Santa Cruz, La Pampa, Neuquén and San Juan), with a total operating capacity of 131.4 MW measured in April 2012. Many projects aiming to increase this capacity are on the move. The potential for wind generation capacity has been estimated at 6,086 TWh/year (Argentine Renewable Energy Chamber, 2008).

According to the U.S. Commercial Service,<sup>2</sup> renewable energies have a huge potential in Argentina, with wind power standing out as the most promising among all renewable sources of energy, considering its stage of development. Recently, attention has moved toward wind energy as a viable alternative to electricity.

**Map 2: Wind resources in Argentina**



Source: Regional Wind Energy Center and Ministry of Federal Planning, Public Investment and Services.

<sup>1</sup> In other words, the potential to install land-based wind parks within the territory.

<sup>2</sup> *Argentina Report*, U.S. Commercial Service (May 2012).

#### National technology for the sector

Argentina is a pioneer in wind energy generation in the region. The first wind park was built in 1994.

Important national manufacturers and developers –including IMPSA and NRG Patagonia, which manufacture high power turbines, and Invap, dedicated to manufacturing low-power turbines– are part of the country's long-standing industrial tradition.

Argentina has an important “wind cluster” comprised of around 60 companies that manufacture all the elements required for wind energy generation and which have the capacity to build turnkey wind parks.

#### **1.1.b) Solar power**

Photovoltaic (PV) is the most widely disseminated solar generating technology in Argentina. Despite the fact that the installed capacity in the country has no current relevance, solar energy has significant potential for growth.

Currently, there are two solar power stations located in the province of San Juan. The first one, belonging to EPSE, the provincial energy company, has a capacity of 102 MW. The other, whose concession was granted under the GENREN program (see below), is to become the largest facility in Latin America and has a capacity of 20 MW, 5 MW of which are currently in operation.

Furthermore, there are other specific projects aimed to increase this installed capacity: the Chinese Sky Solar is projecting investments of US\$ 70 million in the city of Ullum, San Juan, together with the governmental companies Enarsa and EPSE to build the necessary installations to generate 20 MW.

Regarding thermal solar energy, there is a wide range of small producers that are not part of the Wholesale Electric Market (MEM for its acronym in Spanish). Currently, studies to install two large-scale projects of 25 MW each in the provinces of San Juan and La Rioja are being conducted.

#### **1.1.c) Mini-hydro:**

Mini-hydro involves small-scale facilities which, depending on their power capacity, can supply energy to both the public grid and small homes or rural establishments located far from the power distribution grid.

There are 32 mini-hydro plants located in Argentina with a total operating capacity of 428 MW. Seventy five percent of these stations have a capacity of less than 20 MW. Argentina has a long-lasting tradition in this kind of energy, as the first plant was inaugurated in 1911 in the city of La Calera (province of Córdoba) and is still in operation. As shown in Map 3 below, hydroelectric facilities are mainly located along the Andes Range owing to its incredible conditions for this energy source. However, the province of Córdoba also boasts important water resources, as it has the largest small-hydro concentration in the country.



**Map 3: Small-hydro in Argentina**



Source: Energy Secretariat

Argentina has enormous small-hydro potential. According to the report Clean Energy 2011, Argentina's installed capacity will duplicate, reaching 2000 MW. The Energy Secretariat has analyzed over 100 feasible mini-hydro projects. The installed capacity is expected to be 440 MW by 2013.

### **1.1.d) Geothermal power**

With 14 geothermal basins, Argentina has great potential to develop geothermal power. The main basin is Copahue-Domuyo, which used to host the first 670 kW geothermal pilot plant in South America (currently out of operations).

However, other areas have been growing in importance in the last decade: in 2011, the province of Mendoza declared 100 thousand hectares to be geothermal reserves distributed in 14 areas located in Cacheuta, San Rafael, Malargüe, Valle de Uco, Las Heras and Levalle. The areas of Los Molles and Peteroa volcano, located in Malargüe, meet important exploration and exploitation characteristics. Additionally, a joint venture between a local company and a foreign company with Canadian and Australian capitals will make investments of US\$ 1.5 million to conduct preparatory studies.

Furthermore, rights over areas in the provinces of San Juan, Salta and Jujuy involving a total of 80 MW will be acquired.

### **1.1.e) Biomass**

The country's biomass potential is mainly located in the north-east and the *Mesopotamia* regions (provinces of Formosa, Chaco, Misiones, Corrientes, and Entre Rios). Biomass is obtained from sugarcane bagasse, wood chips and other residues from the forest industry (such as sawdust and shaving), especially in Misiones. Other sources of biomass include agro-industrial residues (sunflower seed, rice and peanut skin) used in boilers, the use of landfill gas (LFG) and biogas from milking barns.

Currently, there are 3 projects involving a total capacity of 58 MW. An additional 62 MW of biomass capacity was projected for 2012, while 8 projects involving 82 MW in the aggregate are expected in 2013.

## **2. Public support for investment:**

### **2.1. National promotion regime for electric power generation from renewable sources of energy**

This regime was established by Law No. 26190, passed in December 2006, and provides for both express and implied goals:

#### Implied goals

- Diversify the energy matrix.
- Reduce the cost of fossil fuels.
- Create jobs.
- Promote investments.

#### Express goals

- The regime declares electric power generation from renewable sources for public service purposes to be of national interest.
- It establishes that renewable energy sources should contribute to 8% of the total electric consumption in Argentina in a term of 10 years as from its implementation.
- It fosters electric power generation from the following sources: wind, sunlight, geothermal heat, tides, hydropower of up to 30MW, biomass, landfill gases, wastewater treatment plants and biogas, except for the sources provided for in Law No. 26093 (biofuels).

The beneficiaries of this regime are persons investing in new projects to generate electricity from renewable energy sources aimed to the wholesale electricity market or the electricity public service for a term of 10 years.<sup>3</sup>

#### Options available to investors:

1. Early value added tax refund for purchasing, manufacturing and importing capital goods and infrastructure works.
2. Flexibility in income tax payments through the accelerated amortization of assets.

Additionally, the assets falling within the scope of this regime are excluded from the taxable base of the minimum presumptive income tax for the first 3 years after start-up.

To apply for the benefits under this regime, the relevant projects must be presented.

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<sup>3</sup> Within the framework of the Investment Regime, priority is given to all ventures that favor, in terms of quantity and quality, job creation and to those employing capital goods of domestic origin.



## **2.2. Power Purchase Agreements (PPAs) for renewable energies**

Resolution No. 108/11 of the Energy Secretariat provides for the execution of PPAs between the wholesale electricity market (MEM for its acronym in Spanish), represented by CAMMESA, the Administering Company of the Electric Wholesale Market, and the agents related to the generation of renewable energies.

The purchase price is established taking into account the operations costs and the investment repayment. The contract term will have a maximum of 15 years, which can be extended for an additional 18 months.

In this way, investors may reduce risks involving prices, competitiveness, exchange, payment and regulatory changes.

## **2.3. GENREN Program (Generation of Renewables)**

The GENREN program involves a tender organized by ENARSA (an Argentine state-owned company engaged in the generation, transportation, distribution and trading of electricity, among other things) for the purchase of electric power from renewable energy generators. Bids of up to 50MW were accepted. The sale of the energy so generated to the wholesale market is conducted by ENARSA through a 15-year supply contract. Payments are guaranteed by a trust created with National Treasury funds.

The first tender under the Genren Program was launched in 2009, and 1,015 MW were put out to tender involving the following energy sources: wind, thermal with biofuels, urban solid waste, biomass, mini-hydro, geothermal, solar thermal and solar photovoltaic. A total of 32 projects were awarded, which reached 895 MW on the basis of an economic evaluation of the projects that considered the local element, the price and the time required to start. The selected bids involved wind energy, thermal energy with biofuels, mini-hydro and solar photovoltaic energy projects.

A new stage of the GENREN program, known as GENREN II, was launched in September 2010, whereby 200 MW were put out to tender for wind energy projects only. A total of 26 bids were submitted and involved a generation capacity of more than 1,200 MW.

## **2.4. Credit lines from the Investment and Foreign Trade Bank (BICE)**

This credit line is directed to SMEs in order to finance renewable sources investment projects to meet the higher demand from the productive sector.

This line finances up to 80% the total amount of the project for a maximum term of 120 months:

- Individual projects: from AR\$ 250,000 to the equivalent of US\$ 10,000,000;
- Group projects: up to US\$ 20,000,000.

The interest rates are applied as follows:

In Argentine pesos: Badlar<sup>4</sup> plus a spread (cost of funds) plus 300 bps<sup>5</sup>.

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<sup>4</sup>Badlar (Buenos Aires Deposits of Large Amount Rate): rate calculated by the Central Bank of Argentina (BCRA) based on a survey of all interest rates offered by banks of the City of Buenos Aires and Greater Buenos Aires for time deposits for a term of 30-35-days in excess of US\$ 1,000,000 or AR\$ 1,000,000.

In dollars: Libor<sup>6</sup> plus a spread (cost of funds) plus 300 bps.

## **2.6 Fiduciary Funds from the National Bank of Argentina (BNA)**

*Nación Fideicomisos* is a company belonging to *Banco Nación* Group created with the aim of developing fiduciary businesses promoted by the company itself or by third parties to contribute to the growth of productive investments and the development of capital markets in order to satisfy financing needs.

Specifically in the case of renewable energies, a trust can be created under GENREN and Resolution No. 108/11 of the Energy Secretariat. The project owner can obtain financing for 70% of its project through this trust, making an equity contribution for the remaining 30%. The financing term may be extended to 15 years depending on the term of the PPA.

## **2.6. Program for Renewable Energy Generation in Rural Markets (PERMER)**

This program, developed by the Energy Secretariat, aims to serve schools, health care centers, homes and police stations, among others, that are located far from the power distribution grid. The program is financed by Argentina's Energy Secretariat, the World Bank and the Argentine provinces through international public tenders. Currently, it has an installed capacity of 4 MW and is not connected to the grid.

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<sup>5</sup> BPS: Basis Points. 100 bps = 1%

<sup>6</sup> LIBOR (London Interbank Offered Rate): a benchmark interest rate derived from the rates at which banks are able to borrow funds from one another in the London inter-bank market.

## **ANNEX**

### **Argentine electric power system**

Law No. 24065, which establishes the electric power regime in Argentina, describes all the participants in the Argentine electricity market:

- **Generators:** holders of an electrical power station that place their output in the transmission and/or distribution lines. They may enter into freely-negotiated supply contracts directly with distributors and large users.<sup>7</sup>
- **Transporters:** transmission companies holding a concession to transmit electricity from the generator to a distributor or large user, as the case may be.
- **Distributors:** companies holding a concession to supply and deliver electricity to end users within their concession area.

The following participants complete this layout:

- **Energy Secretariat:** its main goals are the preparation, proposal and implementation of a national energy policy to be coordinated nationwide.
- **Compañía Administradora del Mercado Mayorista Eléctrico S.A. (CAMMESA):** CAMMESA is the Administering Company of the Electric Wholesale Market. It is in charge of coordinating the distribution of electricity into the power grid, determine wholesale prices and administer and compensate the transactions completed in grid.
- **Electricity Regulatory Entity (ENRE):** agency in charge of regulating the electricity activities and monitoring that companies in the sector –comprised of generators, transporters and distributors (Edenor and Edesur)– meet the obligations established under the regulatory framework and their respective concession contracts.
- **Energía Argentina S.A. (ENARSA):** a state-owned company engaged in generating, transporting, distributing and trading electricity and conducting commercial activities related to energy assets on its own behalf or through third parties, both in Argentina or abroad. Fifty three percent is owned by the State, 12% by the provinces and the remaining 35% has been offered to the public.

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<sup>7</sup> Those who purchase electricity directly from a generator and/or distributor for their own consumption.