
STATE OF THE WIND ENERGY INDUSTRY IN ARGENTINA

CURRENT ACTIVITY AND PERSPECTIVES

September 2018

Written by:



Platinum Sponsor:



**ARGENTINA
WIND POWER
2018**

GWEC
GLOBAL WIND ENERGY COUNCIL



ARGENTINA WIND POWER 2018

In 2018, wind power in Argentina is experiencing unprecedented development, contributing like no other technology to meet renewable energy consumption targets, within a framework in which events of maximum international impact, such as the G20 and B20 summits, place it on the center stage of the discussions about energy transition and environmental sustainability.

The successful regulatory model implemented to open the power grid to this new source of generation poses new challenges that need to be efficiently met to pave the way for ongoing projects. The wind power industry needs to speed installations if it is to achieve the development of all projects. Dialogue with decision-makers responsible for the areas involved in the projects is of outmost importance to eliminate the remaining barriers, such as grid infrastructure, national and international financing, and local content requirements or logistics in transport and construction.

Argentina Wind Power offers a unique platform for dialogue between government and industry to address issues and provide solutions.

Argentina Wind Power is where agents and operators from across the entire supply chain come together to do business, enhance partnerships and, together, grow the wind power industry in the country.

An event organized by the industry... for the industry.



The Global Wind Energy Council (GWEC) is an international association that gathers the leading companies of the wind power industry, as well as national and regional associations. Our mission is to ensure that wind power establishes itself as the answer to today's energy challenges, providing substantial environmental and economic benefits.

www.gwec.net

Platinum Sponsor:



Vestas is the global leading company in wind power. The company designs, manufactures, installs, and services wind turbines across the globe. With over 94 GW of installed capacity in 79 countries, Vestas has installed more wind power than any other manufacturer.

Together with the company's customers and its more than 24,300 employees, Vestas offers sustainable energy solutions to promote a cleaner planet and a more promising future.

www.vestas.com

Content Ambassador & Silver Sponsor:



EOS is company based in Buenos Aires, Argentina, that provides advisory and consulting services for the power industry in general, with focus on the renewable energy market. The company's services include legal, regulatory, financial, fiscal and technical expert consultancy applicable to the entire investment cycle. The company also provides full services for large users to assist them in the procurement of renewable energy in the Renewable Energy Term Market (MATER).

www.eosenergia.net

STATE OF THE WIND ENERGY INDUSTRY IN ARGENTINA

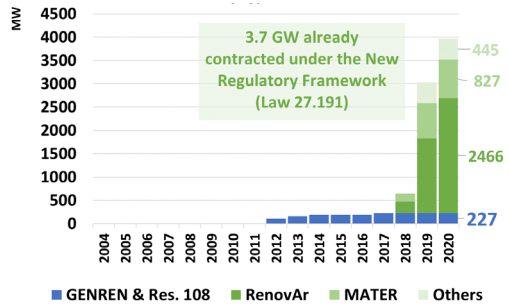
National Law 27.191 of 2015 sets a mandate to incorporate **20% of renewable electricity by 2025**.

Since 2016, and in contrast to the previous energy policy, the Argentine government has been implementing **new procurement schemes** that have revitalized the renewable sector in general and the **wind power** sector in particular.

3.7 GW of wind power capacity. 63 projects. USD 5 billion in investments. 5000 jobs.

The market has awakened.

Evolution of Installed Wind Power Capacity (Detail by type of Contract)



So far, **201 renewable power generation projects** have been contracted for a total of **6 GW**.

Wind power projects correspond to **63 wind power projects** for **3.7 GW** (62% of total capacity)

They are located in **9 provinces** Argentina.

There are **3 main development areas**: Southern Buenos Aires Province Region, Puerto Madryn Region, and Northern Santa Cruz/Southern Chubut Region.

Once these projects start operations they will cover half of the target mandate for 2020.

3 projects made viable by the new regulatory framework are already in **commercial operation** supplying 224 MW.

30 projects under construction, most of them with significant level of progress.

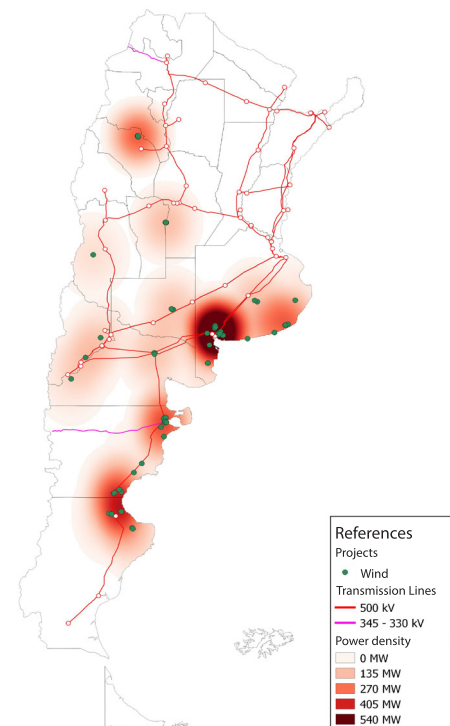
41 projects (2.9 GW) contracted with CAMMESA.

22 active projects (0.8 GW) in the Renewable Energy Term Market (**MATER**).

State-of-the-art WTG are being installed with unit capacity up to 4.2 MW.

OEMs with current projects in the country include Vestas, Nordex, Acciona, Servion, Envision, Goldwind, Siemens Gamesa, GE and Enercon.

Contracted Wind Projects as of August 2018



Source: Ministry of Energy

	Awarded or Assigned Capacity (MW)	# of Projects		
		Total	Operating	Under Construction
ROUND 1	707	12	2	5
ROUND 1.5	765	10	-	8
ROUND 2	993	12	-	1
RESOLUTION 202/2016	445	7	-	7
MATER	827	22	1	9
TOTAL	3,738	63	3	30

Source: EOS Energy based on data from CAMMESA

W.F. Rawson III (Gemeia, 24 MW)
W.F. Corti (Pampa Energia, 100 MW)
W.F. La Castellana (CP, 100 MW)

REGULATORY FRAMEWORK

National Law 27.191 passed in 2015 is the regulatory framework governing the renewable energy sector in Argentina.

The market has been organized around three complementary segments: (i) joint purchases made through CAMMESA (the Wholesale Electricity Market Administration Company), (ii) the Renewable Energy Term Market (a.k.a. MATER for its Spanish acronym), and (iii) self-generation.

Auctions to procure renewable energy under Power Purchase Agreements (PPAs) to 20 years within the framework of the RenovAr Program constitute the main mechanism for enforcing legal compliance.

RenovAr has been designed to achieve multiple objectives simultaneously and as efficiently as possible: assign contracts in a transparent and competitive way, minimize the long-term cost to be paid by users, comply with an explicit legal mandate of geographical and technological diversification, and establish incentives for the development of local supply chain and manufacturing of renewable energy generation equipment. In RenovAr, CAMMESA acts as offtaker of the electricity generated in representation of electricity distributors and large users of the Wholesale Electricity Market (a.k.a. MEM of its Spanish acronym). Contracts are for a period of 20 years and the National State provides a series of guarantees that have been very effective to promote investments in the sector allowing local and foreign investors to access the capital market.

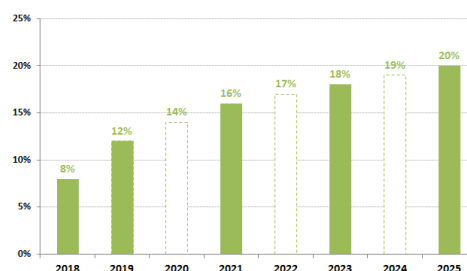
So far, this has been an ambitious yet very successful program. In its first round, executed in 2016, it attracted strong interest among local and foreign investors. Round 2 took place in 2017. So far, 147 projects have been awarded for up to 4966 MW in 5 technologies and 20 provinces. Thirty-four of these are wind power projects for 2911 MW.

Awarded prices were lower than expected, which reflects the interest to invest and the current level of competition.

In Argentina, access to the power transmission system is open and by law renewable generation has dispatch priority in relation to other conventional sources. Regulation developed for the renewable energy sector includes a mechanism by which dispatch priorities are managed among renewable energy generators to minimize the risk of congestion.

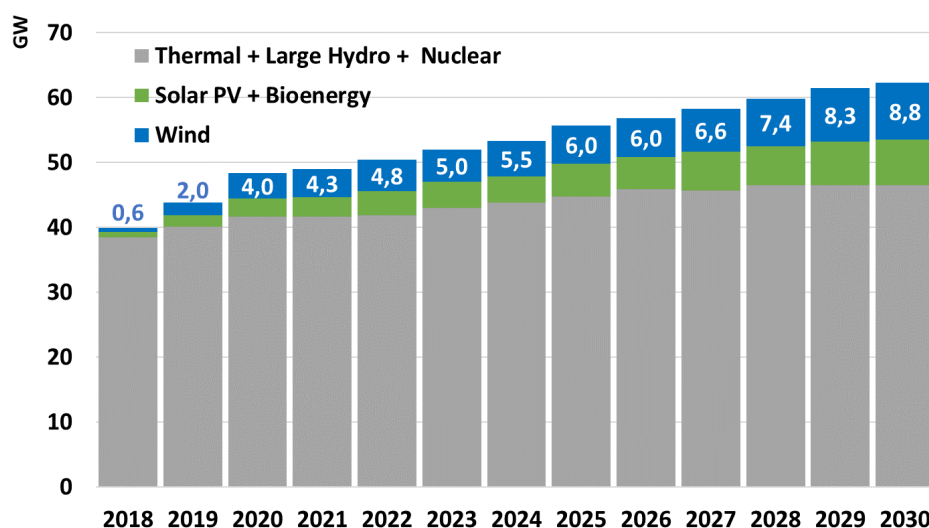
Regulation also includes a series of fiscal benefits and import tariffs exemptions as well as incentives for the integration of locally manufactured equipment.

Renewable Energy Mandates to 2025



Evolution of Installed Capacity to 2030

Wind power reaches 8.8 GW in 2030 equivalent to 14% of demand



Source: Prospective of EOS Energía based on data from CAMMESA and the Ministry of Energy.

MARKET ACTIVITY

At the end of August 2018, three wind power projects were in commercial operation (224 MW), and 30 other were under construction (1700 MW), all of them developed in compliance with the sector's new regulatory framework and using state-of-the-art equipment. This adds to the 227 MW installed in previous years.

Since early 2016, three bidding rounds of the RenovAr Program have been held, contracts facing financing difficulties during the previous administration and which had not been constructed have been readjusted, and a specific regulatory framework for the procurement of renewable energy among generators and power trading companies and large industrial and commercial demand has been launched.

Currently, there are 63 contracted wind power projects for 3738 MW. Their construction and commissioning will require investments in the order of 5 billion US dollars.

It is remarkable that almost half of these projects are already under construction, and some of them are only a few months away from beginning commercial operation.

Within the context of the MATER, created under Energy and Mining Ministry Resolution 281-E/2017, at least 22 projects for over 800 MW of installed capacity and a generation potential of around 3.5 TWh/year (2.5% of the country's aggregate demand) have been mobilized so far. These projects have been granted dispatch priority under a special competitive process, and they have presented guarantees and committed to a certain commissioning date in order to maintain such priority. Although these projects do not automatically have a PPA for the energy they will generate, the sponsor companies are actively working to sign long-term agreements with corporate offtakers and secure financing.

Signing mid and long-term PPAs is a great challenge for both generators and large users; however, the MATER represents a clear opportunity for corporations in Argentina to reduce costs and emissions in their operations in the country.



Port of Puerto Madryn, Chubut.
Photo: courtesy of Genneia.



Puerto Madryn II Wind Farm, 150 MW,
Puerto Madryn, Chubut.
Photo: courtesy of Genneia.



Photo: courtesy of Vestas.



Port of Puerto Madryn, Chubut.
Photo: courtesy of the Ministry of Energy.

MARKET ACTIVITY

Construction deadlines are demanding in all cases and a great majority of this new capacity will be in operation within the next 2 years.

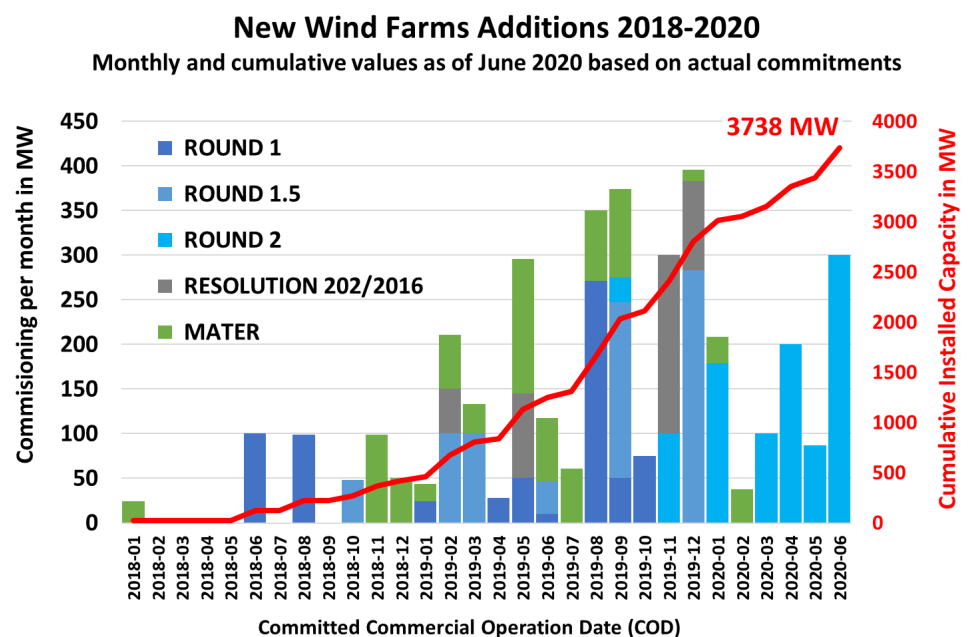
Procurements within the RenovAr Program include commitments of interim milestones and of commercial operation dates, which are punished with tough penalties in the event of delays.

MATER-oriented projects that have been assigned dispatch priority have deadlines up to two years as from the assignment date. However, many have had to compete by reducing the time to COD and thus have shorter periods to build and begin commercial operation.

The chart below shows the monthly additions of new wind power capacity (measured in MW) during the January 2018-June 2020 period. It is remarkable how several MATER projects are ahead of schedule and become intermingled with the RenovAr and Resolution 202/2017 projects. It is also noteworthy that several of them will begin commercial operation before the end of 2018 as in the case of YPF Luz's Manantiales Behr Wind Farm (100 MW) and Aluar's Aluar I Wind Farm (50 MW).



Aluar I Wind Farm, 50.4 MW, Puerto Madryn, Chubut.
Photo: courtesy of the Ministry of Energy.



Source: EOS Energy based on data from CAMMESA

MATER, AN OPPORTUNITY FOR LARGE USERS

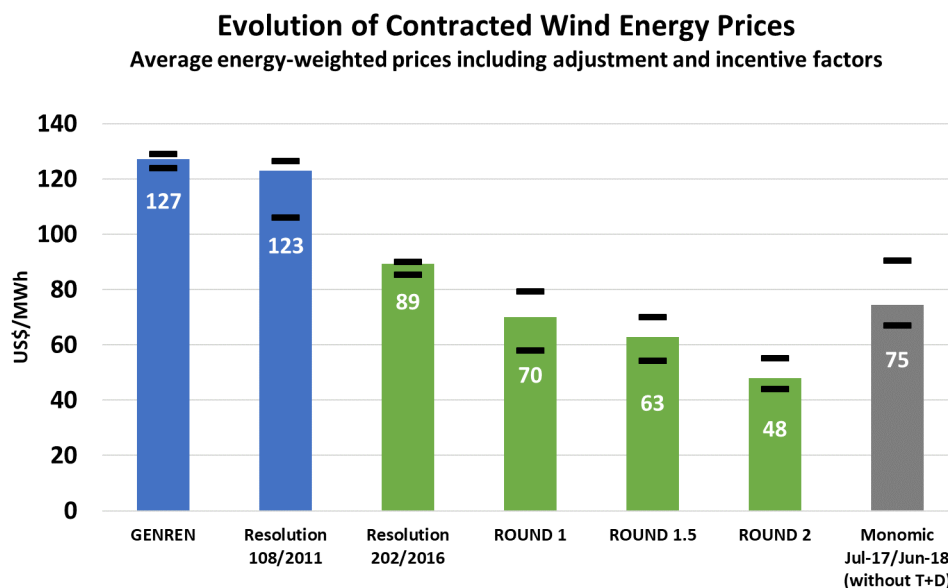
In recent years, companies around the world have shown a marked tendency towards purchasing renewable energy. This phenomenon relies on multiple factors, including substantial competitive improvements of wind and solar power generation technologies, specific incentive schemes, and will to reduce environmental impact of operations, among others. Power markets such as the European, American, Mexican or Japanese, which are so different, already have numerous renewable energy private contracts, commonly known as Power Purchase Agreements (PPAs).

Fortunately, the first renewable PPAs are already being signed in Argentina, within the regulatory framework of the MATER and taking advantage of a very clear opportunity to reduce costs compared with other available alternatives, including prices prevailing in the spot market for monthly purchases to CAMMESA.

The chart below shows final prices (without taxes, transmission and distribution costs) of the different groups of wind power supply contracts that have been signed through CAMMESA over the last few years.

The price reduction observed from the average price awarded within the framework of the GENREN Program in 2010/12 and the average of Round 2 of the RenovAr Program in 2017 is 62% (127 USD/MWh vs 48 USD/MWh). Prices obtained in the three RenovAr rounds are even lower than monomic market prices (i.e. average energy and capacity charges) sanctioned between July 2017 and June 2018, which proves how competitive wind power is.

With free prices and completely free purchasing terms and conditions, the MATER is a great opportunity to reduce supply cost while contributing to the economic and environmental sustainability of the business.



Source: EOS Energy based on data from CAMMESA

MATER, AN OPPORTUNITY FOR LARGE USERS



Large users of the MEM with an average annual demand above 300 kW (a.k.a. “GUH” for the Spanish acronym for entitled large users) can opt out of the joint renewable energy purchases made by CAMMESA. Basically, GUHs have three options to purchase renewable energy:

1. **Purchase directly from renewable energy generators through private contracts**
2. **Purchase from power trading companies in the MEM**
3. **Install their own renewable source generation equipment either on site or remotely, using the transmission grid.**

Large corporate demands which are currently purchasing power from distribution utilities (a.k.a. “GUDIS”) must become agents of the MEM in order to become GUHs and be able to purchase in the MATER. Exercising the opt out option allows GUHs not to pay for the proportional cost of such joint purchases which results in savings. Additionally, GUHs who opt out receive a discount on capacity charges making renewable PPAs even more attractive. All GUHs can freely purchase up to 100% of their demand through PPAs with renewable power generators or power trading companies, as long as the energy comes from projects registered in the National Registry of Renewable Energy Projects (RENPER).

Alternatively, and/or complementarily, GUHs can self-generate power with any renewable technology either on site or by using the transmission grid.

Replacement of monthly purchases in the spot and/or conventional energy market with purchases in the MATER may result in savings of between 10% and 20% of the annual power supply cost when a GUH acquires between 20% and 30% of its demand from renewable sources. Actual savings will depend on different variables, namely spot and contracted prices being substituted, volume contracted, capacity charges, and, obviously, contracted price of the renewable energy. In turn, renewable prices depend on the type of renewable technology used, the tenor of the contract, and other conditions of the PPA.

As we mentioned, the first transactions of the MATER are already taking place.

Wind power is (together with photovoltaic solar energy in certain high irradiation sites), the **cheapest and most competitive renewable source for the MATER**.

It is estimated that this market could mobilize up to **4000 MW of wind power in the next 5 years**.

Arauco II Wind Farm (Stages 1 and 2), 99.75 MW, Aimogasta, La Rioja.
Photo: courtesy of the Ministry of Energy.



Corti I Wind Farm, 100 MW, Bahía Blanca, Buenos Aires
Photo: courtesy of EOS Energía.



Garayalde Wind Farm, 24 MW, Chubut
Photo: courtesy of the Ministry of Energy.



La Castellana Wind Farm, 100 MW, Bahía Blanca, Buenos Aires
Photo: courtesy of the Ministry of Energy.





ARGENTINA WIND POWER 2018

6 & 7 September 2018
Buenos Aires, ARGENTINA

Patrocinador platino:

Vestas®

Patrocinadores plata:

SIEMENS Gamesa
RENEWABLE ENERGY

EOS
energía

VENTUS
NOS IMPORTA EL FUTURO

Patrocinadores bronce:

ENERCON
ENERGY FOR THE WORLD

GenNeia

NORDEX

acciona
Windpower

Patrocinadores auspiciantes:

EOLIASUR

ARCOVERA
RENEWABLES

DNV GL

ENVISION

energiasdelplata
SMART ENERGY MANAGEMENT



Con el apoyo de:

Ministerio de Energía

ITBA
Instituto Tecnológico de Buenos Aires

AHK Cámara de Industria y Comercio
Argentino-Alemana
Industrie- und Handelskammer
Lo hacemos posible.

Agencia Argentina de Inversiones y Comercio Internacional

Brazil Windpower 2018
conference & exhibition

cea
COMISIÓN ENERGÍA ATÓMICA

ame
Confederación Argentina de la Mediana Empresa

AE
Asociación Argentina de Energía Eólica
Asociación de la Industria Eólica Argentina

Medios colaboradores:

Energía Estratégica

energetica
latam.com

FuturENERGY
EFICIENCIA, PROYECTOS Y FUTURO DE LAS EMPRESAS

Energía & Negocios

WINDTECH
INTERNATIONAL

WIND
SYSTEMS

altenergymag.com

Energía Positiva