

D2.1-AR, December 2019

# Auctions for the support of renewable energy in Argentina

Main results and lessons learned





## **D2.1-AR, December 2019, Auctions for the support of renewable energy in Argentina**

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# 1 Introduction

## 1.1 Background

Argentina is the world's eighth-largest country territory wise and the third-largest economy in terms of GDP in Latin America behind Brazil and Mexico. The country is characterised by a broad variety and availability of natural resources including a vast area of agricultural land and substantial reserves of oil, gas, minerals, and water. Additionally, Argentina offers optimal conditions for the development of renewable energy ("RE") like wind, solar, biomass, hydropower, etc. (MEyM, 2016b).

Argentina primarily depends on natural gas and hydropower to meet its electricity demand, but in recent years the contribution of renewable energy technologies has grown significantly. According to the latest report by the country's Electricity Wholesale Market Administrator (CAMESA) in October 2019, Argentina generated 7.8% (806 GWh) of its total electricity using renewable sources (including wind, solar PV, biogas, biomass, and small (i.e. less than 50 MW) hydro<sup>1</sup>) (CAMMESA, 2019). Despite not having reached the government-set objective of obtaining 8% of total electricity supply from RE sources by the end of 2018, it is important to note the impressive rate of development of RE in Argentina. For instance, during the period January 2017 to October 2019 the contribution of RE technologies in meeting total electricity consumption in Argentina almost quadrupled.

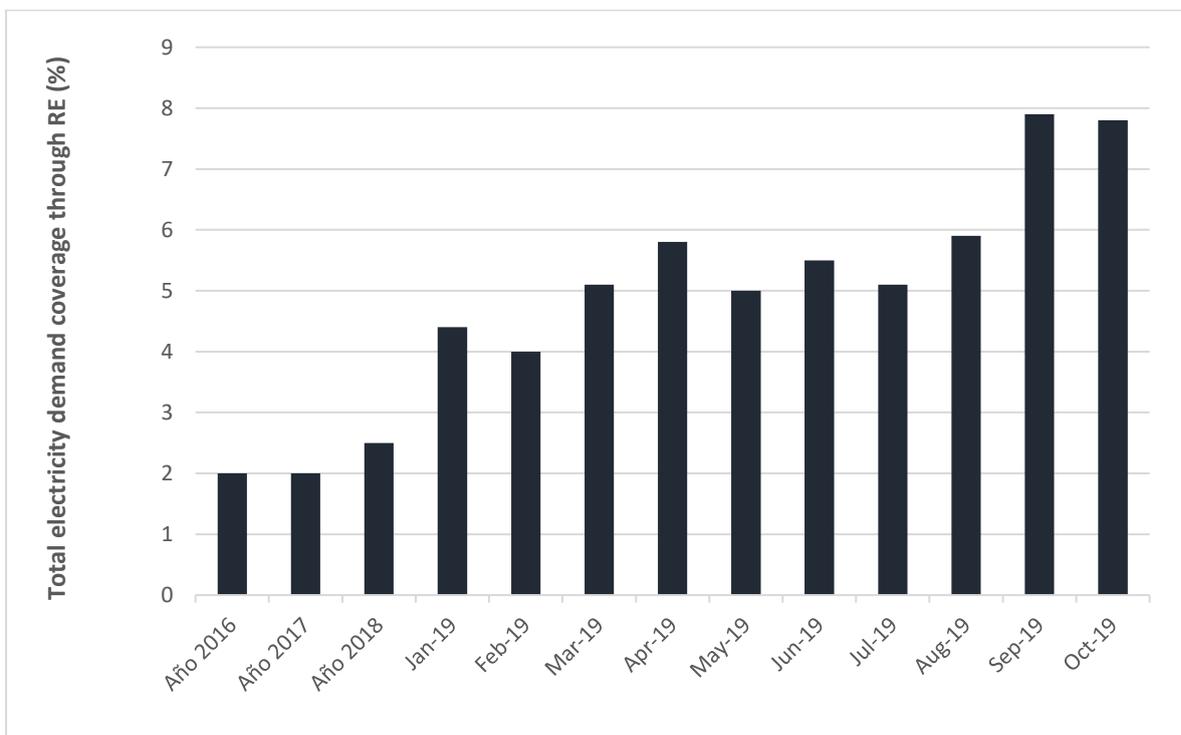


Figure 1: Renewable energy production as a proportion of total electricity consumption in Argentina (2016-2019). (CAMMESA, 2019).

By December 2019, and according to data published by CAMESA, the RE installed power generation capacity reached 2.594 MW in total, including 1.510 MW of wind, 435 MW of solar PV, 488 MW of small hydropower and 161 MW of bioenergy. Today, Argentina is one of the world's fastest-growing wind power markets (REN 21, 2019).

<sup>1</sup> Act 27191, Article 2(b).



According to the 53<sup>rd</sup> Ernst and Young Renewable Energy Country Attractiveness Index (RECAI), which analyses factors driving RE market attractiveness, Argentina is the most attractive country for investments in RE in Latin America (ranked 9th globally), among the countries studied (Argentina, Chile, Brazil, Mexico and Peru) (EY, 2019). Moreover, RE capacity is expected to increase due to a USD 160 million loan agreed in 2019 between the Inter-American Development Bank (IDB) and the Argentinean development bank **Banco de Inversión y Comercio Exterior (BICE)** to finance private investments in RE and energy efficiency coming from Small and medium-sized enterprises (SMEs) in RE. The IDB - as the implementing agency of the Green Climate Fund (GCF) - will finance USD 100 million, while BICE will co-finance the additional USD 60 million. (Sanchez Molina, 2019).

## 1.2 Political-Economic Background

Argentina has an extensive history of political and economic instability (Heritage Foundation, 2019). Since 2015, the Government of Mauricio Macri took measures to improve the deteriorated state of the Argentinian economy, that had developed partly as a result of high expenditures on social welfare programmes and subsidies in the electricity, gas, water and the industrial sectors. Following a prolonged period of a lack of foreign investment in Argentina, the government attempted to promote foreign investment opportunities in most of the strategic sectors of the economy on a regional and provincial level. Amongst other things, export taxes and import restrictions were removed, and a 4-year plan was established to eliminate the primary fiscal deficit and set up a new Public-Private Partnership (PPP) regulatory framework; and the Argentine central bank transitioned to an inflation targeting regime in 2016 (Cachnosky, 2019).

In the beginning, these measures appeared to have a positive impact on Argentina's economy, resulting in lower inflation levels and an 81% increase in foreign direct investments in the Argentine economy as a whole in the first half-year of 2016 compared to 2015 levels (MEyM, 2016b). Argentina's economy experienced overall economic growth of 2.7 per cent in 2017. However, this positive trend was short-lived, as an economic and financial crisis unfolded (for a multitude of reasons; out-with the scope of this present study). The country's GDP growth rate in 2018 was -2.51%, equivalent to a 5.18% decline on 2017 levels.

Within its efforts to secure Argentina's liquidity, amongst other measures the government turned to the International Monetary Fund (IMF) in 2018, which issued a USD 57 billion loan to the country under the condition that Argentina would keep the public deficit at zero. Yet, maintaining a public deficit of zero proved to be almost impossible to achieve, and the deficit together with the debt and implemented monetary policy led to a new economic crisis in the country with a devaluation of the national currency and a high inflation rate.

On the positive side, Argentina's GHG emissions per capita are low (OECD, 2019), and there seems to be broad cross parliamentary part support for continuing to expand the use of RE in Argentina. RE deployment offers several specific advantages for the country. On one hand, they have the potential to reduce the cost of power supply by displacing thermal generation, which is heavily reliant on imported fuels, and thus influences the country's trade balance. On the other hand, Argentina has large areas that are highly suitable for the deployment of renewables due to the low cost of land and rich RE resources, which make the costs of RE competitive.

### 1.2.1 The Argentine Electricity Sector

Up until the beginning of the 1990s Argentina's electricity generation and transmission infrastructure was in an overall poor technical state, a result of chronic underinvestment and mismanagement in the sector.

In 1991 the electricity sector was privatized within the framework of the country's economic plan, and which foresaw privatization of all major state-owned industries (Pampaenergia, 2019). In the wake of this development, Law No. 24,065 on the Electricity Regulation Framework aimed at modernizing the electricity sector by fostering competition and investments, reducing the cost for consumers, protecting consumer rights, improving service quality and promoting efficiency, reliability and open access. Under this framework, a vertical separation of the electricity sector activities into generation, transmission and distribution took place to avoid the emergence of a natural monopoly (Siboldi; Fanelli; O'Farrel, 2019). The law set the basis for the following aspects:



- Establishment of the National Electricity Regulatory Entity, ENRE (Ente Nacional Regulador de la Electricidad) and other institutional authorities in the sector, including the market administrator, CAMMESA (Compañía Administradora del Mercado Mayorista Eléctrico),
- Electricity spot pricing,
- Tariff setting, and
- Establishment of the basis for the evaluation of assets to be privatized (Pampaenergía, 2019).

Argentina's Wholesale Electricity Market (WEM) agents comprise generators, distributors, transmission companies, large users and brokers. Within the WEM, which is regulated by the Secretariat of Renewable Resources and Electricity Market, market participants can buy and sell electricity within spot transactions or under long-term supply contracts. The Electricity Regulation Framework also defines the responsibilities within the market. As such, the distribution and transmission of electricity is a public service that is determined through a long-term concession agreement between the federal or provincial government and distributors and transmission companies.

**CAMMESA manages dispatch, operations and economic transactions in the Argentine electricity wholesale market, WEM. The WEM consists of:**

- Vertically differentiated generation, transmission and distribution entities.
- A term market (MAT), where contractual conditions, quantities and prices are directly negotiated between buyers and sellers. The MAT however only applies to terms negotiated under the Energía Plus scheme, i.e., power generators, co-generators and self-generators which are not WEM agents or large users with demands in excess of 300kW on top of base demands.
- A term market for renewable energy sources (MAT ER), that offers an alternative to purchase energy other than through CAMMESA's auction processes.
- A spot market, through which spot prices are established on an hourly basis.
- A stabilizing fund mitigating the volatility of spot prices through semi-annually set seasonal prices<sup>2</sup>.

After the privatization wave of the 1990s, an economic crisis hit Argentina in 2001–02. The country underwent a period of economic and political destabilization resulting in the premature resignation of President de la Rúa (1999–2001) in December 2001 and the devaluation of the Argentinean peso in 2002. The Argentine currency dropped sharply in relation to the US dollar affecting in particular investments in the energy and electricity sector (Jimeno, 2015). The WEM and the operations of power generators were significantly altered by the economic crisis and the Emergency Law No. 25,561 that was established during the crisis. This law led to a renegotiation of concession agreements which had an impact on the currency for the payment of fees under concession agreements. Furthermore, the tariffs of distributors and transmission companies were frozen for several years, indexation clauses were forbidden, and the spot prices on the WEM were required to be calculated on the basis of prices for natural gas without taking the actual fuel use into consideration (Pampaenergía, 2019).

During the economic crisis, new indirect subsidies to the energy and electricity sector, which aimed to freeze wholesale prices, were introduced to compensate the low level of energy consumption of the domestic population.

As wholesale prices were frozen and kept below costs, Argentina's WEM faced a structural deficit in its operation, that was balanced through subsidy payments from the National Treasury to CAMMESA, the administrator of the WEM (Siboldi; Fanelli; O'Farrel, 2019). The structural deficit was additionally aggravated by high inflation rates. This resulted in electricity market participants operating at almost full capacity by the end of 2015 as low prices disincentivised much-needed investment in new generation capacity.

This led the new federal government to pass an electricity emergency declaration (Decree No.134/2015) into place which was valid from 15 December 2015 until 31 December 2017, and made the Ministry of Energy

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<sup>2</sup> To counteract price volatility for end user, a stabilization fund had been created in order to bridge differences between spot prices and regulated prices. The fund was found to run significant deficits, although it was assumed to balance in the long-term (Fitch Ratings, 2019).



and Mining (MEyM) responsible for the preparation and implementation of an action plan to improve quality and safety, as well as ensuring electricity supply under appropriate technical and economic terms. Furthermore, the government decreased the subsidies that were paid under the previous administration and implied cost-reflective price schemes. By doing so, the authorities began to close the deficit in the national budget that was created by the prolonged use of price subsidies (Siboldi; Fanelli; O'Farrel, 2019). The reductions in subsidy levels led to a general increase in final prices for consumers. The government's subsidy reform (reduction) measures were strongly resisted by large parts of the population and civil society. The case was taken to the country's Supreme Court, which ruled to stop the freeze the end-consumer price increases at least until the government had followed due process and celebrated public hearings on the issue.

In addition, on 31 March 2016, the government enacted RE Law 27,191, which modified the previous RE Law 26,190, updating the RE targets and policy support schemes. The new RE Law (27,191), which had been passed in 2015 under the previous government, states that consumers should meet 20% of their electricity demand through RE by the end of 2025. Moreover, the RE Law places an individual obligation on large consumers to comply with the 20% consumption target. Large consumers are allowed to generate their own renewable energy or buy it in the wholesale market or directly to the generator. If they do not meet the 20% target they incur a financial penalty.<sup>3</sup> To reach this objective Argentina will need to deploy around 10,000 MW of renewables with an expected average annual investment of USD 1,500 million.

Whilst Argentina's electricity mix remains dominated by thermal (fossil fuel) fired sources, and (to a lesser extent) large hydropower (Cammesa, 2019), RE sources account for an increasingly larger share of the overall mix. In December 2019, RE accounted for around 6.5% (2,594 MW) of the 39,835 MW total installed electricity generation capacity, and it is important to note that a significant amount of new RE power generation capacity is under construction at the time of writing. According to data published by CAMESA, in December 2019, Argentina had 1,510 MW of wind power, 435 MW of solar PV, 488 MW of small hydropower and 161 MW of bioenergy.

## 1.2.2 The MAT ER Electricity Term Market

In August 2017 the MEyM issued Resolution No. 281-E/2017 to regulate the Electricity Term Market from Renewable Energy Sources (MAT ER) regime which set the conditions for large users<sup>4</sup> within the WEM and WEM "Large Distribution Company Users" to meet their RE obligations through individual PPAs within the MAT ER or through self-generation from renewable sources (Pampaenergia, 2019). Together these measures aimed at fulfilling the government's mandates of Law 27,191, i.e. 8% RE by 2016 and 16% by 2021, issued to reach the overall target of 20% RE by 2025 (Soares, 2018). The above-mentioned Resolution (281-E/2017) requires the WEM's large users and CAMMESA to cover 8% of their electricity demand from renewable sources by the end of 2017, whereas the percentage to be covered increases biennially until the 20% objective is reached. Additionally, the distribution of electricity produced from renewable sources for self-consumption and the injection of surpluses into the distribution network was literally declared to be of "national interest" on 27 December 2017 by Law No. 27,424 (Pampaenergia, 2019). In practice, Law No. 27,424 set forth the regulation framework for distributed generation and manages the contractual conditions for self-generation and grid injection.

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<sup>3</sup> The penalty is calculated as equivalent to the "gap" between RE consumption and the target RE consumption (in MWh) multiplied by the variable cost of a power plant using imported natural gas.

<sup>4</sup> Large users of energy are classified as: Grandes Usarios Mayores (Major Large Users "GUMAs"), Grandes Usarios Menores (Minor Large Users "GUMEs") or Grandes Usarios Particulares (Particular Large Users "GUPAs") whereas each of the user groups has to follow different requirements while buying for their energy demand; GUMAs have to purchase half of their demand through supply contracts and the other half in the spot market, GUMEs and GUPAs on the other hand have to purchase all of their demand through supply contracts.

## 1.3 The RenovAr Programme

In order to raise the share of renewables in the electricity mix, the MEyM launched the RenovAr programme on 17 May 2016, under Resolution No. 71/16, in the framework of Law 27,191. The Programme features an open call for tenders in several rounds (Pampaenergia, 2019). Projects eligible to win a PPA for this call should be based on RE sources such as wind, solar, mini hydro, biomass and biogas (Siboldi; Fanelli; O'Farrel, 2019).

### 1.3.1 A Decisive Feature: Liquidity and Solvency Guarantees

A decisive feature of Argentina's RenovAr support programme is a multi-level safety net of payment and solvency guarantee meant to leverage investors' confidence and bring down prices. On one level, in addition to entering into a PPA with CAMMESA, the successful bidder joins a Trust Adhesion Agreement, so-called FODER.

The FODER Trust fund establishes an Energy Payment or Off-Taker Guarantee (see Figure 2, Part 1), which ensures compliance with the PPAs signed between the winning generators and CAMMESA. The generators supply electricity to the national grid, and receive monthly payments via CAMMESA, that acts as an intermediary between the seller and the buyer. If CAMMESA fails to reimburse the seller for generated electricity, the FODER trust fund issues the remaining payments on its behalf.

A second level guarantee (see Figure 2, Part 2) is offered in the form of a put option mechanism, which allows developers to transfer project assets to FODER in case CAMMESA fails to pay for the supplied energy during 4 consecutive months (or 6 non-consecutive months within any 12-month period). In turn, generators are entitled to receive compensation from FODER, the value of which can be based on investment audits or pre-defined per MW schemes. Further, the termination payment guarantee also mandates developers to trigger the put option where the Government of Argentina decides to change the guarantee framework without the developers' consent, or where FODER or the Government of Argentina fails to comply with a firm arbitration sentence. As such, this second level guarantee is especially aimed at mitigating main risk factors inherent to the country itself (country risks and policy risks). FODER was further aimed at providing project funding assistance through a separated funding account, with preferential access given to projects with high local content. Currently, FODER only provides guarantees and no financing support. Specifically, it was confirmed that the objective of the complementary source of local funding provided by FODER in addition to the pre-existing Project for Renewable Energy in Rural Markets (PERMER<sup>5</sup>) mechanism (PWC, 2017) founded by the World Bank, was not achieved (Source: Interview with member of the Argentinian Secretary of Energy, October 2019). In 2016, funding to FODER amounted to roughly USD 800 million (World Bank, 2016).

Furthermore, the World Bank has agreed to act as a backstop (see Figure 2, Part 3) (through the International Bank for Reconstruction and Development) to FODER, with up to USD 480 million for RenovAr rounds 1 and 1.5, and up to USD 250 million for round 2. The World Bank guarantee comprises an optional third level that is meant to further secure against the risk that the Government of Argentina cannot back up the repayment guarantees established through FODER.

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<sup>5</sup> PERMER is not part of RenovAr. It is a parallel program addressed to off-grid systems to be installed in rural and isolated areas.



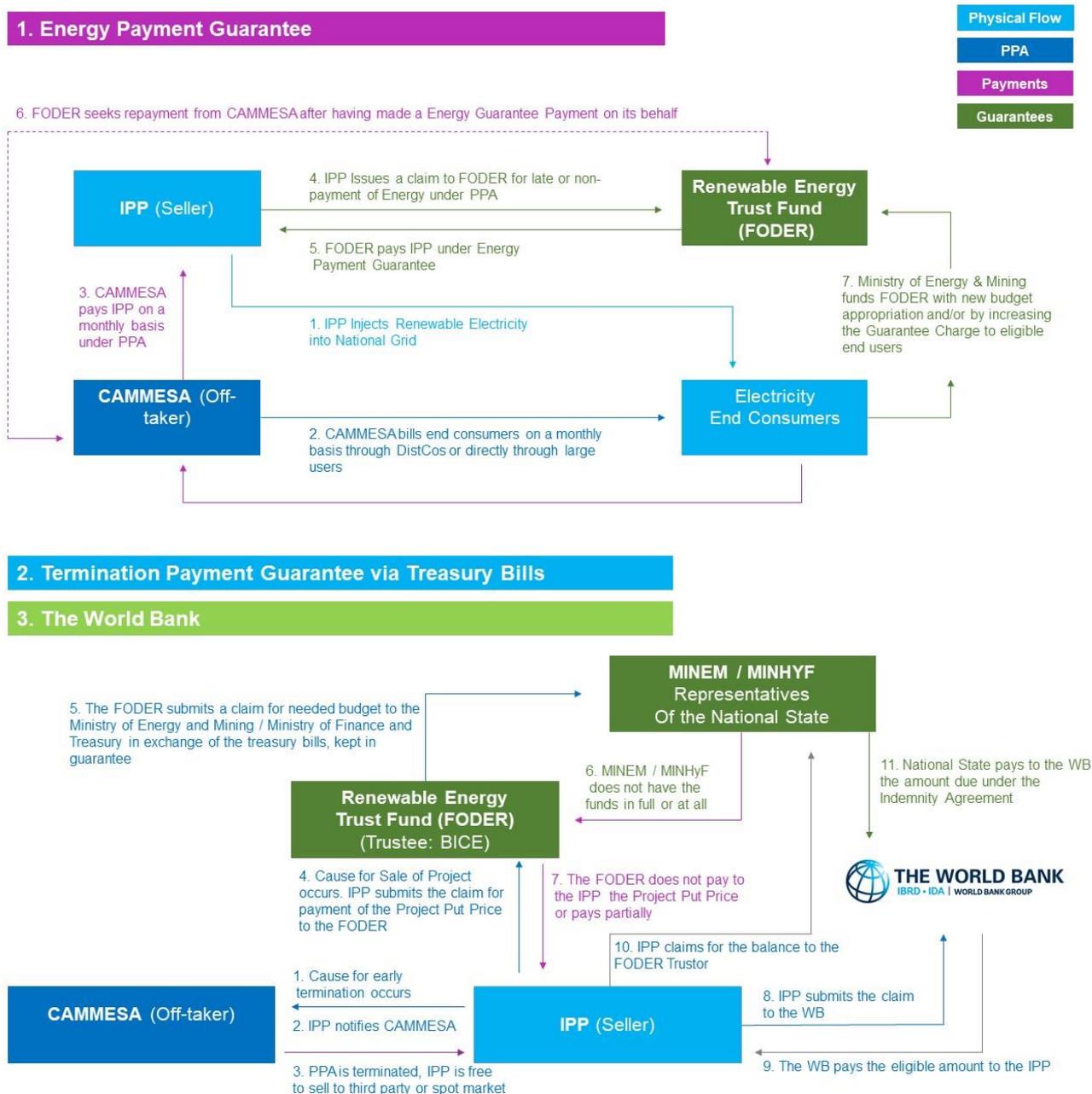


Figure 2: FODER and World Bank Energy Payment Guarantees. (Factor (2019) adapted from MEyM, (2016b)).

### 1.3.2 Significant Fiscal Incentives

The RenovAr programme, in addition to the guarantee schemes, benefits from promotion measures designed to attract bidders to the challenging market conditions of Argentina. Fiscal incentives and tax benefits to project developers comprise accelerated depreciation, extension periods for the computation of tax losses from projects,<sup>6</sup> the early recovery of Value Added Tax (VAT) on asset purchases, relief from minimum national income tax and relief from import duties (PWC, 2017). Furthermore, projects that source more than 60% of equipment and electro-mechanic components locally are eligible to receive tax credits equal to 20%

<sup>6</sup> Accelerated depreciation and extension periods for the computation of tax losses are hereby part of the same benefit as accelerated depreciation enable projects to pay profit taxes later.



of the amount of equipment purchased locally. This eligibility criterion to tax credits applies special terms to wind technologies. Wind power projects are considered to be 100% based on national industries if they incorporate more than 35% of locally manufactured components by June 2020 (Source: Interview with member of the Argentinian Secretary of Energy, October 2019). Additionally, according to Article 17 of Act 27191, the access and utilization of RE sources will not be affected by any tax, canon or royalty until the end of 2025.

### 1.3.3 Design Elements of the Argentine RenovAr Programme

The following table provide details on the design elements of the auction programme in Argentina. The RenovAr Programme has seen 4 auction rounds since 2016 up until today. Round 1 was conducted in October 2016, Round 1.5 in November 2016, Round 2 was conducted in November 2017, and Round 3 in July 2019. A fourth round was announced for late 2019 but had not been launched at the time of writing.

Table 1: Main characteristics of auctions and framework conditions (based on MEyM (2016a))

Characteristics	Description of the auction
Characteristics of the national electricity market	<p>The Compañía Administradora del Mercado Eléctrico Mayorista S.A. (CAMMESA) manages dispatch, operations and economic transactions in the Argentine electricity wholesale market, WEM.</p> <p>The WEM consists of:</p> <ul style="list-style-type: none"> <li>Vertically differentiated generation, transmission and distribution entities.</li> <li>A term market (MAT), where contractual conditions, quantities and prices are directly negotiated between buyers and sellers. The MAT however only applies to terms negotiated under the Energia Plus scheme, i.e., power generators, co-generators and self-generators which are not WEM agents or large users with demands in excess of 300kW on top of base demands.</li> <li>A term market for renewable energy sources (MAT ER), that offers an alternative to purchase energy other than through CAMMESA's auction processes.</li> <li>A spot market, through which spot prices are established on an hourly basis.</li> <li>A stabilizing fund mitigating the volatility of spot prices through semi-annually set seasonal prices.</li> </ul>
Name of auction scheme	RenovAr
Contractual counterparty	<p><b>Regulator:</b> Ente Nacional Regulador de la Electricidad, (ENRE)</p> <p><b>Buyer:</b> CAMMESA</p> <p><b>Off-Taker:</b> CAMMESA, acting on behalf of distribution utilities and large users.</p>

Main features	National auction to competitively assign PPAs and Trust Fund Adhesion Agreements that would further qualify for the participation in incentive and guarantee schemes.
Technology focus and differentiation (eligible technologies)	Technology-specific
Lead time before auction	6 months from the RFP to the signing of the PPA.
Min./max. size of project	<p><b>Wind and PV:</b></p> <ul style="list-style-type: none"> <li>• Minimum: 1 MW</li> <li>• Maximum 100 MW</li> </ul> <p><b>Biomass:</b></p> <ul style="list-style-type: none"> <li>• Minimum: 1 MW (Round 1 &amp; 1.5), 0.5 MW (Round 2)</li> <li>• Maximum 65 MW (Round 1 &amp; 1.5), 50 MW (Round 2)</li> </ul> <p><b>Biogas:</b></p> <ul style="list-style-type: none"> <li>• Minimum: 1 MW (Round 1 &amp; 1.5), 0.5 MW (Round 2)</li> <li>• Maximum 15 MW (Round 1 &amp; 1.5), 10 MW (Round 2)</li> </ul> <p><b>Mini Hydro:</b></p> <ul style="list-style-type: none"> <li>• Minimum: 0.5 MW</li> <li>• Maximum 20 MW</li> </ul> <p>Further, region-specific capacity maxima per interconnection point are set by CAMMESA. These are effectively limiting the to be contracted capacity at any physical connection node to the operational maximum of the Argentine Interconnection System (SADI).</p> <p>RenovAr round 3 limits project sizes to 10 MW, with a minimum of 500 kW.</p>
What is auctioned?	<p>Two contracts are auctioned:</p> <ul style="list-style-type: none"> <li>• Power Purchase Agreement over the guaranteed volume and price of electricity supplied.</li> <li>• FODER Trust Adhesion Agreement, providing energy payment and early termination guarantees.</li> </ul>
Budgetary expenditures per auction and per year	<p>Budgetary expenditures per auction are not known.</p> <p>However, it is known that the FODER trust is funded by the Argentine government through the national treasure.</p>
Frequency of auctions	Not scheduled. 4 Rounds of auctions have been implemented so far. Round 1.5 was a response to the



	large oversubscription of round 1. It was followed by Round 2 and Round 3. Round 4 was announced for late 2019 but has not been implemented at the time of writing.
Volume of the tender	See Table 3: <b>Summary of all RenovAr Rounds to date, based on MEyM (2017) and the Ministerio de Hacienda (2019)</b> for a full overview of tender volumes across all auction rounds.
Costs related to grid connection/access	Connection costs are borne by the generator. For Round 4 is assumed to also shift grid reinforcement costs to the generator.
Balancing and profile costs	Balancing risks are borne by the operator, but project companies have the obligation to provide contracted electricity on an annual basis. Failing to do so is subject to make-up periods and/or penalties.

### 1.3.4 Outcomes of the Argentine RenovAr Round 1 Auction

Table 2: General auction design of RenovAr round 1 (based on MEyM (2016a))

Design elements	Description
Auction format	Technology-specific RE auction for PPA and Trust Adhesion Agreement.
Eligible technologies and participation technologies?	RE power plants or extensions and / or repowering of new or used equipment of existing power plants.
Auction procedure	Static
Pre-qualification requirements - Financial	<p><b>Request for Proposal Price:</b></p> <p>Project developers are required to issue a payment of ARS 150,000 plus VAT in favour of CAMMESA, which allows the developer to issue one or several bids.</p> <p><b>Financial Requirements</b></p> <p>Bidders are asked to prove a minimum of USD 250,000 equity for each MW of offered capacity in each bid. If the bid is submitted by two or more individuals or legal entities at least one of them must comply with the financial requirement.</p> <p><b>Bid Bond:</b></p> <p>Project developers need to provide financial security in the form of a bid bond worth USD 35,000 per MW of the offered capacity.</p> <p><b>Performance Bond (successful bidders only):</b></p> <p>Successful bidders are further required to secure the compliance with terms as defined by the PPA through the establishment of a performance bond</p>



	worth USD 250,000 per MW of contracted capacity and for the time until the project is commercially operating (also for a period of up to 180 days following the start of commercial operation) (Source: Interview with member of the Argentinian Secretary of Energy, October 2019).
<b>Pre-qualification requirements</b> - Material	<p><b>General:</b></p> <p>Project developers need to authorize as WEM (wholesale market) agents and are required to provide evidence that resources to be exploited are available, as well as that legal titles for resource and land use are available. Further, the availability of prospective resources needs to be evaluated and summarized in an extended producer responsibility (EPR) report.</p> <p><b>Local Content:</b></p> <p>There are no legal prequalification requirements for having local content. However, local content constitutes an advantage in the bidding process and can entail cost reductions.</p> <p>Project developers can obtain tax credits equal to 20% of Stated Local Content (SLC), if the project includes a minimum share of 30% (35% in the case of wind power projects before June 2020) of local components (excluding civil works, transport and assembly of equipment) (Eclareon, 2017), with special rules applying to wind technologies.</p> <p>Those projects which contain local content are also eligible to receive a discount in the maintenance cost within the World Bank guarantee scheme, subsidised by the FODER. The discount is equal to one basis point for each one percent of Stated Local Content (SLC).</p> <p>The Stated Local Content is also used by CAMMESA to prepare an order of merit of the received bids, which is used as an evaluation criterion in cases of bid ties.</p>
<b>Auction volume</b>	See full comparison of the auction volumes of all RenovAr Rounds in Table 3: <b>Summary of all RenovAr Rounds to date, based on MEyM (2017) and the Ministerio de Hacienda (2019).</b>
<b>Pricing rule</b>	Pay-as-bid, subject to a predefined annual price for competition (the Adjusted Offered Price, which is a polynomial formula that includes the price, the transmission losses at the interconnection point and the days till commercial operation date (COD). In case of ties the local content is used to select projects on a order of merit basis.

<b>Award procedure</b>	<p><b>Multi-criteria evaluation:</b></p> <p>Winners are selected based on the bid price adjusted for transmission losses at the location and interconnection points (location adjustments) (USD/MWh) and potentially non-price criteria.</p> <p>Non-price criteria include local content integration, delivery time, amount of requested FODER financing, and compliance with documentation requirements. These are only relevant in case of bid price ties.</p>
<b>Price limits</b>	<p>Technology-specific undisclosed ceiling price, disclosed after the opening of bids (for round 1):</p> <ul style="list-style-type: none"> <li>• Wind: 82 USD/MWh (Round 1 &amp; 1.5), 56.25 USD/MWh (Round 2), 60 USD/MWh (Round 3)</li> <li>• Solar: 90 USD/MWh (Round 1 &amp; 1.5), 57.04 USD/MWh (Round 2), 60 USD/MWh (Round 3)</li> <li>• Biomass: 110 USD/MWh (Rounds 1, 1.5, 2 &amp; 3)</li> <li>• Biogas: 160 USD/MWh (Rounds 1, 1.5, 2 &amp; 3)</li> <li>• Small Hydro: 105 USD/MWh (Rounds 1, 1.5, 2 &amp; 3)</li> </ul>
<b>Support period</b>	20 years
<b>Favourable treatment of specific actors</b>	-
<b>Realization time limit</b>	<p>Max. 730 days</p> <p>As COD dates where part of the bidding process some projects will have realization time limits that are shorter than 730 days.</p>
<b>Penalties</b>	Economic penalty for a delayed start. A production deficit (<10%) may be carried over to the next period. Greater production deficits lead to the direct application of a fine (160 US\$/ MWh).
<b>Form of support auctioned</b>	PPA and FODER Trust Adhesion Agreement.
<b>In case of premium schemes describe the method of reference wholesale price calculation</b>	-
<b>Support level adjustments</b>	Support levels are adjusted by virtue of a Price Adjustment Factor of 1.7% YoY, in order to account for the loss of nominal value. Further, a Price Incentive Factor is defined for each year starting in 2017 up to 2038, decreasing from 1.20 to 0.8 over the course of this period.

<b>Transferability of support right</b>	The transfer of ownership of PPAs awarded under the auction system is possible but requires the express permission of CAMMESA.
<b>Other</b>	Developers can decide to opt for additional World Bank guarantees, which can secure against sovereign risk.

Table 3: Summary of all RenovAr Rounds to date, based on MEyM (2017) and the Ministerio de Hacienda (2019)

Auction	Tech	Auction Volume <sup>7</sup> (MW)	Contracted Capacity (MW)	Number of Bids Contracted	Average Price (USD/MWh)	Minimum Price (USD/MWh)
RenovAr 1	Wind	600	707.4	12	59.4	49.08
	Solar	300	400	4	59.7	58.98
	Biomass	65	15	2	110	-
	Biogas	15	9	6	154	118
	Small Hydro	20	11	5	105	-
RenovAr 1.5	Wind	400	765.4	10	53.3	46
	Solar	200	516.2	20	54.9	48
RenovAr 2 <sup>8</sup>	Wind	550	665.8	8	41.23	37.3
	Solar	450	556.8	12	43.46	40.4
	Biomass	100	117.2	14	106.73	92
	Biogas	35	35	20	156.85	150
	Biogas (land-fill)	15	13.1	3	129.18	128
	Small Hydro	50	20.8	9	98.89	89
RenovAr 3	Wind	350	128.7	10	58.04	52.5
	Solar		96.75	13	57.59	54.2

<sup>7</sup> Targeted volume as published in Request for Proposal.

<sup>8</sup> For small scale bioenergy technologies there was a scale incentive of up to 30 USD/MWh.

RenovAr round 2 also featured a second phase, that contracted another 26 MW of biomass (at an average of 112,25 USD/MWh), 21.2 MW of biogas (at an average of 158.3 USD/MWh), 327.6 MW of wind (at an average of 40.27 USD/MWh), and 259.5 MW of solar PV (at an average of 41.57 USD/MWh).



	Biomass	25	8.5	2	106.15	105.9
	Biogas	10	12.75	6	158.57	152.5
	Biogas (land-fill)	5	5	1	129.5	129.5
	Small Hydro	10	7.38	6	103.44	101.8



It is worth noting that under round 1, the total contracted capacities for biogas, biomass and small hydro were markedly lower than the respective auctioned volumes for each technology. This occurred because the RenovAr programme (round 1) was developed and launched over a very short period of time, and the developers of power generation projects based on biogas, biomass and/or small hydro technologies were relatively unprepared as regards the development of auction bids. Moreover, the bid ceiling price was undisclosed, which created some uncertainty amongst potential bidders as regards pricing their bids and it is probable that at least some would-be bidders opted not to participate in round 1 due, to some extent, to this uncertainty. Under round 2, however, bidders had more time to prepare their bids, and the auction volume target was reached (and indeed surpassed) in the case of biomass energy; was reached in the case of biogas; and was almost reached in the case of small hydro.



## 2 Evaluation of Auction Results

### 2.1 Efficiency

Argentina is aiming to meet 20% of national electricity demand from RE sources by 2025, with interim targets of 8% for 2018 and 16% for 2021. From an economic perspective it is important that the aforementioned targets are reached efficiently, i.e. in a way that minimizes the overall costs of bringing RE capacity on-line (Verbruggen & Lauber, 2012).

Average bid prices for solar PV and wind in RenovAr rounds 1, 1.5 and 2 have followed a distinct downward trend, falling from USD 59.4 per MWh to USD 41.23 per MWh for wind and USD 59.7 per MWh to USD 43.46 per MWh for solar PV. This represents a clear minimisation of support costs. In rather exemplary comparison to Argentina's GENREN RE auction in 2011, where solar PV and wind tariffs of about USD 550-240 per MWh and USD 180 per MWh respectively had been awarded, the RenovAr programme can certainly be deemed efficient from a dynamic point of view. The same can be said about RenovAr round 3, which has, albeit with lower rates of competition, yielded credible prices in times of major economic uncertainty.

In comparison to regional experiences, the results of Argentina's RenovAr programme slightly fall behind comparable example cases. In 2016, the year of the first RenovAr round, lower price levels for solar PV and Wind were obtained for instance in Peru (37.49 USD/MWh and 47.98 USD/MWh, respectively) or Mexico (43.90 USD/MWh and 40.50 USD/MWh, respectively) (Argentina obtained 59.7 USD/MWh and 59.4 USD/MWh, respectively) (Lucas & Gomez, 2017). However, this is likely to be the result of lacking a suitable price reference in this initial round, given that it has been the first attempt at tendering renewable energy capacity in this untapped market. This is also suggested by the spread of bid prices in RenovAr round 1. In round 2, price levels for solar PV and wind were squeezed to comparable levels (40.4 USD/MWh and 37.3 USD/MWh, respectively), albeit the economic circumstances and the significant associated risks of the country.

The following analysis will provide an overview of the likely determinants of the final price levels as observed over the course of the RenovAr programme.

#### 2.1.1 Off-Taker Risk and Obtaining Finance

Minimizing the overall cost of bringing RE capacity on-line depends on a policy framework which makes sure that risks are accounted for. The RenovAr programme features relatively stringent but common screening and qualification procedures, as well as milestone commitments and penalty schemes.

The novelty of the RenovAr scheme, however, is its comprehensive approach to mitigating country risks for investors and developers. Payment and termination guarantees, as described in section 0, have contributed to reducing off-taker risk (in fact transferring risks from developers to system operators / the state), helped leverage investor appetite in early rounds, and had a considerable stake in bringing prices down. With the PPAs valued in USD terms and the FODER trust fund backed by the state and the World Bank, the sector was hoped to kickstart, grow and be able to withstand economic or political crises. The current view of the government is that the double guarantee system is working well. Further, it is reported that there have been no issues with respect to CAMMESA's issuance of support payments in a due and timely manner. It is also reported that, in particular, the termination guarantee offering securities against macro-economic crises has settled investors' nerves. To date, no projects have made use of the termination guarantee (Source: Interview with member of the Argentinian Secretary of Energy, October 2019).

Unfortunately, the guarantees, while successful at drawing the attention of project developers, have failed to raise tangible confidence with creditors. The notoriously indebted CAMMESA, as the off-taker of all supplied electricity, is backed by the FODER trust, but only covers 50% of investments (Eclareon, 2017). These country risks raise the weighted average cost of capital (WACC) and make it difficult to obtain asset finance for RE projects, with local banks somewhat reticent to make firm commitments (St. James, 2017). Naturally, the higher WACC would translate into higher bid prices; a notion that on the surface contradicts the price trends seen between RenovAr 1-2.



The difficulty in obtaining project finance in Argentina is reflected by the type and source of finance obtained by successful bidders in the first three RenovAr rounds, in that especially, those with access to corporate finance/balance sheet financing were able to come out of the auction as winners (Eclareon, 2017). The low price levels observed in the first three auction rounds in part are driven by this high share of low-cost foreign (especially Chinese) capital, but they do not reflect the true country risk (St. James, 2016a). The lowest price was USD 37.3 per MWh for wind in round 2, reflecting a price level that is estimated to be up to USD 20 below what would reflect Argentinian risk levels. The low IRR resulting from squeezed prices has also stalled the signing of PPAs, as some successful bidders struggled to secure financing at acceptable rates (Kruger, Eberhard, & Swartz, 2018).

Inflation levels in the country remain in double digits, which bears risks and challenges for Argentina's RE market. While PPAs are valued in USD and as such are immune to decreases in the value of the peso, obtaining affordable long-term finance in local currency under these conditions and high interest rates is futile (Rosenfeld, 2017). This is problematic for local and small actors, who cannot rely on corporate finance. Potentially, this could have affected RenovAr round 3 in particular, which had targeted local energy players for the implementation of small-scale projects (although government officials state that the auction did not fall short of expectations for financial reasons) (Source: Interview with member of the Argentinian Secretary of Energy, October 2019). Finally, a sustained currency crisis in Argentina might also put RenovAr's guarantee scheme under pressure in the next future, as it remains to be financed largely using public funds.

It is also worthwhile reiterating, however, that RE capacity is expected to increase due to a USD 160 million loan agreed in 2019 between the Inter-American Development Bank (IDB) and the Argentinean development bank Banco de Inversión y Comercio Exterior (BICE) to finance private investments by SMEs in RE and energy efficiency projects.

## 2.1.2 Prequalification Requirements

Prequalification requirements, especially where they are stringent, increase the transaction costs for project developers, and as such can drive up bid prices and reduce the static efficiency of the scheme (Winkler, Magosch, & Ragwitz, 2018). At the same time, prequalification requirements are a necessary tool for ensuring the quality and realization of supported projects. This is achieved by restricting the chances of success of specific actors in the competitive process, i.e., that of mostly small, or inexperienced actors, or those without sufficient financial track records. At the same time, prequalification requirements reduce actor diversity.

In the Argentinean RenovAr programme, bidders are requested to issue a bid-bond of USD 35,000 per MW of offered capacity, thereby ensuring the seriousness of the bid and the project developers' intention to sign the PPA if the proposal was successful. On signature of the PPA the bid-bond will be given back to the successful bidder, conditional on the previous establishment of a performance bond of USD 250,000 per MW contracted. The performance bond has the aim of ensuring that project developers adhere to realization schedules and agreed standards. Auctions featuring no bid bonds are usually simpler, especially for the auctioneer (IRENA, 2015), and can be more attractive to bidders. However, given the urgent need to respond to increasing electricity demand in the country, the assurance of compliance with the PPA's schedules has been a reasonable priority for the country, justifying additional transaction costs.

As long as submitted bids reflected serious intentions to develop the offered capacity, the above-mentioned bid and performance bonds do not comprise significant bid risk as little sunk costs are involved, i.e. the bid bond and performance bond are reimbursed if bidders have not been successful or have adhered to commercial operation date (COD) timelines. However, the performance bond is significant and may represent a barrier to small actors. Further, the requirement for international bidders to commit to establishing a Special Purpose Vehicle (SPV) for the participation in the auction process, the necessity to obtain environmental authorisation, irrevocable land rights, grid access permits and an authorisation as a WEM (wholesale market) agent, among other administrative requirements, impose a stringent managerial and financial burden on potential bidders (IRENA, 2017). This burden reflects a significant sunk cost to bidders, a bid risk which is reflected in bid prices and losses in efficiency.



## 2.2 Effectiveness

Table 4: Total Volumes Auctioned and Awarded, based on own computation.

Round	Total Intended Auction Volume (MW)	Total Volume Offered (MW)	Total Volume Awarded (MW)
RenovAr 1	1,000	6,346.5	1,142.4
RenovAr 1.5	600	2,486	1,284
RenovAr 2	1,200	7,496.3	1,281.8
RenovAr 3	400	352,1	259.08

As a general trend, all RenovAr rounds have all been oversubscribed, resulting in larger volumes awarded than what had initially been put out for auction, except for RenovAr round 3, which attracted fewer bidders and has been less effective, with only about two-thirds of the intended volume awarded. The large oversubscription is driven by the offered solar PV and wind projects mainly. Biomass, biogas and hydro projects were undersubscribed in the first round and small hydro was undersubscribed in all rounds in which it participated.

According to a government official, RenovAr round 3 has been undersubscribed for logistical issues related to the distributed generation in Argentina but has not been significantly impacted by the country's economic conditions (Source: Interview with member of the Argentinian Secretary of Energy, October 2019).

Within technology subsets, both national and international actors competed. Within the solar PV auction and considered across the first three auction rounds, the bidders with the highest awarded capacities (in MW, totalled across the three rounds) were primarily Argentinean and Latin American project developers. Specifically, they included JEMSE (300 MW in total), Latinamericana de Energía (250 MW in total), and Energías Sustentables (around 200 MW in total). Four other project developers, including Neoen (of France), Martifer Renovables (of Portugal), Fieldfare/Isolux Ingeniería (of Spain and the UK), plus Empresa Mendocina de Energía (of Argentina), were also awarded around 100MW capacity development rights each. It is worth underlining that there was an especially high prevalence of projects that were supported through Chinese capital or which were based on Chinese technology. The effectiveness of the first three rounds, and potentially the lack of effectiveness in the fourth, may be related to this large influx of Chinese capital and technology in the utility scale auctions (St. James, 2016b). In that sense, auction round 3, focusing on distributed generation, may also have been undersubscribed due to a lack of interest amongst large international companies in this market segment. Furthermore, the ability of large international companies, with liquidity or the desire to bring existing production capacity into new markets, to drive down prices below country risk levels, may have crowded out other players, especially SME actors, during the first rounds (Eclareon, 2017).

### 2.2.1 Transmission Limits

While the auctions have so far been well subscribed overall, the effectiveness of the RenovAr programme with respect to reaching the country's RE targets is limited by the state of its electricity transmission network. It is estimated that more than 5,000 km of new transmission lines are required in order to establish a connection with commissioned RE capacity expansions (Kruger et al., 2018). The insufficient transmission infrastructure, especially high voltages grid lines, is among the main reasons for the suspension of larger projects in RenovAr round 3, which procured only projects between 0.5 MW and 10 MW to be connected to existing medium voltage grid capacities.

Significant investments into distribution and transmission infrastructure are expected to be tied to RenovAr round 4 which was initially postponed to late 2019 (but is now to happen in 2020) after grid constraints and the country's critical financing conditions had raised concerns (Bellini, 2019). It is however not known at this moment how and through which mechanisms the simultaneous investments into transmission assets are

to be leveraged.

## **2.3 Post-Realization Period**

The realization of awarded projects has been stagnant throughout all RenovAr rounds, with delays in the signing process of PPAs as a result of difficulties in securing finance. As of official statements from September 2019, 51 RE projects are in commercial operation, 37 of which were procured through RenovAr, 14 through the MAT ER. This is estimated to add 1,457 MW of installed power. A further 103 projects are under active construction, which will add an additional 3,524 MW (GoA, 2019). Round 4 had originally been scheduled for 2018, was initially postponed to late 2019, and is now expected to take place in 2020.



### 3 Conclusions

Argentina's RenovAr programme was initiated with the goals of kick-starting the country's RE sector, to diversify the energy generation mix and to meet an increasing energy demand. This in turn will help address to initiate the transition to a sustainable energy system.

The programme was initiated following years of electricity sector inefficiencies, chronic underinvestment in infrastructure and the over-subsidisation of electricity tariffs in the WEM. In the context of difficult economic conditions, the main challenge that the programme needed to sufficiently address was to attract investors willing to develop RE projects despite significant country-level macroeconomic risks. The establishment of a multi-layer guarantee scheme backed by the Government of Argentina and the World Bank does appear to have addressed this challenge, in broad terms. The RenovAr programme has managed to attract, on the one hand, international project developers interested in developing RE projects in Argentina, and on the other hand, international investors keen to finance RE projects in Argentina.

Three out of the four RenovAr rounds have attracted considerable interest of the private sector and have been heavily oversubscribed, at least for solar PV and wind. Moreover, they have yielded competitive prices in comparison to other countries in the region and, given the economic circumstances of the country. Wind energy is the most cost-competitive technology in Argentina according to the RenovAr programme, with prices as low as USD 37.3 per MWh. While this should not be surprising in light of the significant wind resources and land availability of Argentina, awarded bid prices seem to be very low considering the overall economic context of the country.

The price levels as obtained through the RenovAr auction rounds are significantly squeezed by cheap international capital and technology, and perhaps do not fully reflect the overall country risk levels. It is possible that those companies which are unwilling to underbid prices may not win development rights within the RenovAr programme. Some argue that many international companies are underbidding prices, perhaps with the strategic aim of entering this potentially very large RE market and securing first-mover advantages.

Local actors, which may be more capable of assessing perceived country risks, can still be able to compete successfully, but they face severe constraints when it comes to securing long-term financing. This has frequently delayed the signing of PPAs in the RenovAr programme.

Another major constraint is that the limitation of current electricity transmission assets is currently hindering the expansion of further RE capacity. The pending auction round of the RenovAr programme (i.e. round 4) has been postponed twice – was initially postponed to late 2019 (but is now to happen in 2020) – specifically due to transmission grid constraints. The extent to which additions of new RE generation capacity will be hindered in the coming years, due to transmission capacity challenges, will be worth monitoring.

It is anticipated that the next RenovAr round will be tied to private sector financed transmission infrastructure expansions. This may be a viable approach to ensuring that projects are technically viable, but specific information on how this would be achieved is yet to be made public.

In 2016 less than 2% of consumed electricity was derived from RE sources, excluding large hydropower. The contribution of RE sources (including wind, solar, biogas, biomass and small hydro) had increased to 5% by May 2019. Despite failing to meet the government-set interim objective of 8% by the end of 2018, Argentina's RE sector is growing fast. Total RE installed generation capacity almost doubled (90% increase) between 2017 and 2018. At the outset of 2019, the RE generation capacity totalled 11,953 MW, comprised of 750 MW of wind, 191 MW of solar PV, and 653 MW of bioenergy. Argentina is currently one of the world's fastest-growing wind power markets.

Overall, given the very limited experience (and levels of installed RE generation capacity) in Argentina prior to the use of RE auctions in that country, the RenovAr programme has so far proven to be an effective way to quickly scale up the RE power generation capacity and continue progressing towards meeting the national 2025 RE target. Moreover, Argentina's RE auction experience to date has demonstrated that RE projects are cost-competitive against traditional power generation options in that country.



## 4 References

- Bellini, E. (2019). Argentina announces new RE auction for 2019 – pv magazine International. Retrieved October 8, 2019, from <https://www.pv-magazine.com/2019/04/04/argentina-announces-new-re-auction-for-2019/>
- Cammesa. (2019). Informe mensual. *Acceso a Nuevos Mercados*, 210–211. <https://doi.org/10.18356/fc4b62a8-es>
- CAMMESA. (2019). *Informe Mensual Principales Variables del Mes*.
- Eclareon. (2017). Enabling PV & Wind in Argentina. Retrieved from <https://www.wind-energie.de/fileadmin/redaktion/dokumente/sonstiges-oeffentlich/themen/05-internationales/final-report-enabling-wind-argentina.pdf>
- EY. (2019). EY - Renewable Energy Country Attractiveness Index - EY - United Kingdom. Retrieved October 31, 2019, from <https://www.ey.com/uk/en/industries/power---utilities/ey-renewable-energy-country-attractiveness-index>
- Fitch Ratings. (2019). Argentine Electricity Sectors. *Argentine Electricity Sectors*, (December 2007), 1–2.
- GoA. (2019). Since 2016, 51 new renewable energy projects were launched | Argentina.gob.ar. Retrieved October 8, 2019, from <https://www.argentina.gob.ar/noticias/desde-2016-se-pusieron-en-marcha-51-nuevos-proyectos-de-energias-renovables>
- Heritage Foundation. (2019). Economic Freedom, 84–85.
- IRENA. (2015). Renewable Energy Auctions - A Guide to Design. Retrieved from [www.irena.org](http://www.irena.org)
- IRENA. (2017). *Renewable Energy Auctions: Analysing 2016. Renewable Energy Auctions : Analysing 2016* (Vol. 1). Retrieved from [https://www.irena.org/-/media/Files/IRENA/Agency/Publication/2017/Jun/IRENA\\_Renewable\\_Energy\\_Auctions\\_2017.pdf](https://www.irena.org/-/media/Files/IRENA/Agency/Publication/2017/Jun/IRENA_Renewable_Energy_Auctions_2017.pdf)
- Kruger, W., Eberhard, A., & Swartz, K. (2018). *RENEWABLE ENERGY AUCTIONS : A Global Overview*. Retrieved from [www.gsb.uct.ac.za/mir](http://www.gsb.uct.ac.za/mir)
- Lucas, H., & Gomez, J. C. (2017). Renewable Energy Auctions in Latin America and The Caribbean, 108.
- MEyM. (2016a). NATIONAL AND INTERNATIONAL OPEN CALL FOR RenovAr Program, (July).
- MEyM. (2016b). Renewable Energy Argentina, (December), 56. Retrieved from [https://www.argentina.gob.ar/sites/default/files/renewable\\_energy\\_argentina\\_-\\_december\\_2016\\_english\\_version.pdf](https://www.argentina.gob.ar/sites/default/files/renewable_energy_argentina_-_december_2016_english_version.pdf)
- MEyM. (2017). OFERTAS ADJUDICADAS RenovAr - Ronda 2. Retrieved from [https://www.argentina.gob.ar/sites/default/files/20171129\\_renovarr2-adjudicacion\\_prensa.pdf](https://www.argentina.gob.ar/sites/default/files/20171129_renovarr2-adjudicacion_prensa.pdf)
- Ministerio de Hacienda. (2019). RenovAr MiniRen- Ronda 3.
- OECD. (2019). Argentina Economic Snapshot, 82–85.
- Pampaenergia. (2019). The Argentine Electricity Sector - Pampa Energia. Retrieved October 1, 2019, from <https://ri.pampaenergia.com/en/our-assets/electricity-power/the-argentine-electricity-sector/>
- PWC. (2017). Energías renovables en Argentina. Oportunidades en un nuevo contexto de negocios. *Pwc*.
- REN 21. (2019). *Renewables 2019 Global Status Report*. Paris.
- Rosenfeld, R. (2017). Argentina plans to auction more PPAs | Norton Rose Fulbright. Retrieved October 8, 2019, from <https://www.projectfinance.law/publications/argentina-plans-to-auction-more-ppas>
- Sanchez Molina, P. (2019). El BID concede 100 millones de dólares para fomentar las renovables en Argentina – pv magazine Latin America. Retrieved October 31, 2019, from <https://www.pv-magazine-latam.com/2019/04/25/el-bid-concede-100-millones-de-dolares-para-fomentar-las-renovables-en-argentina/>



- Siboldi, A., Fanelli, A., & O'Farrel, E. (2019). Electricity regulation in Argentina: overview | Practical Law. Retrieved October 1, 2019, from [https://uk.practicallaw.thomsonreuters.com/6-524-0092?transitionType=Default&contextData=\(sc.Default\)&firstPage=true&bhcp=1](https://uk.practicallaw.thomsonreuters.com/6-524-0092?transitionType=Default&contextData=(sc.Default)&firstPage=true&bhcp=1)
- Soares, M. G. (2018). Innovation in Renewable Energy, *90025*(310). Retrieved from <http://www.renovagen.com/>
- St. James, C. (2016a). Argentina's shotgun approach to renewables creates buyer's market for projects | Latin American Energy Review. Retrieved October 4, 2019, from <http://carlosstjames.com/renewable-energy/argentinas-shotgun-approach-to-renewables-creates-a-buyers-market-for-projects/>
- St. James, C. (2016b). Chinese supply chain finance wins in Argentina | Latin American Energy Review. Retrieved October 8, 2019, from <http://carlosstjames.com/renewable-energy/argentinas-renewable-energy-tender-chinese-supply-chain-finance-wins-the-day/>
- St. James, C. (2017). How flight-to-quality lending is affecting Argentina's renewable sector | Latin American Energy Review. Retrieved October 4, 2019, from <http://carlosstjames.com/renewable-energy/how-flight-to-quality-lending-is-affecting-argentinas-renewable-sector/>
- Verbruggen, A., & Lauber, V. (2012). Assessing the performance of renewable electricity support instruments. *Energy Policy*, *45*, 635–644. <https://doi.org/10.1016/J.ENPOL.2012.03.014>
- Winkler, J., Magosch, M., & Ragwitz, M. (2018). Effectiveness and efficiency of auctions for supporting renewable electricity – What can we learn from recent experiences? *Renewable Energy*, *119*, 473–489. <https://doi.org/10.1016/j.renene.2017.09.071>
- World Bank. (2016). Fund for the Development of Renewable Energy (FODER) Renewable Energy Fund Guarantee Project., 1–18. Retrieved from <http://documents.worldbank.org/curated/en/254231473847861769/Argentina-Fund-for-the-Development-of-Renewable-Energy-FODER-Renewable-Energy-Fund-Guarantee-Project>



AURES II is a European research project on auction designs for renewable energy support (RES) in the EU Member States.

The general objective of the project is to promote an effective use and efficient implementation of auctions for RES to improve the performance of electricity from renewable energy sources in Europe.

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