



# Changes in Renewable energy in Argentina

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# Effects of the implementation of RenovAr

There has been a rise in investments in the country, which are aimed at reaching a share of 8 % of renewable energy in the total national electrical matrix.

## Introduction

In line with the data added to the report published by KPMG in December 2016, “Development of renewables: Latin American context and the Argentine case”, the implementation of clean energy sources is still a matter of global interest, both in terms of streamlining investments in electric power generation, as it is increasingly considered as a business opportunity, and in terms of concern about climate change. In this sense, although the total amount of global investments of this type decelerated slightly in 2016 -primarily due to the reduction in costs associated with project implementation-, the main trends that had begun to be seen last year became stronger this year: to meet the ever growing energy demand, renewable power generating capacity reached 161 GW<sup>1</sup>, even over the amount obtained in 2015 (147 GW), which had set a record in this type of energy sources added to global capacity.

Out of that added total, 46.5% was provided by solar PV energy, 34.1% was provided by wind energy and 15.5% was provided by hydropower, whereas the remaining 4 % was provided by energy derived from biomass, biofuels and other sources, such as geothermal and thermosolar. Furthermore, the global capacity increased by 9 % to 2017 GW by the end of 2016. Moreover, the preference already noted in 2015 as to investing in clean energy sources instead of fossil fuels was maintained and, therefore, renewables accounted for nearly 62% of net additions to global power generating capacity.

During 2015, investments in clean energy sources were mainly driven by the so-called emerging countries, as for the first time in history, these countries spent more money than developed countries in renewable energy projects<sup>2</sup>, thanks to the contributions of China, India and Brazil, which accounted for approximately 50 % of total global investments in this type of energy. However, funds allocated by these economies stabilized in 2016 and even showed certain deceleration and, consequently, the level of global investment in clean energy sources was 20 % lower (US\$ 242 billion)<sup>3</sup> than the amount obtained last year. Finally, although the amount of global investments in projects for the generation/maintenance of this type of energy is not yet available for 2017, **Bloomberg**

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<sup>1</sup> “Renewables 2017 Global Status Report”, REN21, 2017. <http://www.ren21.net/gsr-2017/pages/summary/summary/>

<sup>2</sup> “Development of renewables: Latin American context and the Argentine case”, KPMG, December 2016

<sup>3</sup> “Renewables 2017: Global Status Report”, REN21, 2017. <http://www.ren21.net>

## **New Energy Finance estimates that it would be similar to or slightly higher than that of 2016<sup>4</sup>.**

However, there were two main reasons for the decline in investment in renewable energy: 1) one was the slowdown in investments in Japan and China, which had a negative impact on the global total; ii) the other was the significant cost reductions in solar and wind power, which also improved the competitiveness of these sources. Even though in absolute terms investment flows declined, “the result was that in 2016 investors were able to acquire more renewable energy capacity for less money”<sup>5</sup>.

Regarding leading regions in terms of clean energy investments, China is still the main destination of this type of projects, accounting for 32% of all financings of renewable energy, followed by Europe (25%), the United States (19%) and Asia-Oceania (excluding China and India; 11%), and the Americas (3%, excluding Brazil and the United States), the Middle East (3%), Africa (3%) and Brazil (3%). In this sense, most countries implemented a range of renewable energy support policies to attract investment, drive deployment, foster innovation, encourage greater flexibility in energy infrastructure and support the development of enabling technologies such as energy storage<sup>6</sup>. As per “Renewables 2017: Global Status Report”, prepared by REN21 and Bloomberg New Energy Finance, leaders of 48 developing nations committed to set medium and long-term goals towards achieving 100% renewable energy in their respective nations. Throughout 2016, 117 countries submitted their first Nationally Determined Contributions (NDCs) under the Paris Agreement, and 55 of these countries featured renewable energy targets, including Argentina. State support is fundamental to implement and develop this type of technologies, mainly through tax reduction policies, integrated networks, bids and subsidies. The REN21 report suggests that technology advances, falling costs and rising penetration of renewables in many countries also have continued to require that policies evolve to stimulate both deployment and integration as effectively as possible. In addition, they are not merely focused on power generation and also include renewable technologies relating to sustainable infrastructure and cooling and heating.

In this context, Argentina has a golden opportunity: in addition to the natural land characteristics enabling the development of various clean energy sources, a general consensus has been built about the need to embrace renewables, by strengthening existing policies and implementing an ever more sustainable energy network. Although in general, this document is aimed at showing the recent experience in Argentina in terms of renewable energy, after the effectiveness of Law No. 27191 on the promotion of power generation from renewable sources and the subsequent implementation of the RenovAr program and its bid rounds.

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<sup>4</sup> “Clean energy investment – 3Q 2017 trends”, Bloomberg New Energy Finance. <https://about.bnef.com/blog/clean-energy-investment-3q-2017-trends/>

<sup>5</sup> “Renewables 2017 Global Status Report”, REN21, 2017. <http://www.ren21.net/gsr-2017/pages/summary/summary/>

<sup>6</sup> Idem.

## The Argentine case: recent changes

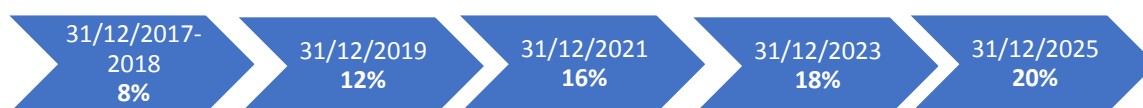
As described in KPMG's report on renewable energy published in 2016, Law No. 27191 of 2015, seeking to promote power generation from renewable sources, specifically sets the goal of reaching 8% of clean energy sources by the end of 2018 and 20% by the end of 2025 (see Figure 1).

Up to 2015, when the law was passed, Argentina had a primary energy matrix where hydrocarbons accounted for 85%, out of which 50% was represented by natural gas, whereas renewable energy had a minor share in the national total amount, of 5%. Furthermore, according to regulations in force, all the country's electricity users shall contribute to the change in the national energy matrix provided they are part of the Argentine Interconnection System, by following a series of objectives for the minimum use of renewable energy per year.

**Figure 1**

Goals for the generation of renewable energy in Argentina (Law No. 27191)

In order to attract capitals that may invest in the sector and help meet the new goals set, in May 2016, the Ministry of Energy and Mining published a call for bids within the framework of RenovAr program to add 1000 MW of clean energy to the national energy matrix. To offer awarded projects adequate transparency and promotion in terms of financing, guarantees and payment predictability, guarantees were obtained from the World Bank and the Fund for the Development of Renewable Energy (FODER) was created. The prices offered in the 123 bids received were approximately 40% lower than the thresholds set and, therefore, the lowest ever recorded. For the generation of wind energy, accounting for 60% of total bids, the average price per MWh was lower than US\$ 70, whereas the average price for solar energy (30% of total bids) was around US\$ 76.



Immediately after publication of projects awarded in this bidding process, the MINEM called for a new round of bids, the RenovAr 1.5, to award those wind and solar projects that were left outside the RenovAr 1. The objective was to add 600 MW of clean energy to the national energy matrix, in addition to the 1000 MW of the previous round. RenovAr 1.5 sought to implement various projects at a regional level, as the program was more federal than the previous version. For this round, the MINEM received 47 bids totaling 2486 MW (1561 MW for wind projects, 925 MW for solar projects), out of which 30 projects were selected which would account for an increase in the national capacity over 1280 MW, i.e. twice the initial amount subject to the government bid. Out of the bids awarded, 10 related to wind projects

(more than 760 MW) and 20 to solar developments (around 516 MW). The average price was approximately US\$54 per MWh, even improving the offers received by RenovAr 1. As it can be noted in *Table 1*, among the 59 projects awarded in both rounds (29 of Round 1 amounting to 1142 MW, and 30 of Round 1.5 amounting to 1281 MW), in 2016 Argentina acquired a total of nearly 2500 MW of renewable energy.

Based on the satisfactory results obtained in the two rounds published last year, in 2017 RenovAr 2.0 was launched. In November this year the economic offers for this round were disclosed, and the objective was to add 1200 MW of clean energy to the national energy matrix. The intention was to award by areas: 200 MW for Comahue, Patagonia and Buenos Aires, with a threshold of 450 MW, and 100 MW for the rest of the country in terms of wind energy. As it relates to solar energy, 200 MW for NOA and Cuyo region (with a threshold of 350 MW) and 100 MW for the rest of the country.

**Table 1**

Results of the successive rounds of RenovAr program as of February 2018

Round	Date	Number of projects awarded	Awarded MW	Average price (US\$/MWh)
<b>1</b>	May 2016	29	1,142	61.33
<b>1.5</b>	Nov. 2016	30	1,281.5	53.98
<b>2*</b>	Nov.-Dec. 2017	88	2,043	51.48
<b>TOTAL</b>		147	4,466.5	54.72*

\*Round 2 includes RenovAr 2.0 and 2.5.

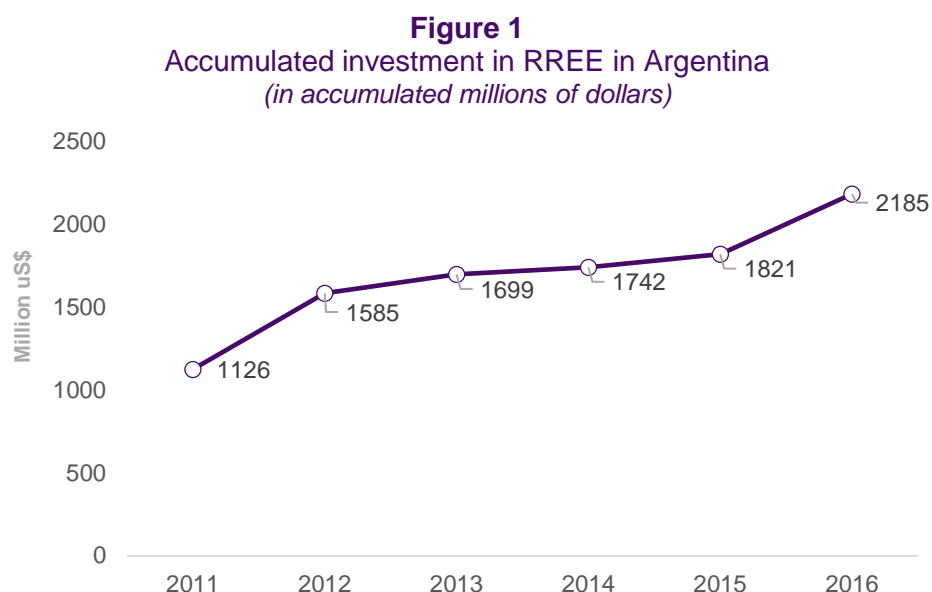
\*\*Average price of all rounds of Plan RenovAr (1, 1.5, 2 and 2.5).

Source: Argentine Ministry of Energy and Mining.

As in the previous rounds, offers surpassed the MINEM's expectations. 228 projects were received for 9321 MW, out of which 192 qualified (accounting for around 7500 MW) and 66 were awarded, which will provide approximately 1400 MW. The minimum price of this round was around US\$ 37 per MWh for wind technology in the Province of Buenos Aires, and US\$ 40 per MWh for solar energy in the Province of La Rioja, even improving the offers received during Round 1.5, which were below official expectations. According to the MINEM, the values are comparable to the best results achieved in the international market.

Finally, by the end of December 2017, the MINEM published the results of the last round of RenovAr, the so-called 2.5. Within its framework, 22 projects were awarded, accumulating a projected power of 634 MW: four wind energy projects for US\$/MWh 40, five solar energy projects (at an average price of US\$/MWh 41.6), and 13 projects related to biomass and biogas (implementing an incentive of 50% per stage estimated in the bidding

terms of round 2) at an average price over US\$/MWh 136<sup>7</sup>. According to the Under-Department of Renewable Energy<sup>8</sup>, the RenovAr program awarded in total 147 projects in 21 provinces for 4,466.5 MW<sup>9</sup> at an average price of US\$/MWh 54,72.



Source: Prepared by KPMG on the basis of Climatescope 2017 (Bloomberg New Energy Finance).

However, according to the data provided by Climatescopio 2017, prepared by Bloomberg New Energy Finance based on information for 2016, only 2% of the national electrical matrix derives from clean sources<sup>10</sup> (around 0.8GW of installed capacity), whereas 78% of the electricity generation capacity depends on natural gas and hydropower plants of more than 50 MW, which are not considered because although the energy source is renewable, the installation cost of a big dam, in terms of deforestation, relocation of people and communities, rotting vegetation (and the resulting generation of greenhouse gases) and destruction of basins is questionable at an environment and climate level.

In this sense, as it can be noted in *Figure 1*, the accumulated investments in clean sources grew in the period under analysis, though at a decreasing pace: whereas the accumulated investments in this type of energy rose by 41% from 2011 to 2012<sup>11</sup>, in 2013

<sup>7</sup> “Se adjudicaron 22 proyectos en la Ronda 2.5 del RenovAr”, Rumbo Energético, 12/20/2017. <http://rumboenergetico.com/se-adjudicaron-22-proyectos-en-la-ronda-2-5-del-renovar/>

<sup>8</sup> Projects awarded by RenovAr, Rounds 1, 1.5 and 2, Under-Department of Renewable Energy, Department of Electric Power, MINEM.

(see <https://www.minem.gob.ar/www/833/25897/proyectos-adjudicados-del-programa-renovar>)

<sup>9</sup> “Energías renovables: cómo avanza la revolución verde en Argentina”, La Nación, 01/28/2015. <https://www.lanacion.com.ar/2104244-energias-renovables-como-avanza-la-revolucion-verde-en-la-argentina>

<sup>10</sup> Therefore, the group of energy derived from biofuels, biomass and waste, as well as energy resulting from geothermal, wind and solar sources and hydropower dams ( $\leq 50$  MW).

<sup>11</sup> Most of the investment during this period results from the implementation of part of the projects awarded under the GENREN program.

these investments went up by 7% and in 2014 they grew by 3%. This limited growth was offset only in 2015, when Law No. 27191 for the promotion of renewable energy was enacted. In fact, according to the data provided by Climascope, until 2016 the accumulated amount of investments in renewable energy reached US\$ 2185 million. During that year, when the rounds under RenovAr (successor of GENREN) started, this figure showed a considerable growth which, between that year and the previous one, accounted for 20% (around US\$ 360 million) and, consequently, the accumulated investments went from US\$ 1820 million to US\$ 2185 million; therefore, the highest increase recorded since 2011. Upon preparing this work, the figure for 2017 was not available. However, considering the projects awarded by RenovAr and the 4000 MW to be added to the system, this year the investment level is expected to remain the same or even exceed the figure for 2016, with a growing trend for 2018 and upcoming years.

The amount of US\$ 360 million invested in 2016 and the current trend begin to pave the way for our country to reach the levels recorded by neighboring countries, such as Brazil, Chile and Uruguay, where investments have been substantially higher in the last years. In this sense, specialists remark that, as opposed to countries such as Uruguay, which seem to have reached their ceiling in terms of generation of energy from renewable sources, Argentina shows potential for growth in this industry in relation to both natural resources and the creation of an attractive scenario for the development of foreign investment, particularly considering the multi-party political decision to support and promote this type of projects. Moreover, the Argentine Agency of Investments and Global Trade (AAICl) states that Argentina has the third largest wind reserve because, at a global level, it is considered that in order to take advantage of wind for the generation of energy, average winds must be over 5 m/s and, in the Argentine case, 70% of the national territory winds reach 6m/s on the average, whereas they may reach 9m/s in other Patagonian areas.

## Final considerations

Year 2017, defined by the Argentine Government as the “Year of Renewable Energy”, set the bases for what is expected to be the most ambitious plan of this type of energy in the history of the country. Even though the objective set in 2015 for the end of this year was not met (i.e. the goal of achieving 8% of renewable energy originally projected by 12/31/2017 was postponed to 12/31/2018), the positive results achieved by RenovAr rounds can be deemed as encouraging, paving the way to future investments and positioning Argentina as one of the destinations preferred by foreign capital in the industry. In addition, both the creation of the Fund for the Development of Renewable Energy and the guarantee offered by the World Bank and the tax benefits provided by Law No. 27191 brought financial and economic security to the participants of bidding processes, helping Argentina consolidate as one of the most important countries globally in the promotion of generation of energy from clean sources.

However, this process should be improved and the actions taken up to this year must be deemed as the baseline of the future strategy on the subject. Although most of the projects



derived from the first RenovAr program have already been launched, it is important to solve, for example, the situation of awards resulting from Ronda 1.5, the state of which varies from the beginning of implementation to the definition of the financing strategy.

Seeking to comply with Law 27191, it is necessary to go on developing this type of policies if Argentina's objective is that 20% of the national electrical matrix may derive from renewable energy sources by the last term included in the plan, 12/31/2025. Taking as a basis the current context, this would imply adding 10,000 MW from this type of energy in 10 years, and large consumers (approximately 8,000 users whose demand is over 300 KW) would be required to diversify their energy matrix and comply with the provisions of the law.

In turn, the legislative projects associated with this matter, such as the recent approval by the Senate of the "Regime for the Promotion of the Distributed Generation of Renewable Energy in the Public Electricity Network"<sup>12</sup>, drive the industry and involve society as a whole in the use of more responsible and clean energy. The new law enables any user -either a house, a business or a factory- to supply energy to the national network, becoming in turn the producer of the energy used by it and saving costs associated with transportation, storage and infrastructure; additionally, the law specifies that as from the enactment of the regulatory decree any project for the construction of a public building must use any system for the generation of distributed energy from renewable sources. In this sense, the MINEM recently authorized eleven new renewable energy ventures and a thermal plant to supply energy to the wholesale market as generators. As a whole, they would add 1300 MW<sup>13</sup> to the installed power.

Furthermore, although Argentina has recently become one of the countries globally concerned about environmental care, one of the additional advantages of focusing public policies in this sense is merely economic. The MINEM<sup>14</sup> has reported that, as private capital investments are expected to reach US\$ 4000 million in the sector during the term specified by the law, it is estimated that annual savings in the import of fuels might amount to US\$ 300 million, whereas carbon dioxide emission might be reduced by 2 million tons a year, approximately the pollution produced by 900,000 cars.

Moreover, a higher share of renewables in the national energy matrix would significantly reduce the budget allocated to imports of hydrocarbons, which in 2016 were over US\$ 3900 million and up to November 2017 had decreased to slightly over US\$ 2200 million<sup>15</sup>.

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<sup>12</sup> "Ya es ley la generación distribuida de energía renovable", Télam, 12/07/2017.

"El Gobierno autorizó a productores de energías renovables a entrar al mercado mayorista", El Cronista, 01/26/2018.

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<sup>14</sup> "Energías Renovables: inversiones, proyecciones y el plan del Gobierno", El Cronista, 11/15/2017.

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<sup>15</sup> "Energías Renovables: inversiones, proyecciones y el plan del Gobierno", El Cronista, 11/15/2017.



In conclusion, Argentina must go on following the road taken in 2015 upon the enactment of Law 27191 and devoting its best efforts to meet the objectives set, taking advantage of the exceptionally favorable global context for this type of investments and maximizing the geographical location of the national territory, whose extension enables the planning of projects including various types of renewable energy: solar, wind, hydropower or even biomass.

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