

Decreasing costs of renewables – Analysis of energy sector planning and climate policy in Argentina

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Table of Contents

- Executive Summary 1
- 1 Introduction 3
- 2 Policies and progress in Argentina: climate change 5
 - 2.1 National climate policy landscape 5
 - 2.2 NDC and LTS process in a political context 8
- 3 Policies and progress in Argentina: renewable energy 9
 - 3.1 Renewable energy policy landscape 9
 - 3.2 Renewable energy in a political context 12
- 4 Main challenges for renewable energy expansion 13
 - 4.1 Macro-economic situation and fiscal deficit 13
 - 4.2 Availability of domestic gas resources 15
 - 4.3 Weak transmission infrastructure 16
 - 4.4 Lack of clear political signals 18
- 5 The COVID-19 pandemic and implications for RE expansion in Argentina 19
- 6 Conclusions 21
- 7 References 23

Executive Summary

Renewable power generation technologies in Argentina are substantially cheaper now than expected in 2015. Parties to the Paris Agreement could increase their renewable energy capacity, if the investments planned for Nationally Determined Contributions (NDCs) in 2015 were maintained and savings reinvested in the same technologies. This additional capacity could facilitate more ambitious renewable energy and NDC targets.

Recent technical analysis suggests that a higher uptake of renewable energy technologies than currently planned is possible in Argentina, without additional costs (Nascimento *et al.*, 2020). The analysis, which is based on a methodology developed by Wachsmuth and Anatolitis (2018), shows that investment costs for solar PV could decrease by 63-76% and for onshore wind by 32-36% in 2030. This could translate into increased shares of renewable energy generation from the currently planned 25% to 38-43% in that same year.

Argentina has recently established a robust legal framework to address climate change. However, the effectiveness of this framework and its power to support ambition raising still need to be proven. Although the Ministry of Environment steers overall climate-related planning and policy making, it has little influence on decision making processes in the relevant sectors. Observation of the current political debate suggests that climate change is not driving the agenda and that climate policy makers may need to find other narratives, for example co-benefits, to reach their audience.

Limited transparency around both climate-related and energy sector planning and policy making processes is prevalent in Argentina. It is not always clear which tools and methodologies are used to define sectoral contributions to climate change and whether or to what extent techno-economic analyses play a role in the processes. Interviews with stakeholders suggest that specific opportunities to reduce mitigation costs by considering technology cost reductions have not been fully seized to date in the context of the NDC update or LTS process, or in discussions around new renewable energy targets.

The reasons for the non-observance of technology cost progressions in planning and policy making processes to date are varied. There are several challenges that often outweigh the importance of technology cost progressions and thus hamper the expansion of renewable energy despite the positive price development:

The **macro-economic situation** and related fiscal deficit present an outstanding challenge to Argentina's economy and to the renewable energy sector. Recurring economic crises and high political uncertainty increase the cost of capital and deter foreign investors. This has strongly affected the country's attractiveness for developing renewable energy projects, despite its huge potential for both wind and solar power.

Closely linked to the economic situation is the **availability of abundant domestic gas resources** in the Vaca Muerta formation, which is expected to bring energy independency and economic wealth to Argentina. The strong focus of economic recovery measures on the support of the fossil fuel industry, e.g. through a reinstatement of public subsidies, impairs the cost-competitiveness of renewable energy technologies and distorts the market. These measures furthermore oppose recent trends of international finance institutions to divest from fossil fuels and diminishes investors' confidence in the renewable energy sector.

The **current state of transmission infrastructure** in the country further hinders the development and uptake of larger renewable energy capacities. The electricity grid does not have enough capacity to transmit larger shares of variable renewables from the North or South of the country, sending a negative signal to project developers and investors. Furthermore, there is still high uncertainty about the allocation of costs for transmission infrastructure which are

often added to the costs of renewable energy in the planning process. This perspective disregards the complexity of the electricity system as well as the multiple benefits that grid expansion grants to all system actors and contributes to the perception of renewable energy as an expensive alternative compared to other power generation options.

Lack of clear political signals or leadership from the current administration aggravates uncertainty and risk perception among project developers and investors in the renewable energy sector. Frequent changes of technical teams result in limited planning capacity and guidance for policy making processes.

The current COVID-19 pandemic may intensify several of these challenges. The pandemic and related lockdown measures have had a palpable impact on renewable energy development and may also affect the country's action towards climate change in the near future. There are also opportunities for renewable energy development that may be seized through their inclusion in future COVID-19 recovery packages.

Regardless of existing challenges, there is **broad agreement among stakeholders that technology cost progressions are relevant for the development of Argentina's renewable energy sector** and would ideally be considered in a transparent and consistent way in climate and energy sector planning processes. A potential entry point for this type of techno-economic analysis could be the technical roundtables convened by the National Climate Change Cabinet (GNCC). Once assumptions on technology cost progressions have been included in scenario development, they can more easily be taken into account in the development of the NDC update and LTS documents and can equally inform the energy sector action plan to guide their implementation.

Our analysis shows that **the current situation in Argentina may compromise not only the successful development of the renewable energy sector, but also the country's potential to raise its climate ambition and to ensure overall socio-economic development.** Against this backdrop, it is important to enhance transparent and effective planning in the energy sector that is based on robust tools and methods and results in the formulation of realistic targets. These targets are ideally embedded in a clear vision of the government towards the development of this sector and flanked by a policy and regulatory framework that shapes implementation. In this context, a more sustainable approach towards stabilising the economy and propelling growth of the energy sector could embrace renewable energy development as a non-subsidised, safe and long-term investment opportunity for local and foreign investors. This could, in turn, decrease the dependency of energy sector development on government subsidies and reinstall the country as an attractive renewable energy market.

1 Introduction

Key climate mitigation technologies, i.e. renewable power generation technologies, are substantially cheaper now than expected in 2015. Solar PV and onshore wind technologies are projected to have faster and steeper cost reductions up to 2030 than assumed in the preparation of countries' Nationally Determined Contributions (NDCs). If the investments planned for the NDCs in 2015 were maintained and savings due to cost reductions reinvested in the same technologies, this could lead to a higher uptake of renewables and allow for more ambitious renewable targets. This, in turn, could support Parties to the Paris Agreement to strengthen their future NDC submissions, which are expected to be presented over the course of 2020.

Argentina was the first country to submit a revised NDC in 2016. The updated version is based on an updated methodology for the GHG inventory and on a more comprehensive set of mitigation measures in key sectors (Ministry of Environment of Argentina, 2016). The current NDC presents unconditional and conditional absolute emissions targets of 483 MtCO_{2e} and 369 MtCO_{2e} in 2030, respectively (Government of Argentina, 2016). To reach the proposed targets, Argentina developed sector action plans for six key mitigation sectors, including the energy sector, which present strategies to implement the country's NDC.

Recent technical analysis elaborated by NewClimate Institute suggests that a higher uptake of renewable energy technologies than what has been put forward in the energy sector action plan is feasible in Argentina (Nascimento *et al.*, 2020). The analysis is based on a methodology developed by Wachsmuth and Anatolitis (2018) and applies country-specific investment cost curves for solar PV and onshore wind to assess the implications of the projected cost reductions on the uptake of these technologies. If replacing fossil fuel powered generation, the additional renewables could reduce GHG emissions and allow for an increase of the level of ambition in Argentina's NDC. Preliminary results from the technical analysis show that the absolute emissions level of the conditional NDC target¹ could be reduced from 369 MtCO_{2e} to 351-356 MtCO_{2e} in 2030, only considering technology cost progressions (Nascimento *et al.*, 2020).

This report draws on interviews with Argentinian stakeholders to investigate two questions: 1) whether and to what extent technology cost progressions are being considered in current planning and policy making processes in the climate and energy sector, and 2) where potential new entry points for a further consideration of these cost progressions could lie in the future. Both questions require a careful analysis of the actors and institutions in the field, as well as of the processes and tools that could potentially influence decision making in the climate and energy sector.

The report starts with providing an overview of the current institutional framework and planning and policy making processes in the climate and energy sectors (Chapter 2 and 3). Chapter 4 analyses the challenges that stakeholders perceive to be dominant in preventing renewable energy development to unfold its full potential, even though costs are decreasing. As an additional aspect, the impact of the COVID-19 pandemic on the situation of renewable energy and on climate policy making is briefly explored (Chapter 6). The report ends with a summary of conclusions from the analysis (Chapter 7).

¹ The technical analysis looked specifically at the conditional NDC target and to what extent technology cost progressions could take Argentina beyond this target without additional investments (Nascimento *et al.*, 2020).

Methodology

To derive the insights presented in this report, the findings from the previous technical study (Nascimento *et al.*, 2020) were shared with a wide range of Argentinian stakeholders and written feedback on the analysis was collected via e-mail. Subsequently, the authors conducted five intensive, bilateral interviews with relevant stakeholders from the public and private sphere. The actors selected had expertise and experience in the field of renewable energy as well as in energy and climate policy and planning processes. While requests for interviews were sent to both policy makers and civil society actors, the response from government representatives was weak, which can be attributed to the recent change in the administration and respective institutions. Hence, more interviews were conducted with non-government actors (3) than with government actors (2).

Each interview was prepared by a list of questions tailored to the interviewee's expertise and shared in advance. All interviews were guided by a presentation and followed a similar two-step structure: First, a short introductory part gave a project introduction and a summary of the results of the preliminary analysis. A longer discussion part followed, in which general feedback was collected and specific questions discussed. While all interviews were recorded and detailed notes were taken, the information from these interviews is treated confidentially and feeds into the present report in an anonymised form.

The interview responses were carefully analysed to better understand current planning and policy making processes in the climate and energy sectors. They furthermore helped to identify the main perceived challenges that renewables currently face in Argentina, which may hinder the consideration of their potential to raise the country's climate ambition. Additional literature research was used to complement the information from the interviews.

COVID-19

The COVID-19 pandemic strongly affected Argentina's economic and political situation. At the time of writing this report (July 2020), the country was under strict mandatory lockdown rules which had been renewed several times since March 2020. While in some areas, restrictions had been eased in early June, the capital and Buenos Aires province remained under lockdown.

The COVID-19 pandemic has had an impact on the central topic of this analysis, directly affecting the situation of renewable energy in Argentina as well as energy sector planning and climate policy processes, as will be reflected throughout this report. Furthermore, the COVID-19 pandemic has had an impact on project implementation itself. A mission to Argentina, planned to take place in May 2020 with the objective to present project results, receive feedback and discuss open questions with key stakeholders, did not take place. Instead, several bilateral interviews with climate and energy experts from government and non-government institutions were conducted in order to discuss and reflect on our findings and their relevance in the Argentinian policy and planning context. Although availability and readiness from in-country stakeholders to engage in this project was limited – due to changes in the working environment and a shift in priorities during the pandemic – the information gathered provides comprehensive insights into the main questions that this report seeks to answer.

2 Policies and progress in Argentina: climate change

To better understand how technology cost progressions relate to and potentially influence climate policy processes in Argentina, the following section provides some insights into the legal and institutional set up supporting these processes as well as a description of the current status of central climate policy documents (2.1). A second section reflects on the effect that the current political situation and related trends and priorities may have on climate related policy processes, aside the institutional framework (2.2).

2.1 National climate policy landscape

Argentina has recently experienced a government shift. Under the previous government of President Mauricio Macri (2015-2017), climate change rose up the political agenda. A draft bill for Law 27.520 about Minimum Budgets for Adaptation and Mitigation of Climate Change (Government of Argentina, 2019a) was introduced to the Congress in 2018 and approved in November 2019, shortly after the new president Alberto Fernández had taken office. While this new Climate Change Law provides a robust legal framework for climate change mitigation and adaptation action throughout the country, it is still unclear which direction the new administration will take on climate change and sustainable development (CAT, 2019a).

Climate related planning and policy making is driven by the Secretariat of Climate Change in the Ministry of Environment, together with the National Climate Change Cabinet (Gabinete Nacional de Cambio Climático – GNCC)² which was formalised and institutionalised through the Climate Change Law. The GNCC brings together national public bodies, including line ministries, under the auspices of the Cabinet of Ministers and under technical coordination from the Climate Change Secretariat. The objective of the GNCC is to ensure coordinated responses to climate change as well as to design and implement public policies, actions, and instruments. As such, it drives several national climate change processes: it steered the first revision of Argentina's NDC in 2016 and is responsible for the current NDC update process as well as for the development of Argentina's Long-Term Strategy (LTS). The elaboration of Biennial Update Reports (BUR) and National Communications (NatCom) for submission to the UNFCCC also falls within the GNCC's realm of responsibility (Government of Argentina, 2019b).

The GNCC meets periodically in Roundtables at the political, technical, and provincial level. It furthermore validates its work in Extended Roundtables (Mesas Ampliadas) that include representatives from different sectors, civil society and academia. Results from these discussions are fed back to the Climate Change Secretariat which is in charge of collecting the information and making a final decision on the GHG emissions reductions targets to be included in a document (Government of Argentina, 2019b). Figure 1 illustrates the climate policy making process with a focus on NDC, LTS, BUR and NatCom's and the flow of information between the involved institutions.

² The GNCC was already established in 2016 through Decree 891/2016. Law 27.520 institutionalises the GNCC and ensures its permanence.

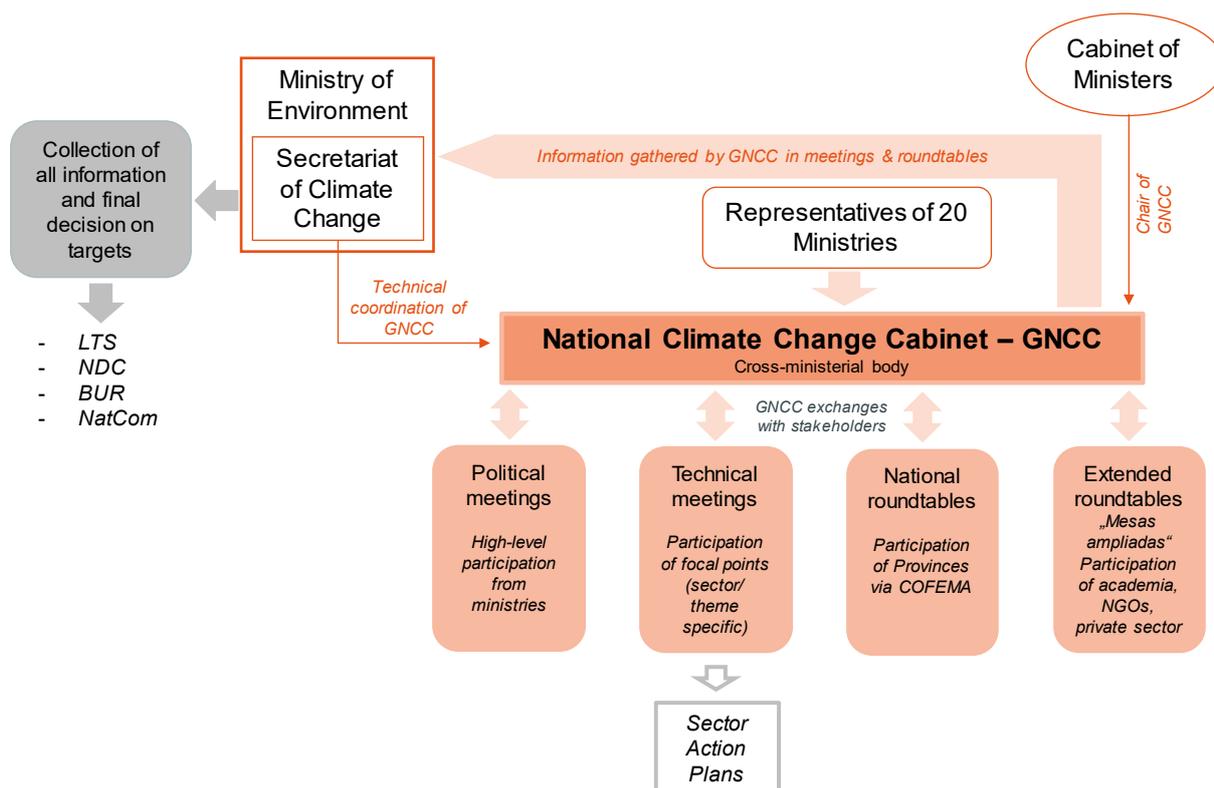


Figure 1: The process of climate policy making in Argentina, with a focus on the development of the NDC, LTS, BUR and NatComs.

Source: author's own compilation.

To guide the implementation of Argentina's 2016 NDC, the GNCC elaborated the National Plan for Adaptation and Mitigation (Plan Nacional de Adaptación y Mitigación al Cambio Climático – PANyMCC) in 2019. This Plan summarises the mitigation and adaptation measures included in seven Sector Action Plans that were elaborated between 2016 and 2019 for the following sectors: Health, Energy, Transport, Forestry, Industry, Agriculture and Land-use, and Infrastructure and Territory. The Sector Action Plans present strategies to implement the country's NDC in key sectors and are regularly updated (Government of Argentina, 2019b).

The PANyMCC states as an overarching objective that once the LTS process has been completed, the NDC should be revised under the leadership of the GNCC, considering a new mid-term target and opportunities for increasing the ambition of the NDC and aligning it with the adopted LTS (Government of Argentina, 2019). The workplan of the GNCC for the period between 2020 and 2023 includes the following tasks (Government of Argentina, 2019b):

- » Development and presentation of an LTS in 2020;
- » Revision and improvement of the Sector Action Plans;
- » Development of a National Information System on Climate Change (including monitoring and evaluation of measures included in the Sector Action Plans);
- » Revision and update of existing measures and incorporation of new mitigation and adaptation measures in development plans of all implementing entities;
- » Preparation of the Fourth National Communication.

Current status of climate policy in Argentina

Argentina's current economy wide GHG emissions reductions targets are outlined in the 2016 NDC. Other documents, such as the updated NDC and first LTS, are still under development (**Error! Reference source not found.**).

Table 1: Economy-wide GHG targets in Argentina's climate policy documents

Policy document	Status	Target year	Target
NDC	Submitted 2016	2030	483 MtCO ₂ e (unconditional)
	Submitted 2016	2030	369 MtCO ₂ e (conditional)
NDC Update	Under development	2030	Under development
LTS	Under development	2050	Under development

Source: based on CAT, 2019a.

The NDC update process has started, after some delay due to the COVID-19 pandemic. Given that renewable energy and energy efficiency measures represent almost 70% of the energy sector commitment in the NDC, representatives from the Directorate for Renewable Energy and Energy Efficiency in the Energy Secretariat participate in all GNCC meetings and in most Roundtables to discuss and provide input to several relevant NDC topics. Currently, the full energy sector contribution to the NDC is being reviewed by a technical team in the Energy Secretariat, with a specific study being developed to assess and quantify the proposed as well as potential additional measures in the energy sector action plan. While there may be some room for raising ambition, details on whether and to what extent this potential will be realised are not known yet (Ref. interviews).

The work around the LTS has equally started. Scenarios and projections are being developed by the respective line ministries, including in the Energy, Agriculture, Livestock, Forestry and Land-use sectors. The details underlying this process, including on methodologies and tools used and on the technical teams involved in their application, are not public. In the energy sector, the only information available is that an inhouse-team in the Sub-Secretariat for Energy Planning is currently developing scenarios up to 2040 and 2050 (Ref. interviews).

Beyond the modelling activities that are currently being undertaken within the line ministries, there is the Plataforma Escenarios Energéticos (Platform for Energy Scenarios)³ initiative in which a number of independent energy sector organisations develop alternative energy scenarios every two years, based on different assumptions on the development of the sector. The government participates in the process through its representation in the initiative's Executive Committee. To date, three rounds have been completed (2011/2012, 2014/2015 and 2017/2018) with funding from different sources (Plataforma, 2019). While the fourth round of scenario development is planned to start this year, funding for this round has not been secured yet. With each round, the modelling exercise is extended by five years, with the upcoming round expected to develop scenarios up to 2045. Regarding the desired impact of the Plataforma scenarios, there is agreement among participating organisations that the results of the process could be more strongly linked to actual policy making processes (Ref. interviews).

³ For more information on the Plataforma initiative, see: <https://www.escenariosenergeticos.org/>.

2.2 NDC and LTS process in a political context

Recent developments in Argentina make it difficult to assess whether the importance of climate change in the national context has changed with the government shift in late 2019. An early step of the new administration was the elevation of the former Environment Secretariat to a Ministry, which could, in theory, give the topic of climate change more weight in the political debate. However, there is currently no concrete evidence that would suggest consistent and progressive action against climate change in planning or policy making processes. This may, on the one hand, be a side effect of the COVID-19 pandemic which led to a shift of priorities in the short term.

On the other hand, the perception of limited climate action at the government level may be caused by a lack of communication between the government and non-government actors. While the legal and institutional framework for climate change related policy and planning processes is transparent, there is less clarity towards the outside on concrete technical work being undertaken regarding the revision process of Argentina's NDC or the development of its LTS. Even though local organisations can participate in the Extended Roundtables organised by the GNCC, these actors still describe processes linked to the NDC update and LTS development often as a "black box" (Ref. interviews).

Although all stakeholders are confident that progress is being made on both the NDC update and the LTS development, it is unclear what their respective status is. Under these circumstances, local non-government stakeholders struggle to find opportunities to provide input and support these processes with scientific analysis and advice (Ref. interviews).

With regards to the methods and tools used in the development of both the NDC and LTS, it is not always fully clear how targets and measures are being developed and updated, and to what extent cost-benefits analysis play a role. While there is evidence that scenario modelling is used in all sectors to derive realistic pathways, the underlying tools and methodologies remain, in some cases, unknown to non-government stakeholders. Regarding content of both NDC and LTS, stakeholders mentioned a stronger emphasis on transversal issues such as gender, social issues and others, in both processes (Ref. interviews).

3 Policies and progress in Argentina: renewable energy

Technology cost progressions must be evaluated in the context of energy sector planning and policy making to assess the potential of these cost reductions to raise Argentina's climate ambition. For that purpose, the legal and institutional framework that guides renewable energy development in Argentina is examined (3.1). Again, a reflection of the political context can provide an indication about the prospects for renewable energy to be promoted or demoted in future energy sector planning and policy making in the country (3.2).

3.1 Renewable energy policy landscape

Over the last five years, renewable energy has experienced a great push in Argentina. In 2015, the government under Cristina Fernández de Kirchner (2007-2015) approved Law 27.191, a new renewable energy law, which was implemented under the following administration of Mauricio Macri (2015-2019). The law adapted the existing regulatory framework to further incentivise the development of non-conventional renewables, including wind, solar, biomass and hydro smaller than 50 MW, and to foster the use of renewable based power across sectors. It furthermore sets targets to achieve an 8% share of renewables in electricity consumption by the end of 2017, and a 20% share by the end of 2025 (Government of Argentina, 2015).

The key policy instrument to reach the renewable energy targets is the RenovAr programme⁴. RenovAr is a renewable energy auction scheme under which centralised auctions are held with the aim to contract new renewable-based power generation capacity. Between 2016 and 2019, four auctioning rounds were completed, leading to contracts over 4.5 GW of new non-conventional renewable energy capacity (CAT, 2019a).

Law 27.191 furthermore stipulates that all large-scale consumers⁵ must comply with the renewable energy targets set in the law. To facilitate compliance with this stipulation, a long-term market for renewable energy (Mercado a Término de Energía Eléctrica de Fuente Renovable – MATER) was created through Resolution 281-E/2017, which encourages bilateral Power Purchase Agreements (PPAs) between energy producers and large-scale consumers. In addition, this resolution provides large-scale consumers with the possibility to comply with the targets through self-generation or co-generation. Combined, these policy instruments have led to the commissioning of 6.3 GW of non-conventional renewable generation capacity in Argentina between 2016 and 2019 (CAT, 2019a).

Beyond the promotion of large-scale renewable energy generation, Law 27.424 was passed in 2017 which focuses on the development of distributed, small-scale renewables and encourages net-metering for SMEs and residential consumers (Government of Argentina, 2017a).

The institutional structure in Argentina's electricity sector is defined by three main government entities: the Energy Secretariat, the national electricity regulator ENRE (Ente Nacional Regulador de la Electricidad) and the wholesale electricity market administrator CAMMESA (Compañía Administradora del Mercado Mayorista Eléctrico).⁶ While the Energy Secretariat is in charge of designing national energy policy and further developing the regulatory framework, ENRE grants grid access licenses and supervises compliance of generation, transmission and distribution entities with existing standards and

⁴ The RenovAr programme was created through Decree 531/2016.

⁵ Resolution 281-E/2017 defines large-scale consumers as those with an average annual consumption of equal to or above 300 kW (Government of Argentina, 2017b).

⁶ CAMMESA is a mixed-capital, government-controlled company 20% of which are owned by the Argentinian Government with the rest being equally distributed among market participants, including generation companies, transmission and distribution utilities and large power consumers (AIREC, 2018).

regulations. A major role in the electricity sector is assumed by CAMMESA, who coordinates electricity dispatch, determines wholesale prices, manages transactions in the national interconnected system, and acts as off-taker in certain PPAs (AIREC, 2018),

The energy sector, including supply and demand sectors such as transport and buildings, is the most relevant sector for Argentina's NDC as it is responsible for 53% of national emissions and contains the highest mitigation potential in the country (Government of Argentina, 2017c). In 2017, the Energy Sector Action Plan, which was coordinated by the Sub-Secretariat for Energy Efficiency within the Energy Secretariat under the Macri administration, was published. It includes specific measures for the sector to contribute to reaching the overall absolute emissions reduction target presented in the NDC: according to the plan, the energy sector is expected to reduce emissions by 103 MtCO_{2e} in 2030, which is equivalent to 46% of the conditional NDC target (MINEM, 2017).

The plan proposes a set of mitigation measures, including the energy supply side as much as the demand side, and will be implemented along four pillars: 1) energy efficiency, 2) renewable energy, 3) fuels, and 4) large-scale generation. The main contribution is envisaged to come from the supply side, where the share of non-conventional renewable energy sources in the power sector shall increase from 8% in 2017 to 20% by 2025 unconditionally, in line with Law 27.191, and to 25% by 2030 conditional upon support (MINEM, 2017).

The currently existing renewable energy and mitigation targets set out in Law 27.191 and the Energy Sector Action Plan, respectively, are summarised in Table 2.

Table 2: Renewable energy and mitigation targets in Argentina's energy policy documents

Policy document	Target year	Measure	Target
Law 27.191	2017	Unconditional	8% RE in electricity consumption
	2025	Unconditional	20% RE in electricity consumption
	2030	Conditional	25% RE in electricity consumption
Energy Sector Action Plan	2030	All measures	103 MtCO_{2e} emission reduction
	2030	Grid connected RE, unconditional	17.55 MtCO_{2e} emission reduction
	2030	Grid connected RE, conditional	4.61 MtCO_{2e} emission reduction
	2030	Decentralised RE, conditional	0.88 MtCO_{2e} emission reduction
	2030	Standalone RE, unconditional	0.05 MtCO_{2e} emission reduction

Source: based on Government of Argentina, 2015; MINEM, 2017.

The PANyMCC states that all sector action plans are periodically updated, with parameters and assumptions used for estimating the impact of the included measures to be updated and new measures to be incorporated (Government of Argentina, 2019b). According to government sources, the revision process for the Energy Sector Action Plan has started in 2019 and is currently ongoing, without new measures or targets being reported to date (Ref. interviews).

Current status of renewable energy in Argentina

While Argentina did not reach the target of 8% non-conventional renewable share in electricity consumption by 2017⁷, missing the first target of Law 27.191 by roughly 6 percentage points, noticeable progress has been made over the past five years. First, the share of renewables in total installed capacity has increased from 1% to 8% between 2015 and 2020.⁸ Second, also the renewable energy generation mix has been diversified further, with increasing shares of small hydro, solar PV and biogas in the total installed renewable capacities (Figure 2).

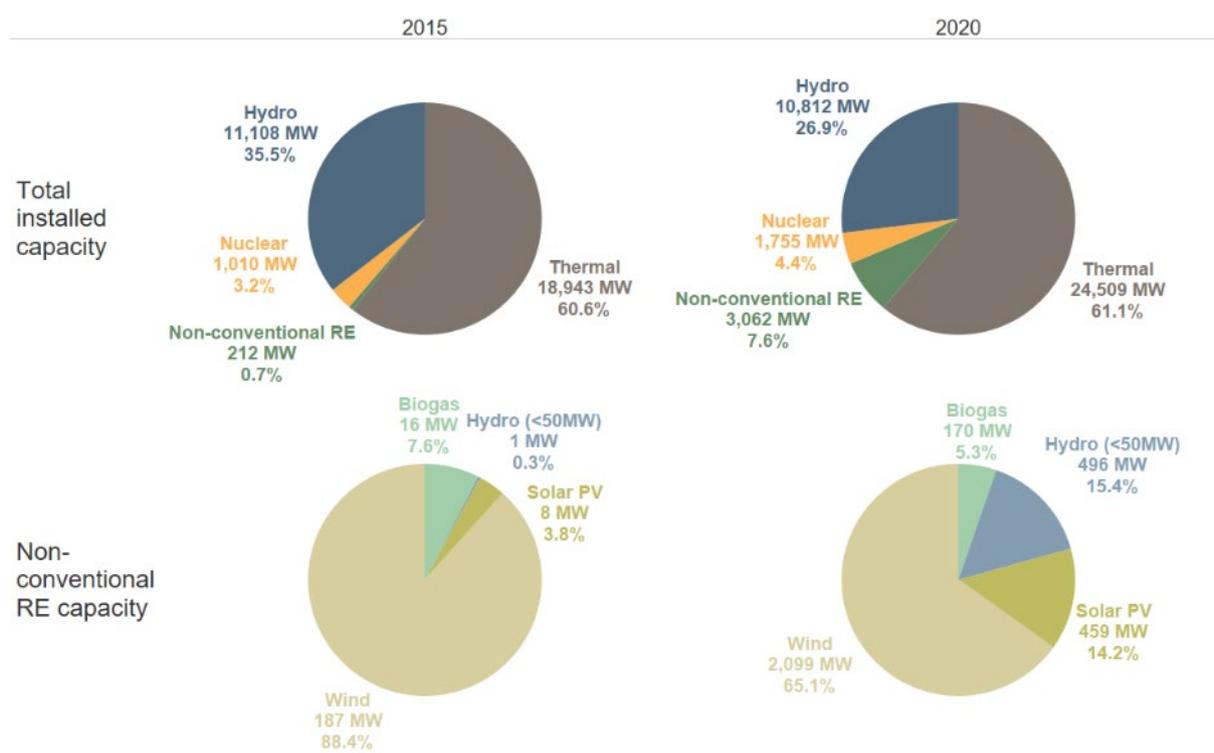


Figure 2 Share of total (upper) and renewable (lower) installed capacity in Argentina

Source: based on CAMMESA, 2015, 2020b, 2020a; Government of Argentina, 2020a.

Since 2015, 244 renewable energy projects have been awarded under the three main support schemes RenovAr, MATER and Resolution 202, that would add a total of 6.3 GW of installed generating capacity to the grid. Of these, around 50 projects have started commercial operation while approx. 100 projects are under construction (Ref. interviews).

To reach the target of 20% renewables share in power consumption by 2025, at least 10 GW of renewable energy capacity need to be installed, including the respective infrastructure to transport the electricity (MINEM, 2016). Given that to date not half of this has been achieved in terms of operational plants, the chances of fulfilling the 2025 target are slim.

The main driving force behind the rapid development of renewables over the past five years was the RenovAr programme. The four RenovAr rounds that have been held to date included round 1, 1.5, 2 and 3. The latest round, termed “MiniRen”, focussed on small-scale renewables with a capacity of up to

⁷ In 2017, renewable-based power generation presented 2% of total power generation that year and covered around 1.8% of total demand (CAMMESA, 2018).

⁸ Given the comparatively low capacity factors for solar PV (27%) and onshore wind (42%), the percentage growth in renewable energy capacity must be higher than the targeted growth in generation.

10 MW per installation, as a result of increasingly tangible grid limitations. These smaller scale projects are distributed across the country and planned to be installed closer to load centres, contributing to more decentralised power generation and avoiding energy losses through transportation (Sánchez Molina, 2019). In April 2019, the previous government announced a fifth auction round under RenovAr (round 4) which was expected to contract around 1 GW of new renewable capacity, focussing on large-scale wind and solar power projects as well as grid infrastructure projects (Bellini, 2019). After the change of government at the end of 2019, however, this plan has not been carried forward.

Yet, the new government remains committed to the renewable energy targets set out in Law 27.191. While it is likely that all existing RenovAr contracts will be respected – which had not always been the case under earlier Peronist governments – no new contracts will be signed (Ref. interviews). Thus, efforts will be undertaken to increase the share of renewables in the power mix and signal commitment to the 20% target by 2025, with a clear strategy towards achievement of this target still missing. A revision of this target to demonstrate higher ambition is currently not on the table (Ref. interviews).

3.2 Renewable energy in a political context

In 2018, three years after the Macri government had taken office, the former Energy Ministry was downgraded to a Secretariat under the Ministry of Economy, as a measure to reduce government costs. Still, the development of renewable energy was high on Macri's political agenda.

With Alberto Fernández taking office in late 2019, the Energy Secretariat was shifted from the Ministry of Economy into the Production Ministry. The unit responsible for renewable energy was downgraded from a Sub-Secretariat to a Directorate, while the Sub-Secretariat for Hydrocarbons maintained its status.

Various sources suggest that Fernández' position on renewable energy is not clearly defined yet. The new administration seems to envisage an integrated approach that provides a legal and planning framework for the entire energy sector, outlining strategic areas for progress and competitiveness. The idea seems to be to link the energy sector more strongly with industrial development, technological innovation and scientific research (Ref. interviews). Recent planning documents, such as a first draft of the Five-Year Plan on the Expansion of Energy Infrastructure, suggest that renewable energy will play a smaller role in this strategy, while the exploration of shale gas and oil fields in the Vaca Muerta formation⁹ are expected to lead sector growth (Government of Argentina, 2020b). It has been pointed out in this context that the exploration of gas is widely considered to be a crucial element to achieve the energy transition and support Argentina's climate change targets (Ref. interviews).

With a view to a new strategy for renewable energy development no details are known yet, although discussions on alternative finance mechanisms are currently ongoing in the Production Ministry. Stakeholders furthermore suggest that a stronger focus may be placed on distributed renewable technologies.

While the approach and focus of the new administration towards energy sector development will certainly differ from the previous one under Mauricio Macri, Vaca Muerta and renewable energy are likely to remain on the political agenda for some time.

⁹ The Vaca Muerta ("Dead Cow") formation in Neuquén Province in northern Patagonia, Argentina, disposes of the second largest shale gas and the fourth largest shale oil deposits in the world. It is a core element of Argentina's energy strategy since 2014.

4 Main challenges for renewable energy expansion

Feedback from Argentinian stakeholders and experts in the climate and energy sectors was consistent in the statement that renewable energy technologies are still perceived as high-cost alternatives for the future development of the energy sector, even though there is awareness that costs are decreasing. Similarly, there was agreement that the costs of renewable energy technologies are relevant but not the most relevant factor to determine renewable energy expansion in the country, and that other challenges need to be taken into account. The following section analyses the most frequently mentioned challenges for the uptake of additional renewable capacity, including the macro-economic situation (4.1), the availability of domestic gas resources (4.2), a weak transmission infrastructure (4.3), and limited political commitment and capacity (4.4).

4.1 Macro-economic situation and fiscal deficit

Key insights

- » The successive economic crises present an outstanding challenge to Argentina's renewable energy sector
- » Despite multiple economic interventions, the cost of capital continues to increase which reduces the attractiveness of renewable energy projects to local and foreign investors
- » The innovative financing mechanisms introduced under RenovAr did not result in a robust, sustainable renewable energy market, mainly due to other economic factors that increased financing costs

Although Argentina is internationally being recognised for having some of the greatest potential for wind and solar generation globally, its attractiveness for developing renewable energy projects has dwindled considerably in recent months. In the Renewable Energy Country Attractiveness Index (RECAI) which ranks the top 40 countries in the world on the attractiveness of their renewable energy investment and deployment opportunities, Argentina fell back from position 11 in late 2019 to position 18 in early 2020 (EY, 2020).

The outstanding challenge not only for renewable energy expansion but for the development of the country as such is Argentina's long history of economic instability. The current economic crisis began to unfold in late 2017, when different factors put Argentina's economy under pressure. The US Federal Reserve raised its interest rates, reducing investor interest in Argentinian bonds; the central bank in Argentina revised its inflation targets and sparked discussions about its commitment to low inflation; and a heavy drought diminished agricultural export revenues. When investors started to sell their Argentinian assets, the Peso was devalued which increased the debt, most of which was denominated in US Dollars (USD). In June 2018, the Macri administration secured a three-year USD 50 billion programme with the International Monetary Fund (IMF) (CRS, 2020). However, despite the IMF programme and several fiscal reforms, the value of the Peso continued to fall. The new administration under Fernández implemented new measures to improve the economic situation and started to renegotiate public debt with bondholders and creditors. Yet, in May 2020, as the COVID-19 pandemic further increased economic pressure, Argentina defaulted on its debt for the second time since 2000, failing to pay around USD 500 million in interest on Dollar bonds (CRS, 2020).

A major challenge for the development of renewable energy projects resulting from the macro-economic context in Argentina is limited funding availability from local as well as international sources (Ref. interviews). Renewable energy projects need significant upfront investment for equipment, which is usually financed through participation of multilateral banks, export crediting agencies, public and private international and national banks, amongst others. In the current macro-economic situation, however,

the costs of credit have increased tremendously which makes it difficult for project developers to access these funds.

Under the Macri administration, the RenovAr programme was designed to address the financing challenge of renewable energy projects by promoting private investment through competitive auctions and providing certainty for the investors. CAMMESA was established as the off-taker and signatory to PPAs that are awarded to Independent Power Producers (IPPs). To enable low cost financing, the government set up a Fund for the Development of Renewable Energy (Fondo para el Desarrollo de Energías Renovables – FODER)¹⁰ that provides guarantees, direct debt, equity financing, and other financial instruments. The primary instrument of FODER was a payment guarantee designed to cover ongoing PPA payments, which was initially backed by a USD 480 million payment guarantee issued by the World Bank (World Bank, 2018). However, despite the strong initial support which considerably reduced risks and financing costs for IPPs, further market development of renewables has been thwarted by the poor economic conditions and underinvestment in supportive infrastructure, as well as more recently by the increased political uncertainty on a new energy sector strategy (Ref. Interviews).

Given that the RenovAr auctions will not be continued under the new government, the perspective for projects that have been awarded contracts under RenovAr to date is mixed. There are two types of projects: those that have been awarded but that have not yet managed to secure funding, and those that are already under construction or in operation. Both have been negatively impacted by sharply rising interest rates and the reintroduction of capital controls under the Macri administration in September 2019, which have been tightened again under Fernández in May 2020. Several awarded project developers have suspended project development due to increased capital costs. In some cases, international investors withdrew from projects and even halted previously authorised payments. Other project developers, who managed to procure financing, face strong currency volatility, affecting their profitability and liquidity, as well as difficulties to process payments in USD, as concerns emerge over debt repayments (Ref. interviews, Santamaría, 2019).

Several energy sector stakeholders suggested that if the macro-economic factors were successfully adjusted, renewables would be the cheapest non-subsidised power generation option in the country. As the exploitation of the Vaca Muerta gas and oil fields also require large up-front investments, they are equally unlikely to see significant progress until financing conditions improve. Yet, gas fired power plant projects have relatively lower investment costs and may thus be a more attractive investment when financial capital is expensive, which is what is being reflected in the current government approach (Ref. interviews).

¹⁰ The Fund was created by Law 27.191 of September 2015.

4.2 Availability of domestic gas resources

Key insights

- » Exploration of the Vaca Muerta gas and oil fields is expected to ensure economic growth and energy security in Argentina
- » Recent global developments turn Vaca Muerta into an economically vulnerable project and increase the risks of stranded assets
- » Production from the Vaca Muerta fields has slowed down considerably in the last year; the government therefore discusses new subsidies for the gas sector in an effort to rescue the gas industry and boost production
- » Continued subsidisation of fossil fuels further strains the national budget and impairs the cost competitiveness of renewable energy technologies

The exploitation of abundant gas and oil reserves in the Vaca Muerta formation has been at the heart of Argentina's energy sector strategy for the last six years. It is seen as a source of cheap fossil fuels which is set to secure domestic supply in the long-term and transform Argentina into a global energy exporter (Ref. interviews).

The fate of the Vaca Muerta project is currently being discussed in the ongoing debt renegotiations between the Argentinian government and the IMF. While two years ago, the IMF promoted Vaca Muerta as a way for Argentina to earn foreign currency and become more energy independent, the fund recently experienced growing international pressure to back away from fossil fuels. Thus, it insisted in early 2019 that Argentina cut government subsidies which support the development of Vaca Muerta. Together with a drop in energy demand and a steep fall of the oil price as a result of the COVID-19 pandemic, these recent developments mean that Vaca Muerta is now amongst the most economically vulnerable fossil fuel projects in the world (Watts, 2020).

Since the further development of the Vaca Muerta project has been put on hold in 2019, production has slowed down considerably. In the first trimester of 2020, only 10 gas wells were drilled, compared to 47 in the same period in 2019 (Gandini, 2020). Gas industry stakeholders voiced their concerns that if no counteracting policy instruments were introduced to revive investments into natural gas production, there would be a serious risk of natural gas shortages in the Argentinian winter as well as a need to significantly increase gas imports (Gandini, 2020).

In this context, there are discussions to fix the gas price at USD 3.50 per million British thermal units (MMBtu) in line with the breakeven for Vaca Muerta gas production, in order to restore investor confidence and boost production (Newbery, 2020). However, since in the current economic situation in Argentina it is impossible to increase the gas tariff without risking social uprising, this measure would require large government subsidies. This runs counter to the message of the IMF that subsidies for fossil fuel exploitation should be cut. It also contradicts efforts to build up a healthy economy, as it would further intensify the dependency of energy sector development on state support.

The expectation of several energy sector stakeholders is that as soon as the economy recovers, fossil fuel subsidies will be reinstated at a high level so that investments into the development of Vaca Muerta pick up again, flooding the country with cheap gas (Ref. interviews). The expansion of fossil fuel subsidies can thereby be expected to have a detrimental effect on the further development of renewable energy. Onshore wind and solar PV are already the cheapest non-subsidised electricity generation sources in Argentina (Nascimento *et al.*, 2020). However, continued subsidisation of gas impairs the cost competitiveness of renewable energy technologies and distorts the market. This reinforces the misguided perception of many Argentinians that gas is cheaper than renewables and can bring more wealth to the country, and that it should spearhead the development of the energy sector.

While the current government promotes gas as an important “transition technology” on the way towards a cleaner energy sector (Ref. interviews), this perception must be treated with caution especially when considering Argentina’s massive gas expansion plans. The substantial investments into gas production and transport infrastructure that need to accompany these plans carry the serious risk to end up as stranded assets. If Parties to the Paris Agreement take their commitment seriously, they need to gradually pull out of fossil fuels: different global energy sector scenarios predict a significant decrease of gas consumption towards mid-century. A transitional role for gas in the longer term (i.e. towards the end of the century) would, according to these scenarios, need to rely heavily on carbon capture and storage (CAT, 2019b). This technology, however, is still expensive and has limited co-benefits, in particular if compared to the development and widespread use of renewable-based power generation technologies in Argentina.

4.3 Weak transmission infrastructure

Key insights

- » Investments in grid infrastructure have not kept up with the expansion of renewables
- » Geographical country characteristics exacerbate grid challenges in Argentina
- » The new government signalled interest in decentralised generation
- » Costs for electricity transmission infrastructure are often exclusively added to the costs of renewable power generation, without accounting for other benefitting actors

The expansion and deployment of renewable energy at larger scales depends on the existence of robust and resilient transmission infrastructure. In Argentina, transmission infrastructure suffers from years of absence of significant investment and maintenance. Under the Macri administration, significant investments in renewable energy capacity were not matched by equally strong investments in grid infrastructure. The expected capacity limitations in the national grid pose another challenge to the expansion of renewable energy capacity, discouraging potential future project developers and investors to become engaged in the sector (Ref. interviews).

In 2015, when the Macri government took office, it declared “electric emergency” after a number of power outages over the year had severely affected the population. The focus was placed on increasing generation and improving distribution networks. Consequently, the existing distribution grid is relatively stable, and the currently low shares of renewable-based power generated can be easily integrated. Transmission network related projects, on the other hand, were less strongly promoted and are largely delayed (Ref. interviews). Part of the reason for limited progress in transmission grid expansion was that the traditional government funded delivery model for infrastructure projects was replaced by Public Private Partnerships. In the ongoing financial and economic crisis, however, this model proved to be impractical, and adherence to this model resulted in no new transmission lines being built under the Macri administration (Ref. interviews). However, shortly before leaving the government, the former Energy Secretariat designed a “master plan” which reactivated a few priority construction sites for transmission lines (Spaltro, 2019).

There are certain geographical country characteristics in Argentina that further exacerbate grid challenges. The country stretches over 3.700 km from North to South. The population concentrates in a few larger cities, while population density outside these cities is extremely low. The existing transmission

network is sparse and the degree of meshing¹¹, especially in the rural parts of the country, is low. Large solar PV and onshore wind resources can be found in the North-West and far South of the country, respectively, the deployment of which requires the construction of new transmission corridors (De Vivero *et al.*, 2019).

The expected capacity limitations in the system put the achievement of Argentina's renewable energy targets by 2025 at risk. Concerns about grid limitations had been raised before RenovAr round 3 which was launched in 2018. Recognising this issue, RenovAr round 4 was planned to include grid infrastructure projects to support the further expansion of transmission capacity in the country; the current government, however, indicated that round 4 will not take place.

Considering current grid limitations for the deployment of large-scale renewable energy, the Fernández administration signalled interest in facilitating distributed renewable energy solutions which could relieve the pressure on the transmission infrastructure. A starting point could be the further development and promotion of the mechanisms and finance instruments introduced with Law 27.424 on distributed energy. However, there is limited incentive for individuals to invest in small-scale renewable equipment for self-sufficient generation as long as the electricity tariff is heavily subsidised (Ref. interviews).

The costs for building and expanding transmission infrastructure to transport electricity are often exclusively added to the costs of renewable-based power generation, reinforcing the general perception of expensive renewables versus cheap gas (Ref. interviews). This perception fails to take into account the complexity of the electricity system. First of all, grid expansion is inevitably necessary to integrate new power plants, whether gas-fired or renewable-based, to meet growing electricity demand. It is true that the integration of large variable sources such as solar PV and wind requires additional flexibility options (e.g. storage or power-to-gas technologies) which often involve high capital costs. Furthermore, gas-fired power plants may be constructed closer to the load centres, which could reduce grid expansion costs compared to a system in which large renewable sources are transported from the far North or South to the load centres.¹²

On the other hand, it is important to not only consider grid expansion and integration costs but full system costs. Studies show that if comparing an electricity system relying predominantly on gas with a system relying on renewable energy, overall system costs tend to be lower in a renewable energy-based system over the long-term. This effect is reinforced if assuming rising fuel prices and the introduction of a global CO₂ price (Öko-Institut, 2017). Apart from that, the fact that higher capital costs for grid expansion in a renewable-based system are often allocated exclusively to renewables falls short of the mark: there are several other actors in the system that benefit from access to clean and reliable electricity, cheaper electricity generation and firm capacity. Ideally, the costs are socialised among all of them, which would reduce the additional costs for renewables and positively impact their competitiveness.

¹¹ The higher the degree of “meshing” in a network, the more paths are offered to reach loads from nearby nodes and the less likely is it that a fault forces a supply interruption for connected customers (De Vivero *et al.*, 2019).

¹² It must be noted here that the unit cost of energy transportation varies significantly between different energy sources and that the costs of transporting electricity are substantially higher than the costs of transporting gas (Saadi, Lewis and McFarland, 2018). Thus, if gas is mainly transported through pipelines to power plants that are located close to the load centre, infrastructure costs decrease. This consideration gains relevance if going one step further and comparing a scenario in which major demand sectors including industry, transport, and buildings are electrified in the long-term with a scenario in which these demand sectors are supplied with gas.

4.4 Lack of clear political signals

Key insights

- » The lack of clear political signals, especially in the form of policy commitments, increases uncertainty among renewable energy investors
- » Frequent changes in the government structure make consistent planning, including target setting, for renewable energy development more difficult

In addition to solid economic and technical challenges that may hamper the expansion of renewable energy technologies in Argentina, the interaction with stakeholders carried out for this analysis revealed equally important but less tangible challenges in the political process. These can be attributed to a lack of clear political signals from the current administration.

In the case of renewable energy in Argentina, the new government under Fernández has not yet demonstrated its clear commitment towards the expansion of renewable-based power generation. This lack of political determination increases uncertainty among project developers and investors – who had originally been attracted to the market through the RenovAr scheme – about future regulations and requirements in the renewable energy sector.

Closely linked to political leadership and commitment is the development and accessibility of planning and policy making capacity. Frequent changes between governments as well as within governments have resulted in the need to frequently rearrange political and technical positions. These changes make the development of a consistent planning process and of a clear vision towards the development of the energy sector more difficult.

5 The COVID-19 pandemic and implications for RE expansion in Argentina

The present situation of the renewable energy sector in Argentina must be considered and evaluated in a context of the current COVID-19 pandemic, which may intensify several of the above described challenges. The pandemic and related lockdown measures have had a palpable impact on renewable energy development and may also affect the country's action towards climate change in the near future. While at the global level, the relevance to include “green” measures in countries' economic recovery packages is being discussed, there are currently no signs that opportunities especially for renewable energy development are being seized in the context of Argentina's COVID-19 recovery measures.

Implication of COVID-19 and recovery measures for the energy sector

The COVID-19 pandemic has reinforced the difficult macro-economic situation in the country. The country's economy is currently forecast to contract by 5.7% in 2020 (CRS, 2020). In combination with delays in construction and operation of renewable projects due to lockdown measures, as well as with an increasing uncertainty over the outcome of ongoing debt renegotiations and a potential new default, the current circumstances deter potential investors and project developers to engage and invest in Argentina's renewable energy sector.

The first set of recovery measures proposed by the government in June 2020 further aggravates the situation of renewables in the country. They reinforce existing energy sector subsidies and introduce new subsidies, with the aim to protect primarily the oil and gas industry from collapsing prices and decreasing demand (CAT 2020 forthcoming).

Three measures are of major significance in this context:

- **Extension of electricity and gas tariff freeze:** Already in December 2019, the new administration under Fernández froze electricity and gas tariffs for six months in order to gain time to develop a new pricing framework and renegotiate contracts with utilities (CAT 2020 forthcoming). In the context of the COVID-19 crisis, the government extended the term until the end of 2020. While the objective of this measure is to cushion socio-economic impacts of the pandemic on the most vulnerable parts of the population, it is increasingly difficult for the government to keep up the subsidies, resulting in defaults on payments to generators. This situation discourages stakeholders and investors in both the fossil fuel and the renewable energy industry.
- **Fixed oil price:** The steeply falling demand as a result of less road and air traffic during the lockdown has hit Argentina's oil production hard. As a consequence, the government artificially fixed the domestic oil price at a minimum of USD 45 per barrel for 2020, regardless of low international oil prices. While the official objective of this measure is to protect jobs and the entire energy industry in the context of the COVID-19 crisis, it effectively presents an intervention and subsidisation to rescue the struggling future of Vaca Muerta and other oil production sites (CAT 2020 forthcoming)
- **Discussion on fixed gas price:** In contrast to oil demand, gas demand has been steadier throughout the crisis and is expected to rise during winter (Newbery, 2020). However, due to the electricity and gas tariff freeze, current prices do not match production costs. Consequently, there are discussions to also fix the gas price at USD 3.50 per MMBtu, which would require a decoupling of the gas price at the wellhead from the domestic tariffs and thus new government subsidies for gas development.

More recovery measures are being developed as the COVID-19 pandemic continues. While “green” recovery measures may be considered in the future, they remain absent in current proposals.

Implication of COVID-19 and recovery measures for climate change

The COVID-19 pandemic has certainly caused a shift of priorities in the government, with climate change moving further down the political agenda. Several climate change related processes, including the NDC update and LTS process, may experience delays.

At the same time, the Climate Action Tracker expects that Argentina's GHG emissions in 2020 will be 10-11% lower than in 2019. This remarkable drop in emissions due to COVID-19 means that Argentina may miss its NDC target only by 2-4% in 2030 (CAT 2020 forthcoming).

However, future emissions development and the question whether Argentina will achieve its NDC targets will depend heavily on the ongoing developments of the pandemic, the definition of future domestic recovery measures, as well as on the outcome of the debt renegotiations. The energy sector and recovery measures taken therein play a major role in this context. They may further aggravate the prospects for renewable energy development in the country, or, in an unexpected turn of events, present an opportunity for these technologies to regain momentum.

6 Conclusions

This report is the second of two reports that have been developed under the Argentina component of a research project, which assesses the implications of a decrease of renewable energy technology costs for the NDC update processes in Argentina, Indonesia and Mexico.

While the first report uses a methodology developed by Wachsmuth and Anatolitis (2018) to assess the implications of projected cost reductions on the uptake of renewable energy capacity and respective potential emission reductions in Argentina, this report focusses on planning and policy making processes and how these determine the consideration of the techno-economic potential in the country.

The present report draws on interviews with Argentinian stakeholders to investigate two questions: 1) whether and to what extent technology cost progressions are being considered in current planning and policy making processes in the climate and energy sector, and 2) where potential new entry points for a further consideration of these cost progressions could lie in the future.

The analysis shows that while a certain **awareness for decreasing costs of renewable energy technologies exists** among stakeholders and experts in the climate and energy sector, **this knowledge has not yet infiltrated main planning and policy making processes** which could use this information in order to raise the country's climate ambition.

Legal and institutional frameworks have been established for both climate-related policy making and renewable energy development. Yet, it becomes clear that the **effectiveness of these frameworks depends to a high degree on the trends and priorities of the current government**. After a change of government in Argentina took place in late 2019, the course of the new administration towards climate change and its position vis-à-vis renewable energy remains vague.

Limited transparency around both climate-related and energy sector planning and policy making processes is prevalent in Argentina. It is not always clear which tools and methodologies are used to define sectoral contributions to climate change and whether or to what extent techno-economic analyses play a role in these processes. Stakeholders suggest that opportunities to reduce mitigation costs by considering technology cost progressions have not been fully seized to date in the development of the NDC update or LTS process, or in discussions around new renewable energy targets.

The assumed reasons for the limited consideration of technology cost progressions in planning and policy making processes to date are varied. There are **several challenges that outweigh the importance of technology cost progressions and thus hamper the expansion of renewable energy despite the positive price development**. The most predominant issues mentioned by stakeholders include Argentina's dire macro-economic situation, the availability of abundant domestic gas resources in the Vaca Muerta formation, the weak transmission infrastructure as well as a lack of clear political signals and leadership.

Regardless of these challenges, there is **broad agreement among stakeholders that technology cost progressions are relevant for the development of Argentina's renewable energy sector** and would ideally be considered in a transparent and consistent way in climate and energy sector planning processes. A potential entry point for this type of techno-economic analysis could be the technical roundtables convened by the GNCC, which consist of the climate change focal points of the respective line-ministries. The energy sector focal point could introduce the information and ensure that it is being considered by the technical team responsible for modelling and scenario development in the energy sector. Once assumptions on technology cost progressions have been included in the tools and methods used for scenario development, they can more easily be taken into account in the development of the NDC update and LTS documents. At the same time, they can inform the update of the energy sector action plan to guide their implementation. Close cooperation with local and international non-

government actors can thereby take pressure off the government while supporting capacity building in the energy sector and ensuring a more transparent and inclusive policy making process.

The current situation in Argentina may compromise not only the successful development of the renewable energy sector, but also the country's potential to raise its climate ambition and to ensure overall socio-economic development. Against this backdrop, it is **important to enhance transparent, effective and efficient planning in the energy sector that is based on robust tools and methods and results in the formulation of realistic and achievable targets**. These targets are ideally embedded in a clear vision of the government towards the development of this sector and flanked by a policy and regulatory framework that shapes their implementation. In this context, a more sustainable approach towards stabilising the economy and propelling growth of the energy sector could embrace renewable energy development as a non-subsidised, safe and long-term investment opportunity for local and foreign investors. This could, in turn, decrease the dependency of energy sector development on government subsidies and reinstall the country as an attractive renewable energy market.

7 References

- AIREC (2018) *2018 Argentina renewable energy report, AIREC Week*. Available at: <http://minaaysp.cba.gov.ar/wp-content/uploads/2018/06/AIRECweek-2018-The-Argentina-Report.pdf>.
- Bellini, E. (2019) 'Argentina announces new RE auction for 2019', *pv magazine*, April.
- CAMMESA (2015) *Informe Anual 2015*. Available at: <https://portalweb.cammesa.com/Documentos/compartidos/Informes/Informe Anual 2015.pdf>.
- CAMMESA (2018) *Informe Anual 2017*.
- CAMMESA (2020a) *Informe Mensual Junio 2020*. Available at: <https://portalweb.cammesa.com/MEMNet1/Informe Mensual/Informe Mensual.pdf>.
- CAMMESA (2020b) *Potencia instalada por región y tecnología*. Available at: <https://despachorenovables.cammesa.com/potencia-instalada/> (Accessed: 10 July 2020).
- CAT (2019a) *Argentina*. Available at: <https://climateactiontracker.org/countries/argentina/>.
- CAT (2019b) *Scaling Up Climate Action: Argentina, CAT Scaling Up Climate Action series*. Available at: https://climateactiontracker.org/documents/540/CAT_2019-09-05_ScalingUp_ARGENTINA_FullReport_ENG.pdf.
- CRS (2020) *Argentina's Economic Crisis and Default*.
- EY (2020) *In the wake of a human crisis do climate goals take a back seat?*
- Gandini, N. (2020) *El gobierno evalúa desacoplar los precios del gas de las tarifas residenciales, Econo Journal*.
- Government of Argentina (2015) *Energía Eléctrica (Ley 27191)*. Available at: <http://www.melectrico.com.ar/web/pdfs/Ley 27191.pdf> (Accessed: 1 December 2016).
- Government of Argentina (2016) *Republic of Argentina First revision of the Nationally Determined Contribution*. Available at: http://www4.unfccc.int/ndcregistry/PublishedDocuments/Argentina First/Traducción NDC_Argentina.pdf.
- Government of Argentina (2017a) *RÉGIMEN DE FOMENTO A LA GENERACIÓN DISTRIBUIDA DE ENERGÍA RENOVABLE INTEGRADA A LA RED ELÉCTRICA PÚBLICA*. Buenos Aires, Argentina. Available at: http://biblioteca.afip.gob.ar/dcp/LEY_C_027424_2017_11_30.
- Government of Argentina (2017b) *Resolución 281-E/2017 Régimen del Mercado a Término de Energía Eléctrica de Fuente Renovable*. Ministerio de Energía y Minería. Available at: <https://www.boletinoficial.gob.ar/detalleAviso/primera/169410/20170822>.
- Government of Argentina (2017c) *Second Biennial Update Report*.
- Government of Argentina (2019a) *Ley 27.520 - Ley de Presupuestos Mínimos de Adaptación y Mitigación al Cambio Climático Global*. Available at: <https://www.argentina.gob.ar/noticias/se-oficializo-la-ley-de-presupuestos-minimos-de-cambio-climatico>.
- Government of Argentina (2019b) *Plan Nacional de Adaptación y Mitigación al Cambio Climático - Versión 1*. Available at: <http://argentinambiental.com/legislacion/nacional/resolucion-447-19-plan-nacional-de-adaptacion-y-mitigacion-al-cambio-climatico/>.
- Government of Argentina (2020a) *Potencia Instalada Energía Eléctrica*. Available at: <https://www.argentina.gob.ar/produccion/energia/planeamiento-energetico/panel-de-indicadores/potencia-instalada> (Accessed: 10 July 2020).
- Government of Argentina (2020b) *Programa Federal Quinquenal Infraestructura Energética*.
- MINEM (2016) *Energías Renovables en Argentina. Nuevo Marco Regulatorio y Perspectivas 2016+*. Available at: https://www.minem.gob.ar/archivos/Reorganizacion/renovables/presentaciones/ARGENTINA_-_Energias_Renovables_-_Nuevo_Marco_Regulatorio_y_Perspectivas_2016.pdf.

MINEM (2017) *National Action Plan on Energy and Climate Change [Plan de Acción Nacional de Energía y Cambio Climático]*. Buenos Aires; Argentina: Ministerio de Energía y Minería (MINEM). Available at: https://www.argentina.gob.ar/sites/default/files/plan_de_accion_nacional_de_energia_y_cc_1.pdf.

Ministry of Environment of Argentina (2016) *Presentation at COP22: Contribución Determinada a Nivel Nacional sobre Cambio Climático (NDC) República Argentina*.

Nascimento, L. et al. (2020) *Decreasing costs of renewables - Implications for Argentina's climate targets*.

Newbery, C. (2020) *Argentina fracking activity up in June but gas imports may rise, S&P Global Platts*.

Öko-Institut (2017) *Renewables versus fossil fuels – comparing the costs of electricity systems*. Available at: https://www.agora-energiewende.de/fileadmin/Projekte/2016/Stromwelten_2050/Agora_Gesamtkosten-Stromwelten-EN_WEB.pdf.

Plataforma (2019) *Plataforma Escenarios Energéticos Argentina*. Available at: <https://www.escenariosenergeticos.org/>.

Saadi, F., Lewis, N. and McFarland, E. (2018) 'Relative costs of transporting electrical and chemical energy', *Energy & Environmental Science*, (3). Available at: <https://pubs.rsc.org/en/content/articlelanding/2018/EE/C7EE01987D#!divAbstract>.

Sánchez Molina, P. (2019) *El precio mínimo adjudicado para la solar en la Ronda 3 de RenovAr en Argentina, PV Magazine*.

Santamaría, G. (2019) *Energías renovables 2020: Perspectivas para los proyectos adjudicados bajo el Programa RenovAr, Abogados.com.ar*.

Spaltro, S. (2019) *El Gobierno trazó un plan para que Alberto Fernández apure obras eléctricas, El Cronista*. Available at: <https://www.cronista.com/economiapolitica/El-Gobierno-trazo-un-plan-para-que-Alberto-F.-apure-obras-electricas-por-us-1500-millones-20191203-0039.html>.

De Vivero, G. et al. (2019) *Transition towards a decarbonised electricity sector - a framework of analysis for power system transformation*. Available at: https://newclimate.org/wp-content/uploads/2019/10/Report_Transition_Towards_A_Decarbonised_Electricity_Sector_A2A_2019.pdf.

Wachsmuth, J. and Anatolitis, V. (2018) *Bringing climate policy up to date – decreasing cost projections for renewable energy and batteries and their implications*. Dessau-Roßlau; Germany. Available at: <http://www.umweltbundesamt.de/publikationen>.

Watts, J. (2020) *Coronavirus pandemic threatens controversial fracking project in Argentina, The Guardian | Environment*.

World Bank (2018) *Argentina Renewable Energy Auctions, Financial Solutions Brief*.



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