



ENERGY SECTOR IN ARGENTINA: PROPOSALS FOR 2030 TO ACHIEVE CARBON NEUTRALITY BY 2050

Carlos Tanides, Daniela Gomel, María Florencia Torres Corpos, Marlene Diedrich, Roque Pedace, Marcelo Álvarez

NOTED POINTS

The energy sector represents more than 50% of Argentina's greenhouse gas (GHG) emissions, making it a strategic sector for achieving the emissions reduction goals by 2030 and decarbonization by 2050.

According to international experience, a hypothesis may be considered for Argentina: a reduction of at least 40-55% in its primary energy intensity by 2050.

In order to develop a low-carbon strategy within a sustainable development framework, a regulatory framework should be enforced promoting such strategy, facilitating the necessary actions and hindering or preventing otherwise.

Institutional and political aspects are one of the most important barriers to progress towards a more sustainable energy system, both in terms of Rational Use and Energy Efficiency (RUEE), electric power generation from Renewable Energies and biofuel production.

A low-carbon strategy, with essentially sustainable development, must consider the situation of the productive sectors that will be affected, focusing on job projections and employability in the renewable sector.

EXECUTIVE SUMMARY

This policy brief describes the characteristics of Argentina's energy sector that are key to its transition to a sustainable energy matrix. At the same time, policy proposals are listed and developed for the purpose of meeting the GHG emission reduction targets by 2030 and total decarbonization of all the economy sectors by 2050. There is a clear need to thoroughly reconvert the sector, to quickly stop the promotion of fossil fuels and, in contrast, to strongly advance with the optimization of energy consumption and a strong increase in the share of renewable energies. The advantages of this type of policies not only translate into environmental benefits, but also into economic savings resulting in the provision of energy services, the creation of more jobs and the decentralization and smooth development of energy activities throughout the national territory. Finally, the importance of both the technological replacement and the complete reformulation of the political-institutional frameworks considering a fair energy transition, among other things, is highlighted.

OVERVIEW

Since the signing of the Paris Agreement and its subsequent ratification, Argentina assumed a significant commitment in the fight against climate change. The second Nationally Determined Contribution (NDC) submitted in December 2020 establishes the absolute and unconditional mitigation target of not exceeding net emission of 359 MtCO_{2e} by 2030, applicable to all economy sectors. The same NDC communication sets the goal of “achieving carbon neutral development by 2050” (Ministry of Environment and Sustainable Development, 2020). However, the NDC contains few details on how the goals will be achieved, what transformations the sectors will face, the resources that will be used and its terms.

In this context, it is necessary to establish a strategy to guide and articulate the actions intended to be taken, under the principle of common but differentiated responsibilities. As regards total global and per capita emissions, according to the data of the World Resources Institute (2020), Argentina is one of the 21 countries with the highest emissions in the world, with per capita emissions exceeding those of Brazil and Mexico.

Given that the energy sector represents more 50% of the country's emissions, energy is a strategic resource for achieving the aforementioned emissions reduction goals by 2030 and 2050.

With regard to the 2030 target, the commitments made in the 2030 Agenda for Sustainable Development are to be considered, in particular SDG 7, which states “to ensure access to affordable, reliable, sustainable and modern energy for all”. According to the latest Emissions Gap Report published by the United Nations Environment Program, countries as a whole must increase their mitigation ambition fivefold to keep global average temperature below 1.5 °C and, consequently, to avoid permanent and irreversible effects on the planet (UNEP, 2020). In the case of Argentina, the 2030 target has been estimated to be between 287 MtCO_{2e} and 175 MtCO_{2e} (UNEP, 2020; Ministry of Environment and Sustainable Development, 2020) ¹.

The following are specific proposals and suggestions for compliance with the NDC and for consideration in the development of the Long-Term Strategy (LTS). Such proposals can also contribute to the National Climate Change Adaptation and Mitigation Plan (Law No. 27,520).

1. This range was estimated as follows: total emissions were taken for the year in which the latest GHI was published, according to which Argentina emitted 0.7% of global emissions. Based on Climate Action Tracker estimations, in order for global emissions to be below 2 °C by 2030, they would have to be 41 GtCO_e, and to be below 1.5 °C, they would have to drop to 25 GtCO_e. Applying 0.7% to these totals gives us the range. If instead of 0.7%, we take the year in which Argentina had its peak emissions, when it represented 0.9% of global emissions, the range would be 369–225 MtCO_{2e}.

PROPOSALS

The proposals for achieving greater climate ambition from the energy sector were elaborated focusing on four key aspects: technological, legal, political-institutional, and social.

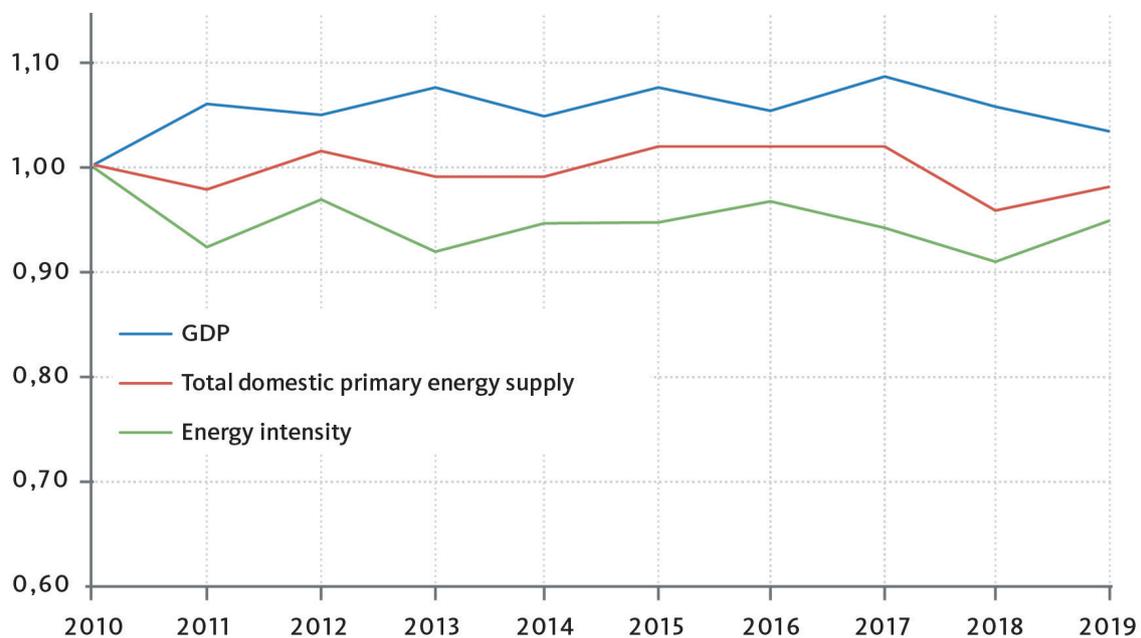
I) Technological Aspects

I.A. Rational Use and Energy Efficiency

The evolution of energy intensity (EI), i.e. the ratio of primary energy consumption to a country's gross domestic product (GDP), reflects the impact that renewable energy policies and RUEE policies have had, and it can be used as a proxy for carbon emissions.

As an example, between 2000 and 2017, in the European Union and the United States, EI decreased linearly (non-cumulative rates) at a 1.47% rate; while in China and India (developing countries, with lower per capita GDP values than Argentina), EI decreased at 1.76% and 2.35% rates, respectively.

As shown in Graph 1, this evolution has not yet occurred in Argentina and, therefore, there is a great potential for energy savings and emission reductions waiting to be realized.



Graph 1. Evolution of GDP, primary energy consumption and energy intensity in Argentina for the period 2010-2019.
Source: prepared by the author.

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In order to meet climate challenges, and considering that a study by Fundación Vida Silvestre Argentina in 2013 estimates that the implementation of RUEE policies for the period 2012-2030 would have spared the investment of USD 35 billion in infrastructure works only in the electricity sector, it is possible to propose a reduction hypothesis of at least 40–55% in its energy intensity by 2050 (with annual reduction targets of 1.5%), although a more in-depth study, accompanied by the appropriate policies, could foresee even greater savings.

To achieve this goal, major policy approaches to energy consumption improvements should be based on the following pillars:

I.A.1. Energy Efficiency. In order to achieve energy efficiency, the following actions stand out:

- a) Promoting more efficient devices which operate based on liquid fuels, natural gas and electricity, gradually increasing their requirements through the progressive implementation of energy efficiency labels, maximum consumption standards and the definition of regulatory instruments that define review deadlines and allow for the homogenization of the regulatory systems in force with respect to this topic.
- b) Prioritizing a strong efficiency policy for industrial electric motors. The savings potential of these devices is the most important in the Argentine electricity sector, in the order of 2100 GWh/year by 2030, and it is virtually unexploited. (FVS, 2013, pp.18–20; see Annex FVSA presentation to NDC Argentina, 2020).
- c) Making promotional mechanisms available, such as credits and other facilities for the acquisition of efficient equipment, voluntary instruments, subsidies for efficient demand (instead of energy supply), determination of goals and associated penalties for non-compliance (depending on user type), among other tools adapted in each case to the sector in question.
- d) Replacing fossil fuel-based consumption for electricity-based consumption, highly increasing final conversion efficiency, and thus, sensitive improvement of final conversion efficiency. Such replacement would be implemented gradually in home heating, water heating and food cooking, and then in other sectors, such as transport and industry.
- e) Designing and planning systems that take into account the environment health and well-being in an integrated manner, in the planning of cities, networks and means of transport, and industrial processes.
- f) Stopping the propagation of natural gas networks. In the North of the country, heating services, which are major consumers of natural gas, are practically unnecessary. We suggest a second stage for the rest of the national territory, and analyzing a policy on the subject matter.
- g) Strengthening electricity transmission and distribution networks and developing smart grids in order to adequately take advantage of electricity production through renewable energies, to implement mechanisms to promote distributed energy and to foster efficient consumption actions that become possible through the articulation with smart grids.
- h) Developing a National HVAC Action Plan, given the weight of gas and electricity consumption both in residential heating, in first place, and residential, commercial and industrial cooling, in the second place. These strategies involve the electrification of HVAC through promotion of heat pumps, increased efficiency of air conditioners and replacement of refrigerant gases, as well as the regulation of construction and urbanization of cities.



i) Improving the habitat sector, by developing stricter building codes and efficiency labeling systems for homes. Promotion of efficient construction techniques and use of insulating materials in roofs and walls, and better doors and windows.

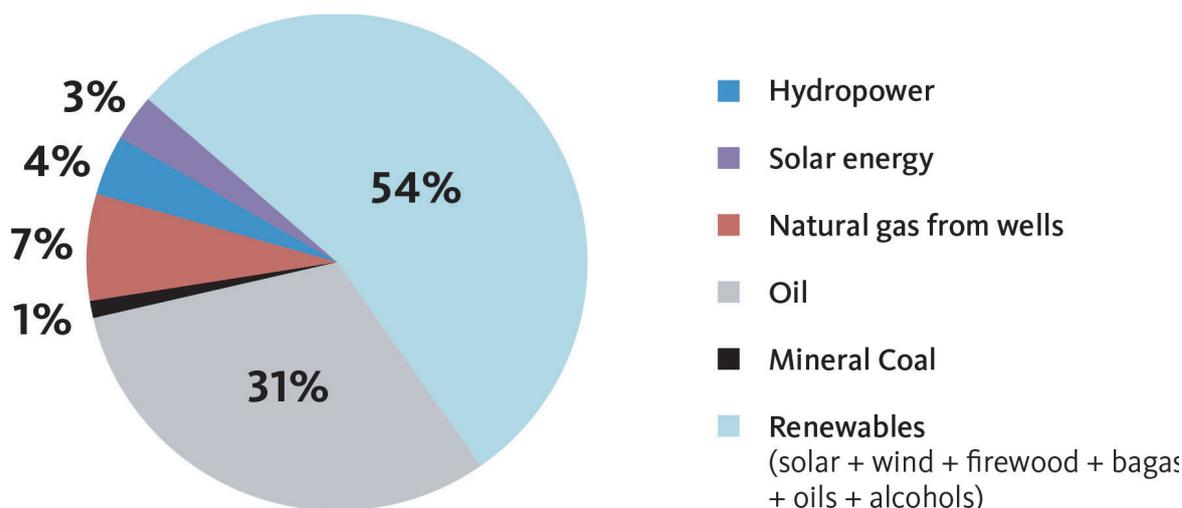
I.A.2. Responsible or Rational Use of Energy. In order to achieve an improvement in behavior, habits and customs, environmental awareness and education, specialized technical and professional training should be promoted. This change should be generated in the educational sector at all levels, as well as in the public sector, and it should be enhanced with campaigns focused on the uses with the greatest savings potential and other ways that can effectively modify human behavior.

I.A.3. Energy Sufficiency. For the purpose of implementing policies to discourage the use of excessive energy, discouraging luxury consumption and the use of excessively large devices and vehicles, among many others.

I.B. Electricity Generation.

According to the Greenhouse Gas Inventory (GGI) of the Argentine Republic, corresponding to the Third BUR (Moreira Muzio, M., et al., 2019), our country emitted 364 MtCO_{2e} in 2016. Of this total, the energy sector was the main GHG emitter to the atmosphere, representing 53%. Electricity generation (33%) and transport (26%) subsectors stand out as the main contributors. In addition, based on the historical series, the evolution of emissions in the energy sector has shown a tendency towards growth.

In terms of total primary energy supply—that is, if all sources prior to their transformation for consumption are to be counted—the country's dependence on fossil fuels amounts to 86%, while renewable sources account for barely 7% (National Energy Information Agency, 2020). This primary energy supply is mostly destined to the transformation centers that then feed the electricity and gas grids, and supply liquid fuels to the consumer sectors (Graph 2).



Graph 2. Domestic supply of primary energy, 2019.
Source: prepared by the author based on the National Energy Balance 2019.

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In a context where the global trend leads the way towards adopting renewable energies and quitting fossil sources for power generation (IEA, 2021a), with a strong call to stop the expansion of all fossil fuel extraction as a necessary condition for the decarbonization of the energy matrix by 2050 (IEA, 2021b), Argentina must face an accelerated substitution for renewable sources in the next two decades. To cope with the transformation of the electricity generation supply, renewable energies should represent at least 66% of electricity generation by 2040, reaching no less than 35% by 2030. This would drastically reduce dependence on fossil fuels and avoid the construction of large hydroelectric works (Tanides, 2020).

In particular, variable renewable energy systems (VRE) (i.e., wind and solar photovoltaic generation) should represent approximately 35% of electricity generation by 2030, including distributed generation, large-scale generation and pumped hydroelectric plants. It should be noted that decentralized and distributed renewable generation contributes to system flexibility and reduces the need for long-distance electricity and gas transportation.

Among the tools for achieving the goal, the following stand out:

- a) implementing the Strategic Environmental Assessment (SEA) of the energy system to plan the emplacement of new plants, avoiding any type of generation that is effectively or potentially harmful to human health and the environment;
- b) establishing goals and promotion mechanisms for the generation of residential and industrial thermal energy from solar sources in order to reach up to 500,000 by 2030, if favorable conditions are created. (CADER proposal for Argentina's NDC 2020);
- c) increasing the integration of electricity systems with the aim of increasing RE penetration in the energy system through new transmission lines and mechanisms that provide flexibility in network management to integrate renewable energies and ensure supply;
- d) implementing an emission pricing scheme based on an emissions limit aligned with the NDC, in a way that extends the current scope of the CO₂ tax to non-targeted hydrocarbons: natural gas, LNG and LPG, with adjustments according to costs;
- e) eliminating incentives for fossil fuel extraction and other non-renewable options;
- f) promoting management of out-of-service infrastructure (refineries, gas pipelines, machinery, etc.) for reuse, recycling or final disposal;
- g) defining policies for promoting innovation in order to deploy renewable energies, focusing on the creation of knowledge and testing and interaction among academia, private and public sectors;
- h) enhancing energy matrix flexibility to promote the incorporation of centralized (pumped) and distributed (e.g. batteries) energy storage through the development of institutional and R&D program representations;
- i) planning taking advantage of the synergy among VRE, storage and energy efficiency.

I.C. Transport

The transport sector is a key sector to work on, in the transition to carbon neutrality in the country.

In the case of renewable source-based transport, Argentina is currently considering the production of biofuels such as biodiesel, biogas and bioethanol derived from organic biomass from agricultural, agro-industrial or organic waste raw materials. The use of biofuels to replace fossil fuels has a positive environmental impact due to GHG reduction, but it also fosters the expansion of the agricultural frontier, in detriment of natural ecosystems, and competes with food production.

Electric mobility, with an enormous potential and the main protagonist by 2050, should lead the sector, followed by biofuels and hydrogen, technologies that will have to define their percentage share in relation to their technological evolution and other socio-environmental parameters.

Among the tools for achieving the goal, the following stand out:

- a) optimizing the current legal regimen by developing stable and long-term public policies to foster biofuel production at three levels: local, provincial and national, accompanied by economic incentives and tax measures;
- b) promoting research and investment in biofuels to migrate to the production of second and third generation biofuels, collaborating in the recoverability of materials that are otherwise considered waste, by means of biorefineries and the promotion of circular economy;
- c) promoting pedestrian, bicycle and public transportation, and freight transportation by rail and river;
- d) increasing the efficiency in truck transport and light and medium-heavy vehicles, successively replacing liquid fuels with natural gas (freed from residential consumption) and, eventually, natural gas with electricity, in addition to advancing towards the electrification of public transportation, in the first term, and of private vehicles and freight mobility, in the second term;
- e) introducing green H₂ and setting as a target the mastery of key technologies in electrolyzers and development of pilot plants in H₂ and derivatives, NH₃ and synthesis hydrocarbons by 2030, by developing pilot plants of these technologies and public-private agreements to carry out the roadmap.

II) Legal Aspects

In order to develop a low-carbon strategy within a sustainable development framework, a regulatory framework should be enforced promoting such strategy, facilitating the necessary actions and hindering or preventing otherwise.

By virtue of the goal set by Law No. 27,191 (2015), amending Law No. 26,190 (2007) on “National Promotion Regime for Production and Use of Renewable Sources of Electric Power”, it is essential to start shaping a continuity plan for the renewable promotion regime. Therefore, we propose: a) complying with the 20% goal set out by the Law by 2025; b) increasing the target to 35% by 2035, and 65% by 2040, aligning with carbon neutrality by 2050; c) increasing integration of the electricity system through new transmission lines and mechanisms that provide flexibility to grid management to integrate renewable energies and ensure supply; d) implementing promotional benefits for RE in order to increase the production of electric power from renewable sources.

On the other hand, under Law No. 27,424 (2017) on “Promotion Regime for Distributed Generation of Renewable Energy Integrated in the Public Electricity Grid”, users may generate their own energy obtained from low-power renewable energy facilities, and inject the surplus produced into the distribution grid. In 2018, under Regulatory Decree 986/18, a new stage began by launching this new model and moving towards the final implementation of the energy program. The provincial adherence to the national distributed generation framework is crucial², and would take advantage of the measures and benefits of its regulation in a virtuous way. In order for this distributed generation regime to be truly effective, the following is proposed: a) implementation of the law in order to reach at least 5000 MW installations with solar photovoltaic sources; b) implementation of FODIS and FANSIGED funds, in order to promote the development of local industry; c) raising awareness among the population about responsible electricity consumption; d) promotion for the acquisition of efficient equipment.

Regarding the biofuels regime, Law No. 26,093 (2006) on “Regulation and Promotion for the Sustainable Production and Use of Biofuels”, as amended by Resolution 37/2016, set forth the obligation to integrate a minimum addition of 10% of biodiesel and 12% of bioethanol in fossil fuels. In view of the expiration of such obligation last May 12, 2021, Decree 322/2021 set forth the validity of the Regime for Promotion for Sustainable Production and Use of Biofuels until July 12, 2021 or until a new regulatory framework for biofuels comes into force, whichever occurs first. In this regard, the new regime cannot stipulate a reduction of the current addition percentages, as it would imply a clear violation of the non-regression principle, according to which the revision of environmental regulations may not imply a regression with respect to the levels of protection previously achieved. Therefore, the next legal regime for biofuels should contemplate: a) addition percentages equal to or higher than those in force; b) economic incentives and tax measures for promotion; c) research and investment in the production of second and third generation biofuels; d) development of bioenergies with a broader vision, not only taking into account bioethanol and biodiesel, but also the incorporation of biogas and other possible biofuels; e) alternative production of raw materials, not only those of agricultural origin but also those that can be produced from other types of waste or biomass.

In 2019, by passing the Law on Minimum Budgets for Adaptation and Mitigation to Global Climate Change, energy regulation became relevant, although it is still necessary to achieve its effective implementation.

According to this approach, and in order to promote the development of greenhouse gas mitigation and reduction strategies, a legal framework is required regarding energy efficiency that institutionalizes energy intensity reduction targets and assigns specific goals to each sector with a strong R&D component. Similarly, with regard to transport, a legal framework is required to promote electric mobility.

On the other hand, and in order to achieve adaptation and mitigation strategies, the need for a legal framework on a fair transition is emphasized. Thus, an energy transition would be achieved, contemplating, among other factors, workers’ employability in vulnerable situations and at risk of exclusion, training for new jobs in the energy system, institutional modernization and facility reconversion.

2. At present, 14 jurisdictions (Autonomous City of Buenos Aires, Catamarca, Chaco, Chubut, Córdoba, Corrientes, La Pampa, La Rioja, Mendoza, Misiones, Río Negro, San Juan, Tierra del Fuego, and Tucumán) have adhered to the law; 19 provinces (Buenos Aires, Catamarca, Chaco, Córdoba, Corrientes, Entre Ríos, Jujuy, La Pampa, La Rioja, Mendoza, Misiones, Neuquén, Salta, San Juan, San Luis, Santa Fe, Río Negro, Tierra del Fuego, and Tucumán) have their own regulatory frameworks and/or regulations in addition to this adherence, and the remaining 3 (Formosa, Santa Cruz, and Santiago del Estero) do not have any regulatory framework yet.

III) Political & Institutional Aspects

Institutional and political aspects are one of the most important barriers to progress towards a more sustainable energy system, both in terms of Rational Use and Energy Efficiency (RUEE), electric power generation from Renewable Energies, and biofuel production.

LEGAL PROPOSALS:

- In order to achieve a continuity plan for the renewable energy promotion regime established by Law No. 27,191, we propose: a) to meet the 20% target by 2025; b) to increase the ambition to 35% by 2035, and 65% by 2040; c) to implement the promotional benefits for RE.
- In order for the distributed generation regime of Law No. 27,424 to be effective, it should contemplate: a) implementing the law; b) implementing the FODIS and FANSIGED funds;
- raising awareness of responsible electricity consumption; d) promoting the acquisition of efficient equipment.
- With respect to biofuels, the next regime should consider: a) addition percentages equal to or higher than those in force; b) economic incentives and tax measures for promotion; c) production of second and third generation biofuels; d) incorporation of biogas and other possible biofuels; e) production of alternative raw materials, both of agricultural origin and from other types of waste or biomass.
- In accordance with the Law on Minimum Budgets for Adaptation and Mitigation to Global Climate Change, the proposal is to regulate energy efficiency, electric mobility and fair transition.

Therefore, the proposal is the following:

- a) To institutionalize an agreement with all energy system stakeholders (national and provincial governments, corporations, trade unions, academia and NGOs), with clear time frames and goals to achieve emission reduction targets by 2050. Both the stakeholders involved in the generation, transportation and distribution of energy, and consumers and cross-cutting sectors, such as construction, transport, manufacturing, etc. should be included.
- b) To provide RUEE and renewable energies at the national and provincial levels with a political and institutional hierarchy, with appropriate structures for their promotion, focusing on the need for innovation in energy accumulation, hydrogen treatment and the development of other new technologies.
- c) To establish policies promoting innovation focusing on knowledge creation and testing and interaction among academia, private and public sectors.

IV) Social Aspects

A low-carbon-emission strategy, with essentially sustainable development, must consider the situation of the productive sectors that will be affected, and focus on labor projections and the employability of the renewable sector. It is also essential to take into account the role of non-state stakeholders when designing the path to achieve carbon neutrality objectives.

On the other hand, the new NDC, in addition to improving the scope in terms of mitigation, incorporates an adaptation goal to be reached by 2030—to reduce territorial, socioeconomic and environmental vulnerabilities and to strengthen resilience in the different sectors.

In this context, the following measures are proposed:

- a) to actively work on training for new jobs in the energy system, transport and construction, among others, with a more sustainable vision and oriented to the transformation presented by our energy matrix;
- b) to train technicians, professionals and other workers so that they can undertake new activities and tasks;
- c) to grant benefits for the transformation of activities directly linked to fossil fuel sources, especially by means of promoting migration of current employees to other economic activities with a lesser impact on the environment;
- d) to establish promotional mechanisms, such as credits and other facilities for the acquisition of efficient equipment;
- e) to work jointly with trade unions, so that they play an active role in channeling demands and necessary changes;
- f) to carry out a participatory process with civil society in order to build a shared vision of the energy transition.

Work proposals from non-state stakeholders

(provincial and municipal governments, private companies and other institutions).

We need to take into account the broad possibilities offered by collaborative work with non-state stakeholders, given their potential for transformation at the territorial level. Among these proposals, the following stand out:

Private Sector:

- Adequacy of their organizational structures to reflect the topics and objectives of the transitions to be developed.
- Promoting and leading actions within its production scope and/or renewable energy purchase and implementation of energy efficient use, with an aim to motivate suppliers and marketers to do the same.
- Leading corporate goal determination to reduce consumption through efficiency, consumption electrification and decarbonization in general.

Provincial and municipal governments:

- Facilitating, by means of tax mechanisms, the decarbonization of corporations and the transport sector.
- Facilitating the use of bicycles and public transport or some other form of consumption reduction, in institutions and corporations.

Civil associations, foundations and other NGOs:

- Working on the dissemination, socialization and awareness of issues related to the energy transition at a general level.
- Promoting instances of trust and dialog among the different stakeholders with the aim of working together.
- Working at the territorial level to disseminate good practices with respect to energy care and rational use.
- Working with vulnerable populations regarding access to clean and affordable energy.
- Promoting instances of joint participation and collaboration with governments at the three levels for the creation of public policies.

Long-Term Strategy (LTS)

The LTS requires a generalized and consensual vision of the economic, social and environmental model for the year 2050, which results from a construction process involving all stakeholders and sectors of society and which will result in the necessary regulatory instruments leading to a fair and comprehensive transition for all sectors.

The long-term strategy should include a plan containing:

- a target of at least a 40-55% reduction in Argentina's primary energy intensity by 2050;
- a plan to stop the promotion of fossil fuels and the construction of associated infrastructure (e.g., natural gas networks) until their future role and trajectory by 2050 is clarified;
- the future participation and trajectories of renewable energy sources of electricity, biofuels and hydrogen, and the redefinition of current law targets, and the adoption of the necessary new laws;
- UREE policies, which decide upon:
 - policies to increase efficiency in all sectors of consumption and energy sources;
 - sources to be promoted, and the transitions that will need to be fostered, for the provision of final energy to the consumption sectors and, within them, to end use; in addition, the options of increased electrification, hydrogen use and biofuels must be taken into account;
- the development of a legal framework that promotes the energy transition, and which considers:
 - the initiation of a dialog processes between the most relevant energy consumption sectors, including the most conflicting stakeholders (e.g. transport or construction);
 - the identification of the needs of the stakeholders affected by the transition process and plan policies accordingly, contemplating actions to facilitate transitions, minimizing social, environmental and economic damages.

CONCLUSION

Taking into account climate objectives established by the Paris Agreement, Argentina's new NDC can be described as encouraging but insufficient.

However, it should be noted that it sets a goal that requires changing the dynamics of the country's economy, and preparing the production system for the accelerated reduction of emissions as of 2030. Therefore, in this second NDC, it is crucial to change the emission trend, since it must stop growing and initiate a reduction dynamics.

From a long-term point of view, if there is to be a decarbonized and efficient energy consumption matrix by 2050, it will have to be based mostly on electric energy, giving way to a strong role for renewable energy sources.

Finally, it is essential to be aware that the energy transition process is not only a technological substitution, but also a transition that must be technically feasible, economically profitable, environmentally beneficial, and socially fair, for which the political mechanisms above must be provided in a specific and effective manner.

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This document is part of the Argentine Climate Action Alliance (AAC) framework, an inter-institutional alliance formed by non-state actors (private sector, academia, civil society), provinces and municipalities, committed to climate action and sustainable development. We work collaboratively to increase climate ambition, motivate by example and articulate with the national public sector and society in the promotion of climate action in Argentina.

The views expressed in this study are those of the author and do not necessarily reflect the views of the AAC. The opinions expressed in this document are the sole responsibility of the author and may not coincide with those of the aforementioned network.

The signatories listed below adhere to the proposals and recommendations detailed in the document: Asociación Sustentar, Banco Galicia, Banco Santander, Cámara Argentina de Energías Renovables (CADER), Empresas B, FLACSO Argentina, Fundación Avina, Fundación Nueva Generación Argentina (FNGA), Fundación Vida Silvestre Argentina, Municipalidad de Vicente Lopez, Natura Argentina, Quilmes, Red Argentina de Municipios frente al Cambio Climático (RAMCC), Universidad del Salvador.



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AUTHORS

Carlos Tanides, Fundación Vida Silvestre Argentina
Daniela Gomel, Fundación Vida Silvestre Argentina
María Florencia Torres Corpos, Fundación Nueva Generación Argentina
Marlene Diedrich, External Consultant - FNGA
Roque Pedace, CADER
Marcelo Álvarez, CADER

REVIEWERS

Paula Bianchi - External Consultant,
Fundación Vida Silvestre Argentina
Marlene Diedrich, External Consultant, FNGA

GENERAL COORDINATION

Paula Bianchi - External Consultant,
Fundación Vida Silvestre Argentina
Leonel Roget, Fundación Vida Silvestre Argentina
Carlos Tanides, Fundación Vida Silvestre Argentina

PROOFREADING

Valeria Verona
valeriaverona.com

DESIGN AND LAYOUT

Valentina Manochi
manochivalen@gmail.com