

Department of Business and Management

Course of International Finance

FINANCING THE TRANSITION TO RENEWABLE  
ENERGY IN DEVELOPING COUNTRIES:

Is the application of incentive policies enough to  
mitigate investment barriers?

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## Introduction and methodology

Renewable energy is a critical part of reducing global carbon emissions and fighting the global warming crisis which is present in the world nowadays. The transition from non-renewable sources of electricity like coal, natural gas and oil, has been a priority for all nations. Today, non-renewables still supply a vast majority of the world's electricity demand, but trends are changing. Scaling up renewables gives the world the opportunity to meet energy needs to support economic development and growth and at the same time pursue social, environmental and climate objectives. The energy transition has been always led by developed countries, however, since 2015 developing countries are leading in global investments in renewables. Although developing countries have been able to progress in the transition to renewables and technology costs have been falling progressively, underlying market barriers and a perception of high risk still constrain the development and financing of renewable energy projects in these countries. Indeed, the energy transition requires a significant increase in renewable energy investment compared to current levels and, since public resources are limited, most of the new investments in renewables have to come from the private sector. Hence, scaling up renewable energy investments will depend on the ability of policy makers and public finance institutions to address different investment constraints and crowd in private finance.

This research attempts to study the influence of policy instruments on the renewable sector and specifically, if they are effective enough to mitigate investment barriers and open the capital market for financing the transition from non-renewables to renewables in developing countries. This study also aims to identify the key factors affecting the private investor's decision to enter the renewable energy market determining the effectiveness of incentive policies for attracting private investment. The focus is on defining if the incentive policies depend on something else to be efficient, or if they can act independently to create the conditions to open-up markets for investment.

The methodologies used for this research were various in order to complete a solid quantitative and qualitative evaluation. For the qualitative analysis, in addition to the analysis made on publications, articles and data, two relevant interviews had been made in order to obtain "first-hand" data. The first interview was made to the Head of Department of "Dirección Nacional de Energía" from Uruguay, Virginia Echinope, who provided information about the regulatory framework of Uruguay, and how they achieved this extraordinary development in the last decade. The second interview was made to Marcelo Álvarez, president of Cámara Argentina de Energías Renovables (CADER), who gave an insight picture and supplied data about Argentina's history in the development of renewable energy, regulatory framework, and the main limitations for financing projects they have right now. For the quantitative approach, a business model of a possible investment in a windfarm for both countries has been made in order to compare the returns. The final goal was to understand if the spread in return was backed up by a similar spread in the country perception, to explain why the two Countries performed differently. Specifically, the main economic indicators of both nations have been

examined as well as the Indicator of Economic Freedom. Finally, a country risk analysis based on the Argentinian and Uruguayan sovereign bonds has been produced in order to provide further information about the country's economic status and why this may affect the implementation of incentive policies for the development of the renewable energy sector.

The first chapter of this research is an introduction to the renewable energy environment, defining the importance of it in today's reality. It shows a quick look at the global landscape of renewable energy finance, which turns into an explanation of the main barriers when investing in this type of projects specifically in developing countries. Furthermore, it analyzes the different renewable energy incentive policies and economic mechanisms applied particularly in developing countries of Latin America in order to unlock investment.

The second chapter focuses on the Argentinian case, which is the first selected developing countries to analyze. This section goes through an introduction of the main characteristics of the country, the development of the renewable energy sector, the recent incentive policies implemented and the present situation of the nation.

The third chapter consists of a deep analysis of the Uruguayan case, the second selected developing country to examine. These two countries were chosen because they are neighbor developing countries with similar natural resources and reflect high potential for the development of renewable energy technologies. It has been evaluated to what level incentive policies enable their capacity of evolution and the potential they have of attracting capitals destined for the development of their renewable energy sources. The findings are quite interesting as we can see how two countries with similar incentive schemes can react and develop differently. Uruguay, in less than 10 years, has reduced its carbon footprint without government subsidies or higher consumer costs, reaching 98% of its consumed electricity from renewable sources during 2019. On the opposite, in Argentina, the share of clean energy in the total generation is below 10% and they were not able to reach their goal during the last decade. These results shall be also referred to a different size of the two energy markets and a different landscape, but they are substantially different. Therefore, basing on these cases, we can foresee that there is more than just applying incentive policies to be successful in financing the transition to renewables.

The fourth chapter is essential to the scope of the thesis as it consists in an extensive comparison between Argentina and Uruguay with a qualitative and quantitative approach. Several variables are evaluated such as incentive policies schemes, economic stability, political plans and guidelines, infrastructure, government subsidies, borrowing costs, capital controls, exchange-rate risk, GDP, return on investment and country risk, between others. The comparison leads to the design of recommendations for Argentina to strengthen the renewable energy policy.

Throughout the study the evidence shows develop policies and instruments might not be enough without a conducive framework for that policy to perform efficiently. The framework includes macroeconomic, political and institutional aspects which must be taken into consideration. These contextual

conditions are the ones that make Argentina short of private investment to develop renewable energy projects and ultimately, is not reaching the targets proposed. Therefore, we can establish as a response to the main question, that incentive policies randomly implemented are not enough as the context in which policies are executed determines how well they perform.

This study pays special attention to the contextual conditions in which policies are designed and finding that it is precisely these conditions that constitute the main reason why renewable energy have such a high performance in Uruguay and such a low degree of penetration in Argentina. Therefore, the analysis suggests that there is an opportunity for stakeholders to engage more in order to encourage renewable energy investments.

# 1. The Renewable Energy Market: Overview

## 1.1. What is Renewable Energy?

Renewable power is booming as the developing technology and innovation decreases costs and it builds a clear path for a clean energy future. Therefore, renewable energy has been continuously increasing its integration into the national electricity grid of almost all nations worldwide. Renewable energy is the energy produced from sources that do not deplete or cannot be replenished within a human's lifetime, which contrasts with non-renewable sources such as fossil fuels.<sup>1</sup>

Renewable energies are called “clean energies” or “green energies” as they come from nature and are considered inexhaustible. Because of this, they should contribute to reduce the dependence on external supplies, reduce the cost to supply energy to each nation, as well as support the development of innovation and new technologies, and create new jobs. As we can see, and it will be analyzed in this thesis, the advantages of using renewable energies are wide, however, together with low environmental impact they produce given that in addition to not using finite resources, they do not generate pollutants. On the opposite, fossil fuels are limited and non-renewable in the human timescale. The most known examples of these resources are coal, oil or natural gas.

There are five different kinds of renewable energy sources which are taking the lead:

- Solar
- Wind
- Hydroelectric
- Geothermal
- Biomass

The development of the renewable energy market has been stronger in the last decade than ever before. Indeed, the renewables share was 8.6% in the global energy mix in 2010 and nowadays it represents one third of the world's energy capacity, according to the International Renewable Energy Agency (IRENA).<sup>2</sup> Renewable energy sources, such as solar and wind, are becoming more efficient and accessible every day. As a result, the possibilities for people and nations to incorporate and adopt this kind of technology into their lifestyles increased. Currently, the generation capacity associated with renewable energies has been surpassing other energy sources such as natural gas.<sup>3</sup>

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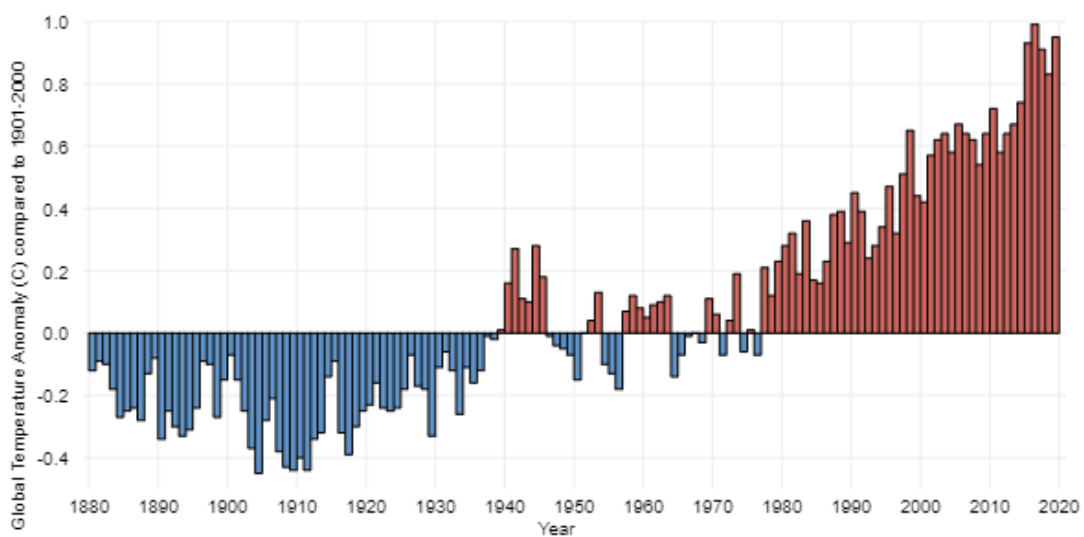
<sup>1</sup> Frewin, Chris. Student Energy, accessed March 3<sup>rd</sup>, 2020, <https://www.studentenergy.org/topics/renewable-energy>.

<sup>2</sup> Comunicado de Prensa, “Renovables representan hoy una tercera parte de la capacidad energética global”, IRENA, 2018, [https://www.irena.org/-/media/Files/IRENA/Agency/Press-Release/2019/Apr/IRENA\\_Capacity-Growth-2018\\_Press-Release-Spanish.pdf?la=en&hash=E47EA2EFB7D1049EECDCC402F4FD346EDADB00DA](https://www.irena.org/-/media/Files/IRENA/Agency/Press-Release/2019/Apr/IRENA_Capacity-Growth-2018_Press-Release-Spanish.pdf?la=en&hash=E47EA2EFB7D1049EECDCC402F4FD346EDADB00DA).

<sup>3</sup> Páez, Aquiles. “Para el 2020: Las Energías Renovables serán el 26% de la electricidad mundial”, Revista Digital, October 14<sup>th</sup>, 2015, <https://revistadigital.inesem.es/gestion-integrada/para-el-2020-las-energias-renovables-seran-el-26-de-la-electricidad-mundial/>.

## 1.2. Sustainable Development

It is commonly recognized that the unmeasured use of fossil fuels throughout the last decades has positioned the world in an environmental crisis. In 2019, the average temperature across the globe surface was 0.95°C above the 20<sup>th</sup> century average of 13.9°C, making it the second-warmest year on record. Moreover, the global annual temperature has increased at an average rate of 0.07°C per decade since 1880 and at an average of 0.18°C (the double) since 1981. The five warmest years between the years 1880–2019 have all occurred since 2015, while nine of the ten warmest years have occurred since 2005. All this extra heat is pushing regional and seasonal temperature extremes, reducing snow cover and sea ice, increasing heavy rainfall, and changing habitats for plants and animals <sup>4</sup>



**Chart 1.** History of global surface temperature since 1880. Source: R. Lindsey and L. Dahlman, Climate Change: Global Temperature, 2020. <https://www.climate.gov/news-features/understanding-climate/climate-change-global-temperature>

In face to this environmental crisis, the issue was addressed in many international agreements, for instance by “The 2030 Agenda for Sustainable Development”, adopted by all United Nations Member States in 2015. In this Agenda 17 specific goals are detailed, which tackle the global challenges we face, involving poverty, inequality, climate change, environmental degradation, peace and justice. The “Sustainable Development Goals” are the proposal to achieve a more sustainable future and they are all interconnected, going from water, oceans, energy, climate, urbanization, transport, and technology.<sup>5</sup>

The 7<sup>th</sup> goal, “Affordable and Clean Energy”, is the one established to address the urgency of climate change. As we explained in the previous point, the existing dependency on fossil fuels it is not sustainable in

<sup>4</sup> R. Lindsey and L. Dahlman, Climate Change: Global Temperature, 2020, <https://www.climate.gov/news-features/understanding-climate/climate-change-global-temperature>

<sup>5</sup> “Sustainable Development Goals”, United Nations. Accessed March 4<sup>th</sup>, 2020, <https://sustainabledevelopment.un.org/?menu=1300>.



the long-run and it is quite dangerous and damaging for the planet. Therefore, this goal is built upon the premise that we must change the way we produce and consume energy. Indeed, energy reports around the 60% of total global greenhouse emissions, meaning that energy is the first contributor to climate change. It is vital to create a sustainable development approach for the future, and this starts by ensuring access to affordable and reliable energy for every nation. However, until today, 13% of the global population still lacks access to modern electricity, which shows that a lot of work is still to be done.

The “Affordable and Clean Energy” objective from the UN agenda focuses on providing universal access to energy and increase the production and consumption of renewable energy sources in order to fight climate change. Thanks to technological and financial maturity, renewable energy solutions are becoming cheaper, more reliable and efficient every day. Hence, introducing them to the national grids of every country is crucial to fight the environmental crisis. To accomplish this, the main goal has diverse targets to confront by 2030:

- Ensure universal access to affordable, reliable and modern energy services.
- Increase substantially the share of renewable energy in the global energy mix.
- Double the global rate of improvement in energy efficiency.
- Enhance international cooperation to facilitate access to clean energy research and technology, including renewable energy, energy efficiency and advanced and cleaner fossil-fuel technology, and promote investment in energy infrastructure and clean energy technology.
- Expand infrastructure and technology upgrade for supplying modern and sustainable energy services in developing countries, in particular least developed countries, small island developing States, and land-locked developing countries, in accordance with their respective programmes of support.

As said before, the result of the effort from all countries, developed and developing, have been mostly seen in the last decade, reaching a one third generation of the total energy capacity from renewables. Nevertheless, there is still a long way to solve the challenge as there is still an immense need to decrease the use of fossil fuels, which even now constitute the major source in the energy generation and consumption. More progress needs to be done in the integration of renewables in the industries and final consumers, in the incentive policies generated by nations and in unlocking public and private investment flows for this cause.<sup>6</sup> This is explained clearly by the General Director of IRENA, Adnan Z. Amin., who said that “The deployment

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<sup>6</sup> “Sustainable Development Goals”, United Nations. Accessed March 4<sup>th</sup>, 2020, <https://www.un.org/sustainabledevelopment/energy/>

of renewable energy must grow even faster to ensure that we can achieve global climate goals and the Sustainable Development Goals. Countries that take full advantage of their renewable energy potential will benefit from a series of socio-economic benefits, in addition to decarbonizing their economies."<sup>7</sup> The possible earned benefits from transitioning to renewables, which were already mentioned in the last point, are a major interest for many countries, mainly the developing ones. This framework, targets and gains certainly put pressure on nations to achieve the shift from fossil fuels to renewable energies.

### **1.3. Global landscape of RE Finance**

In the decade from 2010 to 2019 an amount of 2.6 trillion dollars have been invested in renewable energy projects. The sources which attracted most of the investment were solar with 1.3 trillion and wind with 1 trillion. Also, in this decade the costs of renewables have decrease substantially, driven by economies of scale in the manufacturing process, aggressive competition along the stakeholders and low cost of financing the projects. These factors were even more encouraged by the implementation of auctions in several countries. For these reasons renewable energy is nowadays the most cost-efficient source of energy in most countries around the world.<sup>8</sup>

Moreover, during this last decade renewable energy capacity has expanded considerably due to the high amount of investment made on these projects. It is important to highlight that the level of investment is strictly correlated to the implementation of supporting policies. By this fact we can assume that policies encourage investment decision on clean energy projects.

Regarding the financing of the projects, 90% of the green energy investment of the world comes from private investors. However, public investment is a crucial part of encouraging the financing of renewables, as it drives the incentive policies design, it covers the project risk and helps create a proper credibility framework for the private sector. Furthermore, the most popular trend worldwide is to use project finance in renewable energy investments. It is used a mix of commercial debt and equity were the debt-to-equity ratio floats around 60% and 70%. Contrarily, grants and concessional finance plays a minor role in financing the transition to renewables worldwide.

As already mentioned, incentive policies push many renewable energy investment decisions, and this is the reason why investment tendencies differ from country to country. Nevertheless, a trend that keeps growing in this last decade is that investment is more spread across the globe and not concentrated on few developed countries. Indeed, there is a predisposition to see developing countries taking the lead. This is the case of China, which is the leading country by far in terms of the amount invested in renewable energy projects

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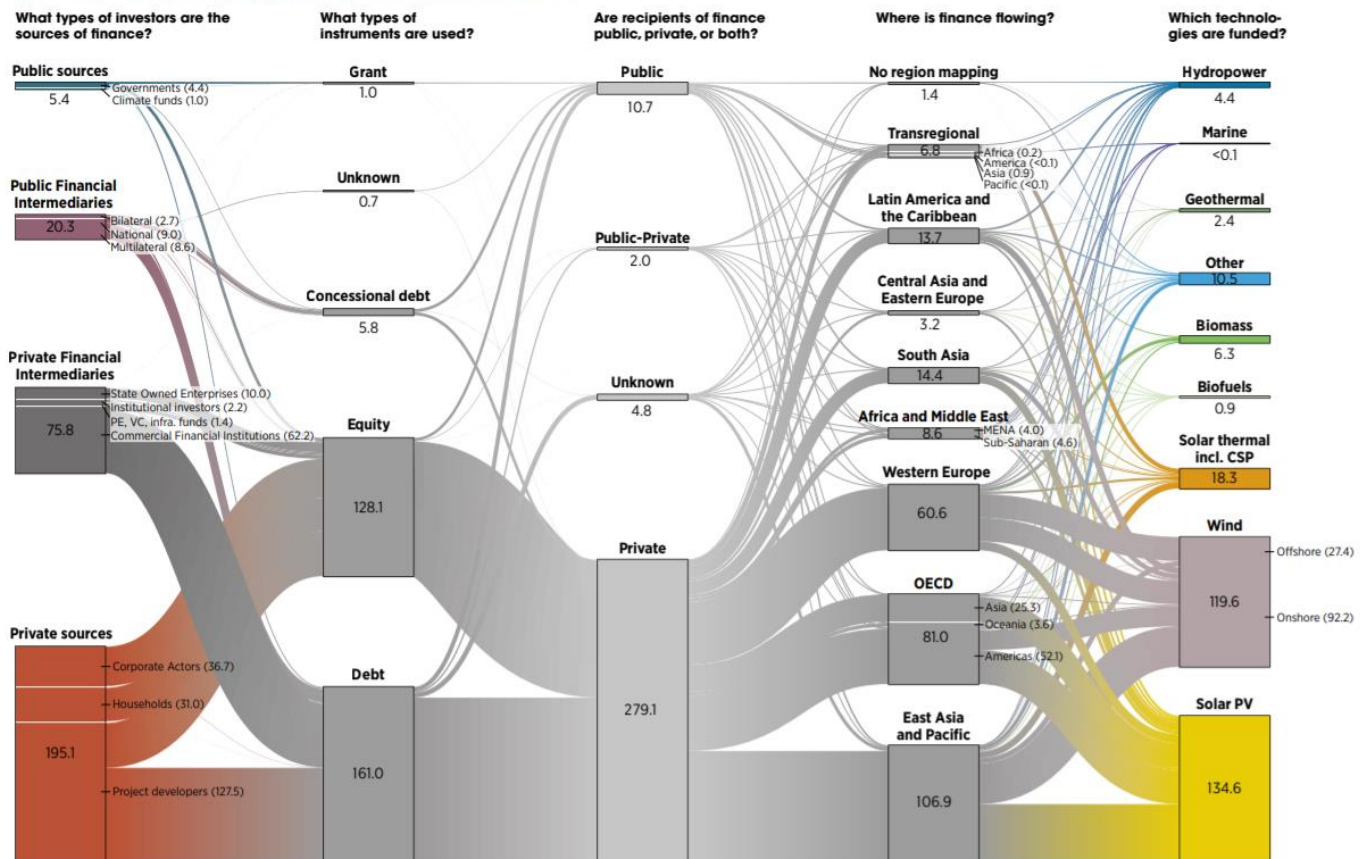
<sup>7</sup> "La energía renovable representa ya un tercio de la capacidad energética mundial, según IRENA", UNFCCC Site, April 4<sup>th</sup>, 2019, <https://unfccc.int/es/news/la-energia-renovable-representa-ya-un-tercio-de-la-capacidad-energetica-mundial-segun-irena>

<sup>8</sup> "GLOBAL TRENDS IN RENEWABLE ENERGY INVESTMENT 2019", Frankfurt School-UNEP Centre/BNEF, 2019. <https://wedocs.unep.org/bitstream/handle/20.500.11822/29752/GTR2019.pdf>

as it dedicated 758 billion dollars in the last ten years.

In fact, the East Asia-Pacific region can be considered the principal target for the flow of financing, growing from 64 billion dollars in 2013 to 114 billion dollars in 2015. Following is Eastern Europe and rapidly increasing is Latin America. The Sankey diagram below exhibits how global renewable energy finance flows, showing the sources of energy, the instruments, portions of public and private investment, and regions involved.<sup>9</sup>

**GLOBAL LANDSCAPE OF RENEWABLE ENERGY FINANCE 2015/2016**



**Chart 2.** Global landscape of Renewable Energy Finance 2015/2016. Source: “Global landscape of Renewable Energy Finance”, IRENA, 2018.

### 1.4. Barriers for Investments in RE in Developing Countries

As indicated before, the global investment for green energy sources has been increasing quickly and steadily through the last decade. In fact, in 2015 the level of investment in renewable energy in developing countries exceeded the level of investment from developed countries. Undoubtedly, this happened because of the implementation of new incentive policies in recent years by developing regions. Indeed, in this year, countries like China, India, Brazil, South Africa, Mexico, Chile, Morocco, Uruguay, the Philippines, Pakistan

<sup>9</sup> “Global landscape of Renewable Energy Finance”, IRENA, 2018. [https://www.irena.org/-/media/Files/IRENA/Agency/Publication/2018/Jan/IRENA\\_Global\\_landscape\\_RE\\_finance\\_2018.pdf](https://www.irena.org/-/media/Files/IRENA/Agency/Publication/2018/Jan/IRENA_Global_landscape_RE_finance_2018.pdf)

and Honduras, invested approximately 156 billion dollars in clean energy investments, however, developed countries invested only 130 billion dollars.<sup>10</sup> Nevertheless, investment barriers still exist specifically for developing countries and they strive to find financing from the private sector. In this section, it is analyzed which are the major limitations for the flow of investment to these countries.

#### *1.4.1. Technological Barriers*

Technology is known as one of the principal barriers to the transition to renewables. The technological barriers involve limited availability of infrastructure, inefficient knowledge of operations and maintenance, insufficient research and development initiatives, and technical complexities like energy storage and unavailability of standards. This barrier is mostly seen in developing countries due to lack of infrastructure and trained staff.

In developing countries there is restricted availability of advanced technologies or if it is available, the obtaining cost is extremely high. The lack of physical facilities as a developed transmission grid is one of the biggest challenges for developing countries, since most of the current grids are not yet suitable for integrating renewable energy projects. As most of the equipment must be imported to developing countries, the manufacture of renewable energy turns out to be costly and unaffordable for them.

Another aspect of the technological barrier is the inadequate servicing and maintenance of equipment. It exists a lack of knowledge in terms of renewable energy operation and maintenance, therefore efficiency is difficult to be attained. This makes the renewable energy choice even less reliable. Many consumers decide to use fossil fuels because they are reliable and easily obtainable. Apart from this, most governments are reluctant to invest in renewable energy because it is in its development stage and investing money in R&D for this is seen as very risky.

#### *1.4.2. Political and Institutional Barriers*

Drivers like lack of national policies, bureaucratic and administrative impediments, ineffective incentives, impractical government targets, and lack of standards and certifications are a limitation for the transition to renewables. To develop a solid renewable energy marketplace, it is vital to build clear policies which enable a stable investment environment to boost the interest of investors. There are important and common issues as the unstable energy policy, deficient confidence in Renewable energy target (RET), lack of policies to incorporate RET and poorly prepared governmental agencies act as obstacles to the implementation

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<sup>10</sup> Donastorg, Renukappa, Suresh, "Financing Renewable Energy Projects in Developing Countries: A Critical Review", IOP Conference Series: Earth and Environmental Science, 2017.  
[https://www.researchgate.net/publication/319561866\\_Financing\\_Renewable\\_Energy\\_Projects\\_in\\_Developing\\_Countries\\_A\\_Critical\\_Review](https://www.researchgate.net/publication/319561866_Financing_Renewable_Energy_Projects_in_Developing_Countries_A_Critical_Review)

of renewable energy projects.

Furthermore, private sector participation in renewable energy projects in developing countries is impeded by administrative hurdles, delays in the authorization of private sector projects and no incentives to remove tax from the equipment necessary for the development of these projects. Consequently, many developing countries are stuck in advancing with the transition to renewables because RE projects are large-scale and involve large amounts of capital to be implemented and the governments fail to apply regulatory incentives that attract the private sector investment.

#### *1.4.3. Financial and Economic Barriers*

Considerations inducing economic and financial barriers are commonly recognized as high initial capital, absence of financial institutes, scarcity of investors, competition from fossil fuels, and fewer subsidies compared to non-renewable energy.

First, fossil fuels are still the major supplier of energy in the world. This is mainly because is already relevant in the energy mix and it seems a cheaper option for some countries and in some cases. Indeed, data taken from the World Bank demonstrates that in 2015 a 78,76% of the energy consumption still was generated by fossil fuels.<sup>11</sup> Moreover, the availability of incentives and subsidies represent a key element to push the energy transition towards renewables. It is commonly recognized that, the amount of government subsidies offered to traditional energy sources, directly or indirectly, is much higher than the subsidies given to renewable energy. Not only this keeps the renewable energy with a disadvantage but also the fact that the initial capital cost is also higher for renewables than for conventional sources and the energy transition might take longer. Some investors usually want to invest in a project with low initial investment and low payback period. Furthermore, the economic status of a country defines the level of renewable energy implementation. If the country is not able to invest in R&D, technology, infrastructure and qualified workforce, it might be less keen to develop a proper grid able to support renewable energy projects. Also, the lack of financing institutions to offer low interest rate credit to buy new technologies and equipment represent an important obstacle. Indeed, most countries encounter problems in securing financing for RE projects at low rates like the ones offered for fossil fuel energy projects, which again, prevent investors from participating in renewable energy projects.

#### *1.4.4. Social Barriers*

The transition from fossil fuel to renewable energy has faced public resistance and opposition due to a

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<sup>11</sup> “Fossil fuel energy consumption (% of total)”, IEA Statistics © OECD/IEA, The World Bank, 2014.  
<https://data.worldbank.org/indicator/EG.USE.COMM.FO.ZS>

lack of knowledge of the benefits of renewable energy, especially in the early development stage. Most households were reluctant to use renewable energy because they thought they were not reliable enough.

Also, in order to develop a renewable energy project, vast areas of countryside are required and most of the times the rural workers are not open to this. Moreover, in most developing countries, there is not social consciousness about the environmental impact of fossil fuels and the sustainable advantages of renewable energy. All these elements, in some cases have limited the level of usage and development of renewable energy. Consequently, it is of vital importance to instruct society about the renewable energy benefits and encourage the circulation of it among the population.<sup>1213</sup>

## **1.5. Renewable Energy Incentive Policies**

As mentioned before in this chapter, nowadays the level of investment in renewable energy in developing countries exceeds the level of investment from developed countries. Undeniably, this is taking place since the application of new incentive policies in the last decade by developing regions. Also, it was already mentioned that incentive policies are the main helpers to overcome the investment barriers for renewable energy projects. In this section, we are going to go deep into the explanation of each financial instrument, the advantages and disadvantages, and the degree of success of each one of them. It is important to understand the way of working of these mechanisms in order to have a better comprehension of the importance of the incentive policies in the transition to renewables.

### *1.5.1. What is an Incentive Policy?*

Due to the great interest of reducing carbon dioxide emissions, different incentive policies have been created in order to encourage the promotion of green sources. In fact, government subsidy schemes are necessary to stimulate the implementation of renewable technologies while they become competitive against traditional energy. Several actions can be implemented to accelerate the further expansion of renewables in the market, which it is going to be explained in this section. However, first it is useful to clarify the definition of an incentive policy.

An incentive policy “is any system adopted to motivate the behavior of people”, which we mostly see in the business environment where incentives are implemented in form of salary bonuses, special benefits, recognitions or gifts. These incentives have the objective of motivating the employees “to do or not to do

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<sup>12</sup> Seetharaman, Krishna Moorthy, Nitin Patwa, Saravanan, and Yash Gupta, “Breaking barriers in deployment of renewable energy”, US National Library of Medicine National Institutes of Health, January 5<sup>th</sup>, 2019.  
<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6351575/>

<sup>13</sup> Dorcas Kariuki, “Barriers to Renewable Energy Technologies Development”, Energy Today, January 25<sup>th</sup>, 2018.

<https://www.energytoday.net/economics-policy/barriers-renewable-energy-technologies-development/#:~:text=In%20the%20essay%2C%20these%20barriers,economic%20barriers%2C%20and%20geographical%20and>

something that is usually of benefit to the company”.<sup>14</sup>

In this section it is presented an analysis of the framework of public incentives which represent the most economically efficient method of achieving renewable energy policy objectives. There are a number of ways in which the incentives can be categorized. This paper explores the options based on the World Bank categorization: Quantitative instruments, Price instruments, Government Funding, Consumer Incentives, Power Purchase Agreements and Auction Mechanism.<sup>15</sup>

### 1.5.2. *Quantity Instruments*

Quantity Instruments are “market-based instruments that define a specific target or absolute quantity for renewable energy production”<sup>16</sup> and there are two types: Renewable Portfolio Standards and Renewable Energy Credits.

#### Renewable Portfolio Standards (RPS)

The RPS is a “policy tool to force greater production of electricity from renewable energy that has attractive social and environmental characteristics”. What is interesting about this incentive is that it tries to boost the development of the renewable energy sector without raising the electricity prices.<sup>17</sup>

Moreover, the RPS targets are set by the government so it guarantees that applying this policy will capture economic and social benefits. However, RPSs are also known for not being able to reach the agreed implementation targets because price, volume and risk persist, and all these create uncertainty in revenues for the investors.<sup>18</sup>

#### Renewable Energy Certificates (REC)

REC is a “non-tangible, tradable commodity that represent proof that one megawatt-hour (MWh) of

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<sup>14</sup> WiseGEEK. “What is an incentive Policy?”

<https://www.wisegeek.com/what-is-an-incentive-policy.htm#didyouknowout>

<sup>15</sup> Pablo Benitez, “Policy Instruments for Renewable Energy: An Introduction”, World Bank Institute, Climate Change Practice, World Bank, September 18, 2012.

<https://esmap.org/sites/default/files/esmap-files/ESMAP%20IFC%20Re%20Training%20World%20Bank%20Benitez.pdf>

<sup>16</sup> Pablo Benitez, “Policy Instruments for Renewable Energy: An Introduction”, World Bank Institute, Climate Change Practice, World Bank, September 18, 2012.

<https://esmap.org/sites/default/files/esmap-files/ESMAP%20IFC%20Re%20Training%20World%20Bank%20Benitez.pdf>

<sup>17</sup> S. Keyuraphana, Thanaraka, Ketjoya, Rakwichiana, “Subsidy schemes of renewable energy policy for electricity generation in Thailand”, School of Renewable Energy Technology, Naresuan University, SciVerse ScienceDirect, September 30, 2011.

<https://www.sciencedirect.com/science/article/pii/S1877705812013409>

<sup>18</sup> Friedemann Polzin, Florian Eglibjarne, Steffen Tobias, S.Schmidt, “How do policies mobilize private finance for renewable energy? A systematic review with an investor perspective”, ScienceDirect, February 15, 2019.

<https://www.sciencedirect.com/science/article/pii/S030626191831818X>

electricity was generated from a renewable energy resource”.<sup>19</sup> Renewable Energy Certificates consist of a surplus in revenues for green energy generation if the producer achieves the minimum production. It is important to highlight that the RECs are traded in a separate market from the energy and it is a quite illiquid market.<sup>20</sup>

### *1.5.3. Price Instruments*

The price instruments main purpose is to “reduce cost and pricing-related barriers by establishing favorable price regimes for renewable energy relative to other sources of power generation”.<sup>21</sup> They help system owners mostly through credits and tax exemptions, regardless of the amount of electricity produced. There are two kinds of price-based mechanisms: Fiscal Incentives and Financial Incentives.

#### Fiscal Incentives

The Fiscal Incentives are any type of credit or tax exemption. For example, when a lower VAT rate is employed for renewable energy projects and the dividends from renewable energy investments are exempt from income taxes. Also, capital subsidies, low interest loans, grants, or rebates. It can also consist on the increase of taxes on fossil fuels.

#### Financial Incentives: Feed-In Tariff

The Financial incentives are the ones which are price-driven and the most popular are the Tariff-based mechanisms. These are mechanisms where the price (which is the tariff paid to the renewable energy producer) is established by the regulatory organization and the quantity produced is determined by the market players.<sup>22</sup> As the price is fixed, this mechanism decreases the company's risk related to market price volatility. The design of FIT policies usually requires three key conditions: A preferential tariff, guaranteed purchase of the electricity produced for a specified period and guaranteed access to the grid.

### *1.5.4. Consumer Incentives*

The Consumer Incentives are the “policies that seek to change electricity consumer’s behavior by

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<sup>19</sup> Pablo Benitez, “Policy Instruments for Renewable Energy: An Introduction”, World Bank Institute, Climate Change Practice, World Bank, September 18, 2012.

<sup>20</sup> “What is a green certificate?”, Kyos Analytics., [https://www.kyos.com/faq/green-certificate/#:~:text=A%20green%20certificate%20is%20a,renewable%20\(green\)%20energy%20source.&text=It%20is%20an%20a lternative%20to,benefits%20and%20feed%2Din%20tariffs](https://www.kyos.com/faq/green-certificate/#:~:text=A%20green%20certificate%20is%20a,renewable%20(green)%20energy%20source.&text=It%20is%20an%20a lternative%20to,benefits%20and%20feed%2Din%20tariffs).

<sup>21</sup> Pablo Benitez, “Policy Instruments for Renewable Energy: An Introduction”, World Bank Institute, Climate Change Practice, World Bank, September 18, 2012.

<sup>22</sup> Hugo Lucas, Rabia Ferroukhi, Diala Hawila, “Renewable Energy Auctions in Developing Countries”, IRENA, 2013.

[https://www.irena.org/documentdownloads/publications/irena\\_renewable\\_energy\\_auctions\\_in\\_developing\\_countries.pdf](https://www.irena.org/documentdownloads/publications/irena_renewable_energy_auctions_in_developing_countries.pdf)



providing them with additional options and information regarding their electricity sources”.<sup>23</sup>

### Mandatory Green Power Options

Mandatory green power options is a mechanism that drive utilities to offer customers the option to buy their electricity from renewable sources. In this way it boosts the demand for the generation of renewable energy. The utilities can generate this option by producing their own clean energy or buying it from another producer or obtaining renewable energy credits from the governing organization.<sup>24</sup>

### Transparency Programs

Transparency programs is an incentive for customers where they are provided with a detailed summary of the sources of the electricity they are consuming. The main purpose of the transparency programs is to put pressure on final users on having a more conscious energy consumption. In fact, the policy is not a direct tool to reduce the use of fossil fuels but creates an indirect pressure to transition to renewables.<sup>25</sup>

#### *1.5.5. Auction Mechanism: Competitive Bidding*

The Auction Mechanism is one of the most popular tools used in developing countries. Through this mechanism the “government issues a call for tenders to install a certain capacity of renewable energy-based electricity. Project developers who participate in the auction submit a bid with a price per unit of electricity at which they can realize the project. The government evaluates the offers based on the price and other criteria and signs a power purchasing agreement with the successful bidder”.<sup>26</sup>

Opposite to the feed-in tariff, in the case of auction schemes the regulatory organization specifies the quantities and the tariff is marked by competitive bidding. Compared to a flat feed-in-tariff, the auction scheme is expected to have several positive outcomes like cost efficiency due to price competition, it helps in setting competitive pricing, it provides high investor security as it is linked to long-term PPAs, and it is helpful for volume and budget control. In fact, well scheduled auctions can increase the predictability of electricity supply and other policy objectives established by the governments can be achieved through auctions.

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<sup>23</sup> Bernardo Sarti, “Policies for the Deployment of Renewable Energies: An Overview”, University of Pennsylvania, Social Impact Research Experience (SIRE), 2018.

<https://repository.upenn.edu/cgi/viewcontent.cgi?article=1063&context=sire>

<sup>24</sup> Bernardo Sarti, “Policies for the Deployment of Renewable Energies: An Overview”, University of Pennsylvania, Social Impact Research Experience (SIRE), 2018.

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<sup>25</sup> Bernardo Sarti, “Policies for the Deployment of Renewable Energies: An Overview”, University of Pennsylvania, Social Impact Research Experience (SIRE), 2018.

<https://repository.upenn.edu/cgi/viewcontent.cgi?article=1063&context=sire>

<sup>26</sup> Hugo Lucas, Rabia Ferroukhi, Diala Hawila, “Renewable Energy Auctions in Developing Countries”, IRENA, 2013.

[https://www.irena.org/documentdownloads/publications/irena\\_renewable\\_energy\\_auctions\\_in\\_developing\\_countries.pdf](https://www.irena.org/documentdownloads/publications/irena_renewable_energy_auctions_in_developing_countries.pdf)

On the other hand, the auction mechanism has some weaknesses, for example they only benefit the winning bidders and are propense to give preference only to large companies that can pay for the linked administrative and transaction costs. Therefore, participating in auctions involves being capable of providing resources that small-scale project developers might not have.

Moreover, the auction mechanism is becoming more popular year by year. There was an increase in the number of countries that implemented the auction policy tool from 9 in 2009 to 44 in 2013. From this number, 30 were developing countries. The interest in auction mechanism is pushed by the ability of auctions to achieve the development of renewable energy in a cost-efficient, controlled and standardized way.<sup>27</sup>

#### *1.5.6. Power Purchase Agreements*

The principal risk associated with the lack of incentives in infrastructure projects as the renewable energy projects is the market risk. This is because the revenues, without specific subsidies, are not guaranteed by a fixed tariff. The renewable energy projects are capital-intensive projects which require a vast amount of capital in the first phases of construction.

In project finance it is vital to recognize all the specific risks in each step and allocate them with the counterpart who is more able to handle them. In order to reduce the risk of unpredictable revenues in some cases, Power Purchase Agreements (PPAs) are used. Moreover, the way of working of PPAs is that a price is fixed, or might vary into a range, and it is assured and paid to the energy plant for the quantity of energy generated. This type of contract is usually long-term but can also be medium-term.<sup>28</sup> PPAs are not directly incentives, but the government might promote these measures, which are expected to drive the market in the coming years.

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<sup>27</sup> Hugo Lucas, Rabia Ferroukhi, Diala Hawila, "Renewable Energy Auctions in Developing Countries", IRENA, 2013.

[https://www.irena.org/documentdownloads/publications/irena\\_renewable\\_energy\\_auctions\\_in\\_developing\\_countries.pdf](https://www.irena.org/documentdownloads/publications/irena_renewable_energy_auctions_in_developing_countries.pdf)

<sup>28</sup> Friedemann Polzin, Florian Eglibjarne, Steffen Tobias, S.Schmidt, "How do policies mobilize private finance for renewable energy? A systematic review with an investor perspective", ScienceDirect, February 15, 2019.

<https://www.sciencedirect.com/science/article/pii/S030626191831818X>

## 2. The Argentinian Case

In this research we have taken as sample two developing countries to examine if the application of incentive policies is enough to mitigate investment barriers: Argentina and Uruguay. These countries were chosen because they are neighbor developing countries with similar natural resources and reflect high potential for the development of renewable energy technologies. In this chapter and chapter three, it is analyzed to what degree do incentive policies enable their capacity of evolution and the potential they have of attracting capitals destined for the development of their renewable energy sources.

### 2.1. Introduction

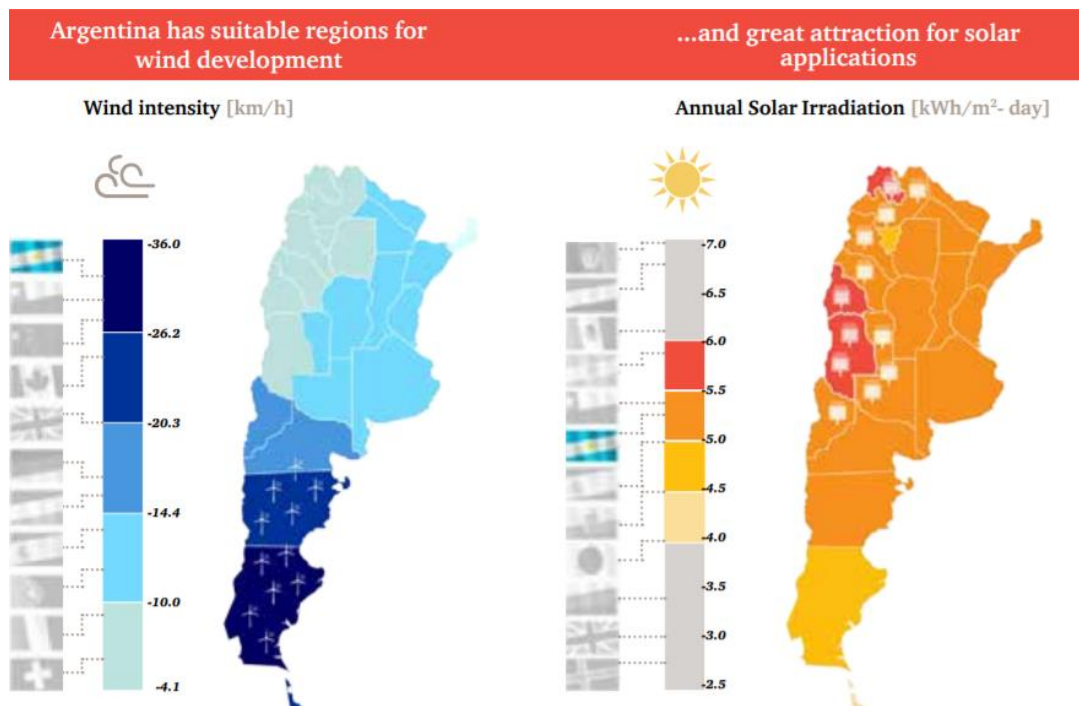
Argentina is one of the G20 countries, it has highly qualified human capital and is very rich in natural resources to generate wind and solar energy. The country's infrastructure is solid and wide, with more than 35,000 kilometers of roads and railway networks, 43 ports and 54 airports. Argentina is a place where the expansion of the energy mix should not be an issue as it owns the necessary conditions for the development of the renewable energies.

The Argentine Wind Energy Association established that the natural resources supply for the generation of wind energy in Argentina is extremely high, consisting of the primary renewable energy source of the country. It has winds of more than 6m per second in 70% of its territory, which allows wind generators achieve higher productivity and profitability and can supplant fossil production for a longer time.

Referring to photovoltaic solar generation, which accounts as the second source of renewable energy in Argentina, more than half of the national territory receives an annual average sunlight over 3.5 kwh/m2. Argentina also has an advantageous environment and resources for the development of biogas, biomass, biofuel and small water projects. However, the wind and solar energy are more promising than the rest, therefore, the government and the private sector are focusing their efforts on these two.<sup>29</sup>

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<sup>29</sup> Ezequiel Mirazón, "Renewables in Argentina Opportunities in a new business environment", PWC Argentina, March, 2017. <https://www.pwc.com.ar/es/publicaciones/assets/renewables-in-Argentina.pdf>



**Chart 3.** Natural resources for renewables development in Argentina. Source: Ezequiel Mirazón, “Renewables in Argentina Opportunities in a new business environment”, PWC Argentina, March, 2017.

## 2.2. The Development of the RE Market in Argentina

In this section it is analyzed the history of the renewable energy development in Argentina, which is highly linked and affected by the government in place, unlike their neighbor, Uruguay. As it is known worldwide, Argentina has suffered regular changes politically speaking which impact the context and the policies applied in the energy sector.

During the first Perón era (“primer peronismo”), which took place between 1946 and 1955, it was celebrated the beginning of the energy policy approach, with a solid goal to diversify the energy matrix, which at this moment in time, energy was mainly imported. The first steps were going to take place as plans were in ready to go into action to develop the geothermal and solar energy sources. Nevertheless, plans were put to an end as the Military Dictatorship in 1976 arrived and lasted until 1985. During this period very little attention was paid into the expansion of the energy mix.

After the end of the Dictatorship, Raúl Alfonsín took power democratically from 1983 to 1989. His mandate was quite difficult due to the social and economic struggles of the country. The situation of Argentina at this period was an inflation of 342% and a very high foreign debt which counted as 82.6% of the gross domestic product. Despite the difficult context of these years, some advances were made regarding the energy sector without major success. Thus, the “National Rational Use Program” (Decree N. 2.247/85) was established, which can be described as the boldest program in that period. The program included three smaller plans: the “Energy Conservation Program”, the “Fuel Substitution Program” and the “Evaluation, Development, and Application of New Energy Sources Program”. Moreover, in 1985, the Regional Wind

Power Center (CREE) was created to calculate and improve the wind power potential and a couple of years later the “National Inventory of Small Hydropower Projects” was established and was successful in scheduling generation projects. However, these programs lacked incentives in order to work properly as there was a constant dispute regarding the participation of private companies in the exploitation of state-owned assets. Therefore, most of the plans that would have created a raise on installed capacity were never executed.

Next into power was Carlos Menem in 1989, whose administration was keen to put attention in the development of the energy sector. The “State Reform Act” (Law 23.696) and the “Economic Emergency Act” (Law 23.697) were the two main incentives to create solid policies. However, the market was not regularized, and the most relevant State companies were privatized, which led into an unsustainable system. Hence, the context was not ready for the application of Renewable energy policies, transforming every attempt into failure. In 1993, Law 24.224 was passed, declaring that geological exploration was an activity on the government agenda. Some years later, in 1998, Law 25.019 was ratified, establishing the “National Wind and Solar Energy Regime”, which established premiums of one Argentine peso per kWh successfully generated. It is important to highlight that at that time; one Argentine peso was equal to one US dollar. Furthermore, some financial policies were applied regarding the VAT on investments. Between 1994 and 2003, investments caused an installed capacity of 28.88 MW of wind power.

Fernando de la Rúa assumed presidency in 1999 in the middle of a recession. The economic activity was decreasing, and it collapsed in 2002 entering into a default status. There was a major discontent in society which was transmitted through protests and Fernando de la Rúa ended his mandate. No developments were made during this period of crisis due to the lack of public investment and the obvious reluctance of private investors in providing funds to this country.

Another brief mandate came into power, Eduardo Duhalde, which only lasted for one year. However, he established the "Public Emergency and Currency Regime Reform Act," (Law 25.561), which set a fixed exchange rate and prohibited the indexation of all kinds of debts, taxes and fees. This transformation of the monetary policy framework changed the way in which contracts were made in the energy sector.

In 2003, Néstor Kirchner took power and after surpassing a big economic crisis, Argentina started to recover. The strategy of the administration was to keep domestic prices low, especially the essential consumable goods, as energy. Despite this improvement, the country entered in an energy crisis as a result of the growing demand for energy and reduced production levels. The government recognized the lack of investment in the previous decades and started to take a more important role in the generation of renewable energy in order to be able to supply energy with different resources other than fossil fuels, which are mainly imported and more expensive. In August 2006, Law 26.123 was ratified, declaring that the development of hydrogen as a fuel and energy vector were of national interest. In 2007, Law 26.190 was enacted, which its main goal was to set a target of reaching 8% of national electricity consumption from renewable energy sources by 2016. This counted as the first real quantifiable aim for the country in terms of renewable energy. However,

the law did not deliver the expected result as there was a constant lack of investment until the GENREN program was implemented in 2010. These policies were fruitless in large part because the renewable energy sector faced economic and financial barriers that could not be overcome with the promotion mechanisms selected. One important fact appeared in scene; the economic incentives fixed in Argentine pesos turned obsolete as it became more expensive to generate energy.

In 2007, Cristina Fernández assumed the presidency for two consecutive periods. Her main goal was keeping public utility prices down, energy prices included. The demand of energy continued growing and the energy crisis was still present as there persisted a lack of supply. In 2009, the trade balance started presented a high deficit due to energy imports and the government in a desperate approach, took over the ownership of the supply of energy, which was a private enterprise. There were no developments of laws to promote renewable energy projects during this period, but the country showed the highest increase in installed capacity in its history. This increase was surely related to the GENREN program which consisted in the offer of tenders to private investors. The first program, GENREN 1, involved of a system of tenders to cover 1000 MW of generation from renewable energy sources. The companies which won the tender, would get into fixed price purchase agreements for a period of 15 years in US dollars. In 2010, GENREN 2 was launched, tendering 1208 MW. For this program, a high return strategy was implemented, offering a return for the wind power generation projects of 121-134 USD/MWh, biofuel 258-297 USD/MWh, and photovoltaic 547-598 USD/MWh. This strategy made other regional countries, like its neighbor, Uruguay, not competitive compared to Argentina (Uruguay offers 60-80 USD/MWh). Unfortunately, most of the projects are still not operating, and there is still a lack of private investment to proceed in the development of the renewable energy sources.<sup>30</sup>

### **2.3. Recent Incentive Policies**

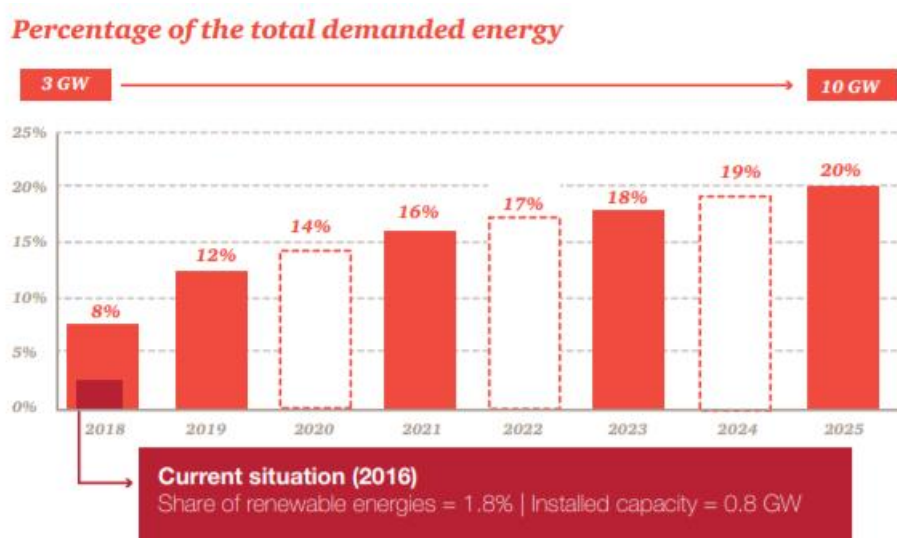
From what we saw on the last section, Argentina had two and a half decades of inconsistent energy policy. Until 2001, the country experimented privatization, contracts in US dollars, barely any planning and little government control. From 2002 to 2015, there was a “pesification” of prices (prices in Argentinian Peso), FX restrictions, subsidies, under investment, under supply, government intervention and again, barely any planning. Now that the background of the energy policy development in Argentina is already known, the next section explores the recent initiatives applied by the country. This will show the big picture of where Argentina is placed now in the transition to renewable energy sources and if the barriers named in the last section could be overcome.

#### *2.3.1. Law N. 27.191*

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<sup>30</sup> Marina Yesica Recalde, Daniel Hugo Bouille and Leónidas Osvaldo Girardin, “LIMITATIONS FOR RENEWABLE ENERGY DEVELOPMENT IN ARGENTINA”, *Revista Problemas del Desarrollo* Volume 46, Number 183, January 13, 2015. <http://www.scielo.org.mx/pdf/prode/v46n183/0301-7036-prode-46-183-00089-en.pdf>

The first relevant transformation in the present era to construct a solid framework for the development of the renewable energy sector was Law N.27.191, which was published in 2015 and determined that renewables should reach 20% of the energy matrix by 2025. In the chart below we can see the projection which was expected from 2016 to 2025 based on this law.



**Chart 4.** Projection of the share of RE in the total demanded energy in Argentina. Source: Ezequiel Mirazón, “Renewables in Argentina Opportunities in a new business environment”, PWC Argentina, March, 2017.

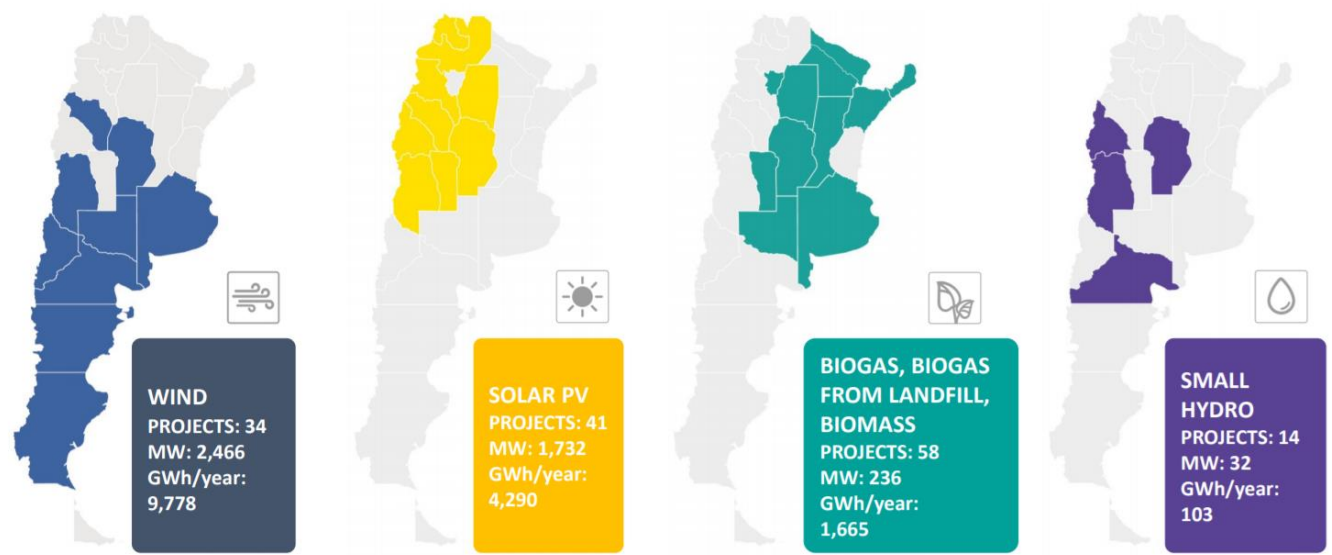
The success of the Law is based on three pillars, which are, “Plan RenovAR”, the use of long-term power purchase agreements (PPA’s) and CMMESA.<sup>31</sup>

### 2.3.2. *RenovAr Program*

In 2016, Macri introduced Plan RenovAR, a 10 years plan to attract investments of a sum of fifteen billion dollars for the renewable energy projects. It is a program which consists of regular public biddings through which the different companies submit their investment projects and the price at which they are willing to sell their capacity. There were three rounds of biddings until now, achieving 147 awarded projects with 4,466 MW of total awarded capacity and 15,836 GWh per year.<sup>32</sup>

<sup>31</sup> Ezequiel Mirazón, “Renewables in Argentina Opportunities in a new business environment”, PWC Argentina, March, 2017.

<sup>32</sup> Mauro G. Soares, “INNOVATION IN RENEWABLE ENERGY POLICIES IN ARGENTINA”, EOS Energía, August, 2018. <https://climatestrategies.org/wp-content/uploads/2018/04/Innovation-in-RE-Policies-in-Arentina-MAURO-SOARES-August-2018.pdf>



**Chart 5.** Awarded projects through bidding with RenovAr Program divided by source. Source: Mauro G. Soares, “INNOVATION IN RENEWABLE ENERGY POLICIES IN ARGENTINA”, EOS Energía, August, 2018.

### 2.3.3. *Signing of Power Purchase Agreements*

The use of PPAs was the tool selected by the Argentinian government in order to support the mandates and speed up the development of the market. The Power Purchase Agreements are signed in US dollars because it safeguards the sales of the investors without getting exposed to devaluations of the Argentinian Peso, which frequently happens. CAMMESA is the company that operates the electricity wholesale market in Argentina and the one that controls these agreements. It is important to highlight that the PPA mechanism contributes to overcome the barrier of lack of financing from private investors.

However, the obstacle is still present, thus, Argentina applied a series of assistance instruments to provide more flexibility in the financing of renewable energy projects. The government created the “Trust Fund for Renewable Energy” (FODER), which offers payment guarantees for all tendered PPA’s in addition to project financing support. FODER is funded by treasury funds, public offerings and multilaterals. Renewable energy projects can also be financed by Project Finance, a financing structure in which debt and equity are used to finance the project and is paid back from the generated cash flow of the project.<sup>33</sup>

## 2.4. The present situation

In terms of economic competitiveness, the average sale price of wind and solar generated energy rounds 54 USD/MWh. Therefore, the prices observed in the bidding process in Argentina are still highly

<sup>33</sup> Ezequiel Mirazón, “Renewables in Argentina Opportunities in a new business environment”, PWC Argentina, March, 2017.



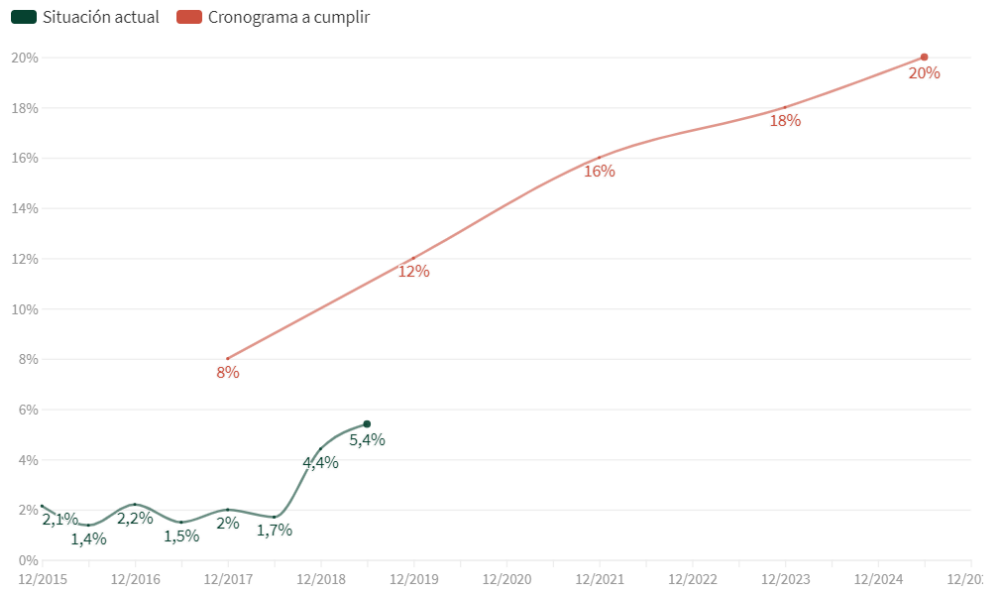
competitive compared with the ones from its neighbor countries, like Uruguay.<sup>34</sup> In the present, there are 49 projects in operation and 102 under construction, which are pushing to follow the set goals established by Law 27.191 in 2015 which were outlined in the past section of this study. It targeted that for 2019, 12% of the total energy matrix must come from clean sources and achieve 20% in 2025. However, the renewable energy sector is slowed in Argentina, as Macri's administration was not re-elected, which was the one responsible for most of the renewable energy programs such as RenovAr. Instead, Alberto Fernández was chosen as President and there was huge uncertainty regarding how plans would change. Over that, the Coronavirus sanitary crisis appeared and paused the development of the energy sector. It is still undetermined what this new government's policies regarding green energy will be and it is difficult to know because it depends on many externalities. What we do know is that the country risk of Argentina is quite high, and the energy sector is a capital-intensive industry, where heavy investment is required to complete a project. Indeed, the dollar return rate is around 13% per year and businesses are financed at 8%, which is expensive compared to neighbor countries.<sup>35</sup> This means that generating green energy projects in Argentina is less encouraging for investors than in other countries in Latin America. The effect of all this political uncertainty and expensive cost of capital has led to a share of clean energy of only 5% in electricity generation in 2019, which is far behind the 12% which was targeted in the Law 27.191 in 2015. Although the goals were not reached, Maximiliano Morrone, National Director of Promotion of Renewable Energies and Energy Efficiency of the Ministry of Energy, explains: "With the projects already tendered and estimating how much demand is going to increase, by 2021 we should be at 15% ". Thus, he assures that by 2021 the green energy share will be tripled compared to the 2019 reality. However, these objectives are far from being achieved and this kind of statement are quite optimistic based on the real situation Argentina is going through nowadays.<sup>36</sup>

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<sup>34</sup> Ezequiel Mirazón, "Renewables in Argentina Opportunities in a new business environment", PWC Argentina, March, 2017.

<sup>35</sup> "The renewable energy sector is slowed in Argentina", Reve, 27 August, 2019. <https://www.evwind.es/2019/08/27/the-renewable-energy-sector-is-slowed-in-argentina/70517>

<sup>36</sup> Ignacio Ferreiro, "El 5% de la electricidad de la Argentina viene de fuentes renovables", Chequeado, 28 August, 2019. <https://chequeado.com/el-explicador/5-de-la-electricidad-de-la-argentina-viene-de-fuentes-renovables/>



**Chart 6.** Generation from renewable sources in Argentina is below the goals established by law. Source: Ignacio Ferreiro, “El 5% de la electricidad de la Argentina viene de fuentes renovables”, Chequeado, 28 August, 2019

## 3. The Uruguayan Case

### 3.1. Introduction

The Oriental Republic of Uruguay, with a population of 3.4 million inhabitants and a gross domestic product of 56 billion dollars, is one of the countries with the highest GDP per capita in the region (US\$ 16,245). According to the World Bank classification, it is a high-income country. The Uruguayan economy is made up of 65% services, 25% industry and 10% agriculture, and has strongly export-oriented sectors, such as agriculture, livestock and food processing. Poverty indicators show that in 2014 about 10% of Uruguayan households fell below the poverty line. That same year, the rural population was calculated at 5% of the total population, a figure considerably lower than the average for Latin America and the Caribbean, which reached 20.4%. According to the publication of the Human Development Index of the United Nations Development Program (UNDP), in 2014 the country was ranked 50 out of the 187 nations that participated in the measurement of the index worldwide. According to the UNDP classification, Uruguay is part of the group of countries with high human development.

Regarding the energy sector, and in particular the hydrocarbon subsector, Uruguay does not have proven oil reserves, so its consumption of hydrocarbons comes from imports of crude oil and its derivatives. Electricity is mainly supplied by hydroelectric plants, and access to electricity reaches 99.5% of the population.<sup>37</sup> The Uruguayan electricity system is characterized by a robust participation of the state sector. The entire transmission and distribution stage and most of the power generation are carried out by state companies. The binational hydroelectric power plant Salto Grande, with 945 MW, and the vertically integrated state company Usinas y Transmisiones Eléctricas (UTE), with 1,614 MW, participate in the generation.<sup>38</sup>

Along the last decade, Uruguay has successfully modified its energy matrix, that is, the combination of energy sources it uses. Indeed, in 1995, 61% of its energy supply came from petroleum and its derivatives, while renewable energy sources (hydro, wind, solar and biomass) represented 38%.<sup>39</sup> However, in 2018, the percentages were reversed, and renewable sources contributed 60%, while oil and its derivatives fell to 39% of supply.<sup>40</sup> This transformation is very relevant for the country, since it does not have natural fossil resources, as it was already mentioned before and, therefore, oil has to be imported. It is even more relevant if it is taken into account that between the late 1990s and the early 2000s, the country experienced energy crises that evidenced its dependence on oil and its vulnerability to external shocks, which even led the government to use programmed cuts of energy.

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<sup>37</sup> R.Espinasa, A. Bonzi, F.Anaya, "Dossier Energético: Uruguay", BID, Enero, 2017, <https://publications.iadb.org/publications/spanish/document/Dossier-energ%C3%A9tico-Uruguay.pdf>

<sup>38</sup> M. Netto, M. Cabrera, J. Gomes Lorenzo, "Expansión de las energías renovables no convencionales en América Latina y el Caribe", Monografía del BID ; 458, 2016.

<sup>39</sup> MIEM. "Balance Energético 2017", 2017, p. 124.

<sup>40</sup> MIEM. "Balance Energético 2018". <https://ben.miem.gub.uy/oferta3.htm>

To illustrate the above, in the year 2000, the second source of energy in the country after oil, was generation with hydraulic sources, which represented 19% of the total generation. However, both sources depend on external factors: the generation of energy with fossil resources depends on the international price of oil, and the hydraulic generation depends on the climate. The country's energy supply was threatened in the early 2000s by the constant increase in oil prices and by the interruption of electricity imports from Argentina caused by the 2001 economic crisis. On the other hand, between 1997 and 2007 severe droughts were experienced.

For this reason, in 2005 the Uruguayan State decided to launch a program to increase energy generation with renewable and indigenous sources, and thus decrease its dependence on oil and other external factors. This long-term program included wind energy which was called “Programa de Energía Eólica de Uruguay” (PEEU), which laid the foundations for the successful development of that sector.<sup>41</sup> Therefore, we can say that the 2001 crisis in Argentina was the catalyst for the installation of indigenous renewable energies and the improvement of its energy security, since Uruguay depended on Argentina for its natural gas imports.

### **3.2. The Successful Neighbor**

As a consequence of the background and initiatives mentioned in the past paragraphs, in just 14 years (2005-2019), the country experienced impressive growth in the renewable energy mix, driven by a modern and transparent regulatory framework, efficient award schemes, tax incentives to the private sector, and increasing levels of sophistication and innovation, which increased the bankability of the projects. As a result, the country has slashed its carbon footprint and lowered electricity costs, without government subsidies. Nowadays, renewables provide 98% of the country's electricity and there are also fewer power cuts because a diverse energy mix means greater resilience to droughts. Uruguay is being recognized for the progress on decarbonizing its economy. It has been praised by the World Bank and the Economic commission for Latin America and the Caribbean naming Uruguay among its “Green Energy Leaders”, declaring: “The country is defining global trends in renewable energy investment.” The energy investment for renewables in Uruguay over the past five years has surged to \$7 billion, or 15% of the country's annual GDP, which is five times the average in Latin America.

Uruguay has surely won the decarbonization race to its neighbor, Argentina, as it was declared by Ramón Méndez, Uruguay's head of climate policy: “For three years we haven't imported a single kilowatt hour. We used to be reliant on electricity imports from Argentina, but now we export to them. Last summer, we sold a third of our power generation to them.”<sup>42</sup>

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<sup>41</sup> GEF. 2013. “Programa de Energía Eólica en Uruguay (PEEU)”. <https://www.thegef.org/project/uruguay-wind-energy-programme-uwep>

<sup>42</sup> Jonathan Watts, “Uruguay makes dramatic shift to nearly 95% electricity from clean energy”, *The Guardian*, December 3<sup>rd</sup>, 2015. <https://www.theguardian.com/environment/2015/dec/03/uruguay-makes-dramatic-shift-to-nearly-95-clean-energy>

The country has managed to exceed their goals and reached 98% of the electricity consumed coming from renewable sources. The strategy for this little country is that the energy mix is quite varied: the biggest portion coming from hydraulic energy (55.6%), followed by wind energy (33.6%), biomass (6%), photovoltaic (2.8%) and thermal (2%). Last year, 2019, apart from being the record year for renewables, was the highest sum for electricity generation, which reached 14,000 GWh and also for exported electricity, as mentioned before in Ramón Méndez quote.

Technology	Installed capacity 2019 (MW)
Hydraulics	1537
Wind	1511
Thermal	1192
Solar	248
Biomass	135

**Chart 7.** Installed power in Uruguay 2019. Source: L.Di Chiara, A. Nogales M. Sanin Jesus Tejada, M. Hallack, “La complementariedad de la generación hidroeléctrica con las energías renovables no convencionales y la importancia de la integración regional”, BID, December, 2019.

Concerning energy exports, around 3,000 GWh were sold to Brazil and Argentina during 2019, which accounts as 21% of Uruguayan electricity demand. Indeed, 80% of the total exported went to Argentina, and the remaining 20% to Brazil.<sup>43</sup> These numbers show again that Uruguay did not only won the decarbonization race with Argentina but also transitioned from being an energy importer from Argentina, to being an energy exporter to them.

### 3.3. Political Framework

In the last subsection it was already mentioned that Uruguay’s transformation of the energy matrix was done through a modern and transparent regulatory framework. In order to implement a policy of diversification of energy sources, the State had to create a structure to support the initiatives and independent organisms to take the regulations into action. The structure of the energy sector in Uruguay consists of three main parts which are: Presidencia de la Republica Oriental del Uruguay, MIEM (Ministerio de Industria, Energía y Minería, MIEN (DNE- Dirección Nacional de Energía). The three sectors are shown in the chart below, specifying the organizations which are related to the activities of the DNE.

<sup>43</sup> Noelia Lopez Redondo, “Uruguay funcionó al 98% con energías renovables en 2019”, Energy News, January 15th, 2020. <https://www.ambientum.com/ambientum/energia/uruguay-funciono-98-con-energias-renovables-en-2019.asp>



Organizaciones relacionadas a las actividades del DNE (en orden alfabético)



**Chart 8.** Structure of the Energy Sector in Uruguay. Source: R.Espinasa, A. Bonzi, F.Anaya, “Dossier Energético: Uruguay”, BID, January, 2017.

The MIEM is the primary policymaking authority of the Executive Branch of the Uruguayan State. It was created in 1974, with the aim of directing government policies related to industry sectors, energy, mining, telecommunications and small and medium-sized enterprises. Within the MIEM, we find the DNE, established by in 1975, which is responsible for elaborating, proposing and coordinating energy policies in order to satisfy national demand.<sup>44</sup>

On the following subsections the most important and relevant guidelines and incentive policies created by these organisms are outlined in order to understand the value of the incentive scheme for the development of the renewable energy sector in Uruguay.

### 3.3.1. National Energy Policy 2005-2030

The 2005–2030 energy policy is composed by strategic guidelines, goals to achieve and lines of action to follow in order to develop the renewable energy sector in the country. The written policy also includes an analysis of the energy topic in the country, in the region and in the world.<sup>45</sup>

<sup>44</sup> R.Espinasa, A. Bonzi, F.Anaya, “Dossier Energético: Uruguay”, BID, January, 2017, <https://publications.iadb.org/publications/spanish/document/Dossier-energ%C3%A9tico-Uruguay.pdf>

<sup>45</sup> Pablo Aguirregaray, “Presente y futuro de las energías renovables en Uruguay”, Oficina de Planeamiento y Presupuesto, March, 2019. [https://estrategiadesarrollo2050.gub.uy/sites/default/files/inline-files/12\\_%20Presente%20y%20futuro%20de%20las%20Energ%C3%ADas%20Renovables%20en%20Uruguay.pdf](https://estrategiadesarrollo2050.gub.uy/sites/default/files/inline-files/12_%20Presente%20y%20futuro%20de%20las%20Energ%C3%ADas%20Renovables%20en%20Uruguay.pdf)

The National Energy Policy it's a complete, long-term energy plan in which the main objectives are to diversify the energy mix, reduce dependency from fossil fuels, improve energy efficiency, and increase the use of domestic resources. Indeed, the main specific goals set by the energy policy are:

- 1) The creation of a robust electric power supply system that meets the supply at the lowest possible cost.
- 2) Improve forms of access of fossil resources, reducing the impact of fuel imports on the national economy.
- 3) Definition of the participation of Natural Gas in the energy matrix.
- 4) Incorporation of alternative energy sources.

It is important to highlight that these goals were based on four main strategic guidelines:

- 1) Directive role of the State, with regulated participation of private actors.
- 2) Diversification of the energy matrix (sources and suppliers).
- 3) Promote energy efficiency in all sectors of activity.
- 4) Ensure adequate access to energy for all social sectors.<sup>46</sup>

The plan started in 2005, following years of underinvestment and a change of government which made the beginning of the initiative a little bit controversial. The overall energy strategy was discussed during the years 2005 to 2007, but finally approved in 2008. In 2010 it was recognized by all political parties represented in the Congress. This was a big step for the future of the renewable energy market in Uruguay, as it meant that the commitment was taken by all parties which could be in power in the next 25 years and it was expected that the plan would be maintained even under a change of government. Certainly, this was respected and led to the Uruguay we see today in terms of energy.<sup>47</sup>

The first target set by the strategic plan was reaching 50% of primary energy from renewable energy sources by 2015, which was exceeded by 6.5% that year (a total of 56.5% of Uruguay's electrical energy came from renewable sources in 2015).<sup>48</sup> In order to achieve the goals set by the energy policy, a set of measures were implemented through decrees and resolutions. The legal decree with the greatest impact was given by the exhortation decrees to UTE to hire renewable source power. The Decree 77/006 instructed UTE to enter into contracts for the sale of energy coming from renewable sources, for a total of no more than 60 Mw, initially distributed equally among three sources: wind, biomass and small hydroelectric plants. If that quota was not reached for some of the sources, the remaining power would be distributed among the remaining sources. We can assume that the Decree 77/006 had a strong intention of the market interest in diversifying

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<sup>46</sup> Diego Velázquez Terranova, "El sector de las Energías Renovables en Uruguay", ICEX, May, 2012.

<https://www.camarazaragoza.com/exterio/BoletinNET/docs/DocumentoHerramienta187.pdf>

<sup>47</sup> M. Muñoz, A. Lopez-Peña, G. Kieffer, A. Khalid, R. Ferroukhi, "Renewable Energy Policy Brief", IRENA, June, 2015.

<https://www.irena.org/->

[/media/Files/IRENA/Agency/Publication/2015/IRENA\\_RE\\_Latin\\_America\\_Policies/IRENA\\_RE\\_Latin\\_America\\_Policies\\_2015\\_Country\\_Uruguay.pdf?la=en&hash=A76CA561F1B9FE54B25756097F5A55D20ED8EB33](/media/Files/IRENA/Agency/Publication/2015/IRENA_RE_Latin_America_Policies/IRENA_RE_Latin_America_Policies_2015_Country_Uruguay.pdf?la=en&hash=A76CA561F1B9FE54B25756097F5A55D20ED8EB33)

<sup>48</sup> "El 56,5 % de la energía eléctrica de Uruguay proviene de fuentes renovables", EFE, April 21, 2016.

<https://www.efe.com/efe/america/economia/el-56-5-de-la-energia-electrica-uruguay-proviene-fuentes-renovables/20000011-2904130#>

the generation of energy through different sources.<sup>49</sup>

### 3.3.2. “Ley de Promoción y Protección de Inversiones” N. 16.906

The Investment Promotion and Protection Law, number 16.906 regulated by the Decree 455 provides a favourable and attractive framework for investments in the country. This investment law declares the national interest of the promotion and protection of domestic and foreign investment and establishes the following benefits for the investments carried out in the country. The specific exemptions that can be obtained are the following: Income Tax from Economic Activities (IRAE), Wealth Tax, Value Added Tax. And the exemption from all taxes and duties charged on the import of machinery and equipment that is not competitive with national industry.<sup>50</sup>

This law particularly establishes benefits for the generation of electricity from non-traditional renewable sources (such as wind, solar thermal, photovoltaic (PV), geothermal, tidal, wave energy and biomass). The main benefit consists of CIT (Corporate Income Tax) exemptions equivalent to:

- 90 percent of net fiscal income generated by the promoted activity for all fiscal years up to 31 December 2017.
- 60 percent of net fiscal income generated by the promoted activity for all fiscal years from 1 January 2018 to 31 December 2020.
- 40 percent of net fiscal income generated by the promoted activity for all fiscal years from 1 January 2021 to 31 December 2023.<sup>51</sup>

### 3.3.3. “Plan Nacional de Respuesta al Cambio Climático (PNRCC)”

Uruguay recognizes the fight against climate change and is adhered to the Kyoto Protocol. This protocol executes the United Nations Framework Convention on Climate Change, committing industrialized countries to limit and reduce greenhouse gas emissions in accordance with the agreed individual goals. The Convention itself only asks those countries to adopt mitigation policies and to report regularly.<sup>52</sup>

Therefore, Uruguay is a country which is active in the Climate Change challenge and the government

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<sup>49</sup> Pablo Aguirregaray, “Presente y futuro de las energías renovables en Uruguay”, Oficina de Planeamiento y Presupuesto, March, 2019. [https://estrategiadesarrollo2050.gub.uy/sites/default/files/inline-files/12\\_%20Presente%20y%20futuro%20de%20las%20Energ%C3%ADas%20Renovables%20en%20Uruguay.pdf](https://estrategiadesarrollo2050.gub.uy/sites/default/files/inline-files/12_%20Presente%20y%20futuro%20de%20las%20Energ%C3%ADas%20Renovables%20en%20Uruguay.pdf)

<sup>50</sup> Diego Velázquez Terranova, “El sector de las Energías Renovables en Uruguay”, ICEX, May, 2012. <https://www.camarazaragoza.com/exterior/BoletinNET/docs/DocumentoHerramienta187.pdf>

<sup>51</sup> André Boekhoudt, “Taxes and incentives for renewable energy”, KPMG International, 2014. <https://assets.kpmg/content/dam/kpmg/pdf/2014/09/taxes-incentives-renewable-energy-v1.pdf>

<sup>52</sup> “¿Qué es el Protocolo de Kyoto?”, United Nations Climate Change, 2020. [https://unfccc.int/es/kyoto\\_protocol](https://unfccc.int/es/kyoto_protocol)



promotes plans to identify and mitigate vulnerabilities within the mission. One of the projects created was the National Climate Change Response System (SNRCC), followed in 2010 by the National Plan for Response to Climate Change (PNRCC).<sup>53</sup> The PNRCC is the instrument Uruguay has established to incorporate climate change into Uruguay's long-term development strategy and government agenda. It aspires to form a planned set of guidelines and directives prepared in an inter-institutional and participatory way. The initiative's goal in terms of energy is to deepen the diversification of the energy matrix, expanding the renewable sources and taking care of the vulnerabilities for the generation. The PNRCC played an important role in reaching the first target of 50% of energy coming from renewables in 2015, and the proposals that helped achieve this goal were:

- Incorporation of wind energy of at least 300 additional MW.
- Incorporation of an additional 200 MW of biomass and at least 50 MW of small hydroelectric.
- Achieve no less than 15% of non-traditional renewable electricity generation.
- Use no less than 30% of the country's agro-industrial waste to production of various forms of energy.
- Introduce 2 small pilot farms for photovoltaic solar energy.
- Promote micro-enterprises (residential, SMEs) based on mini-mills wind farms and solar thermal panels to heat water.

The PNRCC also included the incorporation of non-traditional renewable energy in the design of housing and service equipment and promotion of elements in tourist infrastructures that include renewable energy.<sup>54</sup>

#### 3.3.4. *“Fondo Sectorial de Energía”*

Since 2009, the National Agency for Research and Innovation (ANII) incorporated the Energy Sector Fund. This financing instrument seeks to promote research, development and innovation activities in the energy sector. The creation of this fund contributed significantly to increase the investment levels for the renewable energy projects. Indeed, it is recognized as a solid instrument that provides a strong inclusion of the private sector in financing the transition to renewables.<sup>55</sup>

#### 3.3.5. *Auctions: Main Instrument for the Promotion of RE in Uruguay*

Auctions have been the main instrument for the promotion of renewable electricity in Uruguay. The process works quite easy and is controlled by UTE, which awards power purchase agreements (PPAs) to

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<sup>53</sup> Diego Velázquez Terranova, “El sector de las Energías Renovables en Uruguay”, ICEX, May, 2012. <https://www.camarazaragoza.com/exterior/BoletinNET/docs/DocumentoHerramienta187.pdf>

<sup>54</sup> “PLAN NACIONAL DE RESPUESTA AL CAMBIO CLIMÁTICO”, Sistema Nacional de Respuesta al Cambio Climático y la Variabilidad, MVOTMA, January, 2010.

<sup>55</sup> Diego Velázquez Terranova, “El sector de las Energías Renovables en Uruguay”, ICEX, May, 2012. <https://www.camarazaragoza.com/exterior/BoletinNET/docs/DocumentoHerramienta187.pdf>

successful bidders. All auctions are subject to a bidding guarantee of 1% of the expected 10-year income.<sup>56</sup>

### 3.3.6. *Quota Obligation*

Quota obligation is linked to Law 18.585 which introduced the obligation to incorporate solar thermal technology in sport clubs, hospitals, hotels and heated swimming-pool. It establishes that at least 50% of the energy required to heat the water should come from solar thermal energy. If this requirement is not met, the permit for the construction operation is rejected. New public buildings are obliged to integrate this quota obligation on renewable energy too.<sup>57</sup>

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<sup>56</sup> M. Muñoz, A. Lopez-Peña, G. Kieffer, A. Khalid, R. Ferroukhi, “Renewable Energy Policy Brief”, IRENA, June, 2015. [https://www.irena.org/-/media/Files/IRENA/Agency/Publication/2015/IRENA\\_RE\\_Latin\\_America\\_Policies/IRENA\\_RE\\_Latin\\_America\\_Policies\\_2015\\_Country\\_Uruguay.pdf?la=en&hash=A76CA561F1B9FE54B25756097F5A55D20ED8EB33](https://www.irena.org/-/media/Files/IRENA/Agency/Publication/2015/IRENA_RE_Latin_America_Policies/IRENA_RE_Latin_America_Policies_2015_Country_Uruguay.pdf?la=en&hash=A76CA561F1B9FE54B25756097F5A55D20ED8EB33)

<sup>57</sup> André Boekhoudt, “Taxes and incentives for renewable energy”, KPMG International, 2014.

## 4. Comparison of the Selected Cases

In this section we are going through an extensive comparison between Argentina and Uruguay with a qualitative and quantitative approach. Several variables are going to be evaluated such as incentive policies schemes, economic stability, political plans and guidelines, infrastructure, government subsidies, borrowing costs, capital controls, exchange-rate risk, GDP, return on investment and country risk between others. The comparison leads to the design of recommendations for Argentina to strengthen the renewable energy policy.

### 4.1. Incentive Policies Comparison

In this section a comparative study is done between Argentina and Uruguay's incentive policies to analyze the results achieved. Throughout chapter three we observed that in both analyzed cases, Argentina and Uruguay presented a huge interest in developing the renewable energy sector. We can see this through various attempts of policy applications, laws, decrees and national politic plans. In the chart displayed below, it is summarized the targeted share of renewables of each country, the actual and real share of renewables achieved and the main policies which drive the share of renewables nowadays. It is evident the different outcomes between both cases.

	Argentina	Uruguay
Targeted share of renewables 2025	20%	Around 100%
Actual share of renewables	10%	98%
Main polices which drive RE share	Law N. 27.191	Law N. 16.906
	RenovAr	National Energy Policy 2005-2030

In the successful case of Uruguay, the main mechanism to promote renewable energy projects is the bidding system. The contracts are awarded for twenty years for projects with an installed capacity lower than 10 MW. Furthermore, Uruguay uses a Net Metering process, which is not used by Argentina. Also, Uruguay was a pioneer in the application of complementary regulations which constituted a vital factor to promote renewable energy projects in the country. On the other hand, Argentina did not have a solid complementary regulation framework until 2015 with the creation of Law 27.191.

The Argentinian case is quite different to Uruguay's profitable model, as Argentina's main incentive system for decades was the Feed-in Premium, which was implemented by GENREN program. Only after the RenovAr program was launched, Argentina started implementing the bidding system.

Both cases use the quota system both in order to target a minimum percentage of clean energy sources

in electricity generation. In the case of Argentina, they established 12% for 2019, which was not met, and 20% for 2025, which is still hard to be met. In the case of Uruguay, the government targeted 50% share of renewables in the energy mix by 2015, which was exceeded, and by 2019 they already had 98% accomplished.

In comparison, Uruguay had better results than Argentina. From this last section we can assume that the implementation of the Feed-in scheme was not the best mechanism for Argentina to use. Indeed, Argentina failed to determine the premium to be paid by generators which later gave unsatisfactory results.

Moreover, as we analyze the public policies implemented by both countries, we can conclude that Uruguay's policies have introduced not only specific resolutions regarding renewables, but also, macroeconomic goals. The execution of macroeconomic targets along with the development of the energy sector is very important because it aligns the economic framework to the public policies and denotes that there is a solid government long-term plan installed. Some of the macroeconomic objectives for Uruguay are the development of domestic industry, the creation of employment and the expansion of the local market. Diversely, in Argentina, the policies applied in the promotion of clean energy sources are considered more isolated solutions, which indicates the lack of long-term planning.<sup>58</sup>

## **4.2. Qualitative Analysis based on first-hand Interviews**

To sum up from previous chapters, even though Argentina owns high potential for generating green power and despite having implemented various policies and programs over the past decade, Argentina still has a small share of renewable energy sources. Indeed, only 10% of the total electricity generation is covered by clean sources in the present. On the other side of the river, its neighbor, Uruguay, a smaller country but with similar natural resources, achieved 97% of its electricity generation from renewable energy sources through a number of policies and plans which were quite successful in accomplishing the transition to renewable energies. Therefore, we can deduce that the simple act of applying incentive policies is not enough in order to smoothly finance the development of the renewable energy sector. So, what else is necessary to import the Uruguayan case?

As it has been discussed through this paper, Argentina's governance went through different political and economic crises, which demonstrated a weak regulatory framework and lack of political will regarding the development of the energy sector. Hence, we can assume that the failure of the transition to green energies of Argentina is largely due to the environmental or contextual conditions surrounding the energy policy.

In this section it is deeply explained the specific conditions that represent the main restrictions for the smooth transition to renewables in developing countries, taking into consideration the case of Argentina. Indeed,

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<sup>58</sup> María Florencia Zabaloy, C. Guzowski , "ENERGY TRANSITION POLICY FROM FOSSIL FUELS TO RENEWABLE ENERGY: THE CASE OF ARGENTINA, BRAZIL AND URUGUAY IN 1970.2016 PERIOD", ResearchGate, December, 2018.  
[https://www.researchgate.net/publication/334170790\\_ENERGY\\_TRANSITION\\_POLICY\\_FROM\\_FOSSIL\\_FUELS\\_TO\\_RENEWABLE\\_ENERGY\\_THE\\_CASE\\_OF\\_ARGENTINA\\_BRAZIL\\_AND\\_URUGUAY\\_IN\\_19702016\\_PERIOD](https://www.researchgate.net/publication/334170790_ENERGY_TRANSITION_POLICY_FROM_FOSSIL_FUELS_TO_RENEWABLE_ENERGY_THE_CASE_OF_ARGENTINA_BRAZIL_AND_URUGUAY_IN_19702016_PERIOD)

financing the investments of renewables is still the principal challenge for this country, as it has experienced a shortage of foreign financing which is vital for the funding of these kind of projects. Also, in this section it is exposed the specific conditions necessary to enable the successful development of the renewable energy policies, taking as an example the Uruguayan case.

To strengthen the analysis, two interviews had been made in order to obtain first-hand data. The first interview was made to the Head of Department of “Dirección Nacional de Energía” from Uruguay, Virginia Echinope, who provided information about the regulatory framework of Uruguay, and how they achieved this extraordinary development in the last decade. The second interview was made to Marcelo Álvarez, president of Cámara Argentina de Energías Renovables (CADER), who supplied data about Argentina’s history in the development of renewable energy, regulatory framework, and the main limitations for financing projects they have right now.

#### *4.2.1. Why policies in Argentina did not performed as well as in Uruguay?*

As already mentioned, in Argentina there have been many policy instruments to promote clean energies, however there is not yet a relevant share of these energy sources in the power generation mix. The reasons why the Argentinian incentive policies were not as successful as in Uruguay are of economic, political and financial nature. The main ones were also confirmed by Marcelo Álvarez, president of Cámara Argentina de Energías Renovables (CADER) in an interview produced specifically for this study.

##### 4.2.1.1. Macroeconomic Instability

As we already seen, the history of Argentina has always been surrounded by economic and political crises. The electricity sector was intensely harmed by the macroeconomic instability in the last years due to inflation rate moving around 50% and devaluation of the Argentinian peso.

Nowadays, the country is facing possibilities of default since 2019 which creates an environment of economic instability. The reason behind this is a severe market crash after Alberto Fernandez won the elections, beating Macri who is considered more business-friendly and liberal than Fernandez’s administration. The fear that the government will deliver more interventionist economic policies has led investors to have a more conservative approach, as they worry that the country could be directed again in a more protectionist trend. This political and economic uncertainty has restrained renewable energy projects from being finished and many projects are still paused.

##### 4.2.1.2. Lack of a solid Political Plan with achievable and ambitious Guidelines

Mentioned before in earlier sections and stated in the interview by the president of CADER, one of the elements that has limited the transition to renewable energies is the lack of a viable political plan regarding renewable energy development. Certainly, Argentina did not have a solid guideline until 2015, therefore, there was not a consistent framework in which to imply incentive policies for them to work properly. Politics in Argentina are very volatile, hence, there is not a generous and united transition from one mandate to another. The guidelines proposed in one administration are likely to be changed in the next one elected, thus, there is no consistency in the process of transition to renewables and investors are unlikely to finance projects in an unstable environment like the one in this country.

#### 4.2.1.3. High Borrowing Costs

Last, but not least, Álvarez points out that one of the reasons why financing is limited for Argentina is that loans have very high rates, and this creates difficulty of access to credit to start a new project. Argentina is defined as a high credit risk country and the average WACC is 16.6%, according to his speech. However, in Uruguay the average WACC for this industry is 11%.

In this way we can assume that the contextual or environmental conditions, rather than the incentive policies applied are to blame for the failure of many of the projects presented by the Argentine government and for not being able to tackle the target of renewable energy share.

#### 4.2.1.4. Lack of Infrastructure

Another important point which Álvarez highlighted was the lack of infrastructure for the development of new projects. This is also linked to the lack of financing, as most of the infrastructure projects are done through foreign investment and it is limited. In order to maintain a well-adjusted supply-and-demand market, Argentina will need a solid transmission infrastructure. However, a shortage of financing will result in higher system cost and this means a minor possibility of expansion.

Nowadays, the conditions in Argentina's electricity market have not been favorable for international generators, transmission and distributors operators. For instance, Terna S.p.a., the Italian transmission grid operator which has been investing in Latin American countries, has focused on Uruguay or Brazil, in the past years. In fact, the Business Developer Manager for Latin American projects, Daniele Salerno, who has been interviewed, declared that Argentina is still too unstable and risky to invest in, according to their risk-profile approach. Terna S.p.a. had many opportunities to invest in this country as a transmission grid operator but opt not to because it is considered a high-risk business and they are skeptical of Argentina's long-term financial commitments.

Furthermore, in order to ensure the supply of electricity to the customers and reduce the frequency of

interruptions it is still required foreign investments on the transmission and distribution system, Álvarez suggested.

These four drivers are the ones that define why policies in Argentina did not performed as well as in Uruguay. They also led to two main consequences which are lack of access to financing and reliance on government subsidies.

#### Lack of Access to Financing and Capital Controls

According to Marcelo Álvarez, limited access to funding has been one of the principal obstacles to reach the goals set by the Argentinian government and the success of the incentive policies. The almost interrupted access to foreign financing is majorly due to the weak conditions of the energy policy environment. Also, some of the controversial policies, like the foreign exchange market controls and the constraints on the transfer of profits abroad for international companies have generated such a high uncertainty among investors that most banks and investment funds stopped granting long-term credit. Indeed, debt financing is the crucial driver to finance the transition to renewables in developing countries such as Argentina. Local banks are usually inadequate to structure long-term financing, while foreign banks continue hesitant about the country's long-term commitment to economic stability. Some projects had been completed; however, they are the minority and are only the ones which have access to international financing because of a solid balance sheet or those that use export credit agency guarantees. Nonetheless, these are few and are not enough to attain the targets the government established. Moreover, Álvarez assures that development banks and export credit agencies all stopped making disbursements for Argentinian energy projects because lender fear a sovereign default.

Another factor that is keeping investors away from Argentina is the capital controls applied, which prevent capital remittances to foreign countries. This does not only prevent international companies from investing in the country, but also weakens the currency and increases the scarcity of dollars. The capital controls are originated from the excessive foreign debt owned by Argentina, which does not seem to be restructured and repaid soon. However, the debt default should be a first thing for the new government to tackle as the solution of this implies that Argentina will finally have access to international capital and credit markets.

#### Reliance on Government Subsidies

Álvarez mentions with deep concern the reliance on government subsidies by CAMMESA (Compañía Administradora del Mercado Mayorista Eléctrico SA) to make the payments to the power-generation

companies. In 2019, there was a persistent volatility in payments from CAMMESA as the government tried to lower the fiscal deficit, which showed clearly the heavy sector's exposure to receive subsidies from the government. Even though CAMMESA never stopped paying the power-generation companies, the fact that it will depend even more on the government funds (as inflation still rises and the peso is in constant devaluation risk), makes Álvarez assume that payments will be even more volatile, making investors more disbelieving.

#### *4.2.2. Why the Uruguayan RE Market developed with such a High Performance?*

As we already said, Uruguay was successful in the transition to renewable energies without strong government subsidies. In 2018, the country was identified as one of the top countries in wind and solar energy generation by REN21. Furthermore, the International Renewable Energy Agency (IRENA) declares that Uruguay is an example of successful management of electricity systems with high participation of renewables.<sup>59</sup> Interviewing the Head of Department of “Dirección Nacional de Energía” from Uruguay, Virginia Echinope, it was possible to analyze in depth the conditions which allowed Uruguay to develop successful incentive policies and achieve a smooth and prosperous transition to renewable energies. The main factors which according to Virginia Echinope were the ones capable of generating this energy mix revolution are explained below.

##### 4.2.2.1. Credibility

The first fact the Head of Department of “Dirección Nacional de Energía” mentions is that Uruguay is one of the most developed countries in Latin America and has very strong politics regarding the conservation of native forests and the transformation of the energy grid. The country is known to be highly credible as it has shown an incomparable commitment in the reduction of emissions and transition to renewables. The base of this credibility aptitude is that Uruguay offers contracts for 20 years with guaranteed prices and the Executive Power exhorts UTE to purchase all generated power to producers. This is the case of the wind energy source which is one of the major energy sources in the country.

In order to accelerate the race to renewables, the Uruguayan government encourages speed in the projects. Indeed, they paid higher rates for the projects which were completed before 2015. In this way, in 2015 Uruguay was able to exceed the proposed target of 50% share of renewables in the energy mix. After 2015, the pricing decreased from \$110 per Mwh to approximately \$70 per Mwh.

To summarize, the fact that UTE has a solid track record of fulfilling their contracts, guaranteeing the purchase of all the energy produced and ensuring the return on investment, makes Uruguay one of the most

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<sup>59</sup> “URUGUAY, LEADER IN RENEWABLE ENERGIES”, Invest in Uruguay, December 18, 2019. <https://www.investinuruguay.uy/en/news/article/uruguay-lider-en-energias-renovables/>



credible countries to invest in.

#### 4.2.2.2. Strong Public Companies

In line with the credibility factor, the interviewee also mentions that Uruguay owns very solid public companies (intended as owned by public bodies), like UTE, which also improves the path for an easier access to capital from foreign and private investors. Certainly, Uruguay's energy transformation of the energy mix has been victorious because the State has facilitated that different crucial players join to collectively guarantee its completion. Indeed, the public companies of the countries are the leaders of the revolution of renewables. These have had a clear decision-making attitude, have encourage a supportive regulatory environment and a have maintain a strong partnership between with the private sector.

#### 4.2.2.3. Access to Financing and Strong Private Sector Involvement

Virginia Echinope declares that most of the investment for renewable energy projects came from the private sector. In fact, Uruguay worked together with international institutions for creating the policies in order to overcome the financial barriers. At the early stage, the country captured an initial amount of one million dollars from the Global Environment Facility in 2007 (an organization which is linked to the UN and the World Bank), and another six million dollars were placed by Uruguay's national budget for the first relevant wind energy project. The funding from the government was used to develop the technical expertise among the human resources and for the development of the policy.

Moreover, The Wind Energy Program was created after the launch of this project, which created even more interest from the private investors. Indeed, the price steadiness that Uruguay offers with the low maintenance costs that a project like this carry made this business quite appealing for foreign investors such as Nordex. Furthermore, a 20% of the resources must be domestic and stocks are also sold to the local rural owners, which implies that a portion of the revenues stay in Uruguay. In this way, the involvement of the private sector allows a better access to financing and exploitation of the industry.

#### 4.2.2.4. A Solid National Energy Policy

As we already mentioned in the past sections, in 2008, the Uruguayan government approved the "Energy Policy 2005-2030". In the interview, the long-term plan is mentioned by Virginia Echinope as one of the reasons why investment barriers could be overcome in this country. The policy does not only represent a consistent commitment to the transformation of the energy mix, but also includes targeted social and cultural impacts in the process of achieving energy efficiency, the interviewee stated. She explains that the National

Energy Policy was designed to tackle different topics apart from the obvious energy efficiency, as social and economic development of the country.

However, what is the difference that made Uruguay's Energy Policy different than the unsuccessful Argentine plan? Echinope answers that the difference is that this long-term energy plan obtained a joint support from all political parties, which was signed in 2010. Apart from that, it includes short-term, medium-term and long-term goals and guidelines to achieve the specific goals. Therefore, Uruguay has created an agreement and compromise from all the different political parties and stakeholders, where everyone is working towards the same goal under the same guidelines. Hence, we can assume that the adoption of an inclusive strategy for the construction of incentive policies to be successful in the transition to renewables is the model which better works and should be adopted by the other countries.

It is important to highlight that small countries seem to have more accessibility to develop the renewable energy sector. In this case, Uruguay is a much smaller country than Argentina and the "small is beautiful" concept rises. Small countries have an advantage against big countries in terms of organization, the link between public and private sector, infrastructure and credibility. It is easier for Uruguay which is a country with less kilometers of surface to have a strong power grid connection and public organization, motivating the foreign investors to invest in its assets.

#### *4.2.3. Necessary Conditions to Enable the Development of Renewable Energy Policies*

One of the main conclusions from the qualitative analysis is that apart from the policy and the instruments chosen, it is crucial that the framework is conducive to the policy. In order to overcome the investment barriers to achieve smooth financing in the transition to renewables in developing countries, it is vital to acknowledge that the contextual conditions in which the policy is applied are even more relevant than the policy itself.

Therefore, it is essential to keep these conditions as a priority in the process of designing strategies to develop green energy sources. Which are these conditions? After going through all this information and two key interviews, the main necessary conditions are to keep a constant economic and political stability, to create a sound regulatory framework, to build a solid infrastructure, to maintain a low cost of capital and have access to Debt Financing in order to make financing accessible, and to design a solid national energy policy with achievable and ambitious guidelines with joint support from all political parties. The public institutions and political parties must be aligned with the private investor's interest in order to reach the Uruguayan model.

### **4.3. Quantitative Analysis**

In order to strengthen the analysis, we are going to provide a quantitative evaluation of both countries in terms of return on investment and country risk. These two specific assessments will provide further support to the theory developed during the qualitative analysis gathered through the interviews and researches.

#### 4.3.1. Investment Business Models

In this section it is evaluated the differences in return when investing in a windfarm in Argentina and in Uruguay. From the chart below we can appreciate that the return in Argentina's windfarm is quite higher than the return obtained in Uruguay. Although the sources are different, as well as the studies made in two different years, for the purpose of this thesis we can assume the outcome as a good proxy of the different returns an green investor might expect in Argentina and Uruguay.

Country	ROI
Argentina	14.2%
Uruguay	10%

**Chart 9.** Comparing the return on investment of a windfarm in Argentina and in Uruguay. Source for Argentina's data: Julián Jackson, Nicolás Tarantini, "Estudio de Prefactibilidad de un Parque de Energía Eólica", ITBA, 2016. Source for Uruguay's data: "El viento es una buena inversión", UTE portal, April 25, 2018. <https://portal.ute.com.uy/noticias/el-viento-es-una-buena-inversion>

Regardless of offering a higher return, Argentina is underperforming compared to Uruguay in terms of renewable energy capacity development, as we have seen before in previous sections of this study. As better explained below, the spread between both business models does not seem to offset the country risk that keeps Argentina underachieving its renewable energy targets due to lack of private investment.

In the last 4 years, Mauricio Macri's government proposed attractive conditions that boosted Argentina's renewable energy sector. However, nowadays with Alberto Fernandez's administration several windfarm projects have been stopped. Due to coronavirus pandemic, another financial crisis is surfacing in the country and interventionist measures are being applied. In fact, capital controls are stricter, and negotiations of the sovereign debt have started. Indeed, the renewable energy industry depends mostly on foreign financing, so a renegotiation of sovereign debt and tough control over cashflows are not good news for it. The auction scheme and the renewable energy sector is not a priority in the agenda of Argentina's new government.<sup>60</sup>

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<sup>60</sup> Jonathan Gilbert, "El desarrollo de la energía limpia, en riesgo en la Argentina por el cambio de prioridades y los controles de cambio", INFOBAE ECONOMICO, January 28, 2020. <https://www.infobae.com/economia/2020/01/28/el-desarrollo-de-la-energia-limpia-en-riesgo-en-la-argentina-por-el-cambio-de-prioridades-y-los-controles-de-cambio/>

### 4.3.2. Main Indicators

In the chart below we can observe the main indicators for Argentina's economy valuation. This country has a very unstable political and economic environment. Indeed, it suffers from growth fluctuations every year.

Main Indicators	2017	2018	2019	2020	2021
<b>GDP</b> (billions USD)	642,93	519,49	445,47	443,25	481,84
<b>GDP</b> (Constant Prices, Annual % Change)	2,7	-2,5	-2,2	-5,7	4,4
<b>GDP per Capita</b> (USD)	14588	11658	9888	9731	10462
<b>General Government Balance</b> (in % of GDP)	-7	-4,4	-2,3	-0,7	-1,2
<b>General Government Gross Debt</b> (in % of GDP)	57	86	93	81	76
<b>Inflation Rate</b> (%)	25,7	34,3	53,5	N/A	N/A
<b>Current Account</b> (billions USD)	-31,6	-27,48	-5,36	1,13	-0,12
<b>Current Account</b> (in % of GDP)	-4,9	-5,2	-0,8	N/A	N/A

**Chart 10.** Argentina's economic main indicators. Source: "COUNTRY RISK OF ARGENTINA: ECONOMY", Societe Generale. Last updated: June 2020. <https://import-export.societegenerale.fr/en/country/argentina/economy-country-risk>

As reported in the table, in 2019 Argentina had a negative GDP growth of -2,2%, compared to -2,5% in 2018 and is expected to keep shrinking this year. It also shows a deficit in the General government balance (which represented -2.3% of GDP in 2019 and is estimated to get to -0.7% in 2020 and -1.2% in 2021) and in the Current Account, which might forecast another economic crisis.

Furthermore, corresponding to the IMF projections, due to the outbreak of the Coronavirus pandemic, Gross Domestic Product growth is estimated to drop to -5,7% in 2020 and raise up to 4,4% in 2021 if there is a quick subject economic recovery after COVID-19 crisis.

Moreover, inflation is 53,5% when it was 34,3% in 2018. Regarding Debt-to-GDP ratio, it doubled during Macri's administration, reaching 93% and it is not assured if the country will be able to service its debt. Nevertheless, based on IMF estimates, debt should be reduced in 2020 and 2021, to 80,8% and 76,4%, correspondingly.<sup>61</sup>

In the second chart below, we can appreciate the main indicators for Uruguay's economy valuation. Unlike Argentina, Uruguay had political and social stability in the last decades, supported by a strong

<sup>61</sup> "COUNTRY RISK OF ARGENTINA: ECONOMY", Societe Generale. Last updated: June 2020. <https://import-export.societegenerale.fr/en/country/argentina/economy-country-risk>

democracy and solid legal framework which creates the perfect environment to attract new foreign investors. Uruguay has one of the highest levels of GDP per capita in South America and most of the country is middle-class.

Main Indicators	2017	2018	2019	2020	2021
<b>GDP (billions USD)</b>	59,55	59,65	59,92	62,92	66,89
<b>GDP (Constant Prices, Annual % Change)</b>	2,6	1,6	0,2	-3	5
<b>GDP per Capita (USD)</b>	17046	17014	17029	17819	18878
<b>General Government Balance (in % of GDP)</b>	-4,1	-4,5	-4,3	-3,9	-3,7
<b>General Government Gross Debt (in % of GDP)</b>	60	63,	64	64	64
<b>Inflation Rate (%)</b>	6,2	7,6	7,9	8,8	7,9
<b>Current Account (billions USD)</b>	0,47	-3,5	-1	-1,87	-2,54
<b>Current Account (in % of GDP)</b>	0,8	0,1	0,2	-2,5	-3,1

**Chart 11.** Uruguay’s economic main indicators. Source: “COUNTRY RISK OF URUGUAY: ECONOMY”, Societe Generale. Last updated: June 2020. <https://import-export.societegenerale.fr/en/country/uruguay/economy-country-risk>

Uruguay’s growth rate was quite weak last year in just 0,2%, which can be because of the strong dependency on its neighbor countries: Brazil and Argentina. The economic crisis in Argentina surely hits Uruguay’s economy as they are solidly attached economically. Corresponding to the IMF projections from, because of the coronavirus pandemic the GDP growth is anticipated to fall to -3% in 2020 and increase to 5% in 2021. Regarding inflation, in 2019 inflation persisted a little higher than the target of 7% (at 7,9%) affecting the domestic spending of civilians. In fact, inflation rate should stay unchanged in 2020 and 2021, at 8,8% and 7,9% correspondingly.

Furthermore, public companies have performed better in these last couple of years, hence, public debt is at 64,1% of GDP, and the fiscal deficit fell. However, fiscal deficit is still at high levels (4,3% of GDP). Moreover, the general government balance is expected to decrease to -3.9% in 2020 and -3.7% in 2021 and the gross debt is likely to persist at almost the same level in 2020 and 2021.

Uruguay keeps attracting foreign investment which keeps the GDP growth rate increasing. In fact, this year’s GDP growth is associated to the construction of a second pulp mill by the Finnish group UPM. This new foreign investment will also be dedicated to the improvement of the national grid network, which will ultimately provide better infrastructure to attract investment for renewable energy projects.<sup>62</sup>

<sup>62</sup> “COUNTRY RISK OF URUGUAY: ECONOMY”, Societe Generale. Last updated: June 2020. <https://import-export.societegenerale.fr/en/country/uruguay/economy-country-risk>

### 4.3.3. *Indicator of Economic Freedom*

One key index which is important to look at in order to evaluate the attractiveness of each country for investors is the Indicator of Economic Freedom. This index “measures ten components of economic freedom, grouped into four broad categories or pillars of economic freedom: Rule of Law (property rights, freedom from corruption); Limited Government (fiscal freedom, government spending); Regulatory Efficiency (business freedom, labor freedom, monetary freedom); and Open Markets (trade freedom, investment freedom, financial freedom). Each of the freedoms within these four broad categories is individually scored on a scale of 0 to 100. A country’s overall economic freedom score is a simple average of its scores on the 10 individual freedoms.”<sup>63</sup>

Argentina’s economic freedom score is 52,2/100, while Uruguay’s is 69,6/100. In the World Rank Argentina is in place 148, while its neighbor is in place 40. Finally, in the Regional Rank Argentina gets to place 26, and again Uruguay is in a better position standing in place number 6.

From these rankings we can assume once again that Uruguay owns a more attractive environment for the foreign and private investors. It provides better quality in services as property rights, freedom from corruption, fiscal freedom, government spending. Uruguay also developed a more solid regulatory framework based on this index and is more open to markets.

### 4.3.4. *Country Risk Analysis*

In order to deepen the quantitative analysis, it is important to assess the country risk from each case study. First, it is crucial to review the definition of country risk. Country risk refers to “the uncertainty associated with investing in a particular country, and more specifically the degree to which that uncertainty could lead to losses for investors. This uncertainty can come from any number of factors including political, economic, exchange-rate, or technological influences. Country risk denotes the risk that a foreign government will default on its bonds or other financial commitments increasing transfer risk. In a broader sense, country risk is the degree to which political and economic unrest affect the securities of issuers doing business in a particular country.”<sup>64</sup>

From this definition and after going through the prior evaluation of other variables of each country, we can assume that Argentina’s country risk might be quite higher than Uruguay’s country risk. As the country risk analysis is crucial when considering investing in developing countries, we are going to examine it for both

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[export.societegenerale.fr/en/country/uruguay/economy-country-risk](https://export.societegenerale.fr/en/country/uruguay/economy-country-risk)

<sup>63</sup> “COUNTRY RISK OF URUGUAY: ECONOMY”, Societe Generale. Last updated: June 2020. <https://import-export.societegenerale.fr/en/country/uruguay/economy-country-risk>

<sup>64</sup> Gordon Scott, “Country Risk”, Investopedia, May 1, 2019. <https://www.investopedia.com/terms/c/countryrisk.asp>

cases in this section. Aspects like political instability, sovereign debt and exchange-rate risk are taken into consideration when calculating the capital risk of these nations.

	Export transactions				Commercial Risk	Direct Investments		
	Political Risk Short Term	Political Risk Medium/Long Term	Political Risk Special transactions	Premium classification OECD		Political Violence Risk	Expropriation and Government Action Risk	Currency Inconvertibility and Transfer Restriction Risk
<b>Argentina</b>	6	6	6	7	C	2	5	6
<b>Uruguay</b>	3	3	3	3	C	1	1	3

**Chart 12.** Country risk synthesizing chart. Source: Risk assessment, Credendo, May 25, 2020. <https://www.credendo.com/country-risk/argentina>

In the chart above, it is evident to see that Argentina has a higher country risk than Uruguay, being the premium classification of the OECD the biggest difference. The premium classification refers to the premium rates which are added to the cost of capital due to the credit risk of the country. In the case of Argentina, it is normal to consider a risk premium between 1% and 2%, depending on the size of the company or the stage in which the project is.<sup>65</sup>

A second reference is given by the Italian Export Credit Agency analysis: basing on Sace Simest (Italian ECA, part of the Gruppo Cassa Depositi e Prestiti), Argentina has Sovereign credit risk of 85/100, Bank credit risk of 89/100 and Corporate credit risk of 91/100, which is considered a high-country risk. On the other hand, for Uruguay the numbers are different, with Sovereign credit risk of 37/100, Bank credit risk of 56/100 and Corporate credit risk of 56/100.<sup>66</sup> Uruguay's classification of country risk is medium level.

<sup>65</sup> Ezequiel Mirazón, "Renewables in Argentina Opportunities in a new business environment", PWC Argentina, March, 2017. <https://www.pwc.com.ar/es/publicaciones/assets/renewables-in-Argentina.pdf>

<sup>66</sup> "Risk Map", Sace Simet, Gruppo CDP. <https://www.sacesimest.it/en/maps#/maps/risk-map/uy>



**Chart 13.** Latin American Risk Map. Source: “Risk Map”, Sace Simet, Gruppo cdp. <https://www.sacesimest.it/en/maps#/maps/risk-map>

To complete the picture with some quantitative figures to this country risk analysis, we are going to examine the credit ratings of both countries which is an excellent way to begin analyzing a potential investment. In fact, a sovereign risk analysis can help in creating a macroeconomic picture of the operating environment.

	Industry Group	Coupon	Maturity	Currency	Price	YTW	Rating
Argentina	Sovereign	8.75%	07/05/2024	USD	26.75	52.20%	CCC
Uruguay	Sovereign	4.50%	14/08/2024	USD	108.38	1.72%	BBB-

**Chart 14.** Argentina’s and Uruguay’s bond list. Source: “Emerging markets bond list”, ProCapital, May 22, 2020. <file:///C:/Users/a700058/Downloads/Emerging%20Markets%20Bond%20List%2005222020.pdf>

In this chart we can appreciate the details of the sovereign bonds in Argentina and Uruguay. The calculation of the current Yield is necessary in order to determine the return of the bonds. The current yield is “an investment's annual income (interest or dividends) divided by the current price of the security. Current yield represents the return an investor would expect to earn, if the owner purchased the bond and held it for a



year”.<sup>67</sup>

The calculation of the current yield is the coupon divided by the price. This would mean that the Argentinian bond yield is 32.71% and the Uruguayan bond is 4.15%. With this information and calculation, we can determine several aspects from both economies because examining a country’s bond allows us to evaluate the economic condition and strength of the country. In the end, the underlying asset for a bond is the nation itself and its capacity to grow and generate revenue.

First, when a bond is under the emission price (under USD100) suggests that the economic condition of the country is worse in the current moment than when the country emitted the bond. In this case, Argentina’s economy weaker now as the bond price is currently USD 26.75, conversely to Uruguay were the bond price is surpassed the emission price, reaching USD 108.38.

Second, we can appreciate how the price of a risky bond such as the Argentinian bond goes down as investors sell, meaning the yield on this bond increased. This explains why the yield of the Argentinian bond is much higher than the Uruguayan bond.

Third, the rating of the bond also demonstrates the strength of a country’s economy and the ability that the country has to repay its debt. A bond rating is “a letter-based credit scoring scheme used to judge the quality and creditworthiness of a bond”.<sup>68</sup>

“Investment grade bonds”, such as the Uruguayan bond, go from AAA to BBB- in Standard & Poor’s classification. The ones that have lower ratings are called “junk bonds”, like the Argentinian bond which classifies with CCC. The “junk bonds” are considered higher-risk investments; however, the Argentinian bond may be interest investors who are attracted to the high yield it offers. Contrarily, the bonds which are rated higher are perceived as safer and more stable investments.

The bond rating reveals the credit worthiness of the government that issues the bond. In the case of Argentina, with a CCC classification it shows that “is currently vulnerable, and is dependent upon favorable business, financial, and economic conditions to meet its financial commitments”. However, Uruguay is in a better position with a BBB- classification that indicates that “has adequate capacity to meet its financial commitments”.<sup>69</sup>

Furthermore, a comparison between 10-year bond from Argentina and Uruguay supports the same theory.

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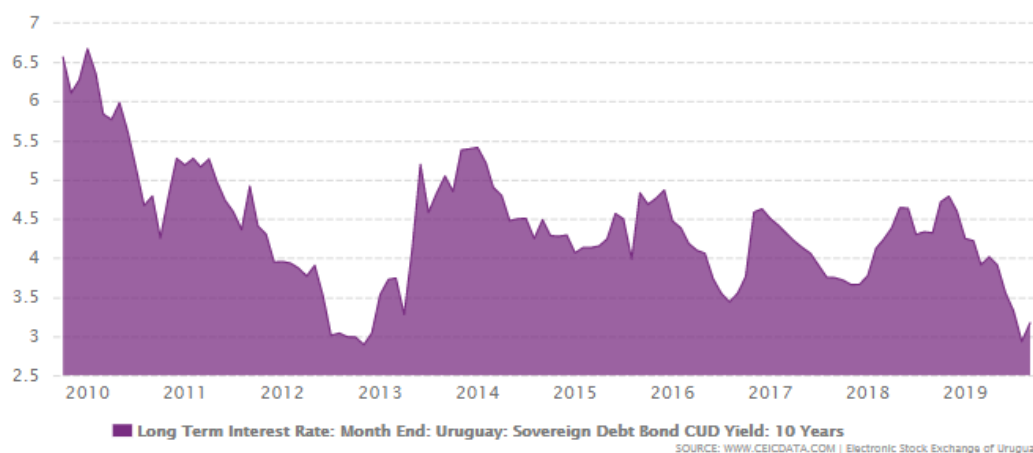
<sup>67</sup> James Chen, “Current Yield”, Investopedia, March 16, 2020. <https://www.investopedia.com/terms/c/currentyield.asp>

<sup>68</sup> James Chen, “Bond Rating”, Investopedia, March 25, 2020. <https://www.investopedia.com/terms/b/bondrating.asp>

<sup>69</sup> “Bond credit rating”, Wikipedia, March 29, 2020. [https://en.wikipedia.org/wiki/Bond\\_credit\\_rating](https://en.wikipedia.org/wiki/Bond_credit_rating)



**Chart 15.** Argentina's 10-year bond. Source: Investing. <https://www.investing.com/rates-bonds/argentina-7-year-bond-yield>



**Chart 16.** Uruguay's 10-year bond. Source: Ceicdata. <https://www.ceicdata.com/en/indicator/uruguay/long-term-interest-rate>

From this information we understand that the spread of IRR to invest in a renewable project in Argentina, rather than Uruguay, seems not to compensate the spread in the country risk. However, based on the data shown in this analysis, the spread of IRRs was 4% (14% vs 10%), while the spread in coupon was quite similar 4.25% (8.75% vs 4.5%). This means the spread of bonds is almost the same as IRR, but investors apply a further spread, for instance as they consider additional risks such as the risk of change in law.

To conclude this section, it is important to remark that investors could be more attracted to Uruguay's economic stability and creditworthiness. Several investors look at the bond rating of the country before investing in projects and Uruguay stands in a more favorable place than Argentina. In fact, from this quantitative analysis we can assume that investment barriers in Argentina are still harder to overcome than in Uruguay and surely the economic, political and regulatory environment that Uruguay owns is more propense to led to a successful implementation of incentive policies for the development of the renewable energy industry. To complete the exposure, we can also say some green investments have done in Argentina, and/or

are expected in the coming years, also driven by the availability of natural resources. However, some additional measures might boost Argentina renewable development.

#### **4.4. Recommendations for Argentina to Strengthen the Renewable Energy Policy**

To finish this study, some recommendations for Argentina's case are outlined in order to improve the conditions which restrict the potential of the energy policies. In fact, Law 27.191 should be consolidated with complementary policies to strengthen the energy policy framework.

First, the new government should promote credibility, which means demonstrating to investors that the state will not violate agreements and that the public entities involved have a strong commitment towards the energy policy. The government must create an environment of trust for foreign investors in order to unblock financing for clean sources projects.

Second, the state must guarantee the returns on investments. Indeed, the state must assure that investments are not going to be vulnerable towards the political impulses when changes in government occur. In addition, Argentina should import Uruguay's model in this case by adopting purchase guarantees of twenty years long to ensure investors the full amortization of the projects. Also, they should base the purchase prices on the generation cost and not on the spot market price, like Uruguay that 95% of their prices are based on the generation cost and not on the spot market price.<sup>70</sup> This strategy can help reducing the prices of the most relevant clean energy sources in Argentina which are wind and solar power, and put them in a better position among private investors.

Third, Argentina should be able to eliminate subsidies and increase electricity tariffs. As it was already demonstrated in this study, the decision from the government to maintain rates of electricity below costs and being supported by subsidies led into low profitability of the energy sector. The low profit margin of the sector also led in less incentives for private investors to finance this kind of projects. Hence, the state should pass a portion of the costs to consumers in order to equilibrate the demand and turn Argentina into an energy exporter again, or at least, stop importing energy from Uruguay and neighbor countries.

Finally, the new government should work to build a solid infrastructure in order mitigate the investment barriers to encourage the financing of renewable energy projects. Argentina counts with a very beneficial environment of plentiful renewable resources, however there is not a developed transmission grid to support the expansion of the clean energy projects. Taking into consideration the Uruguayan case, Argentina should use a percentage of the national budget to build new transmission lines across the country in order to promote investment among private investors.

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<sup>70</sup> Virginia Echinope, Head of Department of "Dirección Nacional de Energía" from Uruguay, interview.

## Conclusions

In this research it is shown and investigated that general policies for renewable sources have been quite similar in the two developing countries analyzed. However, the results of this thesis indicate that Argentina has had a much lower performance in the implementation of the energy transition in comparison to Uruguay, also due to regulatory and economic barriers no matter what economic instruments were applied. Therefore, it is a fact that the implementation of similar policies in these cases led to different results. The first thing we can assume from this affirmation is that the simple application of incentive policies, in some cases, is not enough in order to mitigate investment barriers in developing countries.

Moreover, another conclusion made from this study is that the successful implementation of the economic instrument depends on the context in which it is used. By analyzing the policies applied by these countries throughout history and by interviewing some of the leaders of the energy sector from both nations, the evidence shows that it is not enough to develop the policies and instruments, but there is also the need to create a conducive framework for that policy to perform efficiently. In fact, in section two it is stated that usually the Feed-in system has been a very useful mechanism to develop the energy projects, nevertheless, it represented a failure for Argentina. Contrarily, Uruguay was very successful by implementing the bidding system which is not an instrument normally suggested in the international evidence, especially at the early development stage for renewables. Therefore, the effectiveness of the incentive policies does not depend on themselves only, but on the framework in which they are applied, which includes macroeconomic, political and institutional aspects which must be taken into consideration. These contextual conditions are the ones that made Argentina short of private investment to develop renewable energy projects and ultimately, could not reach the targets proposed.

Indeed, as demonstrated in section 4, Argentina's low performance on renewable energy is mainly due to macroeconomic instability, lack of a solid political plan with achievable guidelines, lack of access to financing and capital controls, lack of infrastructure, reliance on government subsidies and high borrowing costs. However, it is important to mention that Argentina still owns a vast amount of natural resources and it has many opportunities regarding the energy sector, not yet exploited due to the barriers recently mentioned. By studying in depth, the "lack of a solid political plan" of Argentina, this research supports that the policies used to promote renewable energy sources in this country are isolated solutions, which reveals a lack of a long-term plan from the state. On the other hand, Uruguay implemented a long-term planning strategy with full support from all political parties, which resulted in a transformative outcome on low-carbon energy development. Thus, the investigation concludes that it is particularly necessary to tackle the energy sector

development as a multidimensional project, including social, economic, cultural, and technological targets with short, medium- and long-term goals acting as guidelines to monitor the process. The transition to renewables should not be faced as isolated energy wise policies, but as a robust long-term plan with diverse objectives from diverse sectors.

Finally, it is important to highlight that from the research we determined that the successful transition to renewables summarizes in the ability of attracting private and foreign investors. This is done by creating a stable regulatory environment, generating credibility and having strong public companies that involve the private sector through a strong partnership. Consequently, these factors inspire trust among investors who will be more interested in renewable energy projects proposals. This happens to be the case of Uruguay, which was able to tackle all the necessary conditions to enable the development of renewable energy policies. As already explained in section 4, the country achieved the trust from investors by deploying a percentage of the national budget to finance the first round of renewable energy projects. With this public funding, Uruguay built a supporting framework for renewable energy development that granted private investment to flow, resulting in a fast wind power implementation.

Therefore, it is essential to be address these conditions at the time of designing strategies to promote green energy sources in order to choose efficiently the correct instruments and encourage a successful performance. It is crucial to elaborate government policies that tackle and modify these conditions that constrain the potential of the energy policies.

To end, this study proposes that there is an opportunity for Argentinian stakeholders to participate further and in a more connected way in order to create a stable framework for incentive policies to be implemented successfully and mitigate investment barriers. As a result, Argentina and any developing country will be able to achieve a smooth flow of investment from the private sector and finance the transition to renewable energy.

## Bibliography

Frewin, Chris. Student Energy, accessed March 3<sup>rd</sup>, 2020, Available at:

<https://www.studentenergy.org/topics/renewable-energy>

Comunicado de Prensa, “Renovables representan hoy una tercera parte de la capacidad energética global”, IRENA, 2018, Available at:

[https://www.irena.org/-/media/Files/IRENA/Agency/Press-Release/2019/Apr/IRENA\\_Capacity-Growth-2018\\_Press-Release-Spanish.pdf?la=en&hash=E47EA2EFB7D1049EECDCC402F4FD346EDADB00DA](https://www.irena.org/-/media/Files/IRENA/Agency/Press-Release/2019/Apr/IRENA_Capacity-Growth-2018_Press-Release-Spanish.pdf?la=en&hash=E47EA2EFB7D1049EECDCC402F4FD346EDADB00DA).

“La energía renovable representa ya un tercio de la capacidad energética mundial, según IRENA”, UNFCCC Site, April 4th, 2019, Available at:

<https://unfccc.int/es/news/la-energia-renovable-representa-ya-un-tercio-de-la-capacidad-energetica-mundial-segun-irena>

“Global trends in Renewable Energy Investment 2019”, Frankfurt School-UNEP Centre/BNEF, 2019.

Available at:

<https://wedocs.unep.org/bitstream/handle/20.500.11822/29752/GTR2019.pdf>

“Global landscape of Renewable Energy Finance”, IRENA, 2018. Available at:

<https://www.irena.org/->

[/media/Files/IRENA/Agency/Publication/2018/Jan/IRENA\\_Global\\_landscape\\_RE\\_finance\\_2018.pdf](https://www.irena.org/-/media/Files/IRENA/Agency/Publication/2018/Jan/IRENA_Global_landscape_RE_finance_2018.pdf)

Donastorg, Renukappa, Suresh, “Financing Renewable Energy Projects in Developing Countries: A Critical Review”, IOP Conference Series: Earth and Environmental Science, 2017. Available at:

[https://www.researchgate.net/publication/319561866\\_Financing\\_Renewable\\_Energy\\_Projects\\_in\\_Developing\\_Countries\\_A\\_Critical\\_Review](https://www.researchgate.net/publication/319561866_Financing_Renewable_Energy_Projects_in_Developing_Countries_A_Critical_Review)

“Fossil fuel energy consumption (% of total)”, IEA Statistics © OECD/IEA, The World Bank, 2014.

Available at:

<https://data.worldbank.org/indicator/EG.USE.COMM.FO.ZS>

Seetharaman, Krishna Moorthy, Nitin Patwa, Saravanan, and Yash Gupta, “Breaking barriers in deployment of renewable energy”, US National Library of Medicine National Institutes of Health, January 5th, 2019. Available at:

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6351575/>

Dorcas Kariuki, “Barriers to Renewable Energy Technologies Development”, Energy Today, January 25th, 2018. Available at:

<https://www.energytoday.net/economics-policy/barriers-renewable-energy-technologies-development/#:~:text=In%20the%20essay%2C%20these%20barriers,economic%20barriers%2C%20and%20geographical%20and>

WiseGEEK. “What is an incentive Policy?” Available at:

<https://www.wisegeek.com/what-is-an-incentive-policy.htm#didyouknowout>

Pablo Benitez, “Policy Instruments for Renewable Energy: An Introduction”, World Bank Institute, Climate Change Practice, World Bank, September 18, 2012. Available at:

<https://esmap.org/sites/default/files/esmap-files/ESMAP%20IFC%20Re%20Training%20World%20Bank%20Benitez.pdf>

Pablo Benitez, “Policy Instruments for Renewable Energy: An Introduction”, World Bank Institute, Climate Change Practice, World Bank, September 18, 2012. Available at:

<https://esmap.org/sites/default/files/esmap-files/ESMAP%20IFC%20Re%20Training%20World%20Bank%20Benitez.pdf>

S. Keyuraphana, Thanaraka, Ketjoya, Rakwichiana, “Subsidy schemes of renewable energy policy for electricity generation in Thailand”, School of Renewable Energy Technology, Naresuan University, SciVerse ScienceDirect, September 30, 2011. Available at:

<https://www.sciencedirect.com/science/article/pii/S1877705812013409>

Friedemann Polzina, Florian Egliebjarne, Steffen Tobias, S.Schmidt, “How do policies mobilize private finance for renewable energy? A systematic review with an investor perspective”, ScienceDirect, February 15, 2019. Available at:

<https://www.sciencedirect.com/science/article/pii/S030626191831818X>

Páez, Aquiles. “Para el 2020: Las Energías Renovables serán el 26% de la electricidad mundial”, Revista

Digital, October 14<sup>th</sup>, 2015, Available at:

<https://revistadigital.inesem.es/gestion-integrada/para-el-2020-las-energias-renovables-seran-el-26-de-la-electricidad-mundial/>

“What is a green certificate?”, Kyos Analytics., Available at:

[https://www.kyos.com/faq/green-certificate/#:~:text=A%20green%20certificate%20is%20a,renewable%20\(green\)%20energy%20source.&text=It%20is%20an%20alternative%20to,benefits%20and%20feed%2Din%20tariffs.](https://www.kyos.com/faq/green-certificate/#:~:text=A%20green%20certificate%20is%20a,renewable%20(green)%20energy%20source.&text=It%20is%20an%20alternative%20to,benefits%20and%20feed%2Din%20tariffs.)

Hugo Lucas, Rabia Ferroukhi, Diala Hawila, “Renewable Energy Auctions in Developing Countries”, IRENA, 2013. Available at:

[https://www.irena.org/documentdownloads/publications/irena\\_renewable\\_energy\\_auctions\\_in\\_developing\\_countries.pdf](https://www.irena.org/documentdownloads/publications/irena_renewable_energy_auctions_in_developing_countries.pdf)

Bernardo Sarti, “Policies for the Deployment of Renewable Energies: An Overview”, University of Pennsylvania, Social Impact Research Experience (SIRE), 2018. Available at:

<https://repository.upenn.edu/cgi/viewcontent.cgi?article=1063&context=sire>

Friedemann Polzina, Florian Eglubjarne, Steffen Tobias, S.Schmidt, “How do policies mobilize private finance for renewable energy? A systematic review with an investor perspective”, ScienceDirect, February 15, 2019. Available at:

<https://www.sciencedirect.com/science/article/pii/S030626191831818X>

Ezequiel Mirazón, “Renewables in Argentina Opportunities in a new business environment”, PWC Argentina, March, 2017. Available at:

<https://www.pwc.com.ar/es/publicaciones/assets/renewables-in-Argentina.pdf>

Marina Yesica Recalde, Daniel Hugo Bouille and Leónidas Osvaldo Girardin, “Limitations for renewable energy development in Argentina”, Revista Problemas del Desarrollo Volume 46, Number 183, January 13, 2015. Available at:

<http://www.scielo.org.mx/pdf/prode/v46n183/0301-7036-prode-46-183-00089-en.pdf>

Mauro G. Soares, “Innovation in renewable energy policies in Argentina”, EOS Energía, August, 2018. Available at:

<https://climatestrategies.org/wp-content/uploads/2018/04/Innovation-in-RE-Policies-in-Argentina-MAURO-SOARES-August-2018.pdf>

“The renewable energy sector is slowed in Argentina”, Reve, 27 August, 2019. Available at:



<https://www.evwind.es/2019/08/27/the-renewable-energy-sector-is-slowed-in-argentina/70517>

Ignacio Ferreiro, “El 5% de la electricidad de la Argentina viene de fuentes renovables”, Chequeado, 28 August, 2019. Available at:

<https://chequeado.com/el-explicador/5-de-la-electricidad-de-la-argentina-viene-de-fuentes-renovables/>

R.Espinasa, A. Bonzi, F.Anaya, “Dossier Energético: Uruguay”, BID, Enero, 2017, Available at:

<https://publications.iadb.org/publications/spanish/document/Dossier-energ%C3%A9tico-Uruguay.pdf>

M. Netto, M. Cabrera, J. Gomes Lorenzo, “Expansión de las energías renovables no convencionales en América Latina y el Caribe”, Monografía del BID ; 458, 2016.

MIEM. “Balance Energético 2017”, 2017, p. 124.

MIEM. “Balance Energético 2018”. Available at:

<https://ben.miem.gub.uy/oferta3.htm>

GEF. 2013. “Programa de Energía Eólica en Uruguay (PEEU)”. Available at:

<https://www.thegef.org/project/uruguay-wind-energy-programme-uwep>

Jonathan Watts, “Uruguay makes dramatic shift to nearly 95% electricity from clean energy”, The Guardian, December 3rd, 2015. Available at: <https://www.theguardian.com/environment/2015/dec/03/uruguay-makes-dramatic-shift-to-nearly-95-clean-energy>

Noelia Lopez Redondo, “Uruguay funcionó al 98% con energías renovables en 2019”, Energy News, January 15th, 2020. Available at:

<https://www.ambientum.com/ambientum/energia/uruguay-funciono-98-con-energias-renovables-en-2019.asp>

Pablo Aguirregaray, “Presente y futuro de las energías renovables en Uruguay”, Oficina de Planeamiento y Presupuesto, March, 2019. Available at:

[https://estrategiadesarrollo2050.gub.uy/sites/default/files/inline-files/12\\_%20Presente%20y%20futuro%20de%20las%20Energ%C3%ADas%20Renovables%20en%20Uruguay.pdf](https://estrategiadesarrollo2050.gub.uy/sites/default/files/inline-files/12_%20Presente%20y%20futuro%20de%20las%20Energ%C3%ADas%20Renovables%20en%20Uruguay.pdf)

“El 56,5 % de la energía eléctrica de Uruguay proviene de fuentes renovables”, EFE, April 21, 2016.

<https://www.efe.com/efe/america/economia/el-56-5-de-la-energia-electrica-uruguay-proviene-fuentes-renovables/20000011-2904130#>

R. Lindsey and L. Dahlman, Climate Change: Global Temperature, 2020, Available at:  
<https://www.climate.gov/news-features/understanding-climate/climate-change-global-temperature>

“Sustainable Development Goals”, United Nations. Accessed March 4<sup>th</sup>, 2020, Available at:  
<https://sustainabledevelopment.un.org/?menu=1300>.

Diego Velázquez Terranova, “El sector de las Energías Renovables en Uruguay”, ICEX, May, 2012.  
Available at:  
<https://www.camarazaragoza.com/exterior/BoletinNET/docs/DocumentoHerramienta187.pdf>

M. Muñoz, A. Lopez-Peña, G. Kieffer, A. Khalid, R. Ferroukhi, “Renewable Energy Policy Brief”, IRENA, June, 2015. Available at:  
[https://www.irena.org/-/media/Files/IRENA/Agency/Publication/2015/IRENA\\_RE\\_Latin\\_America\\_Policies/IRENA\\_RE\\_Latin\\_America\\_Policies\\_2015\\_Country\\_Uruguay.pdf?la=en&hash=A76CA561F1B9FE54B25756097F5A55D20ED8EB33](https://www.irena.org/-/media/Files/IRENA/Agency/Publication/2015/IRENA_RE_Latin_America_Policies/IRENA_RE_Latin_America_Policies_2015_Country_Uruguay.pdf?la=en&hash=A76CA561F1B9FE54B25756097F5A55D20ED8EB33)

André Boekhoudt, “Taxes and incentives for renewable energy”, KPMG International, 2014. Available at:  
<https://assets.kpmg/content/dam/kpmg/pdf/2014/09/taxes-incentives-renewable-energy-v1.pdf>

“¿Qué es el Protocolo de Kyoto?”, United Nations Climate Change, 2020. Available at:  
[https://unfccc.int/es/kyoto\\_protocol](https://unfccc.int/es/kyoto_protocol)

“Plan nacional de respuesta al cambio climático”, Sistema Nacional de Respuesta al Cambio Climático y la Variabilidad, MVOTMA, January, 2010.

María Florencia Zabaloy, C. Guzowski, “Energy transition policy from fossil fuels to renewable energy: The case of Argentina, Brazil and Uruguay in 1970.2016 period”, ResearchGate, December, 2018. Available at:  
[https://www.researchgate.net/publication/334170790\\_ENERGY\\_TRANSITION\\_POLICY\\_FROM\\_FOSSIL\\_FUELS\\_TO\\_RENEWABLE\\_ENERGY\\_THE\\_CASE\\_OF\\_ARGENTINA\\_BRAZIL\\_AND\\_URUGUAY\\_IN\\_19702016\\_PERIOD](https://www.researchgate.net/publication/334170790_ENERGY_TRANSITION_POLICY_FROM_FOSSIL_FUELS_TO_RENEWABLE_ENERGY_THE_CASE_OF_ARGENTINA_BRAZIL_AND_URUGUAY_IN_19702016_PERIOD)

“Uruguay, leader in renewable energies”, Invest in Uruguay, December 18, 2019. Available at:

<https://www.investinuruguay.uy/en/news/article/uruguay-lider-en-energias-renovables/>

Julián Jackson, Nicolás Tarantini, “Estudio de Prefactibilidad de un Parque de Energía Eólica”, ITBA, 2016. Source for Uruguay’s data: “El viento es una buena inversión”, UTE portal, April 25, 2018. Available at: <https://portal.ute.com.uy/noticias/el-viento-es-una-buena-inversion>

Jonathan Gilbert, “El desarrollo de la energía limpia, en riesgo en la Argentina por el cambio de prioridades y los controles de cambio”, Infobae Economico, January 28, 2020. Available at: <https://www.infobae.com/economia/2020/01/28/el-desarrollo-de-la-energia-limpia-en-riesgo-en-la-argentina-por-el-cambio-de-prioridades-y-los-controles-de-cambio/>

“Country risk of Argentina: Economy”, Societe Generale. Last updated: June 2020. Available at: <https://import-export.societegenerale.fr/en/country/argentina/economy-country-risk>

“Country risk of Uruguay: Economy”, Societe Generale. Last updated: June 2020. Available at: <https://import-export.societegenerale.fr/en/country/uruguay/economy-country-risk>

Gordon Scott, “Country Risk”, Investopedia, May 1, 2019. Available at: <https://www.investopedia.com/terms/c/countryrisk.asp>

Ezequiel Mirazón, “Renewables in Argentina Opportunities in a new business environment”, PWC Argentina, March, 2017. Available at: <https://www.pwc.com.ar/es/publicaciones/assets/renewables-in-Argentina.pdf>

“Risk Map”, Sace Simet, Gruppo CDP. Available at: <https://www.sacesimest.it/en/maps#/maps/risk-map/uy>

“Emerging markets bond list”, ProCapital, May 22, 2020. Available at: <file:///C:/Users/a700058/Downloads/Emerging%20Markets%20Bond%20List%2005222020.pdf>

James Chen, “Current Yield”, Investopedia, March 16, 2020. Available at: <https://www.investopedia.com/terms/c/currentyield.asp>

James Chen, “Bond Rating”, Investopedia, March 25, 2020. Available at: <https://www.investopedia.com/terms/b/bondrating.asp>

“Bond credit rating”, Wikipedia, March 29, 2020. Available at:  
[https://en.wikipedia.org/wiki/Bond\\_credit\\_rating](https://en.wikipedia.org/wiki/Bond_credit_rating)

## Final Summary

Renewable energy is a critical part of reducing global carbon emissions and fighting the global warming crisis which is present in the world nowadays. The transition from non-renewable sources of electricity like coal, natural gas and oil, has been a priority for all nations. Today, non-renewables still supply a vast majority of the world's electricity demand, but trends have changed and are still changing. Scaling up renewables gives the world the opportunity to meet energy needs to support economic development and growth and at the same time pursue social, environmental and climate objectives. The energy transition has been always led by developed countries, however, since 2015 developing countries are leading in global investments in renewables. Although developing countries have been able to progress in the transition to renewables and technology costs have been falling progressively, underlying market barriers and a perception of high risk still constrain the development and financing of renewable energy projects in these countries. Indeed, the energy transition requires a significant increase in renewable energy investment compared to current levels and, since public resources are limited, most of the new investments in renewables have to come from the private sector. Hence, scaling up renewable energy investments will also depend on the ability of policy makers and public finance institutions to address different investment constraints and crowd in private finance.

This research attempts to study the influence of policy instruments on the renewable sector and specifically, if they are effective enough to mitigate investment barriers and open the capital market for financing the transition from non-renewables to renewables in developing countries. This study also aims to identify the key factors affecting the private investor's decision to enter the renewable energy market determining the effectiveness of incentive policies for attracting private investment. The focus is on defining if the incentive policies depend on something else to be efficient, or if they can act independently to create the conditions to open-up markets for investment.

The development of the renewable energy market has been stronger in the last decade than ever before. Indeed, the renewables share was 8.6% in the global energy mix in 2010 and nowadays it represents one third of the world's energy capacity, according to the International Renewable Energy Agency (IRENA). Renewable energy sources, such as solar and wind, are becoming more efficient and accessible every day. As a result, the possibilities for people and nations to incorporate and adopt this kind of technology into their lifestyles have increased. Currently, the generation capacity associated with renewable energies has been surpassing other energy sources such as natural gas.

The result of the effort from all countries, developed and developing, have been mostly seen in the last decade, reaching a one third generation of the total energy capacity from renewables. Nevertheless, there is still a long way to solve the challenge as there is still an immense need to decrease the use of fossil fuels, which even now constitute the major source in the energy generation and consumption. More progress needs to be done in the integration of renewables in the industries and final consumers, in the incentive policies

generated by nations and in unlocking public and private investment flows for this cause. This is explained clearly by the General Director of IRENA, Adnan Z. Amin., who said that “The deployment of renewable energy must grow even faster to ensure that we can achieve global climate goals and the Sustainable Development Goals. Countries that take full advantage of their renewable energy potential will benefit from a series of socio-economic benefits, in addition to decarbonizing their economies.” Moreover, during this last decade renewable energy capacity has expanded considerably due to the high amount of investment made on these projects. It is important to highlight that the level of investment is strictly correlated to the implementation of supporting policies. By this fact we can assume that policies encourage investment decision on clean energy projects.

Regarding the financing of the projects, around the 90% of the green energy investments comes from private investors. However, public investment is a crucial part of encouraging the financing of renewables, as it drives the incentive policies design, it covers the project risk and helps create a proper credibility framework for the private sector. Furthermore, the most popular trend worldwide is to use project finance in renewable energy investments. It is used a mix of commercial debt and equity where the debt-to-equity ratio floats around 60% and 70%. Contrarily, grants and concessional finance plays a minor role in financing the transition to renewables worldwide.

As already mentioned, incentive policies push many renewable energy investment decisions, and this is the reason why investment tendencies differ from country to country. Nevertheless, a trend that keeps growing in this last decade is that investment is more spread across the globe and not concentrated on few developed countries. Indeed, there is a predisposition to see developing countries taking the lead. In this year, countries like China, India, Brazil, South Africa, Mexico, Chile, Morocco, Uruguay, the Philippines, Pakistan and Honduras, invested approximately 156 billion dollars in clean energy investments, however, developed countries invested only 130 billion dollars. Nevertheless, investment barriers still exist specifically for developing countries and they strive to find financing from the private sector. The barriers are technological, political and institutional, financial and economic, and social.

In this research we have taken as sample two developing countries to examine if the application of incentive policies is enough to mitigate investment barriers: Argentina and Uruguay. These countries were chosen because they are neighbor developing countries, both with strong natural resources and reflect high potential for the development of renewable energy technologies.

In the research we found out that Argentina had a lack of stable energy policies for two and a half decades. Until 2001, the country experimented privatization, contracts in US dollars, lack of strong planning and little government control. From 2002 to 2015, there was a “pesification” of prices (prices in Argentinian Peso), foreign exchange restrictions, subsidies, under investment, under supply, government intervention and again, lack of strong planning. The first relevant transformation in the present era to construct a solid framework for the development of the renewable energy sector was Law N.27.191, which was published in 2015 and determined that renewables should reach 20% of the energy mix by 2025. The possible success of

the Law was based on three pillars, which are, “Plan RenovAR”, the use of long-term power purchase agreements (PPA’s) and CAMMESA, as better explained below. In 2016, Macri introduced Plan RenovAR, a 10 years plan to attract investments of a sum of fifteen billion dollars for the renewable energy projects. It is a program which consists of regular public biddings through which the different companies submit their investment projects and the price at which they are willing to sell their capacity. There were three rounds of biddings until now, achieving 147 awarded projects with 4,466 MW of total awarded capacity and 15,836 GWh per year. Furthermore, the use of PPAs was the tool selected by the Argentinian government in order to support the mandates and speed up the development of the market. The Power Purchase Agreements are signed in US dollars because it safeguards the sales of the investors without getting exposed to devaluations of the Argentinian Peso, which frequently happens. CAMMESA is the company that operates the electricity wholesale market in Argentina and the one that controls these agreements. It is important to highlight that the PPA mechanism contributes to overcome the barrier of lack of financing from private investors.

However, the obstacle is still present, thus, Argentina applied a series of assistance instruments to provide more flexibility in the financing of renewable energy projects. The government created the “Trust Fund for Renewable Energy” (FODER), which offers payment guarantees for all tendered PPA’s in addition to project financing support. FODER is funded by treasury funds, public offerings and multilaterals. Renewable energy projects can also be financed by Project Finance, a financing structure in which debt and equity are used to finance the project and is paid back from the generated cash flow of the project.

In terms of economic competitiveness, the average sale price of wind and solar generated energy rounds 54 USD/MWh. Therefore, the prices observed in the bidding process in Argentina are still highly competitive compared with the ones from its neighbor countries, like Uruguay. In the present, there are 49 projects in operation and 102 under construction, which are pushing to follow the set goals established by Law 27.191 in 2015 which were outlined in the past section of this study. It targeted that for 2019, 12% of the total energy matrix must come from clean sources and achieve 20% in 2025. However, the renewable energy sector is slowed in Argentina, as Macri’s administration was not re-elected, which was the one responsible for most of the renewable energy programs such as RenovAr. Instead, Alberto Fernández was chosen as President and there was huge uncertainty regarding how plans would change. Over that, the Coronavirus sanitary crisis appeared and paused the development of the energy sector. It is still undetermined what this new government’s policies regarding green energy will be and it is difficult to know because it depends on many externalities. What we do know is that the country risk of Argentina is quite high, and the energy sector is a capital-intensive industry, where heavy investment is required to complete a project. Indeed, the dollar return rate is around 13% per year and businesses are financed at 8%, which is expensive compared to neighbor countries. This means that generating green energy projects in Argentina is less encouraging for investors than in other countries in Latin America. The effect of all this political uncertainty and expensive cost of capital has led to a share of clean energy of only 5% in electricity generation in 2019, which is far behind the 12% which was targeted in the Law 27.191 in 2015. Although the goals were not reached, Maximiliano Morrone, National

Director of Promotion of Renewable Energies and Energy Efficiency of the Ministry of Energy, explains: "With the projects already tendered and estimating how much demand is going to increase, by 2021 we should be at 15% ". Thus, he assures that by 2021 the green energy share will be tripled compared to the 2019 reality. However, these objectives are far from being achieved and this kind of statement are quite optimistic based on the real situation Argentina is going through nowadays.

As an opposite example, in just 14 years (2005-2019) Uruguay experienced impressive growth in the renewable energy mix, driven by a modern and transparent regulatory framework, efficient award schemes, tax incentives to the private sector, and increasing levels of sophistication and innovation, which increased the bankability of the projects. As a result, the country has slashed its carbon footprint and lowered electricity costs, without strong government subsidies. Nowadays, renewables provide 98% of the country's electricity and there are also fewer power cuts because a diverse energy mix means greater resilience to droughts. Uruguay is being recognized for the progress on decarbonizing its economy. It has been praised by the World Bank and the Economic commission for Latin America and the Caribbean naming Uruguay among its "Green Energy Leaders", declaring: "The country is defining global trends in renewable energy investment." The energy investment for renewables in Uruguay over the past five years has surged to \$7 billion, or 15% of the country's annual GDP, which is five times the average in Latin America.

Uruguay has surely won the decarbonization race to its neighbor, Argentina, as it was declared by Ramón Méndez, Uruguay's head of climate policy: "For three years we haven't imported a single kilowatt hour. We used to be reliant on electricity imports from Argentina, but now we export to them. Last summer, we sold a third of our power generation to them."

The country has managed to exceed their goals and reached 98% of the electricity consumed coming from renewable sources. The strategy for this little country is that the energy mix is quite varied: the biggest portion coming from hydraulic energy (55.6%), followed by wind energy (33.6%), biomass (6%), photovoltaic (2.8%) and thermal (2%). Last year, 2019, apart from being the record year for renewables, was the highest sum for electricity generation, which reached 14,000 GWh and also for exported electricity, as mentioned before in Ramón Méndez quote. Concerning energy exports, around 3,000 GWh were sold to Brazil and Argentina during 2019, which accounts as 21% of Uruguayan electricity demand. Indeed, 80% of the total exported went to Argentina, and the remaining 20% to Brazil. These numbers show again that Uruguay did not only won the decarbonization race with Argentina but also transitioned from being an energy importer from Argentina, to being an energy exporter to them.

The main driver for Uruguay's success was The National Energy Policy which is a complete, long-term energy plan in which the main objectives are to diversify the energy mix, reduce dependency from fossil fuels, improve energy efficiency, and increase the use of domestic resources. Indeed, the main specific goals set by the energy policy are:

- 1) The creation of a robust electric power supply system that meets the supply at the lowest possible cost.



- 2) Improve forms of access of fossil resources, reducing the impact of fuel imports on the national economy.
- 3) Definition of the participation of Natural Gas in the energy matrix.
- 4) Incorporation of alternative energy sources.

It is important to highlight that these goals were based on four main strategic guidelines:

- 1) Directive role of the State, with regulated participation of private actors.
- 2) Diversification of the energy matrix (sources and suppliers).
- 3) Promote energy efficiency in all sectors of activity.
- 4) Ensure adequate access to energy for all social sectors.

The plan started in 2005, following years of underinvestment and a change of government which made the beginning of the initiative a little bit controversial. The overall energy strategy was discussed during the years 2005 to 2007, but finally approved in 2008. In 2010 it was recognized by all political parties represented in the Congress. This was a big step for the future of the renewable energy market in Uruguay, as it meant that the commitment was taken by all parties which could be in power in the next 25 years and it was expected that the plan would be maintained even under a change of government. Certainly, this was respected and led to the Uruguay we see today in terms of energy.

The first target set by the strategic plan was reaching 50% of primary energy from renewable energy sources by 2015, which was exceeded by 6.5% that year (a total of 56.5% of Uruguay's electrical energy came from renewable sources in 2015). In order to achieve the goals set by the energy policy, a set of measures were implemented through decrees and resolutions. The legal decree with the greatest impact was given by the exhortation decrees to UTE to hire renewable source power. The Decree 77/006 instructed UTE to enter into contracts for the sale of energy coming from renewable sources, for a total of no more than 60 MW, initially distributed equally among three sources: wind, biomass and small hydroelectric plants. If that quota was not reached for some of the sources, the remaining power would be distributed among the remaining sources. We can assume that the Decree 77/006 had a strong intention of the market interest in diversifying the generation of energy through different sources. On a side note, it is important to highlight that auctions have been the main instrument for the promotion of renewable electricity in Uruguay. The process works quite easy and is controlled by UTE, which awards power purchase agreements (PPAs) to successful bidders. All auctions are subject to a bidding guarantee of 1% of the expected 10-year income.

In the chart displayed below, it is summarized the targeted share of renewables of each country, the actual and real share of renewables achieved and the main policies which drive the share of renewables nowadays. It is evident the different outcomes between both cases.

	Argentina	Uruguay
Targeted share of renewables 2025	20%	Around 100%
Actual share of renewables	10%	98%
Main polices which drive RE share	Law N. 27.191	Law N. 16.906
	RenovAr	National Energy Policy 2005-2030

In the successful case of Uruguay, the main mechanism to promote renewable energy projects is the bidding system. The contracts are awarded for twenty years for projects with an installed capacity lower than 10 MW. Furthermore, Uruguay uses a Net Metering process, which is not used by Argentina. Also, Uruguay was a pioneer in the application of complementary regulations which constituted a vital factor to promote renewable energy projects in the country. On the other hand, Argentina did not have a solid complementary regulation framework until 2015 with the creation of Law 27.191.

The Argentinian case is quite different to Uruguay's profitable model, as Argentina's main incentive system for decades was the Feed-in Premium, which was implemented by GENREN program. Only after the RenovAr program was launched, Argentina started implementing the bidding system.

Both cases use the quota system both in order to target a minimum percentage of clean energy sources in electricity generation. In the case of Argentina, they established 12% for 2019, which was not met, and 20% for 2025, which is still hard to be met. In the case of Uruguay, the government targeted 50% share of renewables in the energy mix by 2015, which was exceeded, and by 2019 they already had 98% accomplished.

In comparison, Uruguay had better results than Argentina. From this last section we can assume that the implementation of the Feed-in scheme was not the best mechanism for Argentina to use. Indeed, Argentina failed to determine the premium to be paid by generators which later gave unsatisfactory results.

Moreover, as we analyze the public policies implemented by both countries, we can conclude that Uruguay's policies have introduced not only specific resolutions regarding renewables, but also, macroeconomic goals. The execution of macroeconomic targets along with the development of the energy sector is very important because it aligns the economic framework to the public policies and denotes that there is a solid government long-term plan installed. Some of the macroeconomic objectives for Uruguay are the development of domestic industry, the creation of employment and the expansion of the local market. Diversely, in Argentina, the policies applied in the promotion of clean energy sources are considered more isolated solutions, which indicates the lack of long-term planning.

To summarize, even though Argentina owns high potential for generating green power and despite having implemented various policies and programs over the past decade, Argentina still has a small share of renewable energy sources. Indeed, only 10% of the total electricity generation is covered by clean sources in the present. On the other side of the river, its neighbor, Uruguay, a smaller country but with similar natural

resources, achieved 97% of its electricity generation from renewable energy sources through a number of policies and plans which were quite successful in accomplishing the transition to renewable energies. Therefore, we can deduce that the simple act of applying incentive policies is not enough in order to smoothly finance the development of the renewable energy sector. So, what else is necessary to import the Uruguayan case?

As it has been discussed through this paper, Argentina's governance went through different political and economic crises, which demonstrated a weak regulatory framework and lack of political will regarding the development of the energy sector. Hence, we can assume that the failure of the transition to green energies of Argentina is largely due to the environmental or contextual conditions surrounding the energy policy.

In this section it is deeply explained the specific conditions that represent the main restrictions for the smooth transition to renewables in developing countries, taking into consideration the case of Argentina. Indeed, financing the investments of renewables is still the principal challenge for this country, as it has experienced a shortage of foreign financing which is vital for the funding of these kind of projects. Also, in this section it is exposed the specific conditions necessary to enable the successful development of the renewable energy policies, taking as an example the Uruguayan case.

To strengthen the analysis, two interviews had been made in order to obtain first-hand data. The first interview was made to the Head of Department of "Dirección Nacional de Energía" from Uruguay, Virginia Echinope, who provided information about the regulatory framework of Uruguay, and how they achieved this extraordinary development in the last decade. The second interview was made to Marcelo Álvarez, president of Cámara Argentina de Energías Renovables (CADER), who supplied data about Argentina's history in the development of renewable energy, regulatory framework, and the main limitations for financing projects they have right now.

From the interviews it was confirmed that policies in Argentina did not performed as well as Uruguay because of four main drivers: macroeconomic instability, lack of a solid Political Plan with achievable and ambitious guidelines, high borrowing costs, lack of infrastructure. These drivers led to two main consequences which are lack of access to financing and reliance on government subsidies. According to Marcelo Álvarez, limited access to funding has been one of the principal obstacles to reach the goals set by the Argentinian government and the success of the incentive policies. The almost interrupted access to foreign financing is majorly due to the weak conditions of the energy policy environment. Also, some of the controversial policies, like the foreign exchange market controls and the constraints on the transfer of profits abroad for international companies have generated such a high uncertainty among investors that most banks and investment funds stopped granting long-term credit. Indeed, debt financing is the crucial driver to finance the transition to renewables in developing countries such as Argentina. Local banks are usually not ready or not willing to structure long-term financing, while foreign banks continue hesitant about the country's long-term commitment to economic stability. Some projects had been completed; however, they are the minority and are

only the ones which have access to international financing because of a solid balance sheet or those that use export credit agency guarantees. Nonetheless, these are few and are not enough to attain the targets the government established. Moreover, Álvarez assures that development banks and export credit agencies all stopped making disbursements for Argentinian energy projects because lender fear a sovereign default.

Another factor that is keeping investors away from Argentina is the capital controls applied, which prevent capital remittances to foreign countries. This does not only prevent international companies from investing in the country, but also weakens the currency and increases the scarcity of dollars. The capital controls are originated from the excessive foreign debt owned by Argentina, which does not seem to be restructured and repaid soon. However, the debt default should be a first thing for the new government to tackle as the solution of this implies that Argentina will finally have access to international capital and credit markets.

In the research it is also studied the main factors which were the ones capable of generating the energy mix revolution in Uruguay. These were: credibility, strong public companies, a solid national Energy Policy which derived in access to financing and strong private sector involvement.

One of the main conclusions from the qualitative analysis is that apart from the policy and the instruments chosen, it is crucial that the framework is conducive to the policy. In order to overcome the investment barriers to achieve smooth financing in the transition to renewables in developing countries, it is vital to acknowledge that the contextual conditions in which the policy is applied are even more relevant than the policy itself.

Therefore, it is essential to keep these conditions as a priority in the process of designing strategies to develop green energy sources. Which are these conditions? After going through all this information and two key interviews, the main necessary conditions are to keep a constant economic and political stability, to create a sound regulatory framework, to build a solid infrastructure, to maintain a low cost of capital and have access to Debt Financing in order to make financing accessible, and to design a solid national energy policy with achievable and ambitious guidelines with joint support from all political parties. The public institutions and political parties must be aligned with the private investor's interest in order to reach the Uruguayan model.

In order to strengthen the analysis, we are going to provide a quantitative evaluation of both countries in terms of return on investment and country risk. These two specific assessments will provide further support to the theory developed during the qualitative analysis gathered through the interviews and researches.

In this section it is evaluated the differences in return when investing in a windfarm in Argentina and in Uruguay. From the chart below we can appreciate that the return in Argentina's windfarm is quite higher than the return obtained in Uruguay.

Country	ROI
Argentina	14.2%
Uruguay	10%

Regardless of offering a higher return, Argentina is underperforming compared to Uruguay in terms of renewable energy capacity development, as we have seen before in previous sections of this study. As better explained below, the spread between both business models does not seem to offset the country risk that keeps Argentina underachieving its renewable energy targets due to lack of private investment.

In the last 4 years, Mauricio Macri's government proposed attractive conditions that boosted Argentina's renewable energy sector. However, nowadays with Alberto Fernandez's administration several windfarm projects have been stopped. Due to coronavirus pandemic, another financial crisis is surfacing in the country and interventionist measures are being applied. In fact, capital controls are stricter, and negotiations of the sovereign debt have started. Indeed, the renewable energy industry depends mostly on foreign financing, so a renegotiation of sovereign debt and tough control over cashflows are not good news for it. The auction scheme and the renewable energy sector is not a priority in the agenda of Argentina's new government.

In order to deepen the quantitative analysis, it is important to assess the country risk from each case study.

	Export transactions				Commercial Risk	Direct Investments		
	Political Risk Short Term	Political Risk Medium/Long Term	Political Risk Special transactions	Premium classification OECD		Political Violence Risk	Expropriation and Government Action Risk	Currency Inconvertibility and Transfer Restriction Risk
<b>Argentina</b>	6	6	6	7	C	2	5	6
<b>Uruguay</b>	3	3	3	3	C	1	1	3

In the chart above, it is evident to see that Argentina has a higher country risk than Uruguay, being the premium classification of the OECD the biggest difference. The premium classification refers to the premium rates which are added to the cost of capital due to the credit risk of the country. In the case of Argentina, it is normal to consider a risk premium between 1% and 2%, depending on the size of the company or the stage in which the project is.

A second reference is given by the Italian Export Credit Agency analysis: basing on Sace Simest (Italian ECA, part of the Gruppo Cassa Depositi e Prestiti), Argentina has Sovereign credit risk of 85/100, Bank credit risk of 89/100 and Corporate credit risk of 91/100, which is considered a high-country risk. On the other hand, for Uruguay the numbers are different, with Sovereign credit risk of 37/100, Bank credit risk

of 56/100 and Corporate credit risk of 56/100. Uruguay’s classification of country risk is medium level.



Latin American Risk Map.

To complete the picture with some quantitative figures to this country risk analysis, we are going to examine the credit ratings of both countries which is an excellent way to begin analyzing a potential investment. In fact, a sovereign risk analysis can help in creating a macroeconomic picture of the operating environment.

	Industry Group	Coupon	Maturity	Currency	Price	YTW	Rating
Argentina	Sovereign	8,75%	07/05/2024	USD	26,75	52,20%	CCC
Uruguay	Sovereign	4,50%	14/08/2024	USD	108,38	1,72%	BBB-

Argentina’s and Uruguay’s bond list.

In this chart we can appreciate the details of the sovereign bonds in Argentina and Uruguay. The calculation of the current Yield is necessary in order to determine the return of the bonds. The current yield is “an investment's annual income (interest or dividends) divided by the current price of the security. Current yield represents the return an investor would expect to earn, if the owner purchased the bond and held it for a year”. The calculation of the current yield is the coupon divided by the price. This would mean that the Argentinian bond yield is 32,71% and the Uruguayan bond is 4,15%. With this information and calculation,

we can determine several aspects from both economies because examining a country's bond allows us to evaluate the economic condition and strength of the country. In the end, the underlying asset for a bond is the nation itself and its capacity to grow and generate revenue.

First, when a bond is under the emission price (under USD100) suggests that the economic condition of the country is worse in the current moment than when the country emitted the bond. In this case, Argentina's economy weaker now as the bond price is currently USD 26,75, conversely to Uruguay where the bond price surpassed the emission price, reaching USD 108,38. Second, we can appreciate how the price of a risky bond such as the Argentinian bond goes down as investors sell, meaning the yield on this bond increased. This explains why the yield of the Argentinian bond is much higher than the Uruguayan bond. Third, the rating of the bond also demonstrates the strength of a country's economy and the ability that the country has to repay its debt. A bond rating is "a letter-based credit scoring scheme used to judge the quality and creditworthiness of a bond".

"Investment grade bonds", such as the Uruguayan bond, go from AAA to BBB- in Standard & Poor's classification. The ones that have lower ratings are called "junk bonds", like the Argentinian bond which classifies with CCC. The "junk bonds" are considered higher-risk investments; however, the Argentinian bond may be interest investors who are attracted to the high yield it offers. Contrarily, the bonds which are rated higher are perceived as safer and more stable investments.

The bond rating reveals the credit worthiness of the government that issues the bond. In the case of Argentina, with a CCC classification it shows that "is currently vulnerable, and is dependent upon favorable business, financial, and economic conditions to meet its financial commitments". However, Uruguay is in a better position with a BBB- classification that indicates that "has adequate capacity to meet its financial commitments".

From this information we understand that the spread of IRR to invest in a renewable project in Argentina, rather than Uruguay, does not fully compensate the spread in the country risk. However, based on the data shown in this analysis, the spread of IRRs was 4% (14% vs 10%), while the spread in coupon was quite similar 4.25% (8.75% vs 4.5%). This means the spread of bonds is almost the same as IRR, but investors apply a further spread as they consider high the risk of change in law.

To conclude this section, it is important to remark that investors will be more attracted to Uruguay's economic stability and creditworthiness. Several investors look at the bond rating of the country before investing in projects and Uruguay stands in a more favorable place than Argentina. In fact, from this quantitative analysis we can assume that investment barriers in Argentina are harder to overcome than in Uruguay and surely the economic, political and regulatory environment that Uruguay owns is more propense to led to a successful implementation of incentive policies for the development of the renewable energy industry.

## **Recommendations for Argentina to Strengthen the Renewable Energy Policy**

To finish this study, some recommendations for Argentina's case are outlined in order to improve the conditions which restrict the potential of the energy policies. In fact, Law 27.191 should be consolidated with complementary policies to strengthen the energy policy framework.

First, the new government should promote credibility, which means demonstrating to investors that the state will not violate agreements and that the public entities involved have a strong commitment towards the energy policy. The government must create an environment of trust for foreign investors in order to unblock financing for clean sources projects.

Second, the state must guarantee the returns on investments. Indeed, the state must assure that investments are not going to be vulnerable towards the political impulses when changes in government occur. In addition, Argentina should import Uruguay's model in this case by adopting purchase guarantees of twenty years long to ensure investors the full amortization of the projects. Also, they should base the purchase prices on the generation cost and not on the spot market price, like Uruguay that 95% of their prices are based on the generation cost and not on the spot market price. This strategy can help reducing the prices of the most relevant clean energy sources in Argentina which are wind and solar power and put them in a better position among private investors.

Third, Argentina should be able to eliminate subsidies and increase electricity tariffs. As it was already demonstrated in this study, the decision from the government to maintain rates of electricity below costs and being supported by subsidies led into low profitability of the energy sector. The low profit margin of the sector also led in less incentives for private investors to finance this kind of projects. Hence, the state should pass a portion of the costs to consumers in order to equilibrate the demand and turn Argentina into an energy exporter again, or at least, stop importing energy from Uruguay and neighbor countries.

Finally, the new government should work to build a solid infrastructure in order mitigate the investment barriers to encourage the financing of renewable energy projects. Argentina counts with a very beneficial environment of plentiful renewable resources, however there is not a developed transmission grid to support the expansion of the clean energy projects. Taking into consideration the Uruguayan case, Argentina should use a percentage of the national budget to build new transmission lines across the country in order to promote investment among private investors.

## **Conclusions**

In this research it is shown and demonstrated that policies for renewable sources have been quite similar in the two developing countries analyzed. However, the results of this thesis indicate that Argentina has had a lower performance in the implementation of policies to develop the energy sector in comparison to Uruguay,



due to regulatory and economic barriers no matter what economic instruments were applied. Therefore, it is a fact that the implementation of similar policies in these cases led to different results. The first thing we can assume from this affirmation is that the simple application of incentive policies, in some cases, is not enough in order to mitigate investment barriers in developing countries.

Moreover, another conclusion made from this study is that the successful implementation of the economic instrument depends on the context in which it is used. By analyzing the policies applied by these countries throughout history and by interviewing the leaders of the energy sector from both nations, the evidence shows that it is not enough to develop the policies and instruments, but there is also the need to create a conducive framework for that policy to perform efficiently. In fact, in section two it is stated that the Feed-in system is a very useful mechanism to develop the energy projects, nevertheless, it represented a failure for Argentina. Contrarily, Uruguay was very successful by implementing the bidding system which is not an instrument normally suggested in the international evidence. Therefore, the effectiveness of the incentive policies does not depend on themselves, but on the framework in which they are applied, which includes macroeconomic, political and institutional aspects which must be taken into consideration. These contextual conditions are the ones that make Argentina run short of private investment to develop renewable energy projects and ultimately, don't reach the targets proposed.

Indeed, as demonstrated in section 4, Argentina's low performance on renewable energy is mainly due to macroeconomic instability, lack of a solid political plan with achievable guidelines, lack of access to financing and capital controls, lack of infrastructure, reliance on government subsidies and high borrowing costs. However, it is important to mention that Argentina still owns a vast amount of natural resources and it has many opportunities regarding the energy sector which are not yet exploited due to the barriers recently mentioned. By studying in depth, the "lack of a solid political plan" of Argentina, this research supports that the policies used to promote renewable energy sources in this country are isolated solutions, which reveals a lack of a long-term plan from the state. On the other hand, Uruguay implemented a long-term planning strategy with full support from all political parties, which resulted in a transformative outcome on low-carbon energy development. Thus, the investigation concludes that it is particularly necessary to tackle the energy sector development as a multidimensional project, including social, economic, cultural, and technological targets with short, medium- and long-term goals acting as guidelines to monitor the process. The transition to renewables shouldn't be faced as isolated energy wise policies, but as a robust long-term plan with diverse objectives from diverse sectors.

Finally, it is important to highlight that from the research we determined that the successful transition to renewables summarizes in the ability of attracting private and foreign investors. This is done by creating a stable regulatory environment, generating credibility and having strong public companies that involve the private sector through a strong partnership. Consequently, these factors inspire trust among investors who will be more interested in renewable energy projects proposals. This happens to be the case of Uruguay, which was able to tackle all the necessary conditions to enable the development of renewable energy policies. As already

explained in section 4, the country achieved the trust from investors by deploying a percentage of the national budget to finance the first round of renewable energy projects. With this public funding, Uruguay built a supporting framework for renewable energy development that granted private investment to flow, resulting in a fast wind power implementation.

Therefore, it is essential to be address these conditions at the time of designing strategies to promote green energy sources in order to choose efficiently the correct instruments and encourage a successful performance. It is crucial to elaborate government policies that tackle and modify these conditions that constrain the potential of the energy policies.

To end, this study proposes that there is an opportunity for Argentinian stakeholders to participate further and in a more connected way in order to create a stable framework for incentive policies to be implemented successfully and mitigate investment barriers. As a result, Argentina and any developing country will be able to achieve a smooth flow of investment from the private sector and finance the transition to renewable energy.