ENERGY TRANSITION IN THE BASQUE COUNTRY: TOWARDS A SUSTAINABLE MODEL

EXECUTIVE SUMMARY

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Over the last few years, citizens' concern about climate change and energy has heightened. The signing of the Paris Agreement in December 2015 and its subsequent ratification in 2016 has led most countries around the world to have plans to reduce their emissions and adapt to climate change. It also significantly backed work done at all levels of the public administration, business and civil society as well.

At the same time, the energy sector has undergone significant changes over the last decade. The cost of renewable energy has been drastically reduced and non-conventional gas has burgeoned in the United States. Major international energy organizations agree in indicating that a low carbon economy compatible with the Paris Agreement is technically and economically feasible, and should be based mainly on energy savings and efficiency and the roll-out of renewable energy. This, for instance, is stated in the recent joint report by the International Energy Agency (IEA) and the International Renewable Energy Agency (IRENA), presented at the G20 Summit in July 2017.

There is uncertainty surrounding the degree of use of natural gas compatible with a virtually decarbonised economy in the 2050 horizon, and with regards to the availability and future cost of Carbon Sequestration and Storage (CCS) technology in industry and in the energy sector (see IEA/IRENA 2017 report). Nevertheless, all of the analysis concurs in indicating that coal, first and foremost, and then oil must quickly disappear from the global energy mix. In this respect, recently, several countries close to us have established dates for the definitive shutdown (in France, 2023 and in the United Kingdom, 2025) and certain countries have begun to set dates after which no combustion engine automobiles may be purchased (in Norway, 2025, and in France, 2040 or earlier).

This special report aims to place all of these changes in their context and trigger thought among citizens about the present and the future of the Basque Country Region's (CAPV) energy system. It intends to inform citizens about the policies that are being carried out at various levels of government, establish a diagnosis of the current situation and put forward critical elements to spark thought about a sustainable, low carbon future.

In the area of regulation, this report summarises the landmarks establishing possibilities and alternatives for a Basque energy system, including the significant work performed thus far in order to mainstream climate considerations into energy policies. The Basque Country's energy future is contingent upon the European and Spanish frameworks and efforts therefore must be made in line with the EU's contributions to the Paris Agreement (i.e. reducing Greenhouse Gas Emissions (GGEs) 20% by 2020, and 40% by 2030 taking 1990 as the benchmark) and also planning and regulation with a view to reduce emissions, enhance renewable energy use, and bring about energy savings.

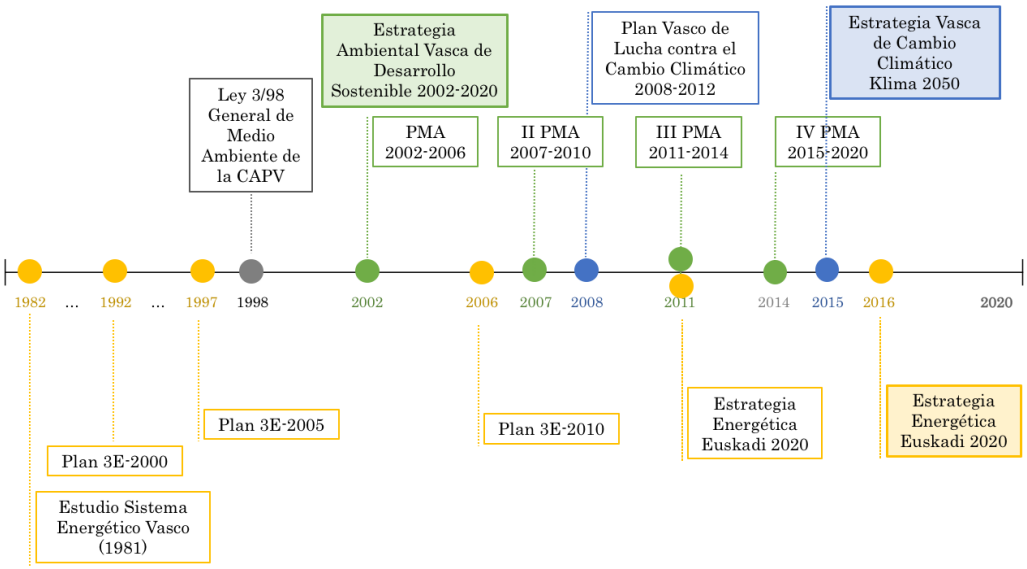
There is also energy planning in Spain[1] and specific climate objectives have been set to meet the effort quota linked to the EU's shared objective. The main objectives for 2020 are: (i) reduce GGEs not included in emission trading rights

[1] Planificación Energética Indicativa (2011-2020) : Council of Ministers agreement dated 11 November 2011. Planificación Energética: Plan de Desarrollo de la Red de Transporte de Energía Eléctrica 2015-2020, approved by the Council of Ministers on 16 October 2015.

(diffuse sectors) by 10% as compared to 2005, (ii) reach the 20% target for gross end consumption of energy from renewables and (iii) minimum energy savings (153 Mtep) consistent with the European objective. Recently, the government of Spain has begun to draw up a Climate Change and Energy Transition Act that would need to include more long-term objectives and lay down measures and tools to meet these objectives. While Spain has jurisdiction over general energy planning, its Regions also have jurisdiction over regulation and enforcement of national regulations.

For the Basque Country (see figure 1 and timeline), currently, the main energy and climate references are the Estatregia Energética de Cambio Climático 2050 (2050 Climate Change Strategy) and the Estategia Energética de Euskadi 2030 (2030 Basque Country Energy Strategy). The latter presents progress in energy efficiency, renewables, technological development and infrastructure. It includes emission reduction objectives and provides for renewables in line with the climate strategy. The aspiration is that renewable sources of energy account for 17% of final consumption by 2025 and 21% by 2030. An energy savings target of 21% has been set for 2025, which increases to 25% for 2030. These objectives are lower than those set out by Spain and Europe. Yet the strategy also includes an ambitious objective for oil consumption for 2050, which would have to be reduced to nil.

Figure 1. Landmarks in environmental, climate and energy planning



Source: own data

Note: PMA stands for the Basque Government's *Programa Marco Ambiental* (Basque government environmental framework plan) while the 3E Plans are strategic energy plans.

Timeline

1982 – Study on Basque Energy System (1981)

1992 – 3E-2000 Strategic Energy Plan

1997 - 3E-2005 Strategic Energy Plan

1998 – Basque Country General Environmental Act 3/98

2002 – Basque Environmental Strategy for Sustainable Development 2002-2020

2002-2006 PMA (Environmental framework plan)

2006 -3E-2010 Strategic Energy Plan

2007 –Second PMA 2007-2010

2008 – Basque Plan to Combat Climate Change 2008-2012

2011 - Basque 2020 Energy Strategy/ Third PMA 2011-2014

2014 - Fourth PMA 2011-2014

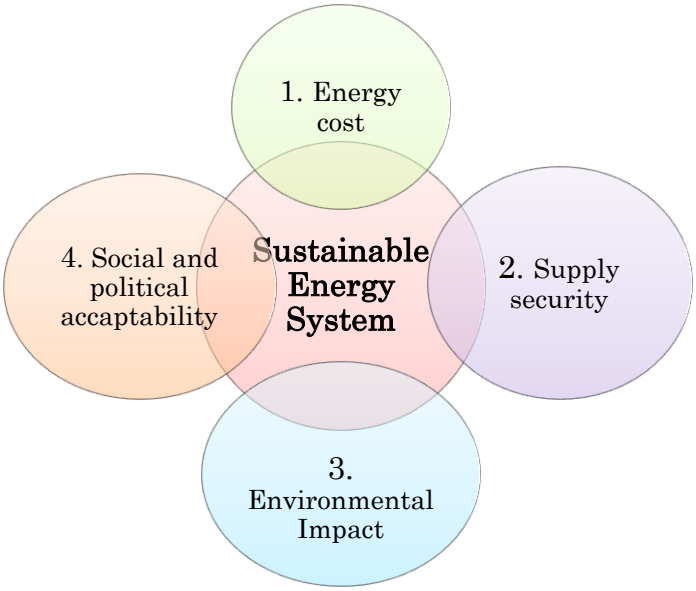
2015 – Basque Country 2050 Climate Change Strategy (Klima)

2016 - Basque Country 2030 Energy Strategy

Meanwhile, the 2050 climate strategy also known as the 2050 Klima Strategy has short and long-term mitigation and adaptation objectives. Insofar as mitigation, a reduction in GGEs of at least 40% is pursued by 2030 and 80% by 2050, as compared to the baseline year 2005. In terms of adaptation, what is pursued is "ensuring the resilience of the Basque Country against climate change".

This document includes an analysis of and developments in the energy situation in the Basque Country based on the fundamental dimensions of a sustainable energy system. Energy sustainability is defined according to the four basic pillars appearing in figure 2, that is 1) energy costs and how they can be transferred to the final prices for end consumers; 2) supply security, referring to physical and/or technical access to sources of energy; 3) environmental impact, reflecting the impacts that energy use has on the environment and on human health; and 4) social and political acceptability, referring to how citizens perceive institutions' political proposals and how these institutions respond measures put forward by citizens and their community and business groups.

Figure 2. Pillars of the sustainable energy system



Source: Own data

Based on the principles established for a sustainable energy system in the Basque Country and in the light of the analysis and the data gathered in this report, the following can be highlighted in terms of major issues found in the diagnosis:

- While efficient in terms of energy use, the Basque energy system currently is mostly based on fossil fuels (between 80-90% over the 2000-2015 period), posing a significant challenge for decarbonisation.
- Regarding the energy mix, in 2012 installed capacity in coal plants was shut in the Basque Country, but renewable energy (7%) remains a modest part of the energy mix compared to other nearby jurisdictions.
- Energy prices have increased over the last decade, and particularly so when it comes to electricity prices which experienced a 63% increase for medium sized businesses and an 110% increase for households in the 2005 to 2015 period. This has led to an increase in the percentage of household income devoted to energy expenses, in turn leading more households into energy poverty. The rise in costs has also affected competitiveness of businesses, particularly of Basque industry, which is energy intensive.
- It is important to consider that transitioning to a low carbon economy does not only pose a threat to certain fossil-fuel dependent sectors. It also poses a significant opportunity in the Basque Country both for economic and industrial development and job creation.
- The Basque Country is highly dependent (95%) on energy from elsewhere. Although there is now diversification of the sources of energy supply, the Basque Country is exposed to the typical volatility of energy markets and potential sharp fluctuations in energy prices.
- In 2016, greenhouse gas emissions were reduced by 12% as compared to the 1990 figure. While the policies implemented and technological improvements have had an impact, (for instance industry has continuously noticeably reduced its energy intensiveness), the most recent reductions, observable as of 2008 are linked to the economic crisis. The most significant increase is accounted for by transport where emissions have doubled since 1990.

- The elimination of installed power in coal thermal plants in the Basque Country has come hand in hand with a co-benefit of a substantial reduction of SO_2 emissions (80% since 1990). Meanwhile however, NOX and PM, mostly associated with combustion and transportation, and which cause significant health problems, have been reduced only slightly.
- According to the latest surveys (conducted by the Basque Government Sociological Prospection) indicate that Basque society is increasingly aware and interested in environmental and energy issues and 82% respond that they agree with the notion that environmental protection is not incompatible with progress. Climate change and associated problems with air pollution and health are what most generate concern among Basque society.

Based on the diagnosis of the situation, some key elements to be included in a sustainable energy transition for the Basque Country have been identified. The following reflect the main elements and ideas.

- Energy efficiency and savings: There is broad consensus on the importance of energy savings (reducing energy consumption) and efficiency (more efficient energy consumption) in the transition to a sustainable energy system. This is because savings and efficiency substantially contribute to the principles of accessibility, security in supply and environmental sustainability. Furthermore, these measures will help to substantially reduce transition costs, both in sheer economic terms and in environmental terms. There is currently a wide range of policies on all levels (European, Spanish, regional and even municipal) aiming at energy savings and particularly energy efficiency.
- Renewable energy: In 2016, renewable energy represented 7.5% of gross energy consumption in the Basque Country. The renewable energy share in terms of final energy consumption is 7.6% (14,3% when factoring in the renewable portion of imported energy) The Euskadi 2030 Energy Plan sets the target of increasing renewables in final consumption in the year 2030 by 21% (including the importing of renewable electric energy). There is also a broad consensus on the need to increase these sources. Taking this into account and given the future of renewables in Spain and Europe thanks to auctions, it is important to lend thought to the role of renewable energy installed in the Basque Country. It is also advisable to reflect on how Basque industry might contribute to developing renewables outside the Basque country and serve as an locomotive for growth and job generation.
- Infrastructure and grids: One of the main transformations that the Basque energy system will experience is the increase in the degree of electrification. For one, foreseeably over the next few years internal combustion engines will gradually be replaced by electric vehicles. In addition, a good portion of renewables that are called upon to play an increasingly important role in the energy mix use electricity as an energy vector. Furthermore, these sources of energy are characterised by being more dispersed than conventional energy and by their intermittence and seasonality. The future energy system will be characterised by greater complexity in energy supply management and demand as well as additional transportation, distribution and storage needs. For all of these reasons, planning and developing an energy transportation and distribution system in line with the needs of a low carbon society will be one of the keys to a successful transition. The Basque Country has potential not only as a demander of smart transmission/distribution systems as well as storage systems, but also thanks to its powerful design, manufacturing and component

industries covering the entire value chain in the sector. A transition towards this type of system could therefore be beneficial not only from an environmental and energy efficiency standpoint, but also in terms of driving growth, progress and industrial competitiveness.

- Distributed energy, self-consumption and energy cooperatives: The European Union's "Winter Package" marks a shift in paradigm from conventional centralised generation towards smart, interconnected, decentralised markets. This will make it easier for consumers to generate their own energy in the future, store it, share it, consume it or sell it to the marketplace either directly or through energy cooperatives. Against this backdrop, energy cooperatives have begun to emerge in the Basque Country, although as things currently stand, the regulatory framework hampers their development. The Basque Country 2030 energy strategy includes among its lines of action the *"Fostering the generation of renewable distributed low voltage electricity"*, albeit centred on buildings, industry and public administration. It would be of interest to examine the conditions under which this diversity of actors could foster meeting the energy and climate targets set.
- Non-conventional gas: On this issue, the viewpoints of the various agents in the Region diverge, warranting caution. Some experts conclude they find no technical reasons to reject prospecting for non-conventional gas (shale gas), arguing that proper environmental impact studies coupled with best operative practice and supervision could be enough to perform the prospection required to confirm the presence of the gas. On the other hand, others assert that the harvesting of non-conventional gas deposits via fracking entails great environmental and public health risks, and they question the advisability of running these risks when the global energy strategy would need to turn towards decreasing its dependency on fossil fuels. While not all operations are to the same standards, and although much of the impact could be substantially reduced, there is concern about the effects this technique could have, and studies must be done on a case by case basis. Regarding acceptability, concern about the impact of fracking aroused considerable citizens' opposition in the Basque Country. This led to a petition-driven law limiting the use of fracking in the Basque Country, and to zoning guidelines that include recommendations advising against the use of these techniques.
- Energy and environmental tax policies: Energy and environmental tax policies involve taxes discouraging behaviour that generates environmental damage. Environmental taxes as a complement to other types of measures and action also help uphold the 'polluter pays' principle. Both in the Basque Country and in Spain, compared to other neighbouring countries, scant use has been made of this tool. Also noteworthy is the lack of coordination between different levels of government. Because environmental taxes are a significant tool to steer economic decisions towards a more sustainable and low carbon energy system that at the same time generates revenue, it seems advisable to lend thought to how this can be achieved in the Basque Country.
- Policy integration: Greater integration of climate and energy policies with other policies could facilitate the transition towards a sustainable energy system and avoid potential inconsistencies and contradictions. In this regard, the European Union has proposed the approval of a regulation on the governance of the Energy Union[2]. As a governance mechanism, this regulation includes the obligation of drawing up national integrated energy and climate plans (INECP)

[2] Regulation on the governance of the Energy Union COM (2016) 759 final.

covering ten-year spans beginning with the 2021-2030 period. In addition to integrating with climate policy, there is a series of pertinent areas and sectoral policies where efficient coordination would be desirable, i.e. transport policies, land use policies, housing, industry, environment, the primary sector and social welfare.

- Governance: According to UNESCO, governance represents *"the norms, values and rules of the game through which public affairs are managed in a manner that is transparent, participatory, inclusive and responsive*." In the broad sense, it can be said that governance represents the institutional culture and environment where citizens and interest groups interact with each other and participate in public affairs. In climate and energy policy, it has been observed that implementation is more effective through participatory processes involving a great number of different agents and not only politicians but also civil society, interest groups, scientists and other experts in the field.
- Adapting the energy system to climate change: Most climate change and energy related action has focused on responding to energy demands while contributing to meeting emission reduction targets. However, the sustainability of the energy system also requires potential climate change impacts in the energy system to be identified and adaptation measures to be designed and implemented as a response to mitigate impact. Adaptation policies' main goal in the energy sector would be to ensure energy supply while balancing production and consumption in time and space. These measures may be geared to preventing impact, sharing responsibility for losses or risk should energy infrastructure be impacted, for instance through insurance systems or, on a larger scale, diversifying the energy systems themselves.
- The importance of health co-benefits: Citizens and public authorities will have a greater appreciation of the energy transition if major co-benefits of greenhouse gas reduction are taken into account. Because a considerable proportion of air polluting emissions are tied to the use of fossil fuels, one of the greatest co-benefits associated with decarbonisation involves improvement in air quality and public health. According to recent estimates made for the Basque Country, a significant percentage of the cost of mitigation policies would be offset by averted health problems. The population also would be more aware of the immediate, beneficial effects this would have on them.

Based on these principles and in the light of the data collected for the Basque Country, the following diagnosis can be established:

- The challenge to decarbonise society in order to prevent greenhouse gas emissions requires a broad consensus in order to shore up the path towards a more sustainable energy transition. International agreements and European Union Law require local consensus to step up efforts and support measures prioritising energy efficiency, fostering renewable energy and offering fair treatment to consumers. The Basque Country's energy future is tied to the Spanish and European Union strategies, although there is manoeuvring room for action.
- The Basque energy system, while efficient in terms of energy use, is currently mainly based on fossil fuels. The Basque Country continues to rely heavily on energy from elsewhere. Energy prices have increased over the last decade, particularly electricity for businesses and households between 2005 and 2015.
- The climate and energy policies introduced in the Basque Country are beginning to bear their fruits. The figures now point to improvement in energy intensity, a

reduction in greenhouse gases and a decoupling of energy consumption and emissions from economic growth. Nevertheless, energy consumption and emissions in transportation continue to increase and consumption of renewable energy in the Basque Country continues to stagnate despite its potential.
- Greenhouse gas emissions continue their downward trend, standing at 12% below 1990 emissions in 2016.
- Transportation remains the main sector where emissions continue to increase and have virtually doubled since 1990, particularly due to the use of vehicles.
- Final energy consumption from renewables in the Basque Country continues to be low as compared with the average in Spain and in the European Union.

Based on this diagnosis, the Basque Country needs to be up to the decarbonisation challenge demanded by the international community. International and supranational engagements may pose an opportunity for the Basque Country to become a benchmark model of a decarbonised society and economy, and to consolidate its role technological and industrial research and development in the field of energy. The 2030 Basque Country Energy Strategy and the 2050 Klima climate strategy are two of the Basque Country's basic pillars. But they can only be comprehensively developed and effectively implemented if there is a high degree of consensus in political, business and community spheres regarding the main principles involved in a sustainable energy system and how they must be applied in the Basque Country.

In these terms, the following conclusions are put forward:

- The energy transition in the Basque Country must be aligned at all times with the European Union's objectives of prioritizing energy efficiency, fostering renewable energy and associated technology, and offering consumers fair treatment.
- The Basque Country must progress along the path of energy savings and efficiency as the policies over the last decade have served to foster a reduction in energy consumption.
- Basque Country public authorities must continue to build upon previous efforts in energy savings and efficiency in industry and households and step up the pace of these efforts as soon as possible in transportation.
- The Basque Country's energy model transition requires a push forward towards enhancing consensus in society in order to be able to increase renewable energy production by examining the possibilities of harvesting renewable energy and focusing efforts and public investment on implanting this type of energy.
- The public sector in the Basque Country must continue to foster innovative, exemplary work in energy savings and efficiency and the use of renewables.
- Good governance in energy must recognize the energy rights and obligations of all citizens. Decisions on climate and energy must be made transparently and with a high degree of participation on the part of all stakeholders.
- The social acceptability of energy and climate-related decisions is the shared responsibility of political authorities, community stakeholders and citizens at large.
- As consumers and producers of energy, people must be placed at the heart of a fairer energy transition that must be equitable for all sectors, particularly the most vulnerable segments of society.
- The transition to a low-carbon economy poses a significant opportunity for economic and industrial development and job creation in the Basque Country.

- Basque public authorities must promote information on the benefits involved in decarbonising our energy model.
- Lastly, the institution of the Ararteko indicates its commitment to energy transitioning towards a more sustainable low carbon model for the Basque Country that ensures the wellbeing of our citizens and of future generations.

Various recommendations and suggestions have been compiled for improving energy and climate governance, including the following proposals:

- The Ararteko recommends that the Basque Country public authorities promote a social pact on transitioning towards a more sustainable low carbon energy model for the Basque Country. In order to do so, the Ararteko suggests that the Basque Government establish a forum for dialogue in order to gather opinions of leading experts and associations in the field of energy and climate change as well as experts from the groups that are most vulnerable to the potential energy and climate decisions that the energy transition requires.
- The Ararteko suggests that the Basque Government draw up parameters for community debate on the energy transition including: funding; analysis of financial and organisational resources available to Basque public institutions and their links to energy and climate objectives; consensus-building within the community to promote renewable energy through technology that has already been developed; promotion of energy 'prosumer' status; promotion of energy grid interconnection; and consensus building on sustainable mobility.
- The Ararteko suggests that Basque government create a Basque independent evaluation system for its energy transition.
- Other recommendations are aimed at promoting Basque energy and climate change legislation. The Ararteko suggests that this legislation, in its provisions, integrate environment and climate, and specifically provide for integrated energy and climate plans in the Basque Country in coordination with the principles stated in international, European and Spanish strategies and plans.
- It also proposes that the Basque energy transition legislation include a catalogue of energy rights, a statute for Basque energy prosumers, and measures for vulnerable groups.
- Legislation should include real and effective measures for citizens' participation in energy and climate decisions and associated environmental and gender impact assessments, particularly through recognition of public action. Mention should also be made of ensuring that information is transparently provided on energy and climate data, and that the public sector in the Basque Country continues to drive its innovative, exemplary action.
- The Ararteko recommends the approval of a plan of action to promote renewable energy production within the provisions of the integrated energy and climate change integrated plan. The revision of land use planning for wind energy and a study of the potential for other sources of renewable energy that might be harvested in all sectors is recommended as well as action to promote photovoltaic panel installation.
- The specific recommendations for the transportation sector and sustainable mobility include a proposal to spur sustainable mobility plans promoting both mass and non-motorised transport, such as bicycles in individual transportation. At the same time, promoting the use of bicycles as a means of more sustainable transportation for citizens in urban and peri-urban itineraries must be further promoted. In the category of individual transportation, electric vehicles should be promoted as a less polluting means of private transportation and a

means of generating new job opportunities. The Ararteko recommends that urban mobility plans integrate zoning to facilitate access to newly developed areas, park and ride areas, parking areas for bicycles, and charging stations for electric vehicles.

- Some of the specific recommendations for industry and the primary sector include continuing public programmes to provide incentives and grants for energy savings and efficiency in industry through energy audits of companies. Networking among businesses for learning should also be promoted.
- It is recommended that energy consumption of households and services be monitored by installing individual, remote-controlled meters and providing end consumers with the technical assistance they need. Information should also be provided in guides for decision-making on profitable measures that can be taken in buildings. Another recommendation is to promote energy audits in current residential buildings and conduct a study on implementing alternative funding measures to bring about energy savings and efficiency. The Ararteko deems it of interest to establish a plan of action to support electrical energy self-consumption in residential and service sector buildings.
- Among the specific recommendations for the electricity grid, the Ararteko recommends measures be put forward to plan for transportation and electricity generation systems that ensure decentralised production and consumption. Regulating the required environmental conditions for implanting or modifying new electricity lines and ensuring the participation of local communities is also recommended.
- Lastly, in the section on specific recommendations for environmental taxation, the Ararteko recommends tax reform foster compliance with the targets set for the energy transition towards a more sustainable low carbon model in the Basque Country. To achieve this, environmental taxes in sectors such as transportation, for instance "congestion taxes" for the entry of the most polluting vehicles in major Basque Cities, should be considered. Rebates on local taxes in order to incentivise energy savings and efficiency should also be maintained.