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# REGIONAL ENERGY TRANSITION AND DECARBONIZATION STRATEGIES

*Review of the cases of Grand  
Est/Grand Reims, Scotland,  
North Rhine-Westphalia and the  
"energy regions" in the  
Netherlands*

Executive Summary

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## Executive summary

The energy transition and the decarbonization of economies around the globe are being structured around major global agreements (e.g., the Paris Agreement of December 2015) and in major regions (e.g., the European Green Pact and the Fit-for-55 package in the European Union) that are then translated into legislative and regulatory frameworks at the national and subnational levels.

The subnational level is particularly relevant when it comes to implementing concrete strategies and action plans, as a large part of the ongoing transformations take place in the local context. Furthermore, the proximity of regional, subregional and municipal governments and institutions makes it possible to design strategies, action plans and instruments that take into account the characteristics and needs of the actors in the different economic, geographic and social contexts.

Many European regions have already been implementing specific energy transition and decarbonization strategies for years and are facing various governance, technological, regulatory and social challenges to try to make the most efficient progress in the process of reducing greenhouse gas (GHG) emissions.

In the Basque Country, the draft Basque Law on Energy Transition and Climate Change (LVTECC), which lays the legislative, regulatory and strategic foundations for the decarbonization process of the Basque economy, with the aim of achieving net zero emissions in 2050, is being discussed in the Basque Parliament at the time of writing this report.

The Law, expected to be passed in 2024, establishes the obligation to design a Roadmap 2050 for Energy Transition and Climate Change in the Basque Country, which must be approved at the latest 18 months after the Law enters into force. This Roadmap will define a long-term decarbonization path with quantitative and sectoral objectives, as well as action plans, tools and resources required to achieve them.

The analysis of specific experiences at regional level carried out in this report allows identifying some patterns and elements that are common to different regions undergoing energy transition and decarbonization processes, and other distinctive and specific elements, which could be applicable in the case of the Basque Country or provide new ideas or elements for the definition of the aforementioned Roadmap.

The regions under scrutiny are Grand Est/Grand Reims (France), Scotland (United Kingdom), North Rhine-Westphalia (Germany) and the "energy regions" in the Netherlands. In all cases, regional strategies and action plans with sectoral granularity have been in place for several years. Moreover, in all of them, the economic structure is characterized by a relevant weight of the industrial sector and, in particular, of the energy- and emissions-intensive industry, which makes them interesting case studies from the perspective of the Basque Country.

Below are some recommendations, based on the analysis carried out, for decision-makers in the Basque economy and, in particular, for public institutions, on various aspects related to the energy transition and the decarbonization process.

***Need to accelerate the process of change and carry out detailed long-range planning***

The speed of transformation proposed by the decarbonization roadmaps in the various regions analyzed (with demanding milestones at the 2025 and 2030 horizons), which have been in force for several years, is based on a thorough analysis of the complexity and difficulty of the process and on the perception of the need to effectively implement a structured and gradual, but ambitious, transition as of now. Experience in other European regions shows that implementing these detailed action plans involving the relevant actors at the local level takes time. Detailed planning of energy transition and decarbonization plans should therefore be initiated as soon as possible, avoiding the risks associated with delays.

***Act in several dimensions, establishing objectives clearly focused on reducing GHG emissions***

Focusing the energy-climate strategy on the reduction of GHG emissions throughout the economy, as the main objective of the energy transition, helps to simplify the evaluation of the different transformation alternatives and to establish (realistic and appropriate) priorities. Despite this, it should not be forgotten that the process of decarbonizing an economy is complex and multidimensional, which implies acting on a large number of variables, in all sectors and with multiple objectives, and aligning sectoral strategies and action plans to make progress in reducing emissions. These strategies must take into account the reality of the different sectors of the Basque economy – e.g., greater difficulty in reducing emissions in certain industrial sectors and activities– in order to protect the competitiveness of the economy.

***Decentralization of strategies and action plans adds value to decarbonization processes, but an effective governance framework is required***

The decentralized nature of energy and decarbonization strategies is essential insofar as it is regional and local governments that have the greatest interest and ambition in implementing measures to reduce emissions, although they are not the decision-makers and do not set the objectives and main guidelines a priori. Furthermore, this decentralization contributes to the success of the transformation in several ways: (1) it allows the design of more efficient solutions adapted to the local reality; (2) it facilitates the effective implementation of the changes, by involving relevant agents locally with decision-making capacity on aspects relevant to the energy transition; (3) it enhances social support, by increasing citizens' perception that their participation in the process has real effects on key aspects for society as a whole. In the coming years, it will be very relevant in the Basque context to achieve adequate coordination between the different layers of the Basque public administration in order to maximize synergies between strategies and actions in the different geographical areas. In addition, the social involvement and participation schemes foreseen in the LVTECC (Social Pact and Citizen's Assembly of Work and Employment) will have to become material and should be adequately coordinated with other movements and processes in place (e.g., in the context of the Euskadi Basque Country Agenda 2030).

***The integration of economic, industrial and environmental aspects facilitates the acceptance of strategies and action plans***

Another noteworthy aspect common to the cases under review is the integration of different economic, industrial and environmental factors when designing decarbonization strategies, which

facilitates the adoption of optimal solutions. The defense of industrial competitiveness during the transition process is another key pillar of the processes in regions with greater industrial weight, where sustainable transformation is linked to techno-industrial development and innovation. The processes are designed to maintain the competitiveness of the industry, driving changes in the short term that do not harm the competitive position of industrial companies and simultaneously laying the foundations (e.g. in the areas of green hydrogen or CO<sub>2</sub>) for a deep and far-reaching transformation in the medium term. This must be complemented by large-scale collaboration schemes between knowledge institutions and companies to facilitate R&D activities and the transfer of viable innovative solutions to the industrial sector.

***All regions implement a multi-technological approach to the process of decarbonization of the economy***

From the point of view of decarbonization technologies, the multi-technological approach to the energy transition stands out. Although bets are placed on certain technologies in different sectors, no technology or energy source is ruled out in sectors where decarbonization is difficult, such as the industrial, mobility/transport or residential sectors. On the other hand, the industrial decarbonization process is addressed in an innovative manner, focusing on the development of a "hydrogen economy", technologies for CO<sub>2</sub> capture, storage and use, and facilitating the "heat transition" (in industry and the residential sector) towards renewable energies. In addition, the development of energy networks, especially electricity grids, under a joint and integrated vision of the energy sector and, in particular, of electricity-natural gas-hydrogen networks, is very relevant. An approach to the process of emissions reduction in the Basque industry based on multiple technological options, taking into account its potential contribution to the decarbonization of the economy, will favor the competitiveness of companies in sectors where it is complex to reduce emissions and where electrification is not feasible.

***The R&D ecosystem plays a critical role in the decarbonization of regions with a high weight of the industrial sector***

In regions with a higher weight of the industrial sector, the scientific-technological ecosystems proactively support (a) research into new technologies and clean solutions and (b) the development and transfer of relevant innovative solutions to companies. The case of North Rhine-Westphalia is emblematic, as this territory has developed a rich and complex research and innovation ecosystem oriented towards the decarbonization of industry that relies on close collaboration between public institutions, companies, universities, research centers, a thriving energy research cluster, a large public-private research initiative and the development of powerful local value chains in relevant areas of the energy transition. The Basque Country has many of these elements and must continue to provide directionality to the efforts of the Basque Science, Technology and Innovation Network (RVCTI), companies and public institutions to develop technological-entrepreneurial ecosystems that accelerate innovation. Initiatives such as the Net-Zero Basque Industrial Super Cluster can prove to be essential to boost the competitiveness of industrial value chains in the Basque Country around clean technologies and effective decarbonization solutions, and contribute to achieving the goals of the Basque industrial sector.



### ***The sectoral strategies in the different regions make use of multiple economic, fiscal and regulatory tools***

In the industrial sector, for example, the following can be highlighted: (a) specific sustainability plans for each industrial cluster; (b) different types of economic and fiscal signals (fees, CO<sub>2</sub> floor price, taxes, sustainability surcharges); (c) standards (on emissions and for new technologies); (d) obligations (e.g, energy savings, mandatory purchases of renewable hydrogen); (e) optimization of subsidy schemes; (f) investments in strategic projects related to innovative technologies; (g) protection of local industry with compensation of energy costs; (h) accelerated deployment of key infrastructures; (i) tailor-made agreements in different sectors on technologies, boosting circular economy and sustainability, etc.; (j) specific support for SMEs (investments, advice, technical support...). A novel aspect of the strategy in the Netherlands is the effort to align budget cycles with action plans to increase the efficiency and effectiveness of the measures adopted and the allocation of capital resources. The design of the 2050 Roadmap for Energy Transition and Climate Change in the Basque Country will have to take into account different types of tools and standards to simultaneously provide incentives for decarbonization and a sufficient degree of flexibility for the key value chains of the Basque industry. Incorporating the energy and climate perspective in the draft General Budget Law of the Basque Country will also have a significant and positive impact on the process.

### ***Measures to support the decarbonization of industry vary across regions***

Although these measures are designed to respond to the specific challenges in each territory, some of them could be applied in the Basque Country, adapting them to its characteristics. These include: (a) the implementation of specific local projects, training and technical support and other tools to promote decarbonization solutions; (b) support for the development of technologies and the provision of economic resources for investment through different types of financial funds (some of them quite innovative); (c) the implementation of specific decarbonization plans for industrial hubs and cooperation schemes between multiple agents (strategic projects, key infrastructures, sectoral agreements, etc.), also using various economic and financial tools to promote decarbonization solutions. ), also using various economic and fiscal tools; (d) accelerated deployment plans for key infrastructure (smart grids, heat networks, hydrogen, etc.); (e) the strengthening of a dynamic and sophisticated ecosystem of innovation and technological developments in energy and decarbonization solutions with multiple sectors and agents involved, both public and private; and (f) the development of financing measures and instruments (mentioned above) in line with the resources and powers of the regions to promote projects, including the promotion of financial support for the development of new technologies.

### ***Optimization of available resources***

In general, it is observed that the strategies and action plans in the different territories take advantage of their strengths in natural and energy resources and are linked to their geographical location, orography and land use. These may include available energy resources (conventional renewable electrical energy, biomass, geothermal energy, etc.), new energies such as offshore wind power, recoverable waste, forestry resources, marine resources and those associated with the blue economy, etc. The optimization of mobility networks (e.g., models based on alternative modes of

transport), energy, heat, etc., takes into account the geographical configuration of settlements, land use, etc. Efficiency in the use of materials also becomes relevant through circular economy strategies with application to companies and households. Human resources must also be adapted, updating training systems and the development of people's knowledge and skills.

### ***Monitoring and follow-up of the strategies and action plans***

A common element to all the territories analyzed is the existence of mechanisms and protocols for the monitoring and evaluation of energy transition and decarbonization processes. These monitoring systems must be flexible, facilitating the adaptation of strategies, plans, policies and tools to the evolution of an uncertain and complex surrounding context. They must also be based on independent visions and voices and facilitate the necessary fluidity in communication between the various levels of the different public administrations involved and with economic and social agents. The LVTECC incorporates a number of mechanisms for monitoring and adapting the transition process (e.g., Energy Transition and Climate Change Office) and it will be crucial for its success to ensure their independence and proper functioning. In this regard, the experiences of other European regions may be useful.

In summary, the experience accumulated in European regions and territories where strategies and action plans for energy transition and decarbonization of the economy are being implemented shows that these processes take time, must involve all the agents of the economy, require innovative governance frameworks and social support and are leveraged on advanced innovation ecosystems, transfer of innovative technologies and solutions to companies and adequate financing of sustainable projects.

The approval of the Energy Transition and Climate Change Law in the Basque Country and the roadmap with details and objectives at sectoral level that will accompany it represents a great opportunity to launch a process of transformation of the Basque economy that facilitates the fulfillment of environmental and social objectives. Identifying best practices in European regions with economies comparable to the Basque economy and which started their decarbonization pathways years ago will undoubtedly contribute to defining efficient roadmaps that provide optimal responses to complex challenges and contexts.



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