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Green Transition and Industrial Competitiveness

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Closing Report

> "Large energy generation projects are necessary, calling for public-private collaboration and a comprehensive approach to industrial energy management"

Foro Industria y Energía

> "The industry in Catalonia requires a shift in societal mindset in order to sustain and grow. This necessary drive must be accompanied by a rapid yet calculated energy transition"

The energy transition is a non-negotiable process driven by regulatory and business competitiveness reasons, directly impacting the industry both as a consumer and a provider of solutions. In fact, industry and energy are inherently intertwined because having a sufficient, affordable, and sustainable energy supply is fundamental for the maintenance and reinforcement of the industrial fabric.

The ambitious decarbonization plans of Europe, Spain, and Catalonia require an acceleration of the process, which involves promoting renewable energies and energy efficiency. This, in turn, necessitates the involvement of various levels of government, private initiative, and civil society.

The industry holds significant value as an economic engine and a creator of high-quality employment, which should be acknowledged by society. In the case of Catalonia, in particular, the industry has historically played a crucial role, and it currently requires a shift in societal mindset in order to sustain and grow. This necessary industrial drive must go hand in hand with a rapid yet calculated energy transition that ensures a continuous energy supply throughout the entire process.

Industry and Energy - Two inherently intertwined vectors

The industrial sector is the foundation of economic growth and wealth creation, and throughout the centuries, it has always relied on energy[1] for its development. Industry and energy have evolved over time, initially focused on improving efficiency and productivity, and later introducing the concept of sustainability. After a profound reevaluation of both sectors, Europe, Spain, and Catalonia are now focusing on industrial revitalization, with energy being an essential vector[2].

The intertwined vectors of industry and energy can no longer ignore green transition, which is essential to address climate change, a scientifically established fact[3]. This process demands policy adaptations, a long-term perspective, deep consensus, and extensive multilateral cooperation. On one hand, a policy is needed to ensure the maintenance of an industrial base in the economy, not only for strategic autonomy but also for stability and inequality reduction[4]. However, it is crucial to balance it with the energy transition, seeking harmony between the two and an appropriate implementation pace to not compromise the industry's competitiveness[5].

In addition to being compatible, industry and the energy transition are complementary. The decarbonization process itself relies on the industry as a provider of solutions to progress[6], and this energy industry will allow the rest of the production system to operate and deliver goods in a "green" and clean manner[7]. Given the new guidelines from the European Parliament, which have set a target of 42.5% renewable energy by 2030, the decarbonization of the industry and other sectors will require massive use of wind and solar energy. The development of these will necessitate supply chains to double their provision, which also presents an economic opportunity for the industry[8].

At this moment, the international community faces an unprecedented challenge in the realm of transition(9), which also represents an extraordinary opportunity for Europe and Spain(10), with the latter currently being the most competitive country in the field of renewable energy(11).

"The decarbonization process requires the industry to act as a provider of solutions, and this energy industry will enable the productive system to operate and deliver goods in an environmentally friendly and clean manner"

Industry in Catalonia – Present and Future

Historically, Catalonia has been an industrial powerhouse that, under new paradigms[12], can and should continue to be a future commitment[13]. Similarly, the city of Barcelona wants to promote industry within its urban fabric, with projects that attract investments for this new industry: clean, urban, and job-generating[14].

Industry has played a fundamental role in shaping modern Catalonia[15]. At present, it constitutes 20% of Catalonia's GDP, and when factoring in related services, it rises to 24%. This sector is instrumental in generating higher-quality employment, improved wages, and greater innovation compared to other sectors, thereby enhancing social well-being and cohesion[16].

However, to undertake the necessary push for industrial revitalization, it is essential to foster a change in mindset within civil society. While Catalonia possesses all the assets and attributes to be an attractive destination for investments and industrial projects, willingness is also crucial[17]. Therefore, it is vital to raise public awareness: to educate society on the need to fulfill certain duties[18] that discourage the relocation of companies, because otherwise decline would be inevitable[19].

"Competitiveness is essential to attract industrial investments. Access to capital, a skilled workforce, affordable energy supply, and political stability are required"

To attract industrial investments, competitiveness is an essential element, for which certain conditions must be met, such as access to capital, professional qualification, affordable energy supply, and political stability - an important factor since these are medium to long-term projects[20].

In summary, the energy transition for Catalan industry is based on three pillars: the support of the region, which requires a social discourse; that of the Catalan, Spanish, and European administrations, also from a regulatory and financial perspective; and that of the companies themselves, to decarbonize "here" – meaning, their operations locally - [21] and not relocate. Thus, it is necessary to convince society and the business world that transition is essential because the country needs industry[22].

Currently, the environment in which Catalan industry operates is in a challenging situation. Since the Ukraine crisis, industrial production in energy-intensive sectors has fallen by 22% in the eurozone. In Spain, industrial turnover has declined by 18% from January to June 2023, while Catalonia has experienced two consecutive quarters of negative GDP growth[23]. The overall economy is grappling with high inflation, while business credit remains nearly nonexistent due to European directives. All of this is leading to a drop in exports, sales, and productivity[24].

Among other factors, this crisis stems from a poor recovery from the pandemic, with a continuous decline in demand since last October. In this negative scenario, the solution lies in increasing industrial productivity, and a significant part of this productivity increase is achieved precisely through energy[25].

The Energy Puzzle of the Industry in Catalonia

"The limited presence of renewables in Catalonia in comparison to the Spanish average entails the need for the development of an additional 8,000 MW of wind energy or 12,000 MW of photovoltaic energy"

Renewable energy constitutes one-tenth of the final energy consumption in the industrial sector in Catalonia, specifically accounting for 10.1%. This figure includes both direct consumption of renewables for heat production (3.6%, mainly biomass) and electricity generated from renewable sources (6.5%). However, it lags significantly behind the Spanish national average (25.1%). Among the most industrialized regions, Catalonia has the lowest percentage of energy consumption originating from renewables. Leading the list are Aragon at 42.4%, followed by the Basque Country (28.4%), and Navarre (26.7%)[26].

It's important to note that electrification alone is insufficient to decarbonize industrial production, as over half of the electricity generated in Spain comes from non-renewable sources, such as nuclear and gas. Moreover, industrial self-consumption of electricity remains relatively low[27]. According to estimates presented in the report 'Where Does the Industry's Energy Consumption Come From?' by Opina360, it is suggested that, in 2022, industrial self-consumption of photovoltaic energy reached 2,600 GWh, accounting for approximately 3.5% of the industrial sector's electrical consumption[28].

This limited presence of renewables compared to the Spanish average, coupled with the anticipated decommissioning of nuclear power plants, requires the development of an additional 8,000 MW of wind energy or 12,000 MW of photovoltaic energy, along with energy storage systems[29]. This presents both a significant challenge and significant opportunities[30]. In this context, large-scale energy generation projects are essential, entailing public-private collaboration and a comprehensive approach to energy management in the industry[31]. At present, the key lies in renewable energy sources, as without this assurance, there will be no industrial plants in the future[32].

To meet this demand for renewable energy, initiatives like Forestalia have emerged. Forestalia has ongoing projects that can supply energy to Catalonia from wind and solar parks located in Aragon[33]. These projects, with approved Environmental Impact Statements, add up to an installed capacity of 4,000 MW, which could potentially address 40% of the energy needs of the industrial sector in Catalonia by 2030[34].

Roadmap

Catalonia has established clear policies and plans to undertake decarbonization, which requires not only technological but also structural changes[35]. To drive this transformation, the Energy Prospect of Catalonia (Proencat 2050) has been approved, comprising twenty strategies to be developed and coordinated at the highest level. Success in this endeavor hinges on reducing bureaucracy and incorporating social and territorial aspects[36].

Regarding the territorial aspect, Catalonia has, for various reasons, been a passive observer of renewable energy projects[37], a situation that needs to be reversed. To achieve this, Catalonia's public energy company, Energies Renovables Públiques de Catalunya (L'Energètica), aims to undertake projects throughout Catalonia with the support of 947 municipalities and 40 county councils [38]. The entity seeks to be "another contributing participant" and hopes to share experiences with all those involved in renewables and the energy transition, whether they are from Catalonia or elsewhere[39].

"The industry demands clear regulation that enables overcoming barriers, such as those currently present in cases like energy communities and closed networks"

In addition to these challenges, the industry also calls for clear regulation that allows overcoming barriers currently present in cases such as energy communities and closed electricity distribution networks[40]. This situation is causing uncertainties in energy allocation processes, the implementation of self-consumption, decarbonization, and electrification, along with generating costs for industries[41]. The fundamental issue is that the regulatory framework is designed for a centralized network with few points of generation, whereas, in reality, it operates with decentralized generation involving thousands of points when considering self-consumption[42].

Small and medium-sized enterprises, many of which are located in industrial zones, face additional challenges in their energy transition, including financing and an individualistic corporate culture[43]. In a transitional period like the current one, it is necessary to have leadership that acts as a spearhead, enabling this process to become a part of everyday business operations[44].

Security of Supply

To embark on the energy transition while simultaneously maintaining the competitiveness of the industry, a commitment to renewable energy is essential, always ensuring a reliable energy supply[45], in line with the 'security, accessibility, and sustainability' trilemma[46]. Thus, while decarbonization is significant, energy policy encompasses more than just decarbonizing; it is also, and perhaps primarily, about ensuring supply security. To achieve this, investments in renewable energies are required, as well as in other primary and final energy sources[47] that will continue to be used in the coming years.

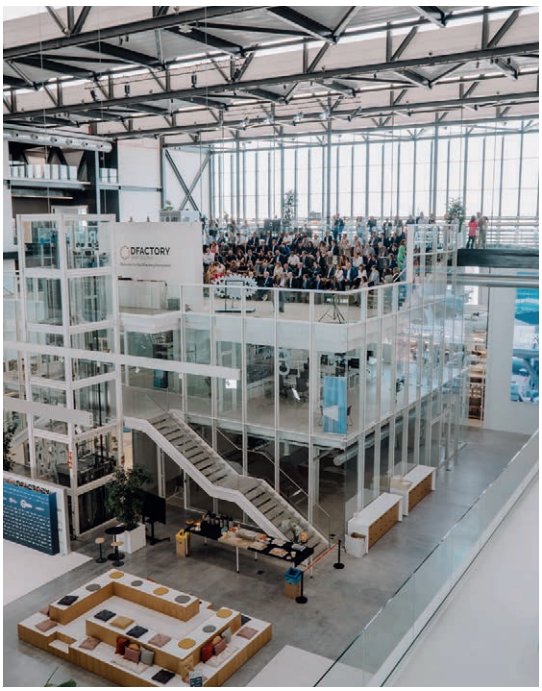
Another fundamental concept closely tied to supply assurance is energy sovereignty. The Ukraine conflict has highlighted that lacking it, not only at the scale of Catalonia, Spain, or the Peninsula, but at least within the EU, can come at a high cost[48]. This requires a European-level reflection[49], which revolves around diversifying, flexibilizing, and being cautious about avoiding new energy dependencies[50].

"Energy policy is much more than decarbonization; it is also, and perhaps primarily, about ensuring supply security"

In essence, the decarbonization of the industry involves investing in reconfiguration and achieving the transition 'in-house,' electrifying everything possible, and working with other vectors such as hydrogen[51]. To succeed in this process, it is essential to 'balance the equation,' recognizing that bridge technologies will be necessary, not only to replace existing energy sources but to further electrify, which require high-voltage power lines[52].

For all these reasons, green transition presents an opportunity for businesses, allowing the creation of a new business and energy landscape[53], in which Barcelona and Catalonia are well-positioned as significant global hubs for the establishment of tech companies[54].

Conclusions



1. Industry, a Key Driver of Wealth Generation and Social Cohesion

The industry plays a fundamental role in generating wealth, creating quality employment, and fostering social cohesion. The current situation is particularly complex for the industrial sector in Europe, Spain, and Catalonia, making a commitment to reindustrialization necessary. Catalonia, with its historically strong industrial base, is well-positioned to maintain its significance in the future, but this requires an energy-driven boost.

2. The Energy Transition is Non-negotiable

In the context of climate change, the energy transition for the industry is non-negotiable for various reasons, including European regulations and long-term business competitiveness. In Catalonia's case, the energy transition demands a resolute focus on renewable energies, which currently lag significantly behind the Spanish average.

3. Clear Regulation, Streamlined Processes, and Embracing Renewables

Clear regulations that eliminate existing barriers, streamlined bureaucratic procedures that ensure projects progress at the necessary pace, territorial engagement, and a public-private commitment to renewable energies with a global energy management approach are essential for the industry to undertake decarbonization while maintaining its competitiveness.

4. Energy Autonomy and Supply Security

The industry requires an energy supply that adheres to the trilemma of "security, accessibility, and sustainability" for its development. This entails promoting energy sovereignty at both the local and European levels and ensuring access to electrical grids.

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