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DISTRIBUTION GRIDS

The driving force behind
electrification

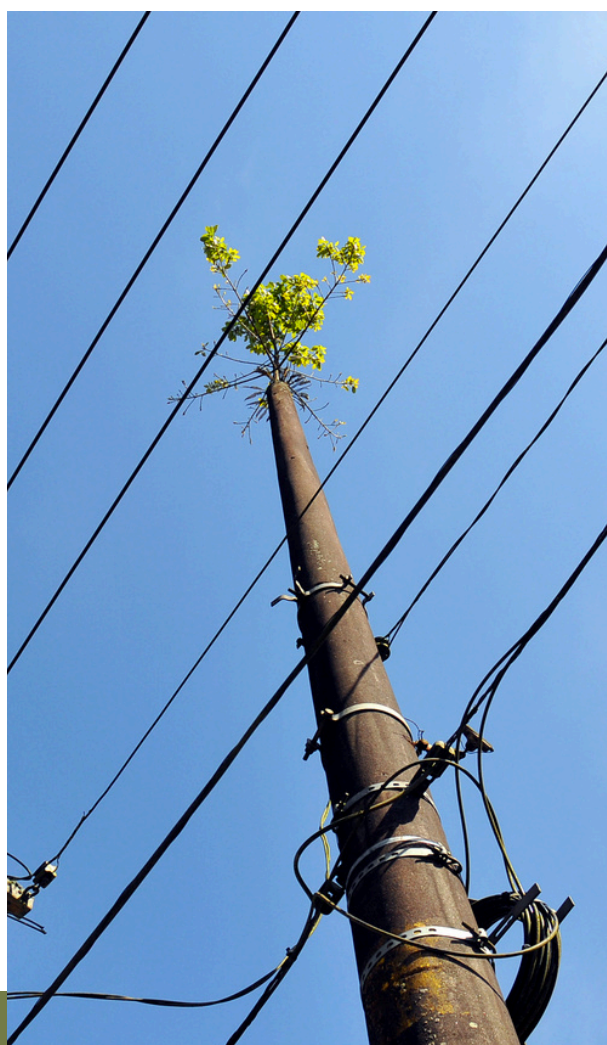


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Start POINT

It's well known that, in recent years, electricity generation from renewable sources has increased significantly in Spain. However, this growth is facing a **major obstacle** to further progress toward the goal of phasing out the use of fossil fuels: the electricity distribution grid.

Due to its saturation, this infrastructure is currently **unable to absorb, manage, distribute, and connect all the electricity demand** that is awaiting access and ready to come online. The lack of modernization and digitization of the grid, along with the backlog in processing access requests for projects that have not yet been implemented, explain this bottleneck.



It's true that the limitations of electric grids are a problem and a challenge shared on a global scale. Any country that wants to achieve the emissions reduction targets set for 2030 must adapt its electric **grids through expansion, modernization, and digitization.**

At the national level, given that the latest update to the National Integrated **Energy and Climate Plan (PNIEC)** projects demand of 353 TWh in 2030, compared to 248 TWh in 2024, expanding grid capacity to accommodate an additional 105 TWh of new connections is crucial to achieving the established goals.

**CONGESTION
AT CONNECTION
POINTS**

94 %

**UTILIZATION
FACTOR**

>16 %

In this regard, the permits granted for energy projects far exceed the final targets that were set. For example, 12 GW has been authorized for data center connections, whereas the government's Artificial Intelligence Strategy proposed only 2.5 GW. **Connection points are operating at approximately 94% capacity, which prevents new demand from being connected in many areas of the country.**



This document seeks to answer a key question: **To what extent does the Spanish distribution grid act as a limiting factor in electrification**—a key factor in achieving the goals set out in the PNIEC, which, in turn, are part of the legislation developed to comply with the Paris Agreement?

A thorough assessment is conducted of the status **of the distribution grids throughout the territory and their technical conditions**, analyzing occupied and available capacity as well as consumption under the various electricity rate plans, in order to determine their actual usage.

Once the resulting issues have been identified, a series of improvement measures are proposed to accelerate electrification in Spain.

Diagnosis of DISTRIBUTION GRIDS

In terms of ownership of distribution grids in Spain, **just four companies control 95% of all supply points in the country**, even though there are more than 300 distribution companies. The territorial and physical concentration of distribution system operators (DSOs) is so significant that users cannot choose their distribution company, as it is determined by geographic location, which limits their options.

**FOUR COMPANIES
CONTROL
95 %
OWNERSHIP OF THE
DISTRIBUTION GRIDS IN
SPAIN**



This situation results in a distribution network that is rigid, **concentrated, and oligopolistic, both physically and from a business perspective**. The lack of competition creates difficulties for meeting electricity demand and for new players to enter the market, offers little flexibility for integrating self-consumption and distributed renewables, and leads to an inequitable distribution of costs and benefits among different users and regions.



Furthermore, this assessment has highlighted the state of saturation of the distribution grids for the main DSOs operating in the country. **It is evident that freeing up network capacity to connect new demand does not necessarily require the deployment of new infrastructure**, but rather an optimization of the use and management of the existing system, as well as a review of currently granted permits to prevent them from becoming a tradable asset. In this case, we must change the concept of grid access, ensuring that the first developer to apply –without demonstrating a mature project behind it– is not granted access and thereby blocks the entry of more developed projects. Furthermore, the amount of open and public data is very limited, and there are also problems stemming from poor governance of such data.

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In short, the natural monopoly associated with the management of the distribution grids has evolved into a **corporate duopoly**, with regulated and deregulated activities now integrated, covering the entire electricity value chain.



It is clear that grid congestion is **contractual and permit-related, not physical**. Although, as previously mentioned, the saturation of **connection points stands at around 94%, the utilization factor is less than 16%**. Therefore, freeing up grid capacity to accommodate new demand does not necessarily require the deployment of new infrastructure, but rather an optimization of the use and management of the existing system.

Possible SOLUTIONS

These are the main measures recommended by the Fundación Renovables to reform and improve the management of distribution grids in Spain, with the aim of addressing the issues identified throughout this document:

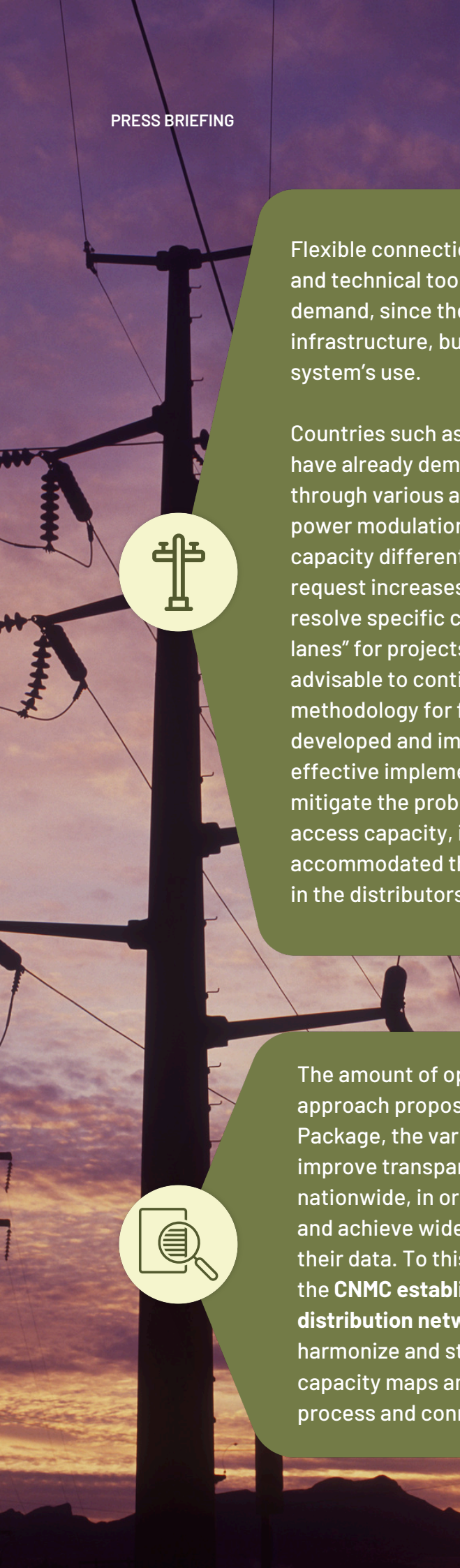


Transparency must be increased, and compliance with the annual investment plans of the companies that own the distribution grids must be audited and reviewed. This is the only way to ensure that investments in the grid are made on time and at the pace dictated by the needs of the electric system.



Proactive investments and sound long-term grids planning—two closely related actions—are vital in this regard. Greater cooperation among DSOs, the regulator, and consumers is therefore essential. Stable regulation that provides an adequate rate of return to reward innovation and enable proactive investment decisions is also essential. However, as ACER points out, excessive remuneration must be avoided, as it can lead to higher bills for consumers. This report has highlighted the state of saturation of the distribution grids for the main DSOs operating in the country.

Therefore, effective, nationally coordinated long-term planning of investments in grid infrastructure is necessary to mitigate this situation.



Flexible connections have proven to be one of the fastest regulatory and technical tools for freeing up grid capacity to connect new demand, since they do not require the deployment of new infrastructure, but rather simply an optimization of the existing system's use.

Countries such as France, Denmark, Lithuania, and the Netherlands have already demonstrated the effectiveness of these measures through various approaches: early connections with time-varying power modulation, interruptible contracts for large loads, flexible capacity differentiated by technology, permits allowing operators to request increases or decreases in demand at different nodes to resolve specific congestion, or a system for implementing “priority lanes” for projects of national importance. In the case of Spain, it is advisable to continue moving forward in the direction set by the methodology for flexible connections that the CNMC has recently developed and implemented, with the greatest possible ambition. The effective implementation of efficient regulations would significantly mitigate the problem of contracted excess capacity and blocked access capacity, in addition to ensuring that all new demand is accommodated through flexible connections for new lines and nodes in the distributors' investment plans.



The amount of open and public data is very limited. In line with the approach proposed by the European Commission in the Grid Package, the various distribution companies should be urged to improve transparency and standardize their access maps nationwide, in order to overcome the current lack of transparency and achieve widespread availability and real-time management of their data. To this end, it is recommended that the government and the **CNMC establish a national observatory for the electricity distribution network**. A single digital platform is needed to harmonize and standardize the available information through capacity maps and to enable the digitization of the application process and connection queues in an accessible manner.



Another problem that needs to be addressed is that of governance, since the current corporate structure that owns and manages the electric distribution grids poses a major bottleneck to advancing electrification. To address the negative consequences stemming from the current oligopolistic situation in distribution grids, it is necessary—provided there is a repeated failure to invest in innovative proposals and tools—to gradually restore public ownership of the assets and maximize the significant potential that these grids can offer for the local energy transition.

For this reason, we should look to the success stories of democratization and public participation documented in other EU countries, as well as the municipally owned cooperatives that already exist in Spain. We cannot leave an asset that is a common good for all of society—and one that is crucial to driving the energy transition—in the hands of just a few.



The distribution network is experiencing a bottleneck because the companies that own it want it that way

In summary, given the availability of tools and initiatives to address current problems, **it can be concluded that the distribution network is experiencing a bottleneck because the utility companies want it that way**, in order to increase their return on investment and their profits, which are regulated by the authorities. In the future, this could lead to higher rates for all consumers. Therefore, the situation is of the utmost urgency if we do not want to continue hindering the electrification of the Spanish economy in the coming years.



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