Policy Brief 2026

Connecting the energy transition

Connectivity and digitalisation for clean and affordable energy



Telefónica

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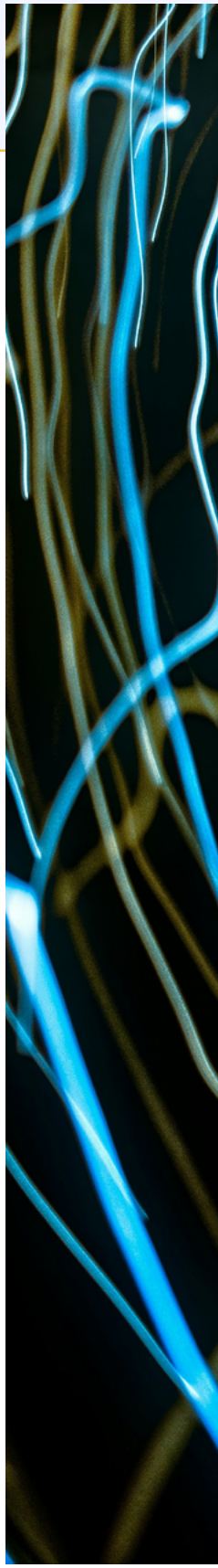
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1. Executive summary



Digitalisation and connectivity, including telecommunications networks, are key enablers of the energy transition. The energy transition requires progress towards a cleaner, more flexible and connected system that facilitates the integration of renewable energy, responds to the growing electrification of the economy and improves energy efficiency.

Integrating renewable energy requires smart grids, greater monitoring capabilities and more efficient management of generation and demand. In this context, smart grids, enabled by digitalisation and telecommunications, make it possible to monitor electricity generation and consumption in real time, detect imbalances and dynamically adjust energy flows.

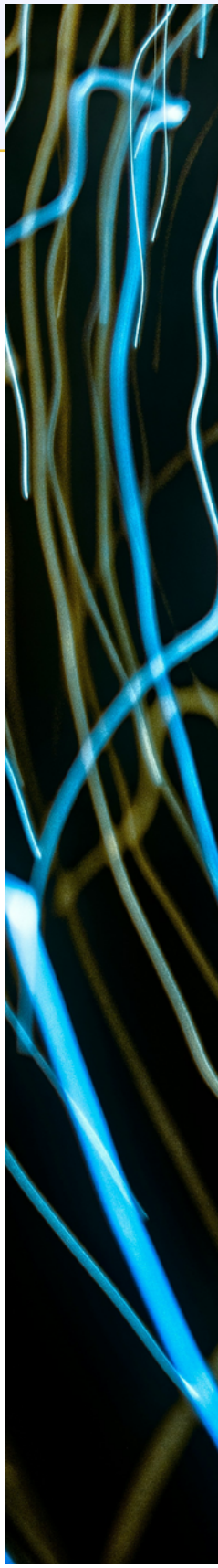
Electrifying households, industry and transport requires increasingly distributed resources to be coordinated through digital technologies and connectivity. Energy systems are becoming more decentralised and bidirectional, and efficient connectivity and digital technologies such as IoT and artificial intelligence are essential to making this transformation possible.

Digitalisation helps improve energy efficiency by optimising consumption and making better use of infrastructure. Electrification must be accompanied by energy-efficiency improvements that make it possible to manage rising electricity demand and reduce the energy required for the same activity. Connectivity and digital solutions enable real-time adjustments to consumption and the optimisation of processes and facilities.

The contribution of digitalisation and connectivity to the energy transition is reflected in a range of Telefónica initiatives, spanning solar self-consumption and storage, smart meters, electricity-grid optimisation and resilient connectivity.

It is essential to harness the potential of digitalisation and connectivity so that it translates into tangible progress in the energy transition. Telefónica therefore proposes recognising and financing these technologies as part of the energy transition, reflecting their environmental contribution in sustainable-finance frameworks and including investments in resilience and cybersecurity, as well as digital-inclusion measures.

2. Connectivity and digitalisation: driving the energy transition

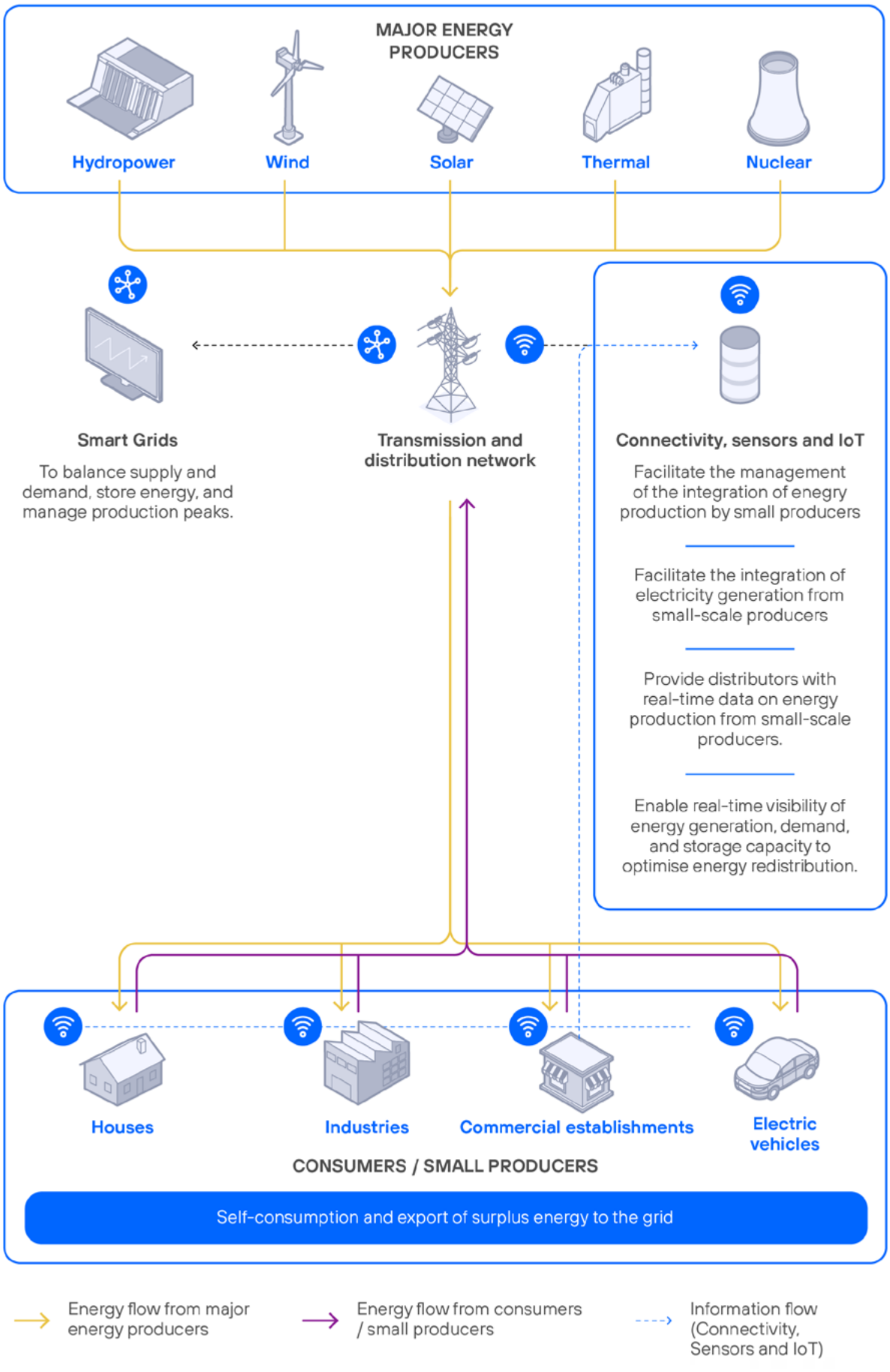


The transformation of the energy system is one of the main pillars of decarbonisation strategies. In a geopolitical context marked by high dependence on external energy sources, it is also central to efforts to strengthen energy autonomy. Moving towards a cleaner, connected, flexible and integrated energy system requires not only transforming how energy is produced and consumed, but also managing an increasingly complex, decentralised and variable system.

In this transformation, connectivity and digitalisation, particularly telecommunications networks, are key enablers for integrating and coordinating electricity generation, transmission and consumption more efficiently. Their role will become increasingly important as renewable-energy integration and the electrification of households and productive sectors advance, and as the need grows to manage an increasing number of distributed resources more swiftly and efficiently.

> Connectivity, including fixed and mobile networks, IoT and edge computing, is the nervous system that connects generation, grids and consumption in real time.

Connectivity and digitalisation enable the transition from a relatively static energy system to one with greater monitoring, control and response capabilities. As distributed generation and new electricity uses, such as electric vehicles, batteries and heat pumps, expand, so too does the need to coordinate these resources and adapt generation and demand to system conditions. This management capability is essential to moving towards a smarter and more flexible electricity system.


MAJOR ENERGY PRODUCERS
Hydropower
Wind
Solar
Thermal
Nuclear
Smart Grids
To balance supply and demand, store energy, and manage production peaks.
Transmission and distribution network
Connectivity, sensors and IoT
Facilitate the management of the integration of enegry production by small producers
Facilitate the integration of electricity generation from small-scale producers
Provide distributors with real-time data on energy production from small-scale producers.
Enable real-time visibility of energy generation, demand, and storage capacity to optimise energy redistribution.
Houses
Industries
Commercial establishments
Electric vehicles
CONSUMERS / SMALL PRODUCERS
Self-consumption and export of surplus energy to the grid
Energy flow from major energy producers
Energy flow from consumers / small producers
Information flow (Connectivity, Sensors and IoT)

Digitalisation and connectivity for renewable energy

The growing integration of renewable energy requires more flexible and intelligent management of the electricity system. The grid must maintain a constant balance between generation and demand, a challenge that becomes more complex as the share of renewable sources increases because their output is variable and depends, among other factors, on weather conditions.

In this context, smart grids combine physical infrastructure with digital technologies and operate bidirectionally, allowing both energy and information to flow in both directions. Digitalisation and telecommunications networks are therefore essential to meeting decarbonisation targets and enable critical developments such as the integration of renewable energy.

They also provide greater real-time visibility into grid operations, making it possible to identify imbalances and dynamically adjust electricity flows. Artificial intelligence can also improve forecasts for both renewable generation and demand, contributing to more efficient management of the electricity system.

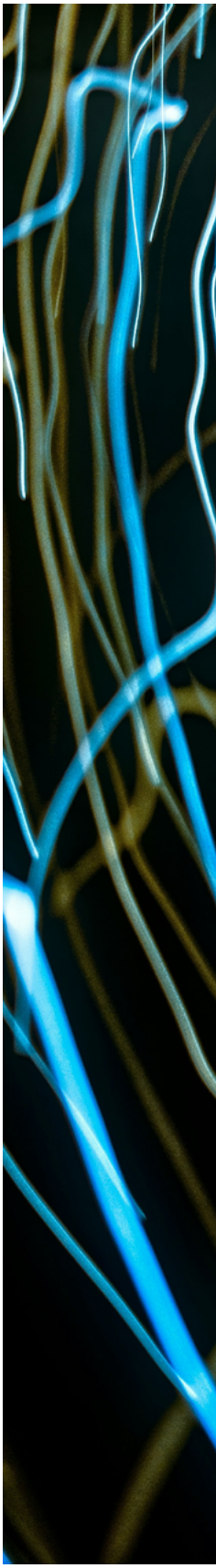
Digitalisation and connectivity for electrification

Europe is accelerating the electrification of its economy, encouraging households, industry and transport to progressively replace fossil-fuel consumption with electricity. For electrification to contribute to decarbonisation while meeting rising electricity demand, it must be accompanied by increased renewable-energy generation, both at scale and through distributed generation and self-consumption systems in households and economic sectors.

This transformation entails moving from a traditionally centralised and unidirectional energy system towards an increasingly decentralised and bidirectional model in which consumers can also produce, store and exchange energy with the grid.

Managing this greater complexity requires further digitalisation of the electricity system through technologies such as IoT and artificial intelligence. These technologies increase visibility into energy flows, enable smarter management of supply and demand, and support more efficient use of infrastructure. Millions of new charging points, heat pumps, batteries and self-consumption installations will only be able to act as flexible system resources if they are connected and can be coordinated securely.

This increasingly distributed and dynamic electrification also requires efficient connectivity tailored to the needs of new energy-consumption models.



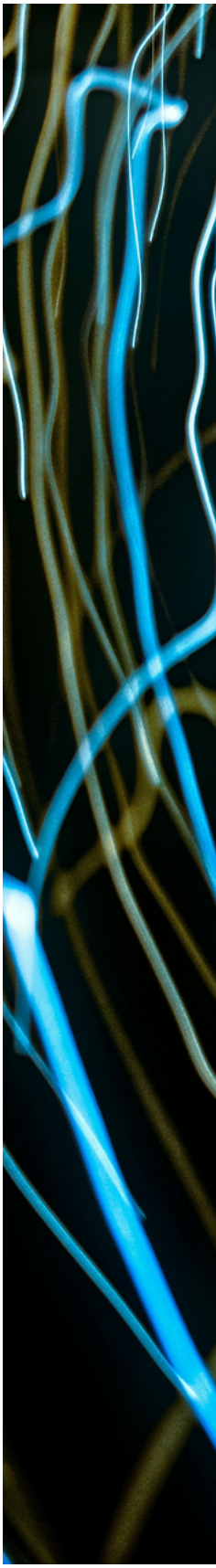
Digitalisation and connectivity for efficiency

Electrification is one of the main levers for decarbonising sectors such as industry, transport and buildings. However, replacing fossil fuels with electricity must be accompanied by continuous improvements in energy efficiency, so that the increase in electricity demand associated with this process is managed while reducing the energy required to perform the same activity.

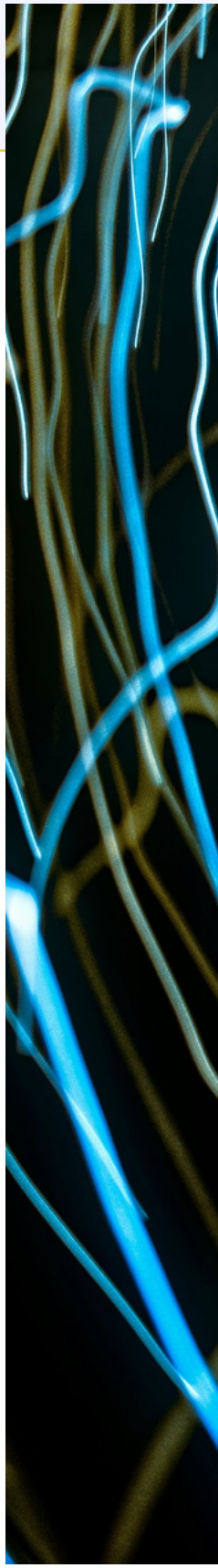
Digitalisation and connectivity play a key role in this area. Technologies such as IoT, artificial intelligence, data analytics and automation provide more precise information on how, when and where energy is consumed and enable action to be taken on that consumption in real time. This helps optimise industrial processes, buildings, logistics networks and transport systems by identifying inefficiencies and automatically adjusting the operation of equipment and facilities to actual needs.

In this way, digitalisation, electrification and energy efficiency reinforce one another, reducing energy consumption, making better use of infrastructure and supporting progress towards a more decarbonised economy.

> Investment and financing in telecommunications networks are therefore just as important to achieving electrification targets as investment in the electricity grid for generation, storage and consumption. Public support for both sectors is equally necessary to achieve the desired electrification rates.



3. Telefónica case studies



SOLAR SELF-CONSUMPTION AND SMART BATTERY STORAGE (SPAIN)

Solar360, a 50:50 joint venture between Telefónica and Repsol, offers comprehensive photovoltaic self-consumption and smart battery-storage solutions optimised using AI. The technology intelligently manages energy generation, storage and consumption, maximising the use of solar energy, reducing dependence on the grid and optimising energy savings[1].

SMART METERS TO REDUCE GRID LOSSES (BRAZIL)

Telefónica Vivo provided M2M connectivity for Eletrobras' Energia+ programme, which deployed smart meters and a meter-data management centre across six distribution companies in northern and north-eastern Brazil, the regions with the highest rates of non-technical losses[2].

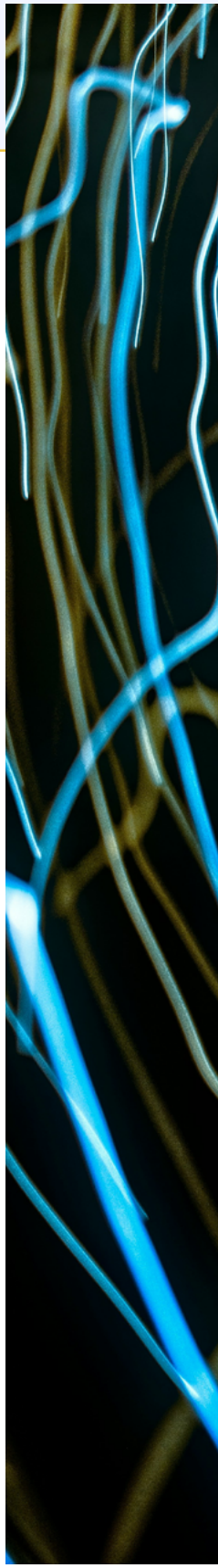
DIGITAL OPTIMISATION OF THE ELECTRICITY GRID (SPAIN)

Telefónica and Red Eléctrica de España developed a Dynamic Line Rating (DLR) solution that uses sensors, weather data, a cloud platform and 4G/5G connectivity to calculate the capacity of power lines in real time. The solution makes better use of existing grid capacity and facilitates the integration of more renewable energy[3].

RESILIENT CONNECTIVITY AND BUSINESS CONTINUITY (SPAIN)

Titán Connect offers a connectivity solution designed to safeguard operational continuity in the event of technical incidents, power failures, cyberattacks or climate-related events. It combines redundant architectures, network diversification, integrated security and 24/7 monitoring to provide continuous, secure and resilient connectivity[4].

4. Recommendations

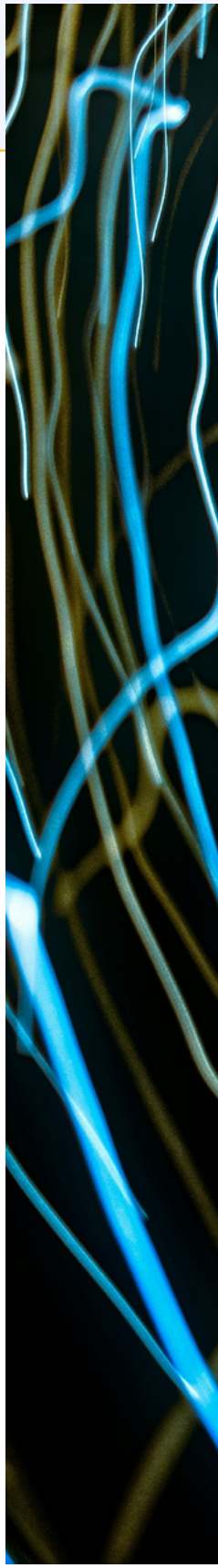


Connectivity and digitalisation are essential to transforming the electricity system and advancing energy, climate and autonomy objectives. They must therefore be placed at the heart of the energy-transition implementation agenda.

Telefónica proposes the following recommendations:

- Recognise connectivity and digitalisation as enablers of global objectives for electrification, renewable-energy integration and energy efficiency.
- Mobilise public and private financing for projects that integrate the ICT sector, digitalisation and connectivity into the energy transition and/or electrification. Recognise the green and sustainable attributes of such initiatives through sustainable-finance frameworks that cover these technologies on the basis of their environmental impact.
- Include cybersecurity and resilience among the eligible areas for financing the digitalisation of energy networks and assets, protecting the monitoring, remote-control and communications systems associated with critical infrastructure and services.
- Ensure that the digital energy transition is fair and inclusive by extending connectivity and digital capabilities to rural areas and vulnerable groups, so that lack of digital access does not become a new barrier to electrification. The COP31 agenda notes that around 730 million people still lack access to electricity.

* References



1. https://www.telefonicaempresas.es/solar360

2. Baguete, «Vivo é rede em projeto da Eletrobras» (February 2015). https://www.baguete.com.br/noticias/vivo-rede-em-projeto-da-eletrobras

3. European Green Digital Coalition, «EGDC Case study: Dynamic Line Rating Platform» (April 2024). https://www.greendigitalcoalition.eu/assets/uploads/2024/04/EGDC-Case-Study-Meth.-Telefonica-DLR.pdf

4. Titán Connect - The Network that Supports Your Business - Telefónica Empresas: https://www.telefonicaempresas.es/grandes-empresas/servicios/para-tu-conectividad/titan-connect/titan-connect/

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