November 2022

Proposals for an ambitious energy transition

FUNDACIÓN RENOVABLES

Fundación Renovables would like to thank the Board of Trustees and the Friends of the Foundation for their collaboration.

The team that worked on this document is: Raquel Paule, Maribel Núñez, Ismael Morales, Juan Fernando Martín, Javier Pamos, María Manzano and Alexandra Llave.

Supervision: Board of Trustees of Fundación Renovables:

President: Fernando Ferrando Vitales.

Vice Presidents: Llanos Mora López, Juan Castro-Gil Amigo and Mariano Sidrach de Cardona Ortín.

Trustees: Domingo Jiménez Beltrán, Sergio de Otto Soler, Luis Crespo Rodríguez, Sara Pizzinato, Assumpta Farran Poca, José Luis García Ortega, Daniel Pérez Rodríguez, Javier García Breva and Marta Victoria Pérez.

Fundación Renovables
(Declared a public utility company)
Pedro Heredia 8, 2º Derecha
28008 Madrid
www.fundacionrenovables.org

Contents

Introduction

Proposals for an ambitious energy transition

FUNDACIÓN RENOVABLES

Introduction

Context

The climate emergency is not stopping, despite the global energy and social tensions we are currently experiencing, and despite the fact that the current political dynamics tend to devalue its importance in legislative processes. In light of this energy vulnerability caused by the high dependence on fossil fuels from third countries, we must continue on the pathway of innovation, technological development and implementation of renewable energy. This is especially important as we are now suffering from the lack of ambition shown over the last ten years.

We must encourage efficiency and energy saving in order to meet the growing energy demand without jeopardising supply or the coverage of basic needs. Responsible consumption of an essential and scarce resource should be the cross-cutting axis that shapes all energy policies. The European Union (EU) is moving towards rapid electrification of demand, which would eliminate and replace the end consumption of fossil fuels. But it is not alone, as all the member states are recognising, at their different production levels, how fragile energy dependence on authoritarian regimes is.

That is why, in both Spain and other countries, the economic and social vulnerability caused by the energy tensions is fracturing the socio-productive fabric, directly affecting families, self-employed workers and companies, all the while exacerbating the energy poverty of the people who cannot afford to pay their bills. Protecting these people while also decarbonising our economy must be a priority, so that nobody is left behind and we can overcome the current crisis by adopting more ambitious strategies in a more united, equitable and caring country.

The revision of the Integrated National Energy and Climate Plan (PNIEC) and the Law on Climate Change and Energy Transition (LCCyTE) must be aligned upwards with the new climate commitments made by the European Commission (EC) in the provisions of the Winter Package, the Fit for 55 and the REPowerEU. As they indicate, **decarbonisation should be at least 55% by 2030**. The also recognise that we are significantly behind the EU average, and additional measures should be put in place in the second half of the decade to achieve the targets set. Disregarding these commitments will prolong our energy vulnerability and place our position as a pioneering and leading country in the energy transition at risk.

Key axes

Working from a basis of needing to electrify demand as an essential means of efficiency, providing a 100% renewable supply, reducing emissions in the coverage of our energy needs and placing consumers at the centre of the energy model, **the three priority lines of action must be**:

Individual and collective self-consumption

Self-consumption breaks the hegemony of a concentrated and centralised electricity system and provides citizens with autonomy, supply-price stability and the capacity to actively and consciously make decisions, therefore placing them at the heart of the new distributed system. The anticipated Royal Decree 244/2019 (link in Spanish) was published in 2019. This established a good legislative base, but it would require a series of improvements that have not been implemented, especially regarding collective self-consumption and the lack of a clear resolution to bad administrative and distributor practices that prevent large-scale implementation.

The short-term measures that need to be resolved include: updating and introducing the targets of the Self-Consumption Roadmap in the PNIEC with the aim of making them binding; committing to transposing EU Directive 2019/944; eliminating the barriers to collective self-consumption (and thus to energy communities); facilitating (and ensuring) access to the grid; and considering individual self-consumption as a household appliance for equipment of less than 2.4 kWp. Other measures are described in more detail later in the document.

We are aware that committing to an open model necessarily involves opening up use of electricity infrastructure and ensuring that these facilities are paid for the service they provide and not based on the profitability demanded by their owners without taking on the challenges established by the market.

Energy rehabilitation

The construction sector is responsible for 30% of national energy consumption. This is because **Spain has an old building stock with serious construction and insulation deficiencies, which are key factors in causing energy poverty, and heating which is operated mainly using gas and gasoil.** The energy rehabilitation of buildings must be a key line of action. That is why we need to convert the construction sector, which was adversely affected by the 2008 crisis, towards building rehabilitation processes that enable economic regeneration in line with the ecological transition that is so urgent.

We need public buildings that are self-sufficient in terms of energy under the term nZEB (nearly zero-energy building), which would include self-consumption facilities, and we need to set the target of rehabilitating 5% of the buildings per year. Similarly, we need to work on the energy rehabilitation of residential buildings that already exist and on the bioclimatic design of new buildings. **The objective is to achieve nearly zero-energy buildings that prioritise efficiency and whose energy demands are covered by self-consumption.** We are faced with the reality of a lack of clarity over the meaning of nZEB buildings and what needs to be amended in the different technical regulations.

Sustainable mobility

Mobility and transport require not only improved efficiency and reduced emissions due to their high consumption of fossil fuels, but also a comprehensive improvement of the entire population's lifestyle. **The main premise is to reduce the need for mobility, as well as achieving a new modal distribution with active mobility as the key basis for our travel**. Its cross-cutting nature means that it needs to be taken into consideration in each and every energy policy plan.

Although the measures should be integrated and part of all of the action plans, there is a need to focus on the measures to improve public transport, promote urban cycling, limit access to large cities, support electric vehicles and improve mobility to work. In order for this to be achieved, moving urban planning towards the concept of a 15-minute city is imperative. This is based on transferring the current hegemony of the private vehicle towards pedestrians. This would improve air quality and the urban environment, while also returning the human dimension to cities.

Demand-side proposals

Proposals for an ambitious energy transition

FUNDACIÓN RENOVABLES

Demand-side proposals

Energy saving and responsible consumption

Through education, training and information, we need citizens to be aware of how they can satisfy their energy needs under responsible consumption criteria, as opposed to consumerist advertising that emphasises a consumption model of goods that we do not have and whose use has perverse consequences for the environment and the future.

Rational energy behaviour should be the result of a programmed learning process incorporated both in the teaching of children and in a clear and transparent information policy on how to save energy without sacrificing comfort and quality of life. That is why we propose a series of energy saving proposals:

- Creation of an **energy efficiency and saving plan by the autonomous regions** to be applied by each town and which includes incentives for the education, development, implementation, monitoring and training of technicians, with a basis for action on air-conditioning, mainly in buildings, to:
  - **Eliminate gas for air conditioning** in all public buildings from 2025 and replace with aerothermal heat pumps.
  - Promote **free cooling** in commercial buildings.
  - **Adopt a plan to replace gas with electricity in homes, which includes financing tools.** This plan would have economic advantages thanks to the elimination of a supply contract and, therefore, of the payment of a fixed rate, as well as lower energy consumption due to the high efficiency of aerothermal energy compared to any gas boiler.
  - **Adapt the set-point temperatures** of public and service buildings, modifying the 27°C in summer and 19°C in winter according to the relative humidity of the area at that time.
  - **Modify remote-working conditions caused by Covid-19 to focus on energy-saving reasons.** If the premise to avoid infections was to ensure as few workers as possible interacted and distance between them was maintained, the objective is exactly the opposite for energy saving. The idea is that when people go to the office, they all go, while also maximising the available space by concentrating the workspaces and ensuring there is no need to air-condition spaces with few people. Therefore, the Spanish remote-working act (link in Spanish) needs to be modified to adapt it to the energy-saving premise. Similarly, **remote working should be imposed in public administrations** wherever possible.

- **Section company buildings with remote working by floor**, with a view to increasing staff density on face-to-face working days to avoid waste and promote energy savings.
- Approve the National Fund for the Sustainability of the Electric System (FNSSE) and provide aid and financial lines. It is more about the use of the fund rather than its collection and filling.

Energy poverty

Universal access to energy and the elimination of energy poverty must be priorities for the updated PNIEC, thus creating a "**Plan to eradicate energy poverty**". The initiatives proposed to achieve this must have two lines of actions: eliminating the structural causes of energy poverty and alleviating its effects until the cause of the situation is resolved.

In general, the three causes of energy poverty that, unfortunately, tend to coexist in most cases are:

- **Insufficient household income.** We need a universal minimum wage that is sufficient to cover basic needs, which includes energy access.
- **Excessive energy prices.** Different lines of actions are detailed throughout this proposal, two of which are:
  - Modifying the price-setting and taxation policy model so that the price signal to the consumer is fair and transparent.
  - Setting a social tariff that recognises a guaranteed minimum consumption at a reduced or zero cost and a progressive tariff design.
- **Bad quality of residential buildings.** The age of many residential buildings and their construction deficiencies are some of the causes of excessive energy demand for adequate climatic conditions, and the consequences of a "sick building" are transferred to the health of the residents. In Spain, more than 50% of the buildings do not have insulation because the first regulation to set limits on loss coefficients was in 1979 and 97% do not comply with the current regulation. A specific proposal for targets and instruments for the energy rehabilitation of buildings is included in a later section of this document.

Town councils are currently carrying out the social assistance measures needed to alleviate the effects of energy poverty that the other administrations are not. This role, which they play today because of their proximity and commitment, must be strengthened and supported by the other administrations. Thus, **the incorporation of**

self-consumption and new lines of action in town councils that consider electricity as a public service should make it easier to cover the needs of the most vulnerable.

Energy rehabilitation

Residential sector

The rehabilitation of residential buildings and focus on efficiency should be key political commitments, in which the energy base is the main component of investment to be made. This is key for the financial viability of the projects. **We could say that energy rehabilitation needs to be the driver of the construction sector**, with a focus on SMEs. More than 30% of the final energy demand is currently produced in buildings and, in the residential sector alone, 40% of this demand is from fossil fuels.

Rehabilitation has formed part of most of the national and EC plans as a basic element for the energy transition, but the lack of agreement on the targets is perhaps what has halted development. There needs to be a clear executive line with greater commitment. In this respect, our proposed targets are as follows:

- **Set a rehabilitation target of up to 500,000 homes by 2025**, which corresponds to 3% of the first-home housing stock per year.
- **Develop an education and communication plan** on energy rehabilitation with real-estate companies at regional and municipal levels.
- **Establish a framework for calculating energy efficiency of buildings in the certificates**. This would reflect typical energy consumption resulting from the broad definition of the technical installations of the building (heating and refrigeration, domestic hot water, ventilation, lighting, automation and control, self-consumption and renewables) being included. This will be expressed by a numerical indicator in kWh/m^2/year. It could also include a greenhouse gas emissions indicator.
- Take into account the *Renovation Wave of the housing stock*, which the EC published in 2020, with the aim of creating more demanding efficiency and energy certification standards for buildings, incentivising private financing, revising the European directives to increase the use of renewables in buildings, and developing approaches based on the neighbourhood, local energy communities and digitisation to develop zero-energy-consumption districts.
- **Establish a political commitment to rehabilitate 250,000 homes/year belonging to vulnerable families or in areas of urgent urban action**, with public responsibility for implementation. An inventory of buildings to be rehabilitated must be available within six months.

- **Commit to rehabilitating 5% of the buildings dedicated to the provision of services.** This would require that nearly zero-energy building (nZEB) criteria be applied to all newly constructed buildings becoming operational from 2024 or those that are currently granted planning permission with a surface area over 1,000 m^2, and that their energy needs be 100% covered by electricity from a renewable source.
- **Develop a plan to eliminate natural gas, butane and propane in the residential sector**, setting a target of transforming 500,000 homes/year to 100% electricity, with support from public aid. This proposal is in line with the EC proposal to reduce the EU's dependency on natural gas.
- **Require A or B certificates** for buildings and areas with more income or a penalty of an increase in the Spanish property tax (known by its Spanish acronym, IBI).
- **From 2025, refuse planning permission for buildings that use fossil fuels.** Adaptation of planning permission to favour the rehabilitation of buildings, considering their quantification according to the area of action (centre and neighbourhoods in need of urgent intervention).
- **Eliminate gas for air conditioning in all public buildings before 2025 and replace with aerothermal heat pumps.**
- **Implement best practices in passive architectural design**, taking into account current and future weather conditions. Many rational construction practices have been lost with the increased use of glazed surfaces and materials whose energy performance, both in terms of direct and inertial gain, does not help the air conditioning systems to be active and mitigate the consequences of prioritising design over the sustainability of the building. Many of the thermal loads to be managed are intrinsically caused by the design adopted.

With regard to financing, a series of complementary tools should be developed, which includes:

- **General state budgets**, although private capital is needed initially to overcome social and socioeconomic barriers. It is also needed in order to rehabilitate all the buildings and due to the delay in aid.
- **Energy-saving certificates.** A tool with enormous potential for coverage if incentives are provided to regulated entities (private capital). The measures would be general rather than individual to each case, and the savings should be monitored as a means for improvement.
- **EuroPACE model.** This system has good development potential as well as being able to attract private investment. What is interesting is that it finances the resource rather than the person, but it is difficult to implement due to the

rigidity of the Spanish taxation system, as taxes cannot be allocated to something that represents a private benefit. A possible solution is financial penalties with small legal modifications to the Spanish Local Finance Act.

- **Ecobonus and superbonus**. The idea of the superbonus emerged in Italy and finances 110% of the rehabilitation measures. In this case, the person who wants to carry out the measure pays nothing, while the taxes of the private entity that finances it are reduced as it is a tax credit. The drawback is that it can easily become a commodity for speculation if it enters into a resale dynamic. The ideal scenario for its implementation would be small packages for cases of extreme poverty.
- **Crowdfunding** as an inclusive and incentivising measure for citizens, at both the investor and recipient level.
- **Savings banks** for small-scale actions. This consists of using the money saved from energy efficiency measures in buildings to **reinvest it** in other actions.

Renovation of equipment

Heating systems with coal and gas boilers should be banned from 2025. In order to identify how many buildings have fossil-fuel boilers, it would be helpful to use the boiler review data to carry out an inventory of all buildings with a natural gas, LPG, propane or gasoil contract.

At this point, it is important to note that biomass cannot be an energy source to target due to the generation of emissions where it is consumed, further aggravating the problem of poor air quality in our municipalities. Moreover, biomass is considered sustainable as long as it is consumed where it is produced and not hundreds of kilometres away. Therefore, it must be considered as a local energy source.

The use of high-efficiency air conditioning systems, such as the reversible heat pump, will improve efficiency by 50% to cover the heating and domestic hot water energy needs and do so with zero emissions. The following is required to implement this:

- **An electrification plan for heating, replacing the fossil-fuel heating systems with heat pumps**, following the proposal in the PNIEC. **One of the lines of action may be** to maintain the heat distribution system to minimise the building work required and to include the mandatory replacement of all boilers that are over ten years old and that are not condensing boilers.

Another incentivising line is to **purchase efficient equipment**, which generates value as it implicitly leads to responsible and sustainable consumption. In this respect, we highlight the following lines:

- Promote the repair of domestic appliances before buying a new one.
- **Replace domestic appliances at the end of their useful life.** The long-term use of the appliance should be promoted over quick replacements, always bearing in mind the risk of scrapping equipment without planning for its treatment and recovery. We need to commit to the circular economy.
- **Require manufacturers to design and produce low-energy-consumption appliances with a limit on the amount of energy that can be consumed per use and type of domestic appliance.**
- **A plan to replace white goods and small appliances at the end of their useful life**, following the provisions for energy labelling in EU Directive 2010/30, including the lines of support/penalties according to the efficiency of the equipment.
    - Aid for repairing domestic appliances, therefore avoiding the purchase of new ones wherever possible and incentivising the circular economy.
    - Establish an aid and tax-break plan for appliances with ecological and efficient labels and using the taxation on inefficient domestic appliances to reduce the cost of the efficient ones.
    - Develop an aid plan for vulnerable homes.

Tertiary sector

Rehabilitating commercial or service buildings has significant advantages over rehabilitating residential buildings, due to both the professional nature of their managers and the owners' interest in increasing the value of the properties. We highlight the following lines of action in this sector:

- **Commit to rehabilitating 5% of the buildings dedicated to the provision of services.** This would require that nZEB criteria be applied to all newly constructed buildings becoming operational from 2025 or those that are currently granted planning permission, and that their energy needs be 100% covered by electricity from a renewable source—preferably through self-consumption, but through type A suppliers if not.
- Promote the use of **bioclimatic architecture**.
- An action plan on buildings and shops in the service sector in order to achieve **electrification within five years**.

- **Update the Spanish technical building code (CTE) with demanding and ambitious criteria** for its basic document on energy savings and the Spanish low-voltage electrotechnical regulation and its respective complementary technical instructions to simplify the introduction of self-consumption and electric vehicles.
- **Promote free cooling** in commercial buildings.
- **Amend the Spanish regulation on thermal installations (RITE)** in buildings to prevent heating open spaces with fixed or mobile installations and demand that they be 100% electric.

The sectoral rehabilitation target, according to the available inventory, as implementation or tendering, would be 5% per year, while the financial solutions are adapted to their type and savings standards are set:

- **Hotels, hostels, etc.**: savings target of >40%. There are more than 15,000 establishments, 52% of which are hotels, with an actual annual consumption of more than 11 TWh.
- **Hospitals:** savings target of >50%. There are approximately 800 centres, 59% of which are private, with an actual annual consumption of more than 6.5 TWh.
- **Offices:** savings target of >50%. 250,000 properties allocated to offices and more than 70 million m^2 with an actual annual consumption of 23 TWh.
- **Small businesses:** savings target of >50%. 800,000 shops with an actual annual consumption of 35 TWh.
- **Shopping centres:** savings target of >40%. 10,000 shops with an actual annual consumption of 11.6 TWh.

Primary sector

Energy efficiency has never been a decisive factor when selecting equipment and machinery for different agricultural work, despite the turnover of existing equipment and its rapid obsolescence. This is due to both cultural reasons and the existence of subsidised fuels.

This unprecedented line of action requires the support and participation of manufacturers and, especially, agricultural organisations. Specific regulations are also needed to define the characteristics of the aid for existing equipment and processes.

Fundación Renovables proposes the following initiatives:

- **Management plan for irrigation water and covering energy needs with renewables**, in particular for desalinating brackish water or seawater. Currently, the area of agriculture that uses the most energy is water management and the energy needs for irrigation. In fact, the irrigation communities are the second largest consumer of electricity in Spain.
- **Agricultural equipment renovation plan**, including certification of specific consumption.
- **Optimisation plan for the use of machinery.** The number of use hours is much lower than optimal and shared use means overcoming cultural issues.
- **Training plan** on energy efficiency when using machinery and for the different tasks carried out by trade unions and agricultural associations.
- **Plan to promote fuels with agricultural** rather than fossil origins. Review of the current fuel subsidy models.
- **Energy conditioning** of livestock and production facilities for meat, dairy products and by-products.
- **Plan to recover agricultural and livestock waste**, prioritising the environmental objective over the energy objective.
- **Plan to implement renewables** in agricultural and livestock facilities for self-consumption generation.

Public sector

The number of public buildings and their consumption shape a sector that is in need of urgent action. This is not only due to the energy burden, but also because public administrations need to set the example for citizens. On the basis of the inventory of the buildings owned by the different administrations, the following will be established:

- **Specific plans to rehabilitate 5% of all public buildings per year**, compared to the 3% set by the European Directive on Energy Efficiency 2012/27/EU for the central government only.
- **Contracting procedures so that measures can be carried out by energy services companies** (Directive 2006/32/EC) that make the investments by participating in the financial savings resulting from the rehabilitation, without limitation on the amortisation period and with the aim of being able to carry out structural rehabilitation that has a return period of over ten years.
- The power to consider the necessary accounting aspects to ensure that energy rehabilitation does not take resources away from the investment chapter by reducing the current expenditure of the administration concerned.

Energy audits

There is a need to create an inventory by identifying the area and a plan, so that **energy audits** can be carried out in buildings owned by the central, regional or local governments. This should prioritise an urgent energy action plan for buildings used specifically for: education and sports facilities, hospitals and care homes, and administrative tasks.

Spanish National Energy Efficiency Fund

In addition to the Spanish National Energy Efficiency Fund, we think amending the tax policy is a priority in order to:

- Consolidate the current regulations to consider **reduced VAT of 10%**.
- **Introduce personal income tax and property tax (known by its Spanish acronym, IBI) deductions**. These deductions would be 5% of investment, and the property tax would be a 10% deduction per letter of improvement of the property certificate over ten years (starting from letter D and going up to A, so a maximum of 30%).
- **Have instruments**, such as financing lines with Next Generation EU and ERDF funds, IBI management collection, public investment funds, and a modification of the law regulating the establishment of local government, **to increase the debt capacity of local governments**.
- Develop public-private co-ownership models, following the town of Olot's experiences with the EuroPACE model.

Lighting

The following actions are necessary in the lighting section:

- **A lighting efficiency plan** in public spaces, shopping centres and offices.
- **Revive the plans to replace LED lights in public street lighting.**
- **Include light pollution studies** in new town plans.
- Review municipal and supramunicipal regulations regarding **safe lighting on roads** to favour more vulnerable modes of transport, such as walking and cycling. Special attention needs to be paid to using the correct lighting (i.e. efficient, suitable and safe) on pavements, footpaths, bike lanes and crossings with other modes of transport.

Urban development and sustainable mobility

Fundación Renovables has already proposed that towns with over 20,000 inhabitants should be required to create low-emission zones (LEZ), not just towns with over 50,000

inhabitants. There is no definition of a series of specific measures to achieve specific targets of traffic reduction and electric vehicle penetration.

When examining the reasons for the varying success of different LEZs, the studies initially highlight that their impact depends on the traffic's contribution to pollution levels. It may be obvious, but this confirmed that in cities where road transport is the main source of pollution, the potential impact of an LEZ is greater. Aside from this, **the main factor determining their effectiveness and capacity to effect changes in the composition of the automobile fleet is the design**.

As we state in our report *Alegaciones al Real Decreto ley que regulará la aplicación de las ZBEs* (Observations on the Royal Decree regulating the application of LEZs—available in Spanish only), **designs need to be standardised nationally**. Moreover, these designs need to continue evolving in line with technological developments so that they provide clear signals of what needs to change in order to improve air quality and fight climate change. A joint and uniform approach makes it possible for both citizens and operators to make simple financial and operational decisions on what vehicles to buy and how to use them, for example.

The measures we believe to be necessary to achieve standardisation and contribute to their implementation include:

- **Ensuring that the defined LEZs are effective in fighting climate change**. As such, they need to be big enough to cause a shift from polluting mobility to more sustainable modes of transport and to ensure that the emissions are not simply transferred to another part of the city. In this respect, the LEZ should be established with the aim of reducing emissions throughout the city and not only in the affected area.
- **Unifying criteria on the types of vehicles allowed to access these zones.** As proposed, and in accordance with the targets set by Spain in the *Marco Estratégico de Energía y Clima: Una oportunidad para la modernización de la economía española y la creación de empleo* (Strategic Energy and Climate Framework: An opportunity to modernise the Spanish economy and create employment—available in Spanish only), and by the EU, these zones should permit access to private and commercial vehicles that have zero emissions or emissions that do not exceed 95g CO_2/km (WLTP—Worldwide Harmonised Light Vehicles Test Procedure). In this regard, it is essential to reform the current system of environmental badges of the Directorate General of Traffic (DGT), which has significant shortcomings in this respect. As these badges are currently

designed, even very polluting vehicles can obtain a C or even ECO classification. This is counter-productive in making the LEZ effective given that the main objective of the widespread implementation of these zones is to reduce CO_2 emissions into the atmosphere. However, the DGT's current labelling system does not distinguish this polluting gas.

With regard to the **modal shift measures**, the recovery of public spaces implicitly involves regulating and promoting non-motorised mobility, giving special consideration to bicycles and scooters in this framework, including their electronic models. Therefore, we need to promote the availability of space and give precedence to these non-motorised means of transport, although pedestrians have top priority. In this respect, we believe the following proposals to be urgent:

- **Commit to promoting the use of bicycles.** It should be an unavoidable objective within the mobility plan, starting with the establishment of the following specific targets for bike lane construction:
  - By 2025, achieving a ratio of 0.25 km/inhabitant in towns of over 50,000 inhabitants, and 0.35 km/inhabitant in towns of between 10,000 and 50,000 inhabitants.
  - By 2030, achieving a ratio of 0.35 km/inhabitant in towns of over 50,000 inhabitants, and 0.5 km/inhabitant in towns of between 10,000 and 50,000 inhabitants.
  - Emphasising the construction of lanes connecting centres of work, business parks, schools, cultural and sports centres and residential areas.
  - A plan to construct safe parking areas in all passenger interchange terminals and dedicated car parks that do not interfere with pedestrian areas.
- **Introduce a plan to promote the use of bicycles for commuting to work**, with the establishment of aid for both companies that facilitate their use and employees who use them.
- **Establish aid for purchasing electric bicycles**, through direct aid and personal income tax relief for the investment.
- **Develop a road education plan** for using bicycles safely, including a specific subject in compulsory education and information and training campaigns to that effect.
- Encourage and support associations that promote the use of bicycles as another element of action and transport.
- **Implement rental systems** so that all towns of over 50,000 inhabitants have a public bicycle rental system. Define an aid plan for recovering abandoned or broken bicycles and scooters as a way to encourage the circular economy.

- **Monitor compliance with the bicycle and scooter travel and use regulations.**

Bicycles and scooters should be included in the sustainable mobility models, but always respecting the priority of pedestrians, just as we proposed in the report *Alegaciones al Anteproyecto de Ley de Movilidad Sostenible* (Observations on the Draft Bill of the Sustainable Mobility Law—available in Spanish only).

Urban development

It is essential to **create sustainable urban development plans for towns of over 10,000 inhabitants by 2025**. These plans should include commitments to construction and the comprehensive regeneration of neighbourhoods and mobility, while also establishing deadlines and taxes according to energy behaviour and emissions. The following would be useful for this:

- Creating a sustainability roadmap for towns of fewer than 10,000 inhabitants by 2025.
- Using land efficiently, which means prioritising rezoning, redevelopment and rehabilitation processes over new land occupation.

Neighbourhood recovery

An urban regeneration process needs to be initiated by recovering, renaturalising, rehabilitating and empowering areas. This would recover public space and avoid the need to use motorised means of transport as services would be available nearby.

In general, this concept should be based on the idea of the neighbourhood as an element of identification and unification for the people living in a town; however, obviously each town has its own characteristics as a result of its growth and evolution. **Therefore, each town needs to implement its own specific urban transformation plan with a horizon of 2025** in order to identify projects and initiatives that can be implemented gradually. The proposals should establish budgetary items and financing procedures for the urban adaptation processes.

Plan to recover public spaces

One of the key objectives of the urban work is to **recover public spaces and remove the supremacy of cars**, therefore recovering the pavements and public spaces. In short, this means taking travel and parking space away from cars.

In this section the proposal is based on:

- **Making it difficult for private vehicles to access and drive in different neighbourhoods and urban areas** by establishing limits, with stricter limits for internal combustion cars. Emphasis should be placed on extending the limitations to the whole city and not exclusively to the central areas subject to pedestrianisation processes for commercial purposes rather than with the objective of improving the liveability of each area.
- **Eliminating or reducing parking areas, especially surface-level car parks, inside the city** as much as possible and establishing limits on the number of parking spaces in new buildings.
- **Expanding the space for pedestrians and bike lanes.** The space freed up by the reduced number of vehicles should be recovered by the citizens.

Renewable industrial parks

In light of the technological innovation towards industrial processes with sustainability criteria, the creation of sectoral action plans on efficiency and the incorporation of renewables needs to be revived in all industrial sectors and is work to be carried out by the IDAE (The Spanish Government's Institute for the Diversification and Saving of Energy). Sectors such as textiles, chemicals, cement, metallurgy and paper need a thorough review of their energy component and the creation of energy certificates for the electrification of demand, the improvement of efficiency and the incorporation of environmental suitability and process sustainability analyses.

The Spanish industry must adapt to a different energy future if it wants to compete with the supply of offshored products from countries with lower operating costs. In this respect, committing to renewables now would notably reduce their electricity bill, thus increasing competitiveness and margins.

Moving industry towards efficiency in the broadest sense is essential when taking into account the elements that make a competitive production process suitable according to the materials available in their own country. Thinking that we can maintain basic industries when we lack raw materials to sustain them is to commit to maintaining artificial competition. Therefore, **developing sectoral decarbonisation plans in industrial parks and office areas** is essential. In order to increase industrial energy self-sufficiency, these plans need to focus creating energy communities, drawing up sustainable mobility business plans, promoting the aggregation of demand and P2P platforms, implementing charging points in car parks and air conditioning with heat pumps.

Town councils as the driver of the energy transition

Fundación Renovables believes that town councils should play a more significant role than they do currently and commit to developing their capacities to become the driver and an example of success for the energy change by adopting measures such as:

- Considering **energy as a public service** and, therefore, **a service that town councils should provide**, taking into account that the regulated PVPC (Voluntary Price for Small Consumers) tariff must be provided with renewable energy.
- **Making it mandatory for all town councils to get electricity from renewable sources** from type A suppliers before 2030.
- **Ensuring financial sustainability of town councils** by budgeting for the development of energy policies around local corporations. This is important both for committing to combining generation and consumption of electricity and for the need to support local structures. **The budgetary resources of town councils should increase by 50% compared to the current values for 2025**. This proposal should be part of the agenda for the local elections in 2023.
- Committing to improving energy efficiency by 40% by 2030.
- **Participating**, as much as possible, **as investor and entrepreneur in digitalising the distribution lines**, bearing in mind that these lines should have the capacity for exchange between consumers and producers.
- **Participating as investor in the rehabilitation processes**, assuming proportional ownership of the investment and recovering the investment with savings on their energy bill or in future transfers of the properties.
- **Developing their own renewable energy generation plants** to cover their own needs or meet the needs of vulnerable residents and tendering or implementing self-consumption facilities in 20% of public buildings by 2023, with a planned capacity of 280 MW.
- Managing their own energy not only to cover their demands, but also to alleviate the needs of vulnerable residents by **developing energy communities**.
- Incorporating the analysis of life cycles and the carbon footprint in contracts signed by the government. **Reinforcing and recognising the role of social services** by working ex ante and not in the face of real non-payment situations.

Decarbonisation of transport

Spain is decades behind in the development of the railway as a public service and as a means of freight transport, which are both key to progress in the sustainability of the transport sector. Unfortunately, Spain's efforts have been almost exclusively focused on high-speed trains and deregulation. This has resulted in the railway being

abandoned as a primary means of transport. It has also focused on illogical projects that use hydrogen instead of electricity.

The future goal should be to connect all parts of Spain via the railway by recovering routes and connecting production centres that have been abandoned as the only means of access is by road. The commitments of the energy proposal for promoting the railways must take into account:

- **The legal consideration of using the railway as a public service.**
- **The commitment to electrifying 100% of all tracks by 2025.**
- The development of plans required to achieve the **target of 20% of freight transport by 2030**, from the current meagre 5% (France 13%, Germany 19%).
- **The abandonment of diesel engines** and their replacement with electric ones.
- **The renovation of middle-distance and local trains.**
- **The recovery of middle-distance routes** that have been abandoned.
- The development of infrastructure needed to connect **production centres** via railway.
- **The allocation of investment to constructing the railway and not incorporating hydrogen,** as the railway should be a 100% electric product.
- Training and recruiting the staff needed to maintain the routes, while employing **gender equality criteria**.

The common denominator of focusing on public transport and the electrification of transport should be their consideration as a public service and being 100% electrified. Collectivising mobility should be a priority not only due to efficiency but also to reduce the supremacy of cars and their private use.

Some proposals are outlined below to promote public transport and its electrification:

- **Reduction of costs and increased frequency.** The measures proposed in Royal Decree 11/2022, of July 2022, although late, and reduced to the price of the ticket, open a line of work that must be extended to different season ticket models, including the basic and intermodal models, with increased frequency and better service quality.
- **Large-scale elimination of the fossil fuel subsidies** that were included in Royal Decree 6/2022, of March 2022, and all the subsidies for fuels. Then establishing a transitional period for the production and professional sectors.

- **Amendment of taxation for the acquisition of private vehicles and driving licenses** depending on the emissions and vehicle characteristics: weight, power, etc.
- **Focus on inclusive town planning** and the creation of financial support lines to change the urban layout to models such as the superblock model.
- Redesign of the DGT labels for access to urban areas, taking into account not only the fairly unrestrictive CO_2 emission criteria but also extending them to private and commercial vehicles that have zero emissions or emissions that do not exceed 95g CO_2/km (WLTP).
- **15% reduction** in the number of registered private vehicles by 2030.
- **Make it impossible to register private diesel vehicles and use them to access urban centres after 2025.** Establish a deadline of 2035 for eliminating internal combustion engines in public transport.
- **Support sustainable commuting** plans for one million workers, with corporation tax deductions for companies that implement them individually or collectively in industrial parks.
- **Focus on infrastructure management** instead of constructing or expanding existing infrastructure.
- Promotion of access roads to towns for **high-occupancy vehicles**.
- **Promotion of carsharing and motorbike sharing** in towns of fewer than 50,000 inhabitants, which is managed by a public company through the town council.

Renewal of the vehicle fleet

In order to renew the vehicle fleet, it is essential to **commit to acquiring electric and hybrid plug-in vehicles for 100% of the public transport fleet**, with the target of achieving this by 2030. The intermediate milestones would be:

- The inclusion of an intermediary target of 1,000,000 electric vehicles in circulation by 2025.
- A ban on non-plug-in hybrid vehicles by 2030.

Boosting electric vehicles

Even for the largest automobile corporations, **implementing electric vehicles is undoubtedly a strategic priority in the short and medium term** given that their energy needs per kilometre travelled are two times less than those of internal combustion vehicles, and they have no emissions.

The technological and industrial transformation of the powerful automobile industry in Spain must be one of the lines of economic growth and development for the future, ensuring that the conversion of the current factories has the necessary financing and support programmes, and guaranteeing a real domestic market for the manufactured vehicles.

Future sustainability depends on implementing electric vehicles, mainly for shared use. The aim of the mobility plan should be to gradually convert a vehicle fleet that is currently composed of vehicles with fossil fuel combustion engines (cars, buses, trucks, service vehicles, motorbikes, etc.) into other vehicles that operate 100% with electricity and have an active exchange capacity with the supply network. In accordance with what is established in the PNIEC, the following **proposed targets of limiting access and circulation of internal combustion and private vehicles** are aligned with the updating of the current vehicle fleet with plug-in electric vehicles (PEV) in order to reach the five million electric vehicles by 2030:

- Access and travel ban in towns of over 50,000 inhabitants:
  - Diesel vehicles by 2025.
  - Petrol vehicles by 2030.
- Access and travel ban in towns of fewer than 50,000 inhabitants:
  - Diesel vehicles by 2030.
  - Petrol vehicles by 2030.

On the other hand, the administrative and budgetary procedures will facilitate the **development of park and ride sites** in towns, the availability of connecting public transport and bicycle parking facilities.

Similarly, **the expansion of electric vehicles should entail the development of a network of rapid and ultrarapid charging points across Spain**. The problem is that seven out of ten charging points are currently located in urban areas with a large population concentration, revealing the very low capacity in rural areas today. Only 36% of the charging points are located on main roads outside major cities. This is evidence that can further disintegrate and break social and vital cohesion between large cities and rural areas.

It is essential to **provide battery charging systems** that guarantee vehicles have a supply, both in rural areas and large cities. On the other hand, it is essential to implement different types of charging points depending on the use characteristics of the vehicles and ensuring the following are available:

- Charging infrastructure at installations owned by the user. (Private garages).
- Charging infrastructure that includes system concessions in public parking places (parking by hour, supermarkets, stations, etc.).
- Charging points on public roads via cable or induction connection.
- Electric vehicle charging stations for quick recharging, replacing the current petrol stations.
- One charging point per parking space in private garages in new and rehabilitated buildings from 2025 and 25% in public garages. The charging systems should take into account the technological development of this type of facility and be designed to facilitate manageability to maximise charging using renewable energy. Towns will need to align standards for fuelling systems to make way for battery charging systems.

Similarly, the **e-credits mechanism** in Spain is a measure that would boost implementation and expansion of electric vehicles, as is happening in other European countries. The Directive (EU) 2018/2001 of the European Parliament and of the Council on the promotion of the use of energy from renewable sources enables member states to include renewable electricity in national mechanisms when transposing the Directive with a view to energy management.

Adding electricity to the credit mechanism would provide a new and significant source of financing for the electrification of transport and, as a result, would reduce emissions in the transport sector. **A credit mechanism can play a key role in creating a level playing field between renewable electricity for electric vehicles and mixed biofuel vehicles**. This enables fuel suppliers to comply with the obligations in a profitable way. An easy way to incorporate electricity in the system is to enable users of charging points to indicate how many kilowatt-hours they have used for their road vehicles over a calendar year and convert these kilowatt-hours into credits.

Self-consumption

The current status and the expected short-term maturity of generation, storage, communication and management technologies are making self-consumption not only an unbeatable activity both financially and technologically, but also a key for **making consumers an active part of the system**. This also makes an efficient, distributed, safe, non-dependent and, of course, environmentally friendly model within reach.

Self-consumption is fundamental for urban areas, regardless of the population size, as these systems are designed as the basis of the decarbonised energy model and enable

cities to stop being energy sinks and become increasingly more co-responsible and sustainable with the environment.

Based on historical data for 2020 and taking into account data for 2021, by the end of 2022, 2 GW of new installed capacity will be exceeded in Spain, and only 5 GW would be left to achieve the target in eight years' time. In other words, the annual target, with appropriate regulatory development, which should be the consequence of the Self-Consumption Roadmap, is lower than what is currently being installed with limitations and with hardly any development of collective self-consumption and energy communities. These targets not only need to be updated, but also need to be included in the PNIEC in order to make them binding. In this sense, the target of the high-penetration scenario (14 GW by 2030) seems more consistent.

In this scenario, 1.4 GW/year should be installed, which is easily achievable in the context of self-consumption because we already have it and it is expected to improve as barriers are broken down, energy communities are introduced and citizens become more interested. In fact, **Fundación Renovables** proposes that the current high-penetration system (14 GW) should become the target scenario and a new high-penetration scenario of 24 GW should be set. This value corresponds to 10% of the electricity demanded in a low-penetration electricity scenario, as detailed in the PNIEC. 20% can be achieved by fully implementing distributed generation, collective self-consumption and energy communities, and activating legislative, education and dissemination tools, such as:

- **Committing to urgently transposing** EU Directive 2019/944 on the interior market for electricity, not least because it gives an explicit mandate that the design of the electricity system must change in order to open it up to better practices and to give consumers an active role. Spain is not complying with the transposition deadline given that the Directive is from June 2019 and should have been transposed in one year.
- **Combining the energy rehabilitation of buildings with self-consumption as a symbiotic project**, regulating the obligatory nature of their joint consideration.
- **Considering individual self-consumption as a domestic appliance.** As is already happening in many countries, there is a need to raise self-consumption expectations for prefabricated facilities that have less than 2.4 kWp and consider self-consumption as another domestic appliance. This should be done without applying for any licenses and, obviously, provided that the pre-set requirements are met to ensure the safety and quality of the electricity to be used.

- **Access to the automatic grid** at a percentage of the contracted power or, at least, equal to the power demanded hour by hour.
- **Reduced VAT for taxpayers.** Another way of incentivising and accelerating implementation of self-consumption is with an appropriate taxation policy that has a strong facilitating nature by reducing VAT to 10% for residential facilities in which the owner is a VAT taxpayer.
- **Smart meters**. Regulatory amendment to ensure consumers can simply and automatically access their consumption data. Public information management operators can be established outside the distribution companies, which have a clear conflict of interest.
- **Maximise the use of rooftops** as we have a limited surface area that is smaller than needed to meet the needs of the citizens.

Almost 100% of the installed self-consumption capacity in Spain today is individual. Collective self-consumption is not working because there is no robust legislative framework to prevent mainly suppliers performing bad practices. **Collective self-consumption is key for all citizens to be able to access the energy system** as 66% of the population live in residential buildings. **It is also key for developing energy communities** as it is their legal basis. The solutions we propose are:

- **Eliminate the collective self-consumption barriers and facilitate access to the grid.** The maximum distance of 500 metres is a limiting factor, contrary to the spirit of the European directives and it remains insufficient and arbitrary, even though it has just been amended to 1,000 metres for self-consumption on rooftops and it appears that it will be extended to 2,000 metres. In order for collective self-consumption, which is basic in cities, to be a success, it must be given greater flexibility and more freedom. The only limiting element in the first phase is that the location of generation and consumption must be at the same voltage level. Considering distance as a limiting element is not only a constraint but, specifically in rural locations, it is an insurmountable barrier because urban planning regulations require urban centres to be separate from livestock and agricultural facilities and building standards are much lower.
- **Eliminate the need to add one of the collective self-consumption coefficients.** This is important because there may be an investor other than the associated consumers, and access for new associated consumers should be simplified. It is essential to approve **truly dynamic coefficients** to improve the efficiency of the facility and maximise the self-consumed energy.
- Facilitate the implementation of the **Associated Consumer Statute** for collective self-consumption facilities in order to make it easier for self-consumers to leave

or join without being owners of the facility. The development of this figure, by means of which any consumer can be associated with a generation facility, would require the establishment of tolls for grid use, so its implementation will have to be developed gradually until the reform of the electricity system is in place. It will also be necessary to define limits which, under no circumstances, can be based on distance, but rather on their location at the same voltage level.

- Create the figure of the **sole interlocutor or self-consumption manager**, who has the ability to resolve conflict.
- Adapt the figure of the **back-up supplier** so energy can be exchanged between consumers automatically and easily.
- Review the Low-Voltage Electrotechnical Regulation (known by its Spanish acronym, REBT) and its supplementary technical instructions so that they define self-consumption.

Local energy communities

As mentioned above, **the legislative base of the energy communities is collective self-consumption**. That is why they cannot become a reality without fully developing the collective form, meaning it is necessary to implement all the points proposed in the previous paragraphs.

The energy communities and all energy services that supply citizen groups across Spain are the key to self-consumption, efficiency and active participation becoming common elements in our lives, so our basic energy needs can be covered. Despite the increased number of initiatives organised by both citizens and local administrations across Spain, there is a need to develop favourable legislation without limiting barriers, such as access to the grid itself, the way in which generation and surpluses are distributed and the maximum distance between generation and consumption.

The current process of developing energy communities, despite there being no legislative framework, is heterogenous, dynamic, flexible and extremely dependent on factors such as localisation, renewable resources and town size. Energy communities are not going to be homogenous because conditions in urban areas are not homogenous, but this is an advantage for the adaptability and improvement of energy services. In addition, taking into account the intrinsic participatory nature of energy communities, new players with a highly social value would emerge in the electricity system. The challenges that have been identified and should be included in the PNIEC include:

- **Creating social networks** with facilitators of knowledge exchange between the different initiatives, with institutional support for their consolidation.
- **The desire to decide for yourself** on how actions will be carried out, the choice of agents, energy saving and efficiency, while taking into account the local resources and future generations.
- **Searching for innovative financing formulas and sources** so that the different municipal agents can easily get involved. Improving facilitating regulatory frameworks to make it possible for collective citizen initiatives to forge this path, placing a focus on consumers.
- **Having a group of people with social participation, technical and legal knowledge and skills in the field of energy who will be able to lead**. They will also need to be independent of specific business and political party interest.

This point lists some issues to bear in mind according to current European directives:

- **Energy communities should be related and connected to local economic development and microeconomies.** However, the decision making within a citizens' energy community should be reserved for the members not participating in a large-scale economic activity and for whom the energy sector is not a main area of economic activity. It is very important for local, provincial and regional entities to participate, and the leadership of the town council is fundamental in creating a favourable environment that encourages development.
- If the energy communities benefit the electricity system, the grid **operator is obliged to compensate them for the technical benefits they provide the grid**.
- As they are a flexible tool, **they should be included in energy planning** with specific objectives and measures that drive development and short-, medium-, and long-term growth.
- **The aim of energy communities is for consumers in the electricity market to participate directly or through demand aggregators.** Therefore, they should be able to submit offers in all energy markets under the same conditions as the other agents, without needing to have back-up suppliers.

Management and storage

The model needs to be electric, so the transmission of energy must be prioritised as electricity and not renewable gases, which should be produced where they are needed.

Incorporating renewable energy and effectively improving energy saving and efficiency processes require decisive action in actively managing demand. Most of

the renewable energy incorporation proposals involve needing to increase generation capacity for energy coverage and security, assuming that the peak power demand will increase as electric vehicles are incorporated and demand is electrified in sectors that currently consume fossil fuels.

This is why it is fundamental that this greater energy consumption, both currently with seasonal changes and in the future, brings with it **active management procedures that enable power to be transmitted quickly and effectively, smoothing the curve or, at least, matching demand with supply as much as possible**. The efficiency processes proposed later in the document would be invalid if they did not involve demand management systems, which is why we consider home automation to be a fundamental aspect of the rehabilitation and electrification of demand processes. The following actions are proposed to promote this initiative:

- Transparent availability of data measured and recorded by the installed smart meters (more detail in point 4.6 Access to data).
- Approval and certification plan of control and management equipment.
- Public subsidies and aid for implementing automation systems in residential, commercial and public administration buildings.
- Plan for consumption control and management systems to be implemented by autonomous regions and applied by the town councils.
- Promote self-consumption and fixed and variable storage (more detail in point 1.4).
- Plan to promote and support P2P platforms that enable direct action between consumers and producers without administrative obstacles. Enable consumers and energy generators to aggregate so that they can openly carry out shared self-consumption without restrictions. This then enables them to establish groups of users who can share one or several generation facilities and management systems. This involves:
    - Making it possible to conclude individual supply contracts, meaning meters can be aggregated both at generation and consumption.
    - Enabling the purchase and sale of energy between individuals or an aggregation of individuals.
    - Providing individual and/or collective accumulation systems for demand management.
    - Clear regulations that develop this right without administrative obstacles or tolls, so that all energy flows can be accounted for and monetised.

Another point to highlight is **electric vehicles as a storage vector and energy demand manager**. The PNIEC established the target of reaching five million vehicles by 2030 by committing to electric mobility. This would mean having a not inconsiderable energy storage capacity simply by keeping the vehicle connected to a power socket. Having a vehicle permanently connected when it is not moving will maintain an active purchase-sale exchange of electricity according to market demands and the mobility requirements of each vehicle.

It is important to note that a fleet of five million vehicles, approximately 25% of the registered light-vehicle fleet, with an average unit capacity per vehicle of 80 kWh, would mean having 400 GWh of energy available to be managed instantaneously. This energy is too much for the management capacity of the current electricity system, regardless of the degree of availability and simultaneity applied.

Electric vehicles, as an element that can store electricity that can be exchanged with third parties, mean that the electricity model of the future, which already exists, has management elements with more capacity than the current ones. Managing the load of the vehicles' storage system opens up a new line of opportunity in which the availability of energy will have greater value than the energy transmitted, facilitating two-way batteries and participation of individuals in the market.

Supply-side proposals

Proposals for an ambitious energy transition

FUNDACIÓN RENOVABLES

Supply-side proposals

Plan to develop new renewable energies

The accelerated development of new renewables facilities is an obligation in accordance with the commitments of the Paris Agreement. It is designed to fight climate change structurally and entails increasing electricity generation using renewables, which will reduce the price of electricity and increase the degree of electrification of the final energy demand in Spain. **Electricity is the energy vector of the future due to is efficiency, zero emissions, cost and consumer autonomy.**

The energy policy proposal drawn up and the greater level of commitment established by the EU in its Winter Package, in the *Fit for 55* and the most recent *REPowerEU* (link in Spanish), call for an unavoidable upward revision of the LCCyTE, the PNIEC and our own national targets.

The PNIEC does not consider electrification as a target but as a result, which yields negligible values in response to an error in the PNIEC's approach to energy policy: the proposed plans to reach 27% by 2030. This is a meagre target if we are to reduce dependence and improve efficiency and emissions. Similarly, it continues to pursue combustion processes and not the promotion of electricity, ignoring the efficiency of electrical equipment and the reduction of the energy demand. Of the 42% of renewables in the coverage of the final energy demand, 22 percentage points are not electricity, which means maintaining the same inefficient and emissions model from now until 2030. That is why **Fundación Renovables** is proposing a target for the electrification of the final energy demand of 55% for 2030.

The target of reaching 74% of the electricity generated being from renewable sources by 2030 has a significant drawback, which is that the electrification percentage is very low: 27% compared to 50%, which is the target of electricity coverage of the final energy demand that we propose. In a clear, basic error, it states **generation of electricity with renewables, but not electricity**.

This is why the reduction of emissions by 2030 is a measly 23%. In other words, it is because the demand model continues to pursue combustion processes, even if they use renewable energy. We also propose raising electricity generation with renewables to 90% and reaching a 55% coverage of the final demand with renewables by 2030. With these targets, the greenhouse gas emissions reduction can be raised to 58% by 2030 compared to the 1990 level. This would then raise ambitions, reducing energy dependence to 45% by 2030.

On the other hand, the supply-side model proposed by the PNIEC involves an oversizing of both power and infrastructure. This oversizing is aligned with the interests of the electricity sector in increasing its regulated income.

The capacity required to reach the targets proposed by **Fundación Renovables** in relation to the target set by the PNIEC is an additional 14% to cover the electricity generation needs of 90% of the electricity demand, which is established at 382 Twh. **This would mean an increase of 133 Twh, or 53% more on the 2019 demand**.

The breakdown of installed capacity by generation technology has been made taking into account different considerations:

- **Photovoltaic power: 58,877 MW[1].** The commitment to photovoltaic power in general and, specifically, to self-consumption, with a target of 10% by 2030, which represents 23,877 MW, to cover 10% of the electricity demand. 15,000 MW would be distributed generation, 23,000 MW self-consumption and 20,000 MW centralised generation. In photovoltaic power, 27,000 MW more than what is included in the PNIEC would need to be installed, primarily due to the self-consumption target and the capacity of hybrid plants[2], which is 8,000 MW.
- **Wind power: 52,836 MW**, of which 20,000 MW would be new onshore capacity, 15,000 MW of repowering and 1,500 MW of offshore wind.
- **Solar thermal power: 5,803 MW.** This entails a reduction of 1,500 MW due to temporary feasibility issues. The assignment of solar thermal energy capacity should also be carried out via auctions in which their capacity to contribute manageability to the system is recognised. It is also necessary to **implement storage systems in the plants that do not have them**. Currently, of the 44 plants in operation with parabolic cylinder concentration (PCC), 27 lack storage, despite the fact that the great added value of solar thermal power is its capacity to store thermal energy and dispatch it regardless of the meteorological conditions. Including storage in at least nine and optimising storage capacity in the 17 PCC plants that do have it has been assumed as an objective. And optimising five plants has also been assumed as an objective.
- **Hydro-electric power: 24,133 MW.** The forecast development of hydro-electric power has been reduced, remaining at the 2021 values.
- **Biomass: 1,500 MW.**

[1]Historically, wind power continues to account for 50% of all renewable electricity, followed by 31.4% from photovoltaic power in all its forms.

[2]We have taken into account that all wind power must have 15% hybridisation, which means that the new auctions require a minimum starting capacity factor in the proposals.

- **Biogas: 600 MW.**

In short, the **Fundación Renovables** target is **to reach 147,749 MW of installed renewables capacity by 2030. This is part of the road to achieving 100% renewables and, following the intentions of the EC plans, increasing the targets in the PNIEC**, which are also in line with the technological development made and the future, to achieve the following final energy demand coverage targets:

- **55% by 2030.**
- **80% by 2040.**
- **100% by 2050.**

Committing to renewables means committing to electrifying demand as a basis of energy policy, and we need to focus on this to achieve:

- **50% coverage of demand by 2030 with 90% renewable electricity generation.**
- **80% coverage of demand by 2040 with 100% renewable electricity generation.**
- **90% coverage of demand by 2050 with 100% renewable electricity generation.**

Values at 2030	
Commitments made	
Coverage of final demand with renewable energy	55%
Electrification of demand	50%
Generation of electricity with renewables	90%
Results obtained	
Reduction of emissions compared to 1990	58%
Energy dependence	45%

Table 1. 2030 targets.
Created by Fundación Renovables.

Meanwhile, biodiversity and the climate must be protected while developing new renewables projects, as the IPCC indicates. In this respect, when there is conflict regarding the environmental values of an area, a mechanism to search for feasible alternatives needs to be established via dialogue with the local population and mediation processes.

Installing renewable energy infrastructure must always be based on the principle of not affecting or damaging biodiversity. It is always preferable to make use of existing

infrastructure. There needs to be an obligation to carry out a strategic environmental assessment in areas with a high density of renewable energy infrastructure to avoid the accumulated impacts caused by individual projects. This would take into consideration the overall impact of lines and plants and other past, present and planned human activities in the same ecosystem, as well as a specific analysis of the effects on the environment of projects for the storage or use of electricity that is not evacuated. This situation is solved by:

- **Suitable binding and mandatory socioeconomic and environmental zoning** and organisation of the different areas, ultimately establishing the rules for carrying out the initiatives. In addition, with regard to areas that have already been created, they need to be enforced strictly, as they are not applied in a binding way in many cases.
- **Including an additional clause with specific content or organising the land** to avoid what is happening at the moment. This clause must contain sectioning of the capacity to be installed, with a binding economic zoning and an analysis of the impacts on the land, among other measures.
- **Guaranteeing that there is enough capacity at transmission grid access nodes**, so that all the distributed generation projects can be carried out without evacuation restrictions or limits. 30% of the capacity would need to be assigned to projects of less than 25 MW, with a special portion of at least 10% for initiatives of less than 5 MW, so that distributed generation is really provided.
- A power reset mechanism with granted access that has not been executed.

Hybridisation plans

The existing plants, primarily wind power plants, have a further development which should be promoted by including hybridisation with photovoltaic power. The aim of this is to increase the capacity and use of the electricity grids. Where there is wind, there is sun, which is why we think a target of 15% of photovoltaic capacity should be considered. This would mean that of the 7,700 MW of hybridisation forecast, 3,000 MW would be in existing wind farms.

Repowering plans

The development of wind energy should be designed both to exploit sites with higher resource quality and to guarantee the economic development of the existing plants and their repowering. The proposals from **Fundación Renovables** include a repowering plan by developing wind power in Spain and making technological and industrial

progress to achieve 15,000 MW of repowered energy by 2030. It would be aimed at wind farms over 20 years old with machines of lower than 1 MW and would include the option to increase the installed capacity per site by a minimum of 50%.

In turn, it would require an industrial reconversion plan nationally rather than regionally according to the new installed power capacities, and with the aim of creating a competitive industry and adapting the current one to be able to migrate towards new models of wind turbines.

On the other hand, there needs to be an analysis of how feasible it is for the facilities currently subject to the RECORE framework to be able to provide more power to their installations and, therefore, to the market. This is an interesting option because many are small facilities in the hands of small-scale, under-used operators.

Promotion of bilateral renewable energy contracts

Fundación Renovables advocates for **taking energy quotas out of the market by using bilateral contracts made through auctions of infra-marginal technologies** (as approved by Royal Decree Law 17/2021 (link in Spanish only)), in the case of electricity generated by nuclear plants, and by changing from marginalism to pay-as-bid. This would cushion the increases in an energy mix in which 70% of generation is infra-marginal and 35% of the RECORE, and at an acceptor price (renewables, co-generation, nuclear and flow hydro bid at lower prices than technology with a higher marginal cost, as in the case of combined cycle plants).

Virtual power purchase agreements (VPPA) need to be enhanced. These are contracts through which the developer sells their electricity on the spot market. The developer and the purchasing company liquidate the difference between the variable price of the market and the price of execution, and the purchaser receives the generated electricity certificates. This is different to more traditional PPAs in which the developer sells electricity directly to the purchaser.

On the other hand, **auctions need to continue being held**, moving towards more diversity, with specific bids for distributed generation, requirements of project maturity, and anti-speculation clauses that avoid imbalances in the concentration of agents and further diversify the profiles of successful bidders. One of the key goals should be providing security to small investors, long-term income that enables them to reduce the cost of financing projects, sending a signal of security, economic feasibility and regulatory stability, something which smaller agents lack.

Failures in some sizes and technologies denote a lack of dialogue and successful pre-auction procedures. Solar thermal power is paradigmatic, especially due to the small number of agents. This technology should not have been subject to tender if the government thinks it is not feasible to raise the ceiling.

Fair transition and organisation of the land

Committing to an energy transition towards a 100% renewable supply entails gradually abandoning some economic activities and the need to implement initiatives in which people and land is going to be affected.

The demand for a fair transition in the change of model has been focused on the effects that migrating the energy model had in areas of fossil fuel extraction, mainly coal mining, while ignoring the fact that **the energy transition is, above all, a change that affects many more sectors than just mining**. Before the energy transition began, the mining sector had practically disappeared without sufficient social and economic regeneration measures having been put in place in the affected areas. In many cases, supporting the mining areas, which are firmly rooted in a past that is not returning, has led to the abandonment of other lines of action with a view to the future.

The fair transition must have a broad scope in terms of generation, land and labour in the affected sectors, with a long-term vision, because the decarbonisation target is set for 2050.

An interdisciplinary analysis of all the affected sectors and their territorial and temporal influence should be carried out in order to propose measures that compensate and regenerate the areas affected by the decline or abandonment of unsustainable activities, and that prepare and organise the development of activities that will have to be accommodated due to the opportunities that will be generated.

It is important to highlight that the current facilities that use fossil fuels will be valid until they can be replaced by sustainable sources without needing to implement new unsustainable facilities. The transition process entails different energy sources, renewables and fossil fuels, sustainable and unsustainable sources, all co-existing. Therefore, it is essential to set deadlines for a scheduled replacement of unsustainable sources.

Another element that has been ignored is the need to assume the consequences of the mortgage we are leaving for future generations. Criteria need to be established so that

current owners assume the responsibility for the costs of restoring and disassembling the facilities.

Fundación Renovables has created various guides for awarding fair transition nodes in order to incorporate criteria and maintain the socio-economic value in different areas. The awarding of these nodes involves a series of economic, social and environmental factors that would be affected and, therefore, need to be subject to the capacity assignment criteria in tenders for high-voltage grid access.

The criteria to be taken into consideration when awarding grid capacity nodes are:

- **Composition of decision-making bodies.** We believe the decision-making body should consist of entities or institutions from the area in which the projects that are selected for each of the nodes will be carried out. The representatives of the institutions and entities of the area that intends to benefit from the fair transition and the change of model, as well as the entities that work to preserve and restore biodiversity, should also be present.
- **Technical characteristics and composition of the nodes.** The tenders should focus more on promoting small initiatives and more diversified bidders. In previous auctions, there has been a concentration in assignment and, above all, in many cases a post-assignment sale with a clear speculative effect. That is why the development of the evacuation capacity should take into account the following distribution requirements:
    - Ensure that the entire area of influence, which includes not only the affected land but also most of the province, has enough capacity so that all the individual, collective, local and energy community projects can be carried out without evacuation limits or restrictions. To ensure this condition, the target of 10% self-consumption and energy communities and another 10% of distributed generation in the province where the node is located should be included.
    - **Promotion of more distributed initiatives.** Once the above has been guaranteed, 30% of the capacity would need to be assigned to projects of less than 25 MW, with a special portion of at least 10% for initiatives of less than 5 MW.
    - **Required capacity factor.** The capacity factor needs to be maximised at the connection point of each initiative in order to promote the hybridisation of technologies and produce the maximum energy per unit of evacuation. We propose that the capacity factor be equal to or greater than 50%, establishing a reducing correction factor in the valuation of initiatives that

do not reach this 50%, deducting one percentage point from the value reached by the initiative for each point of lower capacity factor. This requirement will allow the evacuation capacity to be better exploited. The hybridisation with storage systems is open but will depend on the willingness of the bidder and a better offer, with a higher valuation independent of the score obtained for the required capacity condition.

- With regard to wind power, the requirement is a minimum size of 3 MW per wind turbine in order to **limit the visual and environmental impact**.
- Requirement of a **maximum evacuation capacity per plant of 100 MW** and the incorporation of environmental and land distribution criteria. With regard to the maturity of the projects or initiatives submitted, they must have a degree of administrative progress and real definition of the project, taking into account:
  - ✓ Having initiated the administrative process with a sufficient degree of maturity with regard to the presentation of the execution project and environmental impact study and having pre-agreements to support the local industry.
  - ✓ Having land contracts (or at least pre-agreements), although these should be non-exclusive so as not to limit the development of other initiatives.
  - ✓ Defining the capacity factor and translating the socio-economic proposal to landowners and the area of impact. Opening the project to public and citizen participation, both for its design and financial participation. In the latter case, more points would be awarded to projects that allow for greater participation. With regard to the duration of the operation period of the assigned capacity, the duration of the evacuation capacity assigned in the tender, which should be 30 days, is currently not specified. Different conditions need to be established from that moment onwards, in which transmission and distribution facilities and facilities in use should become public institutions again, unless a new agreement of ten additional years is reached between the parties, with the possibility of extending it for a further ten years in the event that the facility has been repowered. In both situations, the parties awarding the contracts will assume the costs, the responsibility for decommissioning the facilities and the environmental restitution of the land used at the end of operation.
  - ✓ Mass green hydrogen projects such as the one just submitted by the shipping company Maersk should be thoroughly examined so that it does not interfere in the development of other technologies.

On the other hand, there is a tendency to locate the plants on land where the ownership is concentrated, either because of negotiated agreements or because, in many cases, the land is leased and the rent would be greatly increased if generation plants were implemented. In order to minimise the effects on useful agricultural area and to generate a distributive effect in the area, the following will be taken into account:

- Using less than 25% of the useful agricultural area in each project, bearing in mind that it is land allocated under the Spanish Common Agricultural Policy (known by its Spanish acronym, PAC) in the last five years. Establishing a scale according to the degree of *Superficie Agrícola Utilizada* (Used Agricultural Land, SAU), considering a factor of 1 for 0% and a degressive scale of a reduction of 0.05 per 10% (i.e. for an SAU of 40%, a factor of 0.8 will be applied; 0.85 for 30%; 0.9 for 20% and 0.95 for 10%).
- 50% of the lease agreement should go to the landowners, 25% to the other farmers that host evacuation lines and the remaining 25% would remain as a fee for the different town councils in the area. It is proposed that 75% of this fee be for the town councils in which the plants and evacuation lines are installed, with it being apportioned proportionally to the power hosted, and 25% for the town councils where nothing is installed given that the connection power disables some sites over others.
- **Land consolidation.** We propose establishing land consolidation procedures so that remuneration for land responds to the ownership structure existing in the implementation area and does not benefit solely the owners of the land hosting the plants.
- **Using land affected by mining activity if possible.** In addition to the guidelines for environmentally recovering the land affected by mining activity and energy generation, the use of this land should be prioritised.

With regard to allocating the Next Generation EU funds to increase the targets proposed by the PNIEC and taking into account that the targets of the Spanish Recovery Plan are set for the period from 2021 to 2026, raising the low investment percentages and speeding up the provision of financial resources to autonomous regions should be prioritised. Therefore, as indicated above, it is essential to facilitate, plan and promote self-consumption at all levels (shared and individual), in addition to committing to distributed generation with renewable energy, conducting the energy rehabilitation of buildings to stop Spanish cities becoming energy sinks due to the age of the housing stock, ensuring active sustainable mobility and decarbonisation of transport, establishing a pioneering and leading technological industry for batteries

and electric vehicles, and improving the efficiency of equipment and infrastructure to encourage digitalisation.

Electrical interconnection

In order to improve the manageability of the system, we need to focus on international and inter-island electrical interconnection, as well as re-defining access, connection and dispatch priorities that reduce discharges, digitalising the low-voltage distribution networks, especially in cities, and improving generation forecasting.

Increasing interconnection is key to promoting the manageability of the electricity system, but it is not the degree of interconnection that sets the target for the contribution of renewable energies. Interconnections in the rest of Europe (which would account for 8% of the installed capacity in Spain by 2030) would support a renewable generation pool with greater balance between flow and manageable technologies, guaranteeing demand is met by 2030, with supplementary support from a much smaller pool of combined cycle plants, which, at most, would represent 20% of generation by 2030.

Nuclear

The **Fundación Renovables** energy proposal includes the **scheduled closure of all nuclear power plants** as they are considered unsustainable, environmentally unacceptable and not competitive for society.

The fact that nuclear power plants are loss-making, according to their operators, reinforces the arguments against artificially extending their lifetime with public money because it would require new subsidies which are totally unacceptable, especially since the taxes currently levied on their activities are not sufficient to cover the full costs.

Nuclear energy is not part of the desirable energy scenario for Spain and, in general, if it is desirable for the electricity sector, it is because it has a favourable regime and because it does not assume all its costs, which gives it an advantage over other sources with which it should compete. As a result, once the existing licenses expire, they should not be renewed, as long as there is no official plan showing the need for a specific capacity at a specific site and, in this case, it should always be for a limited time.

With regard to the problem of waste, the Empresa Nacional de Residuos Radiactivos, S.A. (Spanish National Radioactive Waste Company, known by its Spanish acronym,

ENRESA) is responsible for managing the funds for managing radioactive waste and decommissioning plants and has not done enough in its role to control these funds and update the treatment plans. The Court of Auditors' continuous corrections do not say much for its management. The Law 12/2011 on civil responsibility for nuclear damage or damage from radioactive materials (link in Spanish) was supplemented by the disastrous—at least in its energy scope—Law 15/2012 on fiscal measures for sustainable energy (link in Spanish), which includes in its preamble a statement that is impossible to accept from a responsible perspective as it states that using nuclear energy means society assumes a series of burdens and easements whose economic impact is difficult to assess. **This is the unfair intergenerational transition** that our energy policy is developing and on which we need to act by holding the owners of the facilities that have benefitted financially from the lack of accountability directly responsible.

Gas system

The practice of greenwashing is becoming prominent within the system in order to sweeten unsustainable processes, especially in the case of new gas facilities dressed up as hydrogen facilities. These play a role, of course, but can never be a replacement for electricity because its origin needs to be from renewable electricity sources.

Projects such as MidCat, which had a transmission capacity of 7.5 bcm, was designed to double the capacity of the current interconnections between France and Spain and was abandoned in 2019 as it was deemed to be too expensive, invasive on the environment and not essential for the gas supply to Europe, have re-emerged. In fact, the Regulatory Commission of Energy (RCE) of France had rejected the pipeline project. Its Spanish counterpart, the Spanish National Markets and Competition Commission (known by its Spanish acronym, CNMC), stated that “the project’s current configuration and capacities did not meet market needs and did not show sufficient maturity to receive a favourable decision.” In this context, focusing on gas facilities with a useful life of between 40 and 50 years would anchor us to a model dependent on fossil fuels, which leads us away from the fair energy transition we need.

However, several voices from different sectors have tried to revive the discussion on this project in view of the juicy possibility of receiving funding through the Next Generation EU recovery funds, if they are used to transport green hydrogen in the future. It would be totally inappropriate to restart the MidCat project as a response to the gas supply being cut off by Russia given that construction period would be between two and six years. In particular, AFRY (link in Spanish), the consultancy firm that advised against the MidCat in 2019, estimated that construction would take at

least three years and doing so in this time would entail more investment than forecast, and this cost would be indirectly borne by European citizens.

On the other hand, countries such as France, Italy and Germany, which would be some of the countries most affected by the potential closure of Russian pipelines, are already developing their own solutions. In addition, the gas transport volume forecast for the MidCat is 7.5 bcm, which means, in the best-case scenario, it could transport only 2.2% of the 2021 European gas demand by 2025. Therefore, we do not see how MidCat fits in the context of the energy crisis. The same is true of its replacement proposal: the BarMar. This is a new green hydrogen corridor between Barcelona and Marseille which has just been agreed between the governments of France, Portugal and Spain and has a more than palpable technical inconsistency as 99% of the hydrogen currently produced comes from natural gas. Constructing a pipeline with these characteristics is incompatible with the network of domestic pipelines, in addition to the fact that a theoretically submarine pipeline focused on transporting hydrogen needs special materials, which represents a high financial cost and high energy consumption. On the other hand, Marseille exports gas and, therefore, will most likely carry gas or gas mixed with some hydrogen for decades (a technique known as blending). This all shows that this is promoted by the gas sector and that it is not in line with the energy and social reality.

As far as compatibility with green hydrogen is concerned, the forward-looking proposal is based on a hypothetical attempt to develop an international hydrogen economy and turn Spain into a major hydrogen exporter. Underlying this idea are the same interests of a few who tried to turn Spain into a fossil gas hub, and they are now trying to do it again with hydrogen.

Hydrogen should not be used to strengthen the role of gas in the energy mix or reduce the ambition of the energy transition to eradicate fossil fuels. The interest in transporting hydrogen by mixing it with natural gas in the gas network is an error that would mean wasting a high-value renewable-energy vector and binding us to more years of burning fossil gases. This halts the commitment to a sustainable future, even more so considering this technology's lack of maturity and the large consumption of energy involved in its production. This horizon would divert resources away from the investments needed to deal with decarbonising the electricity mix, would entail a loss of energy efficiency, and would have a significant and unnecessary effect on the land.

Plans to promote co-generation

This document states that the target is for supply to be 100% renewable before 2050 and for electricity generation to be 100% from renewable sources before 2040. The transition process should combine the progress of renewables and efficiency with the maintenance of systems that use increasingly residual non-renewable energy sources. In order to achieve 100% renewables, we need to determine what sources and what technologies of use should be maintained in the transition and which should be eradicated as a priority.

In this sense, eradicating nuclear energy, coal and diesel is the priority over petrol and natural gas, but until the latter two have been replaced, high-efficiency processes with lower emissions need to be promoted.

Co-generation is a process that we cannot ignore, mainly because it means improving the performance of the use of natural gas and because it is associated with the survival of a basic industrial sector for the national economy with a clear local presence.

11% of electricity currently comes from co-generation systems which must be maintained if the industrial process is not 100% electrifiable or the gas used is from a renewable origin.

That is why we need to establish a plan to support co-generation that clearly reflects the useful life of the facilities to achieve 100% electricity generation from renewable origins by 2040. This can be achieved by implementing:

- A plan to renovate the current co-generation facilities by establishing the support mechanism needed to promote the industry and maintain co-generation as an electricity generation process in the industrial sectors in which demand cannot be electrified.
- The promotion of renewable gases as the basis of co-generation.
- A plan to develop new capacity that is customised for each industrial sector with performance requirements.
- Co-generation as a priority over the combined cycle gas turbines (CCGT) and considering the option of bilateral processes for the destination of the electricity generated.

Renewable gases

Biogas

The Biogas Roadmap (link in Spanish) takes into account the biogas produced by anaerobic digestion (in the absence of oxygen) as it has a more advanced level of technological maturity and sectoral development than other biogas production processes. The roadmap is also limited to the treatment of organic matter from different types of waste or by-products mainly from livestock, when it should be generalised for all organic waste to which anaerobic digestion can be applied. This would also represent clear progress in the development of the circular economy as it is produced from organic waste locally, therefore generating value sustainably.

Fundación Renovables believes there is a need to expand the framework, both in its comprehensive consideration and in the responsibility and requirement to authorise facilities that generate or treat waste as the roadmap focuses solely on the treatment of waste (this topic is discussed later in the document). The proposals and measures that should be included in the new revision of the PNIEC are:

- **The mandatory inclusion of anaerobic digestion treatments for generating biogas in all processes in which organic waste is generated in large livestock operations by 2025** (pig facilities with capacity for more than 2,000 fattening pigs of more than 30 kg or 750 breeding pigs, and poultry facilities with more than 40,000 hens or the equivalent number in nitrogen excretion for other types of poultry), considering minimum sizes and suitability of the waste to be used in a digestion process. Financial aid plans should also be created for their implementation.
- The use of digestate in energy recovery.
- The circumscription and approval of livestock facilities and wastewater treatment plants (WWTP) in integrated waste treatment processes.
- The inclusion of temporary restrictions and limits on the percentage of fossil fuels in the mix.
- Added tax for the facilities that do not have a waste management system.
- Create a programme to review the suitability of existing slurry treatment plants, taking into account the use of the transformed waste, and the programmed closure of co-generation plants using natural gas in which the treatment is slurry dehydration.
- Modify the level of requirement in the action plan by setting obligations rather than recommendations.
- Increase targets in line with mandatory treatment.
- Adapt higher-level regulations and plans so that these initiatives can find support, such as the LCCyTE.

The roadmap includes a broad range of lines of action which, in general terms, cover most of those needed for it to be implemented. Below we highlight the most relevant lines of action, adding some notes on their definition and content:

- The need to implement an **origin guarantee system** that verifies the amount of energy from renewable gases in a supplier's supply structure or in the energy supplied to consumers. This line should be limited in both time and the percentages of fossil fuels in the mix, so that it does not become used to support the very system it is intended to replace. On the other hand, the origin guarantees cannot become greenwashing elements, entailing a higher gas price when what should be included is an additional cost for consuming fossil fuels.
- **Streamlining plant authorisation procedures and cooperating to homogenise administrative procedures.** This is an important point, but it is especially important to impose tighter restrictions on the design conditions and the authorisations for farms, which are currently highly permissive due to their consideration as elements that generate value in the rural environment as a supplement to agricultural activity. Similarly, reviewing the operating conditions and the mandatory inclusion of treatment facilities is essential in both new and existing farms. It is also important to control discharges and their consequences on aquifers.
- **Establishing annual targets for biogas/biomethane penetration in the sale and consumption of natural gas**. These targets should be increased considering the obligation of waste treatment plants, the incorporation of limits on current direct discharges and their consideration as a suitable fertiliser for agricultural work, taking into account the progression of limits over time and in the percentages of blending.
- **Promoting the use of materials resulting from biogas production**, which means the regulations on direct discharges per hectare from agricultural production need to be modified in order to replace these discharges with materials digested in the anaerobic digestion process.
- Analysing the convenience of **setting a minimum quota of use for fertilisers of organic origin in agriculture**, both in terms of percentages and their NPK composition, while establishing limits according to the characteristics of the agricultural land.
- **Promoting the biogas systems on site and for co-generation.** This line should be implemented and promoted as a priority because it is easier to transport electricity than fuel, especially if they are gases. The hybridisation component and the existence of connection capacity on the farms requires their evacuation capacity to be in line with the consumption capacity. Promoting self-

consumption on farms and organic waste treatment facilities should be a priority to add to the PNIEC, while establishing clear targets.

- **Prioritising the use of biogas in transport**, as a surplus element and produced by large treatment complexes where, due to their location, there is no electricity evacuation capacity. This should be a basic alternative for use in heavy transport, mainly because the treatment plants will be located according to the map of waste to be treated and in most cases, there is no need for evacuation capacity.
- **Using existing aid lines for the development of biogas**, which should be directly related to livestock policies and the commissioning of WWTPs. The limits on size of the waste generation facilities and the need to blend waste for correct operation should make local centralised collection plants a clear target.
- **Promoting the creation of local energy communities in the farming sector.** This is fundamental because, in all cases, the relationship between livestock breeders and farmers already exists contractually for direct discharge, and it is important to promote cohesion between actors.

Hydrogen

With regard to **hydrogen**, Fundación Renovables believes it is indispensable as it will play a key role in the energy transition. Spain needs to focus on developing hydrogen so as to maintain its position on the path set by the EU. Having said this, Spain cannot ignore the reality of its costs and inefficiency as an energy vector. This focus **cannot be on promoting demand for hydrogen because the value chain is not mature and the only thing that will happen is that the cost differential will continue into the future**, jeopardising the price signals and its own development. It is also necessary to open the debate regarding the proportion and differential targets between ammonia as a fuel and hydrogen as a gas, as the uses need to be specifically sectorised and foreseen.

Establishing specific targets on hydrogen penetration can be dangerous and even more so if they are established in a specific sector. What is clear is that **we need to replace brown hydrogen, which currently accounts for 90%, with green hydrogen by 2030**. By restricting the technological options with which to reach a target, other renewable alternatives such as electricity may be excluded, thus generating an extracost for the economy as a whole. It may also jeopardise the achievement of the established decarbonisation targets by implementing an inefficient policy that is more focused on showing the grandeur of the endeavour than on efficiency criteria, in the broadest sense of the term.

The aim of turning Spain into one of the main exporters of hydrogen is an error, among other reasons due to the inefficient transformation processes for transport, which may

also perpetuate the current centralised system of resource/generation and consumption areas instead of providing energy to each region, which is the best form of empowerment. The distributed nature of the renewable energy sources enables generation close to consumption points (distributed generation), thus reducing transport, increasing efficiency and promoting energy self-sufficiency, rather than leading to energy sinks.

We do not understand the financial resources allocated to promoting investment in hydrogen projects, which in most cases are pilot initiatives far removed from the focus on improving the basic hydrogen production conditions. We cannot make the same errors as the past and focus on funerary monuments with immature technology to cover unreal needs, driven by the sole aim of financial returns on investments, under the protection of ad hoc regulations, and with an eternal dependence on public funds.

We need fiscal policy that introduces homogeneity criteria. It is true that the price of hydrogen produced from natural gas is currently around €1–1.5/kg, while hydrogen produced through water electrolysis, using electricity from a renewable origin, costs between €5/kg and €7/kg. But it is also true that fossil fuels continue to receive tax allowances without internalising the costs of damage caused to the environment and people, which result from the negative externalities of greenhouse gas emissions.

Fundación Renovables has always advocated that Spain's focus should be on **electrifying demand and based on generating electricity 100% with renewable sources**. Hydrogen can play a role in this, but it will be temporary and not a decisive factor. This technology should not be promoted so that, through blending, it supports the current fossil energy model and expands oversized infrastructure.

Biomass

Biomass is of vital importance in developing a 100% renewable energy model. This is due to its thermal contribution and distributed nature, as well as the need for it to be the pillar for recovering areas that have deteriorated occupationally and environmentally, as biomass has the capacity to generate territorial value. **It should be borne in mind that it is a local energy source** and that the positive effects of its growth, such as capturing carbon, are not affected by distributed use in urban environments, which are also subject to high-contamination processes.

Biomass should be promoted, above all, for its use as a source of electricity generation in environments close to its production. Biomass development must always take into account the hierarchy and the lowest priority between energy and the

coverage of food needs and the recovery of the organic layer of soils, as well as the non-use of technologies that transgress the natural biological base. In any case, biomass will be replaced, provided that it is possible with flowing renewable electricity applications, as a resource that can be stored.

The initiatives that must be carried out to incorporate biomass in the energy model need to include measures, such as:

- **A national plan to promote biomass under sustainability criteria.** Using biomass as an energy source must be based on criteria that guarantee the sustainability of the entire production and transformation cycle, as it is compatible with agricultural activities.
- **A plan to use agricultural, forestry and industrial waste for energy purposes.**
- **A regulation to create biomass markets with proximity criteria.**
- **A national forestry plan**, under the double prism of economic and spatial recovery and for the management and control of species and uses of the forest mass.
- **A national biofuel plan** which is subject to strict sustainability criteria and prioritises national production and eliminates the possibility of importing oils for the production of first-generation fuels.

One of the lines that needs to progress is the hybridisation of renewable energy technologies and sources that supplement both system operation and improvement of manageability. Biomass, storage, or even the combination of different sources should provide feasibility and optimisation of resources.

Forest sinks

Fundación Renovables advocates for and promotes sustainable forest management as it is an effective framework for mitigation measures and adapting to the climate change in forests. Forests and woodlands are an important carbon sink and reservoir. The use of plant biomass for energy purposes in the rural environment, from the use of agricultural waste and the cleaning of forests, makes perfect sense if there is proximity between the environment of use and the place of extraction, as long as it is carried out under sustainability criteria and with the appropriate control. It is therefore a priority that forest management should explicitly lead to on-site or near-site energy utilisation of waste and non-timber production.

That is why **Fundación Renovables** is demanding a sustainable forestry law that is definitive, has an energy outlook, and requires regular cleaning and clearing of forests

to prevent forest fires and use plant biomass for energy uses in the area. This, therefore, promotes:

- Using native species and expansion of surface area.
- Forest cleaning and clearing work with the aim of generating electricity in rural areas. This is never to be transported to urban areas.
- Incorporating tax benefits and aid to expand agricultural land.
- Not using the CAP to consider as arable crops what are in fact tree species with annual crops.
- Fostering and monitoring water management.
- Safeguarding the reuse of land that has suffered from fires or unforeseen transformations.
- Promoting forest management companies.

Agriculture and livestock

Agriculture and livestock have become a bone of contention in election campaigns due to the constant neglect of modern regulation that creates value while advancing sustainability. As with energy, the **current standard agriculture and livestock model is extractive, concentrated and centralised**, and the benefits of agricultural mechanisation and intense livestock farming cannot be exclusively financial returns.

Action is pending in many productive sectors that are alien to the responsibility and internalisation of waste production and treatment. The energy policy must establish the actions needed to reduce waste for energy recovery, such as waste from livestock farming. Costs due to environmental treatment must be intrinsically included in livestock production and in no case can energy be used to support such processes.

The natural environment in rural Spain is deteriorating due to the concentration of activities and tolerance for initiatives that appear to be local but actually are not, as is happening with the livestock integration model. There is no longer correspondence between waste generation and its treatment, and this has turned agricultural land into a dumping ground for livestock slurry. This model is neither sustainable nor long-lasting.

In this case, we need to rethink the development model for rural areas, which are becoming the backyard for achieving the targets of the energy policy in terms of supply by incorporating **electricity generation systems that are leading to social rejection as people feel at the mercy of big cities and electricity companies**. This has the unfortunate consequence that the possibilities of Empty Spain, due to the availability

of land and the low population and activity density, will not be altered as they will be irretrievably lost, and that its role will be that of **Spain's energy granary**.

Fundación Renovables focuses on electricity generation with renewable energy, but not at the cost of losing agricultural and rural development capacity. Land that is non-fertile and cannot be cultivated should be used for energy purposes, but without losing the production capacity, especially in an economy with a large deficit in terms of domestic agricultural production. It is hardly helpful for agricultural development if leasing farmland to generate electricity in photovoltaic facilities results in an income more than ten times higher than that which would be obtained if agricultural activity were maintained. Specifically, we believe the following action criteria need to be borne in mind to create energy plans in the primary sector:

- **Strict regulation** that prevents the removal of fertile land to implement generation plants, establishing destination criteria and using non-fertile land.
- **Developing self-consumption and distributed generation**, especially in rural areas, by implementing energy communities, and with a target of 400 MW for the period.
- The creation of **energy communities** in rural areas.
- All irrigation and livestock facilities must operate with **renewable energy**, incorporating this condition as a basic requirement for obtaining necessary permits.
- The necessary implementation of **digestion systems for treating livestock waste** at large facilities, based on a predetermined size, and greater control of dumping on cropland for compliance with volumes per hectare and time.
- **Considering investments in renewable energy in livestock, agricultural and forestry operations as eligible** for income tax purposes under the objective direct assessment method, including an additional deduction of 20% of the investment on the repayment instalment of this investment.

Biofuels for transport

The large majority of biofuels used in the EU come from food crops. Although the general belief is that biofuels come from raw materials that could be sustainable, such as waste and rubbish, the reality is that these are only a small part of biofuel production. In the case of biodiesel, 78% of the raw materials are oils from rapeseed, palm, soybean and sunflower crops. In the case of bioethanol, 96% of the raw materials are from maize, wheat and sugar crops (such as sugar beet) and other cereals (such as barley and rye). Although they are cultivated internally, imports of sunflower oil and rapeseed are also significant.

The consumption of biofuels in Europe already requires an area equivalent to 5% of the total farmland. This surface area would be doubled to compensate just 6.5% of the crude oil, petrol and diesel that the EU imports from Russia. If all these imports need to be replaced by biofuels from Europe, at least 70% of all the farmland would need to be dedicated to fuelling our vehicles. The options for using more biofuels based on rubbish and waste are very limited and would make Europe dependent on importing it from abroad.

Therefore, **biofuels are not the solution for decarbonising transport, either in Europe or in Spain, because it may hinder the infrastructure and logistics for electrified mobility** by maintaining combustion vehicles and the associated polluting logistics. The target should be a gradual electrification of the fleet of each transport sector, depending on the market availability of electric vehicles. So, biofuels should be limited to a supporting role, according to the national production capacity or the certified non-substitutable origin, for uses that cannot be covered more efficiently by renewable electricity.

It is important to highlight that the renewables target has been lowered from 14% to 7% by 2030 in order to reduce the use of first-generation biofuels, which could mean the target of 14% would be used for the use of first-generation biofuels.

A target for progressively eliminating first-generation biofuels that do not contribute to reducing greenhouse gas emissions should be included. It is particularly important to ensure that biofuels from palm oils and soya beans are not used. With regard to establishing specific biofuel consumption targets in aviation, they should be advanced biofuels or electrofuels.

Waste management

Another outstanding issue is the establishment of action criteria relating to **energy recovery of waste**. Waste of organic origin must be treated with the exclusive responsibility of those who produce it.

This treatment must mean that for fuels to be classified as renewables, whether from biomass as a by-product or as the main crop, or from anaerobic digestion of organic waste, they must inherently entail:

- The consideration as a local-use fuel, both to cover the needs of the waste producer and to produce electricity.

- The impossibility of using incineration systems, mainly with regard to Urban Solid Residues (USR).
- That the value of energy production is not the leitmotif of waste treatment. In other words, that the added value outweighs compliance with the regulations.
- The consideration of biomass as a local energy source due to the logistics required and its capacity to capture carbon. Biomass combustion contaminates locally, although it has neutral effects globally. So, it cannot be used in large generation plants to make supply flexible, as some associations have claimed.
- That, for the approval of agricultural, livestock and industrial installations producing a high volume of waste, the existence of treatment plants and the minimisation of the effects of this should be required.

Another point to highlight is that the evolution of both the integration model and the demand for financial profitability of livestock activities has led to the extensive livestock farming model—small farms which are mostly family farms—migrating towards an intensive model in which farmers have become a subsidiary link in a production chain prioritising profitability.

The data points towards a clear boom of large farms in Spain. For example, in Castilla y León in the last five years alone, environmental authorisations have been granted for the installation of 156 pig farms. These **macro farms** are causing strong social protests and local opposition and are difficult to understand from a sustainability perspective.

Component 5 of the Spanish Register of Emissions and Pollutant Sources (known by its Spanish acronym, PRTR) assumes the commitment of the approval of the Royal Decree on protecting water against diffuse contamination caused by nitrates from agricultural sources and highlights the risk of increased concentrations of nitrates resulting from surplus inorganic or organic products used as fertilisers. This is especially concerning when it comes to water intended for public supply, which is regulated by Directive 2020/2184 of 16 December on the quality of water intended for human consumption.

This problem affects not only Spain. The EU considers pollution from diffuse sources as a core problem in the environmental and agricultural policies. That is why European strategies have been implemented in this respect, such as the so-called “Farm to Fork” strategy, which is aligned with the Biodiversity Strategy for 2030 and encompassed in the European Green Deal.

As mentioned above, **it is necessary to reinforce the requirement of tighter restrictions on design conditions and farm authorisations**.

Cross-cutting proposals

Proposals for an ambitious energy transition

FUNDACIÓN RENOVABLES

Cross-cutting proposals

Electricity market

There is still a lot of progress to be made because the behaviour of supply and the management capacity of demand de facto represent differentiating elements to what exists. We are aware that this process cannot be instantaneous, but rather gradual and the result of a dialogue between the government and the agents that reflects the setting of an objective and the consensus to achieve it, without reducing the level of ambition required.

What we are talking about is a **wholesale market** with a price matching method that is accepted and used by most EU countries and ratified by Regulation 2015/1222 of the EC, with the same functioning whether the price is high or low. On the other hand, it should be borne in mind that, since the **marginalist criterion** was adopted, the generation mix has changed drastically, as well as the technologies of which it is composed. It is also necessary to adapt its functioning to a different reality and future, due to both the number of participating agents and the characteristics of the energy vectors that currently play a role in the market.

When the marginalist system was incorporated to close the daily market price, the structure of supply was defined by the majority presence of generation based on fossil fuels; in other words, with a greater weight of variable costs subject to strong fluctuations on international markets and with a greater concentration of bidding agents. The current reality is that, according to 2019 data, 37% of generation was with renewable energy, with marginal costs tending towards zero, and 20.9% of generation was with nuclear, which is price-acceptable because of its limited manageability capacity due to economic and, to a lesser extent, technical conditioning factors.

If we consider the 2030 horizon, this situation will increase because, according to the PNIEC, 74% of electricity will be generated by renewable sources, which are capital intensive, have very low variable costs, lower capacity factor per unit of power and lower management capacity. In short, **the current form of the marginalist system has become obsolete**. Therefore, it should be modified so the market functioning more closely represents reality, not only for our own specific characteristics as a country, in which the only available energy sources are renewables with an interconnection capacity that is far below what is desirable and currently promised, but also for the whole of Europe.

Some of the generation technologies that should leave the marginal market as we know it would be the plants that use flowing renewable energy sources but which have very low annual variation, and even nuclear, although there are many doubts that the price to be agreed for this technology will be below the pool price, not to mention the difficulties caused by the lack of diversity of agents and the scheduled shutdown agreed with the government. Reducing the demand that is placed on the wholesale market through the marginalist procedure can lead to a higher cut-off price as the price-reducing renewable supply disappears. This situation would not arise if the following were taken into account:

- The specific aim is to have a uniform market in terms of the configuration of the remaining bids.
- Not all renewables are removed from the market.
- Supply and demand are reduced to the same level.
- If the market is transparent and fair, there should be no abuse of power, even if supply is concentrated among fewer agents.
- It is so important that the matched price is not so exorbitant that it is zero or negative, as in other countries where that is permitted, let alone that it is passed on to all bids.

Logic dictates that the model to be followed in this transition period should be based on gradually and consensually achieving that:

- New renewables emerge through auctions or PPAs that recall them from the market, obviously on a pay-as-bid basis.
- Hydro, nuclear and part of the renewables currently in operation enter with predefined profitability, following the resulting cost audits.
- Estimated annual gas back-up capacity is auctioned on a take-or-pay basis, so that it is available when needed, maintaining remuneration even for a higher input.
- Norms are established for assigning discharges as there are two models of remuneration for renewables.

Reform of the electricity market. Improving the price signal

Currently, due to high electricity prices and gas shortages in the markets, demand management, in many cases with cost-saving measures, is bringing to the table the potential for manageability and generation reduction that it contributes to the system.

However, the first measure for progressing towards better demand management is to **achieve an electricity price signal that corresponds to the real generation cost**. Cheap electricity is required, but above all, the final price needs to correspond to the costs that arise from when it is generated to when it is consumed. This signal must also include the time variable in order to make the most of everything that technology and the internet of things currently offers and its great potential for the future. That is why **reforming the electricity tariff and redesigning the functioning of the wholesale electricity market is a priority**. This is done by:

- **Leaving some bids outside the market.** It is important to note that most of the infra-marginal technologies are currently heavily centralised in four large energy companies (hydro with public ownership and nuclear with the socialised risk cost). It is clear that if technology auctions or PPAs were to be carried out between peers, the infra-marginal generation will fall on them, breaking competition in the sector and preventing the entry of new players.
  With regard to the market, one element that can be adjusted is to make the pool price not applicable to all technologies and generation plants. In other words, that not all of demand goes through the wholesale market, but that part of it is set by prices agreed through technology auctions. This means that these plants will have a competitive price that is adjusted to the setting process, so that, as mentioned above:
  - New renewables emerge through auctions or PPAs that remove them from the market, obviously on a pay-as-bid basis. Meanwhile, hydro, nuclear and part of renewables currently in operation would do so with pre-defined profitability after the resulting cost audits or due to an auction to cover the demand for PVPC.
  - Estimated annual gas back-up capacity is auctioned on a take-or-pay basis, so that it is available when needed, maintaining remuneration even for a higher input.
- **Paying by function assumed within the market.** Thinking to the future, we need to start paying each source or technology for what it contributes to the system. This contribution should be clearly reflected in the national energy planning documents. All renewable technologies are valuable because their availability and operation enable the supply mix and demand management to have a diversified and economically optimised system. It needs to be consistent with the contribution of each technology, and we are seeing how some countries are starting to assess the capacity factor as a decision-making element by considering hybridisation and storage as basic elements for the planned plants.

The electricity tariff

Energy is a variable that directly affects both the social and productive fabric. It affects families, self-employed workers, companies, industry, transport and all sectors, posing a risk to the most vulnerable as they cannot bear the price increases. Since February 2021, the price of natural gas, which directly affects the price of electricity in the wholesale market, has increased by 250%.

Far from becoming standardised, the situation got worse with the Russian invasion of Ukraine on 24 February 2022. This suddenly increased the price of natural gas on the main organised European markets and the price of electricity on wholesale markets to historic levels. For example, on 8 March 2022, the average price of electricity on the daily market in Spain rose to €544.98/MWh, and on the same day reached its maximum hourly value of €700/MWh during peak consumption at night.

In light of the current situation, **we need to protect electricity consumers by creating a social tariff**, which is something Fundación Renovables has been supporting for some time. Although we believe this should be part of the Spanish General State Budget because it is a basic right that should be covered, regardless of how the electricity tariff is designed and sized, it should also not be an obstacle to be included in the structure of the tariff framework.

Electricity tariffs should do more social work than boosting the economy, even if this is important. And this tariff, once the inefficiencies that are being shown by the marginalisation of all generation units in the wholesale market have been resolved, should be connected to the market price, which, except for temporary circumstances, has shown that it is more economical for users in recent years.

In view of the necessary progressiveness of the tariff in relation to consumption, it is necessary to include a first tranche of minimum vital electricity consumption, with lower prices and taxes, which is free of charge when the consumer is classified as vulnerable. The amount required to cover the needs of a social tariff, in accordance with the Fundación Renovables proposal included in the report "Towards a Sustainable Energy Transition. Proposals to face global challenges" from March 2018, would be €364 million for a population of 2.5 million people, which is much higher than the CNMC's €139 million.

Enabling PVPC customers to transfer to medium- and long-term tariffs, which is what the main operators in the sector are trying to do under the mantra of panicking due to the incorrect development of the current wholesale market, would be hugely

irresponsible and would adversely affect the most vulnerable consumers, who are being offered false security in exchange for fattening the EBITDA of these companies.

The **Fundación Renovables** proposal for restructuring the tariff is designed based on the consideration of a progressive, monomic tariff, which would mean:

- **Differentiating between consumers** when establishing how the structural costs of the system affect them.
- **That the energy price is growing with consumption** as a measure to incentivise efficient practices.
- **That the price of electricity is related to hourly costs** arising from the available supply and demand.
- Establishing **a fixed cost per connection** as payment for the right to receive supply services, but which would not be comparable to the current fixed rate.
- **The possibility of acquiring energy through PPAs**, establishing only the costs of using the infrastructure, which would be a considerable reduction for the industry or for large consumers.
- **Objectivity and transparency in the distribution of regulated costs** between different types of consumers. This would be done using methodologies which take into account their opinion and eliminate the current cross-subsidies between different types of consumers.
- That if the **electricity tariff** were monomic and, therefore, the final price were known in time, each consumer could adapt their demand or generation to optimise their energy bill.
- **The establishment of generation costs according to technology** and abandoning the marginalist pricing model, except for technologies for which the market can approach perfect competition.
- **Simplifying the self-consumption operation** because only the variable cost of actual use of the different services that the system provides would need to be added to the value of the energy.
- **Specific regulation of non-discriminatory market mechanisms** for basic measures that can alleviate the intrinsic variability of some renewable sources: demand management, manageable plants (with special focus on hydro-electric technology, whose concessional conditions should be public), storage and increase of interconnections.
- **An audit to analyse the costs of the system** and suitably structure the new tariff and to re-establish the legal security of investments made in the past, which include:
    - Eliminating windfall profits for nuclear and large hydro technologies.

- Restoring the original conditions for investment in renewable technologies.

Cleaning the electricity tariff

The measures on the regulated part should have a double commitment, as happened temporarily, to compensate for the current price increase:

- **Cleaning the tariff.** The most logical way to reduce the price of electricity is by removing from the tariff any charges that should never have been part of it and which do not correspond either to its consideration as a basic need or to the basic criteria of transparency.
- **Pay per use**. As a prior element before specifically reviewing each part, what is currently fixed needs to become variable. In other words, converting the regulated part to paying market prices for the service actually received. If the structure of the tariff were variable, consumers would need to develop more rational behaviour and would have to make more decisions on their energy consumption, deciding when, how and how much energy they need to cover their needs. It would also incorporate the possibility of demand being shifted and becoming manageable by efficiency. In this respect, promoting responsible consumption should transmit to consumers that their consumption behaviour should be based on efficiency and saving. That is why it is important that the costs reflect that consuming above standards set previously would have financial consequences. For the domestic segment, it is proposed to establish differentiated brackets according to standardised groups of consumers, from a broad conception and with the consideration of three bands: minimum vital, standardised and penalised.

Electricity networks and digitalisation

We are in the process of changing economic model and we are in the midst of fighting climate change and electrifying demand, so the availability of an open and flexible electricity system will be one of the most important elements for reactivating the economy—committing to the future in the face of practices that belong in the past as they are neither sustainable nor inclusive for most of society.

The mass implementation of renewable energy and, especially, self-consumption and distributed generation requires not only automating the electricity grids, but also **modernising by digitalising distribution and low-voltage grids**, both upstream and

downstream of the user's meter. With the fall in demand following the 2008 crisis, the grids of the electricity system do not experience problems regarding lack of capacity, but they do need to be automated due to both the entry of more generation points and the randomness of renewable sources and the need to incorporate demand management.

The PNIEC forecasts, which match the **Fundación Renovables** proposals of achieving 5,000,000 electric vehicles by 2030, require a significant effort to adapt and modernise the electricity system. The move to a new energy model by electrifying demand through distributed generation implies the emergence of a multitude of new agents and, therefore, the need to control many variables. Measuring devices are necessary due to the shortening of the operating period because of the increased management of the energy exchange. This means the energy system needs to change both its way of working and its response capacity. Taking into account the needs already present, digitalising the electricity system is something that cannot be avoided. In order to have the capacity to move forward, actions such as the following are necessary:

- **Focusing on international and inter-island electrical interconnection.**
- **Redefining access, connection and dispatch priorities** that maximise the penetration of renewables and minimise the discharges of primary energy.
- **Establishing regulatory signals for locating renewable energy plants**, so as to minimise losses in the grid and take advantage of the evacuation infrastructure of closed plants or those in the process of closing.
- **Explicitly supporting the digitalisation of low-voltage distribution grids**, especially in cities.
- **Simplifying regulations to allow for the planned and large-scale installation of electric vehicle charging systems**, so that they can be used not only in urban areas, but also for middle-distance journeys, approved for control by the system operator.
- **Improving the generation forecast.** The emergence of multiple generation systems with more difficulties in managing the source, and in many cases associated to consumption processes, requires progress to be made in forecasting its availability and reducing the oversizing that a greater number of agents, etc. entails.
- **Improving the energy and grid planning processes**, which would decrease investment and improve the quality of the service. This must be carried out in the short to medium term by enhancing digitalisation of substations, transformation centres and grids to improve the predictive maintenance of control centres and third-party control centres (aggregators and self-consumers)

and by boosting the development of algorithms to manage data and machine learning.

- **Developing and implementing demand aggregators.** One of the largest deficiencies in our current electricity market is that it doesn't allow for the aggregation of consumption in the form of collective contracts through demand aggregators. This practice would represent a noticeable reduction of contracted power, in line with the simultaneity coefficients of all the consumers grouped together. The flexibility of demand is the best element for system manageability and means changing the oversizing of generation and networks, so demand matches supply to optimise investments.

Another notable point is the **need to publicise the distribution networks and put them in the hands of town councils again** given the deficient application and delays in the protocols of the distributors with different suppliers, which is a burden in many locations for accelerating the integration of self-consumers into the system. The measures proposed should be applied in case distributors do not respond effectively and quickly. The proposal consists of:

- **Completely separating the ownership of the electricity distribution grids and associated service infrastructure** from the private companies that carry out deregulated activities (generation and distribution). This step would be equivalent to what has already been carried out with the transmission grid, from which the traditional electricity companies had to be forcefully removed, although this was not to improve the public service and independence but to create a structure that is more to do with bonds than service. Learning from previous experience would mean that a rapid and direct schedule could be applied now for the distribution networks. This would stop economic interest prevailing over public service and stop the companies maintaining partial ownership, even on a transitory basis. This proposal is designed for the companies that have integrated control and a specifically relevant influence. Distributors with a purely local or regional scope of action, for which this measure would not be necessary, should be considered separately.
- **Progressively recovering public ownership of assets and distribution functions**, especially those connected to towns and cities. This measure would not only recover the driving force of the future, but also the management of the reference suppliers that manage 10.5 million customers, who are being pressured to migrate to a deregulated market in which not only is the supply of electricity 20% more expensive, but also the consumers are the ones who retain the PVPC. This supply is sold by the reference suppliers, who are protected from potential supply cut-offs due to non-payment or benefit from the rates subsidy.

Fundación Renovables proposes separating the functions of the system operator and the transmission operator and recovering the public nature of the latter. The current transmission operator is the Red Eléctrica de España (REE), in which the state has an interest of 20%. This position does not demand the transmission networks be nationalised, but that their remuneration be adjusted according to the services provided and the real cost of money and remuneration of this type of infrastructure as a natural monopoly.

We do not believe that the transmission being publicly owned is an additional benefit because it is an activity that is carried out according to the government's energy plan. However, we do think it is necessary to readjust their remuneration figures and, above all, that the system operator with the assets it requires to guarantee the manageability of the system should be of a public nature.

The system operator, as a public entity, should include the ownership of the elements and infrastructure required for the manageability of the system, with a special emphasis on the storage facilities, including the pumping facilities. This is not about intervening in price setting, including hydroelectric power plants in the scope of action or as facilities owned by the system operator; we only refer to providing it with the means to make system manageability possible. Combatting the positions of dominance in the price setting of the wholesale market should be the role of the government, the control institutions such as the CNMC and of self-regulation and greater competition in the market itself.

Access to data

The current meters serve only the interests of electricity companies and do not allow for the necessary citizen empowerment and their legitimate participation in the energy transition. Therefore, they should be replaced, charging this cost to their owners and not to consumers.

We think it is important that the management of data be delegated to the technical operator of the system, a function which is assigned to the transmission operator, without detracting from the fact that the distributor remains responsible for metering. Many European countries have done this, such as Germany, Norway, Finland and Denmark. Spain has also tried to do this, and the task would fall to REE, the transmission operator and technical operator of the system, to take over the data access system. A request for bids was published by REE (July 2015) but was never consolidated.

The existence of a **data-dump platform** that enables online access to data and that is public or managed by an independent body is very important as it requires distribution companies to put all the data on this common platform. The EU, through its Recommendation 2012/148/EU, proposes the ten minimum functionalities, and Spain does not comply with the "sufficiently frequent readings for energy saving plans", which limits the potential of energy efficiency and demand management measures.

Fundación Renovables believes that the meters currently installed do not meet the requirements necessary to comprehensively implement the energy transformation that society is demanding, providing citizens with easy and accessible interaction with their energy consumption data. The main problems we detected and proposed to improve in the previous public consultation on access to data and evolution of the electricity metering system (link in Spanish) are the following:

- **Different communication protocols.** The meters have been installed through two different communication protocols. Meters&More by Enel-Endesa and the PRIME protocol for the rest, led by Iberdrola. The functionalities achieved and their consequences were as follows:

- Accessibility to data:
  - ✓ **Own data.** Access to the data set is limited to visual consultation of the meter itself using the menu in the integrated display. There is no direct digital access nor connection possible as there is no free port.
  - ✓ **Third-party data.** Access to data by any company that has the legal and technical competences to do so is a dynamic element of the electricity market. Activating this functionality will reduce the existing natural monopoly for distribution ownership.
  - ✓ **Remote data.** Consumers have access to data via the website of the distribution company. The distribution companies provide their customers with some apps to view consumption, but in any case, the information can only systematically be viewed at least one day later. In some distribution companies, you can request access to values for more recent periods, but not with short time intervals.
- **Interoperability.** Another key aspect within the scope of accessibility is the capacity of the digital meter itself to be able to interact with other elements and equipment in the house. The lack of interoperability of digital meters in Spain therefore limits the development potential of smart homes as the management

of domestic appliances cannot be automated according to price signals. This then prevents demand management actions such as virtual storage plants (connection with thermostat) being coordinated and distributed generation sources and electric vehicle penetrating, which are all measures identified and promoted by the Winter Package. This lack of interoperability is already one of the key issues and means meters are becoming obsolescent more quickly. So, this issue needs to be addressed both technically and legally if the electricity system wants to modernise.

- **Neutrality.** In order to make the most of the potential of data from digital meters, the neutrality of the data needs to be guaranteed. Neutrality should be understood as **equal access and quality of data for any recognised party, and no competition between whoever gathers and transmits the data** (distributor or any related company or business group) **and others**. The data networks are owned by the distribution companies, who then make them available to the electricity grid and the common platform, so that all the supply companies can invoice.

With regard to **self-consumption**, in addition to modifying the communication formats, measures that ensure these changes are applied effectively should also be implemented. The experience of previous format changes to the exchange files has shown that not all distribution companies have the capacity to apply these changes in the way and by the deadlines agreed. Ultimately, the delivery delays and the multiple and repeated errors in the file formats (especially F1) have led to consumers not being able to receive their invoices based on their real consumption, and consumers associated to a self-consumption facility not being aware of the surpluses or being unable to benefit from the simplified compensation mechanism.

Therefore, in light of these and future format changes, mechanisms must be established that guarantee the changes agreed by all parties are implemented in the appropriate manner and time, without long delays and incidents, ensuring consumers' rights are duly protected.

Deregulation and simplification of administrative procedures

One topic that is generating a lot of disagreement is the large number of regulations for facilities, especially self-consumption facilities, but also energy rehabilitation of buildings in several towns. **Administrative complexity hinders this** due to the excessive number of different procedures that delay the processing time more than is necessary. It is essential to unify and simplify these regulations, as well as the requirements, rights and obligations of all the actors involved. For example, we believe

that when activating simplified compensation, documentation or access requests do not need to be submitted when the power to be installed is less than 75% of the contracted power as a consumer. However, evacuation capacity is needed to guarantee its development and the development of smaller, diversified plants in local areas.

In the case of large renewable electricity generation plants, it should be the central government that controls the administrative simplification for environmental issues at a regional and local level. If this phenomenon is observed (as is typical in times of economic crisis), they should increase the quality, duration and intensity of the field work requirements of the environmental impact statements (EIS).

Citizen awareness and promotion of the energy culture

Climate change requires society to make essential changes. Therefore, work needs to be done to ensure the public administration, media, private sector and all citizens are fully involved in the change of energy model. Responsibility, learning and understanding of basic energy concepts, as well as environmental and political awareness, should permeate all of them as much as possible. **A new citizen for a new energy model, but knowledge is key to participating.**

Furthermore, as we mentioned in previous points, providing citizens with the tools needed to become active, such as self-consumption and demand management, is essential to progress towards a distributed system. Only when the energy policy considers demand and consumers to be a key part of its development and the commitments made will citizens truly become active participants in the transition process.

It is essential to promote a **new energy culture** that is based on efficiency, savings, responsible consumption and renewable energy, allowing society to discover that committing to energy sustainability is a form of inclusion, cohesion and value generation. Progressing towards this objective requires implementing programmes such as:

- **Clear communication.**
  We live in a pseudo-reality in which greenwashing has become a tool to sweeten unsustainable processes. Clear communication should be essential so as to avoid disguising the energy reality through marketing and communication. The doubts raised by Regulation (EU) 2020/852 regarding the establishment of a framework to facilitate sustainable investments or the EC proposals reflect that

ambiguity is not a tool for change and that areas of legal doubt always fall in favour of those with economic power. The use of colours to differentiate the goodness or otherwise of energies and processes distorts reality, although it may seem that the measurement provides simple signals for the characterisation process because of the range of colours chosen and assigned.

The use of concepts that sound good on paper, such as technology neutrality, the use of cleanliness concepts to define cleaner fuels, or the merging of concepts such as renewable gases or power to gas are bad practices regarding the perverse and premeditated use of aseptic, harmful elements.

In the *Manifiesto de los sin cromos* (Manifesto against horse-trading), we request an amendment to the Spanish General Advertising Act (Law 34/1988 of 11 November 1988, General Advertising Act (link in Spanish) and the amendment of 28 March 2014) regarding products, goods and services that emit greenhouse gases, to prevent illegal advertising and, specifically, misleading and unfair advertising (greenwashing). This would be in the same way as was done with the sectors of alcoholic beverages, tobacco or advertising aimed at minors.

Half-truths always defend the part that is a lie. We have recently seen that the EC believes nuclear and gas to be part of the sustainable investment taxonomy, although it is clarified that it is only to help the energy transition. This, therefore, calls into question the basis of the energy policy that the EC had previously agreed. We have also heard the explanation regarding the fulfilment of the Prime Minister's promise on the costs of the domestic tariff in 2021 compared to 2018 and, apart from the unnecessary controversy, the lack of truthfulness, transparency and clarity in the explanations has been evident.

- **Education: design of curricula.**

  While it is mandatory to study literature, mathematics and history, we believe it is very important to incorporate environmental, energy and climate change into the educational curriculum for all ages of primary, secondary and higher education.

  It is impossible to achieve the target set in the Paris Agreement if there is no education on environmental and climate change issues in primary school.

  Fundación Renovables establishes the following proposals regarding the school curriculum:

  - **Primary education.** Introduction of basic elements in subjects related to science and environmental knowledge, such as environmental respect, awareness that energy is a scarce and limited resource and global warming. Of course, this would be adapted through gamification and storytelling for younger students.
  - **Secondary and basic professional training.** Introduction of a more flexible course, so that students become aware of the problems caused by climate

change, the need to change the energy model, the eradication of fossil fuels, the different renewable energies, and so on.

- **Higher education and advanced professional training.** This includes treating students with responsibility and maturity, encouraging them to reflect on the consequences of certain behaviours, making them aware of the environmental policies implemented in Spain, and fostering and encouraging their critical thinking on broad environmental, climate and energy concepts.
- **Teacher training.** Educating students is impossible if the teachers lack the necessary training themselves from experts. They need to acquire the necessary technical and practical knowledge for the school age they teach.
- **Parents.** The role of parents in the environmental education process cannot be ignored either. They should be co-responsible for being active in and promoting change by participating in the tasks and projects assigned to their children both at school and at home.

- **Transparency and clear communication in all administrations.**
  All energy and environmental policies implemented by any public administration should have a high degree of transparency and accessibility. In this respect, measures need to be implemented in order for:
  - Energy communication to be aligned with **clear communication** principles, whereby simplicity is the key aspect of all energy and environmental messages from any public administration.
  - The information that is communicated by the public administrations to be **complete and thorough**. Simplification should be an inspiring principle whereby information reaches the whole of society in a comprehensible form.
  - **Knowledge to be universal**. This is so that all citizens, regardless of their financial and education level, can understand and access the information that concerns them as responsible consumers.
  - **Information requested by citizens to be accessible** to them quickly and digitally, so that as many people as possible can be reached.
- **Active promotion of the energy culture.**
  It is impossible to change the energy model if it is not implemented by the citizens. That is, through a more visible energy culture in society, in all spheres of economic, social, education, occupational and political life.
  That is why it would be desirable for the following aspects to be implemented:
  - Considering citizens as **active subjects** from a participatory perspective and philosophy, giving them a central place at the heart of the political debate in terms of sustainability and energy.
  - **Information and promotion of self-consumption**, incentivising it to achieve maximum penetration among citizens.

- Creating **guides and materials** that incentivise and promote self-consumption.
- Distributing practical handbooks on issues relating to climate change and the global temperature increase of two degrees (what is at stake and what we are facing), energy consumption patterns, waste management and recycling, polluting emissions from vehicles, and analysis of atmospheric pollution.
- **Regularly informing** people on the initiatives that the different administrations are implementing to promote the energy culture.
- **Launching media campaigns** for energy efficiency and saving.
- Promoting **citizen consultations** on energy and the environment.
- Increasing knowledge on the ecological footprint and environmental impact.

- **Dissemination of best practices.**

  Companies, trade unions, associations, political parties, administrations and the media need to act as transformation agents capable of contributing to the change of energy model. The following would be necessary for this:
  - **Better and clearer communication** between the energy companies and consumers on matters such as prices, auctions, consumption, billing, concepts, price changes, contracts, etc.
  - Public administrations need to **provide citizens with information on legislative initiatives regarding energy**, explaining the social implication of such legislation.
  - With regard to heating and air conditioning, **promoting the installation** of heat pumps and replacement of natural gas, electric radiators and other inefficient heating and cooling systems, within the financial means of the companies.
  - With regard to energy saving measures, **promoting insulation measures** to benefit savings and efficiency.
  - **Disseminating best practices for employees** by creating handbooks on recycling, turning off lights, computer equipment, etc.
  - **Informing employees about the invoicing of supplies** on the basis of collaboration and awareness, so that they can find out whether the measures to be taken have results in terms of savings.
  - Informing people on the CO_2 emissions of large polluting companies and on pollution indices.
  - Distributing **de-energisation manuals**.
  - Promoting **environmentally efficient behaviour**.

Energy education and training

Companies in the photovoltaic energy sector employed 4.3 million people in 2021, which is a third of all the positions in the global green energy sector according to the Renewable Energy and Jobs: Annual Review 2022 report from IRENA. The direct contribution of photovoltaic power to Spanish GDP was €3.72 billion in 2020. The European employers' organisation SolarEurope forecasts that it will grow by 64% to 584,000 jobs by 2025. But if the EU's renewables milestone rises to 45%, as the EC proposes, the figure would triple to 1.1 million by 2030.

A recent study from Brussels on renewable energy in the EU placed Spain third in terms of jobs. In 2020, which was the reference year of the study, 11% of all jobs were in renewables (140,500), behind Germany, which was 18% (242,100), and France, which was 13% (164,400). With regard to self-consumption, and according to Measure 8 of the Self-Consumption Roadmap (training to improve renewable energy skills), training measures will be carried out to improve the technical, health and safety, and quality skills required for working with renewable sources of self-consumption for at least 500 professionals before the end of the second quarter of 2023.

Continuing to develop a multi-disciplinary training plan with a gender perspective is urgent. This change requires focusing on training and creating new job profiles that should combat the gender divide with a series of measures that integrate the gender perspective at all levels, including policy formulation, initiative design, project execution and management, training adaptation and skill development. It is especially important to attract and retain talent based on the implementation of work-life balance and equal opportunities policies.

It is also necessary to satisfy the growing demand of operators for the installation of photovoltaic self-consumption in different locations across Spain, promoting the economic value in towns that are isolated from large urban centres and avoiding the bottleneck that is emerging, whereby installation deadlines are taking several weeks instead of two or three days.

That is why free courses should be offered to workers, unemployed people, people receiving unemployment benefit and self-employed workers. These courses should be subsidised by the Spanish State Public Employment Service in order to speed up the process, attract professionals and improve their technical capabilities so that they view self-consumption installations as an optimal work activity for their professional development. The programme of courses would consist of two basic lines: converting other electricity modules for self-consumption installers and creating new fast-track training modules that last less than one year.

Green and active taxation

Fundación Renovables has always considered taxation to be an active element in making progress in introducing best practices and responsible consumption, in addition to maintaining state income.

There is a need to draft and approve a new **active and green taxation act** which stipulates, for example:

- That taxes on CO_2 emissions also be allocated to **promoting the initiatives that reduce emissions or have no emissions**.
- That tax brackets that progressively reduce the tax burden for essential consumption and progressively tax additional consumption be established, **turning the energy price signal into an instrument promoting universal access and efficiency**.
- That the tax increase for registering internal combustion vehicles be allocated to **reducing taxes on electric vehicles**.
- That the levies on road and air transport be allocated to promoting railways.
- That the IBI reduction for type A and B energy certificates be covered by increases for D or higher certificates.
- That personal income tax and corporation tax exemptions or deductions be implemented for **improving responsible consumption**.
- That direct estimation coefficients be created to **promote investments and best practices in sustainable initiatives**.
- That **sustainable mobility be promoted at work**, with tax breaks for companies and employees that use less contaminating access systems.
- That there be a **positive fiscal stance** towards remote working, equal opportunities, inclusion, and so on.
- That there be reductions in IBI and ICIO (Spanish Construction, Installation and Works Tax) at local councils for **photovoltaic self-consumption facilities**.
- That **differentiated VAT management** be implemented to promote investments in sustainable activities.

Similarly, in terms of energy, the Spanish General State Budget should bear the items that guarantee social access to essential goods and services. In this respect, the social tariff, the vital energy minimum and the extra-peninsular costs of territorial tariff equality, among other items, should be included in the Spanish General State Budget.

The tax policy is the best means for introducing standards of more sustainable behaviour, in addition to being the revenue base for covering the state's financial

needs, as has been mentioned before. It should also be based on criteria of transparency, fairness and redistribution of taxes.

Spain's tax policy has had the sole objective of tax collection, leaving the energy and environmental policy out of its definition. In fact, Spain is the country that collects the least tax after Ireland and Luxembourg.

The scope of the energy policy must also include some elements that are not included in the Spanish White Paper (link in Spanish) and which would supplement the framework of proposals outlined above:

- **Tax policy as a tax collection and penalising element** that acts as a deterrent to fait accompli activities, following the maxim of "whoever pollutes pays" and ensuring that legislation puts regulation first in order to prevent problems from occurring, regardless of the assessment of the effects of its development. We cannot take on a greater tax burden to prevent or resolve a problem because the tax burden is exclusively the reflection of incorporating a cost that will be passed on to consumers, especially in markets in which competition is absent or there are no alternatives to replace lobbying practices or sectoral business concentration.
- In this line, before planning to deliver the necessary "whoever pollutes pays" model, we need to reflect on the concept underlying the regulation, which is "pay to be able to pollute". It is not a question of incorporating a fiscal cost, but of not allowing the implementation of practices that are unsustainable, including, for example: the development of productive or consumer activities due to the financial capacity to carry them out in segments of the population with greater economic resources or the taxation of emissions and the pollution of aquifers by intensive livestock farming, but without requiring facilities that minimise untreated waste.

Beforehand, we need tighter regulatory requirements and more control on activities that entail negative consequences for health and the environment.

FUNDACIÓN RENOVABLES

Pedro Heredia 8, 2° Derecha
28028 Madrid

www.fundacionrenovables.org

DEMOCRATIZAR PARA ELECTRIFICAR