



Towards a Sustainable Energy Transition
Proposals to address global challenges



March 2018

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The coordination and final drafting were carried out by the Executive Committee of the Board of Trustees of **Fundación Renovables**, which consists of:

Chairman: **Fernando Ferrando**

Vice-chairmen: **Juan Castro-Gil, Mariano Sidrach de Cardona and Sergio de Otto.**

Trustees: **Domingo Jiménez Beltrán, Concha Cánovas, José Luis García Ortega and Joan Herrera.**



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Fundación Renovables

(Declared a public utility company)

Pedro Heredia 8, 2º Derecha

28008 Madrid

www.fundacionrenovables.org



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Introduction

Fundación Renovables presents Spanish society with its Energy Policy Proposals as a contribution to the essential national debate regarding the Energy Transition we are heading towards. “**Towards a Sustainable Energy Transition**” is an update and expansion on the document “**Energy as a vector of change for a new society and a new economy**”, published in October 2015 following the election called for December that year. This updated document includes the same ideas and proposals but is much more ambitious.

Unfortunately, we have lost thirty months in the task of drastically changing our energy model, as is required, firstly, for the fight against climate change, a task for which the **Paris Agreement** in January 2016, despite its limitations, clearly states that the path requires a radical transformation of the way we currently use energy. There are several factors in Spain itself that also call for this transition, including the extremely high energy dependency rate (a real burden on Spain’s trade balance); the imbalance in the electricity system which results in some of the most expensive electricity bills in Europe; and the scourge of energy poverty, which is an embarrassment, or should be an embarrassment, to us as a society.

This document also strongly advocates for the **need to act comprehensively in cities** as they are a primary setting for this change of energy model. It includes proposals ranging from urban layout, recovery of neighbourhoods as places where people can live together, rehabilitation and, of course, the transformation of energy self-sufficiency and mobility.

The basis of our Energy Policy Proposals is the assertion of the values and principles which frame our actions, and which are based on the notion of **energy as a citizen’s right**, a basic good and a public attribute which should take precedence over the economic interests that surround it.

The first section of this document addresses the **action plans for demand**, an area in which we have a lot still to do and which should have a significant effect on reducing emissions through a more rational use of energy and generalised electrification by 2050, although great progress must be made in the next decade.

Secondly, we look at **supply** with strong action plans for renewable energy, which should assume its role more quickly in order to eradicate coal and nuclear power, and, of course, to promote self-consumption. The last proposals refer to the most transversal measures, such as the urgent overall reform of the electricity sector and the extensive range of taxation measures which we believe are essential for carrying out the Energy Transition.

We want to point out that **the change should be fair and respectful of all citizen’s rights**. For example, this starts with their right to inhale clean air and ends with the opportunity to generate their own energy, a right which is currently limited by the most restrictive legislation in the world.

*Our basis for achieving this objective, which is widely accepted today, is to **have a decarbonised energy system by 2050**, and that is why we have set targets for the coming decades with regard to reducing emissions, electrifying demand, incorporating renewables, etc. We understand that to guarantee this final objective we must start decisively committing to the task from the very first moment, and that is why we believe the goal for 2030 should mark a turning point in the way we use energy.*

*We have cross referenced the effects of the proposed measures with several prospective models and they all confirm the **feasibility** of these measures in reaching our desired objectives.*

Our proposal is aligned with our vision of energy, is economically and technologically viable, is comprehensive, structured and not opportunistic, is open to changes and improvements, and is undoubtedly a good script for the debate on a real Energy Transition, which we want to be sustainable and, ultimately, undertaken with the commitment of everyone.

Fernando Ferrando Vitales
Chairman

Executive summary

Fundación Renovables contributes a new version of its Energy Policy Proposals to the debate on the Energy Transition. This new version expands upon and revises the document we published in November 2015 entitled “[*Energy as a vector of change for a new society and a new economy*](#)”. In this document we provide **an overview of what a change of energy model entails—a sustainable and fair change for everyone.**

Although the final objective of these proposals is to decarbonise not only the Spanish energy system but also the economy in general by 2050, **our reference for most of the proposed measures is 2030** because we believe that **we should have started the radical change in how we use energy by that time**, something we strongly advocate at **Fundación Renovables**.

This drastic change is essential in the global fight against climate change and against the serious dysfunctions of the energy system in Spain. Therefore, this clearly requires **addressing demand as a priority** to significantly reduce emissions in two ways: **more rational use of energy** and **general electrification of this demand**.

With regard to supply, we believe, as we have indicated on several occasions, that firstly, **renewable technology is ready** to take on its role in a sustainable model and the **spectacular reduction of costs** negates any doubts regarding competitiveness in a model based on renewables. Therefore, **all that remains is the political decision** to look past the interests of conventional technology, interests which are not aligned with those of society as a whole in terms of the challenges we face.

Objectives

Year	% reduction of emissions vs. 1990	% reduction of emissions vs. 2015	% reduction of final energy demand vs. 2015	Electrification of demand	% electricity generation with renewable energy	% coverage of final energy demand with renewable energy
2030	51	59	25	50	80	50
2040	67	80	30	70	100	80
2050	Zero emissions	Zero emissions	40	80		100

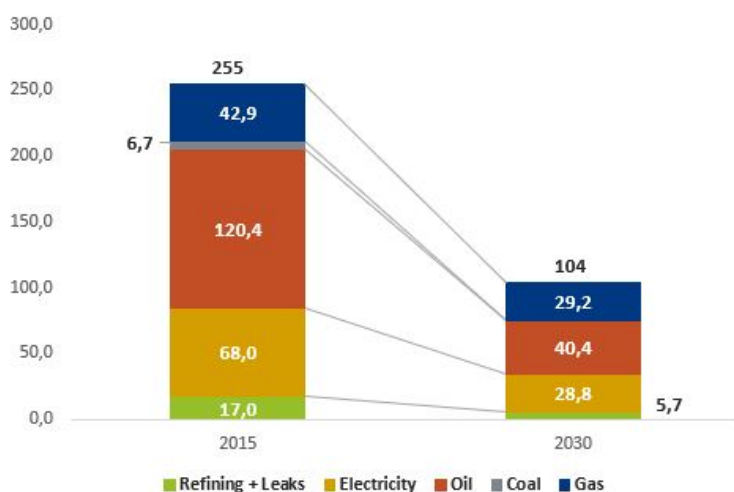
Table 1. *Fundación Renovables* objectives for 2050 and partial objectives for sustainable energy.

Source: Fundación Renovables.

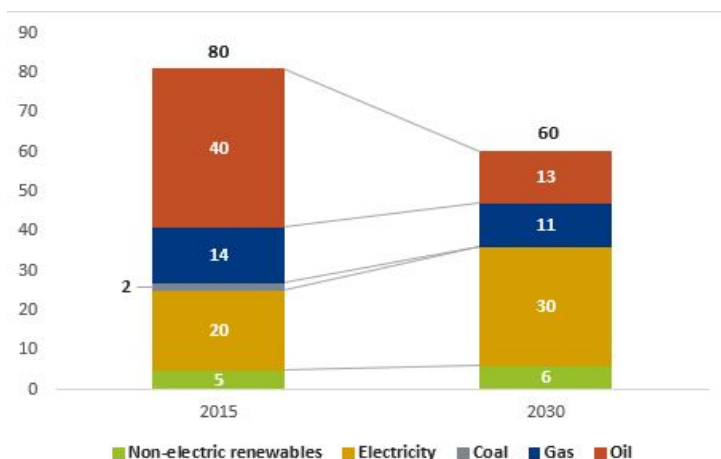
As we have indicated, the objective is to have zero greenhouse gas emissions and a system free of any other environmentally unsustainable elements, such as radioactive waste generation, by 2050. Table 1 shows that we propose five variables to create the roadmap to 2050, with partial objectives per decade. Nobody is currently discussing the mid-century target, set by the European Union, but the **Fundación Renovables** proposal is different because it is getting started now and not leaving the principal task until the last decade or decades.

Therefore, by **2030**, we propose: **reducing emissions by 51%** compared to 1990 and 59% compared to 2015, from **255 MTCO₂** in 2015 to **104.1 MTCO₂** by 2030 (see image 1); **reducing final energy demand by 25%** compared to 2015 (or more than 40% compared to what we would have in 2030 if the Spanish economy continues as it has been until now, without changes in

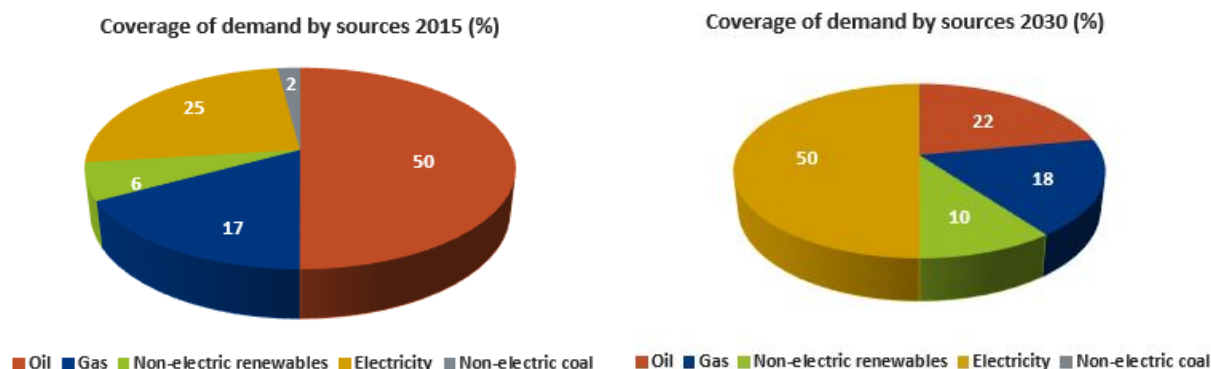
energy efficiency and with an annual **GDP growth equivalent to 1.5%**; a **50% electrification** of the final energy demand (double today's amount); **80% incorporation of renewables** in the electricity system; and **50% coverage of the final energy demand** (see Graphs 2 and 3).



Graph 1. *Forecast reduction of CO₂ emissions from 2015 to 2030 (in MTCO₂).*
Source: Fundación Renovables.



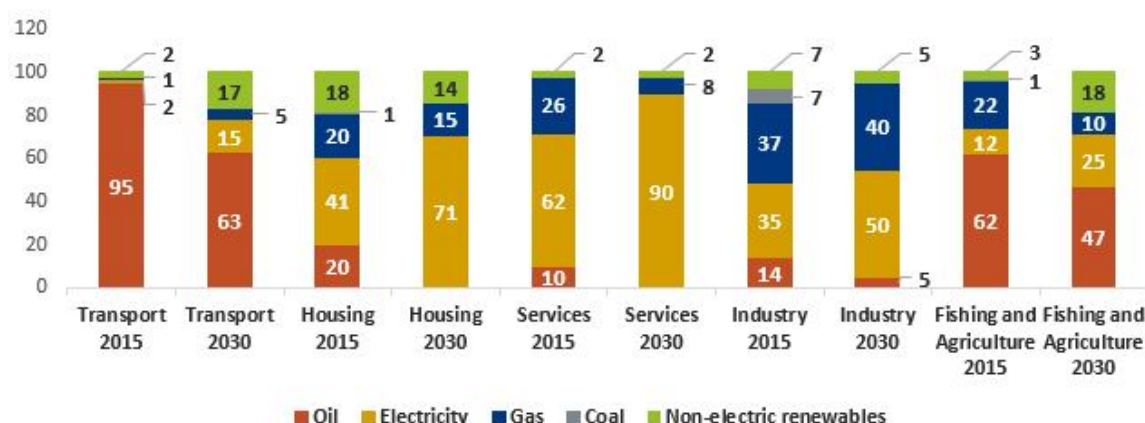
Graph 2. *Evolution of final energy demand and energy mix for 2015 and 2030 (in Mtoe).*
Source: Fundación Renovables.



Graph 3. Comparison of total coverage of demand by energy source in 2015 and 2030. Source: Fundación Renovables.

This means that the **transport sector** will go from a final energy demand of **33 Mtoe** (millions of tonnes of oil equivalent) in 2015 to **18 Mtoe** in 2030, and **only 63% of this will be covered by oil, compared to 95% currently**. Meanwhile, in the **housing sector**, we are committed to eradicating consumption from oil, with a final energy demand that would go from 15.4 Mtoe to 11.4 Mtoe in the same period.

This is shown in the following image:



Graph 4. Change of the coverage mix in the different sectors by energy source, expressed as a percentage, 2015-2030.

Source: Fundación Renovables.

Two more pieces of information to assess what achieving these objectives would mean:

- **Reduction of the oil bill by over €9 billion by 2030** (an oil barrel price of \$60).
- **Reduction of dependency from 83% to 50%.**

Principles and values

If the pursuit of ambitious objectives is one of the main features of this document, the other is that we are working from some principles and values that place **citizens at the heart of the model**, overcoming their position as captive consumers to become producers, managers and users of energy.

This position is based on the conviction that energy is a **basic good** and a right, which goes far beyond the economic interests surrounding it, and that is why we advocate it as a **public utility** and demand access be universal and guaranteed.

Similarly, we believe that **efficiency and renewable energy are the fundamental axes for any energy measures** because the best energy is that which is not consumed, and renewables are sources that are clearly available across Spain.

Another of our fundamental principles is that **cities are the drivers of the new energy model**. The population concentration and urban development model are making cities energy drains with a high concentration of emissions. Changing the current model for a more sustainable one requires urgent action in the urban setting.

When we claim that **acting on demand and its electrification should be a priority**, we do so because this means democratising the energy system to place citizens at its heart. In fact, for **Fundación Renovables**, **energy is the driver of a new social and energy model**.

But this will not be possible if we do not make **transparency and good governance the bases of management and relations** to overcome the current misgovernment of the system and reverse the current lack of trust. This would be done with measures such as making decision-making, participation and social dialogue more open, so measures like those in the latest legislature are avoided.

Finally, it is important to note that we should **encourage a new energy culture** in which society accepts that the **current situation is neither sustainable nor competitive** due to the demand of **unavailable resources** and the costs resulting from **climate change** and pollution.

This document is divided into three sections which correspond to the action plans for **demand, supply and transversal measures**. The Annex includes the baseline data, the hypothesis and estimated results from implementing the measures.

MEASURES FOR DEMAND

I Urban measures

Fundación Renovables has been indicating for years that **cities are the setting for the change of energy model**. This is not only because more than 80% of the Spanish population live in cities and 75% of the energy consumption occurs in them, but also because they are the most suitable places for a model that empowers citizens and society as a whole.

That is why we demand a **strategic plan** that is capable of including the overall needs of cities in general, and also outlining objectives, deadlines and yearly reviews of every aspect of urban sustainable development:

- Measures in defined geographic areas: neighbourhoods, districts, etc.
- Mobility measures.
- Rehabilitation of buildings.
- Plans for public spaces.

Proposals of urban measures (among others)

- Prioritisation of **public space as a space for people**.
- Creation of a network of quality public spaces that are considered fundamental axes **in the mobility plans**.
- Creation of specific legislation that regulates and addresses **new modes of transport**, prioritising those without **emissions**.
- Review of regulations and the design of public roads to **ensure they are used sustainably** and safely and are accessible.

The role of cities

- **Cities as service providers:**
 - Energy as a **public service** requires a study of the **new functions of cities** as energy **providers**, **managers** of their own energy, **promoters of P2P energy exchange and collaboration platforms**, etc.
- **Cities as owners of assets and investors or promoters of initiatives:**
 - Transformation of the **distribution lines**, **rehabilitation** processes, development of **own renewable generation plants**. These are points that clearly require a change to the Spanish [Local Government Regulatory Law](#).
- **Cities that pass regulations:**
 - Mobility and transport:
 - Amendment to the Spanish **Vehicle Road Tax** and **vehicle access and traffic regulations** which do not comply with emissions regulations, **banning diesel vehicles by 2025** and **internal combustion vehicles by 2040**, promoting the installation of electric vehicle recharging systems, etc.

- Construction:
 - **LVT depending on the energy certificate grade.**
 - Adaptation of planning permission to **encourage rehabilitation of buildings.**
 - Promoting installation of **self-consumption initiatives.**
- Energy in general:
 - **Prohibition or taxation on gas facilities** and use of fossil fuels.
 - Commitment to **100% electrical energy consumption from renewable sources in all public facilities** and 50% improvement of energy efficiency by 2030.
- **Cities as a participatory setting and a place to spread best practices:**
 - Support **communication and dissemination of best practices.**
 - Plan of actions to **garner public support for the new urban design.**

II Eradication of energy poverty

Energy poverty **confirms** that, together with climate change, **the current energy model does not work.** This is a necessity good which should be available to everyone, regardless of purchasing power.

Three factors generally cause energy poverty:

- **Insufficient income in a large section of society.**
- **Unaffordable energy prices.**
- **Bad construction and living conditions in homes.**

In order to eradicate energy poverty, different lines of action must be implemented based on its causes:

- Availability of **social tariffs** that are adapted **according to level of income** and specific family characteristics, and which should include:
 - No **fixed rate.**
 - A **basic contracted power** which is enough for the size of family.
 - **Minimum energy consumption at a reduced price.**
 - **Exemption from VAT or reduced VAT.**
- **Rehabilitation of 250,000 homes/year** with an action plan that does not require resources from those who do not have them.
- Consideration of electricity coverage as a **public service of city councils.**

III Energy measures in buildings

One of the primary lines for **Fundación Renovables** is to develop a series of energy measures that contribute to energy efficiency and improve living conditions in the current housing stock.

In Spain, the **energy expenditure in buildings** accounts for approximately **31% of the final energy demand**. There is a **strong dependency on fossil fuels**, especially in the **housing sector (41%)**, and **low construction quality** means as only **3% of buildings meet the current regulation standards**.

Lines of action

Based on the analysis of the situation of buildings in Spain, both in terms of the energy and environmental significance, and so that there are decent living conditions, a series of energy measures has been created, which have the following principles:

- The decisive measure to **sustainably construct new buildings and rehabilitate existing buildings**.
- **The commitment to electrifying demand due to the need** to eradicate fuels that are inefficient and environmentally unsustainable.
- **The implementation of transversal measures and tools** to facilitate the change of energy model.

National Plan for Energy Rehabilitation of Buildings

- **Regulatory framework that taxes energy inefficiency in buildings** depending on their energy certificate and facilitates their **mandatory development**.
- **Rehabilitation of 500,000 homes/year** (3% per year of the current housing stock of first homes).
 - **Adapt 250,000 vulnerable homes per year**.
 - Implement **shared investment measures** for tenants who cannot or do not want to get into debt to carry this out.
 - **Public budget allocation of €2.5 billion/year**. Source: 50% increase of tax pressure on fossil fuels, 10% surcharge on the LVT for every letter below C in the energy certification, European Funds and General State Budgets, etc.
- **Yearly rehabilitation of 5% of public buildings**.
- **Rehabilitation of buildings/premises in the service sector before 2030**.
- Basic measure criteria:
 - **Electrification of 100% of the energy demand, which constitutes a reduction of 50%**.
 - **Fees and taxes according to the energy label of every building/commercial establishment, both on the LVT and the activity license**.
 - **Requirement of energy certificate C or higher than all the reforms to obtain the construction permit**.

New construction. Nearly Zero-Energy Buildings (nZEB)

From 2020, buildings with a surface area greater than 1,000 m² must be constructed under the nZEB criteria, meeting the objectives established by the [Energy Performance of Buildings Directive \(2010/31/EU\)](#).

Electrification

The electrification of the energy demand is a priority of all of these proposals as they **intrinsically entail eliminating consumption of fossil fuels**, because in addition to them not being available, they are inefficient and polluting.

That is why Fundación Renovables establishes the following lines of action:

- **Ban on any type of advertising promoting consumption of fossil fuels.**
- **Plan to replace air-conditioning equipment:**
 - **Commitment to high-efficiency systems such as heat pumps** by implementing a two-stage plan to replace fossil fuel heating systems:
 - **Mandatory incorporation in buildings that are rehabilitated**, encouraging built-in cold/hot air conditioning.
 - Plan to **replace boilers for heat pumps**, maintaining the heat distribution system and minimising the work needed for installation.
 - **Ban on heating systems with coal boilers from 2021 and gasoil boilers from 2025.**

Transversal measures and tools

- **Energy Efficiency of Buildings Certification Plans. Amendment to [Royal Decree 235/2013](#)**, making it more executive and operational.
- **Encouraging electricity consumption instead of fossil fuels by:**
 - Establishing **fossil fuel reduction percentages** in electricity companies.
 - **Separating the marketing or sales of electricity and fossil fuels** in the domestic and services sector.
 - Tax plan for **taxation on consumption of diesel, coal, natural gas, butane or propane.**

IV Sustainable mobility and transport

At **Fundación Renovables**, we believe that mobility should not only revolve around changing the model of vehicles but should also consider a **concept of mobility that is shared and is a public service**. Therefore, we must **minimise the commuter transport needs** by employing **minimum consumption and emission practices**, gradually abandoning internal combustion vehicles.

Objectives and commitments

2025

- **100% electrification of the railway network.**
- **Ban on diesel vehicles** in cities.
- Obligation to install a **charging point in every private parking spot** and in 25% of all parking spots in public car parks in all new and rehabilitated buildings.

2030

- **80% of the float for public-use electric vehicles and 100% for new electric vehicles.**
- **60% quota of new private electric vehicles.**
- **Reach a 30% quota**, with 5,000,000 EVs registered.
- **Decrease the fleet of registered vehicles by 15%.**
- **Reach 20% of goods transport by railway.**

Maximum emission standards:

- Average of tourist fleet: **50g CO₂/km in 2030.**
- Average of lorry fleet: **88g CO₂/km in 2030.**

Reduction of needs and improved accessibility

- **Urban planning and design** that favours accessibility and sustainable mobility, giving priority to pedestrians, bicycles and public transport.
 - **Limiting city access** for private vehicles.
 - **Handling mass tourism.**
 - **Minimising transport needs.**
 - **Managing parking** in the centre of cities and the concentrated transport hubs.
 - **Mobility plans in companies** and incorporating the **mobility manager** in industrial parks, education centres and shopping centres.
- **Promotion of collective transport:**
 - **Change of fare models** for public transport in the urban and metropolitan networks.
 - **Electrification of the shared vehicle and urban public transport fleet:** buses, trams, railway and metro.
- **Increased vehicle occupation:**
 - **Commitment to shared use systems**, with reduced tax and traffic charges facilitating their implementation.
 - **Promotion of alternatives** to move from an economy based on possession of transport means to a model based on mobility services.

Investments in mobility and transport infrastructure

- **Change priority in urban and interurban transport investments.**
- **Cease construction of new high-capacity roads**
- **Maximise and promote use of the railways.**
- **Plan for developing charging and recharging facilities.**

V Self-consumption

Fundación Renovables is committed to the priority of developing self-consumption as a **right that should be appropriately regulated without the legal and administrative obstacles**, as currently occurs in Spain, which try to prevent its development. Our commitment is based on the following reasons:

- **It is a main element for empowering consumers and giving them an active and central role in the energy system.**
- **It is a basic instrument for demand management.**
- Effectiveness in **reducing waste.**
- It is a way to **diversify the agents** in the energy sector, encouraging exchange between consumers.
- **Its energy storage capacity as a basis for system manageability.**
- It is a basic pillar of the efficiency, self-consumption and sustainable mobility triangle.

Related objectives

- Commitment to establishing **objectives related** to the capacity to cover the final energy demand through distributed generation systems, **establishing the following objectives for electricity demand coverage**:
 - **10% by 2030**
 - **20% by 2040**
 - **30% by 2050**

For the **2030 forecasts**, the power to install would be **18,000 MWp** of photovoltaic solar energy.

Proposed measures

- **Repeal of [Royal Decree 900/2015](#), and approval of a legal framework in accordance with European Parliament guidelines and aligned with the objectives of the Paris Agreement.**
- **Availability of simple administrative procedures.**
- **No limits on power of facilities.**
- **Monetisation of all the energy flows.**
- **Equal rights** with other market agents.
- **Fair remuneration** of all the **excess dumped into the network**.
- **Promote the incorporation of storage batteries at generation facilities to improve the manageability of the system.**
- **Development of shared self-consumption:**
 - **Enables the energy generators and consumers to be aggregated** openly and without restrictions.
 - **Facilitates single supply contracts to be drawn up**, enabling meters to be aggregated, both at generation and at consumption.
 - **Enables energy to be purchased and sold between individuals** or through an aggregation of individuals.
 - Provides **individual and/or collective accumulation systems** for demand management.

MEASURES FOR SUPPLY

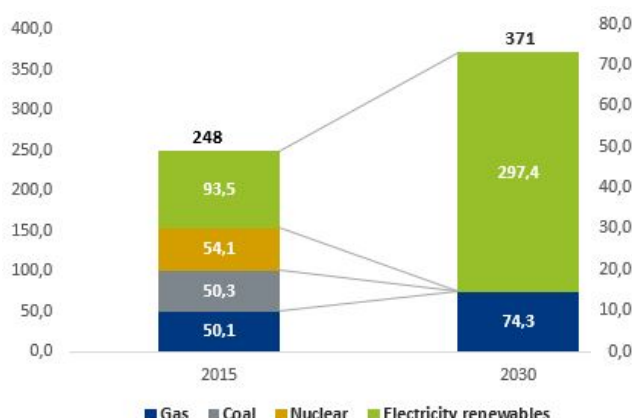
VI Renewable Energy Plan

The **technological maturity** of **renewable energy** has been achieved primarily in electricity generation technology, hence the importance of committing to a **model of electrified energy demand**.

Proposed objectives

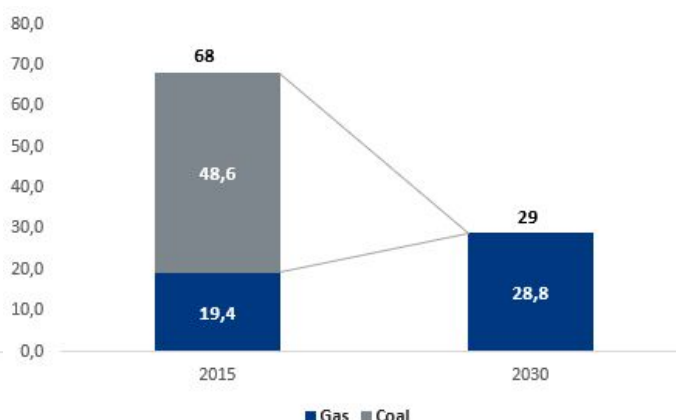
The proposal from **Fundación Renovables** and the objectives set have been divided into two blocks:

- Commitment to covering total final energy consumption with renewable energy: **50%** by **2030**, **80%** by **2040** and **100%** by **2050**.
- Electricity generation with renewable energy: **80%** by **2030** and **100%** by **2040** (see Graphs 5 and 6).
-



Graph 5. Electricity consumption from renewable sources according to comparative forecast for the period 2015-2030 (in TWh).

Source: Fundación Renovables.



Graph 6. Electricity emissions according to comparative forecast for the period 2015-2030 (in MTCO₂).

Source: Fundación Renovables.

In accordance with the energy plan created, in order to reach the objectives established, **electricity generation with renewables should reach 297 TWh by 2030**, which represents an **increase of 194 TWh compared to 2015/17**.

A distribution of power between technology has not been included because this exercise should be the result of an energy planning process that depends on how demand evolves and the manageability parameters of the electricity system.

As an indicative example, the power to be installed within a planning exercise today would be 85,000 MW until 2030, including the MW assigned in the three auctions and 15,000 MW of wind repowering, **which would represent additional power of 61,000 MW, of which 18,000 would be from distributed generation or some form of self-consumption**.

Proposed measures

- **Cancellation and application of retroactive measures of the applicable legislation, re-establishing the framework of stability** against investments and administrative procedures prior to the reform carried out in 2010, by **establishing a political accord** that reaches an agreement between the parties.
- **Creation of a Renewable Energy Plan with a 2050 horizon** and objectives every 10 years, including the following:
 - It has **legal status** and is the result of as wide a political agreement as possible.
 - It has **binding** objectives for all public administrations.
 - It has **technological objectives** and forecasts for use of flexible adaptation mechanisms according to learning curves.
 - It has **opportunities for different agents**, both in plant size and its origin.
- Establishment of allocation procedures based on **auctions to cover energy blocks according to the PPA model**.
- **Adaptation of networks** and incorporation in the same binding state plan.
- **Increase of interconnection** as a key aspect to benefit the manageability of the electricity system, but without the degree of interconnection setting the objective of renewable energy contribution.

VII Plan to eradicate coal and nuclear energy, and waste management

Eradication of coal

As part of the Spanish economy's decarbonisation objectives, **the task of progressively closing the coal-fired power plants and leaving mining is unavoidable**. The coal-fired power plants currently remain in operation thanks to an **inefficient policy setting CO2 costs** and a policy that subsidises national coal to make competitive something that is not competitive in terms of quality or environmental impact, and due to the pressure, all governments have been put under by the mining areas in Spain. Therefore, the following would be necessary:

- **Create “fair transition” plans** which the working world is already aware of and which the International Labour Organisation already recognises.
- **In 2018, establish a plan to progressively close the coal-fired power plants in Spain**, which will occur before 2025 in any case.
- **Eliminate all coal subsidies**, just like for all other dirty and inefficient energy sources.
- **Demand that all power plants**, as long as they are not closed or being dismantled, **comply strictly and fully with the European emission limits (BREFs)**.
- **Complete internalisation of environmental externalities** produced at every plant, and their operation costs.
- **Abandon** the Royal Decree project draft establishing mechanisms to make it **impossible to close plants**.

Closure of nuclear plants and waste management

- **Programmed closure of all nuclear power plants** as they are unsustainable, not environmentally friendly and not competitive for society.
- Once the **current licenses expire**, they should not be renewed until there is an official plan demonstrating the hypothetical individualised need for a certain power in a certain place.
- The operation of these licenses should **assume all the costs regarding risk coverage and manageability difficulties**, as well as the **necessary investments to maintain the highest level of security**.
- Carrying out the **high-level radioactive waste management only makes sense as another element of the plan to close** and dismantle nuclear power plants.

TRANSVERSAL PLANS

VIII Urgent global reform of the electricity system

Proposal of measures

If the current tariff model is kept, its operation regulation must be substantially changed, including:

- **The petroleum and gas sectors jointly** bearing the costs of fulfilling the commitment of covering 20% of the final energy demand, which until has been borne by the electricity consumer, by 2020.
- **Eliminating** the implementation of industrial, territorial and **interruptibility** policies if the current coverage rates remain the same.
- **Adjusting** the **capacity payments**.
- Reviewing the **retribution of distribution and transport and moving to energy that is truly distributed** and transported.
- Modifying the **retribution system of renewables for energy and not for investment**.
- **Eliminating the environmental tax** on generating electricity.
- Establishing **marginally increasing tariffs according to consumption** in the housing and services sectors, reducing the fixed part.
- Creation of a **social tariff**.

Proposal from Fundación Renovables for reforming the tariff system:

- **Setting monomial and progressive tariffs** with criteria of transparency and efficiency that depend solely on the electricity that is consumed, turning fixed costs into variables. Ultimately, **it is about energy used and not the investment at source**:
 - **Differentiating between consumers** when establishing how the system's structural costs affect them.
 - **The price of energy will increase** with consumption.
 - The **price of electricity** will be **related** to the **hourly costs**.
 - **Minimum fixed cost per connection** for the right to receive the supply.
 - **Possibility of acquiring energy through PPAs**, establishing only the costs of infrastructure use.
 - **Objectivity and transparency** in distributing costs between different types of consumer.
 - **Generation costs according to technology and functions**, abandoning the model of setting marginalist prices.

Other measures to reform the electricity sector

- Increased measures to **separate vertically integrated activities**.
- **Creation of an audit to analyse the costs of the system**.

- Review of the remuneration of the **value that manageability and storage provide to the system.**
- **Promotion of self-consumption** as a basic future technology.
- **Enabling and encouraging the exchange of energy** between producing consumers.
- **Re-establishment** of the Spanish National Commission of Energy as a fully independent regulatory body.
- **International and inter-island electricity interconnection**, provided that it is confirmed as the most economical and sustainable option.

System Operator: capabilities and configuration

- Its management and strategic plans must be **instruments that prioritise social interest and not the economic interest** of shareholders and executives.
- **Stockholder and functional separation of the System Operator** (including the shares required to perform their role) and the **ownership system of the High-Voltage Networks.**

IX Taxation

An *ad hoc* tax policy is proposed as a priority tool for achieving the proposed objectives, not only to **favour what it wants to support, but also to penalise what it wants to limit.** It is not about increasing collection but using tax pressure to force changes in consumption habits.

Increase of taxes (among others)

- **Elimination of tax breaks** for fuels.
- **Elimination of exemption** from the Hydrocarbon Excise Duty in aviation.
- **Review** of the IAE (Spanish Business Activities Tax) **allowance for companies outside the urban centre.**
- **Elimination of direct and indirect subsidies and incentives** for fossil fuels and electricity generated using these fuels or nuclear energy.
- **Modification of levies for economic activities.**
- **Elimination of deductions for investments** in non-renewable energy.

Reduction of tax pressure

- Energy rehabilitation of buildings: **VAT reduction, tax reliefs, LVT reduction and investment subsidy.**
- Reinforcement of the [Movalt Plan](#) designed exclusively for electric vehicles
- **Reduction of Registration and Traffic Charges for zero-emission cars.**
- **VAT reduction for efficient equipment.**
- **IAE allowances** for companies with collective transport, a mobility plan or an environmental management system (EMS).
- **VAT reduction** on the proposed social electricity tariff.
- **Etc.**

To implement the different plans and proposals, we propose **modifying the Hydrocarbon Excise Duty** by increasing the levy on fuels derived from liquid petroleum by **€0.05 per litre and**

from natural gas by €1 per MWh. This increase should allow **approximately €3.5 billion to be collected in the first year**, which would be assigned annually to the following:

- | | |
|----------------------------------------------|--------------------|
| • Development of urban plans: | €1 billion/year |
| • Rehabilitation of vulnerable homes: | €1.25 billion/year |
| • Rehabilitation of non-vulnerable homes: | €250 million/year |
| • Replacement of boilers for heat pumps: | €150 million/year |
| • Home automation and demand management: | €100 million/year |
| • Electric vehicles and charging facilities: | €750 million/year |

The levy will have a starting duration of six years until 2025 and its prime destination will be rehabilitating homes, in case collection is reduced due to price elasticity of demand.

X Promotion of citizen participation and dissemination

The Energy Transition requires essential changes to society, changes that cannot be delayed. **Fundación Renovables is seeking the full involvement of the whole of society in changing the energy model**: from public administrations, through the media and companies, to, last but not least, the citizens.

Therefore, one of the main motivations of the previous nine chapters in this document was to make citizens fully aware of and **learn** about the **responsibility** and **assumption of basic concepts about energy**, as well as to make them environmentally and politically aware of the change of energy model.

But it is essential to know in order to participate. So, without knowledge, change is impossible and, as a result, the change of energy model will not be a reality. In this respect, **Fundación Renovables** wants to be one of the many articulating agents that work to make citizen participation real and effective, and also fully integrated in the current social and political agenda.

As we have stated so far in this document, if we are committed to an energy system based on demand and not exclusively on supply, this same model should be applied to citizens, who should demand more instead of waiting to consume. Therefore, **they should find out more instead of waiting to be told**. In summary, knowing what to consume, being consistent and demanding responsible behaviour from all the agents involved in climate change.

Transversal lines of action

- **Education: curriculum design.** Proposals for students, teachers and parents.
- **Transparency and clear communication** from all administrations.
- Active promotion of the **energy culture**.
- Spreading **good practices**.

Industrial sector

Just like in the services sector, to **improve competition in Spanish industry**, it is essential to update industrial plans by sector, to electrify demand and improve efficiency, and incorporate environmental suitability and process sustainability analyses.

Sectors such as textiles, chemicals, cement, metallurgy, paper, etc. should carry out a thorough review of their energy component and the creation of environmental certificates.

Energy effectiveness and efficiency plan in agriculture and livestock

Energy efficiency has never been a decisive factor in selecting equipment and machinery for different agricultural tasks, despite equipment turnover and the fact that they quickly become obsolete. This situation is due to cultural reasons and subsidised fuels.

This unprecedented line of action requires **support and participation from both manufacturers and, above all, farming associations** and specific regulations to define the characteristics of the support to existing equipment and processes.

Fundación Renovables proposes implementing the following **initiatives** throughout 2018:

- **Water management plan for irrigation** and meeting energy needs with renewables, especially for desalination of brackish water and sea water.
- Currently, the largest energy expense in agriculture is due to water management and the energy needs for irrigation. In fact, irrigation communities are the second largest consumers of electricity in Spain.
- **Renove Plan of agriculture equipment**, including certification of specific consumption.
- **Plan for optimising machinery use**. The number of hours of use is much lower than the optimum and shared use implies the need to overcome cultural issues.
- **Training plan** for energy efficiency when using machinery and in the different tasks carried out by unions and agricultural associations.
- **Plan to promote fuels deriving from agriculture** and not fossil fuels. Review current models of fuel subsidies.
- **Energy conditioning** of livestock facilities and producers of meat, dairy and derivatives.
- **Plan to recover agricultural and livestock waste**, prioritising the environmental objective over the energy objective.
- **Plans to implement renewables** in agricultural and livestock facilities for self-consumption generation.

SECTION ONE

Measures for demand

I. Urban measures

A priority of **Fundación Renovables** is to act comprehensively to adapt cities for energy sustainability, not only because most people live in cities, but also because each one has an inherently close connection to the people. Cities also have the capacity to become the centre of the change of energy model.

In fact, cities and urban settings are where most people on the planet live. Cities have been expanding due to the increasing number of arrivals attracted by the **concentrated hubs of resources, opportunities and exchanges**.

In particular, **the way cities in Spain are growing is due to a developmental model that places profitability of transforming developable and buildable land at the centre of all its operations**. The general plans, far from guaranteeing a balance between development and growth and ensuring land is reserved for public use or green spaces, have contributed to creating a speculative economy surrounding land and construction. Throughout this process we have considered **how cities have proliferated by growing extensively and consuming large amounts of resources and land, making them energy drains and the focal point for contaminating emissions**.

The result is a model that has ignored the inhabitants of cities, leading to places that prioritise road traffic infrastructure and profitability of investors, and neglect the quality of public spaces and most buildings, especially those constructed during the development boom.

The indiscriminate use of resources has led to **cities that are extremely energy inefficient**, using land for low densities, which greatly contributes to increasing vehicle transport (especially private vehicles) while abandoning the idea of compact cities, which promote local consumption, life in public spaces and walking.

In the new urban developments, the disintegration of public spaces and gradual transformation of streets into places without a social interest contribute to isolating some areas from others and also cause the city to lose its structure. The total disconnection of domestic spaces with the urban fabric and public spaces negatively affects cities' use as meeting points.

However, we are currently immersed in a process in which we are mostly speaking about **regeneration of existing materials** to make the urbanisation process and consolidated city more sustainable, recovering places where the quality of life and living spaces are priorities.

This represents **a significant change from the point of view of citizens in the city, who are so often ignored by the unlimited urban growth**. This will once again form part of the process, becoming a fundamental element in constructing a scenario in which they are taken into account.

- **Elements that turn the urban setting into the setting of a disruptive process for establishing an energy model in which the city and its inhabitants play a predominant role:**
 - **Technological and industrial evolution of systems that use renewable energy sources**, which have managed to become competitive against non-renewable and unsustainable sources of supply, even in small sizes.
 - **Social acceptance of the available technological changes**, mainly with regard to the maturity of Information and Communication Technology (ICT).

- Social progress in assuming the sustainability objectives and the changes implemented in urban adaptation.
- Demographic evolution of the city, taking into account and protecting the “neighbour” of the urban nucleus.

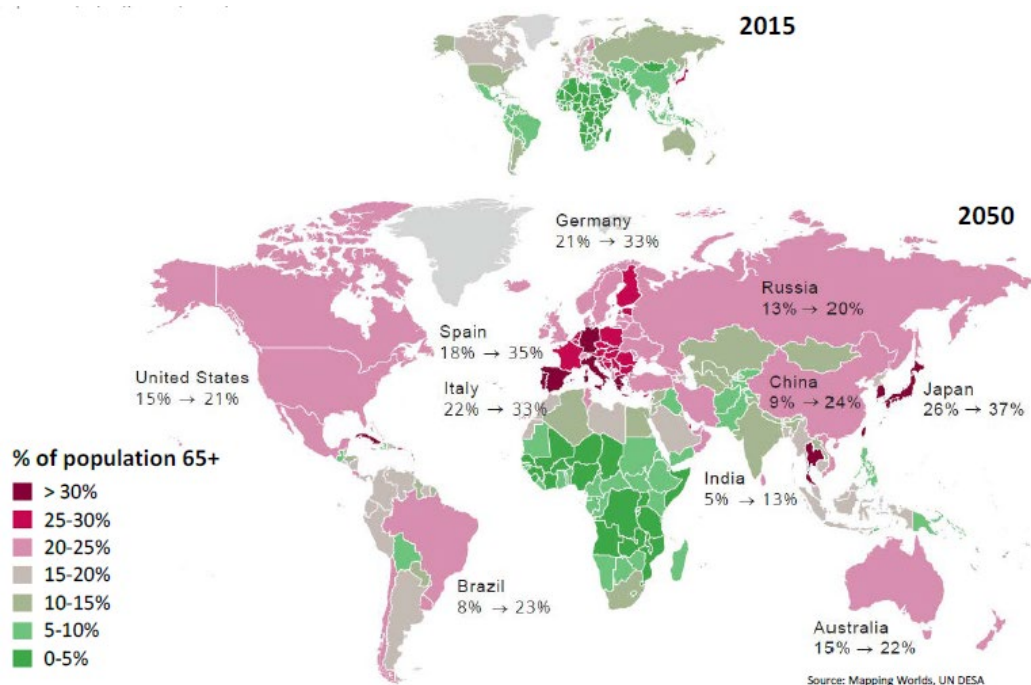


Image 1. Comparison of the global population between 2015-2050, in which the age of the population is shown. Europe, and in particular Spain, is striking as 35% of the estimated population will be older than 65 in 2050.

Source: Mapping Worlds, UN DESA.

- The extensive framework of action and the **real possibility of measures from the city councils, not only in their position as a consumer, but also as a key agent in the city.**
- Taking into account the opinion, position and **role of all the stakeholders** that form part of the life of a city.

There is a big task awaiting us in terms of **recovering the social value of cities. We need the support of the public, a willingness to agree** and the capacity to accurately indicate the mechanisms required to create catalytic programmes for quality projects.

In more sustainable, accessible and healthier cities, **the role of energy is fundamental, and cities are considered key settings in which to propose solutions that contribute to overall sustainability.** Local measures **should involve citizens, companies and governments**, and this joint action can lead to the establishment of efficient ways of working to improve cities and sustainably develop regions.

Good urban planning and management is essential for promoting more sustainable societies, with the key factors being access to housing, urban infrastructure and basic services, improvement and regeneration of neighbourhoods, and urban renovation.

I. 1 Diagnosis

I.1.1. Short-term urban planning and system for designing cities based primarily on economic profitability of investors

The **developmental planning of cities** has created a land economy in which good design and quality of urban spaces is often of secondary importance, with the priority being placed on high yields generated by transforming developable land. This system has promoted an economy of investment in construction at all levels, from small investors to large companies, and even investment funds. This contributes to creating cities in which the economic aspect is the sole reason for its growth.

I.1.2. High dependency on private vehicles

Cities have been defined by the mass use of private vehicles, which have been given priority over any transport system that is more sustainable and fairer. This aspect has been encouraged and promoted due to two things:

- Diffusion of uses, dividing cities into areas with specialised uses, therefore **creating monofunctional urban pockets that promote travel using private vehicles.**
- **A growth model based on large transport roads** that cut through cities and create an urban model designed for automobile traffic. In this model, the spaces are determined by the speed and density of traffic, ignoring the human element, which is extremely important for the living conditions of cities. This line also fails to emphasise covering needs by proximity.

LAS 100 CIUDADES DEL MUNDO CON MÁS TRÁFICO

Horas perdidas en congestiones en 2017

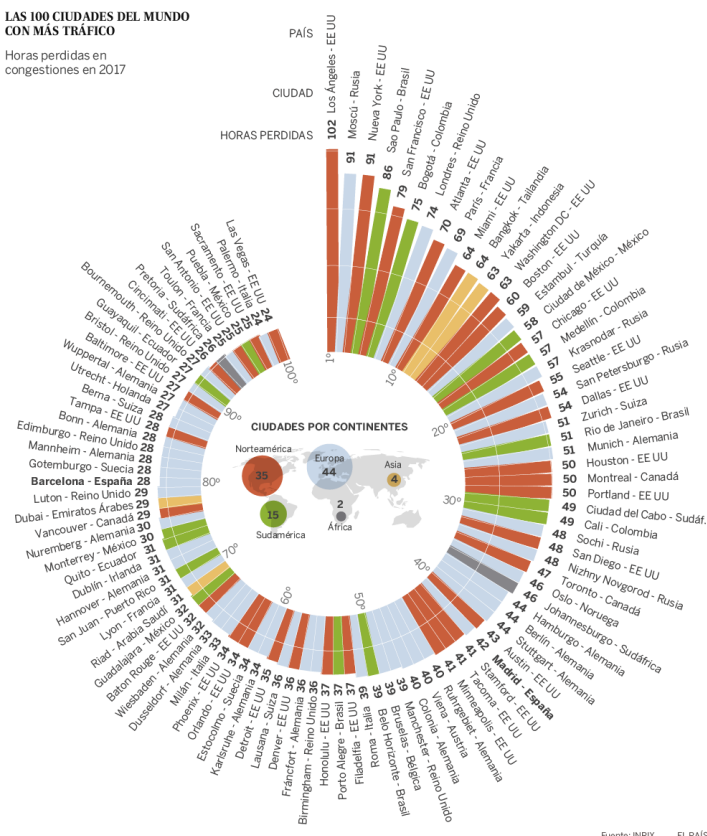


Image 2. *Number of hours lost by drivers in the largest cities in the world. In the case of Madrid, drivers lose up to 42 hours per year.*

Source: El País.

I.1.3. Lack of citizen involvement in urban processes

Management of cities has been left in the hands of governments and investors, therefore neglecting citizens. The complex and barely transparent processes of governments have disconnected inhabitants from the transformation processes of cities. For this reason, the tenth chapter concludes this proposal with citizen participation.

Although in recent years we have helped people become more aware of the important role of citizens in the decision-making processes, as well as good governance in administrations, **there is still a long way to go to ensure the participatory methods are tools that can truly involve citizens in decision making.**

I.1.4. Lack of strategic planning in cities

Due to the complexity of their operation, mechanisms and social fabric, **cities currently need tools that go beyond traditional planning and management.**

Strategic planning should be aimed at achieving broader objectives than just urban objectives and **should be designed to socially and economically improve the urban community**, assessing the achievement of results.

Therefore, there is a lack of quality in public spaces and green areas. Free spaces are one of the places with most potential in cities, and in most cases, they are

underused, ill-equipped and badly designed. **Public spaces should be places to meet and carry out activities, because this is the only way cities are created.**

In urban planning, it is more difficult to secure public spaces because they need to fit in blocks that have already been defined by roads. They are also often obtained from waste spaces, which means the minimum amount of free spaces can be reached, in accordance with the corresponding legislation.

I.1.5. Lack of quality buildings

In Spain, maintenance tasks on buildings have not traditionally been a priority, and they are based more on **palliative measures** than preventative ones. Not even the specific legislation has paid particular attention to the issue of updating and reviewing the housing stock, which has led to its gradual deterioration.

Section Two of this proposal from **Fundación Renovables** outlines the building line of action, not only in terms of energy, but also in terms of improving living conditions as an **obligatory step in combatting energy poverty**.

I.2. Global strategies

In the urban sector, the proposal from **Fundación Renovables** not only refers to **the measures that cities should carry out as energy consumers, and which are outlined in the document “*Cities with future*”**, published in November 2014, but also refers to using the abilities of city councils to implement plans and measures that make them key agents in changing the current energy model, which is inefficient and environmentally unsustainable.

The comprehensive interventions in cities should address a fundamental issue for its planning and impact: **the different scales and frameworks of action**.

When we refer to scales, we are referring to the need to introduce the proposals within a comprehensive planning strategy that enables measures to be carried out beyond the four years mandated following elections. **Reaching a political agreement among the majority of political forces is a requirement to be able to implement long-term policies.**

We often observe that measures are carried out in cities for infrastructure, buildings and public spaces in a completely unconnected way. This makes these actions even more inefficient, and they are often redundant, insufficient and obsolete from the start. Only by working comprehensively can we create coherent strategies in which we can incorporate common objectives and plans that can be assessed. With regard to **frameworks of action, it is essential to have a strategic plan that can incorporate the general needs of cities, and set objectives, deadlines and reviews of every aspect of sustainable urban development**. We can establish some transversal work areas that will be outlined in the plans specifically created for this purpose, but which should comply with a comprehensive concept of cities.

These strategic plans can design and evaluate the tools cities have to achieve their objectives, establishing deadlines and actions, and most importantly, **budget allocations**, which are key for achieving them.

I.2.1 In the urban and construction sector

The neighbourhood as a key element of the change. Citizens’ quality of life is closely linked to the living conditions in the neighbourhoods in which they live. Neighbourhoods

are key for resolving environmental and energy problems (reducing emissions and energy consumption, implementation of renewable energy, etc.), but they can also incorporate social cohesion measures, economic measures to improve the productive fabric and sustainable urban mobility measures. In all cases, acting in cities requires establishing the field and space of action.

Mobility measures should be proposed with a general plan for the city and even a broader area, conciliating specific measures in neighbourhoods or sectors with municipal mobility plans.

The plans for public spaces should take into account some fundamental factors such as quality of design, accessibility and good maintenance. It should be ensured that these spaces are used because this is the only way to guarantee people are present, which is what gives these spaces meaning. Public spaces connected to pedestrian roadways, with tertiary and leisure activities, guaranteeing that the use of free space is diversified and supports the presence of individuals, but they should also be related to the overall mobility of the city.

Measures in different neighbourhoods and buildings should be part of other comprehensive measures that promote work synergies to transform them. They should include social and economic measures that guarantee the measures are feasible, the inhabitants are involved, and the overall objectives are achieved.

Town planning should propose that neighbourhoods change from being mere consumers of energy to having a more active role, generating, storing and exchanging electricity from renewable sources, while combining saving and efficiency habits. Generation at consumption is one of the keys for improving the metabolism of cities.

Rehabilitation of buildings should include standards that guarantee energy saving while also updating facilities as much as possible to meet the requirements of current regulations. Similarly, it should also incorporate the measures that guarantee universal access for buildings, as this is one of the largest shortcomings and one of the biggest challenges.

However, the draft and formulation of the **new [Spanish State Housing Plan 2018-2021](#) does not meet the urgency and existing need** as expected, nor does it incorporate effective measures for promoting urban rehabilitation.

The [Strategic Plan for Building Rehabilitation and Energy Efficiency](#), drafted for compliance with Article 4 of the [EU Directive 2012/27](#), which stated that Spain should establish a long-term strategy for mobilising investments in renovating the national housing and commercial building stock, was revised in 2017. This was essentially mandatory due to European directives, but it did not lead to progress in terms of information, actions, budgets or commitment to action. In fact, it repeats the same line as in the [Aid Programme for Energy Rehabilitation of Existing Buildings \(PAREER\) from 2013](#), which cannot be considered a success in light of the actual outcomes for mobilising investment in rehabilitation.

We are witnessing a deceleration of investment in urban regeneration and a lack of specific planning. What started in 2013 as an opportunity to reactivate the construction sector with the Three R's Law, learning from past mistakes, has actually

stopped, and we are now seeing a re-emergence of the ways of operating from before the economic crisis.

The strategy proposed from 2013 must be recovered. Revitalising neighbourhoods and rehabilitating buildings were the cornerstones of the measures at the Ministry of Development and consequently in the different Autonomous Communities.

I.3. Proposals of urban measures

- **Prioritising public space as a space for people in the urban design concept.**
- **Creation of a network of quality public spaces that are considered fundamental aspects of the mobility plans to ensure the spaces are fit for the inhabitants, either walking or cycling,** promoting a good urban design (furniture, trees, pavements, uses, etc.), universal accessibility and good air quality.
- **Creation of specific legislation that regulates and includes new modes of transport, prioritising those without emissions.**
- Urban mobility and plans that manage it should **stop encouraging the use of private vehicles** and focus on **promoting non-polluting public transport** and walking, as well as properly regulating the use of new modes of non-polluting lightweight transport, such as bicycles, scooters, etc.
- **Review of regulations and design of public roads to promote their sustainable, accessible and safe use, and to guarantee the utmost safety for less polluting journeys.** It will be carried out from the following perspective:
 - **Road design prioritising the most vulnerable modes of travelling.** Special attention should be paid to the following aspects:
 - Modes of travelling such as bicycles **should not reduce space for pedestrians** but should be a real alternative to private vehicles. It should be private vehicles that are reduced or replaced and not the pavements or squares. Special attention should be paid to the introduction of electric bicycles to remove use restrictions.
 - **The spaces used by different modes of transport,** especially junctions and crossings.
 - **Priority on aspects without emissions,** restricting use of contaminating vehicles.
 - **Minimising surface-level parking** which otherwise limits spaces for people.
- **Efficient and safe lighting of roads.**
Review of municipal and supramunicipal regulations regarding safe lighting of roads, favouring more vulnerable modes of travelling, such as walking or cycling. Special care will be taken with the correct lighting, making it efficient, suitable and safe for pavements, pedestrian paths, bicycle lanes and crossings with other modes of transport. Glares due to overlighting should be avoided and it should be ensured that the light flow does not go too high.
- **Use of public space for implementing renewable energy in cities.**
 Public spaces have great potential for implementing renewable energy by incorporating them in the urban setup, pavements, etc. and **promoting the idea of neighbourhoods as key elements in producing energy at consumption.**
- **Implementation of a quality network of sensors for measuring air quality.**

This means an increase in measuring points, rational distribution across the city and open data information in real time for the citizens. The health impact of the air quality we inhale in cities is one of the worst consequences of the unsustainable use of energy, especially in modes of transport. In order to become aware of and understand the real scope of the air situation, it is necessary to have an extensive, well-distributed network of open, geolocalized data that is available in real time

- **Comprehensive rehabilitation of neighbourhoods.**

Neighbourhood revitalisation measures that include measures for a comprehensive rehabilitation of buildings, sustainable mobility with support from shared modes of transport, recovery of free spaces for people and generalised integration of renewable energy production.

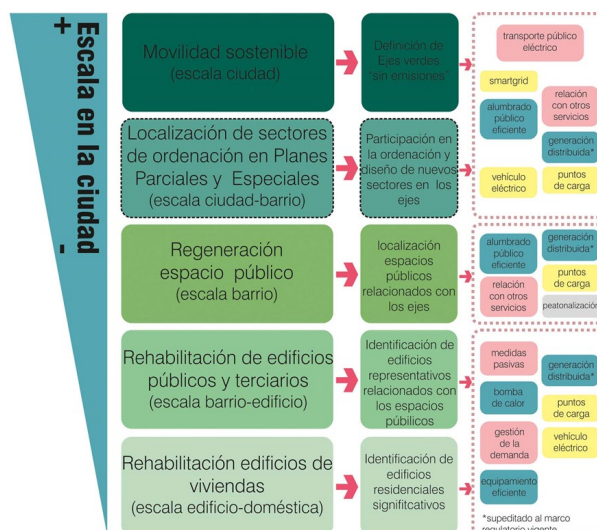


Image 3. Different measures depending on the scale of action, from the building to complete incorporation in the city.

Source: Fundación Renovables.

In order to carry out the planned developments, we suggest **assigning the additional €1 billion/year of revenue from the Hydrocarbon Excise Duty** proposed in Chapter 9 for specific urban measures, according to open tenders throughout 2018.

I.4 Proposals of functional measures

As we have already stated, at Fundación Renovables we believe that cities should play a bigger role than they currently do and should use their capabilities to be the driver of the energy change. This is based on the assumption of the following proposals:



Image 4. Detail of the capabilities of the city council and its impact as a primary agent of the energy change.

Source: Fundación Renovables.

I.4.1. Cities as service providers

- The idea that **energy is a public service** and is therefore a service that city councils should provide.
- The role of the city councils as **energy suppliers**.
- The work of the city councils as **managers of their own energy**, with the aim of not only covering demand, but also alleviating the needs of its vulnerable inhabitants.
- Reinforcing the **work of the social services** working ex ante and not in situations of real non-payment.
- Promoting **collaboration and P2P energy exchange platforms**.

I.4.2. Cities as owners of assets and investors or promoters of initiatives

- The city council's participation as an **investor and instigator in the digitalisation of the distribution lines**, ensuring that they have the capacity to exchange between consumers and producers.
- Participation as an investor in the rehabilitation processes**, as stated in Chapter 3, assuming the aliquot ownership of the investment in rehabilitation by recuperating the investment with savings from the energy bill or in future transfers from homes.
- Development of their own renewable energy generation plants** to cover their own needs and to meet the needs of their vulnerable inhabitants.
- The need to amend the [Local Government Regulatory Law](#), increasing both spending power and the ability of councils and local bodies (cities, towns, parishes, etc.) to act.

I.4.3. Cities that pass regulations

City councils have the ability, through their regulations, to amend working and operation regulations of everything relating to energy. The proposals in this line are:

Mobility and transport

- Amendment of the **Spanish Vehicle Road Tax**, establishing the emissions capacity.
- Reform of the **access and traffic regulations** for vehicles that do not comply with the emissions regulations.
- **Ban** on diesel vehicles by **2050**.
- **Ban** on plug-in non-hybrid internal-combustion vehicles and hybrid vehicles by **2040**.
- Promoting the installation of **recharging systems for electric vehicles**.

Construction

- Establishing the **LVT depending on the energy certification grade**.
- **From 2030, no granting of construction permits** in buildings that use fossil fuels.
- **Adaptation of construction permits, favouring rehabilitation of buildings**, with the amount determined by the area (centre and neighbourhoods requiring urgent intervention).
- **Promoting the installation of self-consumption initiatives**.

Energy in general

- **Ban or levy on fossil-fuel facilities and any use of them**.
- **Commitment to 100% renewable electricity consumption** in all public facilities and to improving energy efficiency by 40% in 2030.

I.4.4. Cities as a participatory setting and a place to spread best practices

In its contact with the citizens, city councils play a predominant role in introducing better energy practices:

- **Supporting communication and dissemination of better practices** so citizens can understand and adopt them.
- Establishing **awareness campaigns**.
- Creating a **single point of contact** for information and processing initiatives, in order to facilitate citizens' access to the best practices.
- Planning measures aimed at **reinforcing the will of citizens in the new urban design**.
- **Encouraging citizen participation**. This issue is developed in **Chapter 10**.
- Implementing **support for the information and Big Data needs**.

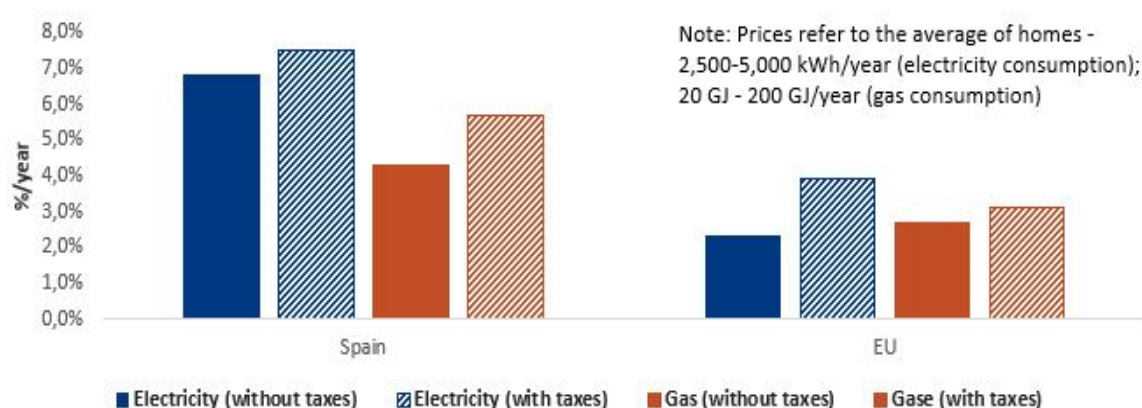
II. Eradication of energy poverty

Energy poverty, along with climate change, confirms that the current energy model does not work. Energy is a **necessity good which should be available to everyone, regardless of purchasing power.** Not only did the current system not know how to combat the effects of the economic crisis and the reduction of income in the majority of Spanish homes, but it actually accentuated the problems. The 7th edition of the [AROPE index](#) (At-risk-of-poverty or social exclusion) reported that 12.9 million people are on the threshold of poverty, which represents 27.9% of the population.

Three factors generally cause energy poverty:

- **Insufficient income in a large section of society.**
- **An unaffordable energy prices.**
- **Bad construction and living conditions in the home** due to a lack of insulation and low-quality materials.

The Spanish situation, as shown in Graph 7, indicates that **Spanish homes have faced continuously increasing energy prices**, much above the European average, and a greater increase of electricity prices compared to fuel prices, which perfectly reflects the failure of an energy policy that is devoid of the most basic principles of equality and rationality.



Graph 7. Annual variation of the energy prices in homes in Spain and the European Union in the period 2008-2014.

Source: Eurostat.

The proposal from Fundación Renovables is completely against the Bono Social (Social Tariff) because, even with the improvements included in the different amendments, it is a long way from being the solution to the problem. This is primarily due to the following reasons:

- **It is not applied exclusively to the group for which it should be designed**, which means it is subsidising the energy consumption of those who do not need the subsidy. Its application should be exclusively based on income or lack of resources for each family structure.
- **The amount is insufficient**, covering a percentage of the electricity bill that has been increasing not only in average values, but above all, asymmetrically. The fixed rate has been increasing, to the detriment of the most disadvantaged groups.
- Receiving the subsidy is normally **degrading**. Identifying the group of vulnerable families should be carried out beforehand and **not only due to continued non-payment** or the

work of the council's social services, whose work is adding an element of reason to the absurdity of energy poverty.

- **It does not eradicate the problem** because we must act on the three fronts from which it originates, otherwise it will end up being a mere stopgap.
- **The cost of the *Bono Social* is distributed disproportionately to consumption among supply companies**, whose claim to the courts will lead to the need to reverse the situation, as has happened in the past. The measures to eradicate energy poverty that are separate from energy consumption should be considered in Spain's General State Budget or in the tariff if it is related to energy consumption.
- **The *Bono Social* complies more with a charity plan than recognition of a right.**

In light of the causes of the problem, energy poverty should be eradicated with the following lines of action:

II. 1. Availability of social tariffs that adapt to the level of income and specific family characteristics.

The tariffs should be regulated regardless of a process of liberating the energy supply. The right to the social tariff must be regulated by law.

According to the current configuration of the electricity tariff, the social tariff should include:

- No **fixed rate**.
- A **basic contracted power** which is enough for the size of family.
- **Reduced price of minimum energy consumption.**
- **Exemption from VAT or reduced VAT.**

The proposal for reforming the electricity system towards a monomial tariff (see **Chapter 8**) facilitates this application as there is no power quota and what needs to be applied is a discount coefficient by consumption range for vulnerable families.

II.2. Implementation of a housing rehabilitation plan which improves the conditions of current installations.

53% of buildings lack thermal insulation and **over 1.5 million homes require urgent action**. This means the energy losses increase the energy bill and accentuate the problem of energy poverty, regardless of the bad living conditions and comfort.

It is clear that if **structural measures of improvement** are not undertaken, the problem at source will remain and tariff measures will always be just a temporary solution, so the problem will not be eradicated.

Chapter 3 of this document includes an extensive action plan for building rehabilitation and urban measures for the more than 1.5 million homes that require urgent measures. **The objective of this plan is:**

- **Rehabilitate 250,000 homes per year with an action plan that does not require resources from those who do not have them.**

Developing cities and **revitalising neighbourhoods, especially the old districts**, is once again important because this is where most homes that do not meet living conditions are located. The cause of these poor living conditions is to the age and bad quality of the building, abandonment or the age and bad purchasing power of the inhabitants (See Chapter 3).

II.3. Consideration of electricity coverage as a public service of city councils.

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

Energy self-sufficiency in city councils and their role as energy managers in the future are priority lines of action, as outlined in Chapter 3 of this proposal.

The city councils are carrying out the **social assistance** measures required to alleviate the effects of energy poverty, which other administrations are not carrying out, except for exceptions such as the legislative proposal made by the regional government of Catalonia. This role, which is now performed locally and with commitment from city councils, should be promoted and protected by the other administrations.

III. Energy measures in buildings

For **Fundación Renovables**, one of the main lines of action is to **create a series of energy measures that contribute to energy efficiency and improve the living conditions of the current housing stock**.

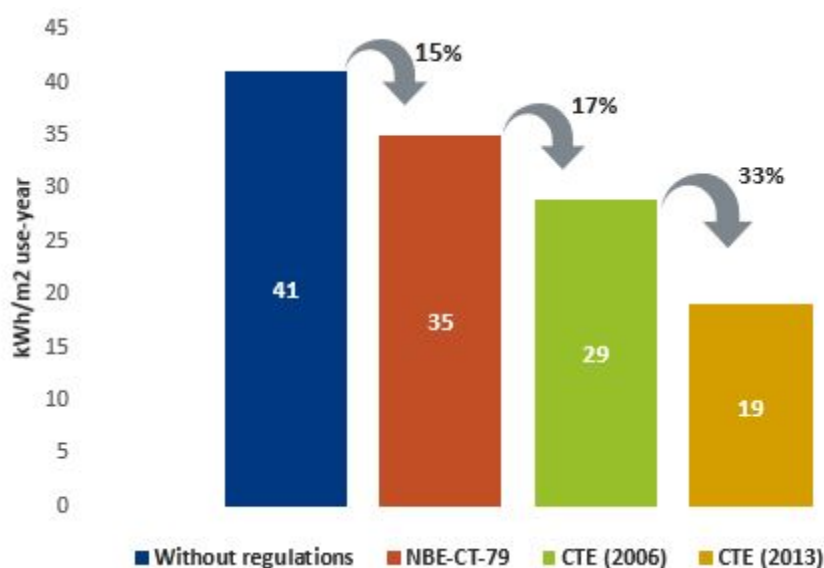
The reasons we believe it is a priority to act on the energy suitability of buildings are not only due to the effect they have on the final energy demand, but also because they also partially resolve the issue of bad quality construction of most residential buildings, **a bad quality which is one of the causes of energy poverty**.

Reducing consumption in homes and, therefore, the associated emissions is especially relevant as most of the buildings are located in urban settings.

Promoting measures for sustainable construction and energy rehabilitation of buildings creates value provided they are carried out without losing sight of the need to enact them by introducing a **redistributive effect**, both due to the characteristics of the users who, as stated in the previous chapter, are often vulnerable people, and the specific features of the construction and associated sectors.

In summary, the reasons for considering this line of action as basic are shown in the following data:

- **Spain has an energy bill in buildings which is approximately 31% of the final energy demand**, less than the European average despite the bad quality of buildings due to having a more benign climate. The energy cost is approximately €18 billion/year.
- **The housing sector accounts for 19% of the final energy demand and this is due in large part to the fact that of 25 million homes**, 70% of which are first homes, **53% are constructed without any form of insulation**, and of that total, only 7% would comply with the legislation from 2006 and **3% would meet the standards of current regulations**.
- Until the first regulation requiring compliance with standards of energy losses in building ([NBE CT 79](#)) was passed in 1979, there were no construction requirements regarding energy, which means **almost all buildings constructed before this year lack insulation**, so they have the lowest energy certification grade of G.
- If the regulation from 1979 and the current regulation are compared with the [CTE 2013](#) (Spanish Technical Building Code), you can see how **the regulatory requirement to reduce energy consumption in buildings has actually reduced it by 53%**.



Graph 8. Evolution of maximum demand according to regulations for residential buildings.
Source: Fundación Renovables.

As we have seen previously, the bad condition of homes with regard to energy living conditions is one of the main causes of energy poverty. Vulnerable people have seen their energy bill increasing not only due to price rises, but also due to the bad energy performance of their homes as they lack insulation and good living conditions. **Over 1.5 million homes in Spain require urgent measures.**

The **energy structure of the housing sector** also still consumes a significant **amount of fossil fuels**. The **41%** consumption is split evenly between natural gas and fuel derived from petroleum, and the remaining 1% is from coal.

There is currently more competitive, efficient and cleaner technology available to cover these demands, such as renewable electricity, which means fossil fuels can be abandoned to cover the heating and domestic hot water (DHW) needs.

Spanish society is clearly urban, and has cities that demand decisive measures regarding:

- **The historical centres**, which in many cities are gradually deteriorating due to both poor construction and being inhabited by a very old population without resources.
- The **gentrification** processes that are occurring are caused by poor responsiveness to maintaining minimum living conditions for the current occupants and economic pressure from business groups that see a significant business opportunity in creating housing solutions primarily for mass tourism, which is turning the historical centres into theme parks for leisure.
- **The existence of working-class neighbourhoods that arose during the development boom** are very badly constructed and were built in the 1950s as a solution to the rural migration.
- **The lack of decent homes at rational prices, mainly for renting, and especially in densely populated areas in Spain such as provincial capitals and coastal areas**, which require new construction housing plans for permanent use and for young people as a way of

addressing the speculative processes caused by the non-regulated competition of the demand of mass tourism (tourist apartments).

- The services sector, with 13% of the energy demand, although 60% is covered by electricity, has **significant shortfalls regarding modernisation of facilities and also the need to replace the 36% of fossil fuels it still uses.**

III.1. Lines of action

Based on the analysis of the situation of buildings in Spain, both due to their energy and environmental importance and so they are in decent condition, a **series of energy measures** has been prepared with three main pillars:

- **Sustainable construction both in new buildings and in the rehabilitation of existing buildings**, which would mean, on the one hand, recovering lost job positions, and on the other hand, reducing energy consumption and emissions, as well as improving living conditions, therefore combatting the social scourge of energy poverty.
- **Commitment to electrifying demand, a basis of our energy proposal, due to the need** to eradicate consumption of fossil fuels as they are inefficient and environmentally unsustainable, as well as being the main element of the untenable energy dependency in Spain.
- **Implementation of transversal tools and measures** to facilitate the change of energy model and cover the energy needs in buildings.

III.2. Sustainable construction and rehabilitation

In Spain, rehabilitation is an activity which has not been assigned much importance, despite having a highly inefficient stock of buildings. In fact, they have not reached the objectives set by the European Union for public buildings, do not have a plan that undertakes to do so, and they do not even recommend it. In this respect, it is important to note the European legislation, such as [Directives 2002/91/EC](#) and [2010/31/EC](#) on energy efficiency in buildings, [Directive 2006/32/EC](#) on efficiency of the final use of energy and [Directive 2012/27/EU](#) regarding energy efficiency.

The mandate of Directive [2012/27/EU](#) requires all member states create a long-term strategy. In 2014, Spain complied with this by sending the “[Long-term strategy for energy rehabilitation in the building sector in Spain \(ERESEE\)](#)”, a non-executive plan and **another proposal along the lines of making recommendations rather than implementing a binding plan of action**. In fact, the outcomes do not correspond to the obligations and ideas established in the Directive.

If the different initiatives are analysed, you can see that they are **based primarily on the existence of subsidies or the availability of financing in beneficial conditions**. In other words, the owner must invest in the rehabilitation of the part of the building that corresponds to them, and mainly through a process of borrowing. In addition, the way of making decisions in housing communities does not make it easy to implement rehabilitation of buildings.

The borrowing model has not worked even with subsidies, especially if you analyse the economic power of the building owners and the uncertainty arising from taking on new

debt, regardless of the current limitations on credit availability ([Spanish State Housing Plan 2018-2021](#)).

At **Fundación Renovables**, we believe the role of national, regional and local governments should change and start considering **rehabilitation of vulnerable homes as an initiative based on redistribution of income and not as a borrowing process for private households that do not have the capacity nor the resources to take on the debt**.

On the other hand, we consider rehabilitation to be a necessity in Spain, and it should be committed to by implementing a comprehensive framework of measures that requires it to be carried out in two ways:

- **Development of a regulatory framework that taxes energy efficiency of buildings according to their energy certificate**, taking into account the situation of vulnerability and frameworks of urgent urban measures. (See Chapter 9 for tax proposals).
- **Availability of a framework of measures to facilitate its obligatory performance**, ranging from shared rehabilitation for vulnerable segments, to plans and measures with collateral benefits, such as a reduction of the LVT, existence of subsidies and access to credit, reduction of legalisation costs, etc.

The lines proposed by Fundación Renovables depending on the type of use of the buildings and the need for action according to the vulnerability of their occupants, are:

- Development of a **National Plan for Energy Rehabilitation of Buildings**.
- Newly constructed buildings should be **nearly zero-energy buildings**.

III.2.1. National Plan for Energy Rehabilitation of Buildings

The Rehabilitation Plan proposes individual measures for homes (vulnerable and not vulnerable), public buildings and, finally, commercial or service buildings.

Development of a National Plan for Energy Rehabilitation of Buildings

Promoting energy rehabilitation is fertile ground for the work promoted by the European Commission through the different directives. A suitable transposition and assumption of commitments would have been sufficient to change the unsustainable construction model that has prevailed in Spain.

In Spain, in line with the provisions of the European Parliament and Council of the European Union, [Law 8/2013 on Rehabilitation, Regeneration and Urban Renovations \(3R Law\)](#) was created and passed. Although it is a magnificent instrument to reactivate the construction sector and revalue the existing building stock, there **has not been the regulatory development for it to take advantage of the basic lines with which it originated**. Therefore, to a certain extent, the opportunity that [Law 18/2014 on urgent measures for growth, competitiveness and efficiency](#) should have established in its third chapter has been lost. For example, the 3R Law included:

- A regulatory framework to reactivate the construction sector.
- Promoting **quality and sustainability** regarding objectives of efficiency and energy poverty eradication.
- **Removing barriers** for carrying out the rehabilitation measures by:
 - Incorporating new forms of **public-private collaboration**.

- Facilitating **grouping of housing associations**.
- Granting **housing associations legal capacity** and making it easier to reach agreements.
- **Increasing constructability** as an instrument of feasibility for measures.
- Incorporating **accessibility and energy efficiency studies**.

The Fundación Renovables proposal is to rehabilitate 500,000 homes per year, representing 3% per year of the housing stock of first homes.

In December 2017, the IDAE launched the second aid scheme for the energy rehabilitation of buildings, the [PAREER Programme II](#), with €125 million. It is an initiative which, although it represents a budget allocation, we consider it insufficient and unsuitable given that it **fails to consider subsidies as a line of action against incorporating co-participation in investment**. In addition, this programme **does not address the issue of vulnerable homes**, but is rather designed for owners without financial problems, people for whom the subsidy represents a push for making a decision. This initiative is a continuation of what was carried out in 2013 ([PAREER-CRECE](#)), which had the same amount of €125 million, which indicates the current government's concern for rehabilitation (€250 million of subsidies in eight years).

In order to carry out the plans for rehabilitating residential buildings, we propose **assigning an additional collection of €1.5 billion/year from the Hydrocarbon Excise Duty**, as outlined in Chapter 9.

The plan we propose was designed by considering vulnerable homes, non-vulnerable homes, rehabilitation of public buildings and rehabilitation of commercial and service buildings separately.

If there is an in which the national, regional or local governments should act urgently, it is in **implementing an ambitious plan for rehabilitating homes that are severely damaged, which stands at approximately 1.5 million**, taking into account the vulnerability and lack of resources of the occupants.

We believe there should be a **target of rehabilitating 250,000 homes/year, which would eradicate the problem in six years**.

The implementation process should be based on shared investment measures for the buildings whose occupants cannot or do not want to borrow.

It takes into account the need to have a public budget allocation of €2.5 billion/year, the equivalent to half the investment forecast for carrying out rehabilitation of homes (the average cost per home is €20,000).

The source of the funds required to carry out the proposed programme is based on the following considerations:

- 50% of the budgetary needs, €1.25 billion, would come from **funds raised by increasing the tax pressure on fossil fuels**. (See Chapter 9).
- **Collection from adding a surcharge of 10% on the LVT** for homes not classified as vulnerable with an energy certificate lower than C.
- Funds from the **General State Budgets**.
- Funds from **Europe**.

The funds will be applied as follows:

- **Non-repayable measures** in homes of vulnerable families and low economic capacity.
- **Development of public and private co-ownership plans** in which the government makes and recuperates the investment, either as a payment related to reducing the energy bill or by transferring the balance in future housing transactions home through sale or inheritance.
- **Measures in urban centres to recover plots or buildings through agreements with owners or expropriation processes designed for renting to young people.** The objective of this measure is to both renovate the centre of cities as a residential area and enable the independence and availability of decent homes for young people, making it easier for them to become independent.
- **Development of urgent framework** of measures for non-preserved buildings or plots.

The destination and use of the funds should be managed by the city councils through the approval of specific budgets by the State, amending the [Local Government Regulatory Law](#) (passed in 1985), regulating the financial capacity of local entities.

An objective of rehabilitating 250,000 homes/year in private buildings of non-vulnerable residents is established.

The energy characteristics of buildings constructed in Spain changed following the passing of [Regulation NBE CT 79](#), which meant almost all the buildings built before 1979/80 are in category G, so **rehabilitating them to category B would entail reducing the energy costs six-fold.**

In addition, the competent authority should call on the implementation of rehabilitation plans in buildings with an energy grade lower than C, establishing a surcharge on the LVT for all buildings that are lower than C, with a waiting period to submit the rehabilitation plans of three years, and five years to implement them.

Similarly, aid framework programmes will be established to facilitate access to credit and the existence of **subsidies with a yearly financial value of €250 million.**

- **Rehabilitation of public buildings**

The [Directive 2012/27/EU](#) requires the creation of an **inventory of public buildings exceeding 500 m² and their energy certification**, which was carried out and is available on the [SIGEE-AGE platform](#), which includes the buildings of the national government. With regard to autonomous communities and local corporations, there are no centralised inventories or homogeneous action plans. The reality of the national government is that it has 2,142 buildings, excluding the Ministry of Defence, with an energy consumption that exceeds 1 TWh and with an electricity consumption percentage of 67%.

The number of public buildings and their consumption represent a sector requiring urgent action, not only due to the energy consumption, but also because the example of public authorities could be extrapolated to the civilian population.

Based on the inventory of buildings owned by the different authorities, the following will be established:

- **Specific plans for rehabilitating 5% of buildings per year**, compared to the 3% provided for in the [European Directive of Energy Efficiency 2012/27/EU](#), establishing an objective of rehabilitating all the buildings larger than 1,000 m² by 2030.
- **Contracting procedures** so measures can be carried out through **energy service companies** ([Directive 2006/32/EC](#)) that make the investments through a share of the economic savings resulting from rehabilitation, without a limit on the amortisation period, in order to be able to undertake structural rehabilitation with a return period greater than 10 years.
- The power to **consider the accounting aspects necessary** so the energy rehabilitation does not divert resources from the investment chapter by leading to a reduction of running costs at the corresponding administration.
- **An inventory identifying the regional scope**, as well as a plan, so energy checks can be made in buildings owned by the national, regional and local governments **throughout 2018**, highlighting an urgent plan of energy measures for buildings specifically designated to:
 - Education and sports facilities.
 - Hospitals and residences for the elderly.
 - Administrative tasks.
- Rehabilitation of **commercial or services buildings** presents significant advantages regarding rehabilitation of residential buildings due to the professional nature of their managers and the interests of their owners to increase the value of the properties.

With the aim of establishing standards of measures, **sector plans will be created in order to establish demand scales for the performance of different buildings**, not only to improve energy consumption, but also to update the services in every sector.

It also proposes creating specific rehabilitation plans for each sector throughout 2018, in which the economic procedures are enabled so the measures can be performed, the financial solutions are adjusted and the savings standards are set:

- **Hotels, residences, etc. Saving objective >40%.** There are over 15,000 establishments, 52% of which are hotels, with a current annual consumption greater than 11 TWh.
- **Hospitals. Savings objective >50%.** There are approximately 800 centres, 59% of which are private, with a current annual consumption greater than 6.5 TWh.
- **Offices. Savings objective >50%.** 250,000 properties for offices and over 70 million m² with a current annual consumption of 23 TWh.
- **Small businesses. Savings objective >50%.** 800,000 premises with a current annual consumption of 35 TWh.
- **Shopping centres. Savings objective >50%.** 10,000 premises with a current annual consumption of 11.6 TWh.
- **Sports centres, etc.**

The sector objective of this type of centre is to undertake energy rehabilitation in them before 2030, establishing the following as basic criteria:

- **Electrification of 100% of the energy demand.**

- **50% reduction of demand** by incorporating high-efficiency LED technology in lighting and heat pumps in air conditioning, as well as other measures.
- **Establishing energy quality stamps** with an obligation to visibly publicise the efficiency level of every building.
- **Establishing fees and taxes** depending on the energy label of every building/commercial establishment, both for the LVT and the activity license, with a minimum value required to carry it out.
- **Requirement of an energy certification of C or better** for all the reforms carried out as a requirement for obtaining the construction permit and opening license.

III.2.2. New construction. Nearly Zero-Energy Buildings (nZEB)

From 2020, **Fundación Renovables** believes that new buildings with an area greater than 1,000 m² should be constructed under the criteria of **nearly Zero-Energy Buildings (nZEB)**, whose energy needs are 100% covered by electricity. This criterion clearly assumes the objectives established by the [European Energy Performance of Buildings Directive \(2010/31/EU\)](#) in new public buildings and rehabilitation buildings.

In order to comply with these requirements, it is essential that the minimum requirements for defining a nearly Zero-Energy Building are officially defined.

For **Fundación Renovables**, the basic requirements are:

- **Zero or negative net exterior energy consumption based on both the implementation of efficient and manageable technology to cover the energy needs of the building, and the implementation of renewable energy electricity generation systems and heat pump systems, with the equivalent consumption above the consumption of comparative technology counting as renewable** (see [Directive 2010/31/EU](#)).
- **Zero emissions in covering overall energy needs**, including the primary energy sources of electricity generated and consumed by the building. Zero emissions in a highly contaminated urban setting means it is also required for the building and its surroundings.
- **100% renewable energy** from both primary sources of electricity generation and the fuels used (biomass, biogas, biodiesel, etc.). As most buildings are in an urban setting, **Fundación Renovables** specifically emphasises that the **direct use of biomass for heating should be avoided because it is a scarce renewable resource which should be reserved for uses where there is no easy alternative**, and this is not the case for heating. Biomass for heating can be justified in rural settings where the resource is available locally.
- Use of **low-temperature solar energy support systems**.
- **Installation of electric vehicle recharging points** in private car parks for all parking spots and at least 25% coverage for all public car parks.

Promotion of nZEB buildings requires the adoption of regulatory measures that ensure:

- Buildings that have not been designed/constructed under the previously established criteria **cannot obtain construction permits or living permits**.

- The **development of a regulation for privately owned buildings** that are advised or must be characterised as nZEB buildings depending on their size, modifying:
 - The LVT.
 - Construction fees.

III.3. Electrification of demand

Both the objective established for efficiency (40% reduction of demand) and the objective for the contribution of renewable energy (50%) are directly related to the electrification level of the coverage of energy needs in the different sectors. **The electrification of the energy demand intrinsically entails:**

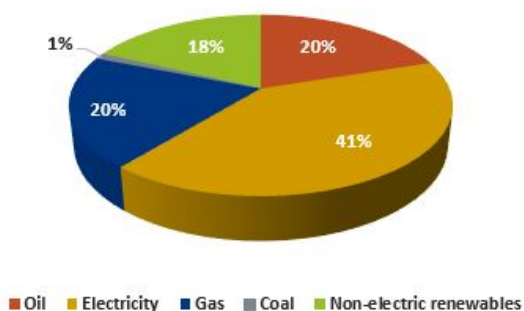
- **Committing to developing renewable energy** as they are currently used primarily for electricity generation.
- **Improving efficiency in the coverage of demand**, especially in buildings as the systems that use electricity are currently more efficient than those that use fossil fuels.
- **Eliminating greenhouse gas emissions (GGE) in use**, in addition to the fact that most buildings are in cities, would improve the air quality for all citizens.
- **Eliminating consumption of fossil fuels**, because in addition to not having them, they are also inefficient and polluting.

Due to the reasons established above, we believe all the measures proposed for sustainable construction and building rehabilitation processes should be based on the idea that they are all **100% electric**.

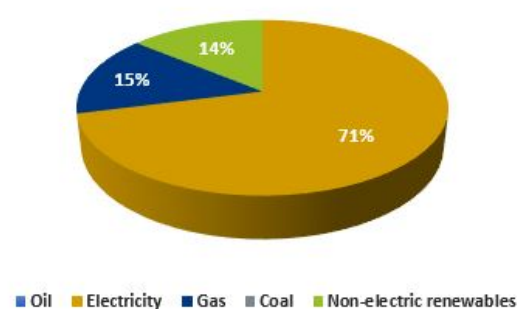
The price elasticity of demand of the different energy aspects signifies the importance of the final price in order to change the current energy supply model. From this point of view, **electricity, as an aspect to promote, must have the lowest possible final price and fuels must incorporate the cost items that discourage their use over electricity**. Chapter 8 of this document includes the scope of the reform of the electricity sector required to reduce the kWh price, and Chapter 9 includes the taxation proposals for fossil fuels.

The proposed measures are separated according to their segment of use and, of course, should be part of any rehabilitation or new construction process.

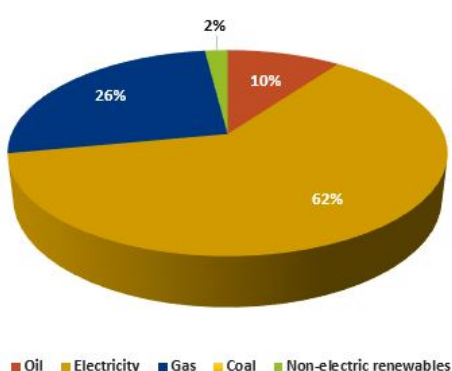
By implementing the proposed measures and in compliance with the objectives in the housing and services sectors, coverage of demand would be transformed by 2030 as follows:



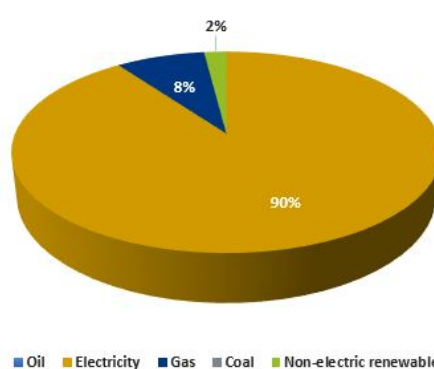
Graph 9. Coverage of demand in the housing sector by 2015.
Source: Fundación Renovables.



Graph 10. Coverage of demand in the housing sector by 2030.
Source: Fundación Renovables.



Graph 11. Coverage of demand in the services sector by 2015.
Source: Fundación Renovables.



Graph 12. Coverage of demand in the services sector by 2030.
Source: Fundación Renovables.

The structure of consumption in buildings is characterised as follows:

- **In the housing sector, 41% of energy needs are covered by fossil fuels**, not renewables, which accounts for 7.7% of national consumption, equivalent to 6.15 Mtoe.
- **In the services sector, 36% of energy needs are covered by fossil fuels, although electricity covers 60%.** These needs are primarily due to heating demands, except in services buildings such as residences, hospitals and hotels, in which DHW must be included.
- **Acting on heating**, the main need covered by fossil fuels, would reduce final energy consumption by 40%.

III.3.1. Proposals for electrifying demand

Fundación Renovables establishes the following lines of action:

- **Development of a Plan for Disseminating Best Practices**, so coverage of energy needs is efficient and manageable.
- **Ban on institutional advertising for maintaining fossil fuel consumption.** If marketing and advertising policies are analysed, especially in the electricity sector, we can see that all the information and advice broadcast to customers, in particular domestic customers and small services premises, is focused more on consumption of

natural gas and changing boilers and their respective maintenance contracts, than on establishing advice on how to cover energy needs efficiently and sustainably with electricity.

- **Responsibility of supply companies** to reduce energy consumption by 1.5% per year, as indicated in the European Directive.
- Reaching an agreement with the electricity supply companies on a **plan for disseminating best practices for replacing equipment** and introducing efficient practices for electrifying demand.
- Plans for **replacing equipment** by establishing **economic incentives from direct public funds** and programmes with the industrial and commercial value chain of this equipment.

The measures are based on the following plans:

Heating

The heating demand is not characterised exclusively by adverse weather conditions but is primarily **due to the design and construction of buildings and inefficient consumption habits** (changing the temperature by one degree means an average saving or increase in energy consumption of 7%).

Committing to heating through high efficiency systems such as heat pumps (which generate four kWh of useful energy for every kWh of electricity consumed) would competitively increase efficiency of heating and DHW energy needs by 50% compared to conventional technology based on fossil fuels, and would make it zero emissions as the electricity would be generated in a renewable way. In addition, the use of fluorinated refrigeration gases would be prevented due to its extremely high warming potential. For these reasons, a plan for replacing fossil-fuel heating systems with heat pumps will be implemented, with two lines of action emphasised:

- **Obligatory incorporation** in buildings that are rehabilitated, promoting comprehensive heating/cooling.
- The **development of a plan for replacing boilers with heat pumps**, maintaining the heat distribution system and minimising the works required for their implementation, which include:
 - **The obligation to replace all boilers that are older than 10 years old** or are not condensation boilers.
 - A **boiler review plan** based on the inventory of all buildings/homes that have a natural gas, LPG, propane, etc. contract or gasoil supply.
 - **Ban on heating systems with coal boilers** from 2021 **and with gasoil boilers** from 2025.
 - Creation of an **operation plan with maintainers** to identify this type of equipment.

In order to carry out the plans for replacing boilers with heat pumps, we propose **assigning the additional €150 million/year of revenue from the Hydrocarbon Excise Duty**, as proposed in Chapter 9.

Domestic appliances

- **Plan for replacing white goods and small appliances**, following the stipulations for energy labelling in [Directive 2010/30](#), including the lines of support/penalisation depending on the efficiency of the equipment.
- Implementation of a **plan to homogenise and simplify energy labelling** and a **different commercial offer** for replacing inefficient equipment, which results in:
 - **Replacing domestic appliances at the end of their useful life.** Prolonged use of equipment should be encouraged over accelerated replacement in order to commit to the circular economy.
 - **Banning the manufacturing and selling of inefficient domestic appliances.** Improving a letter represents 20% less consumption.
 - **Support and tax relief scheme for efficient equipment with an ecological label.** Acting under sub-zero budget principles and allocating the levy from inefficient domestic appliances to reducing the cost of efficient domestic appliances.
 - **Support scheme** for replacing domestic appliances in vulnerable homes.
 - **Market withdrawal within five years** of domestic appliances without an A label.
 - **Specific plan of communication and economic support for replacing natural gas cookers** as a key element of gas supply in homes.

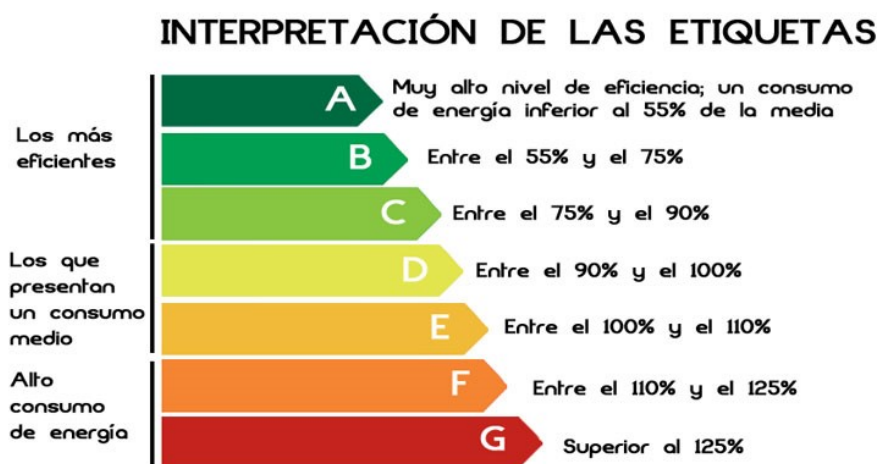


Image 5. Energy labels of domestic appliances.

Lighting

Although regulations for stopping use of incandescent lamps have had an impact and replacing low-consumption lighting systems is a reality, **it is necessary to go further into sectors such as business and offices to strongly urge a definitive replacement of inefficient systems.**

The following is proposed to maintain this development:

- **Creation of an action plan for changing to lights and lighting systems which are efficient and rational** in small business and offices.

- **Specific information and dissemination plan** for freelance and self-employed professionals.
- **Commercial support scheme for replacing equipment**, led by city councils as an element of proximity and knowledge.

Domotics for demand management

Incorporation of renewable energy and effective improvement of energy saving, and efficiency processes require **decisive measures in active demand management**.

Most of the renewable energy incorporation proposals entail the **need to increase generation power** as a coverage or security aspect, based on the idea that the peak demanded power will rise with the incorporation of electric vehicles and electrification of demand.

For this reason, it is fundamental that this greater electricity consumption entails **management procedures which allow loads to be moved, slowing the curve or, at least, connecting supply and demand as far as possible**.

The efficiency processes proposed in this chapter would not be valid if they did not include **demand management systems**, the reason why we believe domotics to be vitally important as a fundamental piece in the rehabilitation and electrification of demand processes.

The following measures are proposed to promote this initiative:

- **Transparent availability of the data** measured and recorded by the installed smart meters.
- **Accreditation and certification plan** of management and control equipment.
- **Control system implementation plan** and management of consumption.
- **Promotion of self-consumption** and fixed and variable storage.
- **Promotion and support plan for P2P platforms** to enable direct measures between consumers/producers.

In order to carry out the plans for implementing domotics, access to information and demand management, we propose **assigning the additional €100 million/year of revenue from the Hydrocarbon Excise Duty**, as proposed in Chapter 9.

We also propose **measures to encourage electricity consumption over fossil-fuel consumption**, which are based on:

- Establishing electricity campaigns of **percentage reductions of fossil fuels**.
- **Separating the marketing or selling activity** of electricity and fossil fuels in the domestic and services sector.
- **Reducing the price of electricity** by implementing a reform of the domestic electricity tariff.
- **Tax plan** for levying consumption of gasoil, coal, natural gas, butane and propane.

III.3.2 Transversal tools and measures

The operability and efficiency of both the plans and measures proposed depends on having tools that are able to identify the problems and the real situation of each sector, and change consumption habits. To achieve this effectiveness, it is necessary to:

- **Have energy efficiency certification plans for buildings** and inspect installations, so no buildings can be bought, sold or rented without an energy certificate and the category of the building must be visible.
- **Amend [Royal Decree 235/2013](#)**, which regulates the establishment of procedures for energy efficiency certification for buildings, changes the procedure for calculating and assigning the corresponding letter, taking into account the different technology, assets and liabilities, and the characteristics of the different climatic areas, providing a greater executive and operational aspect.
- **Review the current system of building energy certification** so that it truly reflects energy consumption and not theoretical prototypes.
- **Extend the requirements** that make it obligatory to have an energy efficiency certificate for all the buildings and homes within five years. The objectives of this plan are:
 - **To identify the buildings and homes whose efficiency certificate is above letter C** and to have a plan of action aimed at correcting this and eradicating fossil fuel consumption.
 - To create **proposals of measures**.
- **Implement a series of tax incentives/penalties** according to the energy certificate and the financial instruments guaranteed by the percentage of energy saving.
- **Reform the electricity system**, which reduces the cost of kWh, adjusting it to reality so that it is competitive with other energy sources.
- **Establish legal procedures** to facilitate shared ownership in rehabilitation processes of vulnerable homes.
- Support the **development of ESCOs** with financing lines.
- Propose specific regulations that prioritise the **incorporation of photovoltaics in construction**, as an added element, as an enclosure and in urban planning.
- **Applications to cover specific needs:** heat pump+photovoltaics, sole consumer, P2P platforms, community recharging systems, etc.
- Develop the **photovoltaic/storage** pairing and promote demand management systems.
- **Mixed LTSTE and heat pump systems** to cover DHW and heating.
- **Define management models:** demand, production, storage and supply of the electricity market.

IV. Measures in sustainable mobility and transport

Sustainable transport and mobility should be defined not only by energy, environmental or dependency criteria, but also because mobility structures the development of cities and the relationships between citizens.

From an energy point of view, consumption in **mobility and transport** represents **over 40% of final energy consumption**, with almost all of it coming from petroleum, the main source of polluting emissions and, therefore, responsible for the bad air quality in our cities.

Mobility and transport plans are not only part of the commitment to one modal system or another but are also part of the model of land occupation, and urban conception and development. **Measures on land planning are what end up defining and causing, in most cases, the need for travel and the configuration of production networks and very centralised roads.**

It is essential to suitably manage mobility and transport through **comprehensive plans, under sustainability criteria**, and to commit to changing the current trends.

In this respect, it would be necessary to:

- **Manage demand** in contrast to the continually insufficient increase in supply.
- Emphasise **infrastructure management** due to the continuous discourse on new construction and development of existing infrastructure.

One of the aspects which should have an impact on the proposal for sustainable mobility is **working in an urban setting that is becoming increasingly overcrowded**. This is due to people coming to work from outside towns, and mass tourism and overcrowding, which in most cases require mobility solutions that are a long way from meeting the criteria of sustainability. In this respect, **the inhabitants need to start being protected by establishing access limits and implementing fees and taxes to disincentivise unsustainable practices.**

These are the reasons why **Fundación Renovables** believes that not everything should revolve around changing vehicle models, but also **a concept of mobility that is shared and a public service**, firstly by minimising transport needs by making local goods and services available locally using low-consumption and low-emission practices, and gradually stopping use of internal-combustion vehicles.

The framework of action proposed by **Fundación Renovables** aims to **change a mobility model** that is low in coal, has zero polluting gas emissions, zero traffic accidents, and is more inclusive and economical. In this respect, the following specific proposals are included:

IV. 1. Reduction in mobility needs and improved accessibility

The transport needs in a population structure where over 80% of people live in cities requires firm commitment to providing more efficient systems and, ultimately, reducing the transport needs of people and goods.

Reducing transport needs or mobility should be a priority and it is essential to create and implement plans that include:

- **Urban planning and designs** that promote accessibility and sustainable mobility, prioritising pedestrians, bicycles and public transport by:

- Establishing **access limits to cities** for private vehicles by implementing deterrent access fees and promoting public transport.
- Setting rules and procedures for **mass tourism travel**.
- Minimising transport needs in order to recover a **diversified and local services structure**.
- **Managing parking** in city centres and transport hubs.
- Drafting **mobility plans** at companies and business parks, and education and shopping centres by incorporating a mobility manager.
- **Promoting collective transport.** Collective public transport must become a fundamental aspect of people's mobility systems, based on a dense network of priority and high-frequency traffic which is attractive to citizens because of its supply conditions and the aspects that **discourage private transport and make public transport attractive**. These include:
 - **Internalisation of costs.**
 - **Demand management**, encouraging use of public transport and sustainable means of access for employees.
- **Changing tariff models of public transport** on urban and metropolitan networks. The transport tariff systems must be clearly focused on using combined passes with either a quarterly or yearly flat rate for different types of public transport system: public bicycles, carsharing, etc. They must also include the **electrification of shared vehicle fleets and urban public transport**: electric buses, trams, trains and metro.
- **Social consensus on the challenges of unsustainable and secure mobility**, abandoning the criteria that have been followed to date for most infrastructure and emphasising mobility management and services.
- Creating and forming **Mobility Boards** at industrial parks and economic centres.
- **Bringing production of goods closer to consumers.** One of the lines of action is promoting the localisation of goods and services where they are demanded.
- **Increasing vehicle occupation.** Vehicle occupation is a key factor for both rationalising the energy demand in the transport sector and minimising energy costs in manufacturing and scrapping these vehicles. For this reason, the following are of the utmost importance:
 - **Committing to shared-use systems**, with a reduction in tax charges and traffic fees facilitating their implementation. Promoting carsharing and carpooling systems.
 - **Electrifying shared vehicle floats and urban public transport**: electric buses, trams, trains and metro.
 - **Promoting alternatives** to move from an economy based on the possession of means of transport to a model based on mobility services, therefore reducing the number of vehicles and increasing their rate of occupation.
 - **Encouraging car users to use** collective means of transport.
 - Supporting city access for **high-occupation vehicles** (bus/high-occupancy-vehicle (VAO) lanes, etc.)

IV. 2. New institutional focus for investments in mobility and transport infrastructure

This new focus must start with a **change of priority for investments in urban and inter-urban transport**, regardless of specific measures relating to the increase in security or alternatives.

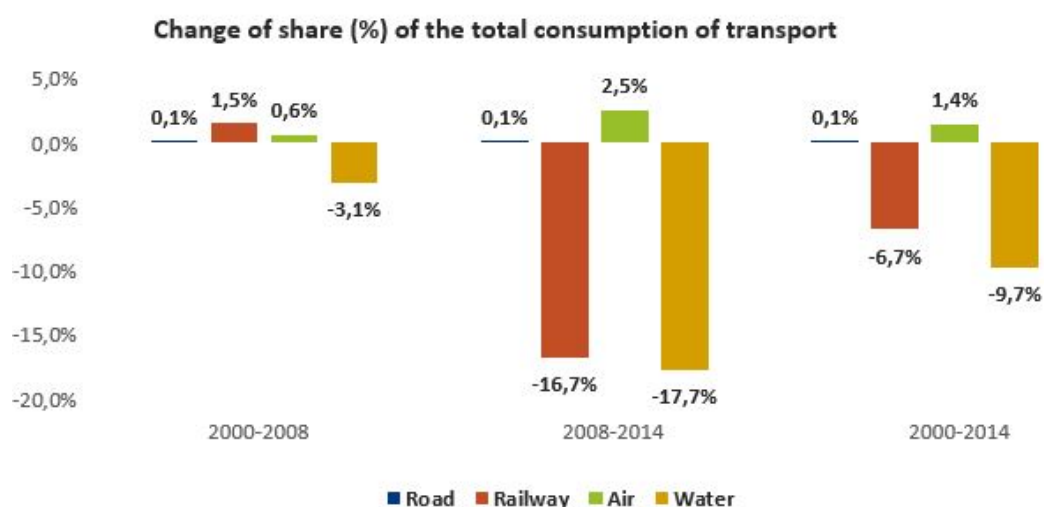
In this respect, construction of new high-capacity roads must be stopped, at least where there is already similar infrastructure.

Public funds should preferably be assigned to **improving access to cities for local services, regional railways, FEVE, bicycle lanes, bus and VAO lanes**, as well as infrastructure that enables the rapid electrification of transport.

Optimisation and promotion of railway use

Railway use for transport of goods and people should be the **cornerstone of Spain**, and it should not only connect, but also structure, establishing economic priorities and flows between road and railway transport. The incorporation of **logistical structures** is a fundamental step for its development.

Spain continues to have a large deficit in promoting and using railways, especially for transporting goods, which accounts for only 5%, compared to countries such as France and Germany where it is 13% and 19% respectively.



Graph 13. Share of energy consumption by modes of transport in Spain, 2000-2014, showing the large role road traffic plays.

Source: Minet- IDAE.

And of course, **electrification of the railway network** is no less important as a large part of train journeys (especially for goods) are currently made with diesel engines due to the lack of electrification of key parts of the network.

Fundación Renovables believes that 2025 should be the objective for achieving a 100% electric railway network. The foundation also insists on the need to promote the use of railways in order to reach 20% of transport of goods by 2030.

Special importance should also be placed on the **promotion of short-distance railway networks** between local population nuclei and within cities where electric public transport is a top-level priority. This is followed by the need to develop the networks of short-distance and local trains, metro, trams and electric buses.

Promoting the use of electric vehicles

Future sustainability depends on the **implementation of electric vehicles, whose use is mainly shared**. These electric vehicles are a priority objective as their energy needs per kilometre travelled are two times lower than for internal-combustion vehicles, and they also have no emissions.

The objective of the mobility plan is to gradually convert a vehicle fleet that is currently composed of vehicles with fossil-fuel-combustion engines (cars, buses, vans, service vehicles, motorbikes, etc.) to **vehicles that operate fully with electricity and have an active exchange capacity with the supply network**.

The objectives should involve **renewing the current vehicle fleet with plug-in electric vehicles (PEV)**, which, in turn, would achieve the following objectives:

2025

- **Electrification of 100%** of the railway network.
- **Ban on registering** vehicles that use diesel.
- **Ban** on diesel vehicles in cities.

2030

- **80% of the fleet of public-use** electric vehicles.
- **100% of the new public-use** electric vehicles.
- **60% quota** of new private electric vehicles.
- Reach a **quota of 30%** with 5,000,000 electric vehicles registered.
- **Decrease** the fleet of registered vehicles **by 15%**.
- **Reach 20%** of the transport of goods via railway.

The technological and industrial transformation of the strong automobile industry that currently exists in Spain should be one of the future lines of economic development and growth, ensuring that the reconversion of current factories includes the necessary support and financing schemes, and the guarantee of a real domestic market for the manufactured vehicles.

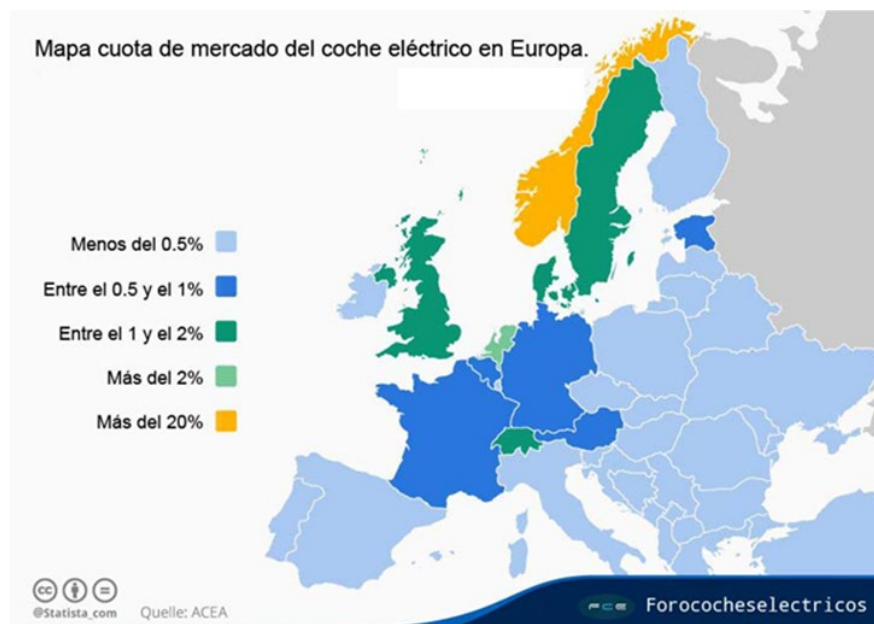


Image 6. *The share of electric vehicles in Spain remains marginal, with less than 0.5% of penetration.*

Source: Forococheselectricos.com.

Development plan for charging/recharging facilities

Alongside developing rules and procedures that promote the incorporation of electric vehicles and mobility criteria, it is essential to provide an **infrastructure of battery charging and recharging systems that guarantee adequate supply for the vehicles.**

It is necessary to **implement different types of charging/recharging** depending on the use features of the vehicles and make the following available:

- **Charging infrastructure** in facilities owned by the user. (Private garages).
- Charging infrastructure including tendering systems in **public car parks**. (Parking by hour, supermarkets, stations, etc.).
- **Recharging points on public roads** via cable connection or induction.
- **Charging facilities** for quick charges, instead of the current petrol stations.
- **From 2025**, equipping new and rehabilitated buildings with **a charging point in every parking spot in private garages and 25% in public car parks.**

The recharging systems must take into account the technological development of this type of facility and focus on facilitating manageability, which means the charging can be maximised using renewable energy. Towns should adopt rules, **so the fuel supply systems step aside for battery charging/recharging systems.**

Incentivise the use and purchase of electric bicycles

Electric bicycles, primarily as a means of urban transport, are the perfect vehicles for independence due to the orographic features of Spanish cities and because there is no limit on age or physical condition.

Fundación Renovables proposes supporting their use by facilitating:

- Availability through **urban renting**.
- Acquisition through assistance from **basic models**.
- Availability of **low-price functional models**.
- **Parking on the streets** to make them easier to use and reduce risk of theft.

IV. 3. Favourable taxation for use of eco-mobility

Sustainable modes of transport should enjoy **tax deductions and fees for use and registration**, among others, and with two aspects: incremental payments for the highly polluting vehicles and allowances for the least polluting vehicles.

It is necessary to establish rules that make it difficult or easy to travel and park depending on the energy, emissions and level of occupation of the vehicle. Therefore, it would be necessary to:

- **Eliminate favourable tax conditions for diesel** compared to petrol, insofar as it does not meet environment reasons.
- **Review the exemptions to the Business Tax**, which certain companies are eligible for as they are located in business parks outside city centres.
- **Eliminate the VAT and Registration Tax exemptions** for yachts and recreational aircraft.

All the initiatives must be accompanied by the establishment of exemptions to **safeguard and protect the citizens**, by both the household composition (income) and vehicle use.

IV. 4. Transversal measures

- **Sustainable Mobility Law**, overcoming the limitations of the current strategy, which connects town planning, land occupation and mobility as a planning instrument of the policies, plans, and programmes that prioritise improving the management of constructing new infrastructure.
- **Public Transport Financing Law** to guarantee the maintenance of universal accessibility across the country, to which a tax on hydrocarbons would contribute.
- **Obligation to adopt mobility plans in large companies** and areas with a high concentration of activity, such as business and industrial parks. These are areas with a high concentration of employment, and therefore with a significant number of frequent journeys which have a large social-environmental impact on cities and metropolitan areas.
- **Creation of roundtables for a political, social and regional pact for sustainable mobility**, with participation of and agreed upon by national, regional and local administrations, composed of social and economic agents, and representatives of environmental organisations and civil society.
- **Improvement of the operation, incorporation and coordination** of all operators of public transport consortia, so that they incorporate different modes, means and services, as well as those that enable the collective and shared use of these means, ensuring a transport subsidy is implemented and fare integration across all metropolitan areas.

- **Coordinate the various capabilities** of different ministries to create one sole ministry that manages urban development, mobility, energy and the environment.
- **Establishment of a tax policy and fees:**
 - Taxing **registration and levying a road tax** for internal combustion vehicles.
 - Including an **excise duty** for petrol, diesel and natural gas vehicles (see Chapter 9).

In order to achieve the objective of zero emissions it is essential to reach the following:

- **Reduce consumption by 45% by 2030.** This is as a result of commitment to electric vehicles, improving combustion engines, reducing the fleet and promoting train transport.
- **Reduce the number of vehicles currently registered for private use by 15%** by implementing measures that support non-motorised, public and shared transport.
- The objectives for implementing electric vehicles would be the following:
 - **30%** of the fleet and **60%** quota of new vehicles by 2030.
 - **70%** of the fleet and **100%** quota of new vehicles by 2040.
 - **100%** of the fleet by **2050**.
- **Gradual electrification**, limiting the use of biofuels as support according to the capacity of national production or certified non-substitute origin, as well as uses that cannot be covered efficiently by renewable electricity.
- Standards of **maximum emissions:**
 - Average of the tourism fleet: **50g CO₂/km by 2030**, compared to the 67g established in Clean Mobility.
 - Average of the fleet of vans: **88g CO₂/km by 2030**.

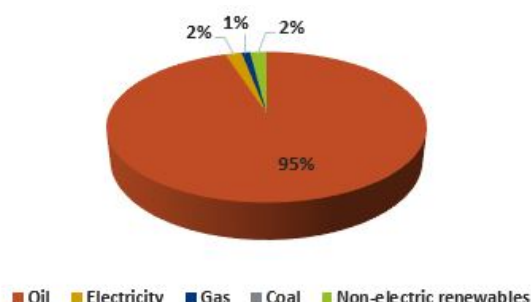
The Registration Tax, Road Tax and VAT must include measures which tax vehicles that exceed the established targets and benefit vehicles that are below the targets.

- **Review the current system of labelling vehicles**, so the vehicles can be easily identified according to their propulsion system: diesel, gasoline, gas, hybrid or electric.

The current labelling system prevents councils from using it to limit traffic of diesel vehicles. One thing is the A-F labelling of energy efficiency which reflects the specific fuel consumption of the vehicle (and indirectly its CO₂ emissions), a label which still contains mandatory information for anyone buying a vehicle, and another is the label according to the level of polluting emissions, which vehicles should display clearly. While the former depends on the energy performance of the vehicle, the latter refers to the contaminants emitted, and this is the one that should be used to differentiate vehicles in terms of their impact on the urban air quality.

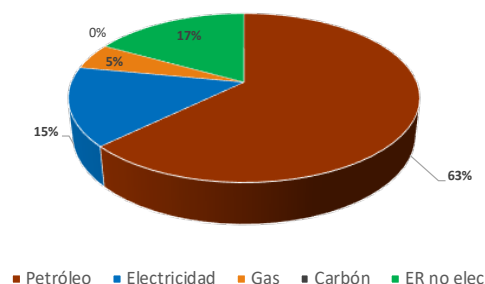
In order to carry out the plans for promoting electric vehicles and recharging facilities, we propose **allocating the additional €750 million/year of revenue from the Hydrocarbon Excise Duty**, as proposed in Chapter 9.

By implementing the proposed measures and complying with the objectives of the transport sector, the coverage of demand would be transformed by 2030 as follows:



Graph 14. Coverage of demand in the transport sector in 2015.

Source: Fundación Renovables.



Graph 15. Coverage of demand in the transport sector in 2030.

Source: Fundación Renovables.

V. Self-consumption and distributed generation

Fundación Renovables is committed to the **priority development of self-consumption** because:

- It is the **main element for empowering consumers and making them active subjects in the centre of the energy system.**
- **It is a basic instrument for demand management.**
- It is effective at **reducing waste.**
- It is an element to **diversify** the agents in the energy sector.
- **Its capacity to store energy** is a basis for the manageability of the system.
- It is a **basic pillar** of the efficiency/self-consumption/sustainable mobility triangle.

Self-consumption represents an important opportunity to improve the current energy systems. It is **an opportunity for citizens, communities, associations and companies** as it offers a possibility to move from traditional energy consumption to renewables and provides society with useful tools for demand management policies, contributing to the democratisation of energy systems and increasing social participation in these systems. By promoting these measures together, alongside storage policies, they should become one of the main dynamic aspects of the Energy Transition.

There is legislation in Spain that prohibits shared self-consumption and imposes a tax on all energy produced (Sun Tax) in the event that the self-consumer wants to charge for the excess that they pour into the grid, making it impossible for self-consumers to generate a profit.

Within the Renewable Directive, the European Parliament has approved a proposal to ensure the Member States guarantee the right of consumers to generate and consume their own energy through renewable energy without the self-consumed energy being subject to any type of fees or taxes. We hope that these spells the end of the so-called “Sun Tax” in Spain in the short term.

Distributed generation has reached a sufficient level of maturity to become an important player in energy supply. **Fundación Renovables believes that distributed generation is a right that must be appropriately regulated without legal and administrative obstacles.** It is currently hindered in Spain.

The **Fundación Renovables** energy proposal is based on the **development of demand**, which implicitly means that if they want, consumers can assume a prominent role when deciding how they want to cover their energy needs.

In order to achieve the **co-responsibility of consumers**, it is necessary to open the possibility of electricity generation at the point of consumption without limits and to establish a framework of open exchange between different consumers and producers.

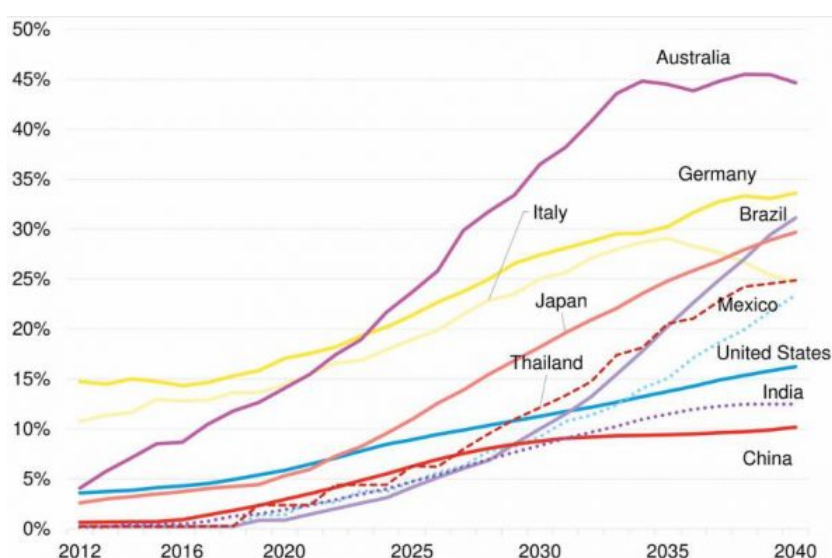
Generation at consumption or distributed generation require commitment from the consumer to assume co-responsibility to create their own energy system, which reduces the environmental impact and the supply costs in the system. Therefore, the current consumer moves from playing a passive role to becoming more active, with the ability to make decisions regarding:

- **Characterising their energy needs** more efficiently and with the ability to manage their demand quantitatively and seasonally.
- **The possibility of generating and storing** their own energy to cover their needs.
- The option to **maintain exchange relationships** with other consumers.

The current state of generation, storage, communication and management technology make self-consumption not only an economically and technically unbeatable activity, but also the **axis for making consumers an active part of the system and achieving an efficient, distributed, secure, independent and, of course, environmentally friendly energy model.**

Self-consumption is especially important for urban settings as these systems form the basis of the future energy model, prevent cities from becoming energy dumps, and give them co-responsibility for their environment while also making them sustainable.

Except in the case of Spain, most countries are committed to generation at consumption and, as can be seen in Graph 16, Australia will lead generation at consumption according to the forecast for 2040, followed by Germany and Brazil.



Graph 16. 2040 forecast of generation at consumption in different countries.

Source: IRENA.

V. 1. Self-consumption implementation measures

Fundación Renovables believes that implementation of self-consumption should be promoted, therefore we promote the following measures:

V.1.1. General

- **Repeal of [Royal Decree 900/2015](#)** and approval of a legal framework consistent with nearby countries and the European Parliament guidelines, and aligned with the objectives of the Paris Climate Summit.
- **Availability of simple and quick administrative procedures** for self-consumption systems, especially for low-power facilities.
- **No limits on power of facilities.** There should be no limitations on the size or power of the facilities, nor on relationship between the energy generated and the energy consumed.
- **No power quotas.** There should be no installed power limits, neither nationally nor locally.
- **Monetisation of all energy flows**, considering monetisation based on its basic characteristics of origin and destination as a procedure for recovering or balancing energy flows.
- **Equal rights with other agents in the market.** The development of self-consumption should involve the commitment and right of consumers, on equal terms with the other agents in the system, to actively cover their energy demand and use the energy they generate themselves with total freedom.
- **Fair remuneration for all the excess poured into the network** for all the facilities, regardless of their size, in accordance with the market prices.
- **Right to storage without obstacles or fees.** Storage is essential for the proper operation of a self-consumption facility as its installation implies managing or adjusting demand to the size of the generation system and, therefore, minimising its consumption with regard to the network.
- **New tax treatment.** Tax treatment for this type of initiative should promote its use both in terms of the VAT on installations and the possibility of netting the generated economic flows.
- **Definition of management and coverage models not provided by demand management**, such as the implementation of centralised primary, secondary and distributed storage systems using fixed batteries or in electric vehicles.
- **Promoting the incorporation of storage batteries** in the generation installations at consumption based on the increase of generation power and active management of demand to improve the manageability of the system.

V.1.2. Development of shared self-consumption

Shared self-consumption refers to one or several consumers sharing one or more generation facility to cover their energy needs.

Shared self-consumption is currently completely legal, but it is subject to stringent restrictions that we would have to remove in order to encourage it. With current legislation, shared self-consumption can only be performed through installations for electricity supply to common areas in a neighbourhood community.

In addition to the inherent benefits of all the self-consumption systems, the **collective dimension of shared self-consumption** leads to more economically efficient installations and opens the door to centralised accumulation systems that make demand management effective, increasing the benefits that these systems create for the electricity grid.

From a social point of view, the development of these systems **stimulates citizen participation and is an accelerator for the change of energy model**. It also enables councils to provide energy services to its inhabitants.

Fundación Renovables believes that the development potential of these systems is high because a large percentage of homes in Spain are tower blocks.

Our specific proposals for developing shared self-consumption are:

- **Permitting the aggregation of consumers and energy generators**, so self-consumption can be carried out openly and without restrictions, establishing groups of users who can share one or several generation installations. This involves:
 - **The possibility of signing individual supply contracts**, enabling meters to be aggregated, both at generation and at consumption.
 - **Enabling the purchase and sale of energy between individuals** or through a group of individuals.
 - **Enabling individual and/or collective accumulation systems** for demand management.
 - **Clear regulations** that develop this right without administrative obstacles or fees, so all energy flows can be recorded and monetised.

V.1.3. Transversal measures

Fundación Renovables proposes additional measures that facilitate self-consumption, but also have an impact on other measures and proposals outlined in this document:

- **The modification of the current tariff system.** The development of self-consumption must entail the modification of the current tariff framework in order to provide a real signal between the costs of producing and selling electricity and the prices that the prosumer encounters. This is to allow them to make decisions under criteria of stability and uniformity.
- **Access to the electric meters.** The right of all consumers to have real-time access to the readings of their electric meters, both the generation and consumption values, as a means of managing their energy flows, and therefore being able to effectively manage their electricity demand.
- **The development of specific plans** for implementing distributed generation equipment in all public buildings, according to the acquired commitments for nearly zero-energy buildings (nZEB).
- **The development and implementation of online platforms that enable self-consumers to exchange energy.** The idea consists of developing smart electricity distribution systems, based on the peer-to-peer (P2P) concept, which are capable of independently matching offers of demand and generation between different groups of producers and/or consumers.

- **The commitment to establishing binding objectives** on the capacity for covering the final energy demand through generation systems located at consumption points, in accordance with the following values:
 - **10% by 2030**
 - **20% by 2040**
 - **30% by 2050**

The power to install for the 2030 forecasts would be 18,000 MWp of photovoltaic solar energy.



March 2018

SECTION TWO

Measures for supply

VI. Renewable Energy Plan

VI.1. Evolution of renewable energy in Spain

The incorporation of renewable energy into the Spanish energy mix started in 2010 when measures that tended not only to paralyse the contribution from renewable energy sources, but also reduced the return on investments in electricity generation from renewable energy sources started to be introduced in law through the “feed in tariff” model, which led to a loss of the legal certainty on which all the support procedures are based.

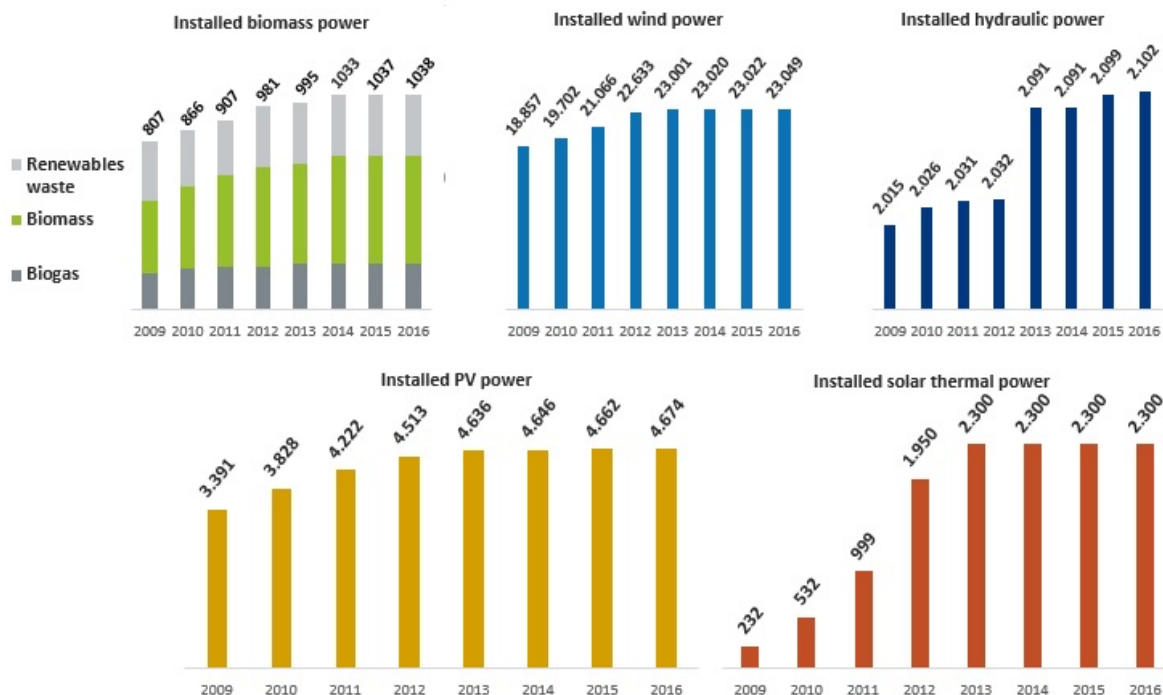
From 2010, the renewables sector was subject to a continuous smear campaign from the national government itself. It was based on the fact that the return on investments in plants using renewable sources was not only more profitable than the market but was also the key factor for the increased cost of electricity for the end consumer.

There are no doubts about the positive nature of the Spanish “feed in tariff” support, but there are with regard to how it was implemented. This is because it introduced inflexible mechanisms, demonstrating that it was incapable of adapting the support according to the evolution of technology and the resulting cost reduction. In the case of photovoltaics, the premiums were maintained although the required investment per installed kWp had fallen by half. This cost reduction had a noticeable effect and the installed power was seven times higher than the objective established.

The situation that began in 2010 culminated with the [Electricity System Reform of 2013](#), which not only lowered the financial return with discounts far above 30%, but also changed the way financial returns were perceived, going from a “feed in tariff” which set a return for energy, to a system that remunerated the installed power depending on the recognition of what has been called “reasonable return”. This is a subjective profitability concept that is subject not only to interpretation but also to the changing, unagreed price projections of the electricity pool and financial indices.

The 2013 electricity reform marked the future of the **auctions** carried out in Spain because it removed the possibility of establishing prices for generated energy due to establishing generic and non-particularised values of installed power in different technology.

Until 2010, Spain was still a leader both in contributing renewable energy to the electricity mix and in the industrial development of different technology. This system has recently changed drastically as the industry has been dismantled or sold and there has been no growth of different technology, as can be seen in Graph 17:



Graph 17. Installed power in Spain according to the different renewables technology, 2009-2016 (in MW)

Source: APPA

Under this historical prism, Spain could recover the industrial position and capacity it had in the past. Achieving this will depend on both our commitment and the binding objectives set, as well as recovering the legal security lost with regulations in force from 2010 to 2014.

VI.2. Reasons for the 100% renewables objective by 2050

The energy policy proposal from **Fundación Renovables** is based on the hypothesis that it is possible **to reach a 100% renewables energy model by 2050**. This proposal involves a new energy model with the following characteristics:

- Sustainable.
- Zero emissions.
- Independent.
- Autonomous.
- Diversified.
- Self-manageable.
- Distributed.

It is a feasible hypothesis taking account of the technological and industrial evolution of the systems using renewable energy sources has reached sufficient and well-proven levels of competitiveness, so that it is up to renewable energy to lead the way for reaching the proposed objectives.

The transition from a model based on fossil fuels to another based on renewable energy and efficiency should, above all, be fair for current and future consumers, and also for all the agents involved. This is in order to establish aspects that enable the objectives

to be reached as quickly and efficiently as possible. Any delays to the change of model go against society, which in the future will have to pay for the consequences of these delays, in environmental, health, economic and social terms.

In addition to the current objective competitiveness of renewable sources, in the case of Spain, we must also include the **availability of sufficient energy resources to cover the increased energy demand in the future.**

The technological maturity of renewable energy has been achieved mainly in electricity generation technology, hence the **importance of committing to a model of electrification of the energy demand.**

Despite the existing energy potential and how the comprehensive implementation of technology using renewable energy sources has led the way in Spain in recent years, the situation has reversed, leading to its paralysis and the gradual industrial closure. This situation requires **additional effort to recover both the technological capacity and the legal security and credibility lost** with the successive regulations passed since 2010.

Reaching the established objective requires decisive commitment from all the administrations involved:

- **National.** Based on energy planning that makes it possible to install the necessary power of every technology and set the objectives with support programmes and appropriate legislation.
- **Regional.** Expanding and using the effect of the administrative capabilities for developing centralised projects.
- **Local.** As a basic aspect, developing generation at consumption and energy self-sufficiency, because it should play a predominant role in the management of electrified demand.

In addition, achieving 100% renewables by 2050 requires binding partial objectives to be set for all the administrations involved.

Before establishing proposals for 2030, 2040 and 2050, it is important to highlight the situation regarding reaching the 2020 objective which was acquired within the European Union framework and which establishes 20% coverage of the final energy demand with renewable energy sources.

The current situation leads us to think that it is highly unlikely this objective will be reached, despite the information the government has tried to disseminate concerning the progress made, which is more **a result of the reduced energy demand due to the economic crisis than the increase in energy produced from renewable sources** in absolute terms.

In fact, even if all the auctioned power were to be installed between 2018 and 2019, it would be difficult to reach in line with the increases in demand that have occurred as GDP has increased.

Achieving this is based more on the commitment to importing first generation biodiesel, in contrast to all energy efficiency criteria, than on using indigenous renewable energy sources, which casts doubts on the sustainability of the objective.

VI.3. Proposed objectives

The proposal from **Fundación Renovables** and the objectives set have been divided into two blocks:

- The contribution of renewable energy to covering the total final energy consumption: **50%** by **2030**, **80%** by **2040** and **100%** by **2050**.
- Electricity generation with renewable energy: **80%** by **2030** and **100%** by **2040** (see Graphs 5 and 6).

This proposal to reach at least 80% of electricity generation from renewable sources by 2040 is based on the following considerations:

- The kWh generated from wind and photovoltaic technology are now **cheaper** than from any other conventional technology (both newly implemented and existing technology).
- The great **complementarity** of the water, wind and solar resources in the different months of the year (biomass provides a stable availability of the resource).
- Hydropower, biomass and solar thermal energy (whose generation costs in Spain are now similar to those of the new combined cycle and will be lower in the future) can provide a great **level of stability** that would be complemented by the flexibility measures that are mentioned below.
- The expected levels of demand management and interruptible contracts (which would be used to support the management of the system), together with the storage capacity at consumption, in both fixed installations and electric vehicles, and the interconnections with the rest of Europe (which should account for 10% of the installed power in Spain by 2030) **would support a renewable generation pool with greater balance between flowing and manageable technology**. This would ensure demand is met by 2030, and with complementary back-up needs of a much smaller pool of combined cycles which would represent a maximum of 20% of the generation by 2030.

Reaching these objectives entails implementing a series of measures aimed at promoting the development of renewable energy and facilitating its consolidation, such as:

- **Repealing and applying retroactive measures of the current legislation by establishing a political pact** that enables an agreement to be reached between the parties, **re-establishing the framework of stability** against investments and administrative procedures from before the 2010 reform. Resolving this conflict via legal means entails both deferring the actual resolution and differentiating its application or not, depending on the origin of the investors.
- **Creating a Renewable Energy Plan with a long-term horizon (2050)** and with targets every ten years. Developing the Plan should include the following elements:
 - It must have **legal status** and derive from an agreement with as wide a political base as possible.
 - The objectives must be **binding** for all public administrations.
 - **Objectives by technology** and forecasts for using flexible mechanisms that adapt to the learning curves.
 - Openness to **different agents**, both in terms of plant size and origin.
 - Development of a **fair regional and industrial transition plan** that resolves the changes arising from cessation of activities.

- **Establishing allocation procedures based on energy block coverage auctions,** taking into account that:
 - They are for **necessary energy** according to the national energy plan.
 - The closed price is **for every offer**.
 - It is a **PPA** contractual model, establishing the delivery commitments for volume and time.
 - The **parameters resulting** from operating the system are set.
 - It serves as an **instrument for achieving a fair transition** and solving local issues.
 - Its **frequency and amount are forecast** for actual projects.
 - **It minimises generation costs and maximises the guarantees of its implementation.**
 - The **diversification of agents** and plant size to be carried out are considered.

The design of the auctions in Spain has not followed the patterns of other countries, nor has it taken into account the successes and failures that others have experienced before, which raises plenty of doubts about how it will be enforced. The auctions in January 2016 and May and July 2017 were only slightly transparent and the result of inadequate energy planning. As can be seen in Table 2, the starting point of 5,700 MW became 8,737 MW, without considering where they were going to be installed and what energy generation capacity they would have as requirements were never established to ensure that real initiatives were submitted with a sufficient level of administrative progress.

Auction	Date	Eolic	FV	Biomass	Total
1ª(700)	14.01.16	500	0	200	700
2ª(2000)	17.05.17	3000	0	0	3000
3ª(3000)	25.07.17	1128	3909	0	5037
Total (5700)		4628	3909	200	8737

Table 2. *Renewable energy auctions held in Spain.*

Source: Fundación Renovables.

- **Adapting networks** and incorporating them in the state plan with the same binding nature. Throughout 2018, **an adaptation plan was carried out for the distribution and transport networks in view of renewable plants entering into operation and the scheduled closure of conventional plants.**
- Committing to **increasing interconnection with other countries** as a key aspect to promoting the manageability of the electricity system, but without the level of interconnection establishing the objective renewable energy contribution, as currently occurs.
- Establishing a **sufficient and convergent remuneration system** and in accordance with the learning curves for the technology that has not reached the level of maturity for the service life and based on the characteristics of each technology and/or location of the facilities.
- Structuring the regulatory context and market mechanisms in order to **fully incorporate demand in the system operations.**
- Establishing an **active tax policy** to ensure the transition towards renewable energy is supported by non-renewable energy, with the criteria of co-responsibility for fees and incorporation of environmental costs.

- Developing a **plan agreed with manufacturers** to recover the level of industrialisation in every technology.
- Implementing an **R+D plan for transferring technology to the industry** to promote technological value generation as a support for using renewable energy sources.
- Developing a **training plan** at different levels, from university studies to professional training.

In accordance with the energy planning carried out, in order to meet the established objectives, renewable electricity generation must reach 297 TWh by 2030, which represents an increase of 204 TWh compared to 2015/17.

Distribution of power between technologies has not been included because this must be as a result of an energy planning process according to the evolution of demand and the manageability parameters of the electricity system.

For example, the power forecast within a planning exercise to date would be the installation of 85,000 MW until 2030, including the MW allocated in the three auctions held, and 15,000 MW of wind re-powering, **which would represent an additional power of 61,000 MW, of which 18,000 MW would be from distributed generation or self-consumption.**

The following sections include some basic initiatives that must be carried out in order to relaunch renewable energy by technology.

VI.4. Technology plans

VI.4.1. Wind power

The development of wind power must be designed to make the most of higher quality resource sites and to guarantee the economic development of existing wind farms and their repowering. In particular, the following aspects should be considered:

- **A repowering plan.** The development of wind power in Spain and the technological and industrial progress should enable **15,000 MW to be repowered by 2030 as, in relation to the current situation, 10,600 MW would be more than 25 years and 9,900 MW would be between 20 and 25 years by this date.** This plan should mean generating an additional 30 TWh to what is currently being generated, without taking into account the possibility of expanding the power that is currently used, for improved performance with the network of wind generators and closing the coal and nuclear power plants in the different nearby areas. Promoting repowering should be considered in particular, with tax measures that encourage its development.
- Development of power at **new on-shore and off-shore sites** according to the network capacities and the management capacity of the system.
- Development of an **industrial re-conversion plan** according to the new **national and non-regional** installed power capacities, with the aim of having a competitive industry.
- A plan to drive medium- and small-power wind power
- **An implementation plan for offshore wind power** according to its actual potential and the environmental impacts, both in its construction and operation.

VI.4.2. Photovoltaic solar energy

Photovoltaics is known as being one of the pillars for covering the energy demand, mainly as it is a modular, distributed technology

Its modular role makes it the basis of generation at consumption and the pillar of the active management of demand as it **enables consumers to assume the role of generator**.

The photovoltaic development plan should focus on two lines of action:

- **Development of centralised generation plants** of different sizes through energy auctions.
- **The development of, and commitment to, distributed generation or individual or shared consumption at generation**, so that it becomes the decisive aspect in the new energy model by turning consumers into committed producers who, based on their legal position, can have the capacity to purchase, generate, store or sell electricity to others or management companies

The commitment to generation at consumption is outlined and supported in the measures planned and proposed in the different chapters of this document.

Its implementation should entail, among others, the following considerations:

- **The establishment of an open regulatory framework without limitations** for self-consumption installations. (See Chapter 5).
- **Energy auctions according to the outcomes of the energy plan**. The auctions held in 2016 and 2017 were biased towards a commitment to wind power instead of photovoltaics, when Spain has more of a generation deficit in the daytime in summer than at night in winter due to the demand and production structure.

The auctions system should take into account the non-concentration of ownership of installations and bringing generation closer to consumption centres to reduce the losses.

An industrial and technological development plan to:

- **Reduce costs** of engineering, installation and assembly.
- Create **specific regulations** which prioritise the incorporation of photovoltaics in construction and urban planning.
- **Develop applications** to cover specific needs: climate, DHW, irrigation, etc.
- **Develop the photovoltaics/storage duality; and promote demand management systems**.
- **Commit to the consumer's role as a generator and storer**, which reduces the power needs through demand management.

VI.4.3. Solar thermal energy

Renewables should be incorporated into electricity generation by giving more weight to manageable technology in future planning, including solar thermal energy.

The solar thermoelectrical power plants should be part of the energy mix due to their capacity to store energy and follow the needs of demand, in addition to their inertial contribution to the stability of the network.

Spain has two important reasons to support the commercial implementation of this technology:

- The current **international leadership situation** to the strong demand which is expected globally in the medium term and which could be lost if new references with the most advanced technology are not provided in the domestic market.
- The **contribution to the manageability of the electricity system** when fossil-fuel plants are being removed from the Spanish generation park.

In this respect, we suggest reconvertng the existing plants without storage to plants with storage, at those plants where this transformation is possible.

VI.4.4. Low-Temperature Solar Thermal Energy (LTSTE)

The commitment to promoting Low-Temperature Solar Thermal Energy (LTSTE) has been unsuccessful despite the installation obligation for new projects according to current regulations. This is mainly due to the fact that its implementation has been considered an obligation or the need to comply with a procedure which has not been given value.

It is essential to expand on the development of applications in which the technology and its use are perfectly coupled. The following must be encouraged in this line:

- The obligatory installation of LTSTE in construction in order to **cover DHW** in rehabilitated buildings.
- Development of **mixed installations of heat pumps and LTSTE**.
- Obligatory installation at **service facilities**.
- The creation of **maintenance plans, installation certifications and incorporation of management contracts**.
- The development of LTSTE should include an **application plan for end uses**, which will be developed in 2018.

VI.4.5. Biomass

Biomass is vitally important to the development of a 100% renewables energy model, both due to its **heat input** and because it should be the **pillar of recovery for areas that have been affected in terms of labour and the environment by mining operations**.

With regard to biomass, it is important always to take into account that it is a **local energy source** and the positive effects on its growth as a carbon capturer are not tested by its distributed use in urban settings that are subjected to highly polluting processes. We believe that biomass should be especially encouraged for use as a source of electricity generation in settings close to its production.

The development of biomass should always bear in mind the hierarchy and the lower degree of priority between energy and the coverage of food needs and the recovery of the organic layer of soil as well as the lack of use of technology that transgresses the natural biological base. In any case, provided that applications can be covered with flowing renewable electricity, this would replace biomass as a resource that can be stored.

The principle of “who pollutes pays” should be one of the main commitments of biomass, which can perfectly replace polluting fossil fuels because they are not recorded by the net emissions produced.

The initiatives that should be carried out for the incorporation of biomass into the energy model must include legislative measures for developing:

- **A national plan for developing biomass under criteria of sustainability.** The use of biomass as an energy source should be based on criteria that guarantee the sustainability of the entire production and processing cycle, which is compatible with agricultural and forestry activities, and above all respects the hierarchy of use for food purposes. It is necessary to establish specific plans that guarantee the management of resources and sustainability of the use of biomass for energy.
- **A national forestry plan** under the double prism of economic and area recovery, and in order to manage and control species and uses of the forest mass.
- **A national biofuel plan** under strict sustainability criteria, prioritising national production and removing the possibility of importing oil for the production of first-generation fuels.
- **A management plan of agricultural, forestry and industrial waste** for energy purposes.
- **A regulation** to create biomass markets with local criteria.
- **A feasibility analysis**, depending on the local weather conditions, of **district heating based on biomass**, including, where applicable, hybridising with other renewable technology.

VII. Plan to eradicate coal, close nuclear power plants, and manage waste

VII.1. Eradication of coal

As part of the Spanish economy's decarbonisation objectives, **the task of gradually closing the coal-fired power plants and stopping mining is unavoidable**. Other countries are setting dates for this activity, and Spain needs to do it now.

The coal-fired power plants currently remain in operation thanks to an inefficient policy setting CO₂ costs and a policy that subsidises national coal to make competitive something that is not competitive in terms of quality or environmental impact, and due to the pressure, all governments have been put under by the mining areas in Spain. This is not due to the importance of these areas, but the power that the structure of large mining families has in the areas of Castilla and Leon, Asturias and Aragon. In addition, Spanish thermal power plants only burn a small percentage of national coal, importing the rest.

Closing mining should be accompanied by **"fair transition" plans** as acknowledged by the International Labour Organisation. These fair transition plans should be created with full participation from the population of regions that have been home to coal-mining activities for decades, paying special attention to the voices of women that are always silenced. These plans should also include suitable measures that:

- **Revitalise and diversify** the economy of the affected areas.
- **Mobilise public-private investments** to create quality employment in more sustainable emerging sectors (renewables, energy efficiency, etc.)
- **Train and retrain workers** in the affected economic sectors and create **active employment policies** that facilitate re-occupation.
- **Provide social protection** for the most vulnerable people.
- Create a **social dialogue** between social agents and the different administrations involved who facilitate agreement of measures and provide an early assessment of their social and employment impacts.
- **Develop measures in renewable energy production**, making the most of the need to environmentally recover the region (forestry development plans) or the free generation capacity not used through electricity generation auctions that are specifically incentivised in those regions.
- Ensure maximum **participation** possible of these areas in the new economy linked to the change of energy model.

The **Fundación Renovables** proposals for achieving this gradual closure of coal-fired power plants in Spain are:

- **To establish a gradual closure plan in 2018**, which will take place before 2025 and includes the necessary investment commitment to guarantee the applicable emission limits are met at all times. This plan should include gradually decreasing the use of coal and the fair transition for all the affected workers.
- **To eliminate all coal subsidies**, just like other dirty and inefficient energy sources, including the incentives from public funds for environmental investment as a mechanism conditioned by the continuing use of fossil fuels, and to establish a schedule for gradually eliminating these subsidies.

- To demand that all thermal power plants, provided they are not closed or being dismantled, **comply strictly and fully with the European emission limits (BREFs)**, which require that the whole power plant reduce its emissions to the same level as the best technology available in Europe. Transferring European regulations to national legislation should be carried out completely and quickly, without any room for delays in its implementation at any of the power plants.
- **That this compliance with the mandatory emission limits** should be carried out by the operators of the power plants, without accepting any public subsidies for this as it would violate the principle of “who pollutes pays”, which is central to the European legal system and prevents any mandatory activity from receiving subsidies in carrying it out.
- The **complete internalisation of environmental externalities** occurring at each plant to the operation costs of these plants.
- Therefore, the **abandonment** of the draft of the Royal Decree establishing mechanisms making it impossible to close the power plants.

VII.2. Plan to close nuclear power plants and manage waste

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

The fact that nuclear power plants are in deficit according to their operators only adds weight to the arguments against artificially extending their life given that this would require new subsidies that are totally unacceptable, especially considering that the current taxes on their activities are not enough to cover all the costs of the nuclear cycle. Spain has already experienced too many bailouts of electricity companies due to the nuclear burden.

Nuclear energy is not part of the energy scenario that Spain wants and if it is part of the electricity sector, it is because it has a favourable operating scheme and because it does not take on all its costs, placing it at an advantage to other sources with which it should compete.

As a result, once the current licenses expire, they should not be renewed unless there is an official plan that demonstrates the hypothetical individualised need for certain power at a certain place and, in this case, it should always be for a limited time.

In order to prevent a retroactive change on the **closing date**, it should occur when the **operating licence available at that time expires**.

The dates for ending operations at nuclear power plants in Spain are:

Plant	Power (MW)	End of operation date
Garaña	446	Closed
Almaraz I	977	8 June 2020
Almaraz II	984	8 June 2020
Vandellós	1,087.1	27 July 2020
Cofrentes	1,092	20 March 2021
Ascó I	1,032.5	28 July 2021
Ascó II	1,027.2	28 July 2021
Trillo	1,066	15 November 2024

The closure proposal must entail a **technical audit** on the state of the power plants and set an expected closure date depending on waste generation, security criteria and feasibility of its storage.

The **dates can be brought forward** in view of the feasibility and opportunity for replacing them, according to the Energy Transition programmes that would be drawn up in 2018.

The power plants must assume all the costs with regard to covering risks and management difficulties, as well as the investments required to maintain the highest degree of security.

The operation of the nuclear power plant depends on the management plan and waste storage, which is why we believe that **making an ICS (Interim Centralised Storage) facility only makes sense if it is another element of the plan for closing and dismantling the nuclear power plants**. In no case must an ICS be planned or decided upon without a plant closure plan previously being scheduled.

The scheduled closure of the nuclear power plants absolutely must be accompanied by “fair transition” plans, in alignment with the terms previously outlined in this document for coal.

SECTION THREE

Transversal measures

VIII. Urgent global reform of the electricity sector

The **Fundación Renovables** energy proposal is based on two axes: **efficiency and renewable energy**. To ensure the energy proposal is viable, our energy needs must be covered by electricity, in other words, electrifying demand.

Our reasons for committing to electricity are primarily motivated by the following:

- **Covering the energy demand is more efficient with electricity**, rather than burning or using fossil fuels, at least with regard to transport and heating.
- Renewable energy is now **technologically and economically competitive** in electricity generation.
- Spain is an urban country in which over 80% of the population live in cities with significant pollution problems caused primarily by the use of fuels. Covering these needs with electricity would mean **zero emissions at consumption** and, obviously, if the electricity is generated with renewable energy sources, there will also be zero emissions at the origin, and therefore throughout the process.
- Covering energy needs with electricity places **consumers in the centre of the system** mainly because it enables them to play an active role in purchasing, generating, storing and selling electricity to third parties, and not be solely consumers.

Under these premises, the electricity sector and the regulation of its operation must be profoundly reformed, especially because it was the electricity sector itself, with support from the current regulations, which instead of promoting the extensive use of electricity as a vector focused on making it impossible for consumers to be an active part in covering their energy needs through an oligopolistic and closed structure.

Adapting the electricity sector must be a priority because a large part of the future energy policy will revolve around it. This means that its activity must not be vertically integrated, favouring the maintenance of positions of dominance due to its activity in the different phases of the electricity business: generation, distribution, commercialisation, etc. In any event, its vertically integrated position must not undermine the rights of consumers.

Apart from the **Fundación Renovables** proposal for structuring electricity tariffs and in the event that the current structure remains, urgent changes must be introduced:

- **The oil and gas sectors must correspond in taking on the costs of meeting the commitments of covering 20% of the final energy demand** (two thirds of this item), which have been supported to date by electricity consumers.
- **Stopping industrial, regional and interruption policies** if the current coverage indices remain.
- Removing the 7% **environmental tax on generation**.
- **Adjusting** the payments by capacity.
- Reconsidering the **remuneration of distribution and transport** to energy that is truly distributed and transported.
- Modifying the **renewables remuneration system** based on energy and not investment.
- Negotiating to reach a **political agreement** for remunerating co-generation and renewables.
- Establishing **marginally increasing tariffs** depending on consumption in the housing and services sectors.

- Creating a **social tariff**.

Ultimately, **acting to ensure the kWh price is reduced and making consumption of electricity much more competitive than fuels.**

VIII.1. Proposals of measures

The following proposals include some principles that the model of the electricity sector must meet, as well as the developments that must be carried out through a regulatory procedure:

- **Configuration of the tariff from a free market**, as a public good, with universal access and following energy inputs.
- **All the elements that compose the functioning of the electricity system must be included in the kWh price** of this configuration.

With the criteria of transparency and efficiency, the electricity tariff, primarily the final price, should be practically monomial and gradual, determined according solely to the electricity consumed, establishing a fixed part which is less than the current amount and reflects the contracted power. This configuration means transforming most fixed costs, defined mainly as remuneration for investments, into variables. That is, charging by energy managed and not the source investment.

For example, in the case of distribution or transport, remuneration must be determined by the energy that has really been distributed or transported in each section.

This philosophy means the owners of the assets assume a greater risk, but **it will mean the cost transferred to the consumer will be more transparent** and even means new agents will appear with complete knowledge of expenses.

The reality is that the electricity sector currently acts as if its assets were financial products exempt from risk.

Making a change like the one proposed should be carried out through a **process of negotiation and dialogue** and with the will to transform the fixed structure of costs into a variable in concepts such as:

- Remuneration of renewables.
- Distribution.
- Transport.
- Double fixed and variable concept for the assets of the system and its manageability.

The current configuration of the double fixed and variable term is inefficient, barely transparent, unfair and leads to dysfunctions, which include:

- **The price marginally decreases with electricity consumption.** The higher the consumption the lower the final price. This is inefficient and contradicts the notion of energy as a scarce good and as a main cause of the climate change problem.
- **The establishment of fixed remuneration or remuneration based on investment, and its consideration as fixed costs, is barely transparent.** The activities of distribution, transport, capacity payments, etc. must be defined

according to the function they represent and the energy they distribute or transport. If we want a free market, all participants must assume the risk that a free market brings with it.

The **Fundación Renovables** proposal of restructuring the tariff is based on the consideration of a gradual monomial tariff, which would mean:

- The need to **differentiate the consumers** when establishing how the structural costs of the system affect them.
- The **price of energy would increase with consumption**, as a measure to incentivise efficient practices.
- The **price of electricity is related to hourly costs**, which arise according to the available supply and demand.
- The need to **establish a fixed cost per connection**, as a payment for the right to receive supply services, but which would not be comparable to the current fixed term.
- **The possibility of acquiring energy through PPAs**, establishing solely the costs of using infrastructure, which would represent a considerable reduction for the industry or large consumers.
- **Objectivity and transparency in sharing the regulated costs between the different types of consumers**, by approving methodologies which are created with consumers' views taken into account and which remove the current cross-subsidies between different types of consumers.
- If the electricity tariff were monomial and, therefore, the final price was known temporarily, **every consumer could adapt their demand or generation to optimise their energy bill**.
- **Establishing generation costs according to technology**, abandoning the marginalist price model, except for the technology for which the market can approximate perfect competition.
- **Simplifying self-consumption** because only the variable cost of the real use of the different services the system provides would be incorporated into the value of the energy.

VIII.2. Other measures to reform the electricity sector

- **Domestic self-consumption.** Defining a simplified regularisation procedure between the energy poured into network and energy consumed from the network.
- Establishing **mechanisms to identify situations of energy poverty**, as well as specific plans to eradicate it through universal access to a guaranteed minimum energy service.
- **Establishing neutral subsidies and surcharges** for the consumer, depending on the energy sources used.
- **Increasing the separation measures of vertically integrated activities** as a rule against exercising market power between different agents acting in the electricity sector.
- Establishing an **open record of activities and shareholders** to guarantee that there is no controlling share between companies.

- **Creating an audit** to analyse the costs of the system and suitably configure the structure of the new tariff, and to re-establish the legal security of investments made in the past, which, at least, include:
 - **Eliminating** the windfall profits for nuclear and large hydropower technology.
 - **Restoring** original investment conditions in renewable technology.
- **Remunerating the value that manageability and storage contribute to the system**, both in terms of renewable generation and demand.
- **Specifically regulating non-discriminatory market mechanisms** for basic measures that alleviate the intrinsic variability of some renewable sources: demand management, manageable power plants (with special attention to hydroelectric technology, whose concessional terms must be public), storage and increase of interconnections.
- Plan for closing **coal-fired power plants** (see Chapter 7).
- Plan for closing nuclear power plants (see Chapter 7).
- **Radioactive waste storage plan** as a result of the closure (see Chapter 7).
- **Integrated power replacement** marked by the commitment to renewable energy, taking advantage of the closure of unsustainable generation plants and the need to manage the system in accordance with the same supply quality and safety standards.
- **Scheduling of plant entry into the transition period** under conditions of transparency. Strict limitation of capacity payments to the requirements of the system operator.
- **Promoting self-consumption as a basic technology of the future**, incorporating the best international practices in aspects such as shared management of generation units.
- **Re-establishing the National Energy Commission** as a regulatory body that must be completely independent.

VIII.3. Infrastructure plan and modernisation of charging and recharging networks and facilities

Electrifying demand is specifically designed for construction and transport, and the basic concept is the need to be able to establish clear exchange relationships between consumers and producers. For this reason, **it is necessary to adapt the supply networks for both the existence of changing energy flows and the exchange relationships** which digitisation favours, and the consignment of the real costs that these entail.

Renewable energies, such as wind, solar and hydropower, have significant fluctuations at origin. In this respect, if we want to consider a future based on these sources, we must have efficient systems that enable demand to change, and energy to be stored and exchanged with third parties. **The larger the exchange market, the easier it is to manage.**

The **Fundación Renovables** proposals regarding infrastructure are:

- **Commitment to international and inter-island electricity interconnection**, provided that it is confirmed that it is the most economical and sustainable way to reach the 100% renewables objective.

- **Redefinition of the access, connection and dispatch priorities** to maximise penetration of renewables and minimise the primary energy dumps.
- **Establishment of regulatory signals for locating renewable power plants**, in order to minimise the losses in the network and take advantage of the evacuation infrastructure of closed power plants or those in the process of closing.
- **Explicit support for digitising the low-voltage distribution networks**, especially in cities.
- **Regulatory simplification** which enables scheduled and large-scale installation of electric vehicle charging systems, making it possible to use them not only in urban areas but also for medium-distance journeys, approved for their control by the system operator.

VIII.4. System Operator: capabilities and configuration

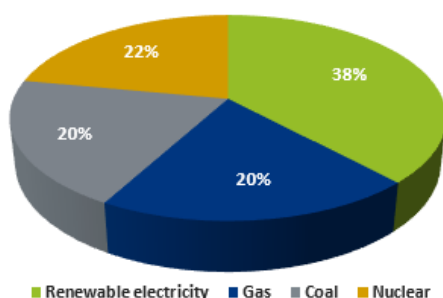
The Spanish electricity network currently has a dual role: operator of the system and owner of the transport networks. It has also recently been granted the management of pump installations on the islands insofar as it has considered them as systems to improve the management of the system and not generation.

The role of the system operator in a model which prioritises the electrification of demand, generation with renewables and, above all, self-consumption, is key. Therefore, **its management and strategic plans must be an instrument which prioritises social interest** and not the financial interests of shareholders and executives.

In view of the role they should play in the future, the changes to be carried out are:

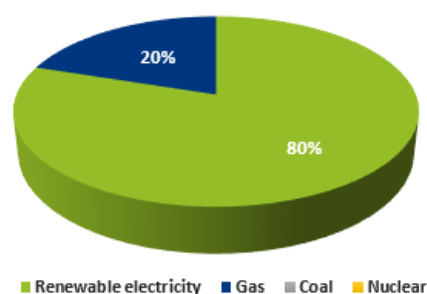
- **The shareholding and functional separation of the system operator**, including the assets that are required to carry out their role with those owned by the high-voltage networks.
- **The configuration of the system operator in the future as a public company** and owner of the management and regulation centres and assets that are required for the correct operation of a de-centralised and distributed electricity system, establishing the mechanisms that guarantee its independence and activity and leaving outside its remit participation in activities that are not strictly required for its functioning.
- The system operator may maintain **ownership of the storage systems** with the sole task of working for the manageability of the system.
- The **company owning the transport system must be independent from the system operator**, without one having shares in the other, but subjecting its development to the needs of the system and the national energy plan. If it is considered as such, its ownership may be 100% private, but in accordance with the mandate of the system operator, both in terms of the operation and growth needs.

By applying the proposed measures and fulfilling the objectives of the electricity sector, the coverage of demand will be transformed by 2030 as follows:



Graph 18. Coverage of electricity demand in 2015.

Source: Fundación Renovables.



Graph 19. Coverage of electricity demand in 2030.

Source: Fundación Renovables

IX. Taxation

One of the basic principles in developing this proposal is having an **ad hoc tax policy** for the proposed objectives, not only to promote what it wants to support, but to penalise what is wants to discourage, a procedure that is doubly effective for substitute goods.

The objectives of this tax proposal do not solely consist of increasing pressure or collection but also **modifying the origin and destination of the collected funds**, as well as using tax pressure to enforce changes to consumption habits.

The consideration of a new tax procedure for energy sources and consumption must be accompanied by **extensive regulatory development**, as well as its application in the different types of taxes in order to be more effective: Personal income tax, Corporation Tax, Business Tax, Excise Duties, etc. Below are some examples of the concepts that must be progressively taxed and how the collected funds are allocated.

IX.1. Increase of taxes

When the origin of the funds has the following considerations:

- **Energy inefficiency** in commercial equipment according to the energy certificate.
- **Inefficiency in buildings** according to certification, which can be translated into an increase of the Land Valuation Tax (LVT).
- **Registration and circulation of internal-combustion vehicles with fossil fuels** depending on the level of emissions.
- **Recreational craft** and vehicles considered a **luxury**, such as aircraft, etc.
- **Generation of electricity with fossil fuels**, according to performance, manageability and emissions.
- **Nuclear generation** for financing waste management and covering risks.
- **Waste** incineration.
- **Surcharges** on fossil fuels.
- **Eliminate tax concessions** for fossil fuels and, especially for gas, in cases in which there is an electricity alternative (in contrast to the [Movalt Plan](#)).
- **Remove** the Hydrocarbon Excise Duty **exemption** for aviation.

- **Remove** the Registration Tax for **recreational aircraft and boats**.
- **Review the subsidy** on the Business Tax **for companies outside the urban centre**, provided that they do not carry out activities that are dangerous to health.
- **Disincentivise excessive urban development**, taxing new urban development and promoting compact urban planning (tax on changing the use of the land).
- **Progressive consumption of energy** according to contracted power.
- **Tax on capital gains** for asset disposal.
- Environmental practices that are **not recommended**.
- Amendment to the Excise Duties Law, with an **excise duty on the most polluting fuels** and elimination of exemptions for uses that are not recommended, such as heating.
- **Elimination of the tax** on the production of electricity.
- **Elimination of direct and indirect subsidies and incentives** for fossil fuels and electricity generated with them or nuclear energy.
- **Modification of taxes** for business activities.
- **Elimination of deductions** for investments in non-renewable energy and the removal of compensation for negative bases according to the activity of the company subject to the tax.
- **Modification of the Corporate Tax** according to activity.
- **Refining** activities.

IX.2. Reduction of tax pressure

Tax reduction and application of funds for:

- **A public investment and tax plan to promote energy rehabilitation of buildings**, in accordance with the VAT reduction, the existence of tax reliefs, the LVT reduction, the subsidy on investment, interest rates and financial guarantees, with a special consideration for homes with few resources and nearly zero energy consumption buildings.
- **Applying** part of the excise duty of fossil fuels to the electricity tariff, due to the larger contribution of electricity to the introduction of renewables.
- **Reducing VAT** for equipment designed for generation at consumption.
- **Reinforcing the [Movalt Plan](#)**, extending the budget and providing it with stability so that it decreases according to the vehicle fleet, which is exclusively electric.
- **Reducing** Registration and Circulation Taxes for zero-emission vehicles.
- **A plan for deductions on investments in assets** that generate with renewable energy.
- **Personal income tax deductions** for investments in renewable energy sources, efficiency, acquisition of transport cards, acquisition of zero-emission vehicles, etc.
- **Reducing VAT for efficient** equipment according to compliance with the required certification level.
- **Business Tax subsidies** for companies with group transport, a mobility plan or an environmental management system (EMAS).
- **Introducing a deduction** for workers who acquire public transport cards.
- **VAT reduction** on the social electricity tariff.
- **Removal** of the excise duty on electricity.

- **Tax relief and subsidies** for industrialisation plans for recovering mining spaces.
- **Tax relief and subsidies** for R+D plans and technological development.
- **Tax incentives** for applied training.

In order to implement the different plans and proposals, we propose **amending the Hydrocarbon Excise Duty** by increasing the tax on fuels deriving from liquid petroleum by **€0.05 per litre and from natural gas by €1 per MWh**.

In the first year, this increase would enable a collection of approximately €3.5 billion, which will be allocated in the yearly calculation as follows:

- | | |
|-----------------------------------------------------|---------------------------|
| • Development of urban plans: | €1 billion/year |
| • Rehabilitation of vulnerable homes: | €1.25 billion/year |
| • Rehabilitation of non-vulnerable homes: | €250 million/year |
| • Replacement of boilers for heat pumps: | €150 million/year |
| • Home automation and demand management: | €100 million/year |
| • Electric vehicles and charging facilities: | €750 million/year |

As the collection should decrease over time due to the elasticity between demand and price, the distribution of available funds will be allocated to the same items, while the portion allocated to rehabilitating vulnerable homes will remain the same.

The tax will initially last six years until 2025.

X. Promotion of citizen participation and dissemination

The imminent climate change emergency requires essential changes to society, changes which cannot wait in any case. **Fundación Renovables** works to fully involve the public administration, media, private sector and, last but by no means least, the citizens in the change of energy model.

Therefore, one of the main motivations of the previous nine chapters in this document was to make citizens fully aware of their **responsibility** and **assumption of basic concepts about energy**, as well as to make them environmentally and politically aware of the change of energy model. **A new citizenry for a new energy model.**

From our perspective, it is essential to know in order to participate. Without knowledge, no change is possible and as a result, the change of energy model will not be a reality if all the social agents involved do not achieve an energy and environmental transformation which makes it possible to have a fairer, more efficient and enduring system. If our greatest requirement is the change of model, we request a total change of citizens' thought as a result.

The demand for knowledge and access to information must be transversal, with continuous feedback between all the participants. In this respect, the public administrations, private sector, media and citizens must send and receive information in a constant flow of knowledge that nurtures all those involved.

Ultimately, **we must all demand, and demand of ourselves, a high level of responsibility**, taking into consideration that it is a highly impactful and significant matter that currently affects us all and, of course, will affect future generations.

In this respect, **Fundación Renovables** wants to be one of the many articulating agents that work to make citizen participation real and effective, and also fully integrated in the current social and political agenda.

As we have stated so far in this document, if we are committed to an energy system based on demand and not on supply, this same model must be applied to citizens, who should demand more instead of waiting to consume. Therefore, they should find out more instead of waiting to be told. **In summary, knowing what to consume, being responsible and demanding responsible behaviour from all the agents involved in climate change.**

X.1 100% sustainable citizenry: ten points

Citizens must learn about the big concepts regarding climate change, energy and consumption. This is the only way to know what must change, what can change and if the changes desired are feasible in terms of efficiency, sustainability and impact.

A citizen cannot fight against climate change if they are not responsible and informed because the assumption of such a broad concept requires taking into account another type of content that goes from particular to global. That is, every citizen must know about the impact of not using fossil fuels for heating at home, the effects of a diesel car and effects of 100% electric public transport.

In this respect, **100% sustainable citizenry** is determined by the following ten points:

- 1. Demanding accurate, clear and thorough information** from media, energy suppliers, associations, companies and public administrations.

2. **Learning about the significance of climate change** and our role in increasing the temperature by two degrees. Understanding that the future of the planet depends on a new energy model in which eradicating fossil fuels is a need and not an option. Having basic knowledge of sustainability, renewable energy, bills, energy saving and efficiency, recycling and landfills, mobility, climate change, self-consumption, etc.
3. **Committing to different renewable energy** for the change of energy model.
4. **Knowing that environmental sustainability is not linked to political views.** It is a transversal issue united by better survival and maintenance of the planet.
5. **Assuming self-consumption as a key mechanism** for environmental and energy responsibility.
6. **Adopting sustainable mobility behaviour:** walking, using public transport, carsharing and carpooling, etc.
7. **Recycling due to conviction and knowledge, not fashion.** Learning about the impact and need to recycle.
8. **Participating actively in society,** becoming as involved as possible in associations and social movements. Disseminating what you know. In other words, socially educating in your private sphere.
9. **Understanding and learning about the carbon footprint** of the clothes you wear, the items you purchase, etc.
10. **Energy consumption from the view of demand** and not supply, under a prism of saving and efficiency.



A 100% sustainable citizenry must understand what we as a society are faced with in terms of pollution.

Image 7. Air pollution in Madrid.

X.2. Social agents and citizen participation: public administration, companies, media and groups

The change of energy model does not make sense if there is no return for society. That is, the public administration, companies, media and associative fabric have to work to promote citizen participation around their own means and instruments.

X.2.1. Public administration: national, regional and local

National and regional administration

Although they make the least legislative and communicative effort, they are certainly **the levels of administration that must work the most** to ensure the change of energy model and fight against climate change are always on the political agenda in Spain. Each level of competence requires different legislative and regulatory development, but both act in accordance with the Spanish constitution, in which there is express recognition for the state and the autonomous communities regarding **legislative development on protecting the environment**.

City councils: participatory budgets for energy

Due to the lack of strong and active state policy for the fight against climate change, **local administrations become a fundamental factor in promoting citizen participation**.

City councils, by recovering their traditional and original role of being the closest administration that best channels the demands of citizens, **must be agents of environmental change** through public policies and local budgets that not only are politically geared towards transforming the energy model, but also ensure that citizens are active participants during the whole process. Therefore, the strategy must take into account the **adoption of good practices among citizens** by implementing policies and actions designed to achieve sustainability, energy efficiency, commitment to renewable energy and an improved energy culture.

City councils, regardless of their political orientation, must follow clear strategic lines to ensure citizen participation is a fundamental constant of local political action, with **citizen participation in creating local budgets**.

City councils are constructed from the bottom up and, in accordance with this premise, the local budgets must be drawn up while taking into account citizens' aspirations for achieving the objectives of every council.

In this respect, the budgets regarding energy efficiency and saving must:

- **Establish a prior diagnosis** through the district councils or, if applicable, the offices of the different neighbourhoods and parishes.
- **Include the demands of the main neighbourhood associations** regarding the environment, energy and energy consumption.
- **Meet the requests of the energy cooperatives**, if there are any.
- **Disseminate the budgets** among the citizens so they are aware of the content, and the argument and approval period.

X.2.2. Associative fabric

The associative fabric is fundamental for channelling the demands of citizens and transforming them into demands aimed at the political class. The work carried out by consumer associations related to the environment and the fight against climate change, trade unions, or the essential neighbourhood associations is a key aspect to re-establishing the citizenry as a sector that demands changes, fights for those changes and never conforms with the status quo.

Every association, especially consumer, neighbourhood and environmental associations, must act as a bridge between the administration and the citizens, promoting and accelerating social changes. That is why they must:

- **Constantly update** the content relating to renewables, climate change, the change of energy model, pollution, etc.
- **Communicate all the information to their members accurately and with a critical perspective**, so that they can draw their own conclusions.
- **Ensure that citizens have sufficient tools** to learn about and request the basic information that concerns them as global (climate change, global warming, etc.) and local citizens.
- **Provide transparent information** which is constantly updated and to which most of the members contribute.

X.2.3. Media: stimulating principles for environmental reporting

Media: principles for ethical environmental reporting

The media is essential for changing the model as it is the media that will ultimately disseminate everything that the members involved in the energy model do, at both a public and private level.

In this respect, and as an example, climate change only occupied 0.19% of prime time media in 2015 according to a report from the *Fundación Ecología y Desarrollo* (Ecology and Development Foundation - ECODES), which means there is a lot of work to do in terms of awareness and dissemination in the media.

As a result, there is an **urgent and essential need for environmental education** regarding the following ten points, through the publications from media specialising in the environment and energy:

1. **Developing a new view of energy** as a basic, costly and especially limited good.
2. **Leaving behind the energy and economic model based on fossil fuels.**
3. **Moving towards a model in which renewable energies are the main support** in energy production.
4. **Developing an energy model which is based on demand** and not on supply.
5. **Promoting a new energy system based on electrifying the demand** produced at source with renewable technology.
6. **Monitoring the large companies in the energy sector and the public policies of the national, regional and local administrations**, exposing abusive policies and calling for a change when necessary.
7. **Promoting new means of transport** (public and private), in accordance with sustainability and energy efficiency.
8. **Encouraging self-consumption**, so that citizens are independent, responsible and consistent.
9. **Ensuring the demand of citizens at a local level changes the energy model** at a global level.
10. **Administrations, media, companies and citizens** must be aware of these axes and act accordingly.

X.3. Transversal lines of action

Fundación Renovables tries to extend the change of energy model to the agents mentioned above through lines of action including education, dissemination of good practices, clear communication from administrations and transversal promotion of the energy culture.

X.3.1. Education: curriculum design. Proposal for students, teachers and parents

In addition to the obligatory study of literature, mathematics and history, we believe it is very important **to incorporate environmental, energy and climate change education** into all the education curricula at primary and secondary school.

It is impossible to achieve the objectives of the Paris Agreement without education of environmental and climate change issues at primary school. With regard to the curricula, **Fundación Renovables** makes the following proposals:

- **Primary education.** Introduction to basic aspects in classes related to science and knowledge of the environment, such as respect for the environment, awareness that energy is a scarce and limited resource or global warming. This would all be adapted through gamification and storytelling techniques for the smallest students.
- **Secondary and Basic Professional Training.** Introduction to a more reflexive line to make students aware of the problems caused by climate change, the need to change the energy model, the eradication of fossil fuels, different renewable energies, etc.
- **Sixth Form and Advanced Professional Training.** Treating students with responsibility and maturity, encouraging them to reflect on the consequences of certain habits, making them aware of the environmental policies carried out in Spain, creating and promoting their critical capacity regarding the main environmental, climatic and energy concepts.
- **Teacher training.** Teaching students is not possible without teachers also receiving the necessary training from experts, so they acquire the theoretical and practical skills required for the level of education that they deliver.
- **Parents.** The role of parents cannot be ignored either in this environmental education process and co-responsibility must be sought, meaning parents are not only active, but also promoters of the change through actions in which they participate alongside their children at school and at home in carrying out the tasks and projects they are assigned.

X.3.2. Transparency and clear communication from all administrations

All policies implemented by any public administration regarding energy and the environment must feature a **high degree of transparency and accessibility**. In this respect, they must implement actions to:

- Ensure that all energy communication is made in accordance with **principles of clear communication**, in which simplicity is the motor and main aspect of all messages from any public administration regarding energy and the environment.
- Ensure that the information communicated by the public administrations is **complete and thorough**. Make **simplification** a stimulant whereby society receives comprehensible information.
- **Universalise knowledge** so that all citizens, regardless of their economic or education level, can understand and access the information that pertains to them as responsible consumers and citizens.
- At the same time, it is recommended to provide quick access to **digital** information that citizens demand in order to disseminate the information as far as possible.

X.3.3. Active promotion of the energy culture

It is impossible to change the energy model if the change we require is not implemented by citizens through the adoption of a more present energy culture in today's society, in all spheres of economic, social, education, work and political life.

That is why it would be useful to develop the following aspects:

- **Consideration of citizens as active subjects** from a participatory perspective and philosophy, giving them a predominant role in the centre of the political debate on sustainability and energy.
- **Information and promotion of self-consumption**, incentivising its practice in order to achieve maximum penetration among citizens.
- **Creation of guides and materials** that encourage and promote self-consumption.
- **Creation and dissemination among citizens of practical manuals** on matters relating to climate change and the two-degree increase in temperature (what is at stake and what we are faced with), energy consumption patterns, recycling and landfill management, polluting emissions from vehicles and analysis of atmospheric pollution.
- **Regular reports** on the initiatives that the different administrations implement to promote the energy culture.
- **Initiation of media campaigns** for energy efficiency and saving.
- **Promotion of citizen consultations** regarding energy and the environment.
- **Improvement of knowledge** of the ecological footprint and the environmental impact.

X.3.4. Dissemination of good practices

The companies, trade unions, associations, political parties, administrations and media must act as **transforming agents** capable of contributing to the change of energy model. The following would be required for this:

- **Better and clearer communication between energy companies and consumers** regarding prices, auctions, consumption, bills, concepts, price changes, contracts, etc.

- Public administrations that will provide **citizens with information on legislative initiatives regarding energy**, explaining their social impact.
- With regard to heating and air conditioning, **encouraging the implementation**, as far as the financial constraints of the companies allow, **of heat pumps and replacing natural gas, electric radiators and other inefficient cooling and heating systems.**
- In terms of energy saving measures, **promoting the installation of insulation measures** to favour saving and efficiency.
- **Disseminating good practices for employees** by creating manuals on recycling, turning off lights, computer equipment, etc.
- **Informing employees about supply invoicing** from collaboration and awareness, so that they can learn if the measures to be adopted will have results in terms of saving.
- Reporting on the **CO2 emissions** of large polluting companies.
- Reporting on **polluting indices.**
- Disseminating **de-energisation manuals.**
- Promoting **changes of efficient environmental habits.**

ANNEX

Scenarios and outcomes

Escenarios y resultados

Consumo final total 2015	991	TWh	80	Mtep
Consumo Electricidad 2015	248	TWh		
crecimiento PIB FR	1,50%			
Crecimiento PIB 2030/2015	25%			
mejora intensidad anual FR	3,3%			
Consumo final total 2030	743	TWh	60	Mtep
Consumo Electricidad 2030	372	TWh		
Consumo electricidad 2030 s/ total	50%		372	TWh
Incremento demanda electricidad 2030/2015	48%			
Incremento anual equivalente	2,6%			
Generacion ER 2015	40%		99	TWh
Reduccion demanda s/2015	25%			
Reduccion demanda sobre tendencial 2030	40%		496	TWh
Generacion electricidad con ER	80%		297	TWh
Incremento ER			198	TWh
Aporte renovable		49,7%		
Vehiculos matriculados				
2015	21.000.000			
2030	17.850.000	15%		
VE 2030	5.290.390	30%		
Rehabilitacion				
Reduccion demanda Electrificacion	40%			
Reduccion demanda rehabilitacion	60%			
Mejora sistemas de combustion	80%			
Edificios Residencial 1ª Residencia	17000000			
Rehabilitacion	4750000	28%		
vulnerable	1500000			
no vulnerable	3250000			
electrificacion	8000000	47%		
Actuacion edificios	12750000	75%		
	2015	2030		
Consumo de petroleo	39,9	13,3		
Reduccion importaciones		26,6	9245	Millones €
precio bbl	60	60		
Consumo de gas	14	11		
EMISIONES MTeCO₂	1990	2015	2015/1990	2030
Energia directa	194,7	238,0	22%	98,4
otros refino+ emisiones fugitivas	17,0	17,0		5,7
Total	211,7	255,0	20%	104,1
				2030/1990
				2030/2015
Dependencia exterior		83%		50%

Escenario Fundacion
Datos
Resultados





Fundación Renovables

comuniacion@fundacionrenovables.org

www.fundacionrenovables.org

C/ Pedro Heredia, 8. 2º Dcha. 28028 Madrid

Tel. 625 474 211