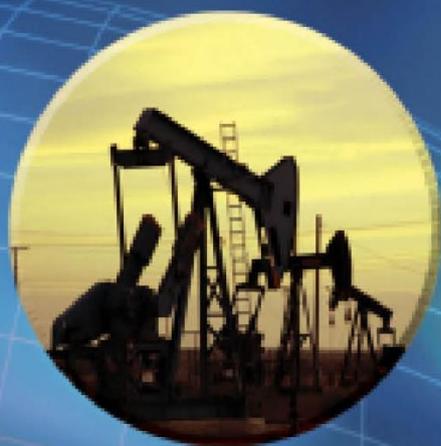


# Management and promotion of energy infrastructures

## Executive summary



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# MANAGEMENT AND PROMOTION OF ENERGY INFRASTRUCTURES

## REPORT

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Consell de Treball,  
Econòmic i Social  
de Catalunya

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Barcelona, September de 2015

## 1. EXECUTIVE SUMMARY

### 1.1. REGULATORY FRAMEWORK

This chapter analyzes the regulation of the electrical infrastructures and the hydrocarbons infrastructures.

Despite the key role of energy in the origin of the EU, it is not until 2007 that energy policy is recognized as a common policy. The main guidelines of the EU in relation to energy, all of them closely linked together, are:

1) Energy and climate: The objectives of the Europe 2020 Strategy are to reduce the emissions of greenhouse effect gases by 20% (30% if the conditions are appropriate) compared with 1990; to increase the share of renewable energy in final energy consumption to 20% and achieve a 20% increase in energy efficiency by 2020, with the possibility that the increases in energy efficiency help to reduce building needs of new infrastructures. Starting from the validity of these objectives, in October 2014 the Strategic Framework for Climate and Energy 2020-2030 is approved, establishing the following objectives: to reduce, by 2030, 40% of the emissions of greenhouse effect gases in the EU compared to the 1990 level, which will be distributed among the sectors covered by the emissions trading scheme and those that are not; to increase the share of renewable energy in the EU level, at least 27% in the total energy consumption by 2030; to improve energy efficiency at least 27% by 2030 at EU level regarding forecasts of future energy consumption based on the current criteria; this is an indicative target to be revised by 2020 having in mind a level of 30% for the EU.

2) Inner market. To achieve a single European energy market to ensure the functioning of the market, with a fair access and a high level of consumer protection as well as high levels of interconnection and generation capacity. It is still an objective to be achieved, despite the measures adopted since 1996.

3) Interconnection of energy networks. Interconnection, interoperability and development of trans-European networks of electricity and gas are essential tools for the proper functioning of the internal market for energy and for the market in general. The Strategic Framework for Climate and Energy 2020-2030 reaffirms the commitment that emerged in 2002 to ensure that at least 10% of the electricity generation capacity installed in the country can circulate to other Member States with special reference to the States that have not achieved a minimum level of integration in the internal market, such as the Baltic States, Portugal and Spain. The Regulation on guidelines for trans-European energy infrastructure, which develops the energy infrastructure priorities from 2020, is the strategic framework for the long-term vision of the energy infrastructure of the EU.

4) Renewable energies. In parallel with the determination of the percentage of renewable energy on energy consumption, guidelines are established with regard to the aid schemes for renewable energies as well as to the use of cooperation mechanisms for achieving the objectives set in this area at a lower cost.

5) Security of energy supply. Dependence on foreign energy has two negative consequences: security of supply and the high cost of imported energy. The European Energy Security Strategy contains short and medium term actions to ensure it, which have been ratified in the Strategic Framework for Climate and Energy 2020-2030, approved in October 2014.

6) Energy efficiency and energy savings. The EU starts from the recognition that improving energy efficiency contributes positively to its energy objectives and, in this line, several instruments have been approved, including the Energy Efficiency Directive and the Energy Efficiency Plan 2011.

The election of the new European Commission, geopolitical factors linked to the external dependency of the EU for gas and oil and the new Framework for Energy and Climate 2020-2030 have prompted the creation of the Union of Energy, which becomes one of the priorities of the Juncker Plan and which aims to achieve the following objectives: security of supply, sustainability and competitiveness.

The competence framework for energy derived from the Constitution and the Statute of Autonomy is complex, given the number of different sector titles. The State has the exclusive jurisdiction on the foundations of the energy system and on the foundations and coordination of the general planning of economic activity.

### Electricity

Law 24/2013 of the electricity sector (LES) maintains the basic principles already established in Law 54/1997; among them, it should be emphasized that the electricity sector is qualified as a service of general economic in-

terest and, therefore, it is subject to specific obligations to ensure that the service is provided under conditions that allow it to develop its mission; the system management is attributed to two private trading companies; it establishes the separation between regulated activities (transport and distribution) and the ones that can be developed under free competition (generation and supply); it recognizes the freedom of access to transport networks and distribution on payment of the tolls; an independent regulator in the sector is established: the National Commission of Markets and Competition. The LES introduces some novelties, among which we should highlight the principle of economic and financial sustainability as a guiding principle that implies the capacity of the electrical system to meet all of its costs so that revenues are sufficient to deal with them and that any measure involving increased costs or reduced revenues for the system is to include an equivalent increase of income or an equivalent reduction of other cost entries that ensures the balance.

The construction, operation, modification, transmission and closure, whether temporary or permanent, of the facilities of production, transport and distribution of electricity require prior administrative authorization.

The right of access of third parties to networks is guaranteed, so that producers, retailers and consumers can use networks in exchange for the payment of access fees.

The electric power production is developed under a free competition regime. The LES includes the scheme introduced by Royal Decree-Law 9/2013, abandons the distinction between ordinary and special regime and sets the concept of reasonable profitability.

The LES also incorporates a specific regulation about self-consumption, which until that moment had not had a single regulation. Therefore, pending the regulatory development of the LES, self-consumption is linked to the consumption of energy that does not come from the distribution network, although the existence or not of a network connection is relevant to determine the applicable legal regime; in particular, it should be highlighted that consumers under any form of self-consumption will be required to contribute to the costs and services of the system for the self-consumed energy when the generation or consumption installations are totally or partially connected to the electrical system. The regulatory development of the so called "support toll", pending approval at the time of preparing this Report, is one of the issues that has generated more reactions in relation to the consumption regulation.

The activity of electricity transport has the character of natural monopoly and is considered a regulated activity. Red Eléctrica de España (REE) is the only carrier and operator of the electricity system and as such is responsible for the development, expansion and maintenance of the network. As the system's operator, its role is to ensure the continuity and security of electricity supply and the proper coordination of the production and transportation system. It is responsible for setting the forecasts of energy demand and operate in real time the facilities for electricity generation and transmission, making that the production scheduled by the electric power plants matches the power demand of the system in each case.

The activity of electricity distribution has the character of a natural monopoly and is considered a regulated activity. It aims at the transmission of electricity from the transmission networks or, where appropriate, from other distribution networks or from the generation connected to the same distribution network until the points of consumption or other distribution networks in appropriate quality conditions with the ultimate aim of providing it to consumers.

## Hydrocarbons

The Law of the hydrocarbon sector (LHS) contains the foundations of the legal activities related to liquid and gaseous hydrocarbons, recently modified in order to fight the tariff deficit in this sector as well as, among others, to regulate certain tax and non-tax measures in relation to the exploration, research and exploitation of hydrocarbons in order to harmonize the risk and profitability of these activities with the general interest, so that, according to its explanatory statement, the economic rents derived from the discovery of new hydrocarbon deposits can be reinvested in society as a whole.

The LHS removes the State's reserve with regard to the hydrocarbon deposits, existing from the Law 21/1974, which entrusted the State, in general, with the research and exploitation of hydrocarbon deposits. Nevertheless, it establishes an administrative control by means of the previous granting of a qualifying title based on the principles of objectivity, transparency and non-discrimination to explore, investigate and exploit hydrocarbon deposits.

The regulation of the market of petroleum products contained in the LHS removes the previous general system of prior authorization for the development of oil activities and maintains the authorization for installation facilities subject to the development of these activities.

The LHS, starting from the process imposed by the European Union, aims to make progress in the liberalization of the gas sector. It considers gaseous fuels the natural gas (including liquefied natural gas and compressed natural gas) and manufactured or synthetic gas fuels, distinguishing between the mixtures of natural gas, butane or propane with air; biogas and other gases obtained from biomass and any other type of manufactured or synthetic fuel gas or fuel gas mixture with air. Anyway, most of the regulation of the LHS in relation to gaseous fuels makes specific reference to the natural gas system.

The LHS recognizes freedom of entrepreneurship for the exercise of the activities of natural gas supply by pipeline (acquisition, production, liquefaction, regasification, transportation, storage, distribution and marketing). These are considered activities of general economic interest and the State must guarantee the supply of gas while simultaneously it must guarantee the free enterprise initiative. Consequently, regasification, basic storage, transportation, distribution and management of economic and technical nature are regulated activities and, therefore, the operating system and the economic system are established by LHS.

Enagas, SA is considered as the technical manager of the gas system and is responsible for organizing the proper functioning of the gas supply in order to ensure the continuity and security of natural gas supply and the proper coordination between the access points, the warehousing, transportation and distribution.

With the approval of the LHS and the abandonment of the consideration of gas supply as a public service, concessions for activities included in the public service of combustion gas supply by pipeline were abolished and replaced by indefinite administrative authorizations which entitle the holder to exercise the activities subject to the concessions that are declared extinct, through the appropriate facility rooms.

The third parties access to the network is in conjunction with the separation of activities, the instrument used to promote the emergence of competition in the gas market. It guarantees the right of third parties to gain access to the facilities of the Basic Network and to the facilities of transport and distribution. The owners of these facilities are obliged to allow access to them by third parties. The obligation to provide access is a requirement of general interest.

The economic regime of the regulated activities established in LHS and in its regulatory development by Royal Decree 949/2001 has been recently reformed, given the proven existence of imbalances between revenues and costs of the gas system. The new economic regime is based on the principle of the economic sustainability of the gas system and the long-term economic balance that takes into account fluctuations in demand, the level of development of gas infrastructures existing today without compromising the principle of adequate remuneration of investments in regulated assets or security of supply.

## 1.2. FUTURE CHALLENGES OF PLANNING IN THE FIELD OF ENERGY

This chapter provides an analysis of the variables that influence energy planning from the international, European, national and Catalan point of view and of the future challenges of energy planning in general as well as those of oil, gas and electricity in particular, including the projected goals already planned and their achievement degree.

### Socioeconomic context and energy planning

To change the energy base of a country requires planning, projecting objectives and establishing regulatory and monitoring measures in order to achieve the projected goals. However, often it is planned without clear objectives, it is not regulated to achieve planned objectives and evaluation and planning are not backed up. The elements that determine the Catalan energy planning are set out below, apart from the dependence on oil and fossil fuels (ratio of net energy imports to gross domestic primary energy consumption), which is 76%.

The elements of the **international context** that influence the planning are: 1) the reserves of oil and gas, which depend on the production flow, technology and economic and political factors (oil peak, rate of decline, unconventional reservoirs, hydraulic fracking, etc.); 2) the nuclear risk and the advisability to extend or not the lifespan of nuclear power plants, 3) geopolitics and conflicts in the Middle East, North Africa and Ukraine, 4) fluctuations in oil prices; 5) the reduction of greenhouse gases and the market for CO<sub>2</sub>, 6) the environmental impact and the regulation and 7) the increase in population, welfare and energy consumption.

The elements of the **European context** which influence planning are related to the European energy policy. For years the EU energy policy has been characterized by the predominance of national solutions and a lack of planning, strategic vision and coordination. But lately the EU has made an integration effort based on three pillars: security of supply, economic competitiveness and environmental sustainability. In this regard we should point out the Juncker Plan, which focuses on investing in gas and electricity interconnections and on a common external energy policy, as well as the 2020-2030 Strategic Framework, that aims to reduce (-40%) greenhouse gas emissions (GHG) and increase the share of renewable energy (27%), energy efficiency (27%) and the interconnections (15%).

The **Spanish context** has been heavily influenced by the economic crisis, the reduction of demand, the increase of installed capacity and the tariff deficit. The mandatory State planning has focused primarily on interconnections, meshing and energy distribution and indicative planning, on diversification, liberalization of the energy sector, energy saving and efficiency and renewable energy, among others. In the context of the Spanish State, there are two outstanding plans: the 2011-2020 Renewable Energy Plan and the 2014-2020 Energy Efficiency Plan, with specific targets for renewable energy and energy saving in the short term (2020).

Finally, the **Catalan context** is characterized by the low quantity of areas of competence on energy and its dependence on imports of energy products, which account for half of the Catalan trade deficit. In fact, the evaluation of the Catalan energy policy and planning is difficult because of the lack of clear objectives and an annual updated energy balance. The latest data are from 2009 and showed that: 1) the available energy for final consumption accounted for 72% of primary energy; transport (25%), industry (16%) and domestic sector (10%) were the main consumers and the degree of supply (24.6%) had worsened since 1990.

As for the degree of achievement on projected objectives in the 2012-2020 Energy Plan and Climate Change in Catalonia, it is observed that those found at greater distances (> 70%) are: the production of renewable primary energy (wind, biomass and biogas) and final consumption of electricity and renewable fuels (biofuels).

### Future planning challenges in the oil field

The main oil producing countries are Saudi Arabia (13%) and Russia (12.5%), and the major oil-consuming countries are no longer the OECD countries but the emerging countries (China and India).

As for the security of oil supply, we must take into account the EU Directive which requires to have minimum reserves of 90 days of average net imports or 61 days of average daily consumption (one third in the form of refined products). 44% of oil reserves in Spain are in warehouses in the Spanish Mediterranean coast.

In Catalonia, according to the latest data (2009), the degree of oil supply is 1% of primary energy consumption.

Despite the improved capacity of storage and transport of petroleum products in recent years, it is observed that the warehouses capacity of the Compañía Logística de Hidrocarburos (CLH) in Catalonia (606 ktoe) represents

8.4% of final oil consumption in 2009 and that, although the minimum oil reserves recommended by the EU Directive in the State are guaranteed, the capacity in Catalan territory remains below 1,795 ktoe.

The objectives projected in the Energy Plan and Climate Change 2012-2020 are to reduce primary (-71%) and final oil consumption from 2009 to 2020. The Plan aims to reduce oil dependency between 2009 and 2020 by nearly six percentage points (from 47.2% in 2009 to 41% in 2020), which means reducing imports, primary consumption and final consumption of oil.

In order to reduce (-17%) final oil consumption between 2010 and 2020 as it is projected in the Energy Plan and Climate Change in Catalonia, the sectors that will have to make a greater effort are: domestic with diesel oil (-48%), services with LPG (-37%), industry with fuel oil (-18%) and transport with diesel oil and petrol (-16%).

### **Future planning challenges in the field of gas**

Overall, global world demand for natural gas has increased, whereas in the EU has fallen. The priorities of the EU in terms of natural gas are the gas interconnection between the Mediterranean Basin and the Northern corridor.

As for the security of natural gas supply, the dependence on Algerian natural gas in Catalonia is 57%. Currently a warehouse in the salt cavities of Balsareny is being built, which will guarantee 14 days of average consumption of natural gas.

Consumption of natural gas represents a third of the primary energy consumption of Catalonia and a quarter of the electricity consumption (combined cycle), according to the latest data (2009). The goals projected in the Energy Plan and Climate Change are the extension of the natural gas network and the construction of propane local networks in the municipalities where natural gas is not forthcoming.

Natural gas is establishing itself as an emerging fuel in the road transport sector, especially in the heavy transport sector.

Catalonia is one of the autonomous communities of the Spanish State that consume more gas (18.7%). However, the 2012-2020 Energy Plan and Climate Change in Catalonia foresees reducing dependence on imports of natural gas (-10%) and primary consumption of natural gas (-18%) during the period 2007 -2020 .

The forecast of the Plan is to increase the final consumption of natural gas in industry and, especially, in transport, and to reduce it in the electric and primary sector and also in the domestic sector and services. This last point is in contradiction with SEDIGAS projected goals to increase demand in the domestic and commercial field.

### **Planning future challenges in the field of electricity**

In the EC 2050 Roadmap, electricity has an increasing weight and could represent between 36% and 39% of energy demand. One of the identified priorities is the South-West interconnection, which would give way to the production of electricity from renewable sources (hydroelectric, wind and solar). In this sense, the very high voltage electrical network (VHV), funded by the EU, will allow to exchange 6% of electricity demand, approximately 2,800 MW, and could be increased to 4,000 MW in 2020.

In the field of electricity, one of the main difficulties is the accumulation of electric power. This storage capacity is 5% of the installed capacity in the European Union and 11% in Spain, thanks to the reversible hydroelectric power plants.

Moreover, we must bear in mind that electricity prices in Spain are above the average of the EU27 and that, according to the National Energy Commission, planning of the electricity sector in Spain should take into account transparency, competition, participation of end consumers in the energy market as well as income and expenses in order to be sustainable.

The Energy Plan and Climate Change in Catalonia foresees that the production of electricity (+20%) will increase during the period 2009-2020 and the electricity generated by renewable energy will become three times bigger. One of the most important areas is transport, namely, changes in mobility and electric vehicles.

The Energy Plan and Climate Change also mentions the need to invest in smart grids, both in rural areas and in cities as part of a distributed generation model, but without developing it.

As for the electricity consumption, the Energy Plan and Climate Change in Catalonia foresees that it will increase and go from 27% (2009) to 30% in the short term (2020). Although the sector of economic activity that will consume more electricity will be the industrial one, the Plan provides that electricity consumption will increase in transportation, domestic and services sectors.

Catalan society has been electrified (1990-2009) in recent years; in fact, the electric intensity of Catalan society and the final electricity consumption per capita have increased, so that the fact of saving it is important as well as energy efficiency. In this area, the Catalan Strategy on Energy Renovation of Buildings, approved by the Government of Catalonia, plans to reduce energy consumption (-14.4%) during the period 2010-2020 and also CO<sub>2</sub> emissions (- 22% ). In this area self-production and self-consumption are very important and also the heat and cold urban networks, since the incineration of renewable wastes or biomass boilers can contribute to produce heat for heat distribution. Concerning transport, mobility changes and the electric, hybrid and gas vehicles play a leading role. In other areas, such as the domestic one and services, smart metering and the price will be the variables with a greater weight.

In terms of installed power, Catalan planning expects to triple renewable installed capacity to represent 49.4% of the total one, but the delay of investment in production facilities for renewable electricity, such as wind, will hinder the achievement of this objective relating to wind power, solar energy, biogas and biomass. Actually, of the 15 Catalan wind installations existing in 2015, only 6 are entitled to bonuses and although self-consumption represents an opportunity for consumption of indigenous energy and for industry, services and agriculture, it hits many barriers.

### **1.3. DIAGNOSIS OF THE CURRENT SITUATION AND NEEDS**

#### **Petroleum**

The oil infrastructure stock in Catalonia consists of a refinery in the Camp de Tarragona with a refining capacity representing approximately 12.0% in the whole of Spain. The oil pipelines network running through the territory joins the two main Catalan ports (Barcelona and Tarragona), and the entry points of liquid hydrocarbons, with the four provincial capitals, while connecting Catalonia with part of the Iberian Peninsula via Zaragoza. Also, Catalonia has storage tanks for petroleum, both in the provincial capitals as in the ports of Barcelona and Tarragona, as well as an extensive network of petrol stations (about 1,300).

The consumption of liquid fuels has decreased considerably as a result of the economic crisis, both in Catalonia and in Spain and other countries (mainly European countries). This decline has occurred in both petrol and diesel oil, being the last one the most consumed fuel in the automobile industry (81.3% in 2013). Thus, the Spanish refineries produce more gasoline than is consumed in Spain, so that the rest is being exported. In contrast, production of diesel had not been sufficient to meet demand until 2014, which made necessary to import refined diesel oil, although nowadays production and consumption are at similar levels, as a result of experienced consumption decline.

The price of crude, which stands out for its volatility, has experienced an upward trend over the past 15 years, although in recent months has suffered a sharp decline. Finally, we must highlight that the price of petroleum products in Spain is above the European average before taxing, although the lower tax burden puts the after-tax price of derivatives below the European average.

#### **Gas**

As for the gas infrastructure, Catalonia has tanks for liquefied natural gas in the Barcelona Port and a transport network connecting from Tivissa to the north of the Iberian Peninsula and the Spanish east, through which gas is imported from North Africa through Almeria and Tarifa. As for the distribution network, it is in a more advanced point of maturity than the existing network on the rest of the State.

Gas consumption in Catalonia increased considerably until 2008, to step back slightly with the onset of the economic crisis, mainly as the result of the decline in gas consumption for electricity generation. Thus, in 2012 the industry concentrated 43.9% of gas consumption in Catalonia, followed by the plants for power generation, representing 23.7%, the domestic consumption, which represented 15, 5%, and services, with 10.5%.

The gas price in international markets has experienced a significant increase over the past 15 years. We must stress that in Spain the price for the consumer before taxes is one of the highest in Europe, and that, once these taxes are incorporated, the price is also above average, although with a shorter distance.

## Electricity

The stock of electrical infrastructures with which Catalonia counts is characterized by a high presence of nuclear energy and combined cycles, and a lesser presence of renewable energy than most European countries. The evolution of the installed capacity shows a significant increase in the years before the crisis, with significant power increases in renewable energy (mainly wind power) and combined cycles, aimed to cover intermittency in the operation of facilities based on sources of not adaptable renewable energy (wind and solar ones). The concentration of installed capacity in the province of Tarragona is also noteworthy, in contrast to the limited participation of the province of Girona in the generation of electricity.

The number of hours of operation throughout the year of wind power plants, coupled with the decline in demand as a result of the economic crisis, has considerably reduced the average number of hours of operation of the installed power, especially in the combined cycle plants.

As for the electric power transmission network, it has increased in recent years, with outstanding projects such as the high voltage line linking Catalonia with France. The investment in the distribution network has also grown, especially during the years before the economic crisis.

As for the price of electricity, it has increased considerably in recent years, as a result of increased tolls set by the State to compensate the costs of regulated activities in the electricity sector, which have grown over the increase of revenues, creating a deficit in the electricity sector. Thus, the price of electricity in Spain before taxes is one of the highest in Europe, although a lower tax burden brings it nearer to the European average, but above it.

## 1.4. CTESC POSITIONING. CONSIDERATIONS AND PROPOSALS

### Energy transition

The energy transition is a concept with different definitions. In the scope of this study, the energy transition is defined as the set of measures that should achieve a low carbon economy and less dependent on fossil fuel energy balance.

The development of measures to decouple economic and demographic growth from energy consumption, making a more efficient use of energy resources, involves significant technological, regulatory, economic and social changes. Many of these are specified throughout this document.

Some of these changes have to do with the application of European directives on climate and energy, with investments to produce energy in a distributed manner (decentralized), smart grids and the citizen participation mechanisms which are necessary to transform the energy model.

However, the distribution of powers in the field of energy summarized below limits greatly the development of these measures by the Generalitat of Catalonia.

### Distribution of powers in energy

The scope of action of the Generalitat of Catalonia on energy is limited, given the distribution of powers derived from the Statute of Autonomy, the Constitution and also of the rules of the European Union.

The Statute of Autonomy gives to the Generalitat shared power within the framework of the foundation established by the State and in the exercise of that power it has the legislative power, the regulatory power and the executive function. As the Report sets out, the Statute of Autonomy details several aspects on which the jurisdiction of the Generalitat extends which, generally, is limited to the facilities operating wholly within the territory of Catalonia; it also recognizes competence to participate in the procedure for granting authorization for facilities devoted to production and transport of energy that exceed the territory of Catalonia or, if power is subject to use outside this territory, in the regulation and planning at the State level affecting Catalonia.

This competence must be framed within the constitutional framework, interpreted by the jurisprudence of the Constitutional Court, which grants to the State exclusive jurisdiction on the basis of the energy system; on the basis and coordination of the general planning of economic activity and on the basis of environmental protection. In electricity matters, it also sets a criterion of territoriality by recognizing that the State has exclusive jurisdiction to authorize electrical installations when their use affects more than one autonomous community or the transport of energy goes out of their territory and to legislate, order and grant the resources and the hydraulic exploitation when the waters flow through more than one autonomous community. On hydrocarbons, a matter which has no specific competence title in the Constitution, the constitutional jurisprudence establishes that the criterion of competence attribution in terms of facilities is the intra- or extra-EU character of the exploitation or transport, so that, if the energy use affects more than one autonomous community or transport leaves the territory of an autonomous community, the jurisdiction over the facility belongs to the State and, otherwise, to the autonomous community.

We must also take into account the Community legislation on energy, which is abundant and aims to ensure the functioning of the internal energy market; to ensure security of energy supply; to promote energy efficiency, energy saving, the development of renewable energy and the interconnection of energy networks. The agreed measures to achieve these objectives can not affect the right of Member States to determine the conditions for exploiting their energy resources, to choose between different energy sources and to establish the general structure of its energy supply although, exceptionally, the Council may approve unanimously tax measures in this area and, for environmental reasons, measures affecting significantly the election that a member State will make among different energy sources and the general structure of its energy supply. Starting from these assumptions, and taking as a base the 2030 Energy and Climate Framework Agreement, we must take into consideration the Framework Strategy for the Energy Union which focuses on energy security, solidarity and trust; the internal energy market; energy efficiency to moderate the EU energy demand and the decarbonization of the economy.

Despite these limitations, the Generalitat of Catalonia should use its scope for action within the competence framework to promote measures that are part of what we consider the energy transition.

## **Social actors**

Both the Public Administrations and the whole society have responsibilities concerning the energy transition.

- Public administrations (EU, Spain and Catalonia) shall have their proper due diligence in adopting measures concerning their various areas of competence, which are specified in this document.
- However, the engine of change in this energy transition should be society, led by Administrations promoting appropriate policies. People individually, groups and institutions collectively must be the agents of change and should be part of this energy transition; therefore mechanisms should be established for citizen participation and the Administration should encourage measures to change the behaviour of individuals, groups and organizations in order to save energy and make an efficient use of it.

## **In the general field of energy transition**

### **The CTESC states,**

- One of the most important challenges that Catalonia has in the next thirty years is the energy transition to a low carbon economy and society, ie, significantly improving energy efficiency, electrifying the economy, among other options, and continuing with decarbonization.

We are obliged by international agreements that must be met, both in the frame of the Kyoto Protocol and in the EU 2020 Horizon.

We should mention the following objectives among the ones that should be achieved with the energy transition: to break the peninsular energy isolation, reduce dependence on foreign energy (imports), reduce the fossil energies consumption, increase electricity production from renewable energy available in the territory and increase energy saving and efficiency.

This must involve changes in all areas so that the territory of Catalonia suits in the most efficient way the challenge of distributed generation and therefore be equipped with adequate networks (smart grids) to provide power and support at the same time.

Moreover, any new or unique urban project, both urban and of industrial type, must integrate the energy supply. In addition, specific actions are needed in the field of transport and building, in order to reduce direct and diffuse emissions and energy consumption and improve energy efficiency.

Therefore, the CTESC requests

1. Each Public Administration should assume its responsibility within its sphere of competence, taking appropriate measures to promote and not hinder energy transition and issue clear signals to consumers and to the market related to the need to make this transition.

Changing the energy base of a country requires to make a good diagnosis of the current situation and the future needs, to project targets on infrastructures, production and consumption of energy in the short, medium and long term as well as regulatory measures and monitoring of the planned objectives .

A review of the various energy plans in Catalonia, documentary and statistical analysis of energy data, and the appearance of various actors in the energy sector at the headquarters of CTESC bring us to the following conclusions and proposals.

### **In the field of planning and energy balance of Catalonia**

The CTESC notes:

- On the date of completion of the Report and in the Catalan area, energy planning is not updated in accordance with the changes that have occurred and the modifications and objectives that have been approved. As a result of the distribution of powers, the regulation does not go in favour of achieving the objectives planned in Catalonia. Divergences are observed between the objectives set in the planning, the trend and the path followed.
- There is not updated information about the Catalan annual energy balance. The latest data are from 2009. A delay like this does not help to track and assess the degree of achievement of the planned objectives as quickly as necessary.
- Energy efficiency in primary energy consumption has improved over the period (1990-2009), going from 66 to 72%.
- According to the latest data from the energy balance (2009), consumption and the losses in the energy sector accounted for 28% of primary energy consumed.

The regulatory framework approved by the Spanish State in the energy field has stopped the development of renewable energy and the regulation of self-consumption is pending development.

Therefore, the CTESC requests that

2. Decisions on energy achieve stability and long-term commitment, beyond partisan positions, and that they provide a planification adjusted to the maturing periods that projects of this type of infrastructure require.
3. The energy balance of Catalonia be updated and clear objectives on a half term (2020), mid term (2030) and long term (2050) are established, in accordance with the economic and social partners and that monitoring is done annually.
4. Transparent information should be provided about which is the energy situation in Catalonia in relation to the planned objectives.
5. Energy planning anticipates the infrastructures that will be needed in the short (2020), medium (2030) and long term (2050), leaning on energy transition and that it prioritizes actions when conditions are more favourable.
6. The budgetary items which correspond to energy policy involving transfers should be fully included in the general State budget.

7. The Government of Spain should be urged to establish a favourable regulatory framework for the development of renewable energy and energy self-consumption, and to develop a clear and stable framework for tolls and connection rights that does not discourage or penalize the already mentioned development.

8. The energy planning takes into account the regional planning.

9. Progress be made in reducing primary energy losses before converting it into energy available for final consumption (processing, consumption, transport and distribution of energy).

### **In the field of security of supply, economic competitiveness and environmental sustainability**

In the field of security of supply, the CTESC notes that

- The dependence on oil and fossil fuels in Catalonia –net imports of energy divided by gross inland consumption of primary energy- is 76%. According to the latest data (2009), 75% of total primary energy consumption comes from imports, production accounts for only 25%, and half of the Catalan trade deficit is due to imports of energy products.

Therefore, the CTESC proposes that

10. Oil dependence should be taken into account when planning the medium term (2030), together with other dependencies such as geopolitical risks, the volatility of oil prices and the environmental and climate impacts. And that planning considers the reduction of energy dependence and quantifies it in accordance with European Directives, as a minimum. Actually the extent of supply has worsened during the 1990-2009 period.

11. The optimal degree of electrification and gasification should be established in planning to reduce oil dependence and that the degree of participation of renewable energy and generation of the distributed power be determined.

12. The production of indigenous primary energy should be increased significantly to the extent that is economically and environmentally viable.

In the field of economic competitiveness, the CTESC proposes that

13. Since it is necessary to support firmly the industry in Catalonia, which can lead to an increase in the energy needs, and at the same time there is a bet on the energy transition, the adequacy of infrastructure and installed capacity should be analyzed in the area of oil, gas and electricity, in medium (2030) and long term (2050).

14. In order to achieve the objective of the EU 2020 Energy Efficiency Directive (+27%), energy efficiency in primary energy consumption should be improved during the period from 2015 to 2020. Moreover, the Administration has to step up support for the industry, to increase energy saving and efficiency and must provide the right signals to encourage energy consumption, cogeneration and closed networks, among others.

15. The necessary measures should be taken to contain the final energy consumption in households and in the service sector. For example, promoting the installation of smart meters providing useful information to users about their consumption pattern, and giving the right signals when one achieves energy efficiency.

16. The set of Administrations should take the necessary measures to increase the energy efficiency of all public buildings in accordance with the objectives of the European Union.

17. Self-consumption facilities in the field of construction should be encouraged in that they are economically and environmentally viable.

In the field of environmental sustainability, the CTESC proposes

18. In a context of a low carbon economy, the planning should consider the necessary measures to achieve the EU binding targets to reduce emissions of greenhouse gases in the medium term (2030), both the regulated and the diffuse emissions, especially the last ones, because they do not depend on the emission rights market, have a higher relative weight and their management is more complex.

19. To bet for encouraging R+D in the field of energy technologies with low emissions of CO<sub>2</sub> in the medium (2020) and the long term (2050).

## In the oil field

The CTESC notes that

- The degree of oil supply in Catalonia is only 1%; oil accounts for 47.2% of primary energy consumption and petroleum products, 49.3% of final energy consumption, and that the territory has tended to reduce imports and oil consumption in recent years.
- During the years of economic development in Catalonia refining facilities were built that are now sufficient. Moreover, according to available data, the provision of oil-related short-term (2020) infrastructure is appropriate.
- In the medium term (2030), the stock storage and distribution infrastructure will depend on the evolution of economic activity.
- The EU forces Member States to take a minimum reserve of 90 days on average of net imports, 1/3 in refined products. The storage and transportation of petroleum products in Catalonia has increased in recent years.

Therefore, the CTESC proposes that

20. The oil field planning includes support to the opening of new markets (promoting the infrastructures of the Mediterranean Basin) and support to increase the export capacity of refined products and the non-energy uses of oil. Considering that, if the outlook is positive, refining facilities in Catalonia could increase their capacity and the the occupancy rate of the pipeline network.

21. In order to advance towards the goal of reducing oil consumption as planned (the 2012-2020 Energy and Climate Change Plan of Catalonia, currently under review, establishes -17%), the decrease of diesel consumption in the domestic sector and services should also be considered, but especially in the transport sector, and fuel oil and petroleum coke in industry.

22. The short-term planning should take into account innovation in the field of mobility with oil, that is to say, infrastructure related to the supply of liquefied petroleum gas (LPG) and hybrid benzine-electric vehicle.

## In the field of gas

The CTESC evidences that

- Natural gas accounts for 25% of primary energy consumed in Catalonia and 21% of final energy. Most of the natural gas consumed comes from Algeria (57%). Biogas installed capacity is only 57 MW (43 ktoe), although the energy planning, currently under review, expects to increase it up to 142 MW (107 ktoe) in 2020, and biogas represents only 0.8% of the primary gas consumed.
- Catalonia is one of the most gasified territories of Spain. Nevertheless, the distribution of natural gas can be extended, and supply points may still increase.

Therefore, the CTESC considers that

23. Since the European Union has decided to increase the degree of interconnection between the energy networks of the member countries, it is necessary to complete the pending gasistic interconnection (MidCat) in the short term (2020).

24. In Catalonia there is the opportunity to incorporate renewable biogas (biomass, waste, etc.) in the gas pipeline network; therefore its injection in a proper way into the gas pipelines should be studied.

25. Planning should examine the feasibility of extending the transport network and distribution of natural gas in Catalonia in places where there are currently satellite plants, such as some regions of the Pyrenees (Vall d'Aran, Alta Ribagorça, Pallars Sobirà, Pallars Jussà, Alt Urgell, Cerdanya, Ripollès and Alt Empordà), of Ponent (Noguera, Segarra and Segrià) and of the Ebre lands (Ribera d'Ebre, Terra Alta and Baix Ebre).

26. In compliance with 2014/94/EU European Directive, that requires a minimum network of supply points with alternative fuels by 2016, it is necessary to begin the construction of the compressed natural gas network (NGN) and of the points of liquefied natural gas (LNG) deemed necessary, both in terrestrial and maritime field (ports).

27. To facilitate the energy transition, as part of a diversification strategy, the consumption of gas in households should be encouraged and the use of natural gas and liquefied natural gas (LNG) promoted, both domestically and in the services, industry and transport, especially in heavy transport.

28. The need of having microgrids of gas distribution with right pressures to facilitate the implementation of economic activity should be studied.

## In the field of electricity

The CTESC states that

- According to the latest data (2009), electricity accounted for 28% of primary energy consumption (production: 24%, import: 4%) and is expected that the consumption of primary electricity represents 39% in 2020 (production: 37%, import: 2%).
- The electrical interconnection with France is currently 3%, but is expected to reach 6% when the MAT becomes operational.
- The economic crisis has reduced demand for electricity and has shown the overcapacity of some power generation technologies.
- In the short term, it is not expected to build any nuclear power plant in Catalonia, but the life of the plants in operation, which was extended to 40 years in 2011, will end between the years 2023 and 2027: Ascó I (2023) Ascó II (2025) and Vandellós (2027).
- As electricity production adjusts to consumption, it is more energy efficient.
- In Catalonia there has been a delay in investment on facilities of renewable electricity and in the objectives planned in the short term (2020), 49.4% of renewable electricity (according to the Energy and Climate Change Plan in Catalonia 2012-2020). Most likely they will not be reached. However, we must be prepared and analyze which should be the objectives of electricity from renewable sources in the medium term (2030).
- In the electrical field, the interruptibility system is a good measure, among others, to make demand more flexible.

Therefore, the CTESC requests

29. To insist that the electrical interconnection with France should achieve the objectives of the EU 2030.

30. To open a debate to define which role should have nuclear energy and carry out the corresponding short (2020) and long term (2050) planning, if appropriate.

31. Within the general framework, first, to enhance distributed generation incorporating renewable energy. In this sense, planning should be based on concrete and comprehensive studies evaluating which are the local and potential resources. Secondly, to continue investing in the search for storage systems of electricity, to maximize renewable energy. But because these systems take time to develop, the electrical system should seek short-term flexible formulas.

32. To increase distributed generation and bet on related infrastructures and invest in them, as the distribution networks that must accommodate the increase.

33. To plan, design and fully develop the smart grids that Catalonia will need during the next decade, and that demand is managed through two-way electrical networks and management systems on peak of demand.

34. To bet on the creation of a modern, robust and meshed network.

35. That consumers should be the owners of the data provided by electric meters to modify the pattern of consumption and, therefore, that the property of meters should belong either to the company or to the consumer.

In the field of transport

**The CTESC asks that:**

36. The Public Administrations increase support and encourage stably and decisively a most sustainable mobility through the electric vehicles and the use of second generation of biofuels, among other options.

37. The Administration leads the greening of the vehicle fleet (compressed and liquefied natural gas, hybrid, electric, biofuels, hydrogen, etc.), especially in the field of public transport, both in terms of the number of vehicles (buses, taxis, trucks, vans, cars) and in the necessary supply facilities.

38. The public and private collaboration be boosted in the field of electric vehicles to ensure the provision and security of the electric vehicles charging infrastructures, both urban (public fast charging points on the street and shared standard ones between cities) and at home (Regulation on installation of charging points at home and plug authorization) and extended mobility (intermodal transport, car sharing, car parking and charging).

39. The regulation of the loading managers should be adapted swiftly to enable the widespread use of electric vehicles.

40. The users of electric vehicles should be encouraged, in proportion to the reduction of environmental impacts, by means of benefits such as free parking. Information about the charging points installation should be provided.

41. Accessibility to the network of gas stations should be guaranteed for all users, especially to the ones of new generation and the multifuel ones.