Putting Regions on Track for Carbon Neutrality by 2050

D2.1: Eleven country reports reviewing the energy planning process

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May 2018
**Lead partner for deliverable** | WOJEWODZTWO  
---|---  
**Work Package** | 2  
**WP Leader** | AURA-EE  
**Deliverable version** | Final  
**Dissemination level** | Public  
**Participating partners** | NTUA, EPTA CONSULTANT, AURA-EE, ICLEI EURO, FAEN, AREAM, REA NORTH, WOJEWODZTWO, LENERG, RIGA PL REG, AMEMM, EAO  
**Reviewer** | Alexandra Papadopoulou (NTUA)
Preface

Local and regional authorities play a decisive role in the attainment of the EU’s long-term climate and energy targets. C–Track 50 aims to support local and regional authorities in energy and climate planning, so as to contribute considerably towards achieving the 2030 and 2050 EU energy and climate targets. More specifically, C–Track 50 will promote multi-level governance and support local and regional authorities in developing, financing and implementing ambitious integrated sustainable energy and climate policy action plans in order to achieve climate resilience and carbon neutrality by 2050.

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Executive Summary

This report focuses on a study and comparison at the national level of the energy planning process for the eleven (11) partner countries (AT, DE, ES, FR, GR, HR, HU, LV, PL, PT, RO) including:

- A review of the relations between the EU and national authorities (procedures put in place for complying with EU set goals and formulating national targets);
- A review of the national target setting procedure in each partner country;
- A report of the interactions of important actors across different levels of government with national executives;
- A set of analysis (respective responsibilities of relevant ministries and departments, related national institutes such as centres for renewable energy and energy efficiency etc.);
- A review of the process for formulating national energy and climate policy plans (along with the role and involvement of local and regional governments in the national planning process).
1. Introduction

Both the Member States and the European Union institutions are responsible for the EU energy policy structure. In line with the Lisbon Treaty and Title XXI on the functioning of the European Union internal market that formalized the energy-competence sharing within, the following objectives are stipulated to be implemented by the Member States: (a) ensure the functioning of the energy market; (b) ensure security of energy supply in the Union; (c) promote energy efficiency, energy saving and the development of new and renewable energies; and (d) promote the interconnection of energy networks.

The term planning can be seen as spinning plans with set targets, and economic planning as the identification of future economic goals and objectives and how to achieve them. Economic planning, which also includes planning in the energy sector, means establishing economic and political goals that systematize and coordinate state activities; goals pursued in the public interest and oriented to ensure that the state’s activities and decisions taken on the market can be material, financial, territorially and temporally oriented. Conjunct economic and energy planning have to mutualise their objectives through the coordination of policies. These actions must be carried out in the interest of the European citizens whether these are financial, geographical or time bound.

Energy and climate planning at national level can be understood in a broad sense as a process of:

i. Defining energy and climate related goals at various levels in the relevant sectors (mobility, agriculture, industries...);

ii. Developing and implementing policy instruments and allocating responsibilities (regulatory frameworks, incentive programmes, etc.) supporting the strategic objectives;

iii. Implementing the measures and assessing their impact.

The main challenge that this process faces is the coherence between energy plans at different levels (EU-Member State, MS-Region and Local Public Authorities). It can be addressed through effective communication and cooperation among all levels of governance.

The energy policy planning process at each national level is a complicated process that requires the active engagement of a series of stakeholders that interact with each other. The current report presents this energy planning process for Austria, Croatia, France, Germany, Greece, Hungary, Latvia, Poland, Portugal, Romania and Spain. Within each national report, the national goals, current legislative framework and core national strategies by 2030 and 2050 are presented, while emphasis is put on the national target setting procedure and the stakeholders engaged in it, as well as energy policy planning as an integrated activity.

The objective of this report, examining the prevailing situation in each one of the 11 C-Track 50 partner countries, is to evaluate the overall energy planning process at national level.

The task leader, assisted by the WP leader, developed a template with the report’s suggested structure at each national level, which formed the basis for the partners to develop the country reports.
2. Energy policy planning process in Austria

2.1. Austrian legal binding instruments

The national laws for energy and climate our outlined in the bullets below:

- KSG – Klimaschutzgesetz 2011 – Climate protection act
- ÖSG – Ökostromgesetz – green electricity law (law); referring to the Green Electricity Guideline of EU
- EEFFG – Energieeffizienzgesetz; energy efficiency law (law); referring to the Energy Efficiency Directive of EU
- EIWOG 2010 - Elektrizitätswirtschafts- und -organisationsgesetz 2010 - Electricity Industry and Organisation Act
- ROG - Raumordnungsgesetz - regional development act

The national guidelines for energy and climate are the “#mission2030 – Die österreichische Klima- und Energiestrategie – The Austrian Climate and Energy Strategy; May 2018 (guideline)” and “ÖREK-Partnerschaft Energieraumplanung - ÖREK-Partnership Energy Spatial Planning”.

2.2. National goals for Energy and Climate by 2030 and 2050

Based on the new Austrian Climate and Energy Strategy - #mission2030 – published in May 2018 - the following goals for 2030 are decided by the Austrian government:

- 36 % reduction of GHG-emissions until 2030, based on 2005, without nuclear energy;
- 100% electricity from renewable sources, on an annual balance;
- 45-50% end-energy from renewables (34 % until 2020, actual 33,5 %);
- Main focus on transport and buildings;
- Rising the energy efficiency;
- Rising primary energy efficiency.

The targets until 2050 include:

- Path until 100 % decarbonisation of the energy system, without nuclear energy
- 100 % fossil free mobility

2.3. Core national strategies by sector by 2030

The Austrian Energy Policy until 2030 focuses on

“The goal-triangle ecological sustainability - security of supply - competitiveness/efficiency forms the framework for Austria’s climate and energy strategy. These different objectives must be equally taken into account and thus coordinated with each other. Only in this way can sustainable and affordable decarbonisation be achieved. In line with growth and employment, cost- and resource-efficiently achieved, the innovative capacity of Austrian companies and the global development towards renewable energies. Energy can be used and co-designed strategically”.
The four pillars comprising the energy policy by 2030 focus on the reduction of CO₂ emissions, the improvement of energy efficiency, promotion of renewable energy and enhanced security of fuels and energy supply, as described in the following paragraphs.

2.3.1. Reduction of CO₂ emissions

Austria will reduce its greenhouse gas emissions by 36% by 2030 compared with 2005. In 2016 Austrian GHG-emissions in the area outside the EU emissions trading were around 50.6 million tonnes of CO₂ equivalent. The target for 2030 is around 36.4 million tonnes of CO₂eq, which is a decrease of around 28%. The focus is on the transport and buildings sectors, which are considered those with the greatest reduction potential.

2.3.2. Improving energy efficiency

Energy efficiency measures are among the most economically advantageous ways of preventing greenhouse gas emissions and are also a guiding principle of the energy union for Austria. Note should be taken of the sometimes long economic amortisation periods, which can make it difficult to implement energy efficiency measures. Central measures, such as the switch to e-mobility and the increase in the renovation rate, are associated with high increases in energy efficiency without loss of wealth (factor 3 for e-mobility).

The European commission proposal in the "clean energy" package provides for an energy efficiency target of 30% for 2030 at EU level. However, the member states will be able to define the energy efficiency target as a relative saving based on gross domestic product - in real terms at 2015 prices - in addition to sharing primary and final energy consumption. With regards to energy efficiency, the primary energy intensity is to be continuously reduced further. As growth is also to be made possible in the future, especially in the industrial sector, the goal is set for Austria to improve the primary energy intensity by 25-30 % compared with 2015. Should a primary energy requirement of 1.200 petajoules (PJ) arises, these excess amounts of energy should be covered by energy from renewable sources. Due to the fixed share of renewable energy in consumption and the fixed greenhouse gas emission targets, more renewable energy must be used as energy consumption increases.

The main energy policy objectives in enhancing energy efficiency are as follows:

- Improve the primary energy intensity by 25-30 % compared with 2015;
- To achieve zero-energy economic growth, i.e. economic growth with no extra demand for primary energy;
- Increase of the renovation rate in existing buildings;
- Switching to electromobility;
- To increase efficiency of end-use of energy.

2.3.3. Renewable Energy

Austria has set itself the target of increasing the share of renewable energy in gross final energy consumption to 45-50 % by 2030. Currently, the share is 33.5 %, and the interim target of 34 % for 2020 has almost been achieved.

In addition, the goal is to achieve 100 % (on a national balance sheet) of total electricity consumption from renewable energy sources by 2030. This expansion takes into account the expected increase in electricity consumption, as electricity from renewable sources in Austria is used in the areas of
mobility, buildings and production, for the substitution of imported fossil fuels. Future trends are digitalization, decentralization and participation.

Electricity exchange in the European single market will continue to play an important role. Austria's objective is therefore to achieve a balanced balance of imported and exported electricity and to cover domestic demand with renewable energy.

Balancing and regulating energy, the flexibility required for grid operation and the availability of guaranteed power will continue to be made available in accordance with the technical and economic feasibility of guaranteeing security of supply. Control and balancing energy for stabilising grid operation is not included in the calculation of the 100 % renewable electricity supply.

Electricity for self-sufficiency in the production of tangible goods should continue to be generated from resource-saving, efficient use of by-products at company sites (e.g. in the steel or paper industry), also on the basis of non-renewable energy sources, for reasons of resource efficiency. As a rule, these are companies subject to emissions trading obligations that have to surrender certificates for their CO₂ emissions. This means that the above electricity volumes do not have to be offset by additional exports.

Despite the already considerable contribution of renewable energy in the heat market, still the dependence on imported fossil fuels is high. In order to reduce this dependence, biomass, solar thermal energy and ambient heat will be further expanded by 2030. The details on this are defined together with the federal states in a national heating strategy.

A substantial proportion of natural gas is to be replaced by renewable methane in the future. "Greening the gas" by biomethane from biogenic residues, hydrogen and synthetic methane from renewable energy sources on the basis of a significantly improved system of proofs of origin are key components for the sustainable further development of the energy system.

A constant absolute quantity of sustainably produced biofuels will take up a higher relative share compared to fossil fuels at least in the period up to 2030 due to the increasing market penetration of electromobility. The protein feeds resulting from the production of biofuels as by-products make a significant contribution to the Austrian protein balance.

2.3.4. Enhanced security of fuels and energy supplies

Security of fuels and energy supplies is understood as ensuring stable fuels and energy supplies at a level that guarantees meeting domestic needs at prices acceptable for the economy and the society, assuming the optimal use of domestic deposits of energy resources, and through diversification of sources and directions of supply of crude oil, as well as liquid and gas fuels, etc.

2.4. National Energy Framework

The eight tasks in the national energy framework for Austria to attain its targets include:

- Task 1: expanding the infrastructure for a sustainable Austria;
- Task 2: creating the necessary economic framework conditions and mobilising investments;
- Task 3: evaluation of the conveying and discharging system for achieving the climate and energy targets;
- Task 4: legal framework conditions for a climate-friendly Austria;
- Task 5: research and innovation as the key to a successful location;
- Task 6: responsibility for everyone - creating education for a sustainable future and awareness;
- Task 7: using technologies for decarbonisation;
- Task 8: making urban and rural spaces climate-friendly.

Also, in line with ÖREK-Partnership Energy Spatial Planning (expert paper to assist climate protection) the most effective adaptation strategy to the climate is based on measures that are close to the design of spatial structures. Space planning unfolds in many different ways for climate protection and energy, as well as the care with which the new energy can be used and the flow of energy consumption can be met. In order to use the language of ecological footprint, the use of fossil resources means that biologically productive land from the past can be used. Anyone who replaces fossil raw materials with renewable ones is currently making new demands on the use of space and its resources, since both land and use compete with each other. Spatial planning must therefore not only include suitable locations for energy, but we also take into account areas for the extraction of new cash resources. For example, areas suitable for the extraction of renewable resources must be kept free from conflicting uses.

2.5. National target setting procedures

Table 1 below presents how the EU energy planning requirements have been integrated in the Austrian national strategy.

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<tr>
<td>Energy Efficiency Directive</td>
<td>Energy Efficiency act</td>
</tr>
</tbody>
</table>

The national goals are discussed at national level in all relevant areas like the green electricity law, energy efficiency law, climate protection plan, and in the long term climate and energy strategy #mission2030, as well as at provincial level like spatial planning act, building law etc.
Also, there are some incentives or voluntary measures supporting the implementation of the national framework, such as subsidies for companies and private house owners in order to realize investments into renewable energy and energy efficiency, thermal reconstruction of buildings etc.

As far as the feedback loop mechanisms to monitor progress, these are the monitoring reports available at national level and the statistical data by the ‘Statistik Austria’.

### 2.6. Energy planning process as an integrated activity

With regards to the energy policy planning process, there are conflicts and hints between energy and climate planning on one hand, and other areas like the Law for rental of flats and the Home Ownership Act for dwellings.

As far as the potential for improving a draft law is considered, there are consultation processes adopted, where interested persons and experts can review drafts of new strategies and plans.

In the laws mentioned above, there are figures like the allowed amount of energy consumption for new buildings, which are binding for investments and reconstructions. There are also others guidelines and masterplans, which are not binding at a legal level e.g. e-mobility masterplan.

### 2.7. The interactions of important actors across different levels of government with national executives

At the beginning of January, the Federal Government adopted an integrated climate and energy strategy in the Council of Ministers. The Federal Minister for Sustainability and Tourism (BMNT), Elisabeth Köstinger, and the Federal Minister of Transport and Infrastructure (BMVIT), Norbert Hofer, have taken the lead for this project.

In the last three months, the present draft climate and energy strategy has been drafted. The top experts from both departments in the fields of environment, energy, climate protection and transport have worked on it. This strategy should form the basis on which the measures of the coming years will be developed and developed.

During this development process, a broadly installed stakeholder process was organizes with 19 workshops and roundtables to special subjects and topics. A special topic was a workshop for the energy counsellors of the Provinces of Austria, to integrate the regional level.

The draft can be downloaded from the established platform [https://mission2030.info](https://mission2030.info) and everybody like experts, interest groups, NGO’s or private people have the opportunity submit suggestions and ideas via the online form.

The concerned authorities in the energy planning process in terms of ministries, observatories, agencies, ESCOs, NGOs, etc., are detailed below:

- Federal Ministry of Mobility, Innovation and Technology ([www.bmvit.gv.at](http://www.bmvit.gv.at));
- Federal Ministry of Sustainability and Tourism ([www.bmnt.gv.at](http://www.bmnt.gv.at));
- Federal Ministry of Digitalisation and Economics ([www.bmdw.gv.at](http://www.bmdw.gv.at));
- Federal Ministry of Education, Science and Research ([www.bmbwf.gv.at](http://www.bmbwf.gv.at));
- Federal Chancellery ([www.bundeskanzleramt.gv.at](http://www.bundeskanzleramt.gv.at));
• Government of the Provinces;
• E-Control - regulatory agency of the electricity and gas market;
• OeMAG - Clearing house for green electricity;
• Climate and Energy fund;
• ESCOs;
• Energy Agencies at national, regional and local level;
• NGOs.
3. Energy policy planning process in Croatia

3.1. Croatian legal binding instruments


3.2. National goals for Energy and Climate by 2030

The goals set at the national level for energy and climate by 2030, as described in the Low-carbon development strategy for 2030 with an outlook to 2050, include the following:

- 40 % reduction in greenhouse gas emissions (in regards to 1990) – 43 % reduction for sectors in ETS in regards to 2005 and 7 % reduction in sectors outside ETS in regards to 2005.
- 65 – 80 % RES share in electricity consumption (see Table 2).
- The use of solar energy with an annual instalment rate of 50 to 100 MW from 2021 to 2030 at minimum (corresponding to 0.35 m² per capita).
- 2 – 4 % electric cars’ share in the total car fleet (70,000 to 150,000 vehicles).
- The use of wind energy with an annual rate of 75 to 150 MW from 2021 to 2030 at minimum.

Table 2: The installed power of renewable energy sources for electricity generation by 2030

<table>
<thead>
<tr>
<th>Technology for using RES</th>
<th>Installed power (MW)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hydro power plants (&gt; 10 MW)</td>
<td>2,600</td>
</tr>
<tr>
<td>Hydro power plants (≤ 10 MW)</td>
<td>100 – 140</td>
</tr>
<tr>
<td>Geothermal power plants</td>
<td>30 – 40</td>
</tr>
<tr>
<td>Solar power plants</td>
<td>1,100 – 1,800</td>
</tr>
<tr>
<td>Wind power plants</td>
<td>1,400 – 2,000</td>
</tr>
<tr>
<td>Biomass power plants, including waste</td>
<td>150 – 200</td>
</tr>
<tr>
<td>Biomass power plants, including landfill gas</td>
<td>80 – 100</td>
</tr>
</tbody>
</table>

3.3. National goals for Energy and Climate by 2050

The goals set at the national level for energy and climate by 2050, as described in the Low-carbon development strategy for 2030 with an outlook to 2050, include the following:

- 80 – 95 % reduction in greenhouse gas emissions (in regards to 1990) – 85 % reduction in ETS in regards to 2005 and 40 – 52 % reduction in sectors outside ETS in regards to 2005.

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1 Low-carbon development strategy of the Republic of Croatia for the period by 2030 with an outlook to 2050 – Draft
2 ETS – Emission Trading System
3 Low-carbon development strategy of the Republic of Croatia for the period by 2030 with an outlook to 2050 – Draft
• 70 – 99 % RES share in electricity consumption (See Table 3).\(^4\)
• 0.5 m\(^2\) per capita of solar systems.
• 25 – 75 % electric cars’ share in the total car fleet (500,000 to 1,500,000 vehicles).\(^5\)

Table 3: The installed power of renewable energy sources for electricity generation by 2050

<table>
<thead>
<tr>
<th>Technology for using RES</th>
<th>Installed power(MW)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hydro power plants (&gt; 10 MW)</td>
<td>2,600 – 2,900</td>
</tr>
<tr>
<td>Hydro power plants (≤ 10 MW)</td>
<td>100 – 140</td>
</tr>
<tr>
<td>Geothermal power plants</td>
<td>30 – 50</td>
</tr>
<tr>
<td>Solar power plants</td>
<td>3,300 – 6,300</td>
</tr>
<tr>
<td>Wind power plants</td>
<td>2,200 – 6,200</td>
</tr>
<tr>
<td>Biomass power plants, including waste</td>
<td>150 – 280</td>
</tr>
<tr>
<td>Biomass power plants, including landfill gas</td>
<td>80 – 120</td>
</tr>
</tbody>
</table>

3.4. Core national strategies by sector by 2030 and 2050

The national strategy, as analysed in the Low-carbon development strategy of the Republic of Croatia for the period by 2030 with an outlook to 2050 – Draft, is presented below per sector.

Energy and industry:
• energy independence and sustainability;
• development of energy equipment and plant industry;
• development of vehicle industry and infrastructure equipment;
• implementing new technologies (consumption management, CCS\(^6\) technology, new renewable sources);
• advanced networks for the purchase of renewable energy;
• a clear development strategy and action plans;
• modernization of refineries;
• investing in new activities;
• investment in research and development of domestic oil and gas sites;
• LNG terminal for EU;
• cautious investments in gas infrastructure.

Traffic:
• low-carbon city traffic;
• raised social awareness of the use of public transport and cleaner forms of transport;
• developed rail and river traffic;
• incentives for vehicles based on lower fuel consumption;

\(^4\) Values are wide ranging due to the existence of two low-carbon scenarios (gradual and strong transition)
\(^5\) Values are wide ranging due to the existence of two low-carbon scenarios (gradual and strong transition)
\(^6\) CCS – Carbon Capture and Storage
- public transport is completely low-carbon.

**Buildings:**
- reconstruction of the existing housing stock;
- construction of exclusively low-energy buildings, reduced CO₂ emissions;
- raised social awareness of the use and production of energy in buildings;
- developed industry and service sector based on energy efficiency and renewable energy sources.

**Agriculture:**
- sustainable management of agricultural areas;
- sustainable and ecological production;
- implementation of measures – reduced use of mineral fertilizers, introduction of green taxes on mineral fertilizers, adequate management of organic fertilizers and biogas utilization, improved manure management system, support for sustainable production and increased carbon content in the soil, payment of taxes based on carbon in the soil;
- integral approach to the development of agriculture;
- self-sustainability in food production.

**Forestry:**
- sustainable forest management;
- increase the value of forests to maintain or improve the existing forest land fund;
- afforestation of areas affected by fires;
- afforestation of fast growing tree species.

**Waste management:**
- reduction (avoidance) of waste generation and greenhouse gas emissions;
- establishing a waste management system;
- sanitation of waste landfill;
- complete waste recovery.

### 3.5. National Energy Framework

The integrated national framework for energy, comprised of the respective laws, programmes and strategies is outlined in bullets below, and briefly presented in the following paragraphs.
- Law on the Energy Efficiency;
- Energy Law;
- National Energy Efficiency Programme;
- Croatian Energy Development Strategy;
- Croatian Low-emission Development Strategy;
- National Renewable Energy Sources Action Plan by 2020;
- Physical Planning Programme of the Republic of Croatia;
- National Spatial Development Plan;
- Spatial Planning Strategy;
• Fourth National Energy Efficiency Action plan for 2017 – 2019 (in preparation);
• Long-Term Strategy for Mobilising Investment in the Renovation of the National Building Stock of the Republic of Croatia;
• Programme of energy renovation of family houses for the period between 2014 and 2020 with a detailed plan for 2014 – 2016;
• Programme of energy renovation of multi-storey buildings for the period between 2014 and 2020 with a detailed plan for 2014 – 2016;
• Programme of energy renovation of public buildings for 2016 – 2020;
• The Programme of energy renovation of commercial non-residential buildings for the period between 2014 and 2020 with a detailed plan for the period between 2014 and 2016;
• National plan for increasing the number of nearly zero-energy buildings.  

The Law on the Energy Efficiency regulates the area of efficient energy use, the adoption of local, regional and national plans to improve energy efficiency and their implementation, energy efficiency measures, energy efficiency obligations, obligations of energy regulatory bodies, transmission system operators, distribution system operators and energy market operators related to transmission and distribution, energy distributors, energy and / or water suppliers, and in particular energy service activities, energy saving and consumer rights in the implementation of energy efficiency measures.

The Energy Law regulates measures for safe and reliable energy supply and its efficient production and use, acts that are determined and based on energy policy implementation and energy development planning, energy activities on market or as public services, and basic issues of energy activities performance.

The National Energy Efficiency Programme for the period 2008-2016 (NPEnU) was developed on the basis of Article 5 of the Act on the Efficient Use of Energy in Final Consumption (Official Gazette No. 152/08), and its aim is for the decision makers, and in particular for the Ministry of the Economy, Labour and Entrepreneurship, a comprehensive basis for the development of other official documents related to energy efficiency, such as the preparation of the National Energy Efficiency Action Plan (NEEAP).

The Croatian Energy Development Strategy aims at building a balanced development system between security of energy supply, competitiveness and environmental protection, which will enable Croatian citizens and the Croatian economy to provide quality, safe, accessible and sufficient energy supply. Such energy supply is a prerequisite for economic and social progress.

The Low-emission Development Strategy represents an innovative strategic document that provides the basis for political decisions, informed investments and behavioural changes with a view to significantly reducing greenhouse gas emissions on its territory by 2050.

The National Renewable Energy Sources Action Plan by 2020 determines the overall national target for renewable energy sources according to the prescribed methodology and sectoral targets for electricity generation, heating and cooling energy and transportation of renewable energy. Also, the National Action Plan needs to identify existing and planned policies for renewable energy sources as instruments, measures and mechanisms to achieve these goals by 2020.

7 Strategic documents, plans and programmes are available at www.mgipu.hr
The Physical Planning Programme of the Republic of Croatia identifies measures and activities for the implementation of the Strategy. It contains, in addition to some basic objectives of development in the space, other criteria and guidelines for the spatial and other units, as well as a proposal of priorities for the realization of the goals of spatial planning and based on the natural, economic, social and cultural grounds. The purpose of space, protection and improvement of the environment, the system of central settlements and the system of development state infrastructure.\(^8\)

The National Spatial Development Plan is a strategic document in which the legal obligation must be fulfilled and the objectives of the spatial planning must be realised. It ensures the conditions for the use (management), protection and management of the territory of the Republic of Croatia as a particularly valuable and limited national good, thus fulfilling the prerequisites for social and economic development, environment and nature protection, cultural goods, the quality of construction and rational use of natural and cultural goods. Furthermore, the purpose of space and surface area, conditions for the development of any activity and infrastructure and their layout in space, conditions of construction, rehabilitation and transformation of built areas, and conditions for the implementation of the project in the area of state significance are determined.\(^9\)

The Spatial Planning Strategy defines the long-term goals of spatial development and planning in accordance with the overall economic, social and cultural development, and it contains the basics for harmonization and orientation of spatial development, the organization of the space of the state, the developmental priority activity and the planning unit of common spatial and developmental features for which the spatial plans or other physical planning documents.

The Third National Energy Efficiency Action Plan (NEAP) is a comprehensive implementation document of the Energy Efficiency Policy for the next three years (2014 – 2016), and includes a report detailing the activities carried out over the previous three-year period (implementation period of the 2\(^{nd}\) NEEAP). The report also shows the realized energy savings in relation to the targets set in the Second National Action Plan for Energy Efficiency of the Republic of Croatia by the end of 2013.\(^10\)

All European Union Member States are required, under Article 4 of the EU Energy Efficiency Directive, to prepare their Long-term strategy for mobilising investment in the renovation of the national stock of residential and commercial buildings and submit it to the Commission by 30 April 2014. The main objective of the Strategy is to identify effective measures, pursuant to a predefined economical and energy-optimal model of building renovation, for a long-term mobilisation of cost-efficient integral renovation of the national building stock of the Republic of Croatia by 2050, including all residential and commercial buildings.\(^11\)

On March 27, 2014, the Government of the Republic of Croatia adopted the Programme of energy renovation of family houses for the period 2014 – 2020 (Official Gazette No. 43/14) implemented by the Environmental Protection and Energy Efficiency Fund. The goal of the Program is to increase the energy efficiency of existing homes, reduce energy consumption and CO\(_2\) emissions into the atmosphere, and reduce monthly energy costs, while improving overall quality of life. At the same time, the planning of such interventions implies the engagement of local companies and experts or promotes economic activity. In 2015, amendments to the Program (Official Gazette No. 36/15) were

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\(^{8}\) Physical Planning Act (Official Gazette No 65/17)

\(^{9}\) Decision on drafting the National Spatial Development Plan (Official Gazette No. 39/2018)

\(^{10}\) [http://cei.hr/zakonodavstvo/](http://cei.hr/zakonodavstvo/) (accessed on 14th May 2018)

\(^{11}\) Proposal of the Long-Term Strategy for Mobilising Investment in the Renovation of the National Building Stock of the Republic of Croatia, April 2014, Ministry of Construction and Physical Planning
made, which enabled the application to all citizens of the Republic of Croatia and directly to the Environmental Protection and Energy Efficiency Fund. Also, the definition of a family home has been altered and a simplified application procedure for incentives has been introduced. In 2016, the co-financing program was additionally adjusted, due to the use of EU funds under the Competitiveness and Cohesion Operational Program. Namely, as the 2014 Government Program envisages, funds should be withdrawn from European funds, which is why additional adjustment of the co-financing conditions is necessary.\(^\text{12}\)

The Government of the Republic of Croatia, on June 24, 2014, has announced the **Programme of energy renovation of multi-storey buildings for the period 2014 – 2020 with a detailed plan for the period 2014 – 2016** (Official Gazette 78/14). The objectives of this program are to identify and analyse energy consumption and energy efficiency in the existing Croatian housing fund, to identify the potential and possibilities of reducing energy consumption in existing residential buildings, to develop measures to promote energy efficiency improvements in existing residential buildings and to evaluate their impact.\(^\text{13}\)

The Ministry of Construction and Physical Planning has developed the **Programme of energy renovation of public buildings for the period 2016 – 2020** (Official Gazette No. 22/17), which was approved by the Government of the Republic of Croatia at a session held on March 2, 2017. The program will ensure continuity of energy reconstruction in the future. The objective of the program is a complete renewal that will result in a reduction of energy consumption in public sector buildings up to 70% and annual energy savings of about 50 GWh.\(^\text{14}\)

The **Programme of energy renovation of commercial non-residential buildings for the period between 2014 and 2020 with a detailed plan for the period between 2014 and 2016** (Official Gazette 98/14) was adopted by the Government of the Republic of Croatia on 30 July 2014. As the 2014 Government Program envisages, funds will be withdrawn from the European Funds in 2016 under the Competitiveness and Cohesion Operational Program, making it necessary to adjust the co-financing conditions. The Government of the Republic of Croatia grants through the Environmental Protection and Energy Efficiency Fund subsidies for energy renovation of the building envelope or for complete renovation. Energy renovation of the building envelope refers to improvements in building insulation, and the building envelope consists of exterior walls, basement walls, outer window and door frames, ceilings bordering an unheated attic, or flat roofs and pitched roofs if attic space is heated. Subsidies can be obtained for projects by the implementation of which energy class B, A or A+ can be achieved.\(^\text{15}\)

The Building Energy Directive 2010/31 / EU defines requirements that each member state must meet in terms of energy performance of buildings. One part of the Directive refers to nearly zero-energy buildings that are defined by the Directive as buildings with very high energy efficiency. This nearly zero or very low amount of energy should be covered to a considerable extent by energy from renewable sources, including energy from renewable sources produced in or near the building. Croatia's standards for the design and construction of nearly zero-energy residential and non-residential buildings and the deadlines they will need to apply are prescribed by the amendments to the Technical Regulation on Rational Use of Energy and Thermal Protection in Buildings (Official Gazette 130/14). Member States are obliged to ensure that by 31st of December 2020 all new buildings are almost zero energy buildings, and all new buildings in which they are resident and owned by public

\(^\text{12}\) https://www.mgipu.hr/ (accessed on 14th May 2018)
\(^\text{13}\) https://www.mgipu.hr/ (accessed on 14th May 2018)
\(^\text{14}\) http://www.mgipu.hr/ (accessed on 14th May 2018)
\(^\text{15}\) http://www.mgipu.hr/ (accessed on 14th May 2018)
authorities are required to have these properties after 31 December 2018. Consequently, the Republic of Croatia made the National plan for increasing the number of nearly zero-energy buildings in order to accomplish EU goals. Plans for increasing the number of nZEB buildings need to be backed up by significant financial instruments that will stimulate the market in considering concepts that are at the same time equally side to entrepreneurs and individual builders.16

3.6. National target setting procedures

By entering the full EU membership on 1st of July 2013, the Republic of Croatia transferred the acquis communautaire of the European Union (EU Directives) and transposed it to national regulation through Laws and Acts, as presented in Table 4.

<table>
<thead>
<tr>
<th>EU energy planning requirements</th>
<th>National strategy in Croatia</th>
</tr>
</thead>
<tbody>
<tr>
<td>Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions Energy Roadmap 2050 (COM/2011/0885 final)</td>
<td>No, but we have in procedure Low-carbon development strategy of the Republic of Croatia for the period by 2030 with an outlook to 2050 – Draft.</td>
</tr>
<tr>
<td>Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee, the Committee of the Regions and the European Investment Bank Clean Energy For All Europeans (COM/2016/0860 final)</td>
<td>This proposal package of EU has been involved in Fourth National Energy Efficiency Action Plan in April 2017. Republic of Croatia, following the example of the EU, united the environmental and energy policy in one ministry as the first step towards harmonization of energy and climate policies.</td>
</tr>
<tr>
<td>National Renewable Energy Action Plan (NREAP) – Directive 2009/28/EU on the promotion of the use of energy from renewable sources</td>
<td>NREAP at the national level By joining the European Union's full membership on 1 July 2013, the Republic of Croatia, together with other member states, under the Directive 2009/28/EC on the promotion of the use of energy from renewable sources, has undertaken to increase the use of renewable energy sources, whereby the share of renewable energy sources in gross final consumption in 2020 should be at least 20 percent, observed at the level of the European Union.</td>
</tr>
<tr>
<td>Communication from the commission to the European parliament, the council, the European economic and social committee and the committee of</td>
<td>This proposal package of EU has been involved in Strategy of Low-emission Development of the Republic of Croatia for the Period by 2030 with Vision of 2050. Republic of Croatia, following the example of the EU, united the environmental and energy policy</td>
</tr>
</tbody>
</table>

16 http://www.mgipu.hr/ (acessed on 14th May 2018)
Whether it is necessary to adopt a bill of laws, a plan, a strategy, etc. each must go through the same procedure to become legitimate. Every national plan of the Republic of Croatia must be adopted by the Croatian Parliament in order to be valid.

The purpose of the National Energy Efficiency Action Plan is to enable central planning and oversight of the achieved savings. For a number of years, counties in Croatia have been obliged to plan their activities on energy efficiency, and they have now worked through three-year programs and annual energy efficiency plans. According to the new Law on Energy Efficiency, obligators of planning are all counties and cities with more than 35,000 inhabitants who have to systematically plan energy efficiency measures. This encourages local self-government to systematically master the energy and deliberately plan the steps they will take in order to spend energy more rationally and at the same time reduce costs. The plans are being worked on an annual and three-year level, so that the next three-year Action Plan for Counties and Large Cities is to be implemented by the end of 2016 for the period 2017 – 2019. By the end of each year, the Annual Plan (including the implementation report for the last year) will be developed and comprise the basis for the National Report on the Implementation of NEEAP Measures. The purpose of this reporting is to harmonize national plans with local activities – from now on national plans will be tailored to the guidelines coming from local self-government. While the counties and major cities are obliged to plan energy efficiency measures in the Energy Efficiency Act, other cities and municipalities may voluntarily be included in the planning. This will increase their chances of obtaining co-financing for certain activities they intend to implement, because the National Action Plan is the basis for planning the allocation of funds to the Environmental Protection and Energy Efficiency Fund.

3.7. Energy planning process as an integrated activity

The energy planning process in Croatia is an integrated activity among the different governance levels. It represents the analysis of all energy issues within a unified policy framework in order to arrive at a set of nationally optimal energy solutions over the long term, according to Law on the Energy Efficiency, transposed to the local level. Moreover, energy planning is an integrated activity among the different sectors and topics, and it is involved in the National Renewable Energy Sources Action Plan.

In accordance with the Law on Energy Efficiency (Official Gazette No. 127/14) each county and big city (> 35,000 inhabitants) in the Republic of Croatia is obliged to draw up an Energy Efficiency Action Plan and Annual Energy Efficiency Plan, i.e. a plan document for a three-year period for Action Plans and one-year period for Annual Plans which sets out the implementation of policies to improve energy efficiency in the county/city.
3.8. The interactions of important actors across different levels of government with national executives

The adoption of regulations, laws, strategies, decisions, resolutions and other acts is the fundamental instrument in achieving the goals and policies of the Republic of Croatia.

The Government of the Republic of Croatia as the head of the executive branch is the main initiator of the adoption of regulations and legislative acts adopted by the Croatian Parliament as the legislator. According to the Constitution of the Republic of Croatia, every MP, working bodies of the Croatian Parliament and the Government have the right to submit proposals.

The Government of the Republic of Croatia exercises executive authority in accordance with the Constitution and the law. In executing the executive authority, the Government determines, directs and coordinates the implementation of policies and programs and for this purpose proposes and implements strategies, provides guidelines, acts and takes other measures necessary to regulate relations within its area of competence.

The Government proposes to the Croatian Parliament laws and other acts through the following regular procedure.

![Diagram of the procedure](image)

**Figure 1: Procedure for proposing laws to the Croatian Parliament**

The normative framework for conducting consultations with the interested public is the Law on Rights to Access the Information and the Code of Consultations with the Interested Public in the Procedures for Adoption of Laws, Other Regulations and Acts.

Consultations with the interested public in the process of adopting regulations is an indispensable part of the modern democratic process of public policy management. In addition to consulting with the interested public, the basic tools that can improve the quality of legislation are:

- assessment of the effects of regulations;
- finding alternatives to formal legislation;
- reduction of administrative barriers.
The most important actors across different levels of government in the national planning process are listed below. The main duties and responsibilities of each are described in continuation.

**The main institutions responsible for energy policy in Croatia:**

- Ministry of Physical Planning and Construction;
- Ministry of Environment and Energy;
- Ministry of the Sea, Transport and Infrastructure;
- Center for Monitoring Business Activities in the Energy Sector and Investments;
- Environmental Protection and Energy Efficiency Fund;
- Agency for Transactions and Mediation in Immovable Properties;
- Energy Institute Hrvoje Požar;
- Croatian Energy Regulatory Agency.

**Institutions and organizations within various energy efficiency areas:**

- HEP Ltd.;
- HEP Heat Distribution;
- HEP Distribution System Operator (HEP ODS);
- Croatian Transmission System Operator Ltd.;
- INA JSC;
- Croatian pipeline (JANAF);
- Faculty of Mechanical Engineering and Naval Architecture;
- Society for Sustainable Development Design (DOOR);
- Croatia Green Building Council;
- HEP ESCO JSC;
- State Office for the Central Public Procurement;
- Energy and Environmental Protection Institute (EKONERG);
- Faculty of Electrical Engineering and Computing (FER);
- UNDP;
- The International Centre for Sustainable Development of Energy, Water and Environment Systems (SDEWES);
- Croatian Business Council for Sustainable Development;
- Croatian Professional Association for Solar Energy;
- Croatian Association of Energy Certificators.

**Regional energy agencies:**

- Istrian Regional Energy Agency Ltd. (IRENA);
- North-west Croatia Regional Energy Agency (REGEA);
- Medjimurje Energy Agency Ltd. (MNEA);
- Regional Energy Agency North (REA North);
- Regional Energy Agency Kvarner (REA Kvarner).

**Energy cooperatives:**

- BAN – UNION;
- Green energy cooperative (ZEZ);
The Ministry of Environmental Protection and Energy (MZOIE) is responsible for national energy policy, energy efficiency policy, action plans and implementation of EU energy efficiency legislation at national level. It is also responsible for the protection and preservation of the environment and nature in accordance with the policy of sustainable development of the Republic of Croatia.

The Ministry of Construction and Physical Planning (MGIPU) is the most important player in the design of policies and measures to achieve set targets for energy savings in buildings, reduction of CO₂ emissions and related and positive effects of increased construction activity. The Ministry issues legal regulations, strategies and programs that guide the long-term integral reconstruction of buildings: family houses, multi-storey buildings, commercial non-residential buildings and public-sector buildings.

The Ministry of the Sea, Transport and Infrastructure (MMPI) is responsible for national energy policy, action plans and strategies pertaining to maritime affairs, transport and infrastructure.

The Center for Monitoring Business Activities in the Energy Sector and Investments (NKT) operates within the Energy Efficiency and Investment Monitoring Centre. The NKT is the body responsible for planning, coordinating and implementing the energy efficiency policy. The NKT has the role of a national energy efficiency agency that has information on all energy efficiency activities in Croatia and maintains a database with realized savings.

The Environmental Protection and Energy Efficiency Fund (FZOEU) is a central place for collecting and investing outside budgetary resources in environmental and nature conservation programs and projects, energy efficiency and the use of renewable energy sources. The activities of the Fund include affairs related to the financing of the preparation, implementation and development of programs and

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17 [https://www.enu.hr/ee-u-hrvatskoj/tko-je-tko-ee-rh/](https://www.enu.hr/ee-u-hrvatskoj/tko-je-tko-ee-rh/) (accessed on 14th March 2018)
projects and similar affairs in the field of conservation, sustainable use, protection and improvement of the environment and in the field of energy efficiency and the use of renewable energy sources.

The Agency for Transactions and Mediation in Immovable Properties (APN) is responsible for the implementation of a program for energy reconstruction of public sector buildings and the implementation of a systematic energy management program for facilities owned by ministries, cities or counties in terms of reducing energy and water costs, with ISGE\textsuperscript{18} monitoring.

Energy Institute Hrvoje Požar, EIHP - the main fields of activity of the institute include strategic planning in energy, development of power, gas, oil and heat systems, market related activities, legislative framework and energy sector restructuring, energy inspection and certification of facilities, and making energy balances and statistics.

The Croatian Energy Regulatory Agency (HERA) was established by the Law on Regulation of Energy Activities and continued to operate in accordance with the provisions of the Law on Regulation of Energy Activities. The Law on Regulation of Energy Activities prescribes that HERA is an independent and non-profit legal entity with public powers to regulate energy activities. The founder of HERA is the Republic of Croatia, and the founder’s rights are realized by the Government of the Republic of Croatia. HERA is responsible for its work to the Croatian Parliament.\textsuperscript{19}

Responsibilities of **Energy agencies** in Republic of Croatia are mainly supporting public authorities in energy efficiency measures and RES implementation, informing the public about energy efficiency and renewable energy sources and raising awareness. By that, they gets to know the public with examples of good practice and promoting regional sustainable development in the field of energy and environmental protection through the use of renewable energy sources and introduction of increased energy efficiency measures.\textsuperscript{20}

**Energy Cooperatives** are associations of individuals, companies, public institutions, local self-government organizations linked to the location key that jointly develop renewable energy projects. Joint investment reduces the risk of investment and divides the profit from the project. The energy cooperatives are organized in such a way that all issues of cooperative management are exercised in a democratic way of decision-making. The goal of such cooperatives is to promote renewable energy sources owned by local communities. In this way, it facilitates the simpler implementation of energy efficiency measures targeted at the local community, as the cooperatives can achieve greater negotiating power, greater knowledge and act on a higher level than the individual.\textsuperscript{21}

**ESCO - Energy Service Company** offers a broad range of comprehensive energy solutions in its business scope, including: designing and implementing energy saving, energy storage, energy production and power generation projects and energy risk management projects. The particularity of these projects is to be financed from the realized savings. It usually takes between five and fifteen years to close the financing cycle (depending on the client and the project), and the realized savings are contained in reducing energy costs and maintenance costs. Energy service providers are operating in the private and public sectors, i.e. in the field of construction (schools, kindergartens, offices, universities,

\textsuperscript{18} ISGE – Informacijski sustav za gospodarenje energijom (Information System for Energy Management)

\textsuperscript{19} https://www.enu.hr/ee-u-hrvatskoj/tko-je-tko-ee-rh/ (acessed on 14\textsuperscript{th} March 2018)

\textsuperscript{20} https://www.enu.hr/ee-u-hrvatskoj/tko-je-tko-ee-rh/ (acessed on 14\textsuperscript{th} March 2018)

\textsuperscript{21} https://www.enu.hr/ee-u-hrvatskoj/tko-je-tko-ee-rh/ (acessed on 14\textsuperscript{th} March 2018)
hospitals, hotels, etc.), public lighting, industry and energy supply systems (district heating, cogeneration).22

The following companies have key role in the energy sector and the implementation of the National Energy Policies:

- **HEP JSC** is responsible for the implementation of the measure E.1 Improving energy efficiency by reducing own consumption in hydro power plants, thermal power plants and cogeneration plants within the HEP Group and measures E.2 Improving energy efficiency through the revitalization of hydro power plants within the HEP Group.
- **HEP Heat Distribution** is responsible for the measure E.5 Replacement and reconstruction of the pipeline and drainage network.
- **HEP Distribution System Operator (HEP ODS)** is responsible for Measure E.7 Reduction of Losses in the Distribution Electricity Network.
- The mission of **HOPS** is to maintain the electricity system of the Republic of Croatia, to transfer electricity and to maintain, develop and build the transmission grid for the reliable supply of users with minimal costs and care for the environment. Within the restructuring of the Croatian power sector, HEP-Transmission System Operator Ltd. (HEP-OPS Ltd.) was founded, which started working in April 4, 2005 under the Energy Act, the Act on Amendments to the Energy Act and the Electricity Market Act.
- **INA - Oil Industry, JSC (INA, JSC)** is a medium-sized European oil company. INA Group has a leading role in oil business in Croatia and plays a significant role in the region in oil and gas exploration and production, oil refining and oil and petroleum products distribution. Responsible for implementing measures E.3 Improving energy efficiency in oil exploration and production and measures E.4 Improving energy efficiency in oil refining.
- **JANAF JSC** is a strategically significant energy and economic company in the Republic of Croatia and Central and Eastern Europe managing pipeline as a modern, efficient and economical oil transportation system for domestic and foreign refineries. In addition to oil transportation, JANAF’s core business is the storage of petroleum and petroleum products. Within the 3rd National Energy Efficiency Action Plan, JANAF is in charge of energy efficiency measures in oil pipeline transportation.
- The **Department of Thermodynamics and Process Thermotechnics (Faculty of Mechanical Engineering and Naval Architecture)** is responsible for the development of the Study and Program for the Accumulation of Cooling Energy in Building, i.e. Measure HC.1 from the 3rd NEEAP.
- The **Department of Energy Systems and Energy (Faculty of Mechanical Engineering and Naval Architecture)** is involved in various national and international projects of the EU (HRZZ, LIFE, FP6, IEE, FP7, Horizon2020) and in a wide range of cooperation with industry, power generation, small and medium enterprises and state institutions.23

The legislative procedure i.e. Law enforcement procedure in Croatia is shown below:

- Launching the Procedure;
- Proposal of the Law;
- Consideration of working bodies;

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22 [https://www.enu.hr/ee-u-hrvatskoj/tko-je-tko-ee-rh/](https://www.enu.hr/ee-u-hrvatskoj/tko-je-tko-ee-rh/) (accessed on 14th March 2018)
23 [https://www.enu.hr/ee-u-hrvatskoj/tko-je-tko-ee-rh/](https://www.enu.hr/ee-u-hrvatskoj/tko-je-tko-ee-rh/) (accessed on 14th March 2018)
- Law’s First reading;
- Final proposal of the Law;
- Law’s Second reading;
- Law’s Third reading;
- Urgent procedure$^{24}$.

$^{24}$ http://www.sabor.hr/zakonodavni (accessed on 14th March 2018)
4. Energy policy planning process in France

4.1. French legal binding instrument

The Act of 17 August 2015 on energy transition for green growth seeks to enhance France’s energy autonomy, cut its greenhouse gas emissions and provide effective tools to all stakeholders in order to boost green growth.

4.2. National goals for Energy and Climate by 2030 and 2050

The Act sets out medium- and long-term objectives for national energy production and consumption:

- Cut greenhouse gas emissions to contribute to the target of a 40% decrease in EU emissions by 2030 (compared with 1990 levels);
- Cut France’s consumption of fossil fuels by 30% by 2030 compared with 2012;
- Reduce the share of nuclear energy to 50% of electricity production by 2025;
- Increase the share of renewables to 32% of final energy consumption by 2030 and to 40% of electricity production;
- Reduce total energy consumption by 50% in 2050 compared with 2012;
- Cut waste going into landfills by 50% by 2050.

The Government has also set itself the target of pricing carbon at €56 per ton by 2020 and at €100 by 2023, for the carbon component of the tax on energy products consumption.

4.3. Core national strategies by sector

4.3.1. Buildings

In 2014, the building sector accounted for 45% of energy consumption in France. It is the largest energy consumer and offers significant opportunities for energy efficiency. It caused 20% of greenhouse gas emissions in 2013.

- Construction: Incentives to develop positive-energy buildings and buildings with high quality environmental certification.
- Renovation:
  - For public buildings: Improving insulation when undertaking major renovation works, co-ownership – simple majority vote for energy renovation works, third-party financing, option to depart from local urban planning scheme regulations
  - For households: individual heating costs, regional energy renovation platforms, energy poverty and energy savings requirements, energy renovation guarantee funds, digital maintenance and repair record, minimum energy performance conditions, smart meters.
4.3.2. Transport

The transport sector is the number one producer of greenhouse gas emissions, accounting for 28% of France’s total emissions in 2013, while it accounted for 32.6% of France’s total energy consumption in 2014.

- Clean vehicles and infrastructure: Renewing public fleets with low-emission vehicles, purchase of electric cars, car parks, minimum of 7 million charging points installed by 2030;
- Traffic and mobility: Restricted traffic areas introduced by local authorities, air quality certificates for local authorities, restricted traffic across an entire town, poor air quality and reduced speed limits, reduced fares to encourage use of public transport, company mobility scheme;
- Clean transport: car-pooling defined, procedures and amounts of allowance per km for cyclists, reduced taxes for companies that provide bicycles.

4.3.3. Circular economy

Ban on single-use plastic bags, tackling built-in obsolescence, labelling product service life, environmental performance factored into public procurement contracts, managing electrical and electronic waste, phytosanitary products etc.

4.3.4. Renewable energy

In 2014, 14.3% of the energy we consumed was produced from renewable sources. The aim is to increase this figure to 23% by 2020 and 32% by 2030. Wind and solar power production increased by over 25% in 2015 (1,000 MW more wind capacity and 900 MW more solar capacity).

Defining renewable energy development objectives, new support for renewables, investing in local renewable energy companies, “self-consumption” call for bids, hydroelectric concessions, injecting biomethane in the gas network ...
4.4. National Energy Framework

![Diagram of energy and spatial planning at national, regional, and local levels]

**Figure 2: Relations between energy and spatial planning at national, regional and local levels**


4.5. National target setting procedures

Concerning the national target setting procedures, there is strong relationship between different sectors and between higher to lower governance levels.

As far as the incentives and compulsory or voluntary measures in place to support the implementation of the national framework, the federations of municipalities more than 20,000 inhabitants are required to implement SECAPs with air quality issues and promote positive energy territories in 2050.

Considering the feedback loop mechanisms to monitor progress, there is a top-down approach adopted in France, which lacks bottom-up cooperation.

In line to the above, the energy planning process is an integrated activity among the lower governance level, but not with the upper one, without any overlap of jurisdiction observed. As a result of the above, local initiatives don’t influence the national planning framework.
Also, energy planning is an integrated activity among the different sectors (social and economic) and topics (energy/mobility, energy/spatial planning, energy/air quality, etc.), while there are strong interactions between sustainable development areas such as climate, energy, waste, green finance, etc. and agriculture and food, agriculture and forestry, transport, biodiversity, land planning, etc.

4.6. The interactions of important actors across different levels of government with national executives

The High Council for Food, Agriculture and Rural Areas (CGAAER) is a high level advisory body under the direct authority of the Minister in charge of Agriculture, Agrifood and forestry. The members of the CGAAER are senior experts from different backgrounds in the public sector who contribute to the elaboration and assessment of public policies within the remit of the Ministry of Agriculture. It carries out audits, assessments and inspections and provides expertise and advice on strategic issues such as agro-ecology, adapting to climate change, sanitary or market crisis management, international cooperation etc.

The Energy Transition for Green Growth Act and its attendant action plans are designed to give France the means to make a more effective contribution to tackling climate change and reinforce its energy independence, while striking a better balance in its energy mix and creating jobs and business growth. The Directorate-General for Infrastructure, Transport and the Sea (DGITM) is responsible for preparing and implementing the national policy on land and maritime transport. The DGITM falls within a policy of sustainable development and energy transition, promoting environmentally friendly transport modes and usage within its areas of competence.

The Directorate-General for energy and climate, for sustainable development and DGITM are within the remit of the Ministry for the Ecological and Inclusive Transition.

Structures in place:
- ADEME is the national energy and environment agency;
- The government has representatives at a regional level, the Prefect. The Prefect is in charge of national interests, of administrative checks, and the respect of Law. The Ministry for the ecological and inclusive transition has also regional directions (DREAL in French) working on environment, land planning and households.
- Regions are in charge of coordinating SECAPs at a local level.

Citizens, local authorities, consumers and companies operating in the transport and energy sectors have all been closely involved in the drafting of the energy transition plan (22 workshops, 800 participants, more than 200 written contributions and oral presentations, over 5,000 contributions in the public consultation), for which a strategic environmental assessment has also been carried out.
5. Energy policy planning process in Germany

5.1. German legal binding instruments

The legal binding instruments for Germany are outlined as follows:

- Energiekonzept 2010;
- Climate Action Plan 2050 (Klimaschutzplan 2050);
- Clean Development Mechanism, Kyoto (CDM, JI);
- Renewable Energy Sources Act (EEG);
- Accelerated approval procedures for grid extension projects (NABEG);
- Increase of efficiency standards for buildings (EnEV);
- Renewable Energy Heat Act (EEWärmeG);
- Financial support of energy efficiency and emission reduction – National Climate Protection Initiative (NKI);
- Energy-Related-Products Act (EVPG);
- KfW subsidy schemes;
- National Action Plan for Energy Efficiency (NAPE);

The German climate- and energy targets are set on the basis of EU policy through the Emission Trading Scheme (ETS) and the ‘Effort-Sharing-Decision’ (ESD), which allows distributing reduction targets among Member States. This is reflected in the Climate Action Plan 2050 and in the Renewable Energy Sources Act and is key to the so-called Energy Transition (Energiewende) in Germany.

5.2. National goals for Energy and Climate by 2030 and 2050

The national goals for energy and climate by 2030 and 2050 respectively are summarized in Figure 3.

![Figure 3: German energy- and climate targets.](Source: German Embassy Warschau)
5.3. Core national strategies by sector

The core national strategy by sector, according to BMUB (2016), is outlined in the paragraphs below.

5.3.1. Energy (main producer of emissions)
- The goal is to reduce emissions in this sector by 61 to 62 percent by 2030.
- Main strategies: phasing out fossil fuels (no hard, binding legislation); structural change and regional development; commission group comprised of government ministries, local authorities, trade unions, representatives of affected businesses, sectors, and regional actors. This commission will create instruments involving economic development, structural change, social compatibility and climate action (e.g. investments in affected regions and sectors).

5.3.2. Industry
- Target: 49 to 51 percent reduction by 2030.
- Main strategies: collaboration between government and industry in developing research programs to reduce emissions of industrial processes; investigating the option of circular carbon economy; tapping into the potential of waste heat.

5.3.3. Transportation
- Target: 40 to 42 percent by 2030.
- Focus areas: cars and light commercial and heavy goods vehicles, fuel efficiency and cleaner fuel (i.e. electricity derived from renewables).

5.3.4. Buildings
- Target: reduction of 66 to 67 percent by 2030; climate-neutral building stock.
- Strategies: build ambitious (but economically feasible) strategies for new building projects and even more ambitious plans to renovate existing buildings; gradual phasing-out of fossil fuel-based heating systems; creation of good incentives for developers.

5.3.5. Agriculture
- Goal: 31 to 34% reduction.
- Strategies: reduce nitrous oxide emissions by curbing use of fertilizers; good nutrient management on farms.

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5.4. National Energy Framework

<table>
<thead>
<tr>
<th>Plans &amp; Programs</th>
<th>Laws &amp; Regulations</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>National level</strong></td>
<td>National climate relevant sectoral laws and regulations</td>
</tr>
<tr>
<td>Action program climate protection, national adaptation strategy</td>
<td>German Renewable Energies Act (EEG), Law for Preservation, the Modernization and the Development of the combined Heat and Power Production (BWK), Energy Saving Act (EnEG), Green House Gas Emission Act (TEHG), Law on Electricity and Gas Supply (ElWG), Renewable Energy Heat Act (EEWärmeG), Energy Saving Regulation (EnEV)</td>
</tr>
<tr>
<td><strong>Federal level</strong></td>
<td>Other sectoral laws with climate-relevant implications</td>
</tr>
<tr>
<td>Climate protection action programs and plans</td>
<td>Federal Building Code (BauGB), Federal Act for the Protection of Nature (NatSchG)</td>
</tr>
<tr>
<td><strong>Regional level</strong></td>
<td>Climate protection laws</td>
</tr>
<tr>
<td>Regional Climate protection concepts</td>
<td></td>
</tr>
<tr>
<td><strong>Local level</strong></td>
<td>Climate protection concepts</td>
</tr>
<tr>
<td>Climate protection concepts</td>
<td>Climate mitigation via measures for renewable energies, cogeneration plants or reduced energy consumption within land use planning</td>
</tr>
</tbody>
</table>

Figure 4: German energy and climate policy framework

Source: Schetke et al., 2018

5.5. National target setting procedure

The EU energy planning requirements and the way they are addressed in the German national strategy are outlined in Table 5, in line with BMUB (2016) and BMWI (2014).

Table 5: EU energy planning and National Strategy - Germany

<table>
<thead>
<tr>
<th>EU energy planning requirements</th>
<th>National strategy in Germany</th>
</tr>
</thead>
<tbody>
<tr>
<td>Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions <strong>Energy Roadmap 2050</strong> (COM/2011/0885 final)</td>
<td>The energy transition (Energiewende) - a policy priority headed by the Federal Ministry of Economic Affairs and Energy (BMWi). The Climate Action Plan 2050 (Klimaschutzplan 2050), lead by the Federal Ministry of the Environmental, Nature Conservation and Nuclear Safety (BMUB)</td>
</tr>
<tr>
<td>Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee, the Committee of</td>
<td>The Renewable Energy Source Act (Erneuerbare Energigesetz – EEG), lead by the Federal Ministry of Economic Affairs and Energy (BMWi).</td>
</tr>
</tbody>
</table>

5.6. Energy planning process as an integrated activity

In Germany, the Regions play a key role in the energy transition in that they co-determine the pace of renewable energy development through their specific targets and regulation. Most Regions have a fundamental interest in the development of renewable energies. They have a high degree of responsibility for the implementation of climate protection goals set at the federal level and the increased use of renewable energy, and at the same time they have considerable discretionary powers. Although the German Regions are confronted with the effects of the regulations initiated by the federal government and do not promote the development of renewables with separate support programs, they have several ways of influencing the energy transition:

- The Regions can supplement the legislative framework set by the federal government with their own laws and regulations, provided the Federal Government does not exercise its right to legislate. Thus they shape the legal and administrative framework.
- The Regions can set their own targets for increasing the share of renewables in electricity supply. All German Regions developed informal energy concepts as general guiding principles for regional and land-use planning (e.g. wind power decrees). The concepts, however, have recommendatory character and are not underpinned in all Regions by formal instruments of spatial planning.
- Some Regions have specified a certain area proportion in their spatial development plan (Landesraumordnungsplan) that is dedicated to wind power.
- Many Regions exert a progressive renewable energy policy by offering programmes for research and development, supporting research at universities and research institutions, providing information and advisory services (e.g. state energy agencies) and by encouraging innovation in small and medium enterprises.
- The Regions are responsible for licensing and approval processes, as well as for regional, spatial, and land use planning. They have the authority to allocate areas for renewable energy. Thus, they can shape the context of the development of renewables and the grids through their regional
planning priorities and through the design of the approval procedures. As part of their room for maneuver the Regions influence the regional political climate for or against renewable energy, which has an impact on sitting decisions of project developers. In particular, the Northern German Regions (Conference North Germany) aim for a systematic expansion of wind energy and bring about a focus of the expansion of wind power in northern Germany.

- At the federal level, the Regions can influence energy policy decisions and federal (binding) law in particular through their representation in the Federal Assembly and in the Federal-State Energy Summit.
- The Regions can exert additional influence in the Joint Committees of the Ministers for Economic Affairs and the Ministers for the Environment of the Regions, as well as in the Conference of Ministers for Spatial Planning (Ohlhorst; 2015) 29.
- Through the representatives of the Regions in Brussels or the Committee of the Regions, they can influence policy at the European level.
- The Regions can contribute to a progressive renewable energy policy through information, advice, and training offers for citizens, investors and farmers. In the federal system, the Regions are intermediaries between the federal and the local levels.

During the development of the Climate Action Plan 30, various actors were included in the discussion: regions and municipalities, as well as associations and the broader public. The regions have representation in national working groups and can thus affect specific policies. The German regions (Bundesländer) have a strong influence over the policy processes on the federal level and function as labs for experimentation in terms of climate and policy and renewable energy extraction (Ohlhorst, 2015). They compete with each other over regional investment, tax incentives, distributional returns and value added. However, the regions present large differences in structural and economic conditions and follow greatly diverging sub national interests. Also the potential for producing renewable energy varies greatly across the different regions.

The WWF and several other NGOs have criticised that business actors have too much influence in this process and hinder the formulation of more ambitious targets. Furthermore, there seems to be a lack of spatial distribution of renewable energy generation. Moreover, Top-down and bottom-up approaches exist in parallel, but the current system exhibits a lack of multi-level integration and governance, spatial coordination, and system optimization. Finally, such multi-level system lacks a platform where the activities of various levels of energy transition could converge (Ohlhorst, 2015).

The Climate Action Plan states the government’s intention to work with trade unions, for instance, as a way to consider all those affected by the changes supported by the plan. Economic development and feasibility is often emphasized, in conjunction with social responsibility and considering social impacts, i.e. through using metrics other than GDP to gauge prosperity, planned research combining natural and social sciences, including social consequences as part of the impact assessment.

Moreover, the Action Plan incorporates as narrative for 2050, a vision of sustainable living. This vision includes, carbon neutral mobility, integrated urban development, as well as affordable housing that promotes well-being. For instance, the German government will extend the national cycling action plan

Eleven country reports reviewing the energy planning process beyond the year 2020 that seeks to promote innovative mobility models that help reduce related emissions and rely on social participation\textsuperscript{31}.

As far as the integration of energy planning with economic planning, the energy and transport sector accounted for about 6.3% of the total value added of Germany in 2015. Similarly, their share in total employment was 5.5% of total employment in 2015, of which 4.9% in the transport sector and 0.6% in the energy sector. The turnover of the renewable energy industry was estimated at around EUR 29.6 billion.

61.9% of German energy consumption relies on imports, a value slightly higher than the EU average. There was an increase of about 1.5 percentage points (p.p.) in overall import dependency in Germany between 2005 and 2015, whilst also at the EU level, import dependency increased by 1.9p.p. over the same period. In 2015, Germany imported more than 90% of its natural gas, almost all of its oil needs, and approximately 88% of its hard coal which represents a considerable increase compared to 2005.

Russia accounted for 42.6% of natural gas imports in Germany. Russia is also the dominant non-EU supplier of crude oil (35.7%) and hard coal (27.0%) to Germany. In the areas of natural gas and crude oil, Russia is followed by Norway (21.5% for natural gas; 13.6% for crude oil)\textsuperscript{32}.

Furthermore, there are new requirements for the German grid, also in the light of renewable electricity generation. Renewable electricity is produced and owned in a decentralised way. Major offshore projects planned in the North Sea and Baltic Sea are expected to increase the need for grid management.

5.7. The interactions of important actors across different levels of government with national executives

One example of inter-departmental cooperation, including other relevant stakeholders, is the German Energy Research Programme (Energieforschungsprogramm). The current, sixth, programme framework is dedicated to reaching the goal of the energy transition (Energiewende). Involved departments are the Federal Ministry of Education and Research (BMBF), the Federal Ministry of Agriculture (BMEL) and the Federal Ministry of Economic Affairs and Energy (BMWI).

The German Climate Action Plan and subsequent initiatives are led by the Federal Ministry of the Environment, Nature Conservation Nuclear Safety (BMUB). Other involved departments include the Federal Ministry of Food and Agriculture (BMEL) and the Ministry of Economic Affairs and Energy (BMWI).

The energy transition and the renewable energy act (Errneuerbare Energiengesetz- EEG) are leded by the Federal Ministry of Economic Affairs and Energy (BMWI) with support from the BMEL, the BMUB and the UBA.


The departments include NGOs in policy processes described, mainly to solicit feedback. NGOs have provided both feedback during the development process and criticism about the finished policy products, pushing the government and agencies to set more ambitious targets.

Representatives from the regional governments (Bundesländer) participate in the assembly and thus influence the policy process. Having jurisdiction over land usage, regional governments are instrumental for renewable energy planning. Additionally, they are able to set priorities by investing in respective R&D.
6. Energy policy planning process in Greece

6.1. National Energy and Climate targets by 2020, 2030 and 2050

The country’s climate change targets are largely set by international and European policy. Greece ratified the Paris Agreement in October 2016 as part of the EU ratification process, but has not set any specific nationally determined contribution beyond the EU-wide target of at least a 40% domestic reduction in greenhouse gas emissions by 2030, from the 1990 level.

Under the EU 2020 Package, Greece committed to an energy efficiency target of 18.4 Mtoe of final energy consumption, with a national renewable energy target of 20% (2% higher than the set target). According to IEA report on Greece (2017 review), the country has made strong progress towards meeting the renewable energy target in electricity and heating, but not in transport. The country is well on track to meet its 2020 target, with a final energy consumption of 16 Mtoe in 2015, because energy demand has decreased substantially since 2008.

In March 2012, the policy paper “National Energy Plan: Roadmap to 2050” was developed and put to public consultation. The 2050 Energy Roadmap contains a complete description of policies and measures that could reduce GHG emissions by 60 to 70 percent compared to 2005. Three scenarios were examined in order to specify and evaluate alternative measures and policies for the fulfillment of national and European targets. The main pillars of the national energy planning are reducing dependence on imported energy, maximizing the penetration of renewables, achieving a significant reduction in emissions of carbon dioxide by 2050, and reinforcing the protection of final consumers.

The main policies suggested to attain this goal include:

- The production of between 85 and 100 percent of electricity using renewable energy technologies that are already commercially available or fully tested;
- A large (60 to 70 percent) contribution of renewables to primary energy supply by 2050;
- The stabilisation of energy demand through energy conservation policies and measures;
- A relative increase in electricity demand due to the electrification of the transport sector and increased use of heat pumps in the residential and tertiary sectors;
- A significant reduction in oil use;
- An increase in biofuel use in transport reaching 34 to 39 percent by 2050;
- A large share (42 percent) of small-distance passenger transport by electric means of transportation; and
- An increase in the share of passengers (18 percent) and freight (13 percent) transported by rail.

Although an energy plan for the country for 2030 is not yet in place, there is one study available, developed in February 2017 by the governing party, with the aim to form a basis for launching the dialogue. This study is titled “Analysis and design study of the Greek energy system for the period 2017 – 2035”. Nevertheless, this study has been criticized as it is not considered to set ambitious reduction targets for greenhouse gases. Currently, the only available long-term planning policy document is the Roadmap to 2050 as described above. In order to update the plan according to the latest economic and other input data, the Ministry of Environment and Energy decided to develop a new strategic plan.

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for the Greek energy sector up to 2030. To date, this plan is not available on the Ministry’s website. It should be noted though that in the run-up to the decision by the European Council in October 2014 on the EC’s climate and energy framework, the Greek Government has committed to set a 30 percent target for both renewable energy and energy conservation.³⁴

In 2014, in line with the EU strategy on adaptation to climate change, the Ministry of Environment and Energy developed the National Climate Change Adaptation Strategy, which was put into public consultation in 2015. The primary objective of the Strategy is to help strengthen the country’s resilience to climate change and create the conditions for decisions to be taken on the basis of correct information, considering long-term targets, addressing the risks of climate change and exploiting any opportunities that arise. More specific objectives, include:

- Improving the decision-making process by collecting information and scientific data on adaptation.
- Promoting the development and implementation of regional / local action plans in line with the strategy.
- Promoting adaptation actions and policies in all areas, with emphasis on the most vulnerable.
- Establishing a monitoring and evaluation mechanism for adaptation actions and policies.
- Raising public awareness.

Finally, a National Council for Adaptation to Climate Change was set up and established by Ministerial Decision 34768/2017 (Government Gazette B 3246).

### 6.2. National Energy Framework

At a national level, the top objective is to safeguard and manage energy resources in a way that secures the smooth, uninterrupted and reliable supply of the nation’s energy needs and access for all users to affordable, secure energy. The second objective is to secure energy stocks, through alliances and alternative energy sources and routes in order to ensure the supply of the domestic market and protect consumers in the case of emergencies. The third objective is the viable and sustainable development of the energy sector from the stage of production to the end-use while protecting nature and safeguarding the environment.

The strategy to ensure supply needs and address energy issues in Greece is shaped by the regulatory and legal framework and focuses on the following general axes, as expressed by the Ministry of Environment and Energy (YPEN, former YPEKA)³⁵:

- Access to a wide variety of energy sources;
- Construction of oil and natural gas pipelines within international networks;
- Increased use of domestic energy sources and stocks;
- Reduced dependence on certain high risk energy sources;
- Development of renewable energy sources installations with the granting of incentives;
- Use and diffusion of clean and efficient environment friendly technologies;

- Liberalization of the market, increased competitiveness and putting an end to monopolies in the electricity and natural gas sectors;
- Establishment of a healthy investment climate for businesses in the energy sector;
- Energy savings for industry, transport, buildings and homes;
- Establishment of national targets for the increased penetration of energy generated from renewable energy sources, the reduction of greenhouse gas emissions and energy saving.

As far as the national regulatory framework is concerned, Directive 2012/27/EU on energy efficiency, establishes a set of binding measures to help the EU reach its 20% energy efficiency target by 2020. This has been transposed into the Greek legislation under Law 4342/2015 (Government Gazette A 143/9-11-2015). Under this Directive, EU countries should develop and update their National Energy Efficiency Action Plan (NEEAP) every three years. Greece has published so far four NEEAPs in 2008, 2011, 2014 and 2017, which focus on 2016 and 2020 and set out the estimated energy consumption, the planned energy efficiency measures and the improvements expected to be achieved.

Furthermore, Directive 2009/28/EC on renewable energy establishes the overall policy for the production and promotion of energy from renewable sources in the EU. It requires the EU to fulfil at least 20% of its total energy needs with renewables by 2020, with at least 10% of transport fuels to come from renewable sources. The Directive specifies national renewable energy targets for each country and it requires the elaboration of national renewable energy action plans that set out national renewable energy policy and how targets will be met. Law N.3851/2010 (Government Gazette A 85/4-6-2010), transposing the Directive into Greek legislation, increased the national goal (from 18% to 20%) regarding the participation of renewables in gross final energy consumption. This is composed of 40% participation of renewable energy sources in electricity production, 20% in heating and cooling and 10% in transport. In line with the above, the National Renewable Energy Action Plan for Greece was developed for the period 2010 – 2020.

Beyond the implementation of the above mentioned directives at the national level, the Ministry of Environment and Energy is also responsible to monitor the progress of the implemented activities. As concerns energy and environmental statistical data, these are gathered by the Ministry of Environment and Energy, in collaboration with the Hellenic Statistics Authority.

It should be noted that the Greek government offers incentives, and obligatory or voluntary measures for promoting the adoption of energy efficiency measures and renewable energy, such as the provision of feed in tariffs, and the launch of EXOIKONOMO (Saving energy) programmes, addressing households or public entities (local administration) for the renovation of their building stock.

Also, in April 2017, the Ministry of Environment and Energy of Greece has officially published the Regulation for the operation of Energy Efficiency Obligation Scheme (National Gazette 1242Β/11-4-2017), in accordance with the stipulations of the Energy Efficiency Directive (2012/27/EU), a development considered important for the energy efficiency sector.

Under this regime, energy distributors and/or retail energy sales companies are obliged to achieve a cumulative end-use energy savings target by 2020, in order to contribute to the achievement of national energy efficiency targets, with the added benefits of reduced energy cost, promotion of energy services and Energy Performance Contracting (EPC), support of low-income households and environmental protection. Both the obligated parties and their energy efficiency targets will be established each year, according to statistical data of energy sales. The obligated parties include electricity, oil and natural gas providers. The fulfilment of the targets can be achieved with the implementation of energy efficiency measures either by the obligated parties or by third parties, on
residential buildings, tertiary sector and industry buildings and infrastructure, as well as on vehicles. The measures include actions for the improvement of users’ behaviour and technical interventions, such as insulation, higher efficiency equipment etc.

### 6.3. National target setting procedure

The main body tasked by the Greek state to elaborate a long-term energy plan for Greece is the National Committee for Energy Planning, which was established by Law 3438/2006. Its structure and composition were specified by Decree 16/2010 of the Council of Ministers. The Committee provides advice to the Ministry of Environment and Energy on energy planning and was responsible for drafting the 2050 Energy Roadmap mentioned above. In addition to the National Committee for Energy Planning, ad hoc committees have been formed to elaborate special energy plans such as the mandated National Renewable Energy Action Plan (NREAP) and National Energy Efficiency Action Plan (NEEAP).

More recently, under the Ministerial Decision 27 of 27/12/2017, as published in the Governmental Gazette, the National Committee for Energy and Climate (NCEC) is established, undertaking the responsibilities of the National Committee for Energy Planning. NCEC has the following tasks:

- The formulation of national priorities, methodological approach and roadmap for the country’s energy planning, as well as the development of the National Plan on Energy and Climate.
- The analysis of scenarios for the development of the country’s energy system.
- The development and promotion of energy policy recommendations.
- The coordination of different institutions for their contribution in these tasks.
- The coordination and organization of public consultation at the national and regional level.
- The consultation process with the European Commission for the finalization of the National Action Plan.
- The coordination of the whole process.

Members of this committee are the general secretaries from different directorates of relevant Ministries (Ministry of Environment and Energy, the Ministry of Finance, Ministry of Infrastructures and Transport), the Centre for Renewable Energy Sources and Savings, the Regulatory Authority for Energy, the Natural Gas Transmission System Operator, the Power Transmission System Operator, the Electricity Market Operator, the Hellenic Statistical Authority and six more external members.

A rolling 10-year plan for the upgrading and expansion of the national electricity grid is also elaborated by the Greek independent transmission system operator, the ADMHE.

### 6.4. Key national actors and energy stakeholders

The Ministry of Environment and Energy is responsible for environment, energy, and climate change policy within the government. Within the Ministry, the Directorate for Energy is responsible for implementing renewable energy and energy efficiency policy, as well as for collating energy statistics.

The Centre for Renewable Energy Sources and Saving (CRES) is the Greek organisation for Renewable Energy Sources, Rational Use of Energy and Energy Saving and is also a Covenant National Coordinator. CRES has been appointed as the national co-ordination centre in its area of activity. It is a public entity, supervised by the Ministry of Environment and Energy and has financial and administrative
independence. Its main goal is the research and promotion of renewable energy sources and energy saving applications at a national and international level, as well as the support of related activities, taking into consideration the principles of sustainable development. CRES manages the national database on renewable energy sources and has formed an energy poverty observatory in order to inform both citizens and decision-makers on energy poverty in Greece.

The Technical Chamber of Greece (TCG) is a professional public organization that serves as the official technical advisor of the Greek state and is also a Covenant National Coordinator. TCG has created an energy observatory to facilitate access to energy data for local and regional energy planning purposes and has actively pursued the collaboration of energy stakeholders, whilst also signing memoranda of cooperation to formalise the collaboration. More specifically, TCG has signed a memorandum with:

- Two of the most important energy providers in Greece, (the Public Power Corporation S.A. (PPC), the biggest power producer and electricity supply company in Greece and the Public Gas Corporation (DEPA) S.A., an important natural gas supply company)
- The Hellenic Electricity Distribution Network Operator S.A. (HEDNO)
- The Centre for Renewable Energy Sources and Saving (CRES)
- The Central Union of Municipalities & Communities of Greece (KEDE) and the Region of Epirus.

The energy sector in Greece is dominated by state-owned enterprises and lacks sufficient competition. Nowadays, fundamental reforms are being made, in particular due to requirements arising from European legislation and international cooperation, which are shaping and harmonizing the institutional and legislative framework of the energy market. Changes include: the liberalization of the electricity and natural gas markets, the extension and enhancement of the domestic and cross-border electricity, natural gas and oil networks, the further separation of production and supply from transmission networks, consumer choice, increased share of energy from renewable energy sources and reduced share of fossil-fuel generated electricity.

6.5. Energy policy planning process as an integrated activity

Local governance in Greece is divided in two levels. The first level of administration is represented by the municipalities, while the second from the regions. The 2010 Kallikratis reform (Law 3852/2010, Governmental Gazette 87/B/7.6.2010), which came into force on 01/01/2011, merged 900 municipalities and 133 communities (formed under Law 2539/1997, Governmental Gazette 244/A/4.12.1997) into 325 municipalities. The new municipalities are subdivided into municipal units. With the Kallikratis Law, thirteen (13) regions were established each encompassing numerous municipalities.

This recent reform significantly changed the existing local governance framework and operation. As a common procedure, many small municipalities merged into a larger one. These small municipalities did not have a Technical Department or technical experts and as a result, information on the energy consumption and performance of buildings, schools, facilities and vehicles was limited or insufficient. Energy planning was not a process that most municipalities were accustomed to, so measures and actions implemented were abrupt and usually implemented as a response to a specific need or a specific call for financing energy efficiency measures.

However, the Covenant of Mayors initiative is gaining momentum in Greece. Currently there are 156 Signatories, six Covenant Coordinators and nine Covenant Supporters in the country. Thus, the Covenant has mobilized approximately 50% of Greek local authorities, which voluntarily commit to
increase the energy efficiency and use of renewable energy sources within their territories, as well as reduce CO₂ emissions. As a result many local authorities have or are currently developing Sustainable Energy and Climate Action Plans.

Furthermore, Directive 2012/27/EU on energy efficiency, notes that Member States should encourage municipalities and other public bodies to adopt integrated and sustainable energy efficiency plans with clear objectives, to involve citizens in their development and implementation and to adequately inform them about their content and progress in achieving objectives. As such, Law 4342/2015 (Government Gazette A 143 / 9-11-2015), transposing the Energy Efficiency Directive, establishes the elaboration of an energy efficiency plan at a local level, with a primary focus on public buildings. The plan must contain specific objectives and outline energy efficiency measures to be implemented. The plan is reviewed every two years and submitted to the Ministry of Environment and Energy. An energy management system, which includes energy audits as part of the energy efficiency plan, should also be put in place.

Moreover, the regional authorities of the thirteen regions in Greece are responsible for the expansion, planning and management of waste disposal sites. Their plans must adhere to the principles and conditions set out in the National Plan for Waste Management, which is the responsibility of Ministry of Environment and Energy and is the strategic plan for all waste streams at national level.

Finally, Law 4414/2016 (Government Gazette A 149 / 09.08.2016), establishes the development of Regional Climate Change Adaptation Plans, which, based on the climatic conditions and vulnerability of each region, will define priority policy areas and specific targeted measures. The content of each plan was specified in Ministerial Decision 11258/2017 (Government Gazette B873).

It should be noted that the process for formulating national energy and climate policy plans does not require the active engagement of local and regional governments. Whilst in some cases key policymakers are involved, there is no clear framework to involve different levels of governance during the national planning process (other than the public consultation phase).

In addition to this, as outlined above, national, regional and local plans are required to be developed. However, the requirements vary at each level, for example a climate change adaptation plan is developed at a regional level and an energy efficiency plan is developed at a local level. Therefore, energy planning is not an integrated activity. Moreover, these plans usually do not take into consideration the plans available at a national level, or vice versa. In reality, these plans are interconnected, therefore there is an urgent need to establish a multi-level cooperation framework and feedback loop mechanism, in order to be able to achieve synergies and economies of scale.
7. Energy policy planning process in Hungary

Hungary’s legal binding instruments are the national law on Energy Efficiency (LVII/2015) and the national goals for Energy and Climate by 2030, and by 2050.

7.1. Hungary’s 2020 renewable energy targets by 2020, 2030 and 2050

The renewable energy targets for Hungary are outlined below:

- **Overall target**: 14.65% of share of energy generated from renewable sources in gross final energy consumption;
- **Heating and cooling**: 18.9% of heat consumption met by renewable sources;
- **Electricity**: 10.9% of electricity demand met by electricity generated from renewable energy sources;
- **Transport**: 10% of energy demand met by renewable energy sources;

In order to achieve the above enlisted targets, Hungary implements and runs a number of programmes supporting the deployment of renewable energies financially, fiscally and also by creating the appropriate legislative and administrative framework, such as:

- Feed-in tariff;
- Various fiscal incentives;
- Promotion of pilot projects;
- Trainings for installers.

In terms of renewable energy sources, combined heat and power, biogas and biomass power plants and geothermal energy utilisation, serving primarily but not exclusively heat generation purposes, will be treated as priorities. In addition to the above, solar energy-based heat and electric power generation and wind-generated electricity are also expected to increase. A more substantial utilisation of the Hungarian solar energy potential for direct electric power generation may become possible after 2020, due to the decreasing price of photovoltaic technology. As far as the utilisation of bioenergy is concerned, decentralised energy-producing units (e.g. biogas plants) processing feedstock originating from energy plantations and agricultural and industrial (e.g. food industry) by-products will be given priority. Another important question is the energy utilisation of communal and industrial wastes non-utilisable in their materials and of waste waters.

The aim is preferably to reduce the 2010 level of domestic primary energy use of 1,085 PJ or, at worst, that it should not exceed 1,150 PJ, which is the typical level of the years prior to the economic crisis, by 2030. This must be achieved while meeting the competitiveness, sustainability and safety of supply requirements and reducing the use of fossil fuels and CO₂ emissions. From 1,150 PJ, a relatively high value in European comparison, the energy intensity of the economy will be substantially reduced as the result of the decreasing primary energy demand, as the growth of the GNP is achieved at a declining or nearly stable level of energy consumption. This may lessen Hungary’s vulnerability and dependency on the import of fossil fuels, as well as decrease the volatility of domestic energy prices. Energy-efficiency projects in the building sector are a key component of the improvement of energy efficiency. Today, 40 percent of all energy consumed in Hungary is consumed by the buildings, two-thirds of which goes to heating and cooling. 70 percent of the approximately 4.3 million Hungarian homes fail to meet
modern functional technical and thermal engineering requirements, with a similar ratio for public buildings. Despite an improving trend, as the result of the communal energy efficiency programs implemented in the recent years, the energy consumption for heating of a flat in Budapest is still twice that of a similar sized flat in Vienna. The renovation of existing buildings, with particular regard to public buildings, is therefore a priority.

It is the purpose of the Energy Strategy to reduce, by 2030, the heating energy requirements of buildings by 30 percent through energy-efficiency programs in the building sector in accordance with European Union targets. This will enable an over 10 percent reduction of the overall primary energy demand in Hungary. The renewal of obsolete, low-efficiency power plants and the reduction of grid losses will, between them, represent an additional primary energy saving of 6 to 9 percent. In addition to the above, the reduction of the energy needs of industrial workflows and transport is another important constituent of the energy saving program. Awareness-raising also plays an important role in the propagation of energy conservation and the reduction of the environmental load of ecosystems: the widest possible groups of society must be converted into environmentally conscious consumers, from schools to adult education.

Hungary’s new energy strategy, the National Energy Strategy to 2030, published in 2012, was a major step in formulating a long-term vision for government policy in the sector. The main objective of the strategy was to ensure a sustainable and secure energy sector while supporting the competitiveness of the economy.

Mindful of high energy costs and their impact on family incomes, the government initiated a policy of mandatory price cuts to reduce household energy bills. While the short-term impact has been a reduction in energy bills, in the long term, this policy may damage national competitiveness. Renewable energy production has increased significantly in the last decade but the growth rate in the sector has slowed. Recent reforms and the introduction of a new support system for electricity from renewable sources could restrain this slowdown. On the other hand, measures that limit wind power developments are likely to have a negative impact on the sector.

Greenhouse gas emissions have declined as the economy has become less carbon-intensive. Nonetheless, the country could adopt more ambitious targets for emission reductions. Energy security has been strengthened and there have been a number of large investments in oil, electricity and natural gas infrastructure. Further investments are expected, notably the construction of two new nuclear power generating units.

This latest review of Hungary’s energy policies, the first since 2011, examines the current energy-policy landscape and makes recommendations for improvements. These recommendations are intended to guide the country towards a more secure and sustainable energy future.

As concerns Hungary in 2050, there is the one hundred percent (100%) renewable energy scenario. Currently, Hungary has two alternatives in terms of shaping its energy policy. One option is to face a future burdened with ongoing and increasingly harsh conflicts or alternatively, try to become as independent from global trends as possible. There are five tools in order to achieve that goal: energy saving, the highest possible share of renewable energy, safe nuclear energy and the related electrification of transport, integration to the European energy market and the establishment of bipolar agriculture.

Discussing the potential Hungarian energy policy scenarios, it should be pointed out in advance that the future of Hungary is envisaged in a cooperative regional environment (V4, V4+), giving preference
to the rational collective exploitation of the mutual economic benefits. A coordinated regional energy policy would enable joint energy projects (jointly built and owned nuclear power plants and the rational integration of peak and baseload capacities), the downsizing of parallel capacities, joint infrastructure improvements and the optimisation of cross-border capacities.

### 7.2. Core national strategies by sector

The main sectors of energy sustainability policy, according to the National Energy Strategy 2030, are analysed in the following sections.

#### 7.2.1. Primary energy

Concerning energy efficiency, the modernisation of electric power stations and the grid is envisaged, by replacing the current low-efficiency power stations up to 2030. This action could result in 78 PJ savings of primary energy compared to the current situation. The retrofitting of buildings and the modernisation of heating and cooling systems holds the greatest energy efficiency potential. The stabilisation of communal consumption requires a minimum of a 30-percent improvement of energy efficiency.

The most important indicator for the characterisation of building energy programs is the depth of retrofit, representing the average savings achieved on a system level (i.e. for all buildings of a particular type). In the modelling of building energy programs, 60 percent depth of retrofit is reckoned with on average up to 2030.

#### 7.2.2. Renewable energy sources

The system of incentives concerning the utilisation of renewable energy sources should be developed in a way that co-generating biogas and biomass power plants are given priority in the case of the co-generation of heat and electricity and that geothermal energy, also of primary importance, should primarily, but not exclusively, be used for heat generation. In accordance with and in compliance with the criteria of sustainability and energy efficiency, the local energy utilisation of the by-products of agriculture (e.g. straw and maize stalk) and sewage water and sludge in biomass power and biogas plants, among other options, are treated as a priority. The utilisation of communal and industrial wastes non-utilisable in their materials must be carried out in waste incineration plants operating under strict conditions and in compliance with strict environmental requirements. The upgrade of the biogas will enable the partial replacement of imported natural gas.

#### 7.2.3. Electric power

The ‘Joint effort’ vision (Figure 5 below), which is considered to be the most realistic and therefore set as a target to be achieved, is reflected in the Nuclear-Coal-Green scenario, which includes the following elements:

- The long-term maintenance of nuclear energy in the energy mix;
- The maintenance of the level of coal-based power generation in order to preserve professional culture and the possibility of the utilisation of the domestic coal resources. The application of clean coal and CCS technologies is a condition of the increasing future level of utilisation;
- In terms of renewable energy, the linear extension of the NREAP (National Renewable Energy Action Plan) after 2020, provided that efforts should be made to increase the targeted share
depending on the meeting of the NREAP, the capacity of the economy and system controllability and technology development.

Figure 5: Hungary’s expected electricity production, according to the various energy mixes

Source: REKK – Regional Centre for Energy Policy Research

With regards to the above, the local utilisation of verified firewood purchased from forest farmers engaging in sustainable forestry, biomass from energy plantations and agricultural by-products should primarily be utilised, preferably in CHP plants. Wherever the geothermic potential is suitable for power generation, it should be combined with heat utilisation, due to the greater efficiency of combined systems. In the case of photovoltaic systems, the expected further technological development will enable the exploitation of the domestic potential, due to the lower cost of investment and purchase price. An important consideration, however, since the large-scale installation of photovoltaic systems should not be detrimental to green areas, brown field projects and roofs should be given preference. As far as hydro energy is concerned, the number of small-capacity power-generation units should be increased, as they are mobile, do not lead to irreversible environmental changes and do not require the construction of major aquatic structures.

7.2.4. Heat energy

Building energy programs – district heating network through development and the utilisation of renewable energy sources, the achievement of national and EU energy targets, rationalisation of energy consumption, improving urban air quality, reducing import dependency, in particular natural gas and petroleum dependency, innovations and the implementation of the related advanced technologies, awareness-raising (energy – environmental awareness) and the utilisation of intellectual potential, accommodation of domestic and international businesses, resulting in significant job-creation and boosting the construction industry.

7.2.5. Transport

Since there are technical obstacles to the blending of biofuels into traditional fuels, particularly as far as the Hungarian vehicle stock is concerned, the blend-in rate probably cannot exceed 10 percent. By 2030, the share of biofuels will reach 14 percent. In terms of biofuels, the most important objectives are to meet EU targets while resolving the contradictions vis-à-vis primary food and fodder production. The desired higher share can be achieved through switching public transport systems and agricultural
equipment over to locally produced second-generation and biogas fuels. For passenger cars, meeting the updated EU targets in terms of the share of electric and/or hydrogen-propelled vehicles by 2030 is a top priority.

Hungary is on track to meet all of its 2020 targets for energy efficiency, renewable energy and reducing greenhouse gas emissions, although its transport sector needs to make greater efforts to source more energy from renewables.

7.3. National Energy Framework

The national energy framework comprises of the below outlined strategies and plans:

- National Energy Strategy 2030;
- National Building Energy Strategy;
- National Renewable Energy Action Plan;
- National Climate Change Strategy (contains the Decarbonization Road Map including the goals of the GHG emission reduction until 2050, as well as the National Adaptation Strategy).

The national energy framework comprises of the below outlined strategies and plans:

- National Energy Strategy 2030;
- National Building Energy Strategy;
- National Renewable Energy Action Plan;
- National Climate Change Strategy (contains the Decarbonization Road Map including the goals of the GHG emission reduction until 2050, as well as the National Adaptation Strategy).

The long-term strategy of the Government until 2020 in energy policy is to ensure the security of supply, competitiveness and sustainability.

The National Rural Strategy, which is an environmental plan, could also have an impact on the energy and climate strategy.

7.4. National target setting procedures

The table below summarizes how the EU energy planning requirements have been addressed by the Hungarian national strategy.

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<tr>
<th>EU energy planning requirements</th>
<th>National strategy in Hungary</th>
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<tr>
<td>Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions Energy Roadmap 2050 (COM/2011/0885 final)</td>
<td>The National Energy Strategy 2030 including a roadmap until 2050 puts the measures proposed for the period until 2030 into a more comprehensive and longer term perspective.</td>
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| Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee, the Committee of the Regions and the European Investment Bank Clean Energy For All Europeans (COM/2016/0860 final) | In 2017, Vice-President Šefčovič met the Prime Minister of Hungary, Viktor Orbán, the Minister for Foreign Affairs and Trade Mr. Péter Szijjártó and the Minister for Energy, Mr. András Aradszky. The focus of their discussions is on the Clean Energy for All Europeans package published in November 2016 and in particular on the Energy Union’s governance and national energy and climate plans. The need to further connect Hungary’s electricity grids to the networks of neighbouring countries and ways of lowering the costs of the energy transition in Europe were also high on the agenda. The Vice-President witnessed the signature by Hungary and Croatia of a
memorandum of understanding on building infrastructure to create bi-directional natural gas flow between the two countries. Vice-President Šefčovič met with energy stakeholders to discuss Hungary’s role in the European energy transition and the benefits that a fully functioning EU internal energy market can bring to Hungarian citizens and businesses.

<table>
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<th>EU energy planning requirements</th>
<th>National strategy in Hungary</th>
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<tr>
<td>NREAP</td>
<td>NREAP</td>
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Hungary is doing really well reducing its greenhouse gas emissions, and it reached its 2020 target for renewable energy already in 2015. It is the right of every Member State to determine its own energy mix. At the same time cooperation at a regional level can substantially contribute to ensuring secure energy supplies and energy prices that are affordable for households and for businesses. Boosting more efficient energy use, creating competitive markets and innovation are key in this respect.

The national goals set were discussed and adopted by all governance levels. Concerning any incentives, and compulsory or voluntary measures supporting the implementation of the national framework, in Hungary it is obligatory for local governments to hire an energy expert, while energy audits in public buildings are also compulsory according to the Energy Efficiency Law (LVII/2015). For the public sector it is also an obligatory task to retrofit the publicly-owned buildings; minimum 3% of the total area of their buildings (which do not meet with the energy requirements) in every year.

### 7.5. The Operating Aid for Electricity Production from Renewable Energy Sources (METÁR)

Guidelines on State aid for environmental protection and energy 2014-2020 2014/C 200/01. The METÁR fulfills the basic requirements of the EU Guidelines as follows:

- Producers receiving the operating aid from METÁR above the market reference price, as a surcharge (premium).
- Beneficiaries have to bear the costs of deviations from the previously accepted daily schedule of electricity production.
- The new system ensures that no renewable electricity producers are receiving premium in case of negative electricity market prices if this period is exceeding 6 hours.
- The payment entitlements shall be distributed by competitive bidding (tendering) procedures, in order to maximize cost efficiency 15 METÁR package of legislation.

#### i. Concept

- there were consultations on the concept, and the legislative text was negotiated with the different stakeholders;
- Prenotification phase.
- Legislation. Changes are planned for the Electric Energy Act, there will be new METÁR decree official notification phase.
ii. Further legislation: (ministerial and other decrees) Sixteen (16) Exemptions in METÁR according to the Guidelines. The following electricity producers are enabled to receive feed-in tariff, remaining the main present feed-in tariff national system:

- Power plants below 0.5 MW capacity;
- Demonstration projects.

7.5.1. Feed-in tariff and Demonstration projects

In the case of power plants, with small capacity (up to 0.5 MW) and demonstration projects, METÁR feed-in tariff will be used. The energy produced will be taken over by the Hungarian Electricity Transmission System Operator Company Ltd. (hereinafter: referred to as MAVIR) and will be sold on the market operated by HUPX Ltd.

- In the case of power plants with medium capacity (between 0.5 and 1 MW), administrative premium support will be granted to producers, without any competitive bidding procedure (no tenders). The prices and principles are regulated in MEKH (Magyar Energetikai és Közműszabályozási Hivatal – Hungarian Energy and Public Utility Regulatory Authority) decree, in special cases (e.g. demonstration projects) MEKH is to decide by individual cases, on the basis of calculations under the MEKH decree;
- The Hungarian system similarly to the EU Guidelines treats the demonstration projects as exceptions.

7.5.2. Premium System

- The power plants must sell the electricity produced from renewable sources on the free market at market price;
- Producers receiving the operating aid from METÁR above the market reference price, as a surcharge (premium);
- The benchmark for the floating premium price is the market reference price, i.e. not the price actually gained by the producer;
- Producers real income = market price + premium;
- Brown premium: the operating aid provided for biomass/biogas power plants after depreciation of the power plants.

7.5.3. The competitive bidding process

- The aid shall be allocated to the cost efficiency through the bidding process;
- After 1 Jan 2017 competitive bidding rules are compulsory;
- The premium price support is for a maximum 20 years long period.

The Hungarian Energy and Public Utility Regulatory Authority (HEA) is the regulatory body of the energy and public utility market, supervising the national economy’s sectors of strategic importance. This body collects and publishes the energy data of Hungary.
7.6. Energy planning process as an integrated activity

Hungary is very centralized in terms of energy, and local/regional initiatives don’t influence the national planning framework.

‘A balanced state is needed which encourages everyone to act together. A strong state which above all serves public interest and the interest of our nation, not the business interests of a privileged few’ (2010, The Program of National Cooperation).

The whole system of relations of the energy sector has changed and has become more complex as it now has links to other policies (transport, environmental protection, agriculture, water management, education and employment). The energy policy and the role of the government must therefore adopt a complex approach, also extending to other areas. In addition to the classic fields of energy policy, the role of the government should have a proactive effect on awareness-raising, R&D and innovation activities. Appropriate government measures can ensure in the long term that the energy sector should continue to operate as a sustainable and secure sector, serving the purpose of economic competitiveness to the greatest extent possible. To that end, it is of critical importance to restore and later to increase the stability and credibility of the government system of institutions in charge of energy policy. The key to the sustainable operation of the energy sector is an independent, predictable, transparent, accountable and investment-stimulating industrial regulation in accordance with the requirements of the European Union and regional efforts.

It is the duty of the government to ensure the coherence of the legal and economic conditions falling into the scope of energy policy with a view to fully asserting national interests. To that end, a more definite, efficient and predictable government regulation is required, one that is in accordance with the European regulation and takes consumers’ interests into account.

7.7. The interactions of important actors across different levels of government with national executives

In Hungary, raising citizens’ awareness can happen in several ways. One of the most important is the Environmental and Energy Efficiency Operation Programme, in which local governments can apply for funds to raise citizens’ awareness. They can get a grant between about 15,000 – 65,000 EUR to elaborate a special programme for different stakeholders. The problem could be that sometimes the evaluation process takes more than one year.

Besides, non-profit organization can help in raising awareness of citizens, like LENERG Energy.

The main steps of the legislative procedure are outlined below:

- Energy planning colloquium – National Ministry of Development
- Inter-governmental forums 1
- Published draft document;
- Stakeholder consultations on draft proposal;
- Inter-governmental forums 2;

While the final version of the National Energy Strategy has been the result of mutual efforts of one and a half year, its impacts will last for several decades. During its preparation, extensive professional and
social consultations were therefore conducted in order to secure the support of as many of the stakeholders as possible when we set about to putting the concept into practice.

An economic feasibility study and a strategic environmental assessment were drawn up prior to the public debate, shedding light on the background of the strategy and marking out the framework, both in terms of sustainability and financing, into which the action plans, currently in progress, can be integrated.
8. Energy policy planning process in Latvia

8.1. Latvia’s legal binding instruments

The national laws in place with regards to energy and climate are outlined below:

- Energy Law;
- Electricity Market Law;
- Energy Efficiency Law;
- Law on the Energy Performance of Buildings;
- Law on Pollution.

Some of the most significant Cabinet Regulations issued on the basis of the above mentioned laws are:

- Cabinet Regulation No 221 of 10 March 2009 „Regulations regarding electricity production and price determination upon production of electricity in cogeneration”;
- Cabinet Regulation No. 294 of 17 May 2016 “Procedures for Calculating Savings of Primary Energy Produced by Cogeneration Plants”;
- Cabinet regulation No. 262 of 16 March 2010 “Regulations Regarding the Production of Electricity Using Renewable Energy Sources and the Procedures for the Determination of the Price”;
- Cabinet Regulation No. 383 of 9 July 2013 “Regulations Regarding Energy Certification of Buildings”;
- Cabinet Regulation No. 348 of 25 June “Methodology for Calculating the Energy Performance of a Building”;
- Cabinet Regulations No. 668 of October 11, 2016 “Rules of monitoring of energy efficiency and applicable energy management systems standard”; 
- Cabinet Regulation No. 669 of October 11, 2016 “The procedure for concluding and monitoring a voluntary agreement on energy efficiency”;
- Cabinet Regulation No. 226 of 25 April 2017 “Rules of Energy Efficiency Obligation Scheme”;
- Cabinet Regulation No. 487 of 26 July of 2016 “Enterprise energy audit regulations”.

The development planning documents are:

- Latvian Sustainable Development Strategy till 2030;
- Energy Development Guidelines for 2016-2020;
- Guidelines for the National Industrial Policy for 2014-2020;
- Transport Development Guidelines for 2014-2020;
- Environmental Policy Guidelines for 2014-2020;
- Latvia’s National Reform Program for the Implementation of the EU 2020 Strategy;
• Conceptual report (Order No 379) “On renewable energy resources in transport sector” in which different policy scenarios are analysed;

8.2. National goals for Energy and Climate by 2020 and 2030

The national goals for energy and climate have been confirmed for 2020 and include:

• 40% renewable energy;
• 10% renewable energy in transport;
• 0.670 Mtoe – savings in primary energy consumption;
• 0.850 - cumulative savings in final energy consumption;
• 44.1% energy dependence;
• Energy consumption for gross domestic product (kg of oil equivalent per 1000 Euros of GDP): 280;
• Increase of greenhouse gas emissions in non-ETS sectors: <17% (compared to 2005);
• Total greenhouse gas emissions: <12.19 Mt CO2 equivalent;
• Infrastructure connections in the gas market (number of sources): ≥ 1;
• Electricity interconnection target: 10%.

As regards 2030, the following indicative targets have been set:

• >50% renewable energy;
• <50% energy dependence;
• Reduction of thermal energy consumption of buildings: up to 100 kWh/m²;
• Energy consumption towards generating the GDP: <150 kg of petroleum equivalent per EUR 1,000 of the GDP;
• 6% reduction of greenhouse gas emissions per unit of supplied fuel or energy (compared to 2005).

At this moment no other national targets by 2030 or by 2050 have been set.

8.3. Core national strategies by sector

Together with the implementation of other sectoral policies, the main objective of the Latvian energy policy is to increase the competitiveness of the national economy by promoting security of energy supply, sustainable energy production and consumption, with two sub-objectives of energy policy, sustainable energy and security of energy supply, as outlined in the following paragraphs.

8.3.1. Sustainable energy

Energy sustainability in the economic, social and environmental terms is planned to be achieved by improving energy efficiency, introducing smart technologies and promoting highly efficient manufacturing technologies and renewable energy technologies.

The key energy policy directions in enhancing sustainable energy are as follows:

• diversification of primary energy sources;
• increase of renewable energy share (measures to increase renewable energy share in gross final energy consumption and final consumption of energy in transport);
• efficient heating market (improvement of the regulatory framework, reconstruction and construction of district heating sources, transmission and distribution systems);
• improved energy efficiency (improvement of the regulatory framework, enhancement of energy efficiency in buildings and industrial sector, public awareness and education activities, implementation of Ecodesign requirements; energy efficiency as a horizontal cross-sectoral policy objective).

8.3.2. Enhancing energy supply security

Enhancing energy supply security by providing accessible, stable energy supplies for the energy user, reducing geopolitical risks, diversifying sources and routes of energy supply, developing interconnections and national energy supply infrastructure, introducing smart technologies in energy supply networks, creating energy reserves and engaging in the development of regulatory frameworks. Regional cooperation is also needed in order to optimize energy security costs in the long term – further integration into the EU and Scandinavian networks by achieving price alignment in the region, diversification of energy supply by addressing both electricity and gas infrastructure issues at EU level within the framework of the internal energy market.

The key energy policy directions in enhancing energy supply security are as follows:

• diversification of primary energy resources (possibility evaluation of efficient use of peat, geothermal energy and other alternative sources; facilitate development of natural gas interconnections; opportunity evaluation for promoting waste utilization in energy production);
• development of an efficient energy market (reduce the risk of price volatility in the wholesale electricity market; active participation in development of EU network codes; separate natural gas transmission and storage services from trading and distribution services);
• efficient energy infrastructure (enhanced reliability of the electricity distribution system and modernization of the grid: modernization of transmission lines, transformer substations, construction of new substations, introduction of smart metering; improved infrastructure of the natural gas distribution, transmission and storage system, construction of a high voltage overhead line to ensure the possibility of connecting the increased capacities);
• strengthening international and regional cooperation (promote active participation in international organizations, regional cooperation with Estonia and Lithuania and other countries around the Baltic Sea, coordinate the Energy priority of the Baltic Sea Region Strategy).

Security of supply and sustainability of energy supply will be mainly achieved by the widest use of renewable energy resources (>50% by 2030), reduction of energy and energy resources imports from existing third-country suppliers (50% by 2030) and reduction of the average heat consumption for heating (50% compared to 2009, 100 kWh/m² by 2030).

8.4. National Energy Framework

Figure 5 shows the most important energy related planning documents at national level in Latvia and the relations between them.
Figure 6: Energy related planning documents at national level

The energy policy framework, for example, the Energy Development Guidelines for 2016-2020, are related not only to national planning documents but also to EU policy planning documents such as the Energy Roadmap 2050, the 2030 climate and energy goals for a competitive, secure and low-carbon EU economy, EUROPE 2020 - A strategy for smart, sustainable and inclusive growth and others.

For example, the energy and transport policy guidelines have a common objective – railway electrification, but different policy results are set – for energy it is increase in renewable energy share in transport, but for transport - an increase in the length of electrified railway lines.

8.5. National target setting procedures

At this point the confirmed targets for energy policy have been set only till 2020 and they mainly come from EU legislation: transposition of Energy Efficiency Directive 2012/27/EU, Renewable Energy Directive 2009/28/EU. For example, the Energy Efficiency Directive in the Latvian legal system is transposed with the Energy Efficiency Law. Before the law was drafted, the Concept of the transposition into national law, the requirements of Directive 2012/27/EU were developed. Usually economic entities and society are encouraged for cooperation in the framework of Cabinet Regulation No. 970, Procedures for the Public Participation in the Development Planning Process.

Table 7: EU energy planning and National Strategy - Latvia

<table>
<thead>
<tr>
<th>EU energy planning requirements</th>
<th>National strategy in Latvia</th>
</tr>
</thead>
<tbody>
<tr>
<td>Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions Energy Roadmap 2050 (COM/2011/0885 final)</td>
<td>Related targets for 2020 and 2030 which will also help to achieve EU greenhouse gas emissions target for 2050 are included in: Latvian Sustainable Development Strategy till 2030 and Energy Development Guidelines for 2016-2020.</td>
</tr>
<tr>
<td>Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee, the Committee of the Regions and the European Investment Bank Clean Energy For All Europeans (COM/2016/0860 final)</td>
<td>Discussed at national level in the process of national positions development and coordination.</td>
</tr>
<tr>
<td>EU energy planning requirements</td>
<td>National strategy in Latvia</td>
</tr>
<tr>
<td>--------------------------------</td>
<td>-----------------------------</td>
</tr>
</tbody>
</table>
• Energy Efficiency Law |
| National Energy and Climate Plans | Latvia has started the development of an integrated national energy and climate plan for the period from 2021 to 2030. |

The goals which are determined in directives, are initially discussed in the process of development and coordination of national position and are adopted by all governance levels.

The Energy Efficiency Law envisages implementation of several energy efficiency measures at the State level:

- Introduction of the energy efficiency obligation scheme;
- Development of voluntary energy efficiency agreement scheme (organisations representing merchants, merchants and local governments are entitled to enter into a voluntary agreement with the State represented by the responsible ministry on energy efficiency improvement, including promotion of energy efficiency services);
- Mandatory energy audits for large enterprises and large electricity consumers (>500 MWh/year);
- Obligations of State authorities and local governments (local governments of the cities, local governments of municipalities, the territory development index of which is 0.5 or more and the number of population is 10,000 or more, and State direct administration authorities in the ownership or possession of which there are buildings with the total heated area of 10,000 square metres or more shall put in place an energy management system).

There are also several support programs co-financed from EU (with impact on energy consumption and greenhouse gas emission reduction) which promotes:

- efficient use of energy resources, reduction of energy consumption and transition to the renewable energy resources in the manufacturing industry;
- energy efficiency and use of renewable energy resources in municipal buildings;
- energy efficiency in residential and public buildings;
- energy efficiency and the use of local renewable energy resources in district heating;
- development of an environmentally friendly public transport infrastructure;
- electrification of the Latvian railway network.
The monitoring process of planned and implemented energy efficiency measures and energy savings is ensured with Cabinet Regulation No. 668 Regulations Regarding the Energy Efficiency Monitoring and Applicable Energy Management System Standard.

The EU fund programs include specific monitoring indicators and their achievable values. The relevant data accumulated and reported by the project implementer serves for evaluation of the progress.

Also, the annual report to the European Commission on the achievement of objectives serves as a point of reference for energy policy progress evaluation.

8.6. Energy planning process as an integrated activity

The energy planning process is an integrated activity among the different governance levels. Cross-Sectoral Coordination Centre (CSCC) is the leading institution in national development planning and coordination in Latvia. CSCC contribution lies in initiating cooperation at all levels of the decision-making process, as well as planning and assessment. CSCC promotes interconnection of sectoral policies by strengthening cooperation and joint action between institutions and ministries on behalf of common national goals.

At this moment, there is no feedback loop mechanism identified, or improvement potentials in the cooperation framework.

The energy planning is an integrated activity among the different sectors (social and economic) and topics (energy/mobility, energy/spatial planning, energy/air quality, etc.). At all stages of the evaluation of the policy planning document the policy impact objects, are identified stating whether the policy creates the impact on the macroeconomic environment, the business environment, the administrative burden and the costs involved; social impact; environmental impact; the impact on territorial development; the impact on state and local government budgets; the impact on the functions and human resources of the administration; the impact on the legal system and Latvia’s international obligations; the impact on human rights, in particular the right of individuals to privacy with regard to the processing of personal data.

For example, the public and industry representatives took part in the development of the National Energy Development Guidelines for 2016-2020. The draft guidelines were submitted to the public consultation by placing draft on the website of the Ministry of Economics. For further discussion, discussion meetings were held at the Ministry of Economics and the Energy Committee of National Economy Council. All proposals submitted from the industry were evaluated and the draft guidelines were specified, as well as its updated versions was placed on the website of the Ministry of Economics. In addition, a Strategic Environmental Impact Assessment was developed and was put for public consultation. It was submitted to the State Environment Bureau for an opinion and received a positive opinion.

8.7. The interactions of important actors across different levels of government with national executives

The legal framework for energy policy development and implementation is approved by the Parliament. Management of the energy industry is carried out by the Cabinet and the Ministry of Economics and the Minister responsible for the energy industry implements it. The Ministry of
Economics is responsible for the coordination of energy policy, concrete energy strategy proposals, drafting plans and programs and relevant regulation. Other ministries are also involved in energy policy development and implementation, for example, the Ministry of Environmental Protection and Regional Development, the Ministry of Agriculture and the Ministry of Transport. If the policy planning document provides for assigning tasks to other institutions whether their competence is affected, they shall be involved in drafting the relevant policy planning document.

From NGOs, the Latvian Large Cities Association, the Latvian Association of Local and Regional Governments, the Employers' Confederation of Latvia, the Latvian Chamber of Commerce and Industry represents their members’ interests in energy policy planning process. Various associations become more and more active, for example, the Wind Energy Association, the Association of Biofuels and Bioenergy and the Biogas Association. Also the energy companies play an important role in the decision-making process.

Taking into account the research needs in the energy sector, the Ministry of Economics in co-operation with the Ministry of Education and Science are assigned to develop a new interdisciplinary state research program in the field of energy that will provide the necessary research for sustainable development of the energy sector. Assessing the experience gained so far in the framework of the previous national research program, as well as the research needs for energy innovations and the implementation of a sustainable energy policy, the issue of developing a research program (and the availability of results), based on real demand from both policy-makers and industry, is now very topical.
9. Energy policy planning process in Poland

9.1. Polish legal binding instruments

The Polish legal binding instruments are outlined below:

- The Energy Policy of Poland until 2030;
- Environmental Protection Program;
- Responsible Development Strategy;

9.2. National goals for Energy and Climate by 2030 and 2050

The national goals for energy and climate by 2030 include:

- 21-27% renewable energy usage;
- 10% renewable energy in the transport sector;
- 20% more efficient energy use;
- 20% reduction in greenhouse gas emissions (to 1990-level).

As far as the national goals for Energy and Climate by 2050 are concerned, the Energy Policy of Poland until 2050 is still under construction (level of proposal for consultations).

9.3. Core national strategies by sector

9.3.1. Energy Policy of Poland until 2030

The energy policy of Poland by 2030 focuses on improving energy efficiency and enhancing energy supplies’ and fuels’ security, as analyzed below.

i. Improving energy efficiency

The main energy policy objectives in enhancing energy efficiency are as follows:

- To achieve zero-energy economic growth, i.e. economic growth with no extra demand for primary energy;
- Reducing the energy intensity of Polish economy to the EU-15 level.

Specific objectives in the area are as follows:

- To enhance efficiency of power generation by building highly efficient generation units;
- To achieve a twofold increase (as compared to 2006) in power generation with the use of highly efficient cogeneration technology by 2020;
- To limit grid loss during transmission and distribution by i.e. modernising the existing and building new grid, replacing low efficiency transformers, and developing distributed generation;
- To increase efficiency of end-use of energy;
- To increase the ratio of annual demand for power to the maximum demand for power at peak usage hours, which allows to limit the total cost of meeting the demand for power.
The National Action Plan for Energy Efficiency (NAPEE) is a continuation of measures taken in accordance with Directive 2006/32/EC. It contains a description of energy efficiency improvement measures by end-use energy sectors and calculations for final energy savings obtained in years 2008-2015, as required by Directive 2006/32/EC.

NAPEE states that in 2005-2015 there was an increase in the share in the final energy consumption of the transport and services sectors and a decrease in the share of industry, households and agriculture. The share of transport increased from 22% to 28%, and services from 12% to 13%. Households remained the largest consumer despite a decrease in their share from 35% to 31%. The share of industry decreased from 26% to 24%, and agriculture from 8% to 5%. These changes reflect the directions of economic development, as well as activities undertaken in the industrial sector (consumption rationalization). The largest change took place in the transport sector, in which the increase in energy demand was the result of a significant increase in the volume of both freight and passenger transport (increased public wealth, increased saturation of the passenger car market).

ii. Enhanced security of fuels and energy supplies

Security of fuels and energy supplies is understood as ensuring stable fuels and energy supplies at a level that guarantees meeting domestic needs at prices acceptable for the economy and the society, assuming the optimal use of domestic deposits of energy resources, and through diversification of sources and directions of supply of crude oil, as well as liquid and gas fuels, etc.

9.3.2. Energy Security and Environment Strategy - perspective until 2020 (ESES)

The main objective of the "Energy Security and Environment" Strategy is to ensure a high quality of life for present and future generations, taking into account environmental protection and creating conditions for the sustainable development of a modern energy sector capable of providing Poland with energy security and a competitive and efficient economy. The specific objectives of ESES are:

- sustainable management of environmental resources;
- improvement of the environment.

9.3.3. Electromobility

Electromobility in Poland is a package of legal regulations (program in implementation) which consists of the following strategic documents:

- Electromobility Development Plan "Energy for the Future", adopted by the Council of Ministers on 16/03/2017;
- National framework for the development of alternative fuels infrastructure, adopted by the Council of Ministers on 29/03/2017;
- Act on electromobility and alternative fuels of January 11, 2018;
- the draft Act establishing the Low-Emission Transport Fund, i.e. the act on biocomponents and liquid biofuels and some other acts (UC 79), adopted by the Council of Ministers on 20/03/2018.

#### Plans & Programs

<table>
<thead>
<tr>
<th>National level:</th>
</tr>
</thead>
<tbody>
<tr>
<td>- The Energy Policy of Poland until 2030</td>
</tr>
<tr>
<td>- National Action Plan in the Field of Renewable Energy</td>
</tr>
<tr>
<td>- Environmental Protection Program</td>
</tr>
<tr>
<td>- Responsible Development Strategy</td>
</tr>
<tr>
<td>- Energy Security and Environment Strategy - perspective until 2020</td>
</tr>
</tbody>
</table>

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<thead>
<tr>
<th>Laws &amp; regulations</th>
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</thead>
<tbody>
<tr>
<td>- Energy Law</td>
</tr>
<tr>
<td>- Renewable Energy Sources Act</td>
</tr>
<tr>
<td>- The Act of energy efficiency</td>
</tr>
<tr>
<td>- Environmental Protection Act</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Regional level:</th>
</tr>
</thead>
<tbody>
<tr>
<td>- RES &amp; energy efficiency strategy for Voivodship</td>
</tr>
<tr>
<td>- Environmental Protection Plan</td>
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<tr>
<td>- Air Protection Plan</td>
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</tbody>
</table>

| - Resolution XXXIX/941/17 regarding the introduction, on the territory of the Wielkopolskie voivodship (excluding the City of Poznań - Resolution XXXIX/942/17 and the City of Kalisz - Resolution XXXIX/943/17), restrictions or prohibitions on the operation of installations in which fuels are burned (so-called ANTI-SMOG RESOLUTIONS). |

<table>
<thead>
<tr>
<th>Local level:</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Low-emission economy plans</td>
</tr>
<tr>
<td>- Objective projects for plans of provision of heat, electricity and gaseous fuels</td>
</tr>
<tr>
<td>- Environment protection plan Air Protection Plan (if necessary)</td>
</tr>
</tbody>
</table>

Spatial development plans (if elaborated)

Figure 7: National Energy Framework

List of environmental plans that could have an impact on energy and climate strategy

- The Energy Policy of Poland until 2030;
- Environmental Protection Program;
- Spatial Development Plans of the Voivodships;
- Waste Management Plans for Voivodships;
- National Program for the Development of Low-emission Economy (project);
As far as the relations between energy and spatial planning are concerned, as a result of the 2010 amendment, the Act on spatial planning and development included an article stating that if the area of the commune provides for the designation of areas on which facilities producing energy from renewable energy sources with a capacity exceeding 100 kW will be deployed, they should be included in the study. However, contrary to initial doubts, this provision does not give municipalities the opportunity to refuse a decision on building conditions for RES installations with a capacity above 100 kW in a situation where the study did not determine their deployment, and does not impose the local plan for these investments. The lack of such entitlements is also a consequence of the legal nature of the study, which is an act of internal management, binding only the self-government administration bodies. The study is not a source of universally binding law, and therefore it is not a source of rights and obligations for natural and legal persons and other entities.

9.5. National target setting procedures

The EU energy planning requirements and how these are addressed by the national strategy in Poland are outlined in Table 8.

Table 8: EU energy planning and National Strategy - Poland

<table>
<thead>
<tr>
<th>EU energy planning requirements</th>
<th>National strategy in Poland</th>
</tr>
</thead>
<tbody>
<tr>
<td>Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions Energy Roadmap 2050 (COM/2011/0885 final)</td>
<td>Energy Roadmap 2050 will be reflected in the currently developed document The Energy Policy of Poland until 2050</td>
</tr>
<tr>
<td>Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee, the Committee of the Regions and the European Investment Bank Clean Energy For All Europeans (COM/2016/0860 final)</td>
<td>Present activities concerning Clean Energy For All Europeans: Minister of the Environment is in favour of the need to apply an individual approach in the EU ETS towards Poland due to our specific situation related to the role of coal in the structure of fuel use in energy conversion processes. The Ministry of Energy is presently implementing the Energy Cluster Certification project.</td>
</tr>
<tr>
<td>NREAP (National Renewable Action Plan)</td>
<td>NREAP at the national level</td>
</tr>
<tr>
<td>Energy Efficiency Directive</td>
<td>National Action Plan for energy efficiency for Poland</td>
</tr>
</tbody>
</table>

National goals, resulting from the targets set on EU level for Poland, were adopted at national level. The documents and plans on regional and lower levels are in line with the national ones.

Air protection programs have been prepared based on the Environmental Protection Law (consolidated text: Journal of Laws of 2013, item 1232, as amended).

According to art. 91 § 5 voivodship board, within 15 months from the date of receipt of the results of the assessment of levels of substances in the air, and the classification of zones, submit for an opinion to the competent commune heads, mayors and city presidents or governors the draft resolution on air protection program, and the mayor, and the governor are obliged to give their opinion within one month from the date of receipt of the draft resolution on the protection of air. This program aims to achieve acceptable levels of substances in the air for zones where the level of at least one substance
exceeds the permissible level. For zones in which the level has been exceeded by more than one substance, draw up a common program of Air Protection for all such substances.

The voivodship board provides the opportunity for public participation in proceedings related to the preparation of an air protection program.

Regional parliament, within 18 months from the date of receipt of the results of the assessment of levels of substances in the air, and the classification of zones, determines with a resolution the air protection program.

9.6. Energy planning process as an integrated activity

Energy planning on lower level is aimed at achieving three universal goals of supplying economic entities and the commune society with energy. These are:

i. energy security, which is to guarantee reliable and continuous satisfaction of energy needs;

ii. ensuring economic and social development, i.e. access to energy now and in the future, stimulating the development of new businesses and creating jobs, preventing the excessive increase of energy costs;

iii. ensuring the quality of the environment and protection of the Earth’s climate, i.e. creating conditions for a healthy life of residents, solidarity for the living conditions of future generations.

In the process of integrated energy planning there are interactions among the different governance levels. Some goals result from external conditions, such as energy and environmental policy of the EU and Poland, i.e. they are legally enforced, e.g. standards of air pollution or the amount of energy saved by public sector entities. Some of them are local goals resulting from the need to improve the existing state and the needs of socio-economic development of the commune / region. That is why in Wielkopolska, taking into consideration care for the health and life of residents, throughout the entire Wielkopolska Province, from May 1, 2018, the so-called ANTI-SMOG RESOLUTIONS came into force. They prohibit the use of the worst quality solid fuels, for example very fine coal or brown coal or flotoconcentrate. Moreover, all new boilers must ensure the possibility of only automatic fuel feeding, high energy efficiency and compliance with emission standards.

Objective projects for plans of provision of heat, electricity and gaseous fuels that are elaborated by municipalities/communes must be subjected for voivodship opinions on co-ordination of cooperation with other municipalities as well as be in compliance with the national energy policy.

As regards any improvement potentials in the cooperation framework and feedback loop mechanism, this is not identified at this moment.

9.7. The interactions of important actors across different levels of government with national executives

The Ministry of Energy is responsible (between others) for:

- providing the stable and secure access to energy for all Polish citizens;
• energy policy of the state that takes into account the well-being of citizens, natural resources and the possibilities and needs of the state;
• participation in shaping the energy policy of EU and presenting Poland's position on the international forum;
• energy markets, energy raw materials and fuels, energy efficiency, development and use of renewable energy sources and nuclear energy for socio-economic needs;
• providing Poland with energy independence and security, including security of energy supplies, energy raw materials and fuels;
• energy infrastructure, including the functioning of energy systems, taking into account the principles of a rational economy and the needs of the country's energy security;
• diversifying the sources of energy supplies to Poland;
• initiating and supporting the development of innovative technologies, especially those that can affect the everyday life of citizens;
• informing citizens about all aspects of the development and functioning of the energy area, we provide them with reliable information on this topic;
• initiating, coordinating and supervising international cooperation in the field of energy, energy raw materials and fuels and participation in the work of European Union bodies.

The Ministry also heads the mineral resources management department.

The Department of Renewable and Dispersed Energy, as part of the Ministry of Energy, is responsible for implementation of tasks in the development of proposals for action on renewable energy sources, including bio-components and liquid biofuels and quality of liquid fuels, aimed at achieving national targets for the share of energy and fuels from renewable energy sources consumed in the electricity or heating or cooling and transport.

Ministry of Environment

The Ministry of the Environment, through its input into national policies, fosters the environment both domestically and globally, and ensures the long-term, sustainable national development with respect of natural heritage and human rights to meet the needs of both the present and the future generations.

The activities of the Ministry of Environment primarily cover protection and rational use of environmental resources and involves tasks in the field of sustainable development, climate policy, including adaptation to climate change, and forestry and hunting. The Minister of Environment is responsible for managing waste management issues. Ecological education of the Ministry of Environment concentrates on social campaigns, public opinion polls and other activities showing how to protect nature.


• promotional activities raising the citizens’ awareness,  
  • legislative procedure – the main steps
    o energy planning colloquium
    o published draft document
    o stakeholder consultations on draft proposal
    o final document e.g. Energy Policy of Poland.
10. Energy policy planning process in Portugal

10.1. Portuguese legal binding instruments

Council of Ministry Resolution, examples:

- RCM n° 28/2015 of 30th April – Approves the Commitment for Green Growth – (Goals for 2030 Horizon).

Decree-Law, examples:

- Decreto-Lei n° 68-A/2015 of the 30th of April – Transposes the Energy Efficiency Directive to national law;

10.2. National goals for Energy and Climate by 2030 and 2050

The National goals for 2030, through the Commitment for a Green Growth, include:

- Renewables penetration: 40%;
- Public Transport usage: 15 296 Million pkm;
- Energy Efficiency: 101 tep/M€ GDP;
- CO₂ Emissions: 52.7 – 61.5 Mt CO₂ (-30% to -40% to 2005 base levels);
- Air Quality: 2 days of poor or bad IQAr (Air Quality Index).

As far as the national goals for 2050 are concerned, Portugal assumed the target of carbon neutrality by 2050 – 22nd Conference of the Parties to the UNFCC (COP 22).

Other instruments for long term energy planning include the National Roadmap for Low Carbon Economy in 2050 – RCM n° 93/2010 of 26th November. This Roadmap is aligned with the communication from the European Commission entitled Roadmap for moving to a competitive low carbon economy in 2050, of March 2011, that assumes a target of 80-95% GHG reduction by 2050.

The roadmap includes the studies of the economic and technical viability of the GHG reduction trajectories in Portugal until 2050. The low and high scenarios corresponds to two economic growth perspectives. The low scenario assumes that economic growth will be similar to recent years and the high scenario assumes a stronger economic growth.

Under these scenarios, the following evaluations for GHG evolution were made:

<table>
<thead>
<tr>
<th>Table 9: Evaluations for GHG evolution</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Sectors</strong></td>
</tr>
<tr>
<td>Energy and industrial processes</td>
</tr>
<tr>
<td>Electric and heat production</td>
</tr>
</tbody>
</table>

D2.1: Eleven country reports reviewing the energy planning process Page | 61
Table 10: Evaluations for GHG evolution – 60% restriction scenario

<table>
<thead>
<tr>
<th>Sectors</th>
<th>2020</th>
<th>2030</th>
<th>2040</th>
<th>2050</th>
</tr>
</thead>
<tbody>
<tr>
<td>Energy and industrial processes</td>
<td>21%</td>
<td>2%</td>
<td>-23%</td>
<td>-55%</td>
</tr>
<tr>
<td>Electric and heat production</td>
<td>15%</td>
<td>-56%</td>
<td>-69%</td>
<td>-72%</td>
</tr>
<tr>
<td>Industry (including industrial processes)</td>
<td>-10%</td>
<td>-4%</td>
<td>-7%</td>
<td>-42%</td>
</tr>
<tr>
<td>Transports</td>
<td>61%</td>
<td>47%</td>
<td>-9%</td>
<td>-64%</td>
</tr>
<tr>
<td>Buildings /services and residential</td>
<td>85%</td>
<td>167%</td>
<td>43%</td>
<td>-54%</td>
</tr>
<tr>
<td>Agriculture (including energy)</td>
<td>-15%</td>
<td>-27%</td>
<td>-39%</td>
<td>-40%</td>
</tr>
<tr>
<td>Waste</td>
<td>-25%</td>
<td>-41%</td>
<td>-47%</td>
<td>-53%</td>
</tr>
<tr>
<td>Soil Management and Forests</td>
<td>-43%</td>
<td>-54%</td>
<td>-79%</td>
<td>-74%</td>
</tr>
<tr>
<td>Total</td>
<td>12%</td>
<td>-6%</td>
<td>-20%</td>
<td>-27%</td>
</tr>
</tbody>
</table>

Both scenarios prove to be insufficient to reach the European Commission target, so two mitigation scenarios were considered, one that assumes a 60% GHG restriction on the energy system and a second one that assumes a 70% GHG restriction on the energy system.
The Roadmap concludes that a 50% to 60% GHG reduction, by 2050, is economically and technically feasible with 60 to 70% restrictions on the energy system, and in line with the EU target of 2 tonnes CO₂ per capita.

10.3. Core national strategies by sector

10.3.1. National Roadmap for Low Carbon Economy by 2050

The National Roadmap for Low Carbon Economy is not a strategic plan or a national strategy but it is a cornerstone instrument for energy planning in Portugal. The roadmap evaluates different scenarios of decarbonization to meet national targets for 2020, 2030 and 2050 set in distinct stages and strategic plans. The Roadmap integrates different strategies in a common framework and evaluates its feasibility for meeting the targets set.

10.3.2. Energy Efficiency National Action Plan (EENAP)

Reporting to the newest version (3rd) of the Energy Efficiency National Action Plan (2017-2020), the objectives for Portugal for 2020 in energy efficiency are 4 Mtep of primary energy usage, corresponding to a decrease in 25% in the PRISME2007 model (5% further decrease in comparison with the commitment made by Portugal under the Energy Efficiency Directive – 20%).

The areas considered under this action plan are:

- Transports;
- Residential and service buildings;
• Industry;
• State;
• Behaviours;
• Agriculture;

The main mechanisms for achieving the overall objective of 4 Mtep in 2020 are:

• **Energy Efficiency Fund** (created by the Decree-Law nº 50/2010 of the 20\(^{th}\) of May and regulated by the Ordinance Portaria nº 26/2011 of the 10\(^{th}\) of January) created for the support of the NEEAP measures;

• **Efficiency in the Consumption of Electric Energy Promotion Plan**, promoted by the Energy Regulatory Services Entity (ERSE) under the framework of the National Plan for Climate Change;

• **Portuguese Carbon Fund** (created by the Decreto-Lei nº 71/2006, of 24\(^{th}\) of March) destined to support projects that lead to a GEE reduction;

• **Operational Program Portugal 2020** and other European funding instruments.

**10.3.3. Renewable Energy National Action Plan (RENAP)**

The Renewable Energy National Action Plan (2013-2020) inscribes the following objectives for 2020:

• 10% of renewable energy in transports;

• 31% renewable in primary energy consumption.

The areas considered under this action plan are:

• Electricity;
• Cooling and heating;
• Transports;

The main policies and specific measures inscribed by each sector:

• **Cooling and heating:**
  a) **Solar thermal** – Promote the installation of thermal solar systems in the residential sector, pools and sports venues and the renovation of outdated thermal solar systems nearing the end of their life cycle;
  b) **Green heat** – Promote the installation of more efficient, and with better environmental performance, energetic systems that use biomass for climatization;
  c) **Registry of small renewable energy systems installer** – National system of registry for small installers working with renewable energy systems for heating (solar thermal, neat pumps and biomass systems).

• **Electricity sector:**
  a) **General regime** – Introduction of a new remuneration scheme that enables the electricity production from RES;
  b) **Market facilitator** – Operationalization of the figure of the market facilitator, obligated to acquire electricity from RES producers that want to sell their energy in market conditions;
  c) **Guarantee of origin** – Operationalization of the Guarantee of Origin Certification Entity;
  d) **Biomass Plants** – Creation of a decentralized network of biomass plants;
e) **Miniproduction** – Reformulation and merger of the former regimes of miniproduction and microproduction;

f) **Electricity single contact shop system** – Streamline procedures for licensing RES for electricity production;

g) **National Plan for Dams with High Hydroelectric Potential** – Development of this plan aims for enabling further RES penetration potential;

h) **Offshore Energy Pilot Zone** – Operationalization of an offshore pilot zone for offshore wind farms, salinity gradient, temperature gradient and oceanic currents;

i) **Overhaul of existing Wind Farms** – Potency validation for overhauling existing wind farms;

j) **Forrest biomass valorisation** – Incentive package for promoting biomass plants that use forest products under specific conditions.

- **Transports:**
  
a) **Biofuels** – Promotion of the usage of endogenous resources and waste for the production of biofuels and solutions connected to second generation raw materials;

b) **Electric Mobility** – Rationalization of the charging infrastructure to the actual needs, namely in high demand zones, preferentially in covered and with surveillance.

### 10.3.4. Commitment for a Green Growth (CGG)

The Green Commitment is the national strategic plan that translates National goals for 2030 in ten key areas:

- Water;
- Waste;
- Agriculture and Forests;
- Energy;
- Transports;
- Extractive and transformation industry;
- Biodiversity and ecosystems services;
- Cities and land management;
- Sea;
- Tourism.

For the **energy sector**, the CGG has the following initiatives and indicators/objectives:

a) Increase renewable energy production by promoting new cost-efficient technologies that increase competitiveness:
   - Renewable production in energy final consumption: 31% by 2020 and 40% by 2030;
   - Total cost reduction in renewable generation;
   - 30-40% reduction in the price of renewable energy.

b) Promote public lighting efficiency, through technological measures and systems management, in buildings, fleets and public administration:
   - Street lighting energy consumption reduction;
   - Energy consumption reduction in public administration of 30% by 2020 and 35% in 2030;
   - Introduction, by 2020, of 1,200 electric and hybrid plug-in vehicles in public administration;
c) Promote energy efficiency in buildings:
   ▪ Energy consumption reduction in buildings by 25% in 2020 and 30% in 2030;
   ▪ Percentage of rehabilitated buildings with energy certification.

d) Promote energy efficiency by extending the Intensive Energy Consumption Management System:
   ▪ Number of companies with energy consumption improvement;
   ▪ Percentage of reduction in energy consumption after investment.

e) Promote the installation of economically viable smart meters, with an indicator on the number of smart meters installed/total meters.

f) Boost the investment in R&D+I in the energy sector:
   ▪ Number of registered patents;
   ▪ Percentage of investment in energy.

g) Establish, in the European context, objectives for electrical interconnection. The objectives for electricity interconnections with Europe are 12% in 2020 and 25% in 2030 (calculated with 40% RES penetration).

h) Promote renewable energy exportation for delivering EU objectives with third countries, with an indicator on the number of transference agreements in renewable energy.

i) Establish, in the European context, natural gas interconnections, positioning Portugal as an entry door for LNG in Europe:
   ▪ Third gas interconnection with Spain.
   ▪ 25% of interconnection until 2030, substituting annually 50bcm of European imports from Russia.

j) Promote energy auto consumption by simplifying procedures and enabling remaining energy injection in the public grid:
   ▪ 300 MW by 2020.
   ▪ Reduction of the cost of kW installed for auto consumption.

10.3.5. Dams with High Hydroelectric Potential National Plan

This plan evaluated the hydroelectric potential of different Portuguese hydrographic basins under four strategic options:

- Hydroelectric potential of the infrastructure;
- Basins Hydric potential optimization;
- Environmental conflicts/conditioning;
- Energetic, socioeconomic and environmental weighting.

These options were evaluated under five critical factors:

- Climate Change;
- Biodiversity;
- Natural and cultural resources;
- Natural and Technological risks;
- Human development and competitiveness.
The plans then identify key investments and infrastructures, evaluated in accordance with the strategic options and criteria listed above, to meet the target of 7000 MW of installed potential by 2020, corresponding to 70% of Portugal’s overall hydroelectric potential.

10.3.6. Climate Policy Strategic Framework (CPSF)

The CPSF is a strategic framework that comprises the Climate Change National Program 2020/2030 and the second stage of the National strategy for Climate Change. The SFCP is articulated with the Commitment for a Green Growth (CGG) and works to identify policy options to ensure the compliance of the objectives of the CGG.

The CPSF establishes the vision and objectives of national climate policy for 2030 horizon. The objectives set for this purpose are:

- Promote the transition to a low carbon economy, creating employment and wealth, and contribute for a green growth;
- Ensure a sustainable trajectory in the GHG emissions reduction;
- Strengthen national resilience and adaptive capacities;
- Ensure dedicated involvement in international negotiations and cooperation efforts;
- Stimulate R&D and knowledge production;
- Involve the Society in Climate Change challenges, enhancing individual and collective actions;
- Improve the effectiveness of information, report and monitoring systems;
- Ensure financing conditions and enhance investment levels;
- Ensure effective conditions of governance and guarantee the integration of climate objectives in sectorial domains.

The CPSF also establishes the Interministerial Commission for Air and Climate Change (ICACC), a governance structure that seeks to coordinate Climate change frameworks with the national strategy for air.

The National Program for Climate Change (NPCC) is a “plan of plans” that centres in the mitigation component of climate policy and encompasses all the sectors of the national economy. The program establishes a new mechanism, the National System of Policies and Actions (NSPA), that promotes involvement and responsibilities assumption in different sectors.

The NPCC centres itself in non-ETS (Emission Trading scheme) sectors, as the ETS is regulated in the European level. In this context, the NPCC integrates the following national policy instruments:

- Commitment for Green Growth;
- Green Taxing Reform;
- National Action Plan for Energy Efficiency;
- Strategic Plan for Municipal Solid Waste;
- National Plan for Waste Management 2014-2020;
- PENSAAR 2020 – Strategy for Water Supply and Wastewater Treatment;
- Rural Development Program 2014-2020;
- National Strategy for Forests;
- National Strategy for the Sea 2013-2020;
- Strategic Plan for Transports and Infrastructures;
- National Strategy for Smart Cities;
- National Strategy of Intelligent Specialization for Research and Innovation.

The SFCP will also review two important instruments for better compliance with the stronger framework set by Portugal after 2012:

- The **National Inventory System of Emissions by source and Atmospheric Pollutants Sinks**;
- The **Portuguese Carbon Fund**.

The SFCP also sets the stage for the second phase of the **National Strategy for Climate Change**, for the period until 2020, for which the ICACC is an important asset.

### 10.4. National Energy Framework

The two figures below represent the integration of energy policy in Portugal.

**Figure 8: Articulation between the Strategic Framework for Climate Policy**

*Source: Resolução do Conselho de Ministros no 56/2015*
10.5. National target setting procedures

The EU energy planning requirements and the way they are addressed by the national strategy in Portugal, are presented in Table 12.

Table 12: EU energy planning and National Strategy - Portugal

<table>
<thead>
<tr>
<th>EU energy planning requirements</th>
<th>National strategy in Portugal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions Energy Roadmap 2050 (COM/2011/0885 final)</td>
<td>National Roadmap for Low Carbon Economy in 2050 – C.M. Resolution nº 93/2010 of 26th of November. As stated above, this roadmap studied different scenarios or achieving in 2050 the target of 2 tonnes CO₂ per capita. This roadmap was published before the European roadmap and, since, there haven’t been any similar studies to incorporate the European roadmap and its targets.</td>
</tr>
</tbody>
</table>
### EU energy planning requirements | National strategy in Portugal
---|---
Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee, the Committee of the Regions and the European Investment Bank Clean Energy For All Europeans (COM/2016/0860 final) | These new set of targets haven’t yet been transposed to a Portuguese plan, program or strategy.
At COP22, the Portuguese government inscribed the target of carbon neutrality by 2050. This target clearly surpasses the European targets set on the roadmap.

At the moment the national government is working on the National Plan for energy and Climate, at it should comprise the new target framework brought by the Clean energy For All Europeans communication and the Paris Agreements.

The National Plan for Renewable energy for Portugal was approved by the RCM nº 20/2013 of the 10th of April.
This plan is valid from 2013 to 2020, that is, it is still in effect.

The first transposition, brought by the Directive nº 2006/32/CE, was made by the RCM nº 80/2008 of the 20th of May. Under this directive there was one Energy Efficiency National Action Plan:

1st – From 2008 to 2015 – RCM nº 80/2008;
After the Directive nº 2012/27/EU, there were two new plans corresponding to the three-year gap instated in the new directive:

2nd – From 2013 to 2016 – RCM nº 20/2013;

The plans are discussed involving the main actors of different sectors, including the regional governments of Azores and Madeira, but the national goals are mainly a top-down initiative. The action plans have incentives, compulsory and voluntary measures (please refer to the 2nd point of this document for further understanding of the measures taken). Finally, all the plans have monitoring, stakeholder engagement frameworks and review targets.

### 10.6. Energy planning process as an integrated activity

The energy planning process is an integrated activity, as depicted by the figures under section 10.4.

The integration with regional level is mandatory and is fulfilled. With the local authorities this integration is made by representative structures of the local authorities (national association of municipalities), and as such, it has difficulties in incorporating particular local initiatives.
The integration in the upper levels is good and efficient, among ministries of different sectors. The upper levels of government are included in every step of energy planning, including the Regional Governments.

As far as the improvement potentials in the cooperation framework and feedback loop mechanism are concerned, in theory there is some potential for the lower levels of energy planning. Remains not certain how to achieve this purpose by the current political management system in Portugal. There are political talks for advancing in a regionalization of Portugal and this could be a window of opportunity to improve integration with municipalities as there will be an intermediate structure between the lower levels and the upper levels. This already happens with the regional authorities of Madeira and Azores.

Finally, Figure 8 demonstrates the integration of energy planning among the different sectors (social and economic) and topics (energy/mobility, energy/spatial planning, energy/air quality, etc.).

10.7. The interactions of important actors across different levels of government with national executives

At a national level, the concerned authorities are:
• Ministry of Environment, that holds the energy sector;
• DGEG – General Directorate for Energy and Geology;
• ADENE – National Agency for Energy;

Other ministries and organizations, public and private, participate in the energy planning process whenever their sectors are involved or their expertise is needed.

At a Regional Level (Madeira) the main concerned authorities are the Vice-Presidency, through the Regional Directorate for Energy and Transports and the Madeira's public energy utility company (EEM). AREAM provides support when needed or requested.

The process of engagement with different levels of government follows these steps:
• The National Government prepares a proposal;
• Working Groups are created with representatives of significant stakeholders, which include representatives of the Regional Authorities.
• The stakeholders’ contributions are discussed and incorporated, when applicable, in the initial proposal.
• The proposal is made available to all stakeholders through a public consultation process;
• The relevant contributions are included and a final proposal is made;
• The proposal gets approved, generally by a Council of Ministries Resolution.
• The plan, strategy or program takes effect through the various levels of government.
11. Energy policy planning process in Romania

11.1. Romanian legal binding instrument

The key legislation on the energy policy planning is summarized in Table 13.

<table>
<thead>
<tr>
<th>Sector</th>
<th>Key legislation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Renewable Energy Sources</td>
<td>Law no. 220/2008 on establishing the promotion system for the production of energy from renewable energy sources with subsequent amendments and completions (Law No. 122/2015) – effective as of 2011</td>
</tr>
<tr>
<td>HIGH EFFICIENCY COGENERATION</td>
<td>Decision no. 494 of June 11th 2014 on the amendment of Government Decision no. 1.215/2009 on the establishment of the necessary criteria and conditions to implement the support scheme for the promotion of high-efficiency cogeneration based on useful heat demand of 2011.</td>
</tr>
<tr>
<td>National Energy Strategy</td>
<td>Since 2007, Romania has an official Energy Strategy with an outlook to 2020. In 2014, the Department of Energy (now the Ministry of Energy) decided to update and revise the Energy Strategy in light of the changed dynamics of the global, EU and regional energy markets. In November 2015, the new Government resumed the revision process started in 2014 and, building on that work, the Ministry of Energy has set the objective of elaborating a new strategic document until the end of this year: the Romanian Energy Strategy – 2016-2030, with an outlook to 2050.</td>
</tr>
</tbody>
</table>
11.2. National goals for Energy and Climate by 2030 and 2050

The national goals for energy and climate are summarized below:

- Greenhouse gas emissions, national target: 19% in 2020 compared to 2005 levels (in non-ETS sectors)
- Share of renewable energy in gross final energy consumption (2020 renewable energy target): 24%
- RES-E share in national gross electricity consumption: 38%
- Energy efficiency, 2020 energy consumption targets: 43 Mtoe (primary energy consumption);
- 30.3 Mtoe (final energy consumption).

In order to be able to make a solid case for its priorities, Romania must prepare a robust and persuasive draft of the National Energy and Climate Plan for 2021-2030, which must be submitted by the end of 2018. The Plan must be consistent with EU laws and long-term commitments, and also delineate areas of substantive regional cooperation.

Also, as concerns the decarbonisation targets for 2020, 2030, 2050 set in the Romanian Energy Strategy – 2016-2030, with an outlook to 2050, these are summarised in Table 14.

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Measurement unit</th>
<th>2015</th>
<th>2020</th>
<th>2030</th>
<th>2050</th>
</tr>
</thead>
<tbody>
<tr>
<td>Greenhouse Gas Emission Reduction</td>
<td>% compared to 1990</td>
<td>54</td>
<td>55</td>
<td>62</td>
<td>75</td>
</tr>
<tr>
<td>non-ETS Greenhouse Gas Emission Reduction</td>
<td>% compared to 2005</td>
<td>8</td>
<td>0</td>
<td>2</td>
<td>30</td>
</tr>
<tr>
<td>Share of RES</td>
<td>%</td>
<td>26.3</td>
<td>24</td>
<td>27</td>
<td>47</td>
</tr>
<tr>
<td>Share of RES-E</td>
<td>%</td>
<td>43.7</td>
<td>44</td>
<td>55</td>
<td>78</td>
</tr>
<tr>
<td>Share of RES-T</td>
<td>%</td>
<td>4.6</td>
<td>10</td>
<td>13</td>
<td>60</td>
</tr>
<tr>
<td>Energy intensity in economy</td>
<td>tep/mil €_2013</td>
<td>218</td>
<td>190</td>
<td>155</td>
<td>105</td>
</tr>
<tr>
<td>Emission intensity – electricity and heat</td>
<td>g CO_2/kWh</td>
<td>319</td>
<td>300</td>
<td>170</td>
<td>50</td>
</tr>
</tbody>
</table>

Source: Ministry of Energy, based on PRIMES model

The energy efficiency target for 2030 comprises of an increase of 27% in energy efficiency. More specifically, energy efficiency is a strategic priority for Romania, for reasons of energy security (maintaining a low level of import dependency), economic competitiveness, price affordability and limitation of negative environmental impacts associated with energy use. The increase in energy efficiency could maintain primary energy demand in 2030 at current levels, an outstanding performance considering the sustained pace of economic growth envisaged for this period. Romania will participate fairly in the achievement of the common EU target for 2030, of an increase of 27% in energy efficiency. Currently, there is no target set for 2050.
11.3. Core national strategies by sector

The Romanian Energy Strategy confirms an important role for conventional fuels - oil, natural gas, coal and nuclear energy - in the energy mix, for the decades to come. Hydropower remains the backbone of the national grid. Despite an increased role for nuclear energy, the energy mix has room also for more renewable energy. Natural gas produced onshore and in fields recently discovered in the Black Sea, can cover domestic demand, while coal, on a medium and long term, will be under increasing pressure due to rising greenhouse gas emission costs. Biomass will remain prevalent in household heating in rural areas, but in more efficient and less polluting forms. High-efficiency cogeneration will play an important role, but requires integrated investment planning, in parallel with the modernisation and resizing of district heating systems and the progress of energy efficiency programmes for dwellings.

The structure of the energy sector and its expected evolution during the period until 2030 indicates that achievement of the five strategic goals depends on successful action within five key areas of strategic intervention, as presented in the following paragraphs.

11.3.1. Renewal of the power generation plants

The first key area of strategic intervention is the renewal (by refurbishment or replacement) of the ageing electricity generation capacity. In this process, Romania’s electricity mix must remain diverse and balanced. A considerable share of the baseload power generation capacities are nearing their end of life, and some are already economically inefficient and too polluting. The replacement of power generation capacities requires investments of €7 bn to €14 bn by 2030, depending on the development scenario. The new generation capacities will use efficient, flexible and less polluting advanced technologies, and will be able to contribute to grid stability by providing ancillary services.

Nuclear energy is a strategic option for Romania. The extension of nuclear capacity can enhance energy security and lower GHG emissions. The nuclear project is the largest potential investment in the Romanian energy sector over the next decades. To be sustainable, the project requires income guarantees and must comply with technical and environmental conditionalities for new nuclear projects, as agreed at European level.

The process of replacing ageing natural gas plants is in progress, as Romania has more than 1,500 MW installed in efficient plants, following investments made over the last decade. The process of replacing the remaining old gas power plants will continue during the next decade. Romania has the strategic option to rely on natural gas in the electricity mix, given the flexibility of new gas units (combined cycle gas turbines and gas engines), which can balance unpredictable RES generation, and the relatively low cost of initial investment. Gas power is also recommended by low maintenance costs and relatively low emissions.

The competitiveness of coal in the electricity mix depends on the efficiency of each individual group (rather low for existing capacities), on the cost of delivered coal and on ETS prices. Coal-fired capacities play an important role in ensuring system stability. The replacement of ageing coal-fired capacities will take place especially after 2025. Any new lignite-fired capacities must have supra-critical parameters, high efficiency and low specific greenhouse gas emissions.

The Strategy envisages, by 2030, a slight increase in hydropower capacity, following completion of the projects already under construction. The essential role played by hydropower on the ancillary services market will be strengthened through the execution, in due time, of maintenance and refurbishment
works. A pre-feasibility study of potential locations for small-sized pumped storage capacities may also be useful. However, investment in a large reverse pumping plant is unlikely before 2030. Hydropower capacities already have a substantial contribution to the ancillary services market, with load variations of up to 4,500 MW within 24 hours.

Romania aims to remain an attractive destination for new RES investments over the long run, and capitalise on its high natural resource potential. It also aims to build a new industrial sector, supplying the energy transition with tools, equipment and materials. Nevertheless, access to the current RES support scheme, i.e. green certificates, ends on December 31, 2016. New capacities based on intermittent RES will continue to develop in the medium and long term, but without any support schemes. A key factor for the development of new RES projects will be access to low cost capital.

Through adequate support mechanisms, the use of biogas and waste for energy purposes will increase, mainly in cogeneration capacities, in compliance with environmental standards.

Romania has committed to the European target of increasing the interconnection capacity of its power transmission grid to 10% of the total installed power generation capacity and is on track to meet it.

11.3.2. Natural gas infrastructure and supply

The second key area of strategic intervention relates to natural gas infrastructure and supply. The Romanian energy system will be resilient to energy supply shocks, by continuing to develop its domestic energy resources in a sustainable manner and through modernisation of energy transmission infrastructure, including the construction of new bidirectional interconnectors for natural gas.

Continuous development of onshore and offshore natural gas production is of utmost importance, as it will reduce import dependency during the next decades. However, maintaining domestic gas production requires investments in geological exploration and further increases in the rate of recovery from existing fields. The development of fields recently discovered in the Black Sea requires the building of connecting infrastructure to the national gas transmission system (NTS).

For integration into the natural gas regional market, the most significant project is the Bulgaria-Romania-Hungary-Austria (BRUA) interconnector, included in the EU list of Projects of Common Interest (PCIs). Another priority is to ensure transmission capacity to the Republic of Moldova. In parallel, the Strategy sets as priority the modernisation of the national infrastructure for natural gas transmission, storage and distribution, to enable operation at high pressure, reduce grid losses and increase operational flexibility.

An important objective of the Strategy is the creation of a competitive gas market: transparent, liquid, with a moderate level of concentration and competitive prices. Coordination with the electricity market requires that the two markets reach similar levels of maturity, through gradual harmonisation of provisions in their secondary legislation.

11.3.3. Maintaining a prevalent role for biomass in household heating

The third key area of strategic intervention addresses the prevalent role of biomass in household heating in rural areas. Almost 90% of dwellings in rural areas and 45% at national level are mainly using firewood for heating. These dwellings are often only partially heated, by burning wood in traditional stoves with incomplete combustion. The comfort level is low and the cost high. For Romania, improving the quality of life for the inhabitants of rural areas is a priority, which includes universal access to quality energy services.
Biomass will preserve a key role in heating rural dwellings. The Government will support, through dedicated policies, the use of efficient and less polluting equipment, as well as biomass and biogas-based cogeneration systems in semi-urban areas which are suitable for the development of small district heating networks.

In 2030, most rural households will probably have access to alternative heating sources, and dwellings will have higher energy efficiency. The extension of natural gas distribution networks will lead to an increase in the use of gas for cooking and heating. Growth in distributed electricity generation systems (solar photovoltaic and wind), backed up by small scale storage capacities, will be common in semi-urban areas and facilitate heating with ground heat pumps. Thermal solar panels will become a popular solution for water heating.

11.3.4. Development of high efficiency cogeneration and modernisation of district heating

The fourth key area of strategic intervention is the development of high efficiency cogeneration, in parallel with the modernisation of district heating supply systems. The relatively low operating efficiency of thermoelectric power plants justifies large scale development of cogeneration which, in Romania, has high potential. The Strategy promotes the integrated local planning of new high efficiency cogeneration capacities, of modernising the heat distribution networks, and of thermal insulation programmes.

The replacement of ageing cogeneration plants by new ones is in progress and will continue during the next decade, especially in municipalities with a high share of apartments connected to district heating. Most cogeneration capacities are based on natural gas, but the new capacities will use to a higher extent biomass, biogas and geothermal energy.

In parallel, it is necessary to improve and develop local heat markets, by modernising, increasing the efficiency and resizing the ageing heat distribution networks, as well as by increasing the quality of services provided to domestic consumers. The Strategy set as target to have at least 1.25 mil apartments connected to district heating in 2030.

11.3.5. Increasing the energy efficiency of dwellings and mitigation of energy poverty

The fifth key area of strategic intervention emphasizes the programmes for increasing the energy efficiency of dwellings. In Romania, energy poverty is a result of low income, rather than of high energy prices, but high specific energy use for heating compounds the problem.

The investments will be channelled mainly for the thermal insulation of blocks of flats, with maximum impact in terms of energy savings and number of inhabitants, as well as to energy efficiency measures in households entitled to heating subsidies, with maximum social and public budget impact. Financing may be both private, supported by appropriate regulations (including to facilitate the development of ESCO services), and public, such as local budgets, the regional and central budgets, as well as structural funds. Thermal insulation works have to comply with minimum quality standards.

To reach the annual target of thermal rehabilitation of at least 3% of the overall number of public buildings, schools, hospitals, administrative buildings etc. will also be prioritised.
11.4. National energy framework

Romania’s strategic document is the Romanian Energy Strategy – 2016-2030, with an outlook to 2050.

The energy sector has an essential contribution to Romania’s development, with strong influence on economic competitiveness, life quality and the environment. To meet consumers’ expectations in the long run, the Romanian energy sector must become cleaner, more economically robust and technologically advanced.

Elements defining the Energy Strategy of Romania for 2016-2030, with an outlook to 2050 are presented in Figure 10.

The Strategy has five key strategic goals: energy security, competitive energy markets, and clean energy, along with good governance in the energy sector and affordable energy supplies, which entails the reduction of energy poverty and better protection of vulnerable consumers.
There is no actual relation between energy and spatial planning. The National territorial Development Strategy of Romania itself specifies that “even though the territorial planning documents have by definition a strategic nature, they are not in fact (with few exceptions) the expression of public programme commitments, but exercises incorporating specific technical knowledge which fail to demonstrate the coverage of public management and administration areas. Strategic territorial planning requires correlation between the technical argument and political will”.

However, the first specific objective of the above-mentioned strategy is “Ensuring of a functional integration of the national territory in the European space by supporting the efficient interconnection of energy, transport and broadband networks”.

11.5. National target setting procedure

The EU energy planning requirements and the way they are addressed by the national strategy in Romania, are presented in Table 15.

Table 15: EU energy planning and National Strategy - Romania

<table>
<thead>
<tr>
<th>EU energy planning requirements</th>
<th>National strategy in Romania</th>
</tr>
</thead>
<tbody>
<tr>
<td>Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions Energy Roadmap 2050 (COM/2011/0885 final)</td>
<td>It has already been taken into account in the new Energy Strategy of Romania – 2016-2030</td>
</tr>
<tr>
<td>Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee, the Committee of the Regions and the European Investment Bank Clean Energy For All Europeans (COM/2016/0860 final)</td>
<td>The new Energy Strategy of Romania – 2016-2030, with an outlook to 2050 orients and substantiates Romania’s position in relation to the reform proposals of the European energy market contained in the Clean Energy for All Europeans Package. The Strategy presents, through the operational objectives and priority actions described in Chapter IV, the strategic intervention options of the Romanian state in the energy sector but without anticipating the final form of the</td>
</tr>
<tr>
<td>EU energy planning requirements</td>
<td>National strategy in Romania</td>
</tr>
<tr>
<td>--------------------------------</td>
<td>-----------------------------</td>
</tr>
<tr>
<td>directives and regulations which will result from a significant negotiation process between the EC and interested parties.</td>
<td>The revision of the strategy and its strategic action directions comprises the opinion of a significant number of experts (over 300) and the team from the Ministry of Energy. Public consultations were held to collect opinions and proposals from any interested party.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>NREAP</th>
<th>NREAP at the national level published in 2010</th>
</tr>
</thead>
<tbody>
<tr>
<td>Energy Efficiency Directive</td>
<td>Energy Efficiency Action Plan IV at the national level (Romania)</td>
</tr>
</tbody>
</table>

The new Energy Strategy of Romania – 2016-2030, with an outlook to 2050 was developed with the participation of a large number of experts, while the preliminary versions were largely debated within dedicated workshops which led to the publication of a dense document, based on a scientific methodology and the expertise of the team of experts with the incorporation of the most valuable opinions raised during the expert meetings. There were no discussions with the regional or local authorities, but any potential stakeholder had the opportunity to submit opinions within the public debate/consultation sessions.

As regards incentives and compulsory or voluntary measures supporting the implementation of the national framework, Law No. 121/2014 on energy efficiency provides the following under Art. 9:

- Economic operators using an amount of energy above 1,000 toe per year shall fill in and submit the total annual energy consumption statement and an energy analysis questionnaire.
- Economic operators using an amount of energy below 1,000 toe per year, with the exception of SMEs, shall draw up every four years an energy audit completed by a certified energy auditor which shall be the basis of establishing and implementing energy efficiency improvement measures.
- The local public administrations in localities with a population higher than 5,000 inhabitants shall prepare energy efficiency improvement programmes including short-term measures and measures for 3-6 years.
- The local public administrations in localities with a population higher than 2,000 inhabitants shall:
  - prepare energy efficiency improvement programmes including short-term measures and measures for 3-6 years;
  - appoint an energy manager, certified as per the regulations in force or conclude an energy management contract with a physical entity certified as per the law or a legal entity supplier of energy services authorised as per the law.

The Ministry of Economy will develop programmes to encourage the SMEs to complete energy audits and further implement the recommendations of the audits. There are significant structural funds for
the programming period 2014-2020, especially through the Regional Operation Programme dedicated to energy efficiency and use of renewable energy installations in public and private projects.

As regards any feedback loop mechanisms to monitor progress, the Romanian Energy Regulatory Authority submits annual activity reports.

In general, a top-down approach is adopted in Romania, with no real bottom-up cooperation from the regional and the local authorities.

11.6. Energy planning process as an integrated activity

As per Law 121/2014 on energy efficiency, the local administrations in localities with a population higher than 5,000 inhabitants are supposed to prepare energy efficiency improvement programmes and submit them to the Romanian Energy Regulatory Authority. However, the law contains no penalties in case of failure to comply with its provisions. Therefore, there is a small number of local administrations who submitted the energy efficiency improvement programmes. In addition, there is no feedback from the Romanian Energy Regulatory Authority (ANRE) to the local administrations regarding the quality of the submitted programme, therefore there are low-quality programmes submitted. On the other hand, the private companies falling under the provisions of Art. 9 of the Law are inspected by ANRE and fined if they fail to comply with the law.

There are municipalities and regional administrations which developed energy planning documents on a voluntary basis, with no obligation to submit them to the national government. Therefore, it is fair to state that energy planning is not an integrated activity among different governance levels.

Local initiatives don’t necessarily influence the national planning framework, however any stakeholder can submit proposals/opinions within public debate sessions of new/amended laws or by means of letters sent to the relevant national authorities. There are associations of stakeholders who have a strong voice and can influence the national regulations.

Energy planning in Romania is based on the bottom-up approach with focus on the energy sector alone. However it is recognised that the energy sector has an essential contribution to Romania’s development, with strong influence on economic competitiveness, life quality and the environment. To meet consumers’ expectations in the long run, the Romanian energy sector aims to become cleaner, more economically robust and technologically advanced.

The energy sector is for Romania a backbone of the economy with an important contribution to the increase of the GDP, being also a supplier of national security. The Romanian energy sector generates prosperity for the society and its modernization will increase the quality of energy services which will reflect in an increased standard of living and economic competitiveness.

The new Energy Strategy places the final consumer in the center and addresses the need for quality services and goods, a less pollutant energy production and continuity in the energy supply.
11.7. Interactions of important actors across different levels of government with national executives

The most important authority at national level is the Romanian Energy Regulatory Authority (ANRE). ANRE regulatory activity was developed in 2015. Main responsibilities conferred by primary legislation include:

- Issuing, amending or withdrawal of authorisations and licenses;
- Issuing technical and commercial regulations, ensuring access and connection to the electricity and natural gas networks;
- Issuing and approving prices and tariffs methodologies, approval of prices and tariffs;
- Ensuring monitoring on the electricity and natural gas markets;
- Promoting electricity production from renewable energy sources and high-efficiency cogeneration;
- Promoting energy efficiency.

Other national level relevant authorities are: Ministry of Energy, Ministry of Regional Development and Public Administration, Ministry of the Environment, Ministry of Waters and Forests.

Other important actors are:

- TRANSELECTRICA, the energy transport and system operator with key role in the Romanian electricity Market;
- OPCOM – operator of the electricity and natural gas market of Romania;
- Energy supply companies;
- Gas supply companies;
- Various energy associations such as: AFEER (Association of Romanian Electricity Suppliers), ACUE (Federation of Associations of Utility Companies in the Energy Sector), RWEA (Romanian Association for Wind Energy), RPIA (Romanian Photovoltaic Industry Association), FAREN (Federation of Local and Regional Energy Agencies);
- Research institutions such as ISPE (Institute for Studies and Power Engineering), ICEMENERG (National Energy Research-Development Institute);
- Energy and environment NGOs, including local and regional energy agencies;
- ESCO Companies;
- Energy consulting companies.

The national energy planning process follows the common path:

- The national authorities prepare a draft document with support from external experts;
- The draft document is discussed within dedicated workshops with key stakeholders and experts;
- The improved draft document is launched for public debate;
- The final version of the document incorporating feedback and comments from previous steps is published;
- Unless there are specific legal requirements, the regional and local administrations are not obliged to take into account the provisions of the national energy planning document. If they draft a regional/local energy plan the regional/local administrations have no obligation under the law to comply with their commitments. In general, they prepare energy plans only if they plan to submit
energy related projects under the structural funds programmes as this is now an obligation in the Applicant Guide;

- Regional/local energy agencies and other NGOs are involved in dissemination and promotional activities and refer to the national energy plans when they apply for funding of energy related projects (under various programmes/mechanisms).
12. Energy policy planning process in Spain

12.1. Spanish legal binding instrument

There is not a legal binding instrument in Spain defining the national goals for Energy and Climate by 2030, but there is a draft called “Circular Economy 2030” and also a report of a Commission of Experts of energy transition: Proposals for the decarbonisation of the economy.

12.2. National goals for Energy and Climate by 2030 and 2050

The national goals in Spain are not defined yet but there will be consistent with the European goals in their minimum requirements.

In the most plausible scenario the estimated contribution of RES is 29.7%. However, there are different scenarios and the national government has to define which one will be selected.

12.3. Core national strategies by sector

The main strategies are:

- Security of energy supply;
- Economic competitiveness;
- Environmental sustainability;
- Reduction of greenhouse gas emissions;
- Technological development aimed at energy efficiency.

For achieving this goals some tools were defined during the last years:

- Regulations and legal approaches;
- Economic and/or financial incentives;
- Incentives for research and development (R&D);
- Information and awareness campaigns.

In the period 2017-2020 some measures have been developed, including:

**ENERGY EFFICIENCY IN BUILDINGS**

- Building renovation strategy;
- Other energy efficiency measures in the building sector.

**ENERGY EFFICIENCY IN PUBLIC ORGANISMS**

- Buildings of the central Administrations;
- Buildings of the administrations of the Autonomous Communities and Local Administration;
- Other actions of Public Organizations;
- Acquisition by public bodies.
ENERGY EFFICIENCY IN THE INDUSTRY

- Analysis and characterization of the industrial sector;
- Efficiency measures of the final use of energy in the industry.

ENERGY EFFICIENCY IN TRANSPORT

- Analysis and characterization of the transport sector;
- Efficiency measures of the final use of energy in transport.

HORIZONTAL MEASURES

- Systems of energy efficiency obligations and policies and alternative measures;
- Energy audits and management systems;
- Accountants and billing information;
- Consumer information and training programs;
- Availability of qualification, accreditation and certification systems;
- Energy services.

ENERGY EFFICIENCY IN AGRICULTURE AND FISHERIES

- Analysis and characterization of the agriculture and fisheries sector;
- Efficiency measures of the final use of energy in agriculture and fisheries.

12.4. National Energy Framework

As mentioned before, in Spain there is no specific legislation or strategy approved in terms of energy policy for energy and climate by 2030 or 2050.

However, some regions in Spain have prepared a regional energy policy for energy and climate by 2030, for example, Andalucía, Murcia, Basque Country, and also some cities are doing the same.

12.5. National target setting procedures

The EU energy planning requirements and the way they are addressed in the Spanish national strategy are outlined in Table 16.

<table>
<thead>
<tr>
<th>EU energy planning requirements</th>
<th>National strategy in Spain</th>
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<tr>
<td>Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions Energy Roadmap 2050 (COM/2011/0885 final)</td>
<td>Last month a report commissioned by the national government of a commission of experts was presented in order to analyse different scenarios for reaching the commitments by 2030 and 2050</td>
</tr>
</tbody>
</table>
### EU energy planning requirements | National strategy in Spain
--- | ---
Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee, the Committee of the Regions and the European Investment Bank: **Clean Energy For All Europeans** (COM/2016/0860 final) | Not yet. At least there isn’t any document published by the national government.

<table>
<thead>
<tr>
<th><strong>NREAP</strong></th>
<th>In Spain, there are different Laws and Royal Decrees for the transposition of the NREAEP:</th>
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<th><strong>Energy Efficiency Directive</strong></th>
<th>The transposition of the EED was developed in:</th>
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<tr>
<td></td>
<td>• Royal Decree-Law 18/2014 approving urgent measures for growth, competitiveness and efficiency</td>
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<tr>
<td></td>
<td>• Law 15/2014 on the rationalization of the Public Sector and other administrative reform measures</td>
</tr>
<tr>
<td></td>
<td>• Royal Decree 56/2017 on energy audits</td>
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</table>

In the past, until 2012, the national plan was discussed with the regions in Spain and there was an effective coordination between national and regional administration for the development of measures regarding energy efficiency and renewable energies. However, during the last years the national government approved the action plan 2017-2020 without any discussion with the regions.

As concerns the existence of incentives, and compulsory or voluntary measures supporting the implementation of the national framework, there are some compulsory measures, for example, energy audits for large companies or intelligent metering systems to be installed. But there are also incentives or voluntary measures for retrofitting buildings, for transport sector.

Regarding the feedback loop mechanisms to monitor progress, there are some reports to prepare for the European Commission:

- Report on the energy saving and energy saving and efficiency policy measures in compliance with some articles of the DIRECTIVE 2012/27/EU;
- A Biennial Report of Spain on Climate Change.

### 12.6. Energy planning process as an integrated activity

Any governance level in Spain (national, regional or local) is preparing specific energy planning taking into account their legal competences but, at this moment, there is not an effective coordination between them and there are some controversies regarding who has to do what.

The current energy planning in Spain (2017-2020) includes actions for all the activity sectors (industry, buildings, transport, agriculture and fishery, ...) and the document analyses the cost and benefits of the different measures in terms of energy and also economy and environment. For sure, it is necessary
to take into account the relationship between energy and other variables, as mobility, spatial planning in cities and regions, etc.

The report of the Commission of Experts about the decarbonisation of the economy includes a relevant analysis of different scenarios (more intensive in RES, use or not use of nuclear power or coal, etc.) in terms of energy, reduction of CO₂ emissions and economy and costs. Everything has to be integrated for having a sustainable strategy by 2030 or 2050, while stakeholders have to play a significant role for the preparation of this strategy.

12.7. The interactions of important actors across different levels of government with national executives

At national level the concerned authorities are, mainly, the Ministry of Energy, Tourism and Digital Agenda supported by IDAE (the national energy agency) with the collaboration of other Ministries like the Ministry of Public Works and Transport and the Ministry of Agriculture and Fisheries, Food and Environment. There are also some working groups in which regional ministries are involved for specific topics.

At regional level, the concerned authorities are the Regional Energy Ministry with the collaboration of regional energy agencies.

Regarding the process along with the role and involvement of local and regional governments in the national planning process as well as the public consultations:

• The national authorities prepares a proposal;
• A working group including relevant stakeholders and/or regional ministries can be created to explain the proposal;
• After the inclusion (or not) of the comments or recommendations of the working group in the proposal there is a public consultation;
• Finally, the plan or the legislative test is finished and published;
• All the regional and local administrations have to take into account the plan and give information to the national administration of the actions made about energy (public investments, energy saved, ...);
• Regional energy agencies and other stakeholders are involved in dissemination and promotional activities.
13. Conclusions

It is evident from the analysis of the countries’ status in the previous eleven chapters that the energy policy planning process is a complicated procedure that engages many stakeholders with overlapping competencies across levels of government and governance.

A different status on the long term energy policy targets for 2050 is acknowledged, since currently out of the eleven countries analysed, France and Germany have set targets for 2050, while few countries have issued roadmaps towards 2050 and are working on the scenarios that will allow them to achieve ambitious targets. Nevertheless, the majority of the countries do not have any targets, plan or roadmap towards 2050.

The situation for the 2030 horizon is considerably improved, as one would expect. Out of the eleven countries, seven of them (Austria, Croatia, France, Germany, Hungary, Poland and Portugal) have already set targets and plans in place. In Greece, the government has committed for the 2030 targets and is working on the finalization of the 2030 plan, which has not yet been published. In Latvia as well, there are some indicative targets set, but there is still no plan in place, while for Spain, there is a draft plan but no legal binding targets. As far as Romania is concerned, the plan is under development and will be submitted by the end of 2018.

As far as the energy policy planning process is concerned, in the majority of the cases this process is rather centralized; nevertheless, regions and municipalities are starting to have a certain role in the overall planning process.

In Croatia, according to the new Law on Energy Efficiency, obligators of planning are all counties and cities with more than 35,000 inhabitants who have to systematically plan energy efficiency measures.

In France, the federations of municipalities with more than 20,000 inhabitants are required to implement SECAPs with air quality issues and promote positive energy territories in 2050.

In Germany, regions play a key role in the energy transition in that they co-determine the pace of renewable energy development through their specific targets and regulation.

In Greece, the regions are legally bound to develop their regional climate change adaptation plans, while they are responsible for the expansion, planning and management of waste disposal sites, in line with the principles and conditions set out in the National Plan for Waste Management. Moreover, local authorities need to develop an energy efficiency plan, with a primary focus on public buildings.

In Poland the provinces (Voivodships) develop their Spatial Development Plans and the Waste Management Plans. Objective projects for plans of provision of heat, electricity and gaseous fuels that are elaborated by municipalities/communes must be subjected for voivodship opinions on coordination of cooperation with other municipalities as well as be in compliance with the national energy policy.

In Portugal, there are currently the regional authorities of Madeira and Azores, while there are ongoing discussions for the regionalization of the country.

In Romania, the local public administrations in localities with a population higher than 5,000 inhabitants shall prepare energy efficiency improvement programmes including short-term measures and measures for 3-6 years. At the same time, the local public administrations in localities with a population higher than 2,000 inhabitants have the same responsibility, including the need to appoint an energy manager or conclude an energy management contract with a physical entity.
A synopsis of the key points per country is provided in the following paragraphs.

### 13.1. Austria

Austria’s energy policy until 2030 is described under #mission2030.

“The goal-triangle ecological sustainability - security of supply - competitiveness/efficiency forms the framework for Austria’s climate and energy strategy. These different objectives must be equally taken into account and thus coordinated with each other. Only in this way can sustainable and affordable decarbonisation be achieved. In line with growth and employment, cost- and resource-efficiently achieved, the innovative capacity of Austrian companies and the global development towards renewable energies. Energy can be used and co-designed strategically”.

With regards to the energy policy planning process, there are conflicts and hints between energy and climate planning on one hand, and other areas like the Law for rental of flats and the Home Ownership Act for dwellings.

### 13.2. Croatia

Regarding international commitments and solidarity in reducing emissions, the Republic of Croatia has fulfilled the Kyoto Protocol’s goal of reducing emissions by 5% in the period 2008-2012. By joining the European Union, the Republic of Croatia fulfils its international obligations within the framework of the common goals of the European Union policy.

The 2030 targets set by the Republic of Croatia include a 40% reduction in greenhouse gas emissions (in regards to 1990) and a 65 – 80% RES share in electricity consumption.

The Republic of Croatia has made great progress by setting up the Ministry of Environmental Protection and Energy. Coordination is provided through two existing inter-sectoral commissions: The Inter-Sector Coordination Commission for the National GHG Monitoring System and the Inter-Sector Policy Coordination Commission for Mitigation and Adaptation to Climate Change.

In addition to this, it is necessary to introduce the function of central coordination at the Government level. It is proposed that one of the Vice-Presidents of the Government has competence over issues of sustainable development and implementation of climate activities. The Ministry of Environmental Protection and Energy remains the central state administration body responsible for sustainable development issues, mitigation and adaptation to climate change.

Also, according to the new Law on Energy Efficiency, obligators of planning are all counties and cities with more than 35,000 inhabitants who have to systematically plan energy efficiency measures.

In general, in order to respond to the challenges of continuous change and adaptation, it is necessary to establish an institutional legal system in the Republic of Croatia that enables dynamic management of climate change policy. According to the European Union and the Paris Agreement, progress reports are submitted every two years and evaluation of implementation every five years. In this context, it is necessary to introduce new management mechanisms in Croatia, with periodic reporting of the progress of the main sectors and participants.
13.3. France

The Act of 17 August 2015 on energy transition for green growth seeks to enhance France’s energy autonomy, cut its greenhouse gas emissions and provide effective tools to all stakeholders in order to boost green growth.

The Act sets out medium and long-term objectives for national energy production and consumption:

- Cut greenhouse gas emissions to contribute to the target of a 40% decrease in EU emissions by 2030 (compared with 1990 levels);
- Cut France’s consumption of fossil fuels by 30% by 2030;
- Reduce the share of nuclear energy to 50% of electricity production by 2025;
- Increase the share of renewables to 32% of final energy consumption by 2030 and to 40% of electricity production;
- Halve France’s final energy consumption by 2050 (compared with 2012);
- Cut waste going into landfills by 50% by 2050.

The federations of municipalities with more than 20,000 inhabitants are required to implement SECAPs with air quality issues and promote positive energy territories in 2050.

13.4. Germany

In comparison to the average energy mix in the European Union, Germany’s (DE) energy mix has a similar share of renewable energy (12% DE; 13% EU), of natural gas (20.5% DE; 22.0% EU) and of oil (33.7% DE; 34.4% EU). Solid fuels have a higher share in Germany (25.0% DE; 16.2% EU) partly due to domestic lignite reserves. Nuclear energy accounts for a lower share (7.4% DE; 13.6% EU) in the German energy mix, reflecting the nuclear phase out in Germany.

The renewable energy share in Germany was 12.9% in 2015 the heating and cooling sector and about 31% in electricity generation. Electricity generation from renewable sources is supported by the renewable energy sources act (Erneuerbare Energien Gesetz, EEG 2017).

As far as research and Innovation Policy, the Federal Government has focused its funding for energy research and development on technologies supporting the low-carbon energy transition, particularly solutions in the areas of energy efficiency, energy conservation, renewable energy and supply systems (including storage, grids and ancillary system services through renewable energy as well as integrated energy approaches). The sixth German Energy Research Programme builds on close cooperation of three Federal Ministries (Education and Research, Economic Affairs and Energy, and Food and Agriculture). Funding programmes focus on the two main pillars of the sixth Energy Research Programme: renewable energy technologies and energy efficiency. Areas of highest priority for research and innovation (R&I) within the field of renewable energy technologies are: (a) photovoltaics, (b) wind power, (c) storage technologies and (d) integration of power, heat and mobility sectors. Priority areas in the field of energy efficiency are (a) industry, trade and services and (b) buildings (a new funding initiative called 'Solar Buildings/Energy-Efficient Cities' has been initiated in this area).

In 2016, the Federal Ministry of Education and Research started the funding initiative 'Kopernikus Projects for the Energy Transition' to create a holistic R&I framework for the energy transition. Other recent flagship initiatives for energy R&I are the funding initiative 'Energiewende in the transport sector: sector coupling through the use of electricity-based fuels' (initiated in February 2017).
Currently a new energy research program is in preparation. Central points are system optimisation, the use of synergies, digitalisation, sector coupling and an accelerated transfer of results to practice.

Regarding the Horizon 2020 programme, Germany has so far received 17.2% of the EU contribution devoted to the 'secure, clean and efficient energy' part of the programme. As of September 2017, 555 participations from German organisations have been awarded EUR 312 million in Horizon 2020 energy projects.

In the area of regional and local cooperation, Germany is a member of the Pentalateral Energy Forum, created in 2005 by Energy Ministers of Benelux, Germany and France (with Switzerland as a permanent observer) in order to promote collaboration on cross-border exchange of electricity. Austria joined in 2011. Furthermore, Germany is part of the Baltic Energy Market Interconnection Plan (BEMIP).

Cities and urban areas have a key role in the energy and climate challenge. The Urban Agenda for the EU, established by the Pact of Amsterdam in May 2016, including on Energy Transition, Urban Mobility, Air Quality, Climate Adaptation and Housing, plays an important role in providing the necessary policy framework.

Moreover, the Regions can supplement the legislative framework set by the federal government with their own laws and regulations, provided the Federal Government does not exercise its right to legislate. Thus they shape the legal and administrative framework. Also, they can set their own targets for increasing the share of renewables in electricity supply. All German Regions developed informal energy concepts as general guiding principles for regional and land-use planning (e.g. wind power decrees). The concepts, however, have recommendatory character and are not underpinned in all Regions by formal instruments of spatial planning.

At the federal level, the Regions can influence energy policy decisions and federal (binding) law in particular through their representation in the Federal Assembly and in the Federal-State Energy Summit. They also have representation in national working groups and can thus affect specific policies. The German regions (Bundesländer) have a strong influence over the policy processes on the federal level and function as labs for experimentation in terms of climate and policy and renewable energy extraction.

At the 2016 edition of the Covenant of Mayors, the sustainable energy action plans delivered by 57 German municipalities had been assessed. Overall, the 57 municipalities cover approx. 15 million inhabitants representing ca. 18% of the total population in Germany. All together, these municipalities are committed to reducing GHG emissions by 34.1% until 2020 (as compared to 1990 baseline).

Furthermore, Germany adopted its National Adaptation Strategy (Deutsche Anpassungsstrategie, DAS) in 2008, which presents an overview of effects of climate change, following a sectoral and a geographic approach respectively. The German Action Plan (Aktionsplan Anpassung der Deutschen Anpassungsstrategie, APA), operationalises the actions mentioned in DAS and was adopted in 2011.

13.5. Greece

The energy policy framework for 2030 is currently under formulation. The Greek government has committed itself to a 30% penetration of renewables and energy efficiency by that horizon. Long-term policy planning is outlined in the “National Energy Plan: Roadmap to 2050”, which among others, promotes the production of between 85 and 100 percent of electricity using renewable energy.
technologies that are already commercially available or fully tested, and a large (60 to 70 percent) contribution of renewables to primary energy supply by 2050.

The Ministry of Environment and Energy is responsible for environment, energy, and climate change policy within the government. Within the Ministry, the Directorate for Energy is responsible for implementing renewable energy and energy efficiency policy, as well as for collating energy statistics. The main body tasked by the Greek state to elaborate a long-term energy plan for Greece is the National Committee for Energy Planning, which was established by Law 3438/2006.

Moreover, the regional authorities of the thirteen regions in Greece are responsible for the expansion, planning and management of waste disposal sites. Their plans must adhere to the principles and conditions set out in the National Plan for Waste Management, which is the responsibility of Ministry of Environment and Energy and is the strategic plan for all waste streams at national level. Also, regions are committed under Law 4414/2016 (Government Gazette A 149 / 09.08.2016), to establish the development of Regional Climate Change Adaptation Plans, which, based on the climatic conditions and vulnerability of each region, will define priority policy areas and specific targeted measures.

It should be noted that the process for formulating national energy and climate policy plans does not require the active engagement of local and regional governments.

On the other hand, the Covenant of Mayors initiative is gaining momentum in Greece. Currently there are 156 Signatories, six Covenant Coordinators and nine Covenant Supporters in the country. Thus, the Covenant has mobilized approximately 50% of Greek local authorities.

13.6. Hungary

Hungary’s overall target is 14.65% of share of energy generated from renewable sources in gross final energy consumption. As concerns Hungary in 2050, there is the one hundred percent (100%) renewable energy scenario.

Moreover, the country’s new energy strategy, the National Energy Strategy to 2030, published in 2012, was a major step in formulating a long-term vision for government policy in the sector. It is the purpose of the Energy Strategy to reduce, by 2030, the heating energy requirements of buildings by 30 percent through energy-efficiency programs in the building sector in accordance with European Union targets.

Hungary is very centralized in terms of energy, and local/regional initiatives don’t influence the national planning framework.

13.7. Latvia

Latvian Energy Long Term Strategy 2030 target is a competitive economy which is ensured by developing energy policy that is well-balanced, effective, as well as economically, socially, and ecologically reasonable and based on market principles. The energy policy until 2030 is oriented to sustainable energy (promoting effective renewable energy resources technologies, promoting energy efficiency measures, heading towards achievement of the EU sustainability targets) and energy supply security (ensuring stable energy supply to energy consumers, reducing geopolitical risks, diversifying supply routes, developing energy infrastructure) and it sets indicative targets to widest use of renewable energy resources (>50%), reduction of energy and energy resources imports from existing
third-country suppliers (50%) and reduction of the average heat consumption for heating (50% compared to 2009, 100 kWh/m² by 2030).

The main legal acts concerning energy policy in Latvia are Energy Law, whose purpose is to ensure the energy user with efficient, safe and qualitative energy supply in the quantity demanded and for justified prices, diversifying the types of energy resources to be used, increasing the safety of the energy supply and observing the environmental protection requirements, Energy Efficiency Law, whose purpose is rational use and management of the energy resources to promote sustainable development of the national economy and restrict climate changes, Electricity Market Law, whose purpose is to establish prerequisites for the operation of an efficiently functioning electricity market, and the regulations issued on their basis.

To implement the measures set out in Latvian Sustainable Development Strategy till 2030 and achieve the goals, it is necessary to integrate these goals and principles into future energy policy regulatory enactments and planning documents. This will be important in development of National Energy and Climate Plan and when transposing amended directives included in Clean Energy for all Europeans package.

13.8. Poland

The "Energy Security and Environment - the perspective until 2020" strategy was adopted by way of a resolution of the Council of Ministers of 15 April, 2014. The main objective of the "Energy Security and Environment - the perspective until 2020" strategy is to ensure high quality of life of present and future generations, taking into account environmental protection and creating conditions to the sustainable development of a modern energy sector that is able to provide Poland with energy security and a competitive and efficient economy. However, as part of work on the Polish development management system, adapting strategic documents to the Responsible Development Strategy, the strategy "Energy Security and the Environment - the perspective until 2020" will be repealed and replaced by two strategic documents: Poland's Energy Policy and Poland’s Environmental Policy. The expected end of the effective date of the Strategy is the end of 2018.

The scope and obligation to develop a document entitled Energy Policy of Poland are imposed on the minister competent for energy with the provisions of the Energy Law Act. The document is prepared every four years in accordance with the principle of sustainable development of the country. The last document adopted by the Council of Ministers in 2009 is the Energy Policy of Poland until 2030.

Currently, the Ministry of Energy is working on the project "Energy Policy of Poland" (until 2050), which will determine the long-term vision of the government for the energy sector. So far Polish government has committed itself for a range 21-27 % of usage of Renewables and Energy Efficiency by horizon 2030.

13.9. Portugal

In Portugal there are two stages of maturity for goals definition, one that is well structured and integrated to 2030, and another that has a goal set to 2050, but not fully developed and technically supported.
For 2030, the Commitment for Green Growth sets the main framework for how energy policy should evaluate the integration with other sectors and with the background structure of a strong change in the economy (green economy transition).

Following the Commitment for a Green Growth, the Climate Policy Strategic Framework, encompassing the National Program for Climate Change and the second stage of the National Strategy for Climate Change, gives the finer structure for energy policy, under climate objectives set in green Commitment, until 2030.

For the 2050 stage, the National Roadmap for Low Carbon Economy by 2050 still is the main framework for understanding how the evolution of GHG emissions could occur until 2050. This study, made in 2010, has since then been outdated by the target set by the Portuguese Government for achieving carbon neutrality until 2050. This goal has no technical support and is a political goal that needs to be studied, integrated and formalized through a strategy, program or plan. At this stage, Portugal is developing the National Plan for Energy and Climate that should respond to both the Clean Energy for All Europeans (COM/2016/0860 final) and the political target instated by Portugal at COP 22.

Portugal has set ambitious targets for climate policy for the different stages (2012, 2020, 2030 and 2050) and, based on the recent past, Portugal has been able to deliver on these targets.

13.10. Romania

Romania will meet its 2020 targets for RES, GHG emissions and energy efficiency at national level. Additional effort is only required to reach the 10% RES share in transportation. The country already met its European commitment for 2020 for 24% RES share of gross final energy consumption, reaching 26.3% in 2015, but at considerable cost for the consumers.

The reduction of GHG emissions will continue, but at a slower pace than in the last 25 years, given that the profound restructuring of the industrial sector can be regarded as completed. Further reductions will be the result of smaller improvements in all sectors, with focus on increasing energy efficiency and the share of clean energy sources in the energy mix.

Energy efficiency is a strategic priority for Romania, for reasons of energy security (maintaining a low level of import dependency), economic competitiveness, price affordability and limitation of negative environmental impacts associated with energy use. The increase in energy efficiency could maintain primary energy demand in 2030 at current levels, an outstanding performance considering the sustained pace of economic growth envisaged for this period.

Three main factors will determine the RES ratio in Romania in 2030: the capital cost for RES financing; the evolution of biomass demand in heating; and reaching the 2020 target for RES in transportation, followed by the development of electro-mobility and electric heating.

Between 2017 and 2030, improving the quality of life in rural areas and better forestry management will be national priorities. The effect will be a slower increase in the RES ratio, due to lower biomass demand in rural heating, including as result of a more efficient use of biomass. Consequently, Romania will analyse thoroughly its level of ambition for the 2030 RES targets. Undoubtedly, Romania will participate fairly in the achievement of the common EU targets for 2030, of 27% RES in gross final energy consumption, an increase of 27% in energy efficiency, and a reduction of GHG emissions by 40% as compared to 1990.
An important source of financing for the investments that contribute to the achievement of strategic goals will be the auctions for emission allowances within the EU ETS system. Depending on the evolution of ETS prices, the amount available for investment can be considerable, i.e. several billion euros.

The EU28 long-term decarbonisation target is to reduce overall GHG emissions by at least 80% in 2050, as compared to 1990. Committing to such a target at national level would involve major investment efforts, in the transformation of most dwellings into zero-energy buildings, as well as in speeding up, in a costly manner, the electrification of transport. Romania should avoid large scale subsidising of first-generation technologies, which are not competitive enough. The Strategy envisages a reduction of GHG emissions by 75% in 2050, an overachievement of this target depending on the reduction of technology costs beyond current projections.

Romania plans to become an essential partner in the achievement of European and global decarbonisation targets, through the participation of Romanian research institutes in international research programmes in the field of clean energies, as well as through the development in Romania of industrial manufacturing of parts, components and equipment for the energy transition, taking advantage of a pool of productive and skilled human resources.

13.11. Spain

The 2030 climate and energy framework sets three key targets for that year:

- At least 40% cuts in greenhouse gas emissions (from 1990 levels)
- At least 27% share for renewable energy
- At least 27% improvement in energy efficiency

This framework is in line with the longer term perspective set out in the Roadmap for moving to a competitive low carbon economy in 2050, the Energy Roadmap 2050 and the Transport White Paper. The key targets are:

- By 2050, the EU should cut greenhouse gas emissions to 80% below 1990 levels through domestic reductions alone.
- Milestones to achieve this are 40% emissions cuts by 2030 and 60% by 2040.

To reach these goals, the EU must make continued progress towards a low-carbon society. Clean technologies will play an important role considering that around 70% of the total amount of emissions come from the power generation. Electricity will come from renewable sources like wind, solar, water and biomass or other low-emission sources like nuclear power plants or fossil fuel power stations equipped with carbon capture & storage technology.

In this particular way, Spain is working to include more renewable installations, mainly wind and solar for the power generation. Also, the electrification of the economy, with e-mobility and the use of electric devices in heating and cooling systems with very high efficiency for buildings will contribute to reduce the greenhouse gas emissions.

The European Directive 2018/410 EU regarding the Emission Trading System is key for the determination of the technologies used in the power generation because of the carbon prices and also to determine the energy policy in each country. The analysis of different possibilities to reach the goals
is under discussion in Spain, but there is not a public and approved document explaining what is expected to do.

But, at the same time, the national government is trying to defend the survival of the coal industry (very important in some regions in Spain, for example, in Asturias, because of economic and employment reasons). In this sense, there is a draft of a new law to avoid the closure of power plants.

Because of all of these aspects, a new energy policy in Spain is required to be established, but this is not expected in the short term.
## Who We Are

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The C–Track 50 project has received funding from the European Union’s Horizon 2020 research and innovation programme under grant agreement no. 784974.

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