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Assessment of the draft National Energy and Climate Plan of Spain

Accompanying the document

Commission Recommendation

**on the draft integrated National Energy and Climate Plan of Spain covering the period
2021-2030**

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1. SUMMARY

Main observations¹

- ✓ The Spanish draft integrated National Energy and Climate Plan (NECP) lays the foundation for a carbon neutral economy by 2050. While covering all dimensions, the draft NECP is particularly comprehensive on targets and contributions as well as policies and measures on decarbonisation (including renewable energy) and the energy efficiency dimensions. A carbon neutral economy needs to be underpinned by equally ambitious policies on the security of supply, internal market dimensions and research, innovation and competitiveness dimensions.
- ✓ Spain's 2030 target for **greenhouse gas (GHG) emissions** not covered by the EU Emissions Trading System (non-ETS), is -26 % compared to 2005, as set in the Effort Sharing Regulation (ESR)². Spain **plans to overachieve** this target by 12 percentage points, while complying with the Land Use, Land Use Change and Forestry (LULUCF) no-debit commitment (i.e. emissions do not exceed removals)³.
- ✓ The draft plan sets out a **comprehensive set of measures** underpinned by mechanisms and allocated responsibilities in all **non-ETS sectors** to achieve this ambitious objective. There is a particular focus on measures in the transport sector to reduce emissions by one third. A quantification of individual measures, as done for the energy efficiency contribution, could further increase the robustness of the final plan. The final plan would also benefit from further indicating how the LULUCF commitment will be achieved.
- ✓ The planned national ambition level of 42 % of **energy from renewable sources** in gross final energy consumption in 2030 is significantly above the share of 32 % in 2030 that results from the formula contained in Annex II of the Governance Regulation and constitutes an above average increase from the 2020 target level. However, the Spanish draft Law on Climate Change and Energy Transition sets a lower target of 35 %. The trajectory to Spain's ambition level in 2030 includes a reference point for 2025, but not for 2022 and 2027⁴. The proposed renewable energy share in the transport sector is above EU average at 22 %. The final plan would benefit from elaborating further on the policies and measures allowing the achievement of the contribution and on other relevant sectorial measures.
- ✓ The draft plan describes comprehensive measures to promote **renewable electricity, heating and cooling and transport**. More detailed quantitative information on some of

¹ In addition to the notified draft NECP this assessment also considers informal bilateral exchanges, which are part of the iterative process established under the Governance Regulation.

² Regulation (EU) 2018/842 of the European Parliament and of the Council of 30 May 2018 on binding annual greenhouse gas emission reductions by Member States from 2021 to 2030 contributing to climate action to meet commitments under the Paris Agreement and amending Regulation (EU) No 525/2013.

³ Regulation (EU) 2018/841 of the European Parliament and of the Council of 30 May 2018 on the inclusion of greenhouse gas emissions and removals from land use, land use change and forestry in the 2030 climate and energy framework, and amending Regulation (EU) No 525/2013 and Decision No 529/2013/EU.

⁴ Pursuant to Article 4(a)(2) of Regulation 2018/1999.

the measures would help to ensure a robust final plan reaches the ambitious renewable energy contribution in a timely way.

- ✓ Regarding **energy efficiency**, the 2030 primary energy consumption target represents a 39.6 % reduction compared to the baseline projections. The targets were set at a sufficient level of ambition, which takes into account the need to increase collective efforts to achieve the Union's 2030 energy consumption targets. The final plan would benefit from more details on policies and measures.
- ✓ On **energy security**, the objective to reduce energy dependency to 59 % by 2030 is very ambitious. Spain had an import dependency of 74 % in 2017 and foresees phasing out of coal for energy and some of its nuclear energy capacity by 2030. Relevant measures warrant being further detailed in the final plan. The savings relating to importing less energy after 2025 are a major contributor to the estimated positive impact of the measures in the draft NECP on jobs and growth.
- ✓ With respect to the improved functioning of the **internal energy market**, the draft plan includes e.g. policies to improve gas market integration and consumer protection. It would benefit from detailed information on these elements, including for instance, on analytical data with respect to barriers for new market participants and the uptake of the different sources of flexibility. On energy poverty, although there are references to specific policies and measures, the draft plan does not clarify whether a dedicated assessment has been carried out as required by the Governance Regulation. Furthermore, there is no reference to national objectives and a concrete timetable to develop the specific measures announced. This would benefit from greater details in the final plan.
- ✓ An increase of the **interconnection level** will be pivotal to improve the integration of Spain and the Iberian Peninsula into the Energy Union, as well as to accompany and steer the development of renewable energy sources in the region. Spain aims for an **interconnection level** of 15 % in 2030. The current level (6 %) is still well below although the ongoing Project of Common Interest (PCI) in the Bay of Biscay will almost double the interconnection capacity between Spain and France. The interconnection level of the Iberian Peninsula taken as a whole is even lower. Specific measures focus still on essential interconnections with Portugal and France, notably PCI.
- ✓ On **research, innovation and competitiveness**, information is provided on the total objective as a share of GDP and on ongoing research areas. The final plan would benefit from policies and measures until 2030 and with 2050 horizon as well as more specific objectives and funding targets.
- ✓ Regarding **investments needs**, the draft plan quantifies a total of EUR 236 billion, in the period 2021-2030, annually around 2 % of GDP, of which 20 % would come from public sources. The figure covers key sectors and dimensions, notably renewables, energy efficiency, grids and non-energy sectors. The draft plan thus takes advantage of the role NECPs can play in providing clarity to investors and attracting additional investments in the clean energy transition, and would benefit from extending it to all dimensions. These investments are the main driver of the projected positive impacts on jobs and growth for 2021-2030.
- ✓ The draft NECP takes stock of the interactions with **air quality and air emissions policy**, from both a policy and methodological point of view. The projections of GHG and air pollutants emissions have been developed in a consistent way and the link with

the National Air Pollution Control Program is established. The presentation of the air pollutants emissions and health effects of the proposed climate and energy measures provides value added to the plan.

- ✓ The draft plan makes reference to the **Just Transition Strategy** (*Estrategia de Transición Justa*). The latter will focus on those regions and people affected by the implementation of the draft plan, providing a framework of action to optimise opportunities under the ecological transition to create more and better jobs. The final plan should complete the assessment of employment and education, skills and social impacts, including just transition aspects, also in relation with coal and carbon-intensive regions.
- ✓ A list of all **energy subsidies** and actions undertaken and planned to phase them out, in particular for fossil fuels, needs to be included in the final plan.
- ✓ There is potential to intensify the good **regional cooperation** already taking place with France and Portugal in the energy security and internal market areas, as well as increased cooperation in the areas of renewable energy and energy efficiency.
- ✓ An example of **good practice** is the clear description of planned measures to achieve the national objectives and, in particular, the quantification of individual energy efficiency measures. Another example is the Just Transition Strategy provided as part of the Strategic Energy and Climate Framework.

Preparation and submission of the draft plan

Spain notified its draft National Energy and Climate Plan (NECP) to the European Commission on 22 February 2019. The preparation of the Spanish draft NECP required the close cooperation of several Ministries, under the steering of the Ministry for Ecological Transition.

The coordination with the Spanish regions will be done in 2019 through the Commission for the Coordination of Climate Change Policies, in order to identify the interlinkage between the draft plan and relevant regional policies.

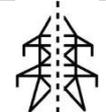
The draft NECP is part of the Strategic Energy and Climate Framework, which also includes the Draft Law on Climate Change and Energy Transition and the Just Transition Strategy (*Estrategia de Transición Justa*)⁵. The latter will focus on those regions and people affected by the implementation of the draft plan, providing a framework of action to optimise opportunities under the ecological transition to create more and better jobs.

Public consultation on the draft plan has taken place from 22 February to 1 April 2019. In parallel, a Strategic Environmental Assessment has been launched. Neighbouring Member States were not consulted on the development of the draft plan.

⁵ <https://www.miteco.gob.es/es/cambio-climatico/participacion-publica/marco-estrategico-energia-y-clima.aspx>.

Overview of the key objectives, targets and contributions

The following table presents an overview of Spain's objectives, targets and contributions under the Governance Regulation⁶:

	National targets and contributions	Latest available data	2020	2030	Assessment of 2030 ambition level
	Binding target for greenhouse gas emissions compared to 2005 under the Effort Sharing Regulation (ESR) (%)	-15	-10	-26	2030 national: -38 %. Total GHG 2030 -20 % to 1990
	National target/contribution for renewable energy: Share of energy from renewable sources in gross final consumption of energy (%)	17.5	20	42	Above 32 % (result of RES formula)
	National contribution for energy efficiency: Primary energy consumption (Mtoe) Final energy consumption (Mtoe)	125.6	122.6	98.2	Sufficient
	Level of electricity interconnectivity (%)	6	6	15	N/A

Sources: EU Commission, ENERGY STATISTICS, Energy datasheets: EU28 countries; SWD(2018)453; European Semester by country⁷; COM/2017/718; Spanish draft NECP.

2. ASSESSMENT OF THE AMBITION OF OBJECTIVES, TARGETS AND CONTRIBUTIONS AND ADEQUACY OF SUPPORTING POLICIES AND MEASURES

Dimension decarbonisation

Greenhouse gas emissions and removals

The draft NECP sets an economy-wide 2030 target of at least 20 % emission GHG reduction compared to 1990, excluding LULUCF. It is worth highlighting that the draft plan translates this into a necessary reduction of effort sharing sector emissions by 38 % compared to 2005, 12

⁶ Regulation (EU) 2018/1999 of the European Parliament and of the Council of 11 December 2018 on the Governance of the Energy Union and Climate Action, amending Regulations (EC) No 663/2009 and (EC) No 715/2009 of the European Parliament and of the Council, Directives 94/22/EC, 98/70/EC, 2009/31/EC, 2009/73/EC, 2010/31/EU, 2012/27/EU and 2013/30/EU of the European Parliament and of the Council, Council Directives 2009/119/EC and (EU) 2015/652 and repealing Regulation (EU) No 525/2013 of the European Parliament and of the Council.

⁷ https://ec.europa.eu/info/business-economy-euro/economic-and-fiscal-policy-coordination/eu-economic-governance-monitoring-prevention-correction/european-semester/european-semester-your-country_en.

percentage points more than the binding target of 26 % set in the Effort Sharing Regulation⁸. Based on the “with existing measures” scenario (WEM) provided, existing measures would lead to 16 % emission reductions compared to 2005. Thus, significant additional measures are needed and planned to achieve the EU and nationally set objectives. For 2050, the stated objective is climate neutrality, or at least 90 % GHG emission reductions compared to 1990.

For the largest effort sharing sector, **transport**, with an emission share of around 40 %, Spain aims to reduce emissions by 28 Mt CO₂eq by 2030 (35 % compared to 2017). This is planned to be achieved by a modal shift towards less emitting modes of transport, increasing the efficiency of the transport system, and by an increased uptake of renewable sources of energy, in particular electricity and advanced biofuels. It is worth highlighting that concrete measures to this end have been identified, e.g. low emission zones in every larger cities, and that the quantitative impact of certain measures has been calculated. As regards electromobility, the draft plan aims at having 5 million electric passenger cars and light duty vehicles on the market in 2030. New vehicles of these categories should have zero emissions by 2040. This will be supported by grants for the purchase of electric vehicles and infrastructure development. Greater detail on the above-mentioned measures could be integrated in the final NECP.

Policies and measures for agriculture, the second largest effort sharing sector in terms of GHG emissions, and for the **LULUCF** sector are clearly described, although it is not always clear whether these policies and measures are existing or planned, and information on their expected mitigation impact is not provided. The draft plan refers to the Common Agricultural Policy as a tool for reducing greenhouse gas emissions from agriculture.

With respect to the National Forestry Accounting Plan including the national Forest Reference Level, submitted by Spain as required by Article 8(3) of the LULUCF Regulation⁹, the Commission has put forward technical recommendations requesting action on a number of issues, detailed in SWD (2019)213.

The draft plan also includes policies and measures for the **building** (efficiency and renewable energy), fluorinated gas (F-gas) and waste sectors.

Regarding **climate change adaptation**, the draft plan indicates that a new National Plan on Adaptation to Climate Change for the period 2021-2030 will be drawn up and describes some of its objectives. Resilience to climate change is one of the research priorities, and the State Plan for Research and Innovation 2017-2020 foresees research on adaptation to climate change, which shall be continued under the future plan for 2021-2024.

Renewable energy

In the draft NECP, Spain has set the ambition level at 42 % of renewables in gross final consumption of energy for 2030, which is significantly above the share of 32% that results from the formula in Annex II of the Governance Regulation. However, the level of the target set in the Spanish draft Law on Climate Change and Energy Transition is 35 %.

⁸ Regulation (EU) 2018/842 on binding annual greenhouse gas emission reductions by Member States from 2021 to 2030.

⁹ Regulation (EU) 2018/841 on greenhouse gas emissions and removals from land use, land use change and forestry.

In the **indicative trajectories** to reach this contribution and the sectoral shares of renewables in electricity, heating and cooling and transport, Spain includes shares only for 2025 and 2030, but not the values for 2022 and 2027 in the trajectory towards the overall contribution. When setting these values, Spain needs to make sure that the indicative trajectory over the 2021-2030 period is equal or above the reference points of 18 % by 2022 and 65 % by 2027. In addition, it is recommended to include annual indicative trajectories, instead of a 5-year interval trajectories.

With respect to sectors, Spain breaks down the national contribution of 42 % of renewable energy into a 74 % (up from 40 % in 2020) share of **renewables in electricity**, a 34 % (up from 18 % in 2020) share in **heating and cooling** and a 22 % (up from 10 % in 2020) share in **transport**. These shares go beyond what Directive 2018/2001¹⁰ sets as an indicative increase of renewables in heating and cooling and as a target in transport. However, according to the data provided in the draft plan, Spain would not meet the specific obligation set in the third subparagraph of Article 25(1) of Directive (EU) 2018/2001 regarding the share of advanced biofuels and biogas. Furthermore, some of the values relevant to calculate the transport target are provided only as percentages, but not in absolute values (ktoes) including the effect of applicable multipliers.

The draft plan describes measures to promote renewables in each one of the sectors, including specific measures in the fields required in Annex I. More quantitative information would be needed to substantiate some of the measures to ensure that the final plan is sufficiently robust to reach the ambitious overall renewables contribution in a timely way.

In **electricity**, the main instrument envisaged to install 57 GW from 2021 to 2030 is the organisation of auctions, for which Spain will publish a pluriennial calendar, together with measures to facilitate the increased penetration of renewables in the grid such as increasing storage capacity by 6 GW and facilitating response demand through demand aggregators. The final plan would benefit from an outline of the indicative auction calendar covering the whole period, especially taking into account that the draft Act on Climate Change and Energy Transition establishes an annual auction of at least 3000 MW¹¹.

In **heating and cooling**, the draft plan includes measures to promote the use of renewable heating and cooling systems, including the revision of the technical code for buildings, the use of guarantees of origin and the use of support schemes. The final plan would need to clarify which measures will be taken to ensure compliance with the obligations set out in Article 24 of Directive (EU) 2018/2001¹², such as ensuring that final consumers are provided information on the share of renewable energy in their district heating and cooling systems or encouraging third party access.

In **transport**, the draft plan describes measures to promote the use of electricity and biofuels, indicating that a general obligation on fuel suppliers and a specific one for supplying advanced biofuels will be established. However, for advanced biofuels and biogas listed in Annex IX part A of Directive (EU) 2018/2001¹³, the draft NECP only foresees a 0.06 % share in 2025 and a 0.11 % share in 2030, well below the respectively required 1 % and 3.5 %. Therefore, these

¹⁰ Directive (EU) 2018/2001 of the European Parliament and of the Council of 11 December 2018 on the promotion of the use of energy from renewable sources.

¹¹ Unless this figure is raised, it would not be sufficient to install 57 GW during the next decade, as stated in the draft plan.

¹² Directive (EU) 2018/2001 on the promotion of the use of energy from renewable sources.

¹³ Directive (EU) 2018/2001 on the promotion of the use of energy from renewable sources.

obligations need to ensure the achievement of the shares established as objectives in the Directive. Furthermore, the draft plan needs to include requirements to limit and then phase out the contribution of high indirect land-use change risk biofuels, bioliquids as well as biomass fuels produced from food and feed crops.

Regarding other areas, the draft plan includes measures for promoting self-consumption, supporting renewables in the industrial sector, promoting renewable gas (biogas and hydrogen), repowering installations the lifetime of which is expiring in the next decade, encouraging power purchase agreements, making use of biomass potential, simplifying administrative procedures, generating information and training, and promoting renewables in the islands.

Dimension energy efficiency

National energy efficiency contributions for 2030 are expressed in both primary and final energy consumption, namely 98.2 Mtoe **primary** and 74.4 Mtoe **final energy consumption**. The target methodology is clearly defined and the modelling of the energy system is complemented by the assessment of the macroeconomic impacts and on air-quality. The 2030 targets are set at a level which would require the country to decrease its consumption by 21.8 % from their primary energy consumption in 2017 and by 11.6 % from their final energy consumption in 2017. Moreover, compared to Spain's 2020 energy efficiency target¹⁴, the 2030 target will decrease by 18.37 % expressed in primary energy (compared to the new target notified in the draft) and by 14.7 %, expressed in final energy. The targets were set at a sufficient level of ambition, which takes into account the need to increase efforts collectively to achieve the EU 2030 energy consumption targets.

The national target is set on the basis of the projections of the scenario with additional measures, which foresees a decrease in energy consumption over the next decade, in contrast to the scenario with existing measures.

With regards to buildings, the information provided for the renovation of the national stock of residential and non-residential buildings, both public and private, into a highly energy efficient and decarbonised building stock by 2050, is limited to 2030 and it does not include specific milestones, measurable progress indicators, estimation of expected energy savings and wider benefits for 2040 and 2050 as required. The targets on the energy renovation of buildings for 2030 are:

- energy efficiency improvement (thermal envelope) of 1.200.000 dwellings.
- energy efficiency improvement (renovation of heating thermal installations and ACS) of 300.000 homes/year.

The target of renovation of central government buildings is correctly calculated for the next decade up to 2020 in line with the requirements under Article 5 of the revised EED¹⁵, and Spain plans to extend this requirement also to regional and local authorities. This extension represents a

¹⁴ Spain has updated its primary energy consumption target for 2020, to adapt to the latest projections. The updated target is 120.3 Mtoe, which is more ambitious than the notified in the 2017 NEEAP (National Energy Efficiency Plan) of 122.6 Mtoe.

¹⁵ Directive 2012/27/EU of the European Parliament and of the Council of 25 October 2012 on energy efficiency as amended by Directive (EU) 2018/2002.

substantial increase in ambition over and above the EED¹⁶ requirement, also in the light of the budgetary savings this, with time, will bring the local and regional authorities.

As for the policies and measures, the draft NECP presents a long list of regulatory and non-regulatory measures addressing energy efficiency. The regulatory measures are mainly to ensure implementation of the EED¹⁷, and EPBD¹⁸, while non-regulatory measures address mainly transport, agriculture, behavioural aspects as well as financial support to efficiency measures across sectors. The plan mentions measures that would contribute towards more efficient organisation of the mobility system and thus towards improved energy efficiency and emissions reductions (e.g. promote modal shift, promote the use of the most efficient transport modes, promote the renewal of the car fleet). More details on how these policies will be further developed would be welcome, as well as information on the promotion and contribution of Intelligent Transport Systems, digitalisation and modal shift in freight transport.

With regard to combined heat and power, the draft plan sets out a development in which a large fraction of the existing (mainly industrial, gas fired) CHP capacity would reach its lifetime and not be renewed or replaced (c.f. section 3.2.2.5 of the plan). At the same time, a surprisingly high CO₂ emission factor appears to have been used for electricity from cogeneration¹⁹. It is unclear whether the planned CHP capacity reduction is due to an exogenous assumption or an outcome of optimisation within the modelling framework. In either case, it should be verified that the planned reduction is not due to an erroneous emission factor.

As regards Article 7 of the EED²⁰, Spain reported correctly a preliminary calculation of the **total cumulative savings** for the next obligation period up to 2030 but it is expected that this would be updated in Annex III of the final plan.

Ten alternative policy measures to achieve the Article 7 goal are presented and described per sector, complemented by an analysis of the expected savings, for which the methodology is not fully explained. Financial requirements are estimated for most of the measures. All of them are at least partly a continuation or reinforcement of current measures. However, the changes to be introduced in the next decade often remain unclear. Given the increased ambition of the Spanish contribution in comparison to the 2020 goal, the current measures would need to be scaled up. The evolutionary approach, starting from existing measures, is valuable in the sense that it shows the draft plan is anchored in reality and experience. However, the upscaling of ambition will be associated with challenges and these could be discussed and explored in more detail in the final plan. The only completely new measure planned is dedicated to the promotion of high-efficiency cogeneration (plan to transform ageing Combined Heat and Power (CHP) units into high-efficiency CHP units).

The measures that are not directly related to the implementation of Article 7 are not described in detail.

¹⁶ Directive 2012/27/EU on energy efficiency.

¹⁷ Directive 2012/27/EU on energy efficiency.

¹⁸ Directive 2010/31/EU of the European Parliament and of the Council of 19 May 2010 on the energy performance of buildings as amended by the Directive (EU) 2018/844.

¹⁹ On p. 267 this is stated to be 0,575 t/MWh, which seems to attribute all emissions to the electricity production and no emissions to the useful heat produced.

²⁰ Directive 2012/27/EU on energy efficiency.

Dimension energy security

Spain plans to phase out nuclear energy and coal which represent 11.6 % and 9.8 % respectively in the energy mix. **Import dependency** is intended to decrease to 59 % in 2030 (from 74 % in 2017), by reducing imports of fossil fuels, mainly coal and oil (by 34 %). As the current energy imports bill amounts to EUR 20 billion per year, this should bring about savings that would benefit sustainable investments. However, the draft plan does not quantify these savings, and the financial impact of the reduced import dependency on the economy. The draft plan also reflects the negative impact on employment of the phasing out of nuclear energy and coal. This chapter might benefit also from data concerning the current volumes of emergency oil and gas stocks held, their composition and geographical distribution. The draft plan includes a specific reference to the situation of the non-peninsular territories, in particular the Canary Islands which have a 98 % dependency from oil and a very low level of electricity interconnection. Greater emphasis on interconnections between the islands and a greater development of renewable sources of energy will be required.

This reduced import dependency is reflected in the evolution of Spain's primary energy mix by 2030, together with the progressive reduction in the nuclear capacity in the country: four out of the seven reactors currently in operation are planned to be shut down between 2025 and 2030, while the remaining three by 2035. In this respect, the draft plan could provide relevant data concerning the phase out of nuclear plants, e.g. how the supply of nuclear fuel should be ensured until the closure of the existing reactors, the strategy on the use of fuel fabrication facilities, the strategic and financial aspects related to decommissioning and waste management, and the exploitation of uranium deposits.

On **risk preparedness**, the draft plan addresses the regional dimension and refers to the ongoing and upcoming update of the national plans and rules in the gas and electricity sectors, in implementation of latest EU rules on risk preparedness and gas security of supply. The draft plan would benefit from including information on the expected timing for carrying out the risk preparedness plan²¹. In the oil sector, the draft plan refers to the ongoing revision of the national contingency and demand restraint plans and puts forward proposals on how to improve the regional security of oil supply.

The draft plan refers to existing measures to protect **critical energy infrastructure**. Information on measures related to other emerging risks, in particular on cybersecurity, would enrich the final plan.

Dimension internal energy market

Spain has put forward a 15 % **interconnection level** aimed for 2030. The level of the target has been justified based on the draft plan's consideration of Spain as an energy island, with the current interconnection level at 6 %, and the expectation that it will not increase significantly in the 2020 timeframe²².

²¹ As foreseen in Regulation (EU) 2019/941 of the European Parliament and of the Council of 5 June 2019 on risk-preparedness in the electricity sector and repealing Directive 2005/89/EC.

²² Communication From The Commission To The European Parliament, The Council, The European Economic And Social Committee And The Committee Of The Regions: Communication on strengthening Europe's energy networks, COM(2017) 718 final.

The draft NECP refers to the assessment of the Commission's Expert Group on electricity interconnection levels, demonstrating that Spain does not comply with any of the thresholds²³, which serve as urgency indicators of the need to develop further interconnection capacity. The measures foreseen to deliver on the 2030 interconnection level indicator include projects with France, and to a lesser extent with Portugal, and the draft NECP points to the key role of the Connecting Europe Facility in the financing of the projects. The attainment of the target would not only put in place the necessary export capacity for the significant production of renewable energy in Spain, but also enable the participation of Spanish energy companies in the EU electricity market.

The draft plan refers to specific measures aiming at improving **gas market integration**, thus allowing the Iberian Gas Market (MIBGAS) to become a liquid and mature gas market. The draft plan states that the use of the existing gas interconnections should be first optimised before starting new infrastructures; it could explain which measures will be taken for such optimisation.

The draft plan also mentions the current system and **generation adequacy** and projections. It might usefully refer to existing capacity payments and evolution in the mid and long term.

While the general impact assessment analyses the compatibility of the measures with the zero deficit as from 2022, the draft plan could also refer to the tariff deficits in the electricity and gas sectors, including lessons learnt, and the tariff deficit expected evolution at medium and long term, as well as the impact that the new policies may have on them.

The draft plan includes general policies to improve consumer protection and competitiveness. However, the draft plan could provide specific objectives, policies or measures in terms of increase of system flexibility, demand response and aggregation, gas smart meters, storage, consumer protection and competitiveness in the retail energy sector.

On **energy poverty**, although there are references to specific policies and measures such as the National Energy Poverty Strategy and the recent national framework, the draft plan does not clarify whether a dedicated assessment has been carried out as required by the Governance Regulation. Furthermore, there is no reference to national objectives and a concrete timetable to develop the specific measures announced as well as the link between energy efficiency and social policies and measures. The description of the current situation concerning energy poverty would benefit from greater details.

Dimension research, innovation and competitiveness

The draft NECP mentions that Spain's **research, innovation and competitiveness' objective** is to invest annually not less than 2.5 % of GDP over the next 40 years, irrespective of economic cycles. A significant share of this investment will be dedicated to research, innovation and competitiveness for the fight against climate change and the decarbonisation of the economy. However, it is difficult to assess the level of ambition since the draft plan lacks a clear identification of research and innovation objectives to be achieved by 2030.

²³ Price differential in the wholesale market exceeding an indicative threshold of EUR 2/MWh between Member States, regions or bidding zones; nominal transmission capacity of interconnectors below 30 % of peak load; nominal transmission capacity of interconnectors below 30 % of installed renewable generation.

Industrial greenhouse gas emissions are expected to decrease from currently 61 Mt CO₂ to 56 Mt CO₂ in 2030, mainly due to changes in the energy mix. The draft plan does not indicate to which extent innovation could further decrease industrial emissions, and does not identify priority areas to be supported.

The draft NECP would benefit from presenting a comprehensive analysis on where the low-carbon technologies sector, including for decarbonizing energy and carbon-intensive industrial sectors, is currently positioned in the global market, highlighting areas of competitive strengths and potential challenges. Measurable objectives for the future should be defined on that basis, together with policies and measures to achieve them, making appropriate links to enterprise and industrial policy.

While it is noted that Spain has been very active in the **Strategic Energy Technology (SET) Plan**, it is not possible to determine how its implementation priorities and targets are reflected in the draft NECP.

3. COHERENCE, POLICY INTERACTIONS AND INVESTMENTS

The objectives of the draft Spanish plan seem overall coherent within and between the dimensions, in particular as regards the decarbonisation and energy efficiency dimensions. However, no clear description of the interactions of the **policies and measures** is provided in the draft NECP.

For Spain, decarbonisation is the cornerstone of the energy transition. To achieve this, it plans to increase substantially the deployment of new renewable electricity capacity (up to a 74 % share), in particular solar and wind, and accelerate the electrification of the energy system including the transport and heating and cooling sectors. This has important implications for the power system and will require additional flexibility means including storage capabilities, as recognised in the draft plan, in particular pumping technologies and batteries. The role of interconnections in delivering the ambitious renewable energy targets is also addressed. Coal will gradually be phased out and the decommissioning of the remaining coal power plants is expected by 2030.

The draft plan takes stock of the interactions with air quality and air emissions policy, from both a policy and methodological point of view. The projections of GHG and air pollutants emissions have been developed in a consistent way and the link with the National Air Pollution Control Program is established. The presentation of the air pollutants emissions and health effects of the proposed climate and energy measures provides added value to the draft plan.

The draft plan mentions the application of the **energy efficiency first principle** in the context of climate change policies, and an allocated budget to this end. However, no further information is provided as regards the measures to implement it. Similarly, no information is provided on how climate change risks might affect energy supply (e.g. wildfires and storms destroying biomass resources and power networks, availability of hydro power), in spite of the fact that in the country's National Adaptation Plan there are measures set out for the energy sector. Information is also lacking on adaptation co-benefits for energy efficiency, such as in the thermal management of buildings. The co-benefits between the foreseen action on management and use of biomass, biodiversity and climate change adaptation are mentioned.

The draft plan mentions the transition to a “resource efficient, circular and low-carbon economy”. However, while describing several policies that relate to circular approaches, it includes few

explicit references to the **circular economy**. The final plan could further integrate the national Strategy on Circular Economy, in view of its relevance for decarbonisation. Regarding **investment needs**, the draft plan foresees a total of EUR 236.1 billion over the period 2021-30 (annually around 2 % of current GDP) to achieve the objectives of the draft NECP distributed as follows: energy efficiency EUR 86.5 billion; renewable energy EUR 101.6 billion; grids 41.8 billion EUR; and non-energetic sectors (other measures) EUR 6.2 billion. Most of them are private investments. 20 % is public investment in energy saving and efficiency measures, in the electrification of the economy and in actions associated with the promotion of sustainable mobility and modal shift. Around 5 % of total investment is planned to come from European funds. Some investment needs could partly be covered by EU funds, in particular cohesion policy funding, notably in line with the investment analysis for 2021-2027 of the 2019 European Country Semester Report for Spain and with any relevant legislation.

The identified **investment needs** could partly be covered by cohesion policy funding, in line with the 2019 European Semester Country Report for Spain and the investment guidance on cohesion policy funding 2021-2027, which identifies energy efficiency; the promotion of smart energy systems at local level; the promotion of renewable energy; enhancement of research and innovation capabilities and the uptake of advanced technologies; support to EU initiatives like clean energy for EU Islands and Coal Regions; and the promotion of sustainable multimodal mobility as priority investment areas for this funding.

The draft plan already identifies the European Regional Development Fund contribution for energy efficiency (residential and tertiary sectors), research and innovation and renewables.

Links with the European Semester

Identifying financing needs and securing the necessary funding will be key to deliver on energy and climate objectives. The Commission had addressed that question as part of the 2019 European Semester process. Based on the 2019 Country Report for Spain, published on 27 February 2019²⁴, the European Commission's recommendation for a Council recommendation for Spain issued on 5 June 2019²⁵, in the context of the European Semester, highlights in particular the need to invest in 'resource and energy efficiency, upgrading rail freight infrastructure and extending energy interconnections with the rest of the Union'. When preparing its overview of investment needs and related sources of finance for the final plan, Spain should take into account these recommendations and links to the European Semester.

The draft plan includes information on **energy subsidies** including fossil fuels. The Commission Energy Prices and Costs report in Europe²⁶ identifies energy subsidies in Spain, including those for renewable energy and fossil fuels. It is important that the final plan includes a detailed description of all energy subsidies as well as of national policies, timelines and measures to phase-out subsidies, particularly for fossil fuels.

²⁴ Commission SWD(2019) 1008 final.

²⁵ COM(2019) 509 final.

²⁶ Report from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions: Energy Prices and Costs in Europe, COM(2019)1.

4. REGIONAL COOPERATION

Since 2006, Spain and Portugal are cooperating closely to create and further develop the Iberian electricity market (MIBEL). Several additional declarations were signed in 2015 and 2018 between Portugal, Spain, France and the European Commission with the aim to create the necessary infrastructure to operate the cross-border interconnections of the gas and electricity grids. Both the Governments of Portugal and Spain expressed the importance of energy security and the necessity to create cross-border and cross regional interconnections to integrate the Iberian Peninsula with the rest of the European market. Furthermore, in the Lisbon Declaration of July 2018, Portugal, Spain and France agreed to coordinate the elaboration of their draft national strategies and share their energy supply hypotheses. They also agreed to work together with the European Commission's technical support, on accelerating energy transition by considering cross-border auctions on renewable energy production and developing green bonds to finance green investments.

Regional cooperation has a key role in assessing regional system adequacy as foreseen in the Electricity regulation²⁷. This will become even more important in the light of increasing shared of renewable energy and corresponding need for system flexibility.

Spain does not include in its draft plan any measure related to regional cooperation in the field of renewable energy. No opening of support schemes is envisaged and there is no mention to the possibility to use any of the cooperation mechanisms established in Directive (EU) 2018/2001²⁸. Spain may want to consider the possibility of opening a small percentage of their support schemes for renewable energy to the Member States it is interconnected to, in line with Article 5 of Directive 2018/2001²⁹, also in light of the upcoming opportunities derived from the revised Connected Europe Facility Regulation.

In addition, there could be a reference to existing measures for regional cooperation in the field of renewable energy. For example, the Roadmap for Sustainable Electricity Trade signed between France, Germany, Spain and Morocco recognizes that improved electricity market integration between the Middle East and Northern Africa and Europe could facilitate the integration of increasing renewable electricity on both sides. As this could have a positive influence in the final objectives concerning renewable energy and decarbonisation, a reference could be included in the final plan.

In May 2017, the Clean Energy for EU Islands Initiative was launched, aiming at accelerating the clean energy transition by helping islands reduce their dependency on energy imports and making better use of locally available renewable energy sources. It also provides a forum for exchange of best practices and aims to promote modern and innovative energy systems and reduce greenhouse gas emissions on islands. Spain is a signatory to the political declaration for this initiative, as mentioned in the draft NECP. Spain could consider enhancing cooperation with other Member States and island regions facing similar challenges and opportunities, including in areas such as interconnections, clean transport, system integration of local renewable production, specific demand response opportunities, for example from desalination plants or cooling loads, and the cost-effective deployment of energy storage systems.

²⁷ Regulation (EU) 2019/943 of the European Parliament and of the Council of 5 June 2019 on the internal market for electricity.

²⁸ Directive (EU) 2018/2001 on the promotion of the use of energy from renewable sources.

²⁹ Directive (EU) 2018/2001 on the promotion of the use of energy from renewable sources.

Promotion of small-scale infrastructure and access to small grids as well as the deployment of smart energy distribution grids and storage solutions linked to demand and supply are particularly relevant in **cross-border regions**.

5. COMPLETENESS OF THE DRAFT PLAN

Information provided

The draft plan is consistent with the template for national energy and climate plans³⁰. National contributions and targets for 2030 are available regarding GHG emission reduction, renewable energy and energy efficiency.

With respect to **decarbonisation**, the draft NECP is mostly complete on **greenhouse gas emissions**. However, the draft plan does not yet present the estimate for the trajectory for 2021-2030 with quantified annual limits under the Effort Sharing Regulation (ESR)³¹ and does not contain any Land Use, Land Use Change and Forestry (LULUCF) projection yet. It justifies this by the need for the calculation of forest reference levels which are still under preparation; therefore, it is unclear how Spain is going to achieve the LULUCF no-debit commitment³².

On **renewable energy**, the key elements for objectives and targets and policies and measures are provided. However, several elements are not or are only partially provided, especially for objectives and targets. For example, some trajectories (e.g. the values for 2022 and 2027) are not included and those included, consist of only a single intermediate point (2025 between 2020 and 2030). In addition, there is no split in the total installed capacity between new and re-powered capacity. Regarding the estimated trajectories per technology, these are only set for the electricity sector and with a single (2025) intermediary step; they need to be provided for the other sectors (heating and cooling, and transport) and for the overall renewable energy trajectory. Finally, no trajectories and assessment on bioenergy have been included disaggregated between heat, electricity and transport in Mtoe. Furthermore, there is no inclusion of trajectories on biomass supply, by feedstocks and origin and trajectories for forest biomass, an assessment of its source and impact on the LULUCF sink. No information is provided on the planned measures to introduce one or more contact points, and the measures to facilitate the development of renewable energy communities are not addressed in a single section.

On **energy efficiency**, not all the required elements concerning the planned policies and measures, especially with reference to their expected impact, are provided. On building renovation, the draft NECP presents some assumptions for the targets for decarbonisation of the building stock as of 2050. There is no specific information provided on the key elements of the long-term renovation strategy (indicative milestones for 2040, the domestically established measurable progress indicators, an evidence-based estimate of the expected energy savings and wider benefits and the contribution of the renovation of buildings to the Union's 2030 energy efficiency target). No information is provided regarding cost-optimal levels of minimum energy performance requirements.

³⁰ Annex I of the Regulation (EU) 2018/1999 on the Governance of the Energy Union and Climate Action.

³¹ Regulation (EU) 2018/842 on binding annual greenhouse gas emission reductions by Member States from 2021 to 2030.

³² Regulation (EU) 2018/841 on greenhouse gas emissions and removals from land use, land use change and forestry.

On **energy security**, information is needed on future electricity generation adequacy including on demand response and storage. Also, information on managing nuclear back-end, on existing risk preparedness plans and the target date for the plans of the Risk Preparedness Regulation³³ would be useful, as well as a description of measures on cybersecurity. References should be added to the existing preventive action and emergency plans for gas and to oil stocks and emergency procedures.

On the **internal energy market**, the draft plan contains only limited information on core quantitative parameters on the functioning of the national retail and wholesale gas and electricity markets. Additional information on the aspects listed under market integration would be helpful, in particular on system flexibility and energy poverty, as well as on the expected evolution of capacity payments at mid and long term and the impact of reforms on the existing tariff deficits in the electricity and gas sectors. On infrastructures, calculation methods for the 15 % **interconnection level** are not provided. The draft NECP does not list all the Projects of Common Interest in electricity and gas that contribute to reaching the electricity interconnection level indicator, nor elaborates on the EU's or any other financial support for the implementation of these projects.

Concerning the specific measures taken to increase the market integration, the draft plan does not explain how some measures will be coordinated with the Spanish regions, for energy domains under regional responsibility (e.g. management of hydro resources).

The information provided related to **research, innovation and competitiveness** lacks completeness. The draft plan lists research domains that could potentially receive attention; however, it does not include any reference to 2030. Also, the draft NECP does not include any objectives or funding targets. International cooperation is briefly touched upon.

Robustness of the Spanish draft National Energy and Climate Plan

The draft plan contains the required elements of the **analytical basis**. The with existing measures (WEM) and the with additional measures (WAM) scenarios have been documented in the draft plan and its annexes, following the format of the voluntary templates. The draft plan relies on Eurostat and national data sources such as the National Statistical Institute, Ministries and the Bank of Spain. Spain has also provided an **impact assessment** of planned policies and measures.

The **WEM** and **WAM** projections cover the five dimensions of the Energy Union. Additional information would be desirable on: (i) separately reported GHG emissions from international aviation, (ii) time series data for non-GHG air pollutants, (iii) projections beyond 2030 for all variables, and (iv) time series data for energy related investment needs.

Most of the key assumptions and model parameters are presented in detail. The sources for the data and the models used are described in the annexe. The **transparency** could be further improved by providing figures on (i) heating and cooling degree days and (ii) technology cost projections.

The **impact assessment** of planned policies and measures is based on an in-depth comparison of the WEM and WAM scenarios. In particular, it already contains a detailed macroeconomic

³³ Regulation of the European Parliament and of the Council of 30 November 2016 on risk-preparedness of the electricity sector and repealing Directive 2005/89/EC.

assessment that could be made more transparent if the effect of energy savings and other benefits from the planned policies and measures on consumption were further explained. The draft plan documents the status of policies and measures in an Annex, implicitly defining which of these are included in the WEM and WAM scenarios. The final plan should complete the assessment of macroeconomic and, to the extent feasible, the health, environmental, employment and education, skills and social impacts, including just transition aspects. An explicit mapping of policies and measures onto the WEM and WAM scenarios would further improve the transparency of the final plan.

The analysis acknowledges uncertainties and includes a sensitivity analysis based on fuel prices, improving the robustness of the projections. Of the key parameters population, primary and final energy consumption (including non-energy use), GDP (if expressed in 2010 prices) and renewable energy shares are in line with EUROSTAT figures for the base year 2015. The draft plan follows the international fuel and ETS carbon price assumptions recommended by the Commission.