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CORRIGENDUM

This document corrects document SWD(2020) 910 final of 14.10.2020

- Modifications are introduced in Annex 1 of the report, regarding specifically values and annotations in tables 1 and 2.

- Minor editorial changes throughout the document.

The text shall read as follows :

COMMISSION STAFF WORKING DOCUMENT

Assessment of the final national energy and climate plan of Croatia

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1. SUMMARY

Croatia's final integrated national energy and climate plan (NECP)¹ sets a 2030 target for **greenhouse gas (GHG) emissions** not covered by the EU Emissions Trading System (non-ETS) of 7% below 2005 levels. This target is in line with the Effort Sharing Regulation (ESR)². Croatia projects to overachieve this target already with a continuation of current policies and achieve 18.5% emission reductions with planned policies, but does not set a corresponding national target. The plan does not include considerations on which planned level of overachievement could be cost-efficient or how the projected overachievement could be used for transfers to other Member States. No information is provided on how to achieve the no-debit commitment (i.e. accounted emissions do not exceed accounted removals) set out in the regulation on land use, land use change and forestry (LULUCF)³.

Croatia has set a contribution to the EU's 2030 **renewable energy** target at the level of 36.4% in gross final energy consumption. The overall figure is considered sufficiently ambitious as it is above the 32% resulting from the formula in Annex II of the Governance Regulation⁴.

For **energy efficiency**, the Croatian contribution to the EU 2030 target has remained unchanged from its draft plan. This contribution is considered to show 'low ambition'⁵ and amounts to 8.2 Mtoe for primary energy and 6.9 Mtoe for final energy consumption. In terms of policies and measures, the final national energy and climate plan mostly relies on implementing and scaling up an energy efficiency obligation scheme. However, after a correction of the quantitative savings goal (see section 3.2), the policies and measures described do not seem sufficient to ensure the attainment of the overall goal.

The final plan contains substantial information on buildings, including a plan to increase the renovation rate from the current 0.7% per year to 3% in 2021-2030. Croatia has not yet submitted its long-term renovation strategy.

In its final plan, Croatia sets objectives for **energy security** with regard to its forecast energy mix until 2050, national preventive action plan and national emergency plan for the natural gas sector, and further measures and investments in energy storage.

¹ The Commission publishes this country-specific assessment alongside the 2020 Report on the State of the Energy Union (COM(2020)950) pursuant to Article 13 of Regulation (EU) 2018/1999 on Governance of the Energy Union and Climate Action.

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 The Commission's recommendations with regard to Member States' ambitions on renewables is based on a formula set out in this Regulation, which uses objective criteria.

⁵ In accordance with the methodology illustrated in the Commission Staff Working Document accompanying the document Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions United in delivering the Energy Union and Climate Action - Setting the foundations for a successful clean energy transition, SWD(2019) 212 final.

Measures promoting security of supply mostly focus on gas infrastructure (new liquefied natural gas terminal under construction, development of the gas storage system). However, the NECP does not include considerations on cybersecurity or reflect a common long-term strategy between Croatia and Slovenia with respect to their joint nuclear reactor.

Regarding the **internal energy market**, the final NECP describes some goals to achieve further market integration with neighbouring countries by connecting the electricity day-ahead markets. The plan does not include a specific electricity interconnectivity level for 2030. However, Croatia's current electricity interconnection capacity is 30%, a figure that already exceeds the 15% target for 2030.

On **research, innovation and competitiveness**, the plan identifies areas where R&I efforts will be concentrated. On competitiveness, the plan puts emphasis on the activities of the national competitiveness council, which acts as an advisory body in different priority areas. Measures have been further developed in the final plan.

Investment needs for the period 2021-30 are estimated at EUR 19 billion. The NECP includes an assessment of planned investment, amounting annually to around 3.5% of 2019 GDP. They focus mainly on building renovation and electricity generation.

The final plan includes a new chapter on **fossil fuel and renewable energy subsidies**. But it does not further detail what these subsidies amount to, although figures on financial support for both renewables and fossil fuels have been estimated in recent Commission analyses on energy subsidies. The final plan does not include action (implemented or planned) to phase out subsidies, in particular for fossil fuels.





The plan provides information on the interactions with **air quality** and air emissions policy, by mentioning briefly the impacts of its measures on key air pollutants. However, it does not explain the methodology used or give information on which measures specifically are expected to provide clean air benefits compared to others.

The final plan considers the **just and fair transition** aspects and provides information on the social, employment and skills impacts of transitioning to a climate-neutral economy. A 2019 Eurostat analysis reported in the plan estimates that 40-80,000 additional jobs could be created. However, the analysis does not appear to be comprehensive. The NECP does address **energy poverty**, albeit without detailed figures.

There are several examples of **good practices** in Croatia's final NECP, in particular the use of voluntary templates to report on quantitative projection parameters and results, as well as on policies and measures, and the more systematic indication of interlinkages between specific measures and climate change adaptation.

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

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.

	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) (%)	-1%	11%	-7%	As in ESR
	National target/contribution for renewable energy: Share of energy from renewable sources in gross final consumption of energy (%)	28%	20%	36.4%	Sufficiently ambitious (32% is the based on the RES formula)
	National contribution for energy efficiency: Primary energy consumption (Mtoe)	8.2 Mtoe	10.7 Mtoe	8.23 Mtoe	Low
	Final energy consumption (Mtoe)	6.9 Mtoe	7.0 Mtoe	6.85 Mtoe	Low
	Level of electricity interconnectivity (%)	30%	N.A.	15%	N.A.

Sources: European Commission, Energy statistics, Energy datasheets: EU countries; European Semester by country; Croatia's final national energy and climate plan.

2. FINALISATION OF THE PLAN AND CONSIDERATION OF COMMISSION RECOMMENDATIONS

Preparation and submission of the final plan

Croatia **notified** its final national energy and climate plan (NECP) to the European Commission on 30 December 2019.

Public consultations on the draft NECP were carried out in December 2018 and in October 2019 and stakeholders were consulted through specialised workshops during 2018 and 2019. The plan does not include a summary of the public's views or of how those views have been taken into account. Key activities requiring coordinated planning with the neighbouring Member States were identified at a regional workshop in Ljubljana in July 2019, at which representatives of Austria, Croatia, Italy, Hungary and Slovenia participated. The NECP does not specify whether the draft plan or any of the policies and measures proposed were subject to a Strategic Environmental assessment (SEA) under Directive 2001/42/EC.

Consideration of Commission recommendations

In June 2019, the Commission issued nine recommendations to Croatia on its draft plan⁷. Annex II to this staff working document offers a detailed account of how the different elements of

⁷ Commission Recommendation of 18 June 2019 on the draft integrated national energy and climate plan for Croatia covering the period 2021-2030.

Commission recommendations have been reflected in the final NECP. Overall, the final NECP **partially addresses** most of the Commission recommendations. The main changes introduced in the final plan are the following:

On renewables, overall Croatia **did not address** the recommendations to include more detailed and quantified policies and measures and increase the level of ambitions in the heating and cooling and transport sectors. In particular, the final NECP provides neither more detailed policies and measures nor evidence that additional measures have been introduced. Furthermore, Croatia has not increased its shares of renewables in heating, as required by the indicative target for the heating and cooling sector. Regarding transport, further information has been added, but the level of ambition has not been increased, the overall level of policy description remains generic and the actual impact of several measures is not clearly described.

On energy efficiency, Croatia **did not address** the recommendation to increase its ambition towards reducing both final and primary energy consumption, to support this with policies and measures that would deliver additional energy savings by 2030 and underpin those by an impact assessment. Croatia maintained its level of ambition, which is assessed as low compared to the EU level of efforts. Overall, limited additional information was included on the specific action planned for energy efficiency. Regarding the transport sector, the contribution of energy efficiency in transport to transport decarbonisation is not specified. With regards to buildings, the plan presents additional information. The long-term renovation strategy has not been submitted yet. Also, it is difficult to assess the status and impact of different measures, due to lack of detail.

In relation to the **internal energy market**, Croatia **partially addressed** the recommendation to set forward-looking objectives and measurable targets for market integration, in particular measures to develop liquid and competitive wholesale and retail markets, by fostering competition within the country and progressing towards fully market based prices and by eliminating barriers to cross-border trade. The final plan outlines the intention for further market integration with neighbouring countries by participating in the electricity day-ahead market. However Croatia has neither provided a qualitative and quantitative assessment of the remaining aspects, nor set objectives and measurable targets for a liquid and competitive market in electricity and gas and addressed remaining regulatory issues respectively.

On research, innovation and competitiveness, Croatia **partially addressed** the recommendation to further develop national objectives and funding targets. The plan identifies areas where R&I efforts will be concentrated. However, there are no national targets for financing public and private research and innovation related to the Energy Union, nor are there supporting programmes and policies. Croatia currently has no national goals for competitiveness related to the Energy Union objectives.

Croatia **largely addressed** the recommendation to continue **regional cooperation** efforts as part of the Central and South-Eastern Europe Energy Connectivity (CESEC) High-Level Group and to explore the cross-border potential and the macro-regional aspects of a coordinated energy and climate policy. In its final plan, Croatia added new chapters on overall regional cooperation and cooperation in specific areas mentioned in the recommendations. However, the plan does not explicitly mention cooperation activities within the CESEC high-level group or within the macro-region.

On **investment needs** and mechanisms and funding sources to lever those, Croatia **partially addressed** the recommendation to extend the analysis of investment costs and sources and also consider the cost-effective generation of transfers to other Member States as a funding source.

While quantified investment needs are laid out, Croatia has only partially determined which sources of finance to use at the national, regional and EU level. The NECP plans to use European Regional Development Fund (ERDF) financing for energy renovation of private and public housing, public lighting (loans) and manufacturing industries. Transfers to other Member States are indicated as a funding source through the national Green Industry Financing Scheme.

Croatia **partially addressed** the recommendation to list action undertaken and planned to phase out **energy subsidies**, in particular for fossil fuels. A chapter on energy subsidies has been included in the final plan. It states that the phase-out of energy subsidies related to exemptions from excise duties in transport and agriculture is currently not planned, and energy subsidies aimed at increasing energy efficiency and the use of renewable energy sources will continue in the future.

Croatia **partially addressed** the recommendation to provide more quantitative information to complement the analysis of interactions between **air quality** and air emissions policy. The final NECP mentions the impacts of its measures on key air pollutants but does not explain the methodology used nor which measures specifically are expected to provide clean air benefits compared to others. Consequently, some concerns are raised, in particular considering the projected continued reliance on bioenergy for heating and the related air pollutants emissions. Links between clean air and climate/energy are made in the national air pollution control programme (NAPCP). It highlights the strong relationship between the two plans. Both plans provide consistent and complementary policies and measures, albeit without details on how the methodology used by both plans is consistent.

Finally, Croatia **partially addressed** the recommendation to better integrate **just and fair transition aspects** and further develop the approach to addressing **energy poverty** issues. Details on the social, employment and skills impacts of planned objectives, and policies and measures are not provided. The approach to addressing energy poverty issues is described, including the already existing measures and new action. However, no assessment of the number and type of households in energy poverty is provided. In general, the impact and need assessment of the transition on employment, social aspects and skills is not presented clearly.

Link with the European Semester

In the context of the European Semester framework for the coordination of economic policies across the EU and of the country report 2019⁸, Croatia received one country-specific recommendation in relation to climate and energy, in particular to “*focus investment-related economic policy on research and innovation, sustainable urban and railway transport, energy efficiency, renewables and environmental infrastructure, taking into account regional disparities*”⁹. In the 2020 country report¹⁰ adopted on 20 February 2020, the Commission assessed that Croatia achieved **limited progress** on this recommendation.

Due to the COVID-19 crisis, the European Semester country-specific recommendations for 2020 considered Member States’ responses to the pandemic and made recommendations to foster economic recovery. In particular, they focused on the need to frontload mature public investment projects and promote private investment, including through relevant reforms, notably in the digital and green sectors. In this context, Croatia received a country-specific recommendation stressing the importance of focusing investment on “*the green and digital transition, in particular on environmental infrastructure, sustainable urban and rail transport, clean and efficient production and use of energy and high-speed broadband*”¹¹.

The Governance Regulation encourages Member States to ensure that their national energy and climate plans take into consideration the latest country-specific recommendations issued through the European Semester. Croatia’s national energy and climate plan can support the implementation of the recommendations formulated in the context of the European Semester, in particular by identifying necessary investment needs and the financial sources to deliver them.

3. ASSESSMENT OF THE AMBITION OF OBJECTIVES, TARGETS AND CONTRIBUTIONS AND OF THE IMPACT OF SUPPORTING POLICIES AND MEASURES

Decarbonisation

Greenhouse gas emissions and removals

Croatia’s binding 2030 **national non-ETS emission target** under the Effort-Sharing Regulation referred to in the NECP is -7% compared to 2005. This target is not translated into estimated annual emission allocations for 2021 to 2030. Croatia has also set the indicative target to reduce emissions in ETS sectors by at least 43% compared to 2005 levels. No long-term greenhouse gas target is mentioned, as the low-carbon development strategy to 2050 has not been adopted yet.

⁸ The Annex D to the 2019 Country report also sets out priority investments for the 2021-2027 cohesion policy, substantially contributing to the clean energy transition.

⁹ Council Recommendation of 9 July 2019 on the 2019 National Reform Programme of Croatia and delivering a Council opinion on the 2019 Convergence Programme of Croatia. COM(2019)511 final.

¹⁰ Commission Staff Working Document “Country Report Croatia 2020” accompanying the document Communication from the Commission to the European Parliament, the European Council, the Council, the European Central Bank and the Eurogroup “2020 European Semester: Assessment of progress on structural reforms, prevention and correction of macroeconomic imbalances, and results of in-depth reviews under Regulation (EU) No 1176/2011 (COM(2020)150 final), SWD(2020)510 final.

¹¹ Council Recommendation of 20 February 2020 on the 2020 National Reform Programme of Croatia and delivering a Council opinion on the 2020 Convergence Programme of Croatia. COM(2020)511 final.

The NECP does not refer to the Croatian commitment stemming from EU legislation that accounted emissions from land use, land use change and forestry (LULUCF) should not exceed accounted removals, nor does it clarify the intended use of the flexibility from the LULUCF sector to the effort sharing sectors.

Croatia expects to overachieve its 2030 target in the effort-sharing sectors. With existing measures, the emission reductions in the effort-sharing sectors are projected to reach 12.7% by 2030, compared to the 2005 base year under the Effort-Sharing Decision¹². With planned additional measures Croatia expects to reduce emissions by 18.5%. The plan does not explain whether Croatia intends to use this overachievement, e.g. for possible transfers to other Member States. Croatia justifies this with the lack of experience and also of practical and price information.

Existing and planned policies and measures (in some effort-sharing sectors and across sectors) are described, albeit not always clearly distinguished. Links with other Energy Union dimensions are addressed for some of the measures, notably horizontal and transport-related ones. Estimates of sectoral emission reduction potentials that could be realised with additional measures are provided through the corresponding quantitative scenario.

There are no sectorial targets. Concerning horizontal measures, a commission for transversal coordination of policies and actions on climate change mitigation and adaptation has been tasked with monitoring the NECP implementation on all dimensions. The plan indicates that considerations have started to include CO₂ emission taxes in the price of fossil fuels from all sectors outside the EU ETS, instead of the current CO₂ emission charge for stationary sources only.

Croatia has not set a specific target for emission reductions in the **transport sector** as part of the non-ETS sector target. The plan presents a comprehensive modelling of the energy-efficiency contribution to transport decarbonisation, but the policy impact is not clear.

Thirteen existing and planned measures are described, covering measures on the alternative fuels infrastructure and on the support of **electromobility** and other alternative fuels. Electrification of the transport sector is regarded as a key step in decarbonising and diversifying fuel supply. The underlying infrastructure for this is supported by a mix of regulatory and financial measures (including tax changes), of which many are under preparation or consideration and lack detail.

For **biofuels**, a pathway analysis is presented but without indicating policy targets, apart from overall compliance with the Renewable Energy Directive¹³. The plan does not address shipping, aviation or rail (tram) in detail.

Soft measures like information and training are also mentioned, to promote low-emission vehicles, as well as measures to promote integrated and intelligent transport, in particular in large cities, counties and agglomerations. The aggregated scenarios provide for a planned additional emission reduction in transport of 483 kt CO₂eq by 2030, nearly half of the projected additional reductions in effort-sharing sectors.

¹² Decision No 406/2009/EC of the European Parliament and of the Council of 23 April 2009 on the effort of Member States to reduce their greenhouse gas emissions to meet the Community's greenhouse gas emission reduction commitments up to 2020.

¹³ 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.

In **buildings**, planned additional emission reductions total 320 kt CO₂eq by 2030, around one third of the total additional reductions planned. These are underpinned with some detail on the planned building renovation measures under the energy efficiency dimension.

Planned additional emission reductions in **agriculture** total 160 kt CO₂eq by 2030. The plan describes 14 mitigation policies considered for decarbonising the agriculture sector, focusing on use of fertilisers, the livestock sector (including dietary shift), and the introduction of new cultivars, varieties and species. But these are often still mainly focused on objectives and lack detail on the concrete measures.

The plan also includes seven policies and measures in the **LULUCF** and agriculture sectors, focusing on a land management strategy to improve LULUCF inventories, increasing storage and sequestration of carbon in forests, wood products and soils.

Croatia refers to climate change **adaptation** as one of the decarbonisation objectives. The plan makes reference to the ongoing process for adopting the draft adaptation strategy and presents the adaptation goals and priorities set in the draft strategy. For some climate mitigation measures, the plan contains an analysis of the links with climate adaptation.

As of 1 September 2020, Croatia had not notified its national long-term strategy to the Commission as required under Article 15 of the Governance Regulation.

Renewable energy

At 36.4%, Croatia's national contribution for renewable energy (proposed in the draft plan and reiterated in the final plan) is above the 32% share by 2030 obtained from the formula in Annex II of the Governance Regulation.

However, despite Croatia's assurances (in its presentation of its final NECP and its response to the Commission recommendations) that "more detailed policies and measures have been developed" and that "additional measures promoting renewable self-consumption and renewable energy communities have been introduced", there is little to no evidence of either in the final NECP itself.

In the **electricity** sector, Croatia aims to achieve a share of 63.8% in gross direct consumption of electricity from renewable sources by 2030.

In the final NECP, the 2030 target for heating and cooling is 36.6%, with heat produced by cogeneration being more than 60%. This compares to an estimated share of 33.3% for 2020. Although this target and progression are well below the 1.3% annual average increase required between 2020 and 2030, cogeneration provides 79% of heat produced for Croatia's district heating. Overall, the information provided on district heating and cooling is limited and the role of waste heat and cold is not addressed.

For the renewables target in **transport**, as required in Articles 25-27 of the Renewable Energy Directive, the explanation for setting it at 13.2% ("*in the transport sector Croatia has decided not to use the flexibility offered by the Renewable Energy Directive and the 2030 goal is higher than minimal share of RES-T, however the 14% goal is deemed not feasible*"), is not clear.

The final national energy and climate plan also announces the adoption of a plan setting out a policy to promote the production and use of advanced biofuels in transport. This plan will include a review and assessment of the state of the biofuels market, new business models, stakeholders,

measures to promote the increased production and use of advanced biofuels in transport, and a trajectory for achieving the goal of advanced fuels in transport by 2030.

In addition, the final plan states that the measures will include ones aimed at producing advanced biofuels from raw materials under Annex IX Part A of the Renewable Energy Directive, measures on the use of advanced biofuels, R&D measures, and market strengthening and administrative measures.

Croatia's final NECP lists the development of production capacity for **electric vehicles** among its key objectives. Electric vehicles will not be subject to a special tax on motor vehicles. In the context of co-financing cleaner transport projects, the plan proposes to define special co-financing lines for specific purposes, namely purchasing electric vehicles, as well as vehicles powered by compressed and liquefied natural gas and hydrogen.

Incentives for co-financing the purchase of vehicles will be primarily geared towards alternative fuels, which the assessment has shown currently account only for a minor share of the total number of vehicles, and will be time-limited until a minimum share is achieved – set at 1% of the total number of vehicles registered in the country.

Among the main sources of funding for electric vehicles, the NECP lists European structural and investment funds and funds collected by auctioning CO₂ emission allowances managed by the Environmental Protection and Energy Efficiency Fund (EPEEF). In addition, ETS funds earmarked for modernisation will be available.

Croatia's final NECP highlights the importance of enacting laws and by-laws to regulate the conditions for filling stations for electric vehicles, conditions for distribution, charging and unit cost of alternative energy used in transport, and to set conditions for filling stations for liquefied natural gas and compressed natural gas. However, it does not give a timeline for introducing these laws.

Energy efficiency

Croatia's **national contribution for energy efficiency** in 2030 under the Governance Regulation is 8.23 Mtoe for primary energy and 6.85 Mtoe for final energy consumption. In its final plan, Croatia maintained its level of ambition, assessed as low compared to the EU level of efforts.

The plan provides descriptive information on the 18 **policies and measures** planned for 2020 to 2030, and includes some information about their expected impact and funding sources. The cornerstone of the Croatian energy efficiency policies is an energy efficiency obligation scheme that has been planned for years but experienced delays, and should become fully operational by 2021¹⁴.

The other policies include grants for building renovation mainly with EU funding, improvements to district heating and transmission and distribution networks, and awareness and training campaigns. The only specific measure addressing industrial and service sectors relates to the promotion of energy management schemes, and the transport sector is not addressed.

¹⁴ The scheme targets energy suppliers who supplied more than 50 GWh of energy to the market during the previous year. Suppliers can fulfil their obligation in one of the following three key ways: investing in and stimulating energy efficiency improvements in final consumption; buying savings from another obligated party or paying contributions to the environmental protection and energy efficiency fund.

The **cumulative savings** to be achieved under Article 7 of the Energy Efficiency Directive¹⁵ were recalculated by Croatia to 2953.1 ktoe¹⁶. In the light of this correction of the energy saving goal, the planned policies and measures do not seem sufficient to achieve it.

The objective of renovating central government buildings, planned under the Energy Efficiency Directive, is clearly reported, and Croatia plans to address it through a set of measures, including a financial support scheme and capacity building measures to promote Energy Service Companies and Energy Performance Contracting to target thorough renovation of public and heritage buildings.

Regarding energy efficiency in buildings, the long-term renovation strategy has not been submitted yet¹⁷. The information in the final plan is much improved relative to the draft, and contains specific measures. The plan announces that Croatia will adopt a long-term renovation strategy with a plan of measures and indicators for 2030, 2040 and 2050, which will be aligned with Croatia's energy development strategy.

According to the final NECP, Croatia is aiming for an annual average renovation rate of 1.6%, with specific annual rates gradually increasing from 0.7% in 2021 to 3% in 2030. To reduce energy consumption in the buildings sector, the plan provides for the adoption of three key energy renovation programmes for 2021 to 2030, for multi-dwelling buildings, family homes and public buildings. In addition to these programmes based on financial incentives, the implementation of a comprehensive promotion programme for nearly zero-energy buildings and renovation standards is also planned.

Energy security

The plan gives a positive outlook for the planned energy mix by 2050, but this still relies on certain assumptions with regard to the exploitation of new indigenous hydrocarbon deposits. When considering risks, the plan recognizes the importance of regional cooperation and envisages strong engagement with neighbouring Member States, as well as in EU-level action to combat specific risks in isolated territories such as **islands**.

The plan refers to the national preventative action plan and the national emergency plan for the natural gas sector. Emergency management in electricity and oil derivatives is not developed in much detail.

As regards **diversifying sources and routes**, the plan sets out a clear vision and policy on the adequacy of gas supply and diversification of its sources. It demonstrates the key role in the country's gas supply security played by liquefied natural gas import terminal on the island of Krk, as well as its role in regional gas markets. This is reflected in plans to upgrade pipelines and interconnection points. The plan also recognises the importance of better, more integrated energy supply planning for energy security and therefore envisages the need for the further application of new technologies and adaptation of the regulatory framework.

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.

¹⁶ The target in the final NECP excluded the energy used in transport from the calculation and makes use of exemptions. This leads to a target less than half than the minimum target defined in Article 7(1): 1,289.8 Ktoe of cumulative savings in 2021-2030. After submitting its final NECP, Croatia recalculated this to 2,953.1 Ktoe.

¹⁷ Croatia only submitted a draft long-term renovation strategy in accordance with Article 2a of the Energy Performance of Buildings Directive.

With regard to **oil and gas** production and management, the plan describes the current situation and the expected developments in the oil derivatives market and the contribution of envisaged new production projects, albeit with the assumption of those projects actually becoming operational.

The plan envisages further measures and investments in **energy storage** for a total of 150 MW by 2030, through various possible technologies. The approach on the type and timeline of planned storage projects is not very detailed, but the information on gas storage development is rather robust. The plan does not include considerations on cybersecurity in the energy sector, or mitigation of risks arising from climate change.

The planned policies and measures reflect a thorough understanding of the forthcoming challenges in relation to achieving the energy security objectives. Some of the measures are supported by credible data and planning information, as in the case of the Krk terminal, the relating gas infrastructure projects and the electricity interconnections. Other policies are lacking detailed information and the indication of more specific action.

Regarding the shared **nuclear facility** with Slovenia, the plan does not reflect a joint, sustainable, long-term strategy between the two countries for the reactor's operation, lifetime management and management of fuel supply.

Internal energy market

Croatia's electricity interconnectivity level is currently at 30%. Installed interconnection capacity exceeds the EU interconnection target. Therefore, Croatia has not presented a plan to increase electricity interconnection capacity. Due to market coupling with Slovenia, 98% of the time there are no price differentials.

The development of new interconnection projects ('projects of commoninterest'), help boosting neighbouring transmission systems' capacities (Bosnia and Herzegovina, Serbia).

Given the electricity sector target of 63.8% renewable energy resources in 2030, the plan offers an overview of the development of the different sources of **flexibility** needed to integrate the rising share of renewable energy into the electricity system.

Croatia has clearly moved forward on certain challenges identified in the draft plan, by setting specific policy actions for regulatory measures to be put in place for the areas of system balancing and ancillary services, as well as aggregation and demand response. The plan includes specific policy measures for introducing the regulatory framework for aggregation, demand response and ancillary services, by 2022. This policy measure will also increase energy security, as well as the penetration of new technologies and renewables.

Although energy demand and final pricing information is present for both electricity and gas markets, Croatia's plan lacks detail on the major **market conditions** for competitiveness, liquidity and regulated pricing, as well as progress made on regulatory issues such as transmission system operator certification.

The plan sets specific goals for further improving **market integration** by integrating Croatia's electricity trading system with that of Hungary, as done in the past with Slovenia. The goal is to increase tradable electricity at interconnection points, and the physical capacity for this already exists.

Despite the planned deployment of **smart grids and smart meters**, no quantitative policy measures or targets are mentioned.

Croatia's final NECP lists some goals for improving competitiveness in the **retail electricity** market, notably activating and aggregating end customers, offering a wider selection of suppliers (increasing the Herfindahl-Hirschman index (HHI)¹⁸ for measuring points from the household and entrepreneurship categories) and a simplified procedure for switching suppliers. However, the plan does not provide any details how these goals will be met and implemented in practice.

The NECP mentions that the introduction of **advanced consumption meters (smart meters)** is planned, to enable the further development of energy markets and an active role of customers in energy markets. However, no further details, such as on timing, are provided.

Regarding **energy poverty**, Croatia does not report the number of households affected. The Croatian final national energy and climate plan does not include a comprehensive analysis of the energy poverty challenge (including the share of energy poor households) nor does it indicate an objective for reducing energy poverty.

It points to the future development of a programme for eliminating energy poverty, which should include action to consult energy-poor citizens, monitor energy poverty and increase efficiency energy – but no direct financial support scheme is mentioned. The monitoring system for the social impacts of the energy transition is yet to be established.

Research, innovation and competitiveness

Croatia has general research, development and innovation objectives for 2020 (namely a spending target of 1.4% of GDP). Without a specific timeline, the plan mentions the objective of reaching the EU average of 3% of GDP of investment in science and technology. Croatia has no specific national 2050 targets for deploying low-carbon technologies.

On how to reach the national objectives and funding targets, the NECP provides a long list of most significant capacities and industries, and mentions its scientific community, but there are no linked tasks or roadmaps. Croatia aims to propose relevant data sources as well as a system for monitoring the output of indicators, but so far it remains to be put in place. The plan lacks clear policies and measures for meeting the objectives Croatia has set. Due to missing hard data and clear implementation plans, the extent and impact of the intentions sketched in the plan cannot be assessed.

According to the NECP, Croatia intends to enable the integration of hydrogen into its energy and transport systems. By 2040, Croatia expects a final hydrogen consumption of 0.01PJ or 2.8 GWh in the transport sector and 3.5% low-carbon vehicles by 2030. To reach these targets Croatia intends to build hydrogen-refuelling stations, provide financial incentives for energy-efficient vehicles (including hydrogen-driven) and develop technical standards to facilitate market uptake.

The NECP mentions the **strategic energy technology (SET) plan**. It contains some alignment of the national energy research and innovation objectives with the respective priorities identified in the latter. However, the national energy and climate plan does not allocate national funds or dedicated activities, and does not make any link between the energy and technology plan and the national energy and climate objectives.

Currently, Croatia does not have a definition of the national **competitiveness** objectives linked to the Energy Union, but the NECP does plan to establish these.

¹⁸ The HHI is a commonly used measure of the concentration of a market. It is calculated by summing up the squares of the individual market shares of all competitors in the market.

The Croatian NECP includes numerical information on patents. But information specifically on low-carbon energy technologies is missing. Likewise, on private research and innovation investment, the NECP tracks private R&D expenditures by scientific field, but the corresponding breakdown does not enable any monitoring of low-carbon or energy technologies. Finally, the plan contains no information on researchers.

Croatia has no national 2050 targets for deploying low-carbon technologies. The NECP states that deployment of specific technologies should be driven primarily by the market.

The NECP identifies such key areas for research and innovation as technological advances in ICT in all sectors, the development of energy storage systems, e-mobility infrastructure, batteries, autonomous systems in various sectors and robotics. However, no concrete policies to raise investment in research and innovation are specified. The plan expects significant financing from EU (public) funds, and does not consider private financing.

4. COHERENCE, POLICY INTERACTIONS AND INVESTMENTS

The policies presented in Croatia's final NECP appear generally in line with the set objectives. **Interlinkages** and interactions between specific measures, in particular between decarbonisation, energy efficiency and security of supply, are more systematically indicated, though not always in a very detailed way. Climate change is mentioned as one of the key risks to energy security and measures are envisaged to prepare the power system, all in the energy security dimension.

The final plan also systematically indicates interlinkages between specific measures and climate change adaptation, though often in a rather general way. However, the final plan hardly implements the recommendations on the circular economy and biodiversity, where interactions with energy and climate policies are still not integrated in the analysis.

The plan contains an overall assessment of **investment needs** and expenditures. The total estimated investment covers 12 sectors and amounts to around EUR 19 billion (HRK 141.47 billion) over the period 2021 to 2030, corresponding to an annual amount of around 3.5% of 2019 GDP. Investments are planned mainly for the building sector (construction and renovation), and electricity production installations. For 2031 to 2050, they amount to around EUR 31 billion (HRK 237.43 billion), with nearly 40% for construction of new energy-efficient buildings in 2021 to 2050, and around 15% for electricity generation using renewable energy sources. Market risks are identified, but not further assessed. The calculation methodology is not clearly stated. The investment needs apparently result from comparing current with projected energy needs.

The national energy and climate plan does not provide a quantitative assessment of current investment, nor a budget for the planned investment. It assumes many of the measures would be co-financed by different European sources, such as e.g., the European structural and investment funds and the European fund for strategic investments, or EU ETS-related sources, such as the modernisation fund and innovation fund (up to 30 million allowances in total, corresponding to EUR 600 million for a carbon price of EUR 20/t)¹⁹ and auctioning of emission allowances.

The energy and climate plan says that the support schemes will be described in detail in the national development strategy for 2030, currently being prepared. The plan does not consider, as a funding source, possible transfers to other Member States under the Effort Sharing Regulation.

The description of existing fossil fuel **energy subsidies** is based on exemptions from excise duties. No timeline for phasing out energy subsidies, in particular for fossil fuels, is provided in the final plan. The plan also states that energy subsidies aimed at increasing energy efficiency and the use of renewables would continue in the future.

The final plan provides information and analysis on **air quality and air emissions policy** and states that, by switching to a low-carbon scenario in 2030, the emissions of pollutants into the air will be reduced by 9-32%. Reaching these targets will require additional effort to reduce the main sources of emissions, namely focusing on energy production and heat generation (where a shift from solid fuels to efficient and clean district heating is needed), transport (in particular in urban areas), and agriculture (introducing or expanding the use of low-emission farming techniques).

Regarding the **just and fair transition** aspects, the plan mentions an expected increase in employment within the construction sector due to planned investment. But it does not provide detailed assessments on any aspect of socially just and fair transition, such as shifts in sectors and respective industry and skills impacts, or revenue recycling. The NECP includes planned measures to address energy poverty, but no assessment of numbers. However, one of the planned measures is a monitoring system of indicators for energy poverty.

The final plan discusses the collection and treatment of agricultural plantations and residues for energy purposes, and the organisation of collection points for biomass and bio refineries.

No trajectories have been estimated for **bioenergy demand and biomass supply** by feedstocks and origin, and no assessment is made of the sources of forest biomass and their impact on the LULUCF sink and on biodiversity.

Although the Croatian plan reports many quantified energy-efficiency measures, the **energy-efficiency first principle** does not seem to have been addressed comprehensively across all dimensions of the plan. In particular, the planned actions for security of supply do not consider measures to reduce energy consumption, and it remains unclear how the expected evolution of energy demand was taken into account.

Information is lacking on climate adaptation co-benefits and trade-offs for energy efficiency, such as in the thermal management of buildings. Energy efficiency measures need to be mindful of adaptation co-benefits and trade-offs under future climate.

The final plan contains a macro-economic assessment of the proposed policies and measures, in comparison with existing policies and measures. The plan estimates, for the period 2021 to 2030, an additional increase in economic output of around 2 to 2.5 % of 2018 GDP and an increase in employment of some 2.4% (compared to 2017).

The national energy and climate plan partially complies with **data transparency** requirements and the use of European statistics.

5. GUIDANCE ON THE IMPLEMENTATION OF THE NATIONAL ENERGY AND CLIMATE PLAN AND THE LINK TO THE RECOVERY FROM THE COVID-19 CRISIS

Croatia needs to swiftly proceed with implementing its final integrated national energy and climate plan, as notified to the Commission on 30 December 2019. This section provides some guidance to Croatia for the implementation phase.

This section also addresses the link between the final plan and the recovery efforts after the COVID-19 crisis, by pointing at possible priority climate and energy policy measures Croatia could consider when developing its national recovery and resilience plan under the Recovery and Resilience Facility²⁰.

Guidance on the implementation of the national energy and climate plan

In the plan, for 2030 Croatia is targeting a reduction in **greenhouse emissions** (non-ETS, i.e. not covered by the EU Emissions Trading System) of 7% compared to 2005.

This target is in line with the Effort Sharing Regulation (ESR). With the current policies and projects, Croatia estimates it will overachieve by reaching 18.5% in emissions reductions, relying mostly on implementing and scaling up an energy efficiency obligation scheme. Croatia has set up several specific plans, such as the long-term renovation strategy, focusing on buildings and promoting renovation standards using near zero-energy construction.

The Croatian contribution to the EU 2030 renewables target is sufficiently ambitious when compared to the share resulting from the formula in Annex II of the Governance Regulation, whereas the Croatian contribution to the 2030 energy efficiency target shows ‘low ambition’. Croatia’s plan still therefore leaves scope for further developing and reinforcing policies and measures on both renewables and energy efficiency, to contribute more to the EU climate and energy targets and strengthen the green transition.

Croatia committed to increase the **share of renewables** in gross final energy consumption to 36.4%. However for the transport and heating/cooling sectors, renewable energy penetration is still lower than the requirements and indicative targets in the Renewable Energy Directive. So Croatia would need to provide further analysis, update the relevant policies and implementing measures and quantify their projected impact.

In addition, the penetration of renewable electricity would be significantly enhanced by ensuring a level playing field in the electricity market. A careful assessment of the regulatory, structural and administrative system, under this perspective, would greatly assist the removal of any barriers and burdensome procedures, streamline licensing, and promote the uptake of power purchasing agreements.

²⁰ On 17 September 2020, the Commission has put forward the Annual Sustainable Growth Strategy 2021 (COM(2020) 575 final), as well as guidance to help Member States prepare and present their recovery and resilience plans in a consistent manner, regardless of the outcome of the negotiations on the proposal for a Regulation on the Recovery and Resilience Facility in the European Parliament and the Council (Commission Staff Working Document. Guidance to Member States – Recovery and resilience plans, SWD (2020) 205 final).

On **energy efficiency** Croatia would benefit from adopting and implementing additional policies and measures that would deliver additional energy savings by 2030 and match the corrected 2030 energy savings target under Article 7 of the Energy Efficiency Directive.

Swift implementation of the proposed Energy Efficiency Obligation Scheme would avoid delays that might risk missing the estimated energy savings and the overall energy efficiency objectives.

Following the recognition of the energy efficiency first principle in the NECP, it is important this principle is applied. Croatia could also consider using the dedicated green transition funding to finance energy efficiency policy, in particular targeting renovation of buildings, services and the tourism sector.

Improving energy efficiency in buildings has much potential for speeding up energy savings and contributing to the recovery of the economy after the COVID-19 pandemic. Building on the momentum of the **Renovation Wave** initiative²¹, there is scope for Croatia to intensify efforts to improve the energy performance of the building stock with concrete targets, measures, and actions with due attention to energy poverty.

Further support for renovating public and private buildings could be provided through increased public funding and by leveraging EU and national budgets with private money – combining grants, lending, guarantees and loan subsidies.

Croatia is expected to provide a robust and comprehensive long-term renovation strategy, in accordance with Article 2a of the Energy Performance of Buildings Directive, which can help it meet the energy efficiency target and recover after the COVID-19 pandemic. The long-term renovation strategy will set out a roadmap for decarbonisation by 2050, with ambitious milestones for 2030, 2040 and 2050, measurable progress indicators, expected energy and wider benefits, measures to renovate the building stock, and a solid finance component, with mechanisms for mobilising public and private investment.

As regards **energy poverty**, Croatia is encouraged to consult the Commission Recommendation of 14 October 2020 on energy poverty and its accompanying staff working document providing guidance on the definition and quantification of the number of households in energy poverty and on the EU-level support available to Member States' energy poverty policies and measures. Energy poverty could be, among other measures, addressed through specific support to socially innovative solutions and social enterprises that work on addressing this challenge (e.g. energy-awareness campaigns, retraining unemployed as energy advisors, supporting green installations by cooperatives, buying energy-saving appliances for social enterprises to rent out).

To further strengthen **energy security**, Croatia would benefit from swiftly implementing the planned investment projects, taking full advantage of the available European funding, notably through projects of common interest. This includes expanding renewables capacity (wind and solar) and reinforcing the transmission grid, as required.

Regarding the **internal energy market**, Croatia would benefit from the timely implementation of its recently overhauled legislation on electricity and gas. Enhanced transparency and provision of information about the functioning of the market and competition, as well as full adherence to

²¹ Communication 'A Renovation Wave for Europe – greening our buildings, creating jobs, improving lives', COM(2020)662 and SWD(2020)550.

market-based prices, would benefit both consumers and operational and regulatory evolution of the market.

Croatia would benefit from defining clear indicators to track the achievement of milestones towards its **research and innovation and competitiveness** objectives. Over time, this process would be helped by gathering more granular data. Croatia needs to ensure there is a link with the activities it has undertaken under its **strategic energy technology** (SET) plan. Croatia would also benefit from further strengthening the link between the competitiveness objective and the policies and measures to put in place for the different sectors by 2030.

In its NECP, Croatia estimates that, between 2021 and 2030, **investment needs** amount to HRK 141.47 billion, i.e. around EUR 19 billion, or annually around 3.5% of its 2019 GDP. Between 2031 and 2050 investment costs are estimated at HRK 237.43 billion, i.e. about EUR 31.5 billion. For both periods, nearly 40% should be used to construct new energy-efficient buildings and around 15% for electricity production and installation. While quantified investment needs are laid out, further detail is needed on the private and public sources of financing (at national, regional, and EU level).

Croatia is invited to continue ongoing efforts on **regional cooperation**, to intensify exchanges and initiatives that can facilitate the implementation of its NECP, in particular as regards relevant cross-border issues, including those in the context of the CESEC High-Level Group.

Croatia is also invited to further explore the possibilities available within the Clean Energy for EU Islands Initiative to advance the clean energy transition on its islands²². Croatia is also invited to better exploit the potential of the **multilevel climate and energy dialogues**, to actively engage with regional and local authorities, social partners, civil society organisations, the businesses, investors and other relevant stakeholders, and discuss with them the different scenarios envisaged for its energy and climate policies.

Croatia is invited to extend and update its reporting on **energy subsidies** and to initiate action to phase them out, in particular for fossil fuels. A rapid phase-out of the fossil fuel subsidies identified in the NECP and recent Commission analyses, by developing and implementing concrete plans with associated timelines (coupled with measures to mitigate the risk of household energy poverty), would further boost the green transition.

For all investments implementing the national energy and climate plan, Croatia is invited to ensure these are in line with national, regional or local plans for **air pollution** reduction, such as the National Air Pollution Control Programme (NAPCP), and relevant air quality management plans.

In implementing its plan, Croatia is invited to make the **best possible use of the various funding sources available**, combining scaled-up public financing at all levels (national and local, as well as EU funding) and leveraging and crowding in private financing. An overview of EU funding sources which should be available to Croatia during the forthcoming multiannual financing

²² The Commission will adopt in November 2020 a European strategy on Offshore Renewable Energy, which will provide a vision and a series of policy initiatives for steering up to 2050 a massive, cost-effective and sustainable scale up of offshore renewable energies and related value-chains in the whole EU.

period (2021-2027), and EU funding addressed to all Member States and companies, is provided in tables 1 and 2 of annex I. For the forthcoming period, the European Council has committed to the mainstreaming of climate action into all EU programmes and instruments and to an overall target of at least 30% of EU funding to support climate objectives. At the same time, EU expenditure should be consistent with the Paris Agreement and the ‘do no harm’ principle of the European Green Deal. At the EU level, funding will be available for Croatia from the Innovation Fund and the Modernisation Fund too, based on revenues from the auctioning of allowances under the EU Emissions Trading System, as well.

Link to the recovery from the COVID-19 crisis

The vast majority of Member States’ final national energy and climate plans were drafted before the COVID-19 crisis, and the present Staff Working Document assesses Croatia’s plan in that context. Nevertheless, the implementation of Croatia’s final integrated NECP will need to fully take into account the context of the post-COVID-19 recovery.

In the context of the Recovery and Resilience Facility, which is expected to be operational on 1 January 2021, the final plan constitutes a strong basis for Croatia to **design climate and energy-related aspects of its national recovery and resilience plan**, and to deliver on broader European Green Deal objectives.

In particular, **mature investment projects outlined in the plan, as well as key enabling reforms that address inter alia, investment–barriers, should be frontloaded as much as possible**. The link between investments and reforms is of particular relevance for the national recovery and resilience plans, to ensure a recovery in the short to medium term and strengthening resilience in the longer term. In particular, Member States’ recovery and resilience plans should effectively address the policy challenges set out in the country-specific recommendations adopted by the Council.

In addition, **the Commission strongly encourages Member States to include in their recovery and resilience plans investment and reforms in a number of ‘flagship’ areas²³**. In particular, the ‘Power up’, ‘Renovate’ and ‘Recharge and refuel’ flagships are directly related to energy and climate action and to the final national energy and climate plans. Investments and measures under the ‘Reskill and upskill’ flagship, in particular as regards green technologies, are also essential to foster the climate and energy transition in all Member States.

In turn, the Recovery and Resilience Facility will provide opportunities to accelerate Croatia’s green transition while contributing to economic recovery. In order to follow the commitment of the European Council to achieve a climate mainstreaming target of 30% for both the multiannual framework and Next Generation EU, **at least 37% of expenditure in Croatia’s recovery and resilience plan will have to be related to climate**. Reforms and investments should effectively address the policy challenges set out in the country-specific recommendations of the European Semester, and will have to respect the principle of ‘do no harm’.

Based on Croatia’s final NECP, and the investment and reform priorities identified for Croatia in the European Semester, **the Commission services invite Croatia to consider, while developing**

²³ Cf. Annual Sustainable Growth Strategy 2021 (COM(2020) 575 final), pp. 9-12.

its national recovery and resilience plan, the following climate and energy-related investment and reform measures:

- Measures supporting investments in renewables, in particular through a stable legislative framework including a functioning and competitive electricity market;
- Measures to support sustainable transport including through reforms to develop sustainable urban and inter-urban mobility and investments to promote a modal shift from road to rail;
- Measures supporting investments in energy efficiency, in particular building renovation with focus on schools, hospitals and social housing, targeting households at risk of energy poverty.

The above mentioned measures are indicative in nature and not meant to be exhaustive. They aim to orient reflections in the development of the national recovery and resilience plan. They do not prejudge the position of the Commission on the actions to be proposed. This position will, inter alia, need to comply with the agreed legislative text on the Recovery and Resilience Facility.

**ANNEX I: POTENTIAL FUNDING FROM EU SOURCES
TO CROATIA, 2021-2027**

Table 1: EU funds available, 2021-2027: commitments, EUR billion

Programme	Amount	Comments
Cohesion policy funds (ERDF, ESF+, Cohesion Fund)	8.7	In current prices. Includes funding for European territorial cooperation (ETC). Does not include amounts transferred to the Connecting Europe Facility.
Common agricultural policy – European Agricultural Fund for Rural Development, and direct payments from the European Agricultural Guarantee Fund.	4.7	In current prices. Commitments under the multi-annual financial framework.
Recovery and Resilience Facility	6.0	In 2018 prices. Indicative grants envelope, sum of 2021-2022 and estimated 2023 commitments. Based on the Commission’s summer 2020 GDP forecasts.
Just Transition Fund	0.2	In 2018 prices. Commitments both under the multi-annual financial framework (MFF) and Next Generation EU.
Modernisation Fund	0.2	Approximation: 7/10 of the allocations of ETS allowances to provide revenue to the Modernisation Fund tentatively allocated to Member States for 2021-2030 and assuming a carbon price of EUR 20 per tonne.
ETS auction revenue	0.5	Indicative: average of actual 2018 and 2019 auction revenue, multiplied by seven. The amounts in 2021 to 2027 will depend on the quantity and price of auctioned allowances.

Table 2: EU funds available to all Member States, 2021-2027, EUR billion

Programme	Amount	Comments
Horizon Europe	91.0	In current prices. Includes Next Generation EU credits.
InvestEU	9.1	In current prices. Commitments both under the multi-annual financial framework (MFF) and Next Generation EU. Includes the InvestEU fund (budgetary guarantee to public and private investment) and the advisory hub (technical advice). Does not consider appropriations available to beneficiaries through implementing partners, such as the European Investment Bank.
Connecting Europe Facility <ul style="list-style-type: none"> • Transport • Energy 	24.1 5.8	In current prices. The commitment for transport includes the contribution transferred from the Cohesion Fund. Excludes Connecting Europe Facility Military Mobility funding for dual use infrastructure.
Recovery and Resilience Facility	360.0	In 2018 prices. Non-allocated commitments for loans. Loans for each Member State will not exceed 6.8% of its gross national income.
Technical Support Instrument	0.9	In current prices.
Programme for Environment and Climate Action (LIFE)	5.4	In current prices.
European Agricultural Fund for Rural Development	8.2	In current prices. Commitments under Next Generation EU.
Innovation Fund	7.0	Approximation: 7/10 of the allocations of ETS allowances to provide revenue to the Innovation Fund for 2021-2030 and assuming a carbon price of EUR 20 per tonne.

Note to both tables

The figures provided by programmes under the EU budget include both the proposals under the forthcoming multiannual financial framework, and the reinforcement of these under the Next Generation EU instrument outside the EU budget, unless indicated differently.

The figures quoted in this document are based on the conclusions of the European Council of 17-21 July 2020. They however do not prejudice the outcome of the ongoing discussions between the European Parliament and the Council on the elements of the recovery package, such as the Multiannual Financial Framework, the sectoral programmes, their structure and budgetary envelopes, which will be concluded in accordance with their respective adoption procedure.

For most of the above funds, support to the climate and energy transition is one objective among others. However, for the forthcoming period, the European Council has committed to the mainstreaming of climate action into all EU programmes and instruments and to an overall target of at least 30% of EU funding to support climate objectives. EU expenditure should also be consistent with the Paris Agreement and the ‘do no harm’ principle of the European Green Deal.

Some of the programmes listed in Table 2 provide funding through open calls to companies, not public administrations.

ANNEX II – DETAILED ASSESSMENT OF HOW COMMISSION RECOMMENDATIONS HAVE BEEN ADDRESSED

Recommendations		Assessment	
Decarbonisation - GHG	No recommendation	n.a.	-
Decarbonisation - renewables	<p>Underpin the welcome level of ambition of a 36.4% renewable energy share for 2030 as Croatia's contribution to the EU's 2030 target for renewable energy with detailed and quantified policies and measures that are in line with the obligations laid down in Directive (EU) 2018/2001 of the European Parliament and Council, to enable a timely and cost-effective achievement of this contribution.</p> <p>Increase the level of ambition of renewables in the heating and cooling sector to meet the indicative target included in Article 23 of Directive (EU) 2018/2001.</p> <p>Increase the level of ambition to meet the transport target in Article 25 of Directive (EU) 2018/2001.</p>	<p>Not addressed</p> <p>Not addressed</p> <p>Partially addressed</p>	<p>Despite Croatia's assurances in its presentation of its final NECP and in its response to the Commission recommendations that 'more detailed policies and measures have been developed' and that 'additional measures promoting renewable self-consumption and renewable energy communities have been introduced', the final NECP does not appear to be providing either more detailed policies and measures or evidence that additional measures promoting the latter have been introduced.</p> <p>As explained above, Croatia has made it clear that it does not intend to increase its shares of renewables in heating in line with requirements of the heating and cooling indicative target.</p> <p>Further information has been added, but the level of ambition has not been increased; the overall level of policy description remains generic and the actual impact of several measures is not clearly described.</p> <p>As per the draft NECP, Croatia aims to reach a 13.2% share of renewables in the transport sector by 2030, mainly from biofuels, falling short of the 14% target for that sector. Nor does the final NECP heed the recommendation to address the applicable multipliers and the sub-target for advanced biofuels, in accordance with Articles 25-27 of the Directive. This makes it difficult to assess if the 14% renewables target for transport has been met.</p> <p>In the final NECP, Croatia does however commit to transposing its obligations under the Renewable Energy Directive (adopted in December 2018), and acknowledges that it will need to achieve an ambitious target for renewables in the transport sector by 2030 (specifically, by stimulating the use of renewable electricity in the sector).</p>

			<p>Furthermore, Croatia states that, to ensure that the expected increase in electricity demand above the current baseline in the transport sector is ensured through the use of additional renewable energy production capacities, the EU framework for the additional renewable energy production will be transposed into the Croatian regulatory framework.</p> <p>Regarding the 3.5% advanced fuels in transport target of the Directive, Croatia explains that it will analyse the feasibility of meeting that target using domestic raw materials and developing domestic technological capacity. As part of the regulatory framework it is creating, Croatia will establish financial mechanisms to support the development and use of the favourable options identified in the analysis.</p>
Energy efficiency	<p>Increase its ambition towards reducing both final and primary energy consumption in view of the need to increase the level of efforts to reach the Union's 2030 energy efficiency target.</p> <p>Support this with policies and measures that would deliver additional energy savings by 2030. Underpin proposed policies and measures by an impact assessment estimating the expected savings and provide a realistic timeframe of implementation of the measures provided for.</p>	Not addressed	<p>Croatia maintained its level of ambition, which is assessed as low compared to the EU level of efforts.</p>
Energy security	No recommendation	n.a.	-
Internal energy market	<p>Define forward-looking objectives and measurable targets concerning market integration, in particular measures to develop liquid and competitive wholesale and retail markets, by fostering competition within the country and progressing towards fully market based prices and by eliminating barriers to cross-border trade.</p>	Partially addressed	<p>Further information has been added, underpinned by a scenario pathway analysis. But the overall contribution of energy efficiency to transport decarbonisation is not specified, and the status and impact of different measures is difficult to assess due to lack of detail in description.</p> <p>On buildings, the information in the NECP is much improved. The long-term renovation strategy has not been submitted yet.</p> <p>The final plan outlines Croatia's intention for further market integration with neighbouring countries by linking to the electricity day-ahead market. The plan still lacks a qualitative and quantitative assessment of the remaining aspects and measurable targets needed both for a liquid and competitive market in electricity and gas and to address any regulatory issues.</p>

<p>Research innovation and competitiveness</p>	<p>Further elaborate national objectives and funding targets in research, innovation and competitiveness, specifically related to the Energy Union, to be achieved between now and 2030, so that they are readily measurable and fit for purpose to support the implementation of targets in the other dimensions of the integrated national energy and climate plan. Underpin such objectives with specific and adequate policies and measures, including those to be developed in cooperation with other Member States, such as the Strategic Energy Technology Plan.</p>	<p>Partially addressed</p>	<p>The plan identifies areas where R&I efforts will be concentrated. However there are no defined national targets for financing public and private research and innovation related to the Energy Union, nor any supporting programmes and policies.</p> <p>As regards competitiveness, the emphasis is on the activities of the National Competitiveness Council, which acts as an advisory body in different priority areas. However, Croatia currently has no defined national goals for competitiveness related to the Energy Union. Priorities and specific topics are defined for the low-carbon technologies sector, but no measurable objectives are mentioned.</p> <p>Cooperation with the SET plan is mentioned but the link between European and national efforts has yet to be developed.</p>
<p>Investments and funding sources</p>	<p>Extend its analysis of investment costs and sources, including appropriate financing at national, regional and Union level, which is currently provided for some transport and energy efficiency measures, to a general overview of investment needs to modernise its economy by reaching its energy and climate objectives.</p>	<p>Partially addressed</p>	<p>An overview of investment needs is included in the strategy, but it would benefit from more detail.</p> <p>Croatia has indicated the financing sources for most of its planned investment under each Energy Union heading in section 3. The sources for Projects of Common Interest (energy security dimension) are only partially presented. For the remaining four dimensions they are as follows:</p> <ul style="list-style-type: none"> • decarbonisation (ETS allowances, EU grants, quota revenues, national funding, loans, EIB loans, European Clean Mobility Fund, CEF); • energy efficiency (EU grants, EIB loans, ECSC schemes, national funding, financial instruments); • internal energy market (CEF); • research (national funding, EU grants, quota revenues, EIB loans, direct EU funding instruments i.e. Horizon Europe, CEF).
	<p>Consider also the cost-effective generation of transfers to other Member States under Regulation (EU) 2018/842 of the European Parliament and Council as funding source.</p>	<p>Partially addressed</p>	<p>This is indicated as a funding source through Croatia's Green Industry Financing Scheme.</p>

Regional cooperation	<p>Continue regional cooperation efforts on the national energy and climate plan in the context of the Central and South-Eastern Europe Energy Connectivity (CESEC) High-Level Group. These could address notably issues such as further integration in the internal energy market, assessing system adequacy, just transition, decarbonisation and renewables deployment.</p>	Largely addressed	<p>Croatia mentions a willingness to further cooperate in a number of areas mentioned in this recommendation. On the internal energy market, it highlights the need to <i>'further strengthen the cross-border and regional cooperation between electricity transmission system operators in order to ensure the quality and security of the system's operation'</i>.</p> <p>A section on cooperation on renewables was added, compared to the draft plan, and explores in particular joint development of renewables projects, analysis of statistical transfer opportunities and cooperation in the context of the Clean Energy Initiative for EU Islands.</p> <p>For decarbonisation and climate change, a new section was also added.</p> <p>In its final plan, Croatia added a chapter on regional cooperation on decarbonisation and greenhouse emissions removal (3.1.1 ii).</p> <p>During a regional workshop in 2019, Slovenia, Italy, Austria, Hungary and Croatia discussed the joint development of parts of their national climate change adaptation strategies (e.g. for the Adriatic region). Issues included waterway and soil management and carbon capture and storage.</p> <p>However no explicit reference was made to cooperation as part of the Adriatic and Ionian Macro-region.</p>
Energy subsidies	<p>List all energy subsidies.</p> <p>List in particular fossil fuels subsidies.</p>	Largely addressed	<p>A chapter on both renewable and fossil fuel subsidies has been included in the final plan. Quantitative figures are not included.</p> <p>A chapter on fossil fuel subsidies is included in the final plan. However, it does not give details of the amounts of these subsidies (although figures on the financial support provided for fossil fuels have been estimated in recent Commission analyses on energy subsidies).</p> <p>No actions or plans to phase out energy subsidies have been included. It is stated that no phase-out is planned for the exemptions from excise duties for transport and agriculture and that energy subsidies aimed at increasing energy efficiency and the use of renewable sources will continue in future.</p>
Air quality	<p>Complement the analysis of the interactions with air quality and air emissions policy with more quantitative information, at least including the required information about the projected</p>	Partially addressed	<p>The Final NECP mentions very briefly the impacts of its measures on key air pollutants but does not explain the methodology used or which measures specifically are expected to provide clean air benefits</p>

Just transition and energy poverty	air pollutants emissions under the planned policies and measures.		<p>compared to others.</p> <p>This raises concerns, especially considering the projected continued reliance on bioenergy for heating and the related air pollutant emissions.</p>
	Integrate just and fair transition aspects better, notably by providing more details on social, employment and skills impacts of planned objectives, and policies and measures.	Partially addressed	<p>The final NECP provides relevant information and figures on employment. But this part still lacks detail, especially regarding the planned policies and measures and their impact. No specific schemes are mentioned to mitigate the effects of the low-carbon transition on the economy, labour market and socio-economic conditions of households.</p> <p>No details are given about the social, employment and skills impacts of planned objectives, policies and measures. The assessment of these aspects is not presented in a clear and comprehensive manner. A distributional impact assessment on households' income (including impact on housing costs) of the planned transition measures is not provided.</p>
	Further develop the approach to addressing energy poverty issues, including by providing an assessment of the number and type of households in energy poverty to allow assessing the need for an indicative objective for reducing energy poverty as required by the Regulation (EU) 2018/1999.	Partially addressed	<p>The Croatian NECP provides a good description of the existing situation but no comprehensive analysis of the challenge (including the number of energy poor), nor any objectives for reducing energy poverty.</p> <p>It points to the development of a future Programme for Elimination of Energy Poverty that should include action to consult energy-poor citizens, monitor energy poverty and increase energy efficiency. But no direct financial support scheme is mentioned.</p>