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Assessment of the draft updated National Energy and Climate Plan of Bulgaria

Accompanying the document

COMMISSION RECOMMENDATION

**on the draft updated integrated national energy and climate plan of Bulgaria covering
the period 2021-2030**

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SUMMARY

Overview of key objectives, targets and contributions in the draft updated NECP


The European Green Deal, the fast-evolving geopolitical context and the energy crisis have led the EU and its Member States to accelerate the energy transition, and to set more ambitious energy and climate objectives, with a strong focus on the diversification of energy supplies. These developments are reflected in the legislative framework adopted under the ‘Fit for 55’ package and the REPowerEU Plan.

Bulgaria’s draft updated national energy and climate plan (‘the draft updated NECP’ or ‘the plan’), submitted on 20 February 2024, partially takes into account this new geopolitical and legislative framework.

Table 1: Summary of key objectives, targets and contributions of Bulgaria’s draft updated NECP

		2020	Progress based on latest available data	2030 national targets and contributions	Assessment of 2030 ambition level
	Binding target for greenhouse gas (GHG) emissions compared to 2005 under the Effort Sharing Regulation (ESR) (%)		2021: +12.1% 2022: +1.9% ¹	-10%	NECPR: +2.1%
	Binding target for net GHG removals under the Regulation on Land Use, Land Use Change and Forestry (LULUCF)		Reported net removals of -27 470 kt CO ₂ eq. in 2021, and reported approximated net removals of -31 690 kt CO ₂ eq. in 2022	-1 163 kt CO ₂ eq. (additional removal target) -9 718 kt CO ₂ eq. (total net removals)	Insufficient ambition based on projections
	National target/contribution for renewable energy: Share of energy from renewable sources in gross final consumption of energy (%)	23.3% (SHARES) 16% (target)	2022: 19.10%	34.1%	Bulgaria’s contribution of 34.1% is slightly above the 33% required according to the formula set out in Annex II of the Governance Regulation
	National contribution for energy efficiency:				
	Primary energy consumption (Mtoe)	16.90 Mtoe	2021:18.58 Mtoe	12.40 Mtoe (-11.6%)	Bulgaria’s primary energy consumption

¹ The ESR emissions for 2021 are based on final inventory data and for 2022 on approximated inventory data. However, the final ESR emissions for 2021 and 2022 will only be established in 2027 after a comprehensive review.

					contribution is 12.40 Mtoe. EED recast Annex I formula based on updated EU reference scenario 2020 result: 14.20 Mtoe (13.71 Mtoe based on EU reference scenario 2020 ²)
	Final energy consumption (Mtoe)	8.60 Mtoe	2021: 10.17 Mtoe	8.42 Mtoe (-10.7%)	Bulgaria's final energy consumption contribution is 8.42 ktce. EED recast Annex I formula based on updated EU reference scenario 2020 results: 8.25 Mtoe (8.85 Mtoe based on EU Reference Scenario 2020)
	Level of electricity interconnectivity (%)	11.3%	16.8%	15% ³	

Source: Eurostat: Bulgaria's draft updated national energy and climate plan

1.1 Summary of the main observations⁴

Bulgaria submitted its draft updated NECP more than seven months after the deadline of 30 June 2023⁵. Therefore, the European Commission had limited time to draft its assessment in this Staff Working Document, in order to enable Bulgaria to submit its draft updated NECP by the legal deadline of 30 June 2024.

² Detailed calculations for Member States' indicative national contributions to the Union's energy efficiency targets, in accordance with Article 4 of the Directive (EU) 2023/1791 on energy efficiency (EED recast)

³ Calculated by the European Commission based on the ETNSO-E data (Winter Outlook 2023-2024). The 2030 level represents the general interconnectivity target of 15%. The level of ambition cannot be assessed because the actual 2030 interconnectivity levels will depend on the implementation of the planned interconnectors and on changes in the generation capacity. The 2020 figure also covers interconnectors with the neighbouring countries outside the EU.

⁴ 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.

⁵ Article 14(1) of Regulation (EU) 2018/1999 on the Governance of the Energy Union and Climate Action OJ L 328, 21.12.2018.

The draft updated NECP of Bulgaria refers to the revised energy and climate targets recently agreed under the **‘Fit for 55’ package** and the **REPowerEU Plan**. However, it does not sufficiently elaborate on how these targets will be effectively reached.

Regarding the reduction of greenhouse gas emissions under the Effort Sharing Regulation (ESR), the plan does not provide evidence and GHG emission projections to demonstrate that Bulgaria is on track to meet its national greenhouse gas target of -10% in 2030 compared to 2005 levels. According to Bulgaria’s projections with additional measures (WAM), submitted in March 2023, there is a gap of over 12.1 percentage points, highlighting the need for more ambitious climate action.

On the regulation on **Land Use, Land Use Change and Forestry (LULUCF)**⁶, the draft updated plan does not provide evidence and emission projections to demonstrate that Bulgaria is on track to meet its national removal target. The draft does not clearly set out a pathway to increase the land sector’s contribution to the EU’s overall enhanced climate target. Despite identifying only vaguely some relevant policies and measures, notably different plans related to forests, the NECP states that a reduction in CO₂ removals is expected. The draft does not provide a detailed description of the proposed measures, a clear implementation timeframe and a quantification of the impacts of specific policies and measures. It also lacks information on the status and progress in ensuring higher tier levels and geographically explicit datasets needed to ensure the robustness of net removal estimates.

On carbon capture, use and storage (CCUS), the plan does not identify any annual emissions that could be captured by 2030 from ETS and non-ETS sources, or contain any concrete estimation of geological CO₂ storage capacity. The plan does not envisage the deployment of any dedicated CO₂ transport capacities.

The draft updated NECP does not provide information reflecting **progress towards international commitments under the Paris Agreement**. Bulgaria does not commit to phasing out coal use for power generation. The draft updated NECP states that Bulgaria does not provide any fossil fuels subsidies.

On **adaptation to climate change**, the draft updated NECP does not contain adequate analysis of the relevant climate vulnerabilities and risks to achieving the national objectives, targets and contributions and the policies and measures in the individual dimensions of the Energy Union. . The link to the specific Energy Union objectives and policies, which adaptation policies and measures should support, is not specified and quantified. Adaptation policies and measures to support Bulgaria’s achievement of national objectives, targets and contributions under the Energy Union are not properly described in terms of their scope, timing and expected impacts.

For renewable energy, the draft updated NECP puts forward a contribution to the overall EU target of 34.1% of the country’s gross final energy consumption by 2030. This is slightly above the share of 33% resulting from the formula in Annex II to Regulation (EU) 2018/1999 on the Governance Regulation of the Energy Union and

⁶ 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 (OJ L 156, 19.6.2018).

Climate Action (the ‘Governance Regulation’). The draft plan includes trajectories for renewables in the electricity, transport and heating and cooling sectors. However, the draft updated plan does not contain trajectories for renewable fuels of non-biological origin (RFNBOs). On the other hand, Bulgaria’s plan provides, for the most part, a comprehensive list of measures it intends to adopt to support the deployment of renewable energy in line with Directive (EU) 2018/2001 on the promotion of energy from renewable sources, as amended by Directive (EU) 2023/2413 (the ‘revised RED II’).

On **energy efficiency**, the Bulgarian draft updated NECP is a **quite detailed plan**. It sets ambitious 2030 energy efficiency contributions, lower than those set in the final 2020 NECP, and even lower than the results of the formula in Annex I to Directive (EU) 2023/1791 on energy efficiency and amending Regulation (EU) 2023/955 (the ‘EED recast’) based on the EU reference scenario 2020. However, the ambition of the targets is not reflected in the planned measures needed to achieve them. The new requirements of the EED recast have been taken into account for the energy savings obligation, but not for other obligations such as those of the public sector.

On buildings, considering the building sector’s high energy potential, increased ambition as compared to the 2020 long-term renovation strategy (LTRS) would be expected. However, Bulgaria’s draft updated NECP does not increase the ambition of the 2020 LTRS but only recalls its key elements, targets and milestones. The draft updated NECP includes various measures targeting improved energy performance in the building sector but their impacts are only partially presented. The energy renovation of single-family buildings is not explicitly addressed, even though these account for a significant part of the direct use of fossil fuels in residential buildings and are consequently a big decarbonisation challenge.

On **energy security**, the plan overall displays good intentions, but provides few details on specific measures. In the **gas sector**, the draft updated plan contains positive elements, such as increasing underground storage and interconnection capacities. Another positive feature is that gas consumption is expected to decrease by 17% by 2040. However, the plan lacks detail about concrete measures and does not assess the compatibility of domestic extraction projects with the 2050 carbon neutrality objective. In the **oil sector**, the plan makes provision for a 41% decrease in liquid fuels consumption, but the prediction lacks clarity. The plan does not assess whether oil infrastructure is adequate in the long run in the context of this expected significant decrease in liquid fuels consumption. In the **electricity sector**, the plan broadly addresses challenges related to generation adequacy, grid developments and integration of renewable sources. However, an overall strategy and concrete objectives for flexibility and storage installations are not provided, with only partial information provided.

On the internal energy market, Bulgaria’s draft updated NECP notes a series of policy objectives and measures. These relate to key infrastructure developments to meet several objectives of the five Energy Union dimensions tabled in the plan. However, the document lacks clear explanation of the steps intended to complete the internal energy market and achieve its full liberalisation, particularly in the gas sector. The description of the measures

to develop demand response is also very lacking while the description of the measure on the balancing market seems to contradict elements of the Recovery and resilience Plan.

Bulgaria's draft updated NECP also refers to the liberalisation of the **retail market**. This is to be achieved by introducing progressive deregulation of retail prices and full liberalisation of the retail segment in 2026.

On energy poverty, the draft updated NECP provides an overview of how the provisions on energy poverty and vulnerable consumers are being implemented. Bulgaria has adopted an act which sets out the definition of energy poverty and vulnerable consumers, which also requires assessment of the number of households in this category in the framework of a dedicated information system. In addition, vulnerable households currently receive assistance during the heating season under a targeted heating aid scheme. However, the plan does not contain a target for reducing energy poverty. Nor does it indicate concrete timelines for when the policies will be implemented.

The research, innovation, competitiveness, and skills dimension of Bulgaria's draft updated NECP contains mostly qualitative targets and measures to support research, innovation and investments in clean energy technologies and the digitalisation of the energy sector. It describes the main R&I support programme, the innovation strategy for smart specialisation (2021-2027), but does not contain an estimated breakdown of R&I investments specific to the energy sector for 2030 and 2050. An objective for private R&I spending is mentioned. On competitiveness, the plan does not set concrete targets or provide sufficient information on measures and investments needed to support manufacturing capacities for net-zero technologies and to reinforce supply chain resilience. The plan refers to the issue of skills shortage for the clean energy transition, but without providing further detail. Digitalisation and modernisation of the electricity grid are established as a priority, as well as clean hydrogen production with funding from the Recovery and Resilience Plan.

The just transition is only partially addressed in the draft updated NECP. The plan mentions on several occasions that the phase-out of fossil fuel in regions has a social dimension. However, there is no clear analysis of the impacts of the climate and energy transition on employment and skills. Concrete policies and measures to achieve the goals of a just transition are not yet included in the plan. Nor does it provide sufficient information for the preparation of the Social Climate Plan and how the consistency between the two plans would be ensured.

In addition, there are inconsistencies between the transition process outlined in the three adopted Territorial Just Transition Plans (TJTPs) for Stara Zagora, Kyustendil and Pernik and the draft NECP. This is valid in particular for the intermediary transition steps by 2026, 2030, 2035 and the commitment that the estimates of coal capacity at national and regional level, including coal phase-out by 2038 at the latest, will support the updated NECP. Finally, the list of resources provided in the draft plan does not comprehensively cover the resources dedicated to supporting a just transition.

On its strategic alignment with other planning tools, the draft updated NECP covers only partially the implementation of the measures in Bulgaria's recovery and resilience plan (RRP). The measures in the draft updated NECP build on the 2023 European Semester country-specific recommendations to reduce dependence on fossil fuels, strengthen interconnections and accelerate building renovation.

The investment needs are not quantified, except for few specific measures. The draft updated NECP does not provide details on the investment needs and funding sources for the various specific policies and measures proposed. It is therefore not possible to identify potential funding gaps .

The draft updated NECP does not include a comprehensive **quantitative analysis**, covering all five dimensions of the Energy Union. It only includes an incomplete scenario *with existing measures* ('WEM'). The methodologies used for the projections and impact assessment of policies and measures are not explained. Furthermore, the draft updated NECP does not include a macro-economic assessment.

2 PREPARATION AND SUBMISSION OF THE DRAFT UPDATED NECP

2.1 Process and structure

The draft updated NECP was submitted on 20 February 2024, more than 7 months after the legal deadline. While the plan is still incomplete, it follows the structure provided in Annex I to the Governance Regulation and covers all five dimensions of the Energy Union. However, it does not always spell out clearly Bulgaria's objectives, targets or contributions for the different dimensions. In addition, it does not always support the objectives, targets or contributions with sound policies and measures. In particular, the analytical basis and impact assessment of policies and measures are still incomplete.

Bulgaria's draft updated NECP describes only briefly and partially the national context in which the updated plan was prepared. The plan provides a good overview of the policy priorities and of the most relevant measures in place but lacks a description of the environmental, social and economic conditions in which the climate and energy transition is taking place.

The plan describes how the different ministries have contributed to preparing the updated NECP, and which sectoral strategies have been integrated. This confirms a 'whole-of-government' approach to preparing the plan.

The role of local authorities and municipalities is well embedded in different contexts in the Bulgarian draft updated NECP, mainly in relation to climate mitigation (e.g. renewables, district heating, energy efficiency, waste management, investments deployment support, etc.). This is also mentioned with respect to climate adaptation. However, their involvement in preparing the plan is not reflected. Moreover, approaches to support multi-level governance, particularly in the plan's preparation, are not clearly explained in the draft plan. There is no mention of initiatives such as the Covenant of Mayors for Climate and Energy (which involves more than 20 cities and local authorities, covering about 40% of the country's population) or the 100 Climate-neutral and Smart Cities Mission (involving Sofia and Gabrovo).

2.2 Public consultation

The draft updated NECP provides little detail on the process followed to ensure early public participation in the decision-making process. The draft updated NECP was published online at the end of 2023 for public consultation. No information is provided on the interest groups identified and encouraged to take part.

The draft updated NECP does not provide information on the timeframe for the public to prepare and participate effectively, nor is it clear on the type and quality of information provided to participants. The plan does not contain a summary of the public's views and does not explain how the opinions expressed were considered and addressed, or why they were not taken on board. It is unclear if a Strategic Environmental Assessment has been carried out, or if there are plans to do so.

2.3 Regional consultations for preparing the draft updated NECP

A number of regional initiatives are mentioned in the context of Bulgaria's collaboration with neighbouring countries, such as through the Central and South Eastern Europe Energy Connectivity (CESEC) or the Black Sea Economic Cooperation Organisation. However, there is no further explanation of how these regional initiatives were instrumental in preparing the draft updated NECP. Additional details on regional consultations and specific cooperative frameworks/actions were only provided on specific cross-border electricity, gas and hydrogen projects involving Bulgaria and other countries in South-East Europe.

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

3.1 Decarbonisation dimension

3.1.1 Greenhouse gas emissions, removals and storage

The draft updated NECP recognises the increased climate targets included in the Effort Sharing Regulation (ESR) and the LULUCF Regulation, as part of the 'Fit for 55' legislative package, but embeds them only partially.

The draft updated NECP confirms Bulgaria's commitment to achieving climate neutrality by 2050. The plan includes neither WEM ('with existing measures') nor WAM ('with additional measures') projections. Despite some gaps in achieving the 2030 national targets, overall, based on the available information, Bulgaria's progress is likely to be consistent with the achievement of the EU climate-neutrality objective in 2050.

The draft updated NECP does not provide information on the expected emissions under the ESR. Hence, it is not possible to assess whether the plan's policies and measures collectively suffice to reach the country's obligation for the effort sharing sectors. The ESR sets **Bulgaria's** 2030 emissions reduction target at -10% compared to 2005 levels. Based on the March 2023 projections submitted for the progress report (NECPR), Bulgaria's ESR emissions will be above this target in 2030, in both the WEM and WAM scenarios, highlighting the need for more ambitious climate action in the sectors involved. In the NECPR WAM scenario, Bulgaria falls short of the target by 12.1 percentage points. In 2021, Bulgaria's ESR emissions exceeded the annual emission allocation (AEA) by **2.08** Mt CO₂ eq.

Member States have **flexibilities under the ESR** to comply with their targets. No specific use of ESR flexibilities is mentioned by Bulgaria. To assess whether Member States comply, the use of saved AEAs from previous years is taken into account.

Table 2: ESR target and projections in Bulgaria's draft updated NECP

ESR target and projections ⁷					
	2030 target*	2021 performance (inventory data) *	2022 performance (approximated data) *	2030 WEM projection*	2030 WAM projection*
Bulgaria	-10%	+12.1%	+1.9%	-	-
EU	-40%	-14.5%	-16.9%	-27%	-32%

*Compared with the 2005 emissions as set out in Annex I to Commission Implementing Decision (EU) 2020/2126.

The draft updated NECP does not fully reflect the increased ambition of the new LULUCF Regulation and the 2030 national target requiring Bulgaria to deliver an additional -1 163 kt CO₂ eq. of net removals to reach a total value of - 9 718 kt CO₂ eq. of net removals in 2030. The draft updated NECP does not include projections on LULUCF emissions or removal, but states that a reduction in net removals is expected, due to the decline in forest growth and the rising age of forests, accompanied by a slight increase of emissions from cropland. However, based on the information provided, it is impossible to assess whether Bulgaria will achieve its target. Moreover, Bulgaria’s plan does not set a clear pathway to increasing the land sector’s contribution to the EU’s overall enhanced climate target.

The draft updated NECP only briefly mentions the policies and measures to support the LULUCF sector. The most significant of these are the national strategy for the development of the forestry sector and the strategic plan for the development of forests, aiming to improve forest management and use, and increase the climate resilience of forests, including preventing forest fires. The draft plan notes that the latest national strategy up to 2030 is awaiting ministerial approval. However, it does not systematically provide information on specific measures, the timeframe for implementation, the source of funding and, most importantly, quantification of the impacts. Bulgaria’s draft updated NECP does not provide information on the status of – and progress to be made in – ensuring improvements to higher-tier levels/geographically explicit datasets for monitoring, reporting and verification, in line with Regulation (EU) 2018/1999. Overall, the draft updated NECP does not clearly present how its policies and measures for Bulgaria’s LULUCF sector will contribute to the long-term transition to climate neutrality by 2050.

Bulgaria’s draft updated NECP briefly describes the Strategy and action plan for the transition to a circular economy 2022-2027, focusing mainly on waste management. It mentions different funding instruments to support the transition towards a circular economy, but it does not explicitly recognise the role of the circular economy for climate-change mitigation, adaptation and supply of critical raw materials. The updated NECP does not present circular economy policies and measures addressing upstream strategies in the life cycle of products, including sustainable and circular design, consumer behaviour, or circular business models. Moreover, the impact of the circular economy does not seem to be quantified or integrated in the plan’s analytical basis.

The updated NECP contains policies, objectives, targets, and measures related to

⁷ The comparison between the ESR target and emission projections does not take into account the flexibilities available for Member States under the ESR to comply with their 2030 targets. The ESR emissions will be comprehensively reviewed in 2027 (for the years 2021-2025) and 2032 (for the years 2026-2030).

transport decarbonisation. The strongest focus is on further developing railway infrastructure along the TEN-T networks, considered as the most sustainable mode of transport. The updated NECP proposes specific plans. It also includes policies and measures for improved access to zero- and low-emission mobility, transport and vehicles such as accelerating the deployment of charging infrastructure for electric vehicles and promoting the demand for zero and low-emission vehicles.⁸

The plan also prioritise the development and expansion of inland waterway and maritime public transport ports for multimodal operations, modernisation and development of combined transport terminals and port facilities, and granting scheme for multimodal operators.

The plan includes measures to decarbonise urban mobility by increasing the share of public electric transport – rail, trolleybus, tram, metro (extension of Sofia metro), establishing low-emission zones (LEZ), supporting car-sharing schemes, and promoting bicycle and e-scooter sharing services. Bulgaria also plan to further develop Intelligent Transport Systems (ITS), which should contribute to reducing environmental pollution by controlling traffic and managing traffic volumes.

The plan refers to the provisions of the Alternative Fuels Infrastructure Regulation (AFIR) by announcing a national scheme to be launched in 2024, to comply with the targets for the deployment of recharging infrastructure for light and heavy-duty electric vehicles. This national scheme will also implement the provisions for public/maritime and inland waterway ports in the TEN-T. However no quantified measures or additional national targets are included.

According to EAFO (European Alternative Fuels Observatory) in 2023, around 1500 recharging points were deployed and almost 8000 electric vehicles were registered. Reaching 29,000 recharging points by 2030 as mandated by AFIR regulation, will require substantial additional many effort.

The draft updated NECP includes some policies to introduce hydrogen into transport, starting from urban bus transport. This will allow scaling up the zero emission fleet and the refuelling infrastructure, with a high percentage of regulated usability. Bulgaria plans also to apply hydrogen as a fuel in international freight transport and waterborne. However, concrete plans are not provided yet.

The draft updated NECP does not include measures for the production and deployment of sustainable aviation fuels (SAF) to contribute to the ReFuelEU Aviation Regulation, nor for the production of renewable and low-carbon fuels for the FuelEU Maritime Regulation.

The draft updated NECP refers only generically to the planned efforts to capture and store CO₂. It does not provide information on the CO₂ volumes to be captured by 2030, and does not identify the share of Bulgaria’s annual CO₂ emissions that can be captured from EU ETS emitters and from other sources. The plan sporadically mentions Carbon Capture and Storage (CCS), including in reference to the Net Zero Industry Act, stating

⁸ Incentive scheme for purchasing, favourable progressive taxation, tax credits for purchase and use, incentives for taxi companies and public carriers, scrapping schemes for old fossil fuels vehicles, awareness-raising campaigns, capacity building of stakeholders for the development of sustainable mobility

that permitting for CCS projects should be facilitated along the value chain. Consequently, the plan mentions that improved permitting procedures will be developed for CCS. On research, Bulgaria intends to prioritise direct air capture and further utilisation (under the ISIS 2021-2027 programme). Another reference states that infrastructure for carbon capture and storage systems could be funded via InvestEU.

The plan pays some attention to mitigating non-CO₂ emissions in different sectors. It presents measures on N₂O from agricultural soils, which is Bulgaria's top source of non-CO₂ emissions, as well as on methane from enteric fermentation and manure management in agriculture. Moreover, the plan contains measures on methane from solid waste in waste management, which is responsible for a third of Bulgaria's methane emissions. In addition, the plan refers to EU legislation on F-gases.

The plan does not provide any quantified projections of non-CO₂ emissions. This is important to understand whether the measures are sufficient to mitigate, for example, the rising trend of agricultural GHG emissions and the high rate of methane emissions in waste management.

Finally, the plan does not provide any information on fugitive methane emissions in energy, which are responsible for almost a fifth of Bulgaria's methane emissions.

The draft updated NECP does not include a properly developed analytical basis. The assessment of how policies and measures affect achievement of the GHG mitigation targets is only qualitative, and very succinct. Most of the policies and measures are not described in sufficient detail in terms of scope, likely impact and timing. Moreover, the plan includes neither WEM nor WAM scenarios for GHG emissions, making it impossible to assess if the policies and measures proposed will enable Bulgaria to reach the GHG emissions targets set in EU legislation.

The draft updated NECP reflects partial progress towards international commitments under the Paris Agreement. The plan refers on a few occasions to the need to phase out the use of solid fossil fuels, including in energy generation. However, it does not include a clear timeline. The plan states that Bulgaria relies heavily on lignite-fired electricity production, due to be phased out by the end of 2038, but projections on final energy consumption expect a reduction of only 88% in 2040 of energy produced from fossil fuels. Furthermore, the plan refers in general terms to the smooth phase-in of low-carbon energy while preserving the functioning of the energy system. The phasing-out of fossil fuel subsidies is not discussed in the draft updated NECP, which explains that Bulgaria does not provide energy subsidies for fossil fuels.

On 22 October 2022, Bulgaria submitted to the Commission its national long-term strategy. The strategy presents alternative scenarios, including a pathway for achieving climate neutrality by 2050, without defining a specific goal.

3.1.2 Adaptation

Bulgaria did not include adaptation goals in its initial NECP of 2019, and nor are **adaptation goals** included in the draft updated NECP. In the plan, Bulgaria repeats the previous information on the 2019 national adaptation strategy and the 2030 action plan. These contain two climate warming scenarios, information on vulnerabilities in the agricultural, energy, transport and energy-intensive industrial sectors, as well as actions in individual sectors, although described in rather general terms. Bulgaria does not identify in its draft updated NECP relevant climate vulnerabilities and risks that may threaten

achievement of national objectives, targets and contributions in the Energy Union dimensions. Furthermore, it does not specify policies and measures in place or envisaged (nature-based or otherwise) to address climate risks. Innovative approaches such as insurance policies or fiscal measures addressing a climate protection gap are not included in the draft updated NECP. The plan does not address investments aimed at minimising environmental impacts such as biodiversity loss

3.1.3 Renewable energy

The renewable-energy contribution proposed by Bulgaria on the share of renewable energy in the draft updated NECP is 34.1% of national gross final energy consumption in 2030. However, absolute values in terms of energy are not included in the draft updated NECP. This contribution is slightly above the minimum share of 33% resulting from the formula in Annex II to the Governance Regulation. The scenarios set out in the draft updated NECP are detailed and provide yearly overall renewable-energy contribution trajectories up to 2030, but do not include trajectories per technology, nor information beyond this period until 2040. The indicative trajectory to reach the 34.1% contribution in 2030 is well reasoned and includes specific reference points for 2022 (a renewables share of 19.2%), 2025 (a renewables share of 29.4%) and 2027 (a renewables share of 31.3%)⁹. The submitted reference point for 2022 is above the trajectory (18%) calculated in line with the EU 2030 renewable-energy target of 32%. The reference points for 2025 and 2027 are also above the trajectory (27% and 33% respectively) calculated in line with the increased EU 2030 renewable-energy target of 42.5%¹⁰.

Renewable electricity generation is projected to reach 42.2% of all electricity generated in 2030. This share is not broken down by technology, and the information on installed capacity is limited only to the total new installed capacity of up to 4 778 MW of solar and wind power. Projections for the share in electricity generated by other technologies such as bioenergy and geothermal are not included. The plan does not provide an **innovative target for renewable energy deployment.**

The use of renewable energy in the heating and cooling sector is projected to reach a share of 40.7% by 2025 and 45.5% by 2030. Bioenergy will remain the dominant renewable energy source in this sector; however, Bulgaria does not provide an indication on the total amount of energy,

The annual increases of renewables in the heating and cooling sector are set at 0.7% for 2021-2025 and 0.96% for 2026-2030, which is below the mandatory levels under the revised RED II (0.8% and 1.1%). The plan refers to the new requirements for increasing renewable energy in the heating and cooling sector and in district heating and cooling under the revised RED II; however, it does not confirm whether and how these requirements will be met. The draft updated NECP does not indicate the role of waste heat and renewable electricity and their impact on setting and achieving targets in the heating and cooling sector.

⁹ Reference points of 18% by 2022, 43% by 2025 and 65% by 2027, as provided for in Article 4(a)(2) of Regulation (EU) 2018/1999.

¹⁰ Given that the provisionally agreed RED was not yet in force by the deadline for submitting the draft NECPs, the value for 2022 has been compared to the trajectory values calculated on the basis of the 2030 EU renewable energy target of 32%. The reference points for 2025 and 2027 are compared to the trajectory calculated on the basis of the increased EU target of 42.5% in line with the revised RED.

The plan does not include an indicative increase of a share in renewables in **district heating and cooling**. Nor does it include indicative estimates for renewable energy use in **industry** and in **buildings** in 2030.

In the transport sector, the share of renewable energy is projected to reach 15.2% in 2030 in energy terms (RES-T). However, the plan states that it will be adjusted and increased in line with new target set out in the revised RED II. Bulgaria has not provided the equivalence of the target in GHG emissions reduction by 2030.

In addition to the planned direct electrification of transport, Bulgaria intends to further promote the use of advanced biofuels, quoting the targets for advanced biofuels and RFNBOs under the revised RED II. The main measures in the plan to achieve those targets are: (i) obligations on fuel and energy suppliers; and (ii) measures to increase energy efficiency in transport and increase renewable electricity use in road and rail. However, the plan does not describe these measures in detail.

Bulgaria's plan underlines the importance of the electrification of transport, especially for road and rail transport. It also includes measures and financial allocations on support for multimodal transport, rail transport and decarbonised urban transport.

Bulgaria's draft updated NECP refers to a support scheme to build 55 MW of electrolyzers that will produce 7 800 tonnes of **green hydrogen** per year, as provided for in the national Recovery and Resilience Plan. No further information is provided about planned capacities for hydrogen production or for industry demand.

The draft updated NECP does not list **international partnerships** between Bulgaria and future exporters of RFNBOs. It only refers to the Greece-Bulgaria hydrogen interconnection in the TEN-E priority corridor in Central Eastern and South Eastern Europe (HI East), which aims to build national hydrogen infrastructure in Greece and Bulgaria and link them with the ultimate objective of transporting hydrogen produced in Greece to other south-eastern and central-eastern Member States. However, the plan does not go beyond describing the planned infrastructure developments.

On **policies and measures**, Bulgaria intends to continue promoting deployment of renewable energy through the existing support schemes (e.g. continuation of already concluded contracts for tariffs with small-scale installations below 500 kW and for premiums with installations above 500 kW). Bulgaria does not intend to set up new support schemes for solar, wind or biomass installations as these will be developed purely on a market basis. Instead, it plans to adopt non-financial measures such as assessing barriers to self-consumption and energy communities, adopting legislation on offshore wind, and publishing guidance on procedures for building and reconstructing renewable energy installations. The implementation of investments provided for in the national Recovery and Resilience Plan is also included in the measures. Bulgaria will also promote guarantees of origin, by establishing and maintaining the Guarantees Of Origins ("GOOs") system domestically. The new regulation will also include the necessary conditions to issue GOOs for biogas and green hydrogen.

Bulgaria also refers to initiatives for regional cooperation with Romania and Greece to make use of offshore wind potential in the Black and Aegean seas. However, the draft plan does not address the offshore renewable development in maritime spatial plan and does not explain how marine environmental objectives will be taken into account.

The draft updated NECP includes measures to accelerate deployment of solar energy. This involves simplifying and accelerating permit-granting procedures and promoting uptake of solar thermal energy units for hot water and photovoltaic systems up to 10 kW, including electricity storage systems in households, which will contribute to the EU's solar energy strategy. Nevertheless, the plan does not present sufficient and well-described measures to promote **individual and collective self-consumption of solar energy and to promote renewable energy communities**.

Bulgaria has not indicated in the draft updated NECP whether it has in place a strategy on **energy system integration**. Nevertheless, some measures aimed at facilitating sector integration have been included, notably measures promoting demand response and energy storage. Bulgaria plans to promote the development of 350 MW local electricity storage facilities via dedicated support scheme financing under the RRF funding.

Measures for renewable heating and cooling set out in the draft updated NECP include a requirement to ensure a minimum share of at least 55% of renewable energy consumed in buildings, as well as requirements on integration of renewables at regional and local level when planning, building and upgrading urban infrastructure, transport and energy infrastructure. However, the measures do not provide any further detail. On the other hand, policies and measures to promote geothermal energy are well-described; these include: (i) simplifying permit-granting procedures; (ii) a new legal framework for prospecting, exploration and exploitation as well as for water use; (iii) priority connection to the heat transmission network; and (iv) priority purchase of the energy by the heat transmission company. However, Bulgaria did not provide any timeline on when the measures will be introduced.

Bulgaria also plans to put in place measures to specifically promote the uptake of renewables in **buildings**. This is to be achieved via connections to district heating networks and by installing solar thermal energy units and heat pumps. On district heating and cooling, the plan indicates that promoting and modernising district heating and cooling is a priority, one that is closely linked to energy efficiency. Bulgaria refers to promoting the use of biomass (with a conversion efficiency of at least 85% for residential and commercial buildings and 70% for industrial buildings) or geothermal as the main sources for renewable energy in district heating.

For industry, Bulgaria's draft updated NECP does not provide measures to address the increased penetration of renewables, notably encouraging industrial operators to enter into power purchase agreements ('PPAs') and to the increased use of renewable hydrogen in sectors for which the transition to net zero emissions is not straightforward. Furthermore, no information is provided in the plan on specific measures to promote renewable-based electrification of industrial processes, or to replace fossil fuels used for industrial heating.

On bioenergy, Bulgaria's draft updated NECP states that solid biomass is the country's most widely used renewable energy source (primarily used in the heating and cooling sector). It expects the use of biomass in general to continue in the long run but provides assurances that this will be in line with the sustainability and greenhouse gas emissions saving criteria of the revised RED II, with particular focus on waste and residues, which current use is now considered negligible. The draft plan refers to the National Action Plan for Forest Biomass Energy 2018-2027, but does not provide sufficient details on its measures. In particular, the draft updated NECP does not include estimated trajectories for biomass consumption per sector, or the estimated trajectories for biomass supply by feedstock and origin, distinguishing between domestic production and imports. Bulgaria

noted that the use of biomass for district and local heat generation will increase by 2030 but did not provide any specific information. In addition, it has to be noted that the draft NECP still refers to solid biomass plants of 20MMW or more and biofuels plants of 2 MW or more to refer to compliance with the sustainability criteria. However, the draft updated NECP does not assess the domestic supply of forest biomass for energy purposes in 2021-2030 in accordance with the revised RED II's strengthened sustainability criteria.

Moreover, the cascading principle has not been highlighted exhaustively **as required by the new rules included in the revised RED II**. The plan also does not assess whether the projected use of forest biomass for energy production is compatible with Bulgaria's obligations under the revised LULUCF Regulation, particularly for 2026-2030; it only states that the increase in biomass use is expected not to affect land use and hence not affect the LULUCF sector, without giving more information. Overall, the plan lacks information on feedstocks needs and their impacts on carbon sinks, biodiversity and air quality.

The draft updated NECP includes **mapping of the areas** for onshore wind as part of the ongoing reform to simplify administrative procedures. The updated NECP also includes detailed information on measures recently adopted to streamline the permitting process, including the setting-up of centres for administrative services at municipal level. Nevertheless, the draft plan does not elaborate on the additional human resources that would need to be dedicated to permitting.

3.2 Energy efficiency (including buildings) dimension

Energy savings are presented as a pillar of the draft updated NECP, with Bulgaria aiming to reduce final energy consumption by 147 ktoe per year until 2030, compared to the 2017-2019 average¹¹. This corresponds to a corrected national contribution of 12.39 Mtoe for primary energy consumption (compared to 13.71 Mtoe under the EED recast Annex I formula results, based on the 2020 EU reference scenario and 14.2 Mtoe based on the updated 2020 EU reference scenario); and 8.42 Mtoe for final energy consumption (compared to 8.85 Mtoe under the EED recast Annex I formula results, based on the 2020 reference scenario and 8.25 Mtoe based on the updated 2020 reference scenario).

Bulgaria's contributions are set at an energy consumption level which is lower, and thus **more ambitious**, than the results of the EED recast Annex I formula¹².

The targets for 2030 are also set at a lower level than the Bulgarian 2020 energy efficiency targets (-26.6% and -2% for primary and final energy consumption respectively)¹³.

The target on reducing **total final energy consumption of all public bodies** as laid down in Article 5 EED recast on the public sector leading on energy efficiency is not well described in the plan. Nor does it include enough information on the measures planned, or on the exclusion of public transport or armed forces. There is also insufficient information on the obligation to renovate at least 3% of the total floor area of heated and/or cooled buildings owned by public bodies in line with Article 6 EED recast on the exemplary role to be played by the buildings of public bodies.

¹¹ Calculations by JRC: 2017-2019 average calculated based on the EED recast FEC definition, and savings per year calculated for the period 2021-2030.

¹² Target set at -9.5% PEC and -5.4% FEC lower than the Annex I formula result.

¹³ Comparison with the 2020 targets as included in the final NECPs 2020 JRC assessments (16.9 Mtoe PEC, 8.6 Mtoe FEC).

The draft NECP provides partial information on what measures will be used to deliver the **energy savings required** under Article 7 EED (Article 8 EED recast) post-2020. The total 2021-2030 cumulative savings requirement is 6.23 Mtoe and savings are consistently expressed in final energy. The Bulgarian draft updated NECP adopts a mixed approach, including both an energy efficiency obligation scheme (EEOS) and alternative measures. The expected contribution of each measure towards the target is quantified but is expected to be insufficient to meet the 2030 energy savings target. There is no specific sub-target for energy poverty.

The Bulgarian draft updated NECP does not present in detail the planned measures to achieve the 2030 energy efficiency targets and does not quantify their **expected energy savings**. The new measures adopted after 2020 have already been detailed in the 2020 NECP, whereas the new planned measures to reach the 2030 targets are not well represented. The Bulgarian draft plan includes measures reflecting the ‘**energy efficiency first principle**’. Among the measures reported, the most important are in the industry, building and service sectors. The most ambitious measure is the National Energy Efficiency Financing Mechanism – National Decarbonisation Fund, which provides support and financial incentives to implement energy efficiency projects, energy performance contracts (ESCOs) and renovate the existing building stock.

On buildings, the Bulgarian draft updated NECP does not increase the ambition of the **2020 long-term renovation strategy (LTRS)** but only recalls its key elements, targets and milestones. The strategy makes provision for the renovation of about 7.9% and 45% of the building stock over the 2021-2030 and 2021-2050 periods respectively. The renovation will lead to energy savings of about 2 917 GWh per year by 2030 and of about 7 329 GWh per year by 2050, reducing CO₂ emissions by 1 306,435 tCO₂ by 2030 and by 3 274,453 tCO₂ by 2050. Additionally, by 2030 it is estimated that implementing the LTRS will create or preserve about 17 600 jobs and generate an additional annual GDP growth of BGN 557 million (or about EUR 284 million at the current exchange rate).

The draft updated NECP includes various measures to improve the **energy performance of the building sector**. The main sources of financing identified are the European Regional Development Fund (ERDF) programme, estimated to provide more than 3% of the total financial resources needed to implement the LTRS by 2050, and the creation of the national decarbonisation fund (NDF, included in the RRP) envisaged as the main financial scheme to support renovation of Bulgaria’s building stock. The NDF will adapt or create financial instruments tailor-made for various types of beneficiaries, addressing current barriers, optimising the use of grants and mobilising private finance.

Notable **programmes and measures addressing renovation** are connected to the RRP aim to renovate about 3.7 million m² of floor area in multi-apartment buildings and to the ongoing national programme for multi-apartment buildings, which started in 2015. The energy renovation of single-family buildings is not explicitly addressed, even though it represents about 50% of the Bulgarian building stock and is responsible for a significant part of the direct use of fossil fuels in residential buildings, thus presenting a big decarbonisation challenge. Finally, the impact of these measures on energy savings is presented only partially.

3.3 Energy security dimension

Fossil fuels still play an important role in the Bulgarian energy mix, accounting for 69% of the gross available energy in 2022. This share is stable, down only by 1 percentage point since 2013. However, due to domestic coal production, this translates into a relatively low

energy import dependency on third countries, which decreased from 46% in 2013 to 43% in 2022¹⁴.

Natural gas plays a relatively modest role in the Bulgarian energy system, accounting for only around 15% of the primary energy mix and 6% of its electricity mix in 2021¹⁵. For its gas needs, Bulgaria is fully dependent on imports as it does not have any national production. In 2021, around 80% of this gas came from Russia¹⁶. Bulgaria does not have any LNG terminal, but it can count on one underground gas storage facility in Chiren, with a capacity of around 0.5 billion cubic metre (bcm), now being expanded thanks to Connecting Europe Facility (CEF) support. With the imminent completion of the LNG terminal in Alexandroupolis and supplies from Azerbaijan, Bulgaria will be able to fully satisfy its annual gas demand from non-Russian sources. Moreover, Bulgaria's transmission system, enhanced through the TEN-E framework and the CEF has also enabled increased gas flows from South to North, in particular to Romania and Serbia, improving the overall regional security of supply.

As regards planned initiatives to strengthen security of supply, the main objectives of Bulgaria are to (i) further diversify energy supply, notably by increasing imports from the Caspian region through the Southern Gas corridor and from LNG, (ii) establish a national strategic gas reserve; (iii) increase the capacity and flexibility of the underground gas storage facility in Chiren and develop new storage facilities (although no further detail is provided on this); (iv) participate in new LNG terminal projects in the region (without providing any additional detail); (v) maintain and develop the natural gas transmission grid and expand the capacity of interconnection points with neighbouring countries (in particular Kulata/Sidirokastro with Greece and Kardam/Negru Vodă with Romania, part of the vertical corridor initiative covering Greece, Bulgaria, Romania, Hungary, Moldova and Ukraine).

The draft updated plan also refers to a possible update of the legal framework to facilitate domestic gas extraction projects given the significant Bulgarian reserves both onshore and in the Black Sea. It is not clear, however, whether these projects are aligned with the objective of carbon neutrality by 2050. Lastly, the draft updated plan does not provide indicative targets for developing renewable/low-carbon gases, except that hydrogen consumption for energy purposes is expected to be around 9 ktoe by 2040.

As a consequence of the Russian war of aggression against Ukraine, Bulgaria reduced its gas demand by 18% between August 2022 and January 2024, exceeding the -15% voluntary objective and equal to the EU-27 average (-18%)¹. The draft updated plan does not, however, describe the implemented gas demand reduction measures or explain how these are integrated in the medium-term planning towards 2030. Despite this, according to the projections, natural gas consumption is expected to decrease from 1 162 ktoe in 2020 to 963 in 2040, while imports should be 38% lower in 2040 compared to 2020 levels. Overall, the draft updated plan identifies some positive objectives to strengthen the country's security of gas supply but lacks detail about their concrete implementation.

On security of **electricity supply**, the plan indicates implemented electricity projects that have improved security of electricity supply, market integration, network reliability and regional interconnectivity. One such example is the Maritsa East-Nea Santa electricity interconnection between Bulgaria and Greece that received CEF funding. The plan puts

¹⁴ Eurostat.

¹⁵ Eurostat.

¹⁶ ENER Chief Economist unit, based on Eurostat data.

significant importance on accelerating the uptake of renewable energy sources. This includes promoting renewable communities and the development of the related electricity infrastructure (transmission, distribution grid development and energy storage), enabling the appropriate level of interconnections with the country's neighbours and enhancing flexibility in its electricity system to ensure security of supply.

Bulgaria has a diverse electricity mix. Most of its electricity consumption comes from domestic resources, resulting in an electricity import dependency barely around 4% over the last few years. 45% of generated power comes from coal (mainly lignite), while the share of nuclear is about 33%, with renewables making up 14% (around half of which from hydro) of the total generation mix. Coal-fired generation has for a long time been the backbone of generation adequacy, but the country plans to phase out solid fossil fuels by 2038. Natural gas plays a less important role in the Bulgarian electricity generation mix (around 5%). In the past, gas was primarily imported from Russia, but since 2022 measures have been taken to find alternative sources (e.g. LNG imports via Greece). Only one third of natural gas consumption is consumed in the electricity sector, the remaining part being for domestic heating.

Nuclear electricity production covers around one third of total generated power, hence its baseload generation makes up an important part of the country's electricity security of supply. The lifetime extension of the two reactor units (5 and 6) of the Kozloduy nuclear power plant (NPP) has been successfully implemented, ensuring that they can operate respecting the applicable safety standards until 2047 and 2051 respectively.

Diversification of nuclear fuel supply (for a long time originating exclusively from Russian sources) is also an important element in the NECP. At the end of 2022, the Kozloduy NPP signed a 10-year supply contract with Westinghouse Electric Sweden for Unit 5. The first delivery of this fuel is scheduled for April 2024, with the first loading expected in May 2024 (subject to completion of the licensing procedures). In addition, the Kozloduy NPP concluded a contract with Framatome for the supply of nuclear fuel for Unit 6, with delivery expected in November 2025.

Bulgaria is considering construction of two new reactor units with a capacity of around 2.4 GWe at the Kozloduy NPP site (Units 7 and 8). To this end, the Westinghouse AP1000 technology is being adapted for use at the Kozloduy site. Bulgaria is also focusing on the preparation of small modular reactor (SMR) projects for cogeneration of electricity and heat for industrial applications (including hydrogen, district heating and the chemicals industry).

Increasing generation from renewables, principally from solar and wind, also makes an important contribution to achieving lower fuel imports and increasing domestic energy security of supply. By 2030, the share of renewables in the energy mix should reach 34%, with an even higher share for gross electricity consumption (42%), up from 20% in 2022.

The integration of renewables requires both upgrading and extending the national power grid and significant investments in electricity storage. The plan specifically mentions two planned pumped hydro storage installations, each with a capacity of 800 MW. Another 350 MW of storage capacity will be devoted to integrating locally produced intermittent sources and to off-grid solutions. Another possible solution, namely frequency control battery storage installations (180 MW), is also mentioned. However, no overall quantified objective for flexibility and storage is mentioned in the plan, which primarily focuses on pumped hydro solutions.

Storage and flexibility solutions are also meant to maintain the country's electricity export potential; and the increase both inland (principally in the north of the country) and cross-border interconnections is of particular importance in the plan. The plan emphasises that Bulgaria has an important balancing role in the South-East European electricity region. According to the plan, the level of electricity interconnections was 22% in 2022 (above the EU objective of 15% by 2030). With new interconnection projects and domestic renewable installations, the interconnectivity level is set to remain above 15% in the forthcoming years.

In 2021, oil consumption accounted for 37.8% of Bulgarian primary energy, with 77.4% of oil products used in transport¹⁷. The country has no domestic oil production and is therefore fully dependent on the import of oil products, in particular from Russia¹⁸. Bulgaria was allowed under EU sanctions to import seaborne Russian oil until 2024 but plans to ban deliveries of Russian oil from 1 March 2024. Bulgaria has two oil trading ports and one refinery. Bulgaria is not connected to other Member State by oil pipeline.

The draft NECP does not include any section on oil security of supply. Bulgaria has been below the 90-day of oil stocks required by the EU Oil Stock Directive since March 2018. Moreover, the plan includes only a brief outlook for liquid fuels consumption by 2030, 2040 and 2050. The plan predicts a 41% decrease in liquid fuels consumption by 2040 but does not address the implications of this significant decrease on the adequacy of oil infrastructure (refinery, oil stocks, ports) in the short and long runs .

Cybersecurity (network and information security) is an important issue in Bulgaria's national security strategy. The plan mentions the importance of cooperation with neighbouring countries in South-East Europe and the national Act on Cybersecurity. The Cybersecurity Act has important provisions to ensure a level of network security and prevent and mitigate the impact of cyber incidents on network and information security in the electricity sector. On a positive note, the European Commission notes that the draft updated plan briefly mentions the resilience of critical raw materials' supply chains, particularly with the objective of promoting recycling and the sharing of best practices among businesses. However, the plan does not address critical infrastructure protection or the impact of climate change on the energy system (particularly impacts of potential water stress on nuclear and hydropower).

The plan also does not describe the measures to be taken in the event of a gas or electricity security of supply crisis. In this regard, the European Commission would stress that Bulgaria has still not submitted its emergency plan, due by 1 March 2023. Bulgaria did, however, submit its preventive action plan, its national risk assessment and common risk assessments for the Ukraine, Trans-Balkan and Caspian regional risk groups. These documents are all being assessed by the Commission.

3.4 Internal energy market dimension

Bulgaria's draft updated NECP estimates an **electricity interconnection** level of at least 15% for 2030, with a nominal transmission capacity of interconnectors amounting at least to 30% of the installed production from renewable sources. Bulgaria reports in its draft

¹⁷ Eurostat.

¹⁸ Eurostat and other sources. Due to confidentiality of the actual countries of origin, in the data reported by Bulgaria to Eurostat since 2020 most of the oil imports are reported as "not specified" origin.

updated NECP that this level of interconnection level would be achieved through projects of common interest and the completion of other projects.

On gas, Bulgaria's draft NECP lists **the major gas infrastructure projects for pipelines, storage sites and an LNG terminal. These are, most notably:** (i) the Southern Gas corridor; (ii) the underground gas storage facility in Chiren; (iii) projects to maintain and develop the natural gas transmission grid; and (iv) projects to expand the capacity of interconnection points with neighbouring countries (in particular Kulata/Sidirokastro with Greece and Kardam/Negru Vodă with Romania, part of the vertical corridor initiative covering Greece, Bulgaria, Romania, Hungary, Moldova and Ukraine). There is also mention of the development of a national hydrogen backbone and interconnection with Greece. If aligned with a parallel decrease in natural gas consumption, this could contribute to future Bulgarian security of gas supply.

The draft NECP includes a description of the measures adopted to advance **liberalisation of the electricity market** by the NRRPs. The draft, however, lacks detail on the way forward and the identification of challenges in the further integration of the Bulgarian electricity market. The Bulgarian's draft NECP also fails to identify the challenges and necessary actions involved in achieving full liberalisation of the gas markets.

Despite some mention of the importance to enhance flexibility, Bulgaria has not indicated any specific objective to increase the **flexibility of the energy system** through policies and measures related to market-based price formation. The plan also lacks national objectives for the deployment of demand response. Nor does it indicate specific measures to accelerate deployment of electricity storage or engage system operators in facilitating the penetration of flexibility services. Overall, the plan lacks quantification of flexibility needs, and clear targets and objectives for demand response, storage and flexibility.

On energy poverty, the draft updated NECP provides an overview of how the provisions on energy poverty and vulnerable customers are to be implemented. Bulgaria has adopted its 'Energy Act', which sets out the definition and conditions for a 'household in energy poverty' and 'vulnerable customer for the supply of electricity'. It also requires assessment of the number of households in energy poverty. A measure to support the most vulnerable people and families meeting the defined income and means-tested criteria is currently being implemented in Bulgaria; this involves providing these people with targeted heating assistance from the social assistance system during the heating season. An information system to keep track of the number of households in energy poverty will be created, together with a new knowledge centre, which would serve as a comprehensive information resource for stakeholders on energy poverty levels. However, the plan does not contain a target for reducing energy poverty and does not yet report on (an estimate of) the number of households currently affected by energy poverty. Nor does it indicate concrete timelines for the policies, apart from specifying that prior to the full liberalisation of the electricity market, a set of support measures would be devised and implemented to help the vulnerable groups..

The draft updated NECP refers to a new **regulatory framework introduced in 2021 to protect vulnerable and energy-poor customers**; this determines the criteria for what constitutes a vulnerable customer. However, the criteria used to designate household customers as vulnerable seem to be based solely on age, and relate in particular to those older than 75 years of age, without any consideration of their income.

3.5 Research, innovation, competitiveness and skills dimension

3.5.1 *Research and innovation*

Bulgaria's draft updated NECP provides general information on the priorities for the research and innovation dimension towards 2030. The main programme is the innovation strategy for the smart specialisation of Bulgaria (2021-2027). The plan lists several R&I objectives, including an objective for the low-carbon economy, digitalisation of the electricity grid, nuclear energy, energy storage, and low-carbon hydrogen and electrolyzers. The plan is, however, not underpinned by concrete targets in the short (2025), medium (2030) and long term (2050), or by funding programmes for R&I in clean energy and climate technologies. On funding, several R&I and competitiveness objectives (such as those related to electrolyzers or digital transformation of the electricity grid) are underpinned by a reference to investments under the Recovery and Resilience Facility, which can be understood as shorter-term priority investments. While Bulgaria does not mention specific plans to increase public spending on R&I, it refers to the enhanced role of private R&I spending, through a more conducive business innovation environment.

The draft plan mentions support for R&I in the field of nuclear energy, including on the sustainable and safe management of radioactive waste. However, it does not provide further information on whether it plans to put the objective into practice through dedicated research programmes or funding.

The Bulgarian draft NECP briefly mentions participation in the strategic energy technologies plan (SET Plan) but does not provide any further details on plans or objectives for increasing regional cooperation, participation, knowledge and knowhow through European-level programmes.

Overall, the R&I chapter of Bulgaria's draft NECP refers to general government objectives and is not sufficiently supported with clear priorities or backed with targets and funding programmes. Some of the R&I funding programmes are being financed through the 'low-carbon economy' priority described in Bulgaria's recovery and resilience plan increasing competitiveness and setting a positive example of the modernisation of the economy.

3.5.2 *Competitiveness*

The Bulgarian draft updated NECP refers to competitiveness in a general way providing information on the competitiveness aspects of the transition to a green and digital economy.

Bulgaria plans to establish industrial parks (part of the Industrial Parks Act) and an 'AttractInvestBG' programme to create a more conducive business innovation environment. The plan does not include clear targets and strategies to increase competitiveness in the **manufacturing of clean technologies, equipment or components**, for example by indicating whether Bulgaria intends to specialise in the manufacturing of certain strategic technologies. In addition, the plan does not provide information on how Bulgaria aims to strengthen the **resilience of supply chains** of key net-zero equipment and components, such as on sourcing the critical raw materials needed to manufacture these technologies. The draft updated NECP mentions circular economy and a strategy and action plan for the transition to a circular economy 2022-2027, but without detailing how it plans to reduce dependence on critical raw materials.

While **digitalisation** of the electricity grid is mentioned as a priority, there is no specific reference to the activities Bulgaria plans in order to participate in and implement the

digitalisation of energy system EU action plan. Nevertheless, the section on implementation of the '**low-carbon economy**' in the recovery and resilience plan refers to key strategies and investments in sectors such as digitalisation of the electricity grid and investments in renewable and low-carbon hydrogen and electrolyzers.

3.5.3 Skills

The draft updated NECP includes an objective to create a skilled workforce to support the manufacturing of net-zero technologies, including through the creation of or participation in the **European Net-Zero Academies**. As part of Bulgaria's innovation strategy for smart specialisation (2021-2027), the PINIDIT instrument supports the development of skills for smart specialisation, industrial transition and entrepreneurship. The draft updated NECP does not, however, specify if Bulgaria intends to focus these instruments on re-skilling and up-skilling in some specific clean energy technology sectors.

Overall, the plan only briefly mentions **reskilling and upskilling measures**, without properly developing how such initiatives will be planned and implemented. The revision of the SET Plan that includes creating a new task force on skills is mentioned but the draft updated NECP does not contain any information on how the Bulgarian key priorities are aligned with the SET Plan. It also does not create a link with or other relevant initiatives to the development of the necessary skills for the transition such as the European Year of Skills or the Pact for Skills large scale partnerships. Other relevant resources, initiatives and programmes, such as the support from the Human Resources Development programme or Programme Development of Regions for skills mapping are not addressed.

4 JUST TRANSITION

The draft updated NECP only partially addresses just transition aspects. It does not develop a comprehensive just transition strategy for the social and employment measures to support the transition of sectors and regions. A proper qualitative and quantitative analysis of the positive impacts of planned policies, measures and funds, with proper breakdown by sector and type of households, is also missing. Similarly, the draft updated NECP does not provide sufficient information on the preparation of the social climate plan, as assessed in Section 7.

In addition, there are inconsistencies between the transition process outlined in the three adopted Territorial Just Transition Plans (TJTTPs) for Stara Zagora, Kyustendil and Pernik and the draft NECP, namely as regards intermediary transition steps by 2026, 2030, 2035 and the coal phase out deadline. Finally, the list of resources provided in the draft plan does not comprehensively cover the resources dedicated to supporting a just transition.

Measures supporting access and preservation of quality employment during the transition are not included in the draft updated NECP, with the exception of the agricultural sector. On the positive impact of the energy system decarbonisation, it does not specify the type of jobs expected or if skill and/or job shortages are foreseen. For some measures, the plan briefly refers to the impact on employment (e.g. the hydrogen infrastructure) or to the need to provide workers with adequate skills (e.g. the national waste management plan). Quantified information on job creation is only included for the construction sector (see section 3.2 above). The access to quality, affordable and inclusive

education, training and life-long learning is sometimes mentioned, and only in the context of measures financed by the EU funds.

The plan only provides limited information and analysis on measures with a social impact. While the partial evaluation on the possible impact of climate changes is provided, the social impacts including distributional effects on vulnerable groups are not addressed sufficiently. Further information should be provided on elements such as the enabling framework and social investment programmes to support households, and notably the most vulnerable, including on improving public information access, how to support the renewable energy energy communities, renewable self consumption and energy efficiency programmes. In this context, while the investment 2 (C4.I2) ‘Renewable energy support to households’ is welcomed, further information should be provided on how households will be targeted, including reduction of administrative hurdles. The plan also refer to the ensure quality and accessible transport in all regions as an objective of the transport policy until 2030, without providing sufficient details.

Finally, the draft updated NECP does not sufficiently elaborate on the resources specifically devoted to supporting the just transition, except for mentioning the Cohesion Policy Funds. The plan recognises the social dimension of the phase-out of fossil fuel. It also refers to Bulgaria, Greece and Romania’s Tripartite Declaration on the development of renewable energy, which also aims at a just transition towards a decarbonised and climate neutral economy. Resources from the Modernisation Fund will be allocated to a just transition of carbon-dependent regions to support the development of the regions concerned.

5 REGIONAL COOPERATION

The draft updated NECP recognises the strategic importance of regional cooperation, especially in the context of the recent energy crisis. Bulgaria is an active member of the Central and South Eastern Europe Energy Connectivity (CESEC). The country is also engaged in the AggregateEU energy platform for demand aggregation and coordinated purchase of natural gas and benefited from it after Gazprom cut off natural gas supplies in April 2022. Bulgaria did not, however, sign any solidarity agreement for the security of gas supply with its neighbours, out of the two required (with Greece and Romania).

The draft updated NECP emphasises the relevance of regional collaboration on a number of completed and ongoing projects, Many of these are projects of common interest and priority projects of the CESEC High-Level Group, which received grants for studies and/or works under the Connecting Europe Facility. These projects include the Bulgaria-Serbia gas interconnector, the Chiren underground gas storage expansion and the Maritsa East-Nea Santa electricity line.

The plan outlines regional cooperation for new important initiatives with other Member States . For instance, information is provided on the declaration of intent between Bulgaria, Greece and Romania, signed on the margins of the CESEC Ministerial meeting in Athens in 2024, to prepare and implement joint projects on renewables, covering offshore wind deployment and hydrogen value chains.

6 INTERNAL COHERENCE AND POLICY INTERACTIONS WITHIN THE DRAFT UPDATED NECP

The draft plan details measure in all of the five dimensions of the Energy Union. Single measures often have objectives which reflect a possible impact on various dimensions at a time. Overall, the plan would still benefit from more thorough analysis of the consistency, complementarity and synergy of policies and measures in each dimension and between each other, possibly with quantitative analysis of the interactions of certain objectives.

7 STRATEGIC ALIGNMENT WITH OTHER PLANNING INSTRUMENTS

Bulgaria's recovery and resilience plan was approved on 28 April 2022 with a first payment authorised on 9 December 2022.

Bulgaria has not yet submitted a REPowerEU chapter to the Commission.

The draft updated NECP only partially refers to the main reforms and investments of the RRP. The draft updated NECP includes or refers to 29 out of the 32 climate-relevant measures in the RRP (of the 32 climate-relevant measures, 14 have 40% climate-tagging, and 18 measures have 100% climate-tagging), covering 20 RRP investments.

Overall, 4 investments among those 100%-climate tagged are poorly or not reflected in the draft updated NECP¹⁹. The plan does not consider significant investments such as the RESTORE project, which consists of support to install and commission a national infrastructure of grid-scale electricity storage facilities with 3000 MWh of usable energy capacity (C4.I8). Furthermore, there are references to two investments that are no longer part of the RRP after its amendment of 5 December 2023²⁰. In addition, some of the measures that are reflected lack the necessary granularity and detail to allow a full comparison with those in the RRP. This is for instance the case for Reform 8 of the Low carbon component on liberalisation of the electricity market (C4.R8). In addition, the NECP indicates that Bulgaria will introduce price limits on the balancing market which may contradict the objective of the reform in the RRP.

Compared to the RRP, the NECP also lacks ambition in railway transport, as it does not provide specific details on modal shifting, or strengthening specific routes. Furthermore, while the RRP includes measures supporting innovative technologies in agro-industrial production, zero-emission transport solutions, and waste reduction in the agri-food sector, the NECP does not cover them adequately.

In terms of consistency with the **national air pollution control programme**, Bulgaria links the NECP to the National Air Pollution Control Programme (NAPCP). The draft plan mentions in general terms the interactions and co-benefits between energy and climate and clean air objectives in relation to some policies and measures. According to the draft plan, an increase of bioenergy use is foreseen. Some relevant measures to address air

¹⁹ Component 2 (Investment 2 (Enhancing the innovation capacity of the Bulgarian Academy of Sciences)), Component 4 (Investment 7 (Pilot project on combined heat and power from geothermal sources), Investment 8 (National infrastructure for storage of electricity from RES (RESTORE)), Component 11 (Investment 1 (Modernisation of long-term care - energy efficiency))

²⁰ Component 8 (Investment 1 (Digitalisation in railways transport and ERTMS - Kaspichan section - ERTMS), Investment 4 (Intermodal terminal in Ruse))

pollutant emissions from biomass combustion are mentioned, notably in connection to domestic heating, including fuelwood quality standards and replacement of old solid fuel stoves and boilers. The impact of planned policies and measures on the main air pollutants for which Directive 2016/2284 sets emission reduction commitments is not quantified.

Even if the draft plan refers to biodiversity and vaguely quotes some policies and actions to maintain or improve it, it does not provide sufficient details about the current situation in Bulgaria and specific measures. Concepts like nature-based solutions, also relevant for climate adaptation and mitigation, are missing, but some nature restoration measures are quoted.

The draft updated NECP is not consistent with the **adopted territorial just transition plans (TJTPs for Stara Zagora, Kyustendil and Pernik)**. The plan refers to the phase-out of lignite by 2038, but projections on final energy consumption expect a reduction of only 88% in 2040 of energy produced from fossil fuels. Also, the plan does not describe the intermediate trajectory, and a timeline for the phase-out of coal and lignite-based power plants. Furthermore, the plan does not include information on the phasing-in of renewable energy to replace coal.

The plan provides an inadequate analytical basis for preparation of the **social climate plan (SCP)**, which will address the impacts of the new emissions trading system for fuel combustion in buildings, road transport and additional sectors (ETS2) on vulnerable households, transport users and micro enterprises. Nonetheless, the plan does refer to a legislative measure ('the Energy Act') that lays down an obligation to estimate the number of households in energy poverty, and establish and maintain a system which provides information on the number of households in energy poverty and the number of vulnerable electricity customers; this would be provided by the national institution designated to develop a national social climate plan.

The plan also outlines that the Social Climate Fund (SCF) would be used to finance the maintenance of a knowledge centre on energy poverty, and to implement other activities related to tackling energy poverty. However, the plan does not mention transport poverty or outline any measures planned for assessing households in transport poverty or a timeline for implementing the SCP. Although the plan contains several measures that would in principle be eligible under the SCF, such as targeted heating assistance, no explicit link is made to the SCP. Thus, the current draft does not explain how the social climate plan will build on the updated NECP or how consistency between the two plans will be ensured.

In the draft updated plan, Bulgaria does not quantify the climate impacts of measures currently included in the **CAP strategic plan (CSP)**. As a result, the plan does not explain whether the CSP is in line with the new LULUCF and ESR targets and whether additional measures are necessary.

Compared to the national adaptation strategy and the 2030 action plan, the draft updated NECP is less detailed and less ambitious. Consistency with other relevant sectoral plans and policies is hardly addressed, such as those under the water *acquis*, biodiversity and more generally under the zero-pollution header (except for air pollution).

In the draft updated NECP, Bulgaria addresses the 2023 country-specific-recommendation to reduce reliance on fossil fuels, accelerate the clean energy transition and reinforce electricity infrastructure. The NECP indicates a strong ambition for accelerated deployment of renewables but could offer more details on the measures to achieve these goals. While Bulgaria's interconnection with its neighbours is mostly

outlined for the gas sector, the NECP emphasises the importance of the commitments given in CESEC in January 2024. The NECP refers to the crucial role of the energy efficiency of buildings and outlines formative reforms in the field of energy poverty, but leaves important questions about reduction targets and timeline of measures. The plan does not offer sufficient detail on how Bulgaria will support future-proof solutions in district heating and the provision and acquisition of skills needed for the green transition.

8 FINANCING THE ENERGY AND CLIMATE TRANSITIONS

8.1 Investment needs

Bulgaria's draft updated NECP does not provide an aggregate quantification of the expected investment needs to implement the planned policies and measures. It only provides information on a few selected measures such as natural gas infrastructure or energy storage projects. The investment needs are not separated into public and private.

8.2 Funding sources

The draft updated NECP occasionally outlines the main sources of financing Bulgaria will use to implement its planned key policies and measures. However, it is incomplete and not done consistently for all measures and there is also no consolidated overview at NECP level. As a result, it is not possible to identify potential gaps in terms of funding. The draft plan also fails to distinguish between public and private sources of funding.

9 ROBUSTNESS OF THE ANALYTICAL BASIS OF THE DRAFT UPDATED NECP

Overall, as the draft updated NECP does not provide any description of the analytical tools used to prepare the plan, it is not possible to analyse the quality of the quantitative analyses. The plan describes only an incomplete WEM scenario, which only includes projections for installed capacity for electricity generation, energy consumption, energy imports and electricity generation, covering the period until 2040. The plan does not provide detailed projections on GHG emissions for sectors covered by the Effort Sharing Regulation and LULUCF Regulations, or for the aggregate emissions. The 'with additional measures' (WAM) scenario is missing.

The draft updated NECP includes a short and very general assessment of the impact on other dimensions such as the environment and health. However, the assessment is only qualitative and still incomplete.

The plan does not include adequate assessment of the macroeconomic impacts of the proposed policies and measures. A few considerations are included under the heading 'Adaptation to climate change', but they are mainly qualitative. The plan does not provide any information on the methodology used to calculate the figures presented.