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

Accompanying the document

COMMISSION RECOMMENDATION

on the draft updated integrated national energy and climate plan of Estonia covering the period 2021-2030 and on the consistency of Estonia's measures with the Union's climate-neutrality objective and with ensuring progress on adaptation

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1 SUMMARY

1.1 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 up ambitious energy and climate objectives, with a strong focus on diversifying their energy supplies. These developments are reflected in the legislative framework adopted under both the ‘Fit for 55’ package and the REPowerEU Plan.

Estonia’s draft updated national energy and climate plan (‘the draft updated NECP’ or ‘the plan’), submitted on 15 August 2023, partially takes into account this new geopolitical and legislative framework.

Table 1: Summary of key objectives, targets and contributions of Estonia’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 emissions (GHG) compared with 2005 under the Effort Sharing Regulation (ESR) (%)		2021: -7%. 2022: -3.9% ¹	-24%	NECP: -11.4%
	Binding target for net GHG removals under the Regulation on Land Use, Land Use Change and Forestry (LULUCF)		Reported net emissions of 2.88 Mt CO ₂ eq. in 2021	-0.434 Mt CO ₂ eq. (additional removal target) -2.454 Mt CO ₂ eq. (total net removals)	Insufficient ambition, Estonia will not reach the LULUCF target
	National target/contribution for renewable energy: Share of energy from renewable sources in gross final consumption of energy (%)	30.1% (SHARES) 25% (target)	38.0%	65%	EE contribution of 65% is significantly above the 50% required according to the formula set out in Annex II of the Governance Regulation
	National contribution for energy efficiency:				
	Primary energy consumption	6.50 Mtoe	4.45 Mtoe	5,130 ktoe	EE 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 5,130 ktoe. EED recast Annex I formula results: 3,927 ktoe
	Final energy consumption	2.80 Mtoe	2.83 Mtoe	2,590 ktoe	EE final energy consumption contribution is 2,590 ktoe. EED recast Annex I formula results: 2,555 ktoe
	Level of electricity interconnectivity (%)	67.6%	69.4%	15% ²	

Source: Eurostat; Estonia's updated national energy and climate plan

1.2 Summary of the main observations³

Estonia's draft updated NECP recognises the new and revised climate targets included in the ESR and the LULUCF Regulation, as part of the Fit for 55 legislative package, but only partially embeds them.

Regarding the **reduction of greenhouse gas emissions under the Effort Sharing Regulation**, the plan provides emission projections demonstrating that with both existing and additional policies and measures, Estonia is not on track to meet its national greenhouse gas target of -24% in 2030 compared to 2005 levels. According to Estonia's projections, there is gap of 12.6 percentage points, highlighting the need for more ambitious climate action.

On **LULUCF**, the draft updated plan states that Estonia will fall short of the 2030 ambition, highlighting the need for enhanced climate action. 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 several relevant policies and measures, net removals are projected to decrease significantly by 2030. The draft does not provide a clear implementation timeframe nor 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 Utilisation and Storage (CCUS)**, the plan does not identify annual CO₂ emissions that can be captured, nor geological CO₂ storage capacity. No details on CO₂ transport are provided. The plan refers to the preparation of a study on the CCS potential, whose outcomes should be made available, once finalised.

² Calculated by the European Commission based on the ENTSOE-E data (Winter Outlook 2022-2023). 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 changes in the generation capacity.

³ 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.

The draft updated plan **does not reflect progress towards international commitments** under the Paris Agreement. Estonia does not refer to the oil shale phasing out commitments from the adopted Territorial Just Transition Plan (TJTP), nor does it provide details on the phasing out of fossil fuel subsidies.

Regarding **adaptation to climate change**, the draft updated NECP does not contain adequate analysis of the relevant climate vulnerabilities and risks for the achievement of the national objectives, targets, and contributions and the policies and measures in the individual dimensions of the Energy Union. While recognizing renewable energy sources being more vulnerable due to seasonality and storage needs, Estonia does not identify specific policy measures to address these vulnerabilities. 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 Greece'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.

On **renewable energy**, the draft updated NECP presents a contribution to the overall EU target of **65% of renewables in gross final energy consumption by 2030**. This is significantly above the share of 50% resulting from the formula in Annex II of Regulation (EU) 2018/1999 on the Governance Regulation of the Energy Union and Climate Action (the 'Governance Regulation'). Overall, the draft updated NECP includes specific trajectories for renewables in the electricity, transport and heating and cooling sectors that take into account Directive (EU) 2018/2001 as regards the promotion of energy from renewable sources, as amended by Directive (EU) 2023/2413 ("revised REDII"). Renewable fuels of non-biological origin (RFNBO) have also been included in the draft updated NECP, but those lack specific trajectories and concrete targets. Although Estonia's draft updated NECP provides policies and measures for renewable energy, these could have been more elaborated, given the level of detail included in the 2020 NECP.

On **energy efficiency**, Estonia's draft updated NECP largely repeats the previous final NECP for 2020. While some targets from the 2020 NECP are updated in the draft updated NECP, certain inconsistencies in the plan have not been resolved, particularly regarding final energy consumption.

On **buildings**, the draft updated NECP does not increase the ambition of Estonia's 2020 long-term renovation strategy (LTRS). The 2020 LTRS was assessed as ambitious but not sufficiently supported by adequate measures and funding. Still, the policies and measures contained in the draft updated NECP under the energy efficiency dimension are not sufficiently well described to consider the achievement of the 2020 LTRS as realistic. Overall, the draft updated NECP merely recalls the LTRS's key elements such as milestones and targets. Further information is needed, mainly to set more precise objectives, volume and to clarify implementation details, the results and co-benefits to be achieved.

On the **energy security dimension**, the draft updated NECP convincingly sets out objectives and targets to increase Estonia's national supply for gas, electricity and oil. The draft updated NECP gives good coverage of the issues of diversification and preparedness for the three sectors gas, electricity and oil. Yet, the draft updated NECP does not fully explain the measures foreseen to achieve these objectives, especially for the gas sector. For instance, the draft updated NECP does not demonstrate in detail how the emergency measures adopted in the aftermath of the Russian invasion of Ukraine are integrated in the mid-term planning towards 2030. The draft updated NECP adequately describes measures to enhance the

flexibility of the energy power system but does not set a target for the deployment of power storage. In addition, the draft updated NECP does not include an assessment of the adequacy of the oil infrastructure (e.g., oil stocks, refinery) in view of the expected oil demand and the shift toward biofuels and biomethane in the upcoming years. On nuclear power, a decision of the government to commission nuclear capacity is still pending. In this regard, Estonia would need to establish a comprehensive legal framework, build national regulatory competencies and relevant infrastructure related to commercial construction of new nuclear capacity.

On the **internal energy market**, the draft updated NECP states that Estonia will take action to enhance the flexibility of the electricity system. According to the plan, Estonia plans to develop a single market model for demand side response and remove legal barriers to support the storage of electricity. Since 2017, all electricity consumers in Estonia have been able to start producing electricity for its own consumption and sell surpluses to the grid. Further, the draft updated NECP indicates more flexibility to respond to rapid changes in electricity generation with a view of system needs. However, the draft updated NECP does not provide specific targets for flexibility.

On **energy poverty**, the plan put forward a robust assessment of households on energy poverty, and does not identify specific target, as the number is not considered significant. If the plan mentions

On the **research, innovation, competitiveness and skills** dimension, Estonia's draft updated NECP reports on the latest available quantitative data on public and private research and innovation (R&I) funding in the clean energy sector. It also provides a quantitative assessment of the digitalisation dimension. However, while the draft updated NECP includes specific information on measures, initiatives and investments to support the clean energy innovation and competitiveness domain, it does not include respective quantitative national targets and objectives for 2030 and 2050. On top of this, the plan lacks detailed information on the investments needed to manufacture key components and equipment for net-zero technologies, and on how Estonia will ensure the resilience of its supply chains in case of insufficient domestic production of these components or equipment to reach its climate and energy targets.

Just transition is addressed in a very limited manner in the draft updated NECP. There is no information on social, employment and skills consequences, including distributional impacts, of the climate and energy transition. The plan does not elaborate much on objectives and policies and measures to tackle these issues more widely and focuses solely on the Ida-Virumaa region. Resources specifically devoted to supporting the just transition are not listed in detail except the Just Transition Fund. Finally, the plan does not provide sufficient information for the preparation of the Social Climate Plan and on how the consistency of the two plans would be ensured.

Regarding its **strategic alignment with other planning tools**, the draft updated NECP refers to and is fully consistent with the Estonian **Recovery and Resilience Plan** ('RRP') and the national REPowerEU plan. Estonia's draft updated NECP is in line with the latest country specific recommendations of the 2022 and 2023 **European Semester**. It reflects and addresses Estonia's identified challenges during the European Semester, notably actions to reduce the dependency on fossil fuels by putting forward ambitious measures to accelerate the deployment of renewables.

Estonia's draft updated NECP partially includes information on the expected **investment needs** to implement the planned policies and measures, and only for some of the five dimensions. It refers to other strategic documents, whose consistency in terms of assumptions is unclear. Therefore, the investment needs cannot be directly compared nor aggregated. Furthermore, the funding needs per policy and measure are not disclosed.

The draft updated NECP is based on quantitative analyses. Details on the projection with existing measures ('WEM') and with additional measures ('WAM') have been reported, including an impact assessment of the planned policies and measures. However, the WAM scenario is incomplete. Moreover, the plan does not provide a **macro-economic assessment**, which under the Governance Regulation is a mandatory requirement.

2 PREPARATION AND SUBMISSION OF THE DRAFT UPDATED NECP

2.1 Process and structure

The Estonian draft updated NECP was submitted to the Commission on 15 August 2023. The draft updated NECP is generally well written and overall follows the structure of the template in Annex I of the Governance Regulation, covering all five dimensions, and including objectives, targets or contributions for each, backed by policies and measures and underpinned by an analytical basis, including an impact assessment.

The draft updated NECP also provides evidence that, in line with the whole-of-government approach, Estonia reached out and worked together with relevant authorities to update the draft updated NECP, taking into account synergies and trade-offs across different portfolios.

The draft updated NECP describes the national context in which the new plan was developed. In particular, it focuses on the consequences of Russia's invasion of Ukraine and the related ban of Russian gas on Estonian markets. The draft updated NECP describes the issues related to extremely high energy prices but gives less coverage to the description of the consequences of climate change, extreme weather conditions and other environmental considerations.

Estonia has established a multilevel energy and climate dialogue in the format of an Energy Council including key stakeholder representatives. However, the composition of this Energy Council is unclear, nor how it has been involved in preparing the draft updated NECP.

It is unclear whether cities and local authorities were consulted on the development of Estonia's draft updated NECP. Nevertheless, the NECP explicitly acknowledges the role of cities and local authorities, particularly concerning climate mitigation, adaptation and action to tackle energy poverty. The Covenant of Mayors is also referenced and several cities in Estonia take part in the Covenant.

2.2 Public consultation

The public participation procedure is outlined in the draft updated NECP in a rather succinct manner. In terms of timing Estonia ensured an early public participation throughout the decision-making process. Moreover, a range of interest groups were identified and encouraged to participate in the consultation. However, it is not clear if individual citizens were also targeted through the online public consultation as the plan only reports a summary of the views of institutional stakeholders. Similarly, the plan is unclear on how social

partners were consulted during the drafting process. This hinders the assessment on the fulfilment of a “whole-of-society” approach, as stated in the Council Recommendation on ensuring a fair transition towards climate neutrality.

The time frame of one month for the online public consultation was roughly sufficient for participants to prepare and participate effectively. A working version of the draft updated NECP was submitted to consultation in a timely manner, but the plan does not provide information on the completeness of this version. The public and the stakeholders were informed of the regulatory context for the review, and the decision-making procedure followed for the update.

The draft updated NECP contains a very clear summary indicating how the views of institutional stakeholders were considered and addressed, or why they were not. A summary of the public and stakeholders’ consultations is missing from the plan.

2.3 Regional consultations for preparing the draft updated NECP

Although Estonia only shared the main objectives and measures of the draft updated NECP with Finland, Latvia and Lithuania, Estonia participated in several regional cooperation fora, following additional prior consultations.

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 new and revised climate targets included in the ESR and the LULUCF Regulation, as part of the Fit for 55 legislative package, but only partially embeds them.

The draft updated NECP confirms Estonia’s commitment to achieve climate-neutrality by 2050 and contains an economy-wide GHG reduction target of 8 million tonnes of CO₂ equivalent (CO₂ eq.) by 2035 (incl. LULUCF).⁴ However, the plan does not include concrete pathways to 2030 and to 2050 that are in line with ambitions set out in the national long-term strategy and with the EU climate-neutrality objective. GHG emission projections in the draft updated NECP have not been revised from those submitted in March 2023 under Art. 18 of the Governance Regulation. The latter show net GHG emissions (including LULUCF and excluding international aviation) of 7 million tonnes of CO₂ equivalent by 2050 considering existing measures, and of 5 million tonnes of CO₂ equivalent with additional measures. This is equivalent to projected reductions by 2050, compared to 1990, of 81% and 88%, respectively. In recent years, net GHG emissions in Estonia have been increasing, mainly driven by a decline in emission removals from the LULUCF sector.

⁴ The “Estonia 2035” long-term development strategy and the recently revised KPP 2050 sets out the fundamental elements of Estonia's’ climate policy.

Despite the commitment to achieve climate-neutrality by 2050, **the information provided in the draft updated plan does not allow for a full assessment as to whether progress by Estonia is consistent with the achievement of the EU climate-neutrality objective.** However, based on the available information, progress by Estonia towards the EU climate-neutrality objective appears insufficient.

The draft updated NECP does not reflect the required ambition under the ESR as the policies and measures in the plan do not collectively suffice to reach the effort sharing sector obligations. The ESR sets Estonia’s target for 2030 to reduce its emissions by -24% compared to 2005 levels. The plan projects emissions from the effort sharing sectors in 2030 to fall short of the target both with existing and with additional planned measures. In the with-existing-measures (WEM) scenario, Estonia’s reduction would amount to -9.8%, while in the with-additional-measures (WAM) scenario to -11.4%. Therefore, Estonia is projected to fall short of its -24% target by 12.6 percentage points. This highlights the need to implement and plan for more ambitious climate action. In the updated plan, the ESR projections are the same as the latest data that had to be reported by Member States by 15 March 2023, under the Governance Regulation.

Member States have flexibilities under the ESR to comply with their targets. No specific use of ESR flexibilities is mentioned by Estonia. 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 Estonia’s draft updated NECP

ESR target and projections⁵					
	2030 target*	2021 performance (inventory data) *	2022 performance (approximated data) *	2030 WEM projection *	2030 WAM projection *
Estonia	-24%	-7%	-3.9%	-9.8%	-11.4%
EU	-40%	-14.5%	-16.9%	-27%	-32%

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

The draft updated NECP does not fully reflect the increased ambition of the LULUCF Regulation and the 2030 national target requiring Estonia to deliver an additional -0,434 Mt CO₂ eq. net removals to reach the total value of 2.454 Mt CO₂ eq. by 2030. The plan explicitly acknowledges that the existing policies and measures in the sector are not sufficient to attain the more ambitious 2030 target. The scenario for the LULUCF shows that projected removals are set to decrease from -2.8 to -3.6 Mt CO₂ eq. by 2030 compared to 2005 levels with existing measures. Forest age structure, felling rates and peat extraction are mentioned as the key factors contributing to these projections. Removals from the LULUCF sector are subsequently projected to fall below the 2030 target, highlighting the need for additional action in the sector. There are no projections of additional measures.

⁵ 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).

The draft updated NECP does not clearly set out a pathway to increase the contribution of the land sector to the EU's overall higher target on climate action. However, it does outline that the Ministry of the Environment is currently assessing the impacts and volumes of the implementation of additional measures needed to restore the carbon sink function of the land sector and to enable compliance. Carbon sequestration by managed forest land will also be supported by measures in the draft **forest development plan 2021-2030**, with particular attention to the production and use of wood fuel. Estonia also provides an overview of the current policies in measures in place to meet the LULUCF targets.

The draft updated NECP does not provide information on the status, nor the progress needed to ensure implementation of these improvements, such as higher tier levels and geographically explicit datasets, in line with the provisions under Regulation (EU) 2018/1999 for monitoring, reporting and verification.

Overall, Estonia does not clearly explain how its policies and measures for the LULUCF sector will contribute to the long-term transition to climate neutrality by 2050.

In terms of **transport decarbonisation**, the draft updated NECP includes policies and measures to improve access to zero- and low-emission mobility, public transport, energy efficiency and the uptake of renewable energy in the transport and mobility sector. The measures should achieve a decrease in transport emissions of 88.5% by 2050 (compared to 1990).

The draft updated NECP refers to planning and measures to promote **active mobility** (walking and cycling). This is related to the Transport and Mobility Development plan which aims at an ambitious increase of the share of public transport, cycling and walking from 38% in 2020 to 55% by 2035 (60% in urban areas). Moreover, it refers to the new Alternative Fuels Infrastructure Regulation as regards national policy frameworks for alternative fuel infrastructure for low- and zero-emission vehicles and mobile assets in multiple transport modes, including measures for recharging points and hydrogen refuelling stations. The draft updated NECP does not include specific roadmaps or measures for the production and deployment of sustainable aviation fuels (SAF) and sustainable maritime fuels.

The draft updated NECP includes measures for the **electrification** and the roll-out of zero-emission technologies and related infrastructure in rail, and for a modal shift to low-carbon modes of transport (e.g., fiscal measures or environmentally harmful subsidy reforms, building infrastructure for zero-emission aircrafts and shore-power infrastructure at ports). The draft updated NECP is consistent with the EU's policies on **CO₂ standards for cars**⁶ and with road transport decarbonisation in general.

In terms of **Carbon Capture Utilisation and Storage (CCUS)**, the draft updated NECP does not identify projects to capture emission, nor does it provide any concrete estimation of geological CO₂ storage capacity. However, the draft updated NECP refers to a study conducted by the Tallinn Technical University on the CCS potential in Estonia, which shows that the technology can be deployed by the shale oil sector, although with cost and use

⁶ An EU-level reduction per OEM of 55% for cars and 50% for vans of CO₂ emission per km by 2030; 100% reduction (only zero-emission vehicles) by 2035. Countries must report measures such as incentives for corporate cars and any fiscal incentives for zero-emission vehicles.

limitations. The plan does not foresee the deployment of any dedicated CO₂ transport capacities.

The WEM scenario for agriculture projects an increase in emissions of 33.3% by 2030 compared to 2005 levels (from 1.2 to 1.6 Mt CO₂ eq.). Emissions from the **agricultural sector** are expected to increase by 4.5% in 2050 compared to 2020. This trend is due to an increase in livestock and the use of fertilisers. Estonia does not propose any specific new measures to reduce non-CO₂ emissions, with the exception of nitrogen input from the application of manure. The plan does not include measures aimed at mitigating **methane emissions** from agriculture, including both enteric fermentation and manure management. The draft updated NECP could link the mitigation of the latter to the production of biogas and bio-methane (with wastewater plants as another source), which the draft updated NECP mentions as an alternative fuel to achieve low-emission mobility (e.g., encouraging the use of bio-methane in heavy-duty vehicles (TR2b) and busses (TR16a)). To this end, the plan could expand the measure on improving manure management (PM20), which focuses on air pollutants but does not mention greenhouse gas emissions.

Regarding **N₂O emissions from agricultural soils**, which constitute the largest source of non-CO₂ emissions, the draft updated NECP mentions a measure aimed at replacing mineral fertilisers by organic fertilisers (PM17) but provides neither information on the measure's effect on N₂O nor additional relevant measures.

The draft updated NECP pays only little attention to mitigating non-CO₂ emissions in other sectors. On methane emissions in waste management, the draft updated NECP provides only generic information on limiting the percentage of biodegradable waste landfilled (JM1), which is already a legal obligation under the Landfill Directive.

Regarding emissions of **F-gases**, the plan refers merely to existing legislation (Regulation (EU) No 517/2014 on fluorinated greenhouse gases; Directive 2006/40/EC relating to emissions from air conditioning systems in motor vehicles).

Finally, the draft updated NECP does not provide any quantified projections of non-CO₂ emissions. These shortcomings are problematic, because non-CO₂ emissions accounted for 41% of all greenhouse gas emissions within the Effort Sharing sectors in 2021, and in the context of the gap towards the ESR target outlined earlier in this section.

The analytical basis of the draft updated NECP includes an assessment of the **impact of policies and measures** on the achievement of the GHG mitigation targets contained in the draft updated NECP. However, the assessment is rather synthetic. The plan provides a comprehensive list of policies and measures, organised by policy areas and scenarios (WEM and WAM). The policies and measures are described in sufficient detail in terms of their scope, but not in terms of timing and likely impact. Based on the comparison of WEM and WAM scenarios, the policies and measures proposed in the draft updated NECP will not allow Estonia to reach the GHG emission targets set in EU and national legislation.

The draft updated plan does not reflect progress towards **international commitments** under the Paris Agreement. The plan does not refer to the commitment in the adopted Territorial Just Transition Plan (TJTP) to cease the electricity production from oil shale by 2035 and phase out oil shale in energy production by 2040. Furthermore, the reporting and phasing out of fossil fuel subsidies (e.g., lower excise duty rate for diesel in agriculture or subsidies used for supporting the production of high-efficiency electricity cogeneration from peat or oil shale-processing) is not discussed in the plan.

On 30 December 2019, Estonia submitted to the Commission its national long-term strategy. The strategy does not include the goal of achieving climate neutrality by 2050. The goal is not currently enshrined into law. In March 2023, Estonia reported on the status of implementation of its initial NECP, where the goal of achieving climate neutrality by 2050 was defined. This climate-neutrality goal is reiterated in the draft updated NECP.

3.1.2 Adaptation

Estonia has not specifically identified relevant climate vulnerabilities and risks that may undermine the achievement of national objectives, targets and contributions in any of the five policy areas. However, it is in the process of updating its national adaptation plan, including the parts on infrastructure and energy. In the context of energy security, Estonia specifically notes that it has a low level of vulnerability of shale oil-based energy generation until the end of the century, while renewable energy sources including bioenergy are more vulnerable due to seasonality and storage needs. The draft updated plan does not identify any specific policy measures to tackle these vulnerabilities, but as part of grid reinforcements to integrate renewable energy, Estonia is taking measures to increase its resilience against storm.

As in the 2020 NECP, Estonia highlights the national goal to increase national preparedness and capacity to adapt to the impacts of climate change, in line with the goals set in the national adaptation plan, under preparation. The draft updated NECP reflects the sectoral goals set in the 2017 national adaptation plan. It does not identify more detailed goals in the context on specific aspects of the Energy Union.

Estonia does not identify innovative approaches such as insurance policies or fiscal measures to bridge the climate protection gap, nor investments designed to minimise environmental impacts.

Nature-based solutions planned to meet the Energy Union objectives are not outlined, except the rehabilitation of peat production areas into wetlands, but without a clear reference to a plan of action.

3.1.3 Renewable energy

The renewable energy contribution proposed in the draft updated NECP is a share of at least 65% of the national gross final consumption of energy in 2030. This is based on the WEM scenario that takes into account current trends in renewable energy production and consumption. Absolute values in terms of energy in GWh were also included, however, details on the overall renewable energy share calculation are missing. The proposed contribution is significantly above the share of 50% resulting from the formula in Annex II of the Governance Regulation. The scenarios are detailed and provide overall renewable energy contribution trajectories, for 2022, 2025, 2027 and 2030. The indicative trajectory to reach the 65% contribution in 2030 is provided, including specific reference points for 2022 (a 38% share of renewables), 2025 (43%) and 2027 (47%).⁷ The submitted reference point for 2022 is above the trajectory (27.2%) calculated to meet the EU's 2030 renewable energy target of 32%, which was in force at that time. The reference points for 2025 and 2027 are

⁷ Reference points of 18% by 2022, 43% by 2025 and 65% by 2027 pursuant to Article 4(a)(2) of Regulation 2018/1999.

also above the trajectory calculated to meet the EU's higher renewable energy target for 2030 of 42.5%⁸.

Estonia's share of renewable electricity is projected to reach 100% in 2030, with wind power becoming the main source of renewable electricity (73% share and 6.84 GW of installed capacity), solar PV (11% share and 1 GW of installed capacity). Bioenergy is expected to account for a 16% share and 1.54 GW of installed capacity, compared with current 1.75 GW. The draft updated NECP provides little information on the **innovation target for renewable energy** deployment and does not explain how Estonia will achieve the target.

The use of renewable energy in the heating and cooling sector is projected to reach 64% by 2030 and 62% by 2022. The draft updated NECP indicates that Estonia may reach a higher level of 69% with additional policies, but this has not yet been translated into national targets due to insufficiently mature modelling. The corresponding increase is below the new mandatory average annual increase of 1.1 and 0.8 percentage points calculated for the periods of 2021-2025 and 2026-2030 respectively set in the revised RED II. As Estonia's share is above 60%, it may count as fulfilling the mandatory increase. According to the draft updated plan, bioenergy will remain dominant; but most of the renewables share increase is expected to come from heat pumps. The gross final consumption of heat pumps is set to increase by roughly a third by 2030 against 2020 figures to reach 1400 GWh. However, this excludes the electricity needed to run these heat pumps and the projected capacity. The use of **renewable energy in industry and buildings** has not been provided. The projected share of renewable energy in district heating and cooling is also lacking, as is information on the role of waste heat and renewable electricity in making the calculation and in estimating its impacts on target setting and achievement.

In the transport sector, Estonia's target for the share of renewable energy is to 14% in 2030. Estonia has not provided the equivalence of the target in GHG reduction. The 14% sub-target in transport will be mainly achieved by promoting electrification as well as the use of domestically produced biomethane. Similarly, Estonia aims to fulfil the needs for advanced **biofuels** as much as possible with domestically produced fuels. The use of biofuels produced from food and feed crops will be minimised. It also plans to support the RFNBOs, but the plan lacks detail about the concrete measures and targets. The plan specifies that electromobility will represent 132 GWh in 2030 and refers to support measures for electric cars, but without clearly explaining the link between the two. It contains very few details on the measures related to electromobility (both relating to vehicles and to charging infrastructure).

Estonia's draft updated NECP lacks information on the 2030 target capacity of electrolyzers. But it refers to the recently finalised **national hydrogen roadmap**, which specifies that 1095 tonnes of **renewable hydrogen** will be needed annually to meet the requirements for (at least) three hydrogen refuelling stations, which Estonia is planning by 2030 to meet its obligations under the new Alternative Fuels Infrastructure Regulation and the revised RED

⁸ Given that the provisionally agreed RED was not yet in force by the deadline for submission of the draft NECPs, the value for 2022 has been compared to the trajectory values calculated on the basis of the EU's 2030 renewable energy target of 32%. The reference points for 2025 and 2027 are compared to the trajectory calculated on the basis of the EU's higher target of 42.5% in line with the revised RED.

II. The plan also clarifies that the lack of large-scale consumption of RFNBOs is a bottleneck for the uptake of hydrogen. Currently there is a lack of industry to boost the hydrogen market. Estonia is also testing the creation of renewable hydrogen value chains in the framework of the Recovery and Resilience Facility.

The draft updated NECP does not contain information about **international partnerships** such as an agreement, Memorandum of Understanding or bilateral talks to facilitate imports of renewable hydrogen. Regarding the pathway for oil-based transport fuel substitution through electrification and renewable hydrogen in land transport, the plan mentions that in early 2023 a support round of EUR 9 million opened, with the aim of supporting the purchase of electric cars and hydrogen fuel cells.

The **policies and measures** planned to help Estonia achieve its objectives and contributions on renewable energy largely repeat those included in the final NECP for 2020. They are prepared on the basis of the 2017 energy sector development plan (ENMAK) and complemented with the policies and measures in Estonia's RRP. Estonia used the voluntary template and included further details on the proposed policies and measures alongside the draft updated NECP.

For example, in the **electricity sector**, Estonia's objective is to accelerate the production of electricity from renewable energy through direct investment support, subsidies for electricity production and regulatory measures such as dedicated areas for wind and eliminating defence-related height restrictions for wind turbines. On guarantees of origin, Estonia did not propose additional measures, for example to enhancing the current system to improve consumer information. On **joint projects**, Estonia signed a Memorandum of Understanding with Latvia to develop an offshore wind farm with a capacity of 700 to 1 000 MW. Cooperation with Latvia is also ongoing with the involvement of onshore wind developers, with the aim of building wind farms in Estonia and exporting production to Latvia. The plan lacks information on measures to accelerate the roll-out of solar energy in line with the EU solar energy strategy but notes that in 2022, Estonia already achieved the solar target it set for 2030 in the NECP from 2020. The updated NECP sets new targets to generate 250 GWh of electricity from solar energy in 2025 and 605 GWh in 2030.

To achieve these objectives, Estonia plans to promote individual and collective self-consumption of renewable energy and renewable energy communities by issuing a handbook for renewable energy communities. The updated NECP does not set quantitative targets for self-consumption or for energy communities. The plan lacks sufficient and well-described measures for promoting individual and collective self-consumption and renewable energy communities. Estonia has not provided an Energy System Integration Strategy.

Estonia lists measures for **renewable heating and cooling** but they have not been updated since the final NECP from 2020. The draft updated NECP lacks information on measures to enable sector integration between energy networks. In the updated draft plan Estonia refers to the use of tenders with the aim of shifting nearly half of the electricity consumption of the central government to renewable energy by means of power purchase agreements. Although the tender carried out in 2022 did not succeed due to insufficient interest from bidders, Estonia expects to run a revised tender in 2023 or 2024 and intended to serve as an example for further government procurements.

The updated draft NECP indicates that **bioenergy** will play an important role in developing renewable energy, and Estonia gives preference to solutions that maximise the value of this resource. This is against a background of continued use of wood and wood fuel in recent

years. At the same time, Estonia sees significant potential to find synergies between sectors, such as energy efficiency, energy efficiency in buildings and solutions based on other renewable sources. Estonia's draft updated NECP strongly emphasises biomethane, encouraging the uptake of biomethane for transport and planning to produce up to 340 GWh of the fuel. It expects a major increase in the use of biomethane for public transport.

The draft updated NECP does not include an assessment of domestic supply of **forest biomass** for energy purposes in 2021-2030 in accordance with the strengthened sustainability criteria of the revised REDII. The plan also does not assess the compatibility of the projected use of forest biomass for energy production with Estonia's obligations under the revised LULUCF Regulation, particularly for 2026-2030. The plan does not include an assessment of the sustainability level of logging and land use that might constrain the high reliance on wood for energy production, whether primary or secondary woody biomass, which may further increase the need for emissions reductions elsewhere.

The draft updated NECP includes a **map of dedicated areas for wind energy** necessary to achieve the national contribution to the Union's 2030 renewable energy target. Estonia aims to make the final mapping available by the first quarter of 2024. To **streamline administrative procedures** and the timeframe for granting permits, the draft updated plan includes references to amendments in the Planning Act, which will simplify the planning process for wind farms with the aim of shortening the process from 3-5 years to about 1.5 years. It also mentions the plan to draw up a standardised environmental impact assessment programme.

Further measures streamlining administrative procedures include a simplified grid connection procedure for installations below 15 kW. The draft updated NECP refers to Estonia's maritime spatial plans, which specify that 6.8% of Estonia's total marine area is suitable for wind energy development. Under the right conditions, there is potential to develop up to 15-17 GW of offshore wind farms in these areas. The draft updated NECP does not provide information on other measures to streamline administrative procedures, including on a single contact point for project promoters or the additional human resources dedicated to permitting.

3.2 Energy efficiency (including buildings) dimension

Energy savings are a pillar of Estonia's draft updated NECP, with the target to **reduce final energy consumption** by 31 ktoe per year until 2030 against the 2017-2019 average.⁹ This corresponds to a corrected national contribution of 5.13 Mtoe for primary energy consumption (up from 3.93 Mtoe according to the EED recast Annex I formula results) and 2.59 Mtoe for final energy consumption (up from 2.55 Mtoe according to the EED recast Annex I formula results). Estonia's reported 2030 contributions for primary and final energy consumption differ from the theoretical results stemming from the formula in the EED recast Annex I by 30.6% and 1.4%¹⁰.

⁹ The 2017-2019 average has been calculated based on the EED recast FEC definition, and the savings per year have been calculated for the period 2021-2030.

¹⁰ According to Article 4(4) EED recast, a Member State shall ensure that its contribution in Mtoe is not more than 2.5% above what it would have been had it resulted from the EED recast Annex I formula.

The target for 2030 is also lower than compared to Estonia's 2020 **energy efficiency targets**, with a -21.1% and a -7.5% reduction¹¹ in primary and final energy consumption. Overall, Estonia's contribution to the reduction of final energy consumption seems to be in line with the EED recast ambition, given the need to increase action at EU level to collectively reach the EU's 2030 energy efficient targets. However, it should be noted that Estonia's draft updated NECP shows a certain degree of inconsistency in the values given for the 2030 final energy consumption target in different passages of the draft updated NECP¹².

The target on reducing total **final energy consumption of all public bodies** is not well described in the draft updated NECP and does not include enough information on the measures planned, such as whether public transport or the armed forces are included. Estonia's draft updated NECP sets a target to renovate 3% of the total useful floor area of buildings occupied by central government each year. It details measures that relate to the target, but they are not underpinned with sufficient information.

The draft updated NECP provides little information on what measures will be used to generate the **energy savings** required post-2020 under Article 7 EED (Article 8 EED recast). Estonia is required to make total 2021-2030 cumulative savings of 21,279 GWh, and it opted to use alternative policy measures. More details are needed to understand how these measures will help achieve the 2030 energy efficiency contributions. The draft updated NECP states that the target and the measures will be reviewed in light of the EED recast.

The updated draft NECP presents in detail the planned measures to achieve the 2030 **energy efficiency goals**, but not their expected savings. There is only one new measure to be adopted after 2020, as the draft updated NECP envisages continuing the existing framework. Adaptations and upgrades will be made in response to market conditions or other factors. The draft updated NECP does not include measures reflecting the '**energy efficiency first principle**'. The draft updated NECP states that Estonia mainly plans to achieve its primary energy consumption reduction target by taking action in the oil shale sector, on the domestic use of wood fuels and on the use of transport fuel.

The draft updated NECP does not update the target set in the 2020 **long-term renovation strategy** (LTRS) but repeats the main elements. In particular, the 2020 LTRS aims to achieve the complete renovation of the building stock built before 2000 by 2050. The LTRS includes targets for 2030, 2040 and 2050, and 5-year milestones, given for five types of buildings. These objectives were already considered as quite ambitious, and it was not clear from the LTRS assessment whether there are sufficient measures and funding to realistically achieve them.

The draft updated NECP lacks a sufficient description of the energy savings impacts of these measures, or of other co-benefits. Some measures refer to renovation areas in m², but they do not detail the energy gains or improvements in energy performance.

¹¹ The comparison has been done with the 2020 targets as included in the final NECPs 2020 JRC assessments (6.5 Mtoe PEC, 2.8 Mtoe FEC).

¹² e.g., FEC 30.19 TWh/year (p. 8), which corresponds to 2.59 Mtoe as above, FEC 115 PJ =32 TWh (p. 35) and FEC 120 PJ= 33.3 TWh (p. 38).

3.3 Energy security dimension

Fossil fuels provide the vast majority of Estonia's energy mix, as in 2021 they still generated 69% of the gross available energy. According to the draft updated NECP, Estonia plans for this share to fall slightly to around 62% (WEM scenario) and to 60% (WAM scenario) by 2030. Estonia is one of the most energy-independent Member States of the EU. Its ratio of **energy dependency** on third countries fell from 13% in 2013 to 11% in 2021¹³, the second lowest in the EU thanks to domestic production of oil shale, renewable energy and peat. However, Estonia is still fully dependent on imports for natural gas and oil products. Before Russia's invasion of Ukraine, it was highly dependent on Russian gas and Russian oil products for its needs.

Natural gas accounts for less than 10% of Estonia's energy mix and slightly over 10% of its electricity mix¹⁴. Estonia managed to reduce its exposure to Russian gas imports dramatically, decreasing its dependency from 98% in 2018 to 11% in 2021¹⁵. Estonia also managed to reduce its exposure to Russian gas imports quite substantially, decreasing its dependency from 98% in 2018 to 11% in 2021¹⁶. Gas imports from Russia have been banned since then. Estonia has since substantially improved the **diversification** of its gas supply. It did so, for instance, by cooperating with Finland on the Inkoo floating storage regasification unit (FSRU) and by commissioning the Paldiski LNG terminal.

Under Estonia's 2030 energy management development plan, Estonia set the following targets for 2030: 1) Compliance with N-1 standard¹⁷; 2) maximum of 70% share from the single largest source of gas supply; 3) maximum 32% market share of the largest gas seller. In line with its objectives to diversify supply, Estonia commits in the draft updated NECP to increase domestic **biomethane production** to 380 GWh per year by 2030 (against some 161 GWh in 2022). All in all, the draft updated plan convincingly outlines policy targets, though it lacks additional details on the measures to reach these targets.

In response to the Russian invasion of Ukraine, Estonia managed to significantly reduce its **gas consumption** by 35% over the period August 2022 to August 2023 compared to the average of the previous 5 years. This is well above the indicative 5% reduction target and the EU-27 average (18% reduction)¹⁸. However, the draft updated plan makes no reference to the measures adopted in the framework Council Regulation (EU) 2022/1369 of 5 August 2022 on coordinated demand-reduction measures for gas, nor how these measures are integrated into the medium-term plan for 2030.

In the electricity sector, one of Estonia's main goals is to accelerate its **synchronisation** with the continental European electricity network along with the other two Baltic States to 2025. Several key **infrastructure investments** are currently being implemented. The security of supply objectives include lowering energy imports, reducing the use of fossil gas and maintaining full energy independence from the Russian Federation. Another objective is to

¹³ Eurostat data.

¹⁴ Data from EU energy statistical pocketbook and country datasheets (europa.eu).

¹⁵ Data from EU energy statistical pocketbook and country datasheets (europa.eu).

¹⁶ European Commission, https://economy-finance.ec.europa.eu/system/files/2023-06/ip230_en.pdf

¹⁷ The N-1 criterion is a long-established operational standard to measure grid resilience, and which means that the network must be able to withstand the (temporary) loss of the biggest asset on the network.

¹⁸ DG ENER Chief Economist data, based on *ESTAT NRG_CB_GASM (sub-series IC_CAL_MG subtracted by TOS) in TJ (as of 29 September 2023, 11:00)*.

increase the use of renewable energy, with plans to build 1 GW of both onshore and offshore wind capacity. This appears reasonable given Estonia's wind potential and its 0.6 GW of solar power capacity. The Estonian government is launching auctions for new RES capacity, both technology-neutral and technology-specific, ensuring that it will meet the minimum target of 15% of electricity interconnection by 2030. This goal is supported by two new planned electricity interconnectors to Finland (EStLink 3) and with Latvia (Estonia-Latvia 4th interconnector). All in all, the targets and the monitoring process appear realistic.

To limit greenhouse gas emissions, domestic **oil shale production** will be put to different use, no longer being used for electricity generation but instead as input to chemical products. Adequacy studies predict that oil shale power plants will no longer be competitive on the market from 2027. Oil shale production must decrease to achieve climate neutrality by 2050. This makes the roll-out of renewable electricity production and storage (including seasonal storage) essential to maintain security of electricity supply.

Estonia is assessing several options for embarking on a **nuclear programme**. However, there is currently no legal framework, competent national authority nor the infrastructure needed for the commercial construction of new builds. Nonetheless, Estonia has carried out a significant amount of preparatory work. It has set up a dedicated working group with the task of drawing up a roadmap for the development of nuclear infrastructure, which is expected to be finalised in 2024. An interim report produced by the working group demonstrates that Estonia could integrate nuclear capacity of less than 350 MWe into the national grid. This means that innovative nuclear technologies such as small modular reactors could be an option, but a final decision is still pending. The draft updated NECP does not report details on measures to be possibly taken to diversify and address long-term supply of nuclear materials, fuel, spare parts, and services.

Storage is mentioned many times in Estonia's draft updated NECP, including under R&D activities, but the plan lacks clear objectives in terms of planned capacity. According to a study on storage commissioned by the European Commission, Estonia does not yet have any operational power storage capacity¹⁹. The recovery and resilience plan includes a pilot **energy storage programme**. One objective set out in the draft updated NECP is to remove the legal barriers to building energy storage. An additional objective is to promote demand-side response. A new hydro-pump storage facility in Paldiski is planned and identified as a project of common interest. Although the studies for the project are underpinned by co-financing under the Connecting Europe Facility, the project still faces difficulties in getting construction underway.

Estonia's draft updated NECP details action on grid flexibility to balance intermittent supply of renewable electricity generation with demand. Elering, Estonia's transmissions system operator (TSO), has set up the Estfeed data exchange platform to develop **flexibility services** in the market and Estonian institutions are involved in several European research projects on this topic and in TSO-DSO coordination.

¹⁹ This figure is derived from the database used for the ENTEC study on storage funded by the European Commission and published in November 2022, taking into account 'operational' facilities only: https://op.europa.eu/en/publication-detail/-/publication/dfcaa78b-c217-11ed-8912-01aa75ed71a1/language-en?WT_mc_id=Searchresult&WT_ria_c=37085&WT_ria_f=3608&WT_ria_ev=search&WT_URL=http%3A//energy.ec.europa.eu/.

Oil products account for over a third of Estonia's final energy consumption²⁰. The country has no refineries and imports 100% of its oil products. Last year, Estonia succeeded in substituting oil product imports from Russia (39% of imports in 2021) with other European countries in particular Lithuania, Finland and Poland²¹. Estonia does not have an oil pipeline network but can use its numerous seaports and rail network to import oil products. Emergency oil stocks are well above the EU requirements for emergency oil stocks and reflect the most in-demand oil products. Three quarters of oil products are used in the transport sector. To reduce **dependency on oil** products, the country promotes alternative fuel for road transport, in particular biofuels, electric cars and biomethane for public transport. No assessment is carried out on the adequacy of the oil infrastructure (oil stocks) with the future expected oil demand and the move toward biofuels and biomethane.

Cybersecurity is explicitly mentioned in Estonia's draft updated NECP. The requirements to ensure cybersecurity are laid down in the Cybersecurity Act. It also mentions the Critical Infrastructure Directive. The climate change adaptation plan includes eight priority areas, one being energy and energy supply. In summer 2022, the Baltic Regional Coordination Center (RCC) was established, adding a new layer to the operation of the grid at regional level.

The draft updated NECP does not describe the measures in the event of **security of supply crisis** for natural gas that are detailed in the Emergency Plan submitted to the European Commission in 2019 and which was under revision at the moment of the drafting of the plan. Estonia has not submitted its common risk assessment at risk group level for the North-eastern group (for which no country has yet volunteered to coordinate the work), which was due by 1 October 2022. It has however recently submitted its updated preventive action plan and emergency plan, as well as its National Risk assessment and the common risk assessment for the Belarus risk group, which are currently being assessed by the European Commission.

3.4 Internal energy market dimension

On infrastructure, since the adoption of the TEN-E Regulation²² in 2013, Estonia has completed gas Projects of Common Interests (PCIs) with neighbouring countries that increased the security of supply and helped it avoid severe disruptions after its decision to stop importing gas from Russia. Projects such as the Baltic connector between Estonia and Finland, in conjunction with the improved interconnection between Latvia and Estonia, the Klaipeda LNG Terminal in Lithuania, and the Świnoujście LNG Terminal have achieved market integration and reduced dependence on Russian gas in a region historically dependent on a single supplier. The situation is expected to keep improving as significant progress are made to the interconnection between Lithuania and Latvia and the Inčukalns

²⁰ Eurostat data. The gap between the low share of oil in the primary energy mix (4%) and the high share of oil products in final energy consumption (33%) is due to the fact that unconventional crude oil is produced from the liquefaction of oil shale, categorised as 'other' in the Eurostat primary energy mix.

²¹ Eurostat data.

²² Regulation (EU) No 347/2013 of the European Parliament and of the Council of 17 April 2013 on guidelines for trans-European energy infrastructure and repealing Decision No 1364/2006/EC and amending Regulations (EC) No 713/2009, (EC) No 714/2009 and (EC) No 715/2009, OJL 115, 25.4.2013 p. 39-75.

UGS. These projects have received maximum support from grants under the Connecting Europe Facility for Energy.

Estonia has tackled the short-term security of gas supply by securing LNG imports through the Inkoo floating storage and regasification unit (FSRU). To pursue its mid and long-term objectives to decarbonise its gas market; Estonia is concluding joint hydrogen infrastructure projects to link the supply of hydrogen from Finland to demand in the Baltic States into Poland. Hydrogen interconnections in Estonia will meet domestic needs, with national production capacities not yet projected to reach export levels.

The draft updated NECP does not give details on **electricity interconnectivity** targets, but Estonia already enjoys a good level of interconnectivity with its neighbouring Member States thanks to a decade-long infrastructure policy to prioritise integration of the Baltic States. The key issue, which was identified in the draft updated NECP, is to swiftly implement all synchronisation investments to enable Estonia and the other two Baltic States to synchronise with the continental European networks by early 2025, as agreed in August 2023 at the highest level. Further interconnections with Finland, as planned through Estlink3, and with Latvia will increase the security of electricity supply and further boost integration between the Nordic and the Baltic electricity systems.

In terms of flexibility, Estonia's draft updated NECP plans activities to develop a single market model for **demand-side response** and to remove the legal barriers to promote storage. Since 1 January 2017, all Estonian electricity consumers have been equipped with remotely readable meters in accordance with the national Regulation on the Network Rules, which is in line with the Electricity Market Act. Household customers are also able to start producing electricity for self-consumption and selling surplus electricity to the grid.

The draft updated NECP indicates that current investments in the context of Baltic synchronisation will contribute to **flexibility of the system**, understood as the system's ability to respond to rapid changes in electricity generation. In this context, Baltic system operators plan to open the market for frequency reserves. Estonian Transmission System Operators (TSOs) and Distribution System Operators (DSOs) are also participating in the EU-funded research project EU-SysFlex.

However, the draft updated NECP does not provide specific targets for system flexibility, though they can be derived from the indicative targets provided for security of supply. No assessment of flexibility needs was carried out either.

Measures addressing **energy poverty** are linked to maintenance support within the meaning of the Social Welfare Act and the receipt of subsistence allowance for households not exceeding the minimum wage. The draft updated NECP identifies 2% of number of households in energy poverty in 2021 facing difficulties in heating their homes, while 4.1% of households had energy bills arrears. The draft updated NECP briefly analyses these data and considers that they are not significant in comparison with EU average. The draft plan also indicates that the 'Wellbeing Development Plan 2023-2030' aims to reduce the absolute poverty rate to $\leq 2.2\%$ and the at-risk-of-poverty and social exclusion rate to 21% by 2030. However, these targets refer to overall poverty targets and do not refer exclusively to energy poverty.

Though not directly identified, the NECP indicates the relevance of financial support for renovation of residential homes as important to fight energy poverty. For instance, a total of 16,508 people received maintenance support for housing costs, including a loan for

apartment buildings, i.e., 1.2% of the Estonian population in 2021. The updated draft NECP does not set any specific sub-target for energy savings coming from energy poverty and affordable social housing.

Overall, the plan lacks a reference to national objectives, a specific timeframe to develop the specific measures announced and a link between energy efficiency and social policies and measures. The description of the current situation concerning energy poverty lacks a more focused analysis and explanations of synergies with measures to develop demand response, accelerate building renovation and energy savings in a targeted manner in order to have a direct effect on households in energy poverty and to empower vulnerable consumers.

3.5 Research, innovation, competitiveness and skills dimension

3.5.1 Research and innovation

The draft updated NECP reported on a number of studies, initiatives and measures related to aiming to strengthen Estonia's **clean energy innovation** landscape. Estonia reported on the national target for research and innovation (R&I) in the energy sector, and on the specific technologies and solutions needed to achieve the country's goal of carbon neutrality while ensuring energy and resource efficiency and energy security. Estonia identifies the 'Smart and Sustainable Energy Solutions' as one of the focus areas of its research and development (R&D) strategy, the innovation and entrepreneurship development plan 2021-2035 (TAIE development plan). The roadmap for this focus area includes energy generation, storage and consumption technologies and solutions, including solar, wind, wave, geothermal and bioenergy. While Estonia provided recent available figures on public and private R&I expenditure, it did not mention 2030 and 2050 targets and objectives in public and private spending in clean energy R&I.

The draft updated plan reported that Estonia cooperates actively in **clean energy R&I**, both at national level and with other Member States. At national level, cooperation between entrepreneurship and R&D&I is channelled through the TAIE development plan that runs for the next 15 years. Cooperation with other Member States takes place under different fora: through the Clean Energy Transition (CET) Partnership and the Driving Urban Transitions Partnership where the Estonian Research Agency and the Ministry of Economic Affairs and Communications (MKM) are members of the consortium of donors through the EU Horizon research partnerships. The CET partnerships in which Estonia is involved are closely linked to the SET plan priorities. Yet, the draft updated NECP did not provide any information on Estonia's direct involvement in the SET Plan. The draft updated NECP also reported on the importance for Estonia to support innovation and green technologies in carbon capture, storage and use. Estonia is also very active in the energy research projects funded by the EU's Horizon 2020 and Horizon Europe framework programmes.

3.5.2 Competitiveness

A number of measures that Estonia has put in place and reported in the draft updated NECP in the field of clean energy and digitalisation translate into the objective of boosting the country's economic competitiveness and its clean energy sector.

Estonia has mobilised investments designed to support research, innovation and investment in manufacturing and scaling up of commercially available **clean energy technologies**

(covering energy generation, storage and consumption technologies and solutions), equipment and components. For instance, Estonia's territorial just transition plan, endorsed by the European Commission in October 2022, aims to boost the economy by developing modern manufacturing industries in Ida-Viru County to support the transition to a climate-neutral economy.

The draft updated NECP highlights Estonia's 2035 strategy, which plans to bring in new solutions to support and strengthen the country's **R&I ecosystem** and thereby boost productivity and international competitiveness. The plan describes in detail the national energy development plan 2030 (ENMAK 2030) that sets clear targets and measures in the energy field to ensure a more competitive economy. The draft updated NECP also reports on several financing measures and implementing bodies to support research, innovation and development in the field of energy, including measures specifically supporting green technologies and start-ups, such as those under the Recovery and Resilience Facility. The draft updated NECP reports on measures and initiatives targeting specific clean energy technologies. For example, in March 2023, ministers endorsed Estonia's **hydrogen roadmap**, which outlines the actions needed to develop the hydrogen market. The roadmap describes the current state of play and areas in which hydrogen can play a role in achieving climate objectives, improving the competitiveness of the economy.

In terms of support and **investments in clean energy** start-ups and scale-ups, the draft updated NECP reported on activities that have made the country attractive for venture capital investments in the green and digital sectors. However, the plan did not report on the future development of the Estonia innovation landscape, including initiatives and measures to increase its attractiveness for venture capital investments and support to start-ups and scale-ups. Moreover, the plan does not provide sufficiently detailed information about the investments already implemented or planned for the manufacturing of key components for other net-zero technologies and for the deployment of other net-zero technologies in the different industrial ecosystems. Moreover, the plan does not elaborate in detail on how Estonia will ensure the resilience of its supply chains to reach its energy and climate targets.

The draft updated NECP reported on a number of measures and initiatives to support the **digitalisation** of several sectors, including energy, which are instrumental to increasing Estonia's competitiveness in the clean energy sector. As an example, the roadmap for the focus area of the TAIE development plan 'Digital solutions in all areas of life' lists 'sustainable digital solutions in energy, construction and transport' as one of the sub-streams. Other measures, such as R&I to boost the competitiveness of the cybersecurity sector, are also instrumental to the digitalisation of the energy system and its competitiveness.

3.5.3 Skills

The draft updated plan acknowledges the risk of skill shortages for the development of strategic sectors, without naming any sectors in particular. The plan reports that in order to underpin the green transition in enterprises, Decree No 208 of the Minister of Education and Research of 30 June 2022, lays down the conditions for granting support to investments related to "Green skills to support the green transition of enterprises", under the RRF. The objective of the support is to create flexible learning opportunities in business, making them more responsive to the development of the labour market, and to provide learning opportunities on skills related to the green transition. The plan does not include information

on skill gaps, nor on measures and investments to overcome them, apart from those financed under the RRP, as for instance: measures to boost European competitiveness in clean energy technologies, equipment and components; skills development required for the clean energy transition, connecting for instance with relevant European Year of Skills initiatives; the Pact for Skills large scale partnerships or the New Innovation Agenda.

4 JUST TRANSITION

The draft updated NECP addresses just transition aspects in a very limited manner. Specific national and sectoral strategies to identify and quantify the **employment, skills and social impacts**, of the energy and climate transition are lacking, and so is the analysis of other distributional impacts on vulnerable groups. The plan also does not provide sufficient information for the preparation of the Social Climate Plan, as assessed in Chapter 7.

The measures to address access and preservation of **quality employment** and access to **quality, affordable and inclusive education, training and life-long learning** are not presented in sufficient detail. Overall, the draft updated NECP does not provide details on national objectives and targets for upskilling, and labour market mobility solutions to contribute to the green transition. One exception is the Decree No. 208 (2022), which lays down the conditions for granting support to investments in green skills under the RRF.

The draft updated plan highlights the support for people and communities negatively affected by the transition in the oil shale sector in the region of Ida-Virumaa, but does not refer to the commitments to phase-out oil shale in energy production by 2040 included in a Territorial Just Transition Plan, which brings into question the related planned actions financed by the Just Transition Fund.

The draft updated NECP also lacks a complete analysis of the situation of **vulnerable consumers and energy poor households**, and sufficient measures for empowering consumers, and fostering energy savings for people in energy poverty and vulnerable consumers (see Chapter 3). The plan does not explain in detail which resources will be allocated to supporting the just transition other than in the case of Ida-Virumaa region, where the Just Transition Fund is being used.

5 REGIONAL COOPERATION

Overall, the plan provides a very good coverage to the **regional cooperation dimension**. The draft updated NECP lays down the different regional cooperation fora in which Estonia participates. The strong involvement in the different workstreams of the **Baltic Energy Market Interconnection Plan** (BEMIP HLG) is described in detail. The Commission has provided political, technical and financial support within the BEMIP HLG to advance the infrastructure investments needed to complete the project.

The latest agreement to accelerate their **synchronisation** to early 2025 made by the leaders of the three Baltic States is another tangible result of regional cooperation in the BEMIP format. Estonia has been actively working with neighbouring Member States in the BEMIP HLG and has committed to a **non-binding offshore wind goal** to install 1 GW of capacity in 2030 and 7 GW in 2040, contributing to the overall goal to have 22.4 GW of offshore wind capacity in the Baltic Sea. These goals, set under the new Trans-European Energy Networks Regulation feed into an integrated onshore and offshore grid plan that identifies

infrastructure needs and projects in line with maritime spatial planning constraints, different uses of the sea space, and other environmental considerations.

Estonia is equally active in the emerging workstream on **decarbonising gas networks** in the region, work that feeds into its proposed measures on hydrogen production and deployment. Estonia has already signed two solidarity arrangements for gas supply with its neighbours, Finland and Latvia.

On renewable energy, Estonia actively cooperates with Latvia on joint projects and made a successful application under the Connecting Europe Facility under the heading for renewable energy cross-border projects.

Estonia's active engagement in multiple regional cooperation fora have yielded concrete results in terms of joint political commitment to achieve energy and climate policy goals for the region and agreements on coordinated action and joint projects to achieve these goals.

6 INTERNAL COHERENCE AND POLICY INTERACTIONS WITHIN THE DRAFT UPDATED NECP

The draft updated NECP reflects to a certain extent **key synergies** within and between the five dimensions of the Energy Union, including the impact of increasing flexibility and demand-response measures on the take up of renewable energy and integration of the internal energy market. Similarly, the plan makes a direct link between the key objectives of **diversification of energy sources** and the roll-out of renewable sources. However, it did not provide a detailed analysis of the consistency of policies and measures under each dimension nor a quantitative analysis of interactions between certain objectives.

7 STRATEGIC ALIGNMENT WITH OTHER PLANNING INSTRUMENTS

Estonia was the first Member State that formally **submitted a modified RRP, including a REPowerEU chapter**, which was approved by Council on 16 June 2023. The updated NECP makes several mentions of the REPowerEU Chapter. In particular, the amended RRP provides granular information on the contribution of this chapter and the overall amended RRP to achieve the NECP targets. A table also identifies the synergies between RRP and NECP measures.

The draft updated NECP describes in a qualitative manner the impact of selected policies and measures on air pollutants, also pointing out trade-offs for energy measure for further development on heating management in replacing district heating with local heat production. The draft updated NECP does not clearly explain whether the modelled scenarios are aligned with the projections submitted under Directive 2016/2284, and more generally how clean air **national air pollution control Programs** and energy and climate programmes are aligned.

The draft updated plan is partially consistent with the **Territorial Just Transition Plan (TJTP)**. The inconsistency refers to the lack of a clear commitment to phase out the use of oil shale compared to the adopted Territorial Just Transition Plan (TJTP), which states that the Estonian government will end additional investment in fossil fuels and electricity production from oil shale by 2035 at the latest and will phase out the use of oil shale in energy by 2040 at the latest.

The plan provides inadequate analytical basis for the preparation of the **social climate plan** (SCP) that 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. The plan acknowledges the availability of funding from the Social Climate Fund (SCF) and mentions that several strategy papers are being drafted to explore possible synergies between the SCF funds and other state-supported activities. It is also mentioned that the SCP will be linked to the next version of the NECP. However, at this stage, the plan stops short of any detail. The plan does not outline reforms and policy framework for the future SCP. It does not explain how the SCP will build on the NECP update and how the consistency between the two plans will be ensured.

In the draft updated plan, Estonia does not quantify the climate impacts of measures currently included in the CAP Strategic Plan (CSP). Thus, the plan does not explain whether the CSP is in line with the new LULUCF and ESR targets and whether additional measures are necessary. The plan is overall consistent with the **national adaptation strategy**, which is currently being updated.

Estonia's draft updated NECP addresses the challenges identified in the 2022 and 2023 European Semester **country-specific recommendations**. The draft updated NECP includes action to reduce the dependency on fossil fuels by putting forward ambitious measures to accelerate the roll-out of renewables. The draft updated NECP also responds to the country-specific recommendations in its coverage of the synchronisation project and electricity security of supply. However, the level of ambition of the plan on energy efficiency, covered in the country-specific recommendations for both 2022 and 2023, is limited. An analysis of the skills gaps is also lacking.

8 FINANCING THE ENERGY AND CLIMATE TRANSITIONS

8.1 Investment needs

The draft updated NECP does not provide an estimation of the total investment needs. It includes only partial information on the expected investment needs to implement the planned policies and measures. The plan presents the results of different studies estimating sectoral investment needs. However, estimates are based on different methodologies, making comparisons and aggregation difficult. For instance, the plan estimates at EUR 24-30 billion the needs for the full **renovation of the building stock**, based on the long-term strategy for the renovation of buildings. However, the result of another study on '**carbon-neutral heating and cooling by 2050**' estimates the costs of renovation of buildings at EUR 16.7 billion of heating and cooling technologies at EUR 2.3 billion, and of district heating and cooling infrastructure at EUR 1 billion. Based on the information provided, it is not clear how these figures should be interpreted.

On **energy efficiency**, the policies and measures included in the draft updated NECP do not report information on the planned budget. However, a detailed section related to the investment needs is included, listing different funds and dedicated financing schemes. However, none of them meet exactly the requirements of the National energy efficiency fund. The social climate fund, the housing investment fund and several Kredex grants for renovations are listed as sources to support the measures and dedicated targets (e.g., energy poverty) in the plan.

8.2 Funding sources

The draft updated NECP does not present the main sources of financing used to implement the planned key policies and measures, including for the fair and just transition. However, it contains an overview of the EU budgetary programmes, including revenues from the EU-ETS, to be used for the measures included in the plan. The plan includes an overview of the support measures by sector for the period 2022-2027, which amount to EUR 3.15 billion.

However, the plan does not provide information on the sources of financing of each policy and measure, nor on the public and private shares. Similarly, the plan contains no information on the expected share of financing sourced from EU funds.

9 ROBUSTNESS OF THE ANALYTICAL BASIS OF THE DRAFT UPDATED NECP

The draft updated NECP includes a quantitative analysis, including projections with existing measures (WEM) and with additional measures (WAM). The WEM scenario covers all dimensions of the Energy Union and includes detailed projections for the relevant sectors of the economy, including industry, the energy system and transport, while the WAM is incomplete. The projections cover the period until 2050.

The methodologies used for projections and impact assessment of specific policies and measures are neither described nor referenced. The assumptions used for the analysis are also not documented, particularly for what concerns the policies and measures included in the WEM and WAM scenarios. However, key model parameters such as gross domestic product, population as well as fuel and emissions prices are reported, ensuring a minimal transparency of the model-based projections. The analysis is only partially based on the parameters recommended by the Commission. The new ETS for buildings, road transport and additional sectors (ETS 2) has been considered in the projection scenarios but not in the plan.

The draft updated NECP lacks a **quantitative macro-economic assessment**. The macro-economic impacts of individual measures of the plan have been only partially and qualitatively mapped. The analysis of the impact on public finances, notably on the budget, public debt and debt to GDP ratio, is missing.