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CORRIGENDUM

This document corrects document SWD(2020) 925 final of 14.10.2020

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

- Minor editorial changes throughout the document.

The text shall read as follows :

COMMISSION STAFF WORKING DOCUMENT

Assessment of the final national energy and climate plan of Finland

Table of contents

1. SUMMARY	2
2. FINALISATION OF THE PLAN AND CONSIDERATION OF COMMISSION RECOMMENDATIONS.....	4
Preparation and submission of the final plan	4
3. ASSESSMENT OF THE AMBITION OF OBJECTIVES, TARGETS AND CONTRIBUTIONS AND OF THE IMPACT OF SUPPORTING POLICIES AND MEASURES	7
Decarbonisation.....	7
Greenhouse gas emissions and removals	7
Renewable energy	8
Energy efficiency	9
Energy security	10
Internal energy market	10
Research, innovation and competitiveness.....	11
4. COHERENCE, POLICY INTERACTIONS AND INVESTMENTS	12
5. GUIDANCE ON THE IMPLEMENTATION OF THE NATIONAL ENERGY AND CLIMATE PLAN AND THE LINK TO THE RECOVERY FROM THE COVID-19 CRISIS.....	13
Link to the recovery from the COVID-19 crisis	16
ANNEX I: POTENTIAL FUNDING FROM EU SOURCES TO FINLAND, 2021-2027	18
Table 1: EU funds available, 2021-2027: commitments, EUR billion.....	18
Table 2: EU funds available to all Member States, 2021-2027, EUR billion.....	19
ANNEX II – DETAILED ASSESSMENT OF HOW COMMISSION RECOMMENDATIONS HAVE BEEN ADDRESSED.....	20

1. SUMMARY

Finland's current long-term objective is to reduce its **GHG emissions** by 80-95%, and the final integrated national energy and climate plan (NECP)¹ aims to achieve this level of emissions reduction by 2035. Finland's 2030 target for **non-EU Emission Trading System (non-ETS) greenhouse gas emissions** is -39% compared to 2005, as set in the Effort Sharing Regulation (ESR)². Finland also intends to use some of the flexibilities provided for by the ESR, including the one between the emissions trading system (ETS) and the ESR sector, which it intends to use to the maximum amount, i.e. 2% of 2005 emissions per year. Based on information provided in the plan on decarbonisation, existing and planned policies and measures, together with the indicated use of flexibilities, could be sufficient for Finland to meet its target. If implemented, planned additional policies may deliver significant emission reductions, notably in transport and agriculture, while a smaller impact is expected in the buildings sector. The plan states that it is possible for Finland to avoid creating any land use, land use change, and forestry (LULUCF) debits, but does not clarify how and does not provide any projections. It puts an emphasis on bioenergy, but does not consider in depth the sustainability of biomass and the impact on the carbon sink. Finland acknowledges that the final plan would need to be revised in view of the ambitious 2035 climate net neutrality target.

Finland's **renewable energy contribution to the European Union's 2030 target**, 51% of gross final energy consumption in 2030, is adequate and in line with the formula in Annex II of Regulation (EU) 2018/1999 on the Governance of the Energy Union and Climate Action ('the Governance Regulation').

For **energy efficiency**, Finland's contribution to the EU target is not ambitious³ and amounts to 25 Mtoe of final energy consumption, translating into 34.8 Mtoe of primary energy consumption. The final plan provides some details on the energy efficiency of buildings, including preliminary targets. Finland submitted its long-term renovation strategy on 10 March 2020⁴.

Regarding the **internal market and energy security**, Finland aims to improve energy security further through a well-functioning domestic and regional electricity market. The plan refers to the national target of 55% for energy self-sufficiency (excluding electricity produced domestically with nuclear power). The target for 2030 is to keep the electricity interconnection level above 15%.

On **research, innovation and competitiveness**, the NECP mentions a general objective of raising investment in research, development and innovation to 4% of GDP. Detailed information on implementing measures (sectors, timeframe, role of public and private funding) is missing.

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

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

³ In accordance with the methodology in SWD(2019) 212 final.

⁴ Finland submitted its long-term renovation strategy in accordance with Article 2a of Directive 2010/31/EU on the Energy Performance of Buildings on 10 March 2020. However, this assessment is only based on the building-related elements provided in the final NECP.

The NECP provides information on sectoral **investment needs**. However, it does not include complete overall figures for all energy-related investment needs throughout the 2021-2030 period.

The NECP mentions that there is no established view in Finland as to which energy subsidies are considered **fossil fuel subsidies**. Nonetheless, a list of renewable energy and environmentally harmful energy subsidies is included in the final plan. It appears to reflect the figures identified in recent Commission analyses on energy subsidies and states that the Finnish Government intends to start preparing to cut environmentally harmful energy subsidies.

The final plan includes a mostly qualitative evaluation of the impacts of change in fuel use on **air quality and air emissions**.

The **just and fair transition** dimension is mentioned as a ‘guiding theme of climate policy’, and the NECP provides some estimates of the impact of economic growth and employment.

On **energy poverty**, Finland considers that few households suffer from energy poverty. This is why the country does not have related national objectives.

There are several examples of **good practices** in Finland’s final NECP, particularly the objective of becoming carbon-neutral by 2035 and the emphasis given to regional cooperation.

The following table presents an overview of Finland’s objectives, targets and contributions under the Governance Regulation⁵:

	National targets and contributions	Latest available data	2020	2030	Assessment of 2030 ambition level
	Binding target for greenhouse gas emissions compared to 2005 under the Effort Sharing Regulation (ESR) (%)	-11	-16	-39	As in ESR
	National target/contribution for renewable energy: Share of energy from renewable sources in gross final consumption of energy (%)	41.2	38	51	Adequate (51% is the result of RES formula)
	National contribution for energy efficiency: Primary energy consumption (Mtoe) Final energy consumption (Mtoe)	32.7 25.8	35.9 26.7	34.8 24.9	Low ambition

⁵ Regulation (EU) 2018/1999 of the European Parliament and of the Council of 11 December 2018 on the Governance of the Energy Union and Climate Action, amending Regulations (EC) No 663/2009 and (EC) No 715/2009 of the European Parliament and of the Council, Directives 94/22/EC, 98/70/EC, 2009/31/EC, 2009/73/EC, 2010/31/EU, 2012/27/EU and 2013/30/EU of the European Parliament and of the Council, Council Directives 2009/119/EC and (EU) 2015/652 and repealing Regulation (EU) No 525/2013 of the European Parliament and of the Council.

	Level of electricity interconnectivity (%)	29%	18	Above 15%	N.A.
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Sources: EU Commission, Energy statistics, Energy datasheets: EU countries; European Semester by country; Finland's final national energy and climate plan.

2. FINALISATION OF THE PLAN AND CONSIDERATION OF COMMISSION RECOMMENDATIONS

Preparation and submission of the final plan

Finland **notified** its final NECP to the European Commission on 20 December 2019.

The **public consultation** on the NECP built upon a long-established consultation process on energy and climate policies in the country. The targets, policies and measures in the Finnish plan had already gone to public consultation when preparing the national energy and climate strategy (2016) and the medium-term climate change policy plan (2017). This process involved the national parliament, regional and local authorities, social partners, civil society and the general public. It included a citizens' survey, panel discussions, expert events, consultations of stakeholders and public debates.

In early December 2019, an almost final version of the NECP was submitted to public consultation. Finland has provided a summary of the public's views and how those views have been taken into account in the final NECP. However, the plan also provides a link to the online background report on the energy and climate strategy⁶, which includes the opinions expressed in the survey. There is no indication of a strategic environmental impact assessment (SEA) of the NECP under Directive 2001/42/EC.

Consideration of Commission recommendations

In June 2019, the Commission issued nine recommendations based on Finland's draft plan, for consideration in the final plan⁷. Annex II to this staff working document provides a detailed account of how the different elements of the Commission recommendations have been reflected in the final NECP. Overall, the final plan **partially addresses** these recommendations.

The recommendation on **greenhouse gas emission** reductions is **partially addressed**. Finland has provided a scenario assessing the impacts of planned measures on effort sharing sectors, but the measures are still incomplete. Finland expects to comply with the no debit rule for the LULUCF sector and provides some information on the expected trends in various LULUCF categories. However, there is no quantified projection about how many LULUCF credits Finland expects to generate due to uncertainty in the estimates.

On **renewables**, the recommendation is **largely addressed**. Finland fully addresses the recommended increase in the level of ambition for 2030 to at least 51% of gross final energy consumption. The plan also includes an indicative trajectory for minimum levels until 2030, in

⁶ <https://tem.fi/documents/1410877/3570111/Energia-+ja+ilmastostrategian+TAUSTARAPOR>.

⁷ Commission Recommendation of 18 June 2019 on the draft integrated national energy and climate plan of Finland covering the period 2021-2030, C/2019/4426.

line with the minimum requirement for the national development of renewable energy⁸. However, Finland only proposes detailed and quantified policies and measures to a limited extent. Finally, the NECP does not provide sufficient details on the enabling framework for renewable energy self-consumption and renewable energy communities.

On **energy efficiency**, Finland **partially addressed** the recommendation to increase the ambition to reduce both final energy consumption (FEC) and primary energy consumption (PEC) and to provide more explicit details on policies and measures. Although the final plan shows an increase in ambition compared to the draft NECP, it is still assessed as low compared to the level of efforts at EU level. On buildings, the information presented with the final plan has improved. The long-term renovation strategy was submitted on 10 March 2020.

On **energy security**, Finland **largely addressed** the recommendation to specify the measures supporting the energy security objectives on diversification and reduction of energy dependency, including measures ensuring flexibility. The main security measure emphasised by Finland is a well-functioning electricity market that provides the right signals for any necessary investments. The country aims to achieve diversification and flexibility through market rules to encourage energy storage and demand side response.

On **research, innovation and competitiveness**, Finland **partially addressed** the recommendation to clarify the national objectives and funding targets and to underpin such objectives with specific and adequate policies and measures. The NECP includes a goal to raise research, development and innovation investments to 4% of GDP and mentions the need for low-carbon technologies. However, no details are provided on the timing, the related policies and measures, the distribution among activities or the interplay between public and private investments.

Finland **fully addressed** the recommendation to intensify **regional cooperation** with Nordic countries and broaden the geographical reach to include the Baltic States. The country also plans to expand active cooperation on the internal energy market and energy security to wider climate policy. Finland has a wide range of energy and climate cooperation initiatives with Nordic countries, including the establishment of the Nordic Electricity Market Forum, and is strengthening its cooperation with Baltic countries on integrating electricity and gas markets.

Finland **largely addressed** the recommendation to list all **energy subsidies**, particularly subsidies for fossil fuels, actions that have been undertaken and plans to phase out these subsidies. The plan includes a catalogue of environmentally harmful energy subsidies, notably tax expenditure items, along with a description of aid schemes to support renewable energy. There are no plans to phase out the energy support scheme (investment subsidies for renewables and emissions reductions in non-ETS sectors). Nonetheless, Finland intends to launch preparatory work aimed at making cuts to environmentally harmful subsidies and redirect the funds released to use in line with current policy targets.

Finland **partially addressed** the recommendation to complement the **analysis on air quality**. The NECP provides a qualitative assessment of the expected effect of changes in fuel use (specifically, the declining use of coal and increasing use of wood) on some air pollutant

⁸ Described in point (a)(2) of Article 4 of the Regulation EU 2018/1999 on the Governance of the Energy Union.

emissions. However, it lacks a proper quantitative assessment and does not consider possible synergies and trade-offs, notably on the impact of increasing bioenergy use.

Finland **partially addressed** the recommendation to integrate better **just and fair transition** aspects, notably by providing more details on the social, employment and skills impact of the objectives in the plan, and on relevant policies and measures. The plan highlights fair transition as a guiding theme in the government's climate policy and announces a number of initiatives. However, there is a need to provide more information on the social, employment and skills impact of the planned objectives and to develop specific plans and measures .

Links with the European Semester

In the context of the European Semester framework for the coordination of economic policies across the EU and of the country report 2019⁹, Finland received one country-specific recommendation¹⁰ in relation to climate and energy, calling on it 'to focus investment-related economic policy on research and innovation, low-carbon and energy transition and sustainable transport, taking into account regional disparities'. In the 2020 country report¹¹, adopted on 20 February 2020, the Commission found that Finland had achieved limited progress on this recommendation,.

Due to the COVID-19 crisis, the European Semester country-specific recommendations for 2020 addressed Member States' responses to the pandemic and made recommendations to foster economic recovery. In particular, they focused on the need to start mature public investment projects as soon as possible and promote private investment, including through relevant reforms, notably in the digital and green sectors. In this context, Finland received a country-specific recommendation¹² stressing the importance of focusing investment on 'the green and digital transition, in particular on clean and efficient production and use of energy, sustainable and efficient infrastructure as well as research and innovation'.

The Governance Regulation requires Member States to ensure that their national energy and climate plans take into consideration the latest country-specific recommendations issued in the context of the European Semester. Finland's national energy and climate plan has the potential to support the implementation of the European Semester recommendations, as it identifies the necessary investments and financial resources to deliver them.

⁹ The Annex D to the 2019 Country report also sets out priority investments for the 2021-2027 cohesion policy, substantially contributing to the clean energy transition.

¹⁰ Recommendation for a Council Recommendation on the 2019 National Reform Programme of Finland and delivering a Council opinion on the 2019 Stability Programme of Finland, COM(2019) 526 final.

¹¹ Commission staff working document, Country Report Finland 2020, SWD/2020/525 final.

¹² Recommendation for a Council Recommendation on the 2020 National Reform Programme of Finland and delivering a Council opinion on the 2020 Stability Programme of Finland, COM(2020) 526 final.

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

Decarbonisation

Greenhouse gas emissions and removals

Finland's current long-term objective remains that of reducing its GHG emissions by 80-95% by 2050, which is consistent with its current low-carbon development strategy.

The NECP also includes additional targets to achieve carbon neutrality by 2035 and to become the world's first fossil fuel welfare society. However, Finland acknowledges that the current final plan needs to be adapted to achieve these objectives and that several policies and measures remain to be prepared and agreed to ensure consistency with the new targets.

Finland's **non-ETS target** is -39% by 2030 compared to 2005. According to the final plan, this corresponds to 20.6 Mt CO₂eq emissions as a maximum in 2030. The starting point of the linear trajectory for 2021-2030 is estimated at 30.2 Mt CO₂eq, which, with existing measures, results in a gap of about 5 Mt CO₂eq in 2030. The plan describes additional policies and measures to cover the gap between the projection with existing measures and the ESR emission target in 2030. The plan also substantiates the intended use of some ESR flexibilities, including the flexibility between ETS and ESR, which is available to Finland, and which it intends to use to the maximum amount, i.e. 2% of 2005 emissions, corresponding to 0.7 Mt CO₂eq per year. With the indicated use of flexibilities, and the existing and planned policies and measures, Finland would achieve its non-ETS target in 2030, assuming that the LULUCF sector generates no debit.

For the **transport** sector, which, with 11.3 Mt CO₂eq in 2017, accounts for 40% of Finnish effort sharing emissions, Finland has an ambitious sectoral target to reduce GHG by at least 50% by 2030 compared to 2005. The final plan identifies a broad range of measures in this sector including transport fuel taxation, increasing the use of biofuels in road transport (up to 30%), support for alternative fuels, and the improvement of energy efficiency of vehicles and the transport system. Finland aims to have 250 000 electric vehicles on the road and 25 000 recharging points by 2030. A roadmap for fossil-free transport is scheduled for the end of 2020, which will present measures to halve GHG emissions from national transport by 2030 and to achieve net-zero transport emissions by 2045. The roadmap is intended to consider measures to reduce emissions from sectors such as shipping and aviation and measures to increase efficiency, which are not addressed in the NECP.

The greenhouse gas emissions of **buildings** are estimated at 7.7 Mt CO₂eq in 2020 and are expected to reduce significantly to 2.9 Mt CO₂eq in 2030, 1.6 Mt CO₂eq in 2040 and 0.7 Mt CO₂eq in 2050, i.e. a reduction of, respectively, 62%, 80% and 91% compared to the 2020 estimate. The plan mentions that the emission reductions are driven by: energy efficiency improvements in renovations, as well as improved building maintenance and automation practices; decarbonisation of heating through changes in heating sources (removals of oil-fired heating boilers and installations of heat pumps); efficiency of space utilisation; and decarbonisation of centralised energy production (district heating and electricity).

LULUCF is an important sector in Finland, where about 72% of the land is forested. Finland's plan considers **LULUCF and agriculture** and includes policies and measures for the two sectors, notably on manure management, mitigation of emissions from organic soils, the increase

of carbon storage, afforestation of organic soils, promotion of biogas production, active forest management, preventing land use change, and implementing a pilot for carbon sequestration and storage markets. The plan refers to the common agricultural policy as a tool for reducing GHG emissions from agriculture. Bioenergy is also considered, being well integrated into the forest system. The plan provides information on historical and future emissions and removal trends in each LULUCF category, including a description of the accounting baseline for forests (the national forest reference level, submitted as required by Article 8(3) of the LULUCF Regulation¹³). The plan clarifies that it is possible for Finland to avoid creating any LULUCF debits, but specific estimates are not disclosed due to uncertainty.

The plan includes contributions and some possible measures in product use and the **fluorinated gas** sector (EU level policies), which will reduce emissions of F-gases from 1.3 Mt CO₂eq in 2017 to 0.59 Mt CO₂ by 2030.

The plan mentions Finland's goals in its **climate adaptation** policy, which has been incorporated into normal planning and decision-making processes in different sectors, and the role of the national climate change adaptation plan. It underlines, in particular, the importance of ensuring energy security of supply in case of extreme weather conditions.

Finland notified its long-term strategy to the Commission on 22 April 2020. Finland aims to become carbon neutral by 2035. This objective covers GHG emitted in all sectors of the economy, and the natural sinks will compensate for the remaining emissions that are most difficult to abate. The long-term strategy addresses most of the elements required by Article 15 of the Governance Regulation.

Renewable energy

The national contribution to the 2030 EU **renewable energy** target is specified in the plan at a level of 51% in gross final consumption of energy in 2030 (compared to 41.2% in 2018). This is considered adequate, as it is in line with the share that results from the formula in Annex II of the Governance Regulation. The indicative trajectory for intermediate years is in line with the minimum requirements¹⁴. The assessment of the impact of the policies and measures that Finland puts forward appears to be consistent with the overall renewables target.

The main policies and measures planned in this area appear to be consistent with the overall renewables target, since the scenario with additional measures (WAM) is expected to lead a total share of renewable energy of 54% of gross final energy consumption (i.e. higher than the target of 51 %).

Finland has not set a specific target for renewables in **electricity**. However, the scenario with additional measures projects a share of renewables in electricity of 53% (52% in the scenario with existing measures (WEM), vs 38.8% in 2018).

A number of measures target the use of renewables in **heating and cooling**, including a quota obligations for biofuels in heating and the phasing out of oil heating. However, no specific target is provided. The main policies and measures planned in this area are projected to lead to an

¹³ 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.

¹⁴ Pursuant to Article 4(a)(2) of Regulation EU 2018/1999 on the Governance of the Energy Union.

increase of the renewables share in heating and cooling to 61% in 2030 (59% in the WEM scenario vs 54.7% in 2018).

The proposed renewable energy share in the **transport** sector, as requested in Articles 25-27 of Directive 2018/2001¹⁵, is 45%¹⁶, a significant increase compared to the current level (14.9% in 2018). The aim is to achieve this via fuel taxation, an increase of the quota obligation for biofuels in road transport to 30%, and by the development of electromobility. The plan mentions a roadmap for fossil-free transport to be drafted by the end of 2020, which would present the measures to halve GHG emissions from national transport by 2030 and to achieve net-zero transport emissions by 2045.

Energy efficiency

Finland's **national contribution for energy efficiency** in 2030 is set at 25 Mtoe of final energy, translating into 34.8 Mtoe of primary energy consumption. The role of new nuclear capacity as a driving factor for primary energy consumption is clear. In contrast, the arguments for a fairly stable final energy consumption by 2030 are not well detailed. Finland explains the contribution of heavy industries with high energy intensity (such as pulp production, biorefineries and data centres) to projected GDP growth, but does not specify which policies and measures would mitigate the likely increase in energy use.

The plan describes **policies and measures** beyond 2020, targeting all sectors. Finland has included new measures for the transport sector (transport fuel taxation, promoting modal shifts, rail infrastructure investments), agriculture and waste heat. However, some of these measures do not have energy efficiency as the main scope and some have already been implemented. Due to the lack of an underlying methodology, it remains unclear whether the contribution of these measures to expected energy savings would be sufficient to meet the overall savings target. Only a few measures include quantified energy savings or emission reduction potential.

Finland presents the **cumulative savings** to be achieved under Article 7 of the Energy Efficiency Directive¹⁷ at a level of 105 TWh (9.03 Mtoe). The calculation of the Article 7 target was not carried out in accordance with point (b) of Article 7(1) of the Energy Efficiency Directive, since a proper baseline was not used. Finland aims to attain the target primarily by means of voluntary agreements combined with other measures (e.g. fiscal incentives, tax measures). These policies and measures are considered sufficient to achieve Finland's proposed energy efficiency target, taking into account the preliminary estimates, the past performance of Finnish voluntary agreements and the energy-saving potential of energy taxes.

Regarding **buildings**, the plan presents the initial target levels for heating energy use by buildings (excluding saunas) at 54 TWh in 2030, 45 TWh in 2040 and 37 TWh in 2050, including the energy harvested by heat pumps. This corresponds to energy savings of 16% in 2030, 30% in 2040 and 42% in 2050, when compared to the baseline of 2020. The NECP does not provide a description of policies and measures that will achieve these targets, but broadly suggests that these reductions will be due to energy efficiency improvements and maintenance, removals from the building stock and efficiency of space utilisation. The national long-term renovation

¹⁵ Directive (EU) 2018/2001 of the European Parliament and of the Council of 11 December 2018 on the promotion of the use of energy from renewable sources (recast).

¹⁶ Considering the application of multipliers for electricity and for feedstock listed in Annex IX.

¹⁷ Directive 2012/27/EU of the European Parliament and of the Council of 25 October 2012 on energy efficiency as amended by Directive (EU) 2018/2002.

strategy¹⁸ describes other measures, such as subsidy schemes for housing companies, voluntary energy efficiency agreements, and energy efficiency measures in the field of district heating and cooling, are provides further details about them. It is not clear, though, whether these measures are enough to help decarbonise the Finnish buildings sector.

Energy security

Maintaining a high level of security of supply is crucial to transforming the energy system, with an objective of 51% of renewable energy in Finland by 2030. When considering risks, the plan takes into account the plans of neighbouring Member States on a technical level in terms of cooperation on market rules and on a political level in the Nordic region through the establishment of an annual forum.

Finland is opening its gas market from the beginning of 2020. This is linked to the construction of the Balticconnector gas pipeline and the related objective of creating a regional gas market comprising Finland and the Baltic States, which will help greatly to diversify natural gas supply.

For the electricity sector, Finland maintains a strategic reserve to ensure that peak demand can be met. It is competitively tendered by the National Regulatory Authority and open to power plants and demand side response.

Finland shows a long-term commitment to nuclear energy, with the planned commissioning of the Olkiluoto OL3 nuclear power plant in the coming year and one additional unit (Hanhikivi 1) planned for the late 2020s. The operation permits for the Loviisa 1 and 2 units are currently in force until 2027 and 2030 respectively. No additional measures are included in the final NECP concerning the diversification and long-term supply of nuclear materials and fuel.

Reference is made to cyber security exercises that have been carried out, although the plan provides no overall assessment of how resilient the energy sector is. In relation to critical infrastructure, the NECP sets out investment plans and states that networks are resilient to extreme weather conditions. However, it does not cover resilience to other risks.

The plan envisages further measures to encourage flexibility through storage and demand side response and through investments in network infrastructure. It also considers peat stocks to be important for energy security. The planned policies and measures are considered credible in relation to the achievement of the energy security objectives because of the mix of domestic and regional measures, particularly in the gas and electricity sector. However, long-term supplies of materials and fuel in the nuclear sector need to be addressed.

The NECP considers links between energy security issues and the **emergency plans** for gas, electricity and oil, provided for by the applicable sectoral rules, including the regional dimension.

Internal energy market

The plan states that Finland's electricity interconnection target for 2030 is to keep the level of interconnectivity above 15%, which is above the target set at EU level, despite some changes in installed capacity for both generation and interconnection. The ratio of interconnectivity is expected to decline, notably due to the commissioning of the Olkiluoto OL3 nuclear power plant. On the other hand, the plan lists current projects of common interest that aim to contribute to

¹⁸ Finland submitted its long-term renovation strategy in accordance with Article 2a of Directive 2010/31/EU on the Energy Performance of Buildings on 10 March 2020.

interconnectivity, and analyses how the rising electricity demand by 2025 affects the level of electricity interconnectivity and the need for infrastructure.

The plan provides a broad overview of current **market conditions** for gas and electricity, particularly for measures to increase flexibility, market integration and regional cooperation. Well-functioning electricity and gas markets are considered fundamental for delivering security of supply and decarbonisation. To this end, the Finnish gas market has been opened up in 2020 and a Nordic Electricity Market Forum has been established to ensure coordination and the path towards a common goal for the Nordic energy markets. Finland has plans to further encourage flexibility in its electricity market through demand side response and energy storage, although clear forward-looking objectives and targets have not been established.

The final plan includes objectives, policies and measures related to the internal energy market, such as measures to ensure the non-discriminatory participation of new market participants and ongoing participation in EU platforms for day-ahead, intraday and balancing markets. Those measures are considered sufficient to achieve the objectives, particularly because of the commitment to pursuing the objectives in close coordination and through a common approach with their neighbours.

With the opening of the Balticconnector gas pipeline, gas price regulation will be dropped. The plan also refers to the fact that Finland has been at the forefront of promoting real price signals (with 9% of retail customers on dynamic electricity price contracts) and the roll-out of smart meters. Regarding the role of new actors in the new electricity market design, the final plan further elaborates on the work of the Smart Grids Working Group to promote the role of ‘prosumers’, aggregators and energy communities and to support demand side response. The final plan also contains more information on existing consumer protection measures, and suggests that further measures are to be considered. While Finland has defined the direction and set clear high-level targets, it does not specify concretely how and in what timeframe they will be implemented.

Finland’s final NECP considers **just and fair transition**, by making it ‘a guiding theme in the government’s climate policy’. For example, a peat industry working group will explore how the use of peat can be directed away from energy use in a way that is fair regionally and socially. However, the plan lacks information on the social, employment and skills impact of planned objectives, and on policies and measures. On the use of peat, it only says that the aim is to reduce use of peat by at least a half by 2030, but without providing further details on how it can be done and with what benefits or impacts.

Regarding **energy poverty**, the final plan contains more information on how social aid schemes help mitigate issues related to energy bills (e.g. with the electricity security deposit). However, a more comprehensive assessment of the potential impact of the transition is missing, particularly for building renovation strategies and associated financial instruments.

Research, innovation and competitiveness

In terms of **research and innovation**, the NECP describes some seemingly well-functioning support programmes, the country’s overall good track record in clean energy technologies and strong export capability. The plan identifies a goal for investment to reach 4% of total GDP. However, the NECP does not provide details on the sectoral distribution or explanations as to when and how it will be reached. It is not clear to what extent the private sector will drive this increase and what will be the contribution of the public sector. Moreover, energy-related research and innovation funding has been declining since 2016.

As regards **competitiveness**, the emphasis is on turning Finland, already among the top clean-tech players in the EU, into the world's best environment for innovation and experiments by 2030. The NECP stresses that additional investments in research and innovation will be needed for low-carbon technologies, especially bioeconomy, the circular economy, clean energy solutions, energy efficiency, emissions-free forms of energy production, energy storage solutions, carbon recovery and energy utilisation.

Finland is active within the **Strategic Energy Technology (SET) Plan**, leading two actions: (1) energy efficiency in industry; and (2) renewable fuels and bioenergy. However, the NECP does not detail investments for each SET Plan action or provide further explanations as to how the SET Plan can contribute to reaching the national energy and climate objectives.

4. COHERENCE, POLICY INTERACTIONS AND INVESTMENTS

The final plan discusses the **interlinkages** between different policy dimensions, within the energy and climate domain, but also beyond. These include biofuel use in the transport and heating sectors, the impact of energy efficiency on district heating needs, and linking the energy efficiency first principle to a smart energy sector approach. The plan stresses the importance of a just and fair transition, but it only partially explores the importance of protecting biodiversity and the impact on air quality. For instance, it does not present measures to tackle recognised climate risks to the energy system (except for the power network, under energy security). Information is also lacking on climate change adaptation for energy efficiency, such as the thermal management of buildings. In addition, the NECP lacks details on how policies take into account the expected social, health and environmental impacts.

The plan provides information on incremental sectoral **investment needs** (rail infrastructure, production of biofuels, renewable electricity, a rough estimate of demand for the electricity grid), without being fully clear whether this covers the entire period 2020-2030 or all sectors. Total investment needs for presented sectors that include an estimate for the period 2020-2030 amount to approximately EUR 11 billion. The plan however does not include all estimated investments required for the period 2020-2030. The plan does not provide full details about the sources of investment needed to achieve the objective, particularly those at European and regional level. Instead, investment estimates are linked to specific macroeconomic projections, using them more broadly. Common projections are also used in the national energy and climate strategy of 2016 and the medium-term climate change policy plan of 2017.

A description of existing environmentally harmful **energy subsidies** is included. The assessment is based on the OECD evaluation tool and Finnish studies. The NECP does not distinguish fossil fuel subsidies, but the vast majority of environmentally harmful energy subsidies are tax breaks for energy consumption in industry, transport and agriculture. Decisions for cutting such subsidies are scheduled for autumn 2020.

The **just and fair transition** and its contribution to a climate neutral economy are not well integrated in the plan. It does not consider in detail the social and employment impacts related to a green/circular economy, shifts in sectors/industries (and skills impacts), distributional effects (and energy poverty) and revenue recycling. On **skills and training**, the plan does not mention any training measures and makes a commitment to training activities without giving any details.

The final plan briefly discusses the relationship with **air quality and air emissions policy** and mentions the expected effect of fuel use change on some air pollutants. However, it does not address synergies and trade-offs.

The NECP acknowledges the potential of the **circular economy** to make a significant contribution to reaching Finland's energy and climate goals, to its climate policy and to reducing greenhouse gas emissions, but without quantifying the potential for reducing GHG emissions. Further quantification efforts would benefit future plans, in line with the most recent scientific evidence. It underlines the close complementarity with the bioeconomy.

Biodiversity is acknowledged as a concern in the context of bioenergy, but the plan has very limited information on interactions with biodiversity policies, synergies and trade-offs, and no solution is presented to the trade-offs concerning bioenergy. Biomass will continue to be predominant in the energy mix, and it will even expand (e.g. with new investment in district heating and cooling infrastructures).

The plan describes how **climate change impacts** will affect energy supply (biomass resources, wind energy, power networks and availability of hydropower), but does not present any measures, except for the power network under energy security. Information is lacking on climate change adaptation for energy efficiency, such as the thermal management of buildings.

The '**energy efficiency first**' principle is linked to the 'smart and efficient integrated energy system' approach. This approach aims to improve energy efficiency in the entire energy system through better integration of renewables in electricity and heat systems.

The final version of the plan largely complies with **data transparency** requirements and with the use of European statistics.

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

Finland needs to swiftly proceed with implementing its final integrated national energy and climate plan as notified to the Commission on 20 December 2019. This section provides some guidance to Finland for the implementation phase.

This section also addresses the link between the final plan and the recovery efforts from after the COVID-19 crisis, by pointing at possible priority climate and energy policy measures Finland could consider when developing its national recovery and resilience plan in the context of the Recovery and Resilience Facility¹⁹.

Guidance on the implementation of the national energy and climate plan

Finland's target for non-ETS greenhouse gas emissions reduction is -39% by 2030 compared to 2005, in line with the provisions of the Effort Sharing Regulation. The current long-term objective is to reduce its GHG emissions by 80-95%, and the final plan aims to achieve carbon neutrality by 2035 and to become the world's first fossil fuel welfare society. Based on information provided in the plan, existing and planned policies and measures, together with the

¹⁹ On 17 September 2020, the Commission has put forward the Annual Sustainable Growth Strategy 2021 (COM(2020) 575 final), as well as guidance intended to help Member States prepare and present their recovery and resilience plans in a coherent way, without prejudice to the negotiations on the proposal for a Regulation on the Recovery and Resilience Facility in the European Parliament and the Council (Commission Staff Working Document. Guidance to Member States – Recovery and resilience plans, SWD (2020) 205 final).

indicated use of flexibilities, could be sufficient for Finland to meet its ESR target. If implemented, planned additional policies may deliver significant emission reductions, notably in transport and agriculture, while a smaller impact is expected in the buildings sector. The plan also introduces an objective of achieving carbon neutrality by 2035 and becoming the world's first fossil fuel welfare society. However, Finland acknowledges that the plan would need to be adapted to achieve carbon neutrality by 2035, and that several policies and measures need to be prepared and agreed to ensure consistency with the new target.

Finland's contribution to the EU 2030 renewables target is in line with the minimum share set out in Annex II of the Governance Regulation, whereas its contribution to the 2030 energy efficiency target is of low ambition. The plan therefore leaves some scope to further develop and strengthen policies and measures on renewables and energy efficiency, so as to contribute more to the EU climate and energy targets and strengthen the green transition.

On **renewables**, more detailed policies for electricity would be beneficial to build up supply chains and provide certainty for investors. These policies would need to address renewable energy self-consumption and communities, further uptake of power purchase agreements, bioenergy and diversifying the energy mix in the heating sector, apart from biomass, while maximising the role of waste heat. The sustainable use of biomass would require continued vigilance due to the high share of biomass in the energy sector.

Although the ambition for **energy efficiency** has increased compared to the draft NECP, there is still room for Finland to further reduce final and primary energy consumption in 2030, also in view of Finland's ambition to be carbon neutral by 2035. There is much potential to increase, and further develop, specific policies and measures in various fields. Although Finland has included new measures for transport, agriculture and waste heat, energy efficiency can still take a more visible role, and more concrete policies and measures can be developed. In the final plan, Finland explains why the expected increase in GDP is being accompanied by an increase in energy consumption, and there is room to define policies and measures to mitigate this development. Finally, Finland can take further advantage of the energy efficiency first principle and streamline energy efficiency measures with other efforts to shape a smart, efficient and integrated energy system.

Improving energy efficiency in buildings has much potential for speeding up energy savings and contributing to the recovery of the economy after the COVID-19 pandemic. Building on the momentum of the **Renovation Wave** initiative²⁰, there is scope for Finland to intensify efforts to improve the energy performance of the existing building stock with specific measures, targets and actions. Further support for the renovation of public and private buildings could be provided through increased public funding and by leveraging EU and national budgets with private money, combining grants, lending, guarantees and loan subsidies. Finland would need to underpin the substantial energy saving potential of the existing building stock by implementing the long-term

²⁰ Communication 'A Renovation Wave for Europe – greening our buildings, creating jobs, improving lives', COM(2020)662 and SWD(2020)550.

renovation strategy, in accordance with Article 2a of the Energy Performance of Buildings Directive²¹.

As regards **energy poverty**, Finland is encouraged to consult the Commission Recommendation of 14 October 2020 on energy poverty and its accompanying staff working document providing guidance on the definition and quantification of the number of households in energy poverty and on the EU-level support available to Member States' energy poverty policies and measures.

Finland would also benefit from further developing measures to support the **energy security** and **internal market** objectives, including measures to ensure system resilience. This includes, in particular, specific measures to preserve and strengthen cybersecurity in the energy sector. In view of the enhanced role envisaged for nuclear energy production, Finland would benefit from implementing a long-term strategy for diversification of the supply of nuclear fuels.

Finland would benefit from defining clear indicators to track progress towards its **research and innovation and competitiveness** objectives. Over time, the gathering of granular research, innovation and competitiveness data will be useful to help strengthen this process. Finland would also need to ensure the link with the SET Plan activities. In addition, the country would benefit from further strengthening the link between the competitiveness objective and the policies and measures that will be put in place for the different sectors by 2030.

Finland provided some quantified sectoral **investment needs** in its NECP, although these will be revised in view of the government's objective of making Finland carbon-neutral by 2035 and fossil fuel-free. A comprehensive agenda of reforms, accompanied by investments in low-carbon technologies, energy transition and sustainable transport infrastructure, would be particularly important in order to deliver on these ambitious objectives. Opportunities arise particularly in the electrification of transport, in the energy efficiency of buildings and in electricity networks. Finland could also underpin its objectives for renewable energy with concrete investments in power production, distribution and system operation. The prioritising of such public investment projects supporting the green transition could have an important role in fostering the economic recovery.

Finland has been rather proactive in terms of **regional cooperation**, notably in the context of the Baltic Energy Market Interconnection Plan (BEMIP) High Level Group and in the context of the regional cooperation between the Nordic countries. Finland is invited to continue ongoing efforts to intensify exchanges and initiatives facilitating the implementation of its NECP, particularly as regards relevant cross-border issues²². Finland is also invited to better exploit the potential of the **multilevel climate and energy dialogues** to actively engage with regional and local authorities, social partners, civil society organisations, the business community, investors and other relevant stakeholders, and to discuss with them the different scenarios envisaged for its energy and climate policies.

²¹ Finland submitted its long-term renovation strategy in accordance with Article 2a of Directive 2010/31/EU on the Energy Performance of Buildings on 10 March 2020.

²² In this context, the Commission will help address related issues in a strategic manner in its upcoming Strategy for Offshore Renewable Energy by identifying key actions in the area of maritime planning, upscaling technologies, and a new approach to infrastructure planning and offshore renewables capacity building.

Finland is invited to extend and update identification and reporting on **energy subsidies** and intensify action to phase them out, in particular for fossil fuels. The green transition in Finland would receive a further boost from rapid phase-out of the fossil fuel subsidies identified in the NECP and recent Commission analyses. This would involve the further development and implementation of specific plans with associated timelines, coupled with measures to mitigate the risk of household energy poverty.

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

In implementing its plan, Finland is invited to make the **best possible use of the various funding sources available**, combining scaled-up public financing at all levels (national and local, as well as EU funding) and leveraging and crowding in private financing. Tables 1 and 2 of Annex I provide an overview of EU funding sources which should be available to Finland during the forthcoming multiannual financing period (2021-2027) and EU funding addressed to all Member States and companies. For the forthcoming period, the European Council has committed to the mainstreaming of climate action into all EU programmes and instruments and to an overall target of at least 30% of EU funding to support climate objectives. At the same time, EU expenditure should be consistent with the Paris Agreement and the ‘do no harm’ principle of the European Green Deal. At EU level, funding will be available for Finland from the Innovation Fund, and will also be based on revenues from the auctioning of allowances under the EU emissions trading system.

Link to the recovery from the COVID-19 crisis

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

In the context of the Recovery and Resilience Facility, which is expected to be operational on 1 January 2021, **Finland’s final plan constitutes a strong basis for it to design the climate and energy-related aspects of its national recovery and resilience plan** and to deliver on broader European Green Deal objectives. In particular, the mature investment projects outlined in the plan and the key enabling reforms would need to start as soon as possible.

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

In addition, **the Commission strongly encourages Member States to include in their recovery and resilience plans investment and reforms in a number of ‘flagship’ areas**²³. In particular, the ‘Power up’, ‘Renovate’ and ‘Recharge and refuel’ flagships are directly related to energy and climate action and to the contents of the final national energy and climate plans. Measures under the ‘Reskill and upskill’ flagship are also essential to foster the climate and energy transition in all Member States.

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

Based on Finland’s final national energy and climate plan, and on the investment and reform priorities identified for Finland in the European Semester, **the Commission services invite Finland to consider, while developing its national recovery and resilience plan, the following climate and energy-related investment and reform measures:**

- Measures to promote a carbon neutral economy and ensure more consistent price signals to foster energy sector integration, energy efficiency and renewable energy;
- Measures and investments to promote energy efficiency in buildings, including automation and digitalisation, as well as the decarbonisation of heating systems;
- Measures and investments to promote the electrification and capacity of railways.

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

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

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

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

Programme	Amount	Comments
Cohesion policy funds (ERDF, ESF+, Cohesion Fund)	1.7	In current prices. Includes funding for European territorial cooperation (ETC). Does not include amounts transferred to the Connecting Europe Facility.
Common agricultural policy – European Agricultural Fund for Rural Development, and direct payments from the European Agricultural Guarantee Fund.	6.2	In current prices. Commitments under the multi-annual financial framework.
Recovery and Resilience Facility	2.3	In 2018 prices. Indicative grants envelope, sum of 2021-2022 and estimated 2023 commitments. Based on the Commission's summer 2020 GDP forecasts.
Just Transition Fund	0.4	In 2018 prices. Commitments both under the multi-annual financial framework (MFF) and Next Generation EU.
ETS auction revenue	1.7	Indicative: average of actual 2018 and 2019 auction revenue, multiplied by seven. The amounts in 2021 to 2027 will depend on the quantity and price of auctioned allowances.

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

Programme	Amount	Comments
Horizon Europe	91.0	In current prices. Includes Next Generation EU credits.
InvestEU	9.1	In current prices. Commitments both under the multi-annual financial framework (MFF) and Next Generation EU. Includes the InvestEU fund (budgetary guarantee to public and private investment) and the advisory hub (technical advice). Does not consider appropriations available to beneficiaries through implementing partners, such as the European Investment Bank.
Connecting Europe Facility • Transport • Energy	24.1 5.8	In current prices. The commitment for transport includes the contribution transferred from the Cohesion Fund. Excludes Connecting Europe Facility Military Mobility funding for dual use infrastructure.
Recovery and Resilience Facility	360.0	In 2018 prices. Non-allocated commitments for loans. Loans for each Member State will not exceed 6.8% of its gross national income.
Technical Support Instrument	0.9	In current prices.
Programme for Environment and Climate Action (LIFE)	5.4	In current prices.
European Agricultural Fund for Rural Development	8.2	In current prices. Commitments under Next Generation EU.
Innovation Fund	7.0	Approximation: 7/10 of the allocations of ETS allowances to provide revenue to the Innovation Fund for 2021-2030 and assuming a carbon price of EUR 20 per tonne.

Note to both tables

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

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

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

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

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

Recommendations		Assessment	
Decarbonisation - GHG	Clarify how it plans to comply with the commitment under Regulation (EU) 841/2018 of the European Parliament and of the Council that land use, land use change and forestry (LULUCF) emissions do not exceed removals, taking into account the possibility of using flexibilities between the effort sharing and the LULUCF sectors. This requires applying the LULUCF accounting rules. Quantify the impact over the whole period 2021-2030 of planned policies and measures to reach the 2030 greenhouse gas target for sectors outside the EU emissions trading system of -39% compared to 2005.	Partially addressed	The sub-recommendation on clarifying how to comply with the LULUCF regulations and that emissions from the LULUCF sector do not exceed removals, including the application of the LULUCF accounting rules, was not addressed. Finland has not clarified how it intends to comply with the no debit rule. LULUCF projections are not provided. Finland also states that the LULUCF flexibility mechanism has not been taken into account because of associated uncertainties. The sub-recommendation on quantifying the impacts over 2021-2030 of planned policies and measures to reach the 2030 GHG target for sectors outside the EU ETS was partially addressed. Finland has provided a scenario assessing the impact of planned measures but underlines that several policy measures related to the energy and climate objectives remain to be prepared and decided.
Decarbonisation - renewables	Increase the level of ambition for 2030 to a renewable energy share of at least 51% as Finland's contribution to the EU's 2030 target for renewable energy, as indicated by the formula in Annex II under Regulation (EU) 2018/1999. Include an indicative trajectory in the final integrated national energy and climate plan that reaches all the reference points pursuant to Article 4(a)(2) of Regulation (EU) 2018/1999 in accordance with that share, in view of the need to increase the level of efforts for reaching this target collectively.	Fully addressed	Finland has set a 51% share as Finland's national contribution to the EU's binding target of at least 32% of renewable energy in compliance with the Renewable Energy Directive, which is in line with the formula. The indicative minimum levels for intermediate years concerning the renewable energy target until 2030 meets the minimum requirement for the national development of renewable energy described in point (a)(2) of Article 4 of the Regulation on the Governance of the Energy Union.
	Put forward detailed and quantified policies and measures that are in line with the obligations laid down in Directive 2018/2001 of the European Parliament and Council, to enable a timely and cost-effective achievement of this contribution.	Partially addressed	On transport, the plan mentions specific measures to limit CO ₂ emissions and provides quantifications of the impact. Finland aims to increase the share of renewable energy to 30% of the final energy use in road transport. The plan contains objectives for the share of transport biofuels to be increased to 30% and to have 250 000 electric and 50 000 gas-powered vehicles on the roads. However, for electricity and heating and cooling, the plan lacks detail

			on the quantified impact of policies and measures.
	Provide additional details on the specific measures planned to ensure the long-term sustainability of the use of biomass in the energy sector, given the important contribution of biomass across the Finnish energy mix.	Partially addressed	Biodiversity is acknowledged as a concern linked with bioenergy, and appears to be a core priority of the new government programme in relation to carbon neutrality. The plan considers that the sustainable management of forests is ensured and no clear actions are presented.
	Provide additional details on the enabling frameworks for renewable self-consumption and renewable energy communities, in line with Articles 21 and 22 of Directive (EU) 2018/2001.	Partially addressed	The final NECP announces that the key concepts to promote energy communities have been identified in the work of the Smart Grid Working Group in 2018. However, it also mentions a study to identify unjustified barriers concerning self-consumption and renewable energy communities, but no more information is provided.
Energy efficiency	As regards energy efficiency, substantially increase the ambition towards reducing both final and primary energy consumption in 2030 in view of the need to increase the level of efforts to reach the EU's 2030 energy efficiency target.	Partially addressed	The ambition was increased but the level for both primary energy consumption and final energy consumption is low compared to efforts at EU level.
	Support the increased ambition with policies and measures that would deliver additional energy savings by 2030	Partially addressed	Finland has included new measures for the transportation sector, agriculture and waste heat. However, some of these measures do not have energy efficiency as a main priority and some have already been implemented.
	Look at the energy savings potential in the residential and industrial sectors and identify the most appropriate measures to address it.	Partially addressed	The energy savings potential in the individual sectors is not described. The policies and measures target these sectors but it is unclear what specific sectors are targeted by a particular policy or measure. The information provided on the renovation of the building stock has been improved.
	Assess the reasons behind the expected increase of the gross domestic product (GDP) being accompanied by an increase of energy consumption, and identify specific measures to mitigate such effect.	Partially addressed	An explanation is provided, based on the projected GDP growth in heavy industries with high energy intensity (such as pulp production, biorefineries and data centres). However, the plan does not specify which policies and measures would mitigate this effect.
Energy security	Specify the measures supporting the energy security objectives on diversification and reduction of energy dependency, including measures ensuring flexibility	Largely addressed	The main security measure emphasised by Finland is a well-functioning domestic and regional electricity market that provides the right signals for any needed investments. In addition, a strategic reserve will be maintained to ensure security of electricity supply. Diversification and flexibility will be achieved through market rules to encourage energy storage and demand side response.

	Specific the strategy to ensure the long-term supply of nuclear materials and fuel, in particular in the perspective of the development of nuclear generation capacity.	Not addressed	No additional information was provided concerning the long-term supply of nuclear materials and fuel.
Internal energy market	No recommendations	n/a	-
Research innovation and competitiveness	Further clarify national objectives and funding targets in research, innovation and competitiveness, specifically related to the Energy Union, to be achieved between now and 2030, so that they are readily measurable and fit for purpose to support the implementation of targets in the other dimensions of the final integrated national energy and climate plan. Underpin such objectives with specific and adequate policies and measures, including those to be developed in cooperation with other Member States, such as the European Strategic Energy Technology Plan.	Partially addressed	The goal of the new government to raise RDI investment to 4% of GDP is welcome and the plan also identifies research and innovation efforts in relevant areas. However, funding targets, timeframes and implementation measures are missing. It is not clear how public and private sector measures will complement each other. As regards competitiveness, the emphasis is put on bioenergy but also on renewable forms of energy (solar and wind power). The low-carbon technologies sector is generally described, but measurable objectives for the future are missing. The cooperation with the Strategic Energy Technology (SET) Plan is well explained.
Regional cooperation	Intensify the already good regional cooperation arrangements between Nordic countries (Denmark, Finland, Iceland, Norway and Sweden), extending them to new areas and broadening the geographic reach to include the Baltic States (Estonia, Latvia and Lithuania). The focus of the regional exchanges should be on internal energy market and energy security areas, in view to the changes in the electricity systems accommodating higher shares of renewable electricity, which will increase electricity import/export and enhance the need for system flexibility.	Fully addressed	The final plan states that NECPs will give a solid basis for future cooperation on energy and climate policy with Nordic and Baltic states. Finland has a wide range of energy and climate cooperation initiatives with Nordic countries and regional cooperation has been intensified with the establishment of an annual Nordic Electricity Market Forum, which addresses all of the areas listed in the recommendations. A well-functioning regional electricity market is identified as contributing to the energy security of Finland (see also the recommendation on 'energy security'). Strengthened cooperation on electricity and gas market integration is also taking place with Baltic countries.
Investments and funding sources	No recommendations	n/a	-
Energy subsidies	List all energy subsidies.	Largely addressed	The final NECP represents a meaningful upgrade of the draft plan. Finland has included information regarding subsidy schemes for renewable energy.

	List in particular fossil fuel subsidies.	Largely addressed	A table of environmentally harmful energy subsidies has been included in the final plan.
	List actions and plans to phase out energy subsidies, in particular for fossil fuels.	Partially addressed	There are no plans to phase out energy subsidies. However, the government intends to launch preparatory work aimed at making cuts to environmentally harmful subsidies and to use the funds that are released to meet current policy targets.
Air quality	Complement the analysis of the interactions with air quality and air emissions policy, presenting the impacts on air pollution for the various scenarios, providing underpinning information, and considering synergies and trade-off effects.	Partially addressed	The NECP assesses qualitatively the expected effect of a change in fuel use on some air pollutant emissions. However, it lacks a proper quantitative assessment, notably to capture the effect of bioenergy, which is projected to continue increasing until 2030. The sub-recommendation on complementing the analysis of interactions with air quality and air emissions policy was partially addressed. Only a brief assessment of the impact of policies on air pollutants has been provided. The sub-recommendation on presenting the impacts on air pollution for various scenarios was partially addressed. The impacts have only be given cursory, qualitative consideration. The sub-recommendation on providing underpinning information to the analysis of air quality impacts of various scenarios was fully addressed. The sub-recommendation on considering synergies and trade-offs was not addressed.
Just and fair transition	Integrate just and fair transition aspects better, notably by providing more details on social, employment and skills impacts of planned objectives, and policies and measures.	Partially addressed	The NECP makes it clear that fair transition is a guiding theme in the government's climate policy and that emissions reduction measures will be carried out in a way that is fair from a social and regional perspective, involving all sectors of society. It announces some welcome initiatives in this respect. However, employment impacts are only indirectly covered, and specific plans and measures are still to be delivered. As well, it would also be relevant to provide a distributional impact assessment on households' income (including impact on housing costs) of the planned transition measures.